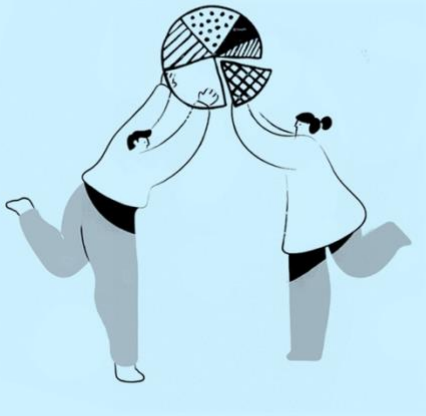

National Assessment Program

ICT Literacy 2022

Public Report

acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY

This public report was written by Dr Tim Friedman, Kate O'Malley, Zachary Watts, Dr Kristy Osborne, Louise Ockwell and Laila Helou from the Australian Council for Educational Research (ACER).

The NAP–ICT Literacy staff from ACARA include:

Wei Buttress – Project Manager

Dr Eveline Gebhardt – Senior Manager, Psychometrics

Leigh Patterson – Data Analyst/Psychometrician

Kim Vernon – ACARA Curriculum Specialist, Technologies

Matthew Stokoe – NAP Sample Project Officer

The NAP–ICT Literacy staff from ACER include:

Julian Fraillon and Dr Tim Friedman – Project Directors

Daniel Duckworth, Stewart Monckton and Dr Kristy Osborne – Lead Test Developers

Kate O'Malley – Field Operations Lead

Dominique Hall – Senior Project Officer

Renee Kwong – Psychometrician

Dr Martin Murphy, Nina Martinus and Emma Camus – Sampling

Acknowledgement of Country

ACARA acknowledges the Traditional Owners and Custodians of Country and Place throughout Australia and their continuing connection to land, waters, sky and community. We pay our respects to all Aboriginal and Torres Strait Islander Peoples, histories and cultures, and to Elders past and present.

Contact details

Australian Curriculum, Assessment and Reporting Authority
Level 13, Tower B, Centennial Plaza, 280 Elizabeth Street Sydney NSW 2000
T 1300 895 563 | F 1800 982 118 | www.acara.edu.au

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Acknowledgements

NAP–ICT Literacy Working Group members

Listed below are the main working group members representing the Australian Government, jurisdictions and school sectors. These members have made a valuable contribution to the project throughout the development, implementation and reporting phases.

National representatives

Australian Government representatives

Gabrielle Phillips
Nicola Hilyard
Breona Humphry
Rhiannon Wynn

Catholic school sector representatives

Liam Garvey
Edwin Choi

Independent school sector representatives

Peter Roberts
Julie Baud

Educational measurement specialist

Susan Dennett

State and territory representatives

Australian Capital Territory

Jodi Adams

New South Wales

Mark Tyler
Anthony Rotondo

Northern Territory

Sue Carter

Queensland

Chantelle Sansness
Dr Emily Ross
Bruce Clark
Chris Brown
Deanne Johnston

South Australia

Paul Clapton-Caputo
Karen Butler

Tasmania

Mark Sivills
Bobby Pederson
Rachael Donaldson

Victoria

Phil Feain

Western Australia

Clayton Godwin
Rosalba Butterworth
Juanita Healy

List of acronyms

AC	Australian Curriculum (Version 8.4)
ACARA	Australian Curriculum, Assessment and Reporting Authority
DT	Digital Technologies
ICILS	International Computer and Information Literacy Study
ICT	Information and Communication Technology
IRT	Item Response Theory
KPM	Key performance measure
MCEETYA	Ministerial Council on Education, Employment, Training and Youth Affairs
NAEP	National Assessment of Educational Progress
NAP	National Assessment Program
NAPLAN	National Assessment Program – Literacy and Numeracy
NAP—ICTL	National Assessment Program – Information & Communication Technology Literacy
STEM	Science, Technology, Engineering and Mathematics
TRT	Technical readiness test

Terms used in this report

Term	Definition
AC: ICT Capability	The Australian Curriculum: ICT Capability was released in 2012. The AC: ICT Capability conceptualises ICT as a cross-disciplinary capability that comprises a broad set of interrelated organising elements that describe how to use ICT effectively and appropriately to access, create and communicate information and ideas, solve problems and work collaboratively in all learning areas at school and in students' lives beyond school. ICT capability involves students learning to make the most of the digital technologies available to them, adapting to new ways of doing things as technologies evolve and limiting the risks to themselves and others in a digital environment (ACARA, 2012).
AC: Digital Technologies	The Australian Curriculum: Digital Technologies was released in 2015. In Digital Technologies students use computational thinking and information systems to define, design and implement digital solutions. The AC: Digital Technologies empowers students to shape change by influencing how contemporary and emerging information systems and practices are applied to meet current and future needs. A deep knowledge and understanding of information systems enables students to be creative and discerning decision-makers when they select, use and manage data, information, processes and digital systems to meet needs and shape preferred futures (ACARA, 2015).
Confidence interval	An estimate derived from a sample is subject to uncertainty because the sample may not reflect the population precisely. The extent to which this variation exists is expressed as the confidence interval. The 95% confidence interval is the range within which the estimate of the statistic based on repeated sampling would be expected to fall for 95 of 100 samples that might have been drawn.
Correlation coefficient	A statistical measure that indicates the degree to which 2 variables are related. The values range between -1.0 (a perfect negative correlation) and 1.0 (a perfect positive correlation). A coefficient of 0.0 shows no linear relationship between the 2 variables being studied.
Effect size	The difference between group means divided by the standard deviation. Effect size provides a comparison of the difference in average scores between 2 groups with reference to the degree in which the scores vary within the groups. When the effect size is large, it means that the difference between average scores is large relative to the spread of the scores. The difference could therefore be considered as "important". Conversely, when the effect size is small, it means that the observed difference is relatively small compared with the spread of the scores and thus arguably less "important".
Exempt	Students with very limited English language proficiency and students with significant intellectual or functional disabilities may be exempted from testing.
Functional disability	The student has a moderate to severe permanent physical disability such that they would not be expected to perform in the assessment situation.
Geolocation	The Australian Statistical Geography Standard (ASGS) Remoteness Structure is used to disaggregate data and classify the locality of individual schools as metropolitan, regional or remote.
ICT devices	ICT devices include desktop computers, laptop computers (including notebooks and netbooks), tablets and smartphones used to access the internet or use apps.
ICT literacy	The ability of individuals to use ICT appropriately to access, manage and evaluate information, develop new understandings and communicate with others in order to participate effectively in society.

Term	Definition
Indigenous status	A student's Indigenous status refers to whether a student identifies as being of First Nations Australian Aboriginal and/or Torres Strait Islander origin. The term "origin" is considered to relate to people's First Nations Australian Aboriginal or Torres Strait Islander descent and for some, but not all, their cultural identity. A student who identifies as a First Nations Australian student is also considered to be of Aboriginal and/or Torres Strait Islander origin.
NAP—ICT Literacy scale	The NAP–ICT Literacy scale is a continuous scale that provides a measure of student achievement in ICT literacy.
Intellectual disability	The student has a mental or emotional disability and cognitive delay such that they would not be expected to perform in the assessment situation.
Jurisdiction	For the purposes of this report, jurisdiction refers to all 3 educational sectors (government, Catholic and independent) that sit within an Australian state or territory. The state/territory level is the most granular level of analysis undertaken for the purposes of NAP sample reporting.
Language other than English spoken at home	Language other than English spoken at home is defined as the language other than English spoken in the home by the student. If the student speaks more than one language other than English at home, the language other than English the respondent speaks most often is reported.
Limited assessment language proficiency	The student is unable to read or speak the language of the assessment and would not be expected to overcome the language barrier in the assessment situation. Typically, a student who had received less than one year of instruction in the language of the assessment would be excluded.
NAP—ICTL Assessment Framework	This assessment framework includes information on how the content assessed in NAP–ICT Literacy relates to the Australian Curriculum: ICT Capability and Australian Curriculum: Digital Technologies.
Parental education	Parental education represents the highest level of parental school or non-school education that a parent/guardian has completed. This includes the highest level of primary or secondary school completed or the highest post-school qualification attained.
Parental occupation	Parental occupation represents the occupation group that includes the main work undertaken by the parent/guardian. If a parent/guardian has more than one job, the occupation group that reflects their main job is reported.
Participation rates	Participation rates are the percentages of sampled students that participated in the assessment. Participation rates are calculated as the number of assessed students from whom data were recorded as a percentage of the total number of sampled students in the year level.
Percentage point	The unit of measurement used to describe the difference between 2 percentages.
Percentages	The percentages of students represented in the tables have been rounded and may not always sum to 100.
Proficiency level	In 2005, 6 proficiency levels were established at equally-spaced intervals across the NAP–ICT Literacy Scale. Each proficiency level spans 120 scale points. Each level description provides a synthesised overview of the knowledge, skills and understandings that a student working within the level can demonstrate.

Term	Definition
Proficient standard	Proficient standards represent a "challenging but reasonable" expectation of student achievement at a year level. Proficient standards provide reference points of reasonable expectation of student achievement at that year in the area. The proficient standards in ICT Literacy (one for Year 6 and one for Year 10) were established following consultations with ICT experts and representatives from jurisdictions and sectors as part of NAP–ICT Literacy – 2005.
Rasch model	The Rasch model of Item Response Theory is a psychometric model for analysing categorical data. It is the chosen model of analysis for cognitive and contextual data across all NAP sample assessments.
Sample	A sample is a subset of a population selected so that reliable and unbiased estimates of statistics for the full population can be inferred.
Sector	Sector refers to the 3 educational sectors of government, Catholic and independent. All schools throughout Australia belong to one of these 3 school sectors. It is important to note that student responses for NAP sample assessments, in their most disaggregated form, are not analysed or reported by sector but are instead examined at the jurisdictional level.
Significant	In this report, the term significant refers only to differences that are statistically significant. Once a difference has been identified as statistically significant, the size of this difference (ranging from a small to very large effect size) can be considered.
Significant difference	A statistically significant difference refers to the likelihood of a difference being a true reflection of the measured outcomes rather than the result of chance.
Standard deviation	The standard deviation is a measure of variability or dispersion in student scores from the mean (or average).
Study utilities	These are digital software or applications that assist in academic learning and research tasks.
Trend module	A test module used in at least one of the previous NAP—ICTL assessment cycles.
Withdrawn	Students may be withdrawn from the testing program by their parent/carer. Withdrawals are intended to address issues such as religious beliefs and philosophical objections to testing.

Foreword

From entertainment to medical science, communication to space exploration, even to questions about the nature of consciousness and intelligence itself, young Australians today face a world in which the need for information and communication technology literacy has never been greater. To evaluate how well our schools are equipping students with the skills necessary to excel in such a data-dependent environment, the Australian Curriculum, Assessment and Reporting Authority (ACARA) conducts the National Assessment Program (NAP) sample assessment in Information and Communication Technology Literacy (NAP–ICTL).

The assessment is held every 3 years with a representative sample of Year 6 and Year 10 students across Australia and provides a national and jurisdictional snapshot of student performance. The first cycle was held in 2005. The 2020 cycle – the sixth in the NAP–ICTL program – was delayed by the COVID-19 pandemic and was administered in 2022.

To ensure real-world applicability, the assessment used purpose-built software that mimicked frequently used software applications. Students were able to demonstrate their ICT literacy abilities across a range of tasks, including accessing and managing information, sharing knowledge, creating information products, and using ICT responsibly by considering social, legal and ethical questions. Students also completed a survey on their attitudes towards using ICT, and their use of digital devices in and outside of school.

Despite the student survey showing high device usage and positive attitudes towards technology, and though most students indicated that they felt well prepared to use ICT devices for remote learning in the future, the findings in this report suggest that there is an opportunity in Australia for student ICT literacy to improve.

This report provides valuable data and contains interesting insights into ICT capability and digital tool use over time, which both educators and national and jurisdictional policymakers can use to address performance disparities between students of different gender, geolocation and parental education/occupation. The report should also encourage a continued and concerted focus on improving ICT learning opportunities for First Nations Australian students.

ACARA acknowledges and thanks the many senior ICT educators, representing all jurisdictions and sectors, who have contributed to the development of this assessment. ACARA also acknowledges the combined expertise of the Australian Council for Educational Research and ACARA's NAP–ICTL technology partner, RM. Lastly, ACARA thanks the many principals, teachers and students at government, Catholic and independent schools who participated so graciously in the field trial and the main assessment, helping to provide important information about this issue.

I commend this report to teachers, policymakers and the educational community at large. Now more than ever we, as a nation, must continue a keen focus on ensuring all young Australians are provided as part of their schooling with the digital skills necessary not only to support successful learning, but to contribute meaningfully to an active, caring and responsible society.

Mr Derek Scott
Chair, ACARA Board

Executive summary

Introduction

This report documents the findings of the sixth National Assessment Program ICT Literacy (NAP–ICT Literacy) assessment cycle.

In reporting national key performance measures (KPMs) of Australian students' ICT literacy, the NAP–ICT Literacy assessment provides a way to monitor progress towards the Alice Springs (Mparntwe) Education Goals for Young Australians.

To access editions of this report for the previous 5 cycles, visit www.nap.edu.au.

Context

The National Assessment Program began as an initiative of ministers of education in Australia to monitor outcomes of schooling specified in the 1999 Adelaide Declaration on National Goals for Schooling in the 21st Century (Adelaide Declaration). In 2008, the Adelaide Declaration was superseded by the Melbourne Declaration, which in turn was superseded by the Alice Springs (Mparntwe) Education Declaration in 2019.

Goal 2 of the Alice Springs (Mparntwe) Education Declaration is that "all young Australians become confident and creative individuals, successful lifelong learners, and active and informed members of the community" (Education Council 2019, p. 6). The elaboration of this goal highlights the importance of young Australians' digital and ICT literacy in a rapidly evolving technological landscape and establishes the context and rationale for reporting on student achievement and progress in this area.

What is assessed in NAP–ICT Literacy

For NAP–ICT Literacy 2022, ICT literacy is defined as "the ability to use ICT appropriately and safely to access, manage and evaluate information; develop new understandings; apply computational, design and systems thinking to create solutions; communicate and collaborate with others; and engage productively with emerging and future technologies" (ACARA 2020, p. 13).

The NAP–ICT Literacy assessment instrument requires students to apply their ICT knowledge within real-world contexts that represent the 4 strands and integrated aspects outlined in the NAP–ICT Literacy Assessment Framework. These are:

- **Understanding ICT and digital systems,** which includes managing information and operating ICT (Aspect 1.1) and understanding digital systems (Aspect 1.2)
- **Investigating and planning solutions with ICT,** encompassing accessing and evaluating information (Aspect 2.1), collecting and representing data (Aspect 2.2), and formulating problems and planning solutions (Aspect 2.3)
- **Implementing and evaluating digital solutions,** which involves communicating with digital information products (Aspect 3.1) and developing algorithms, programs and interfaces (Aspect 3.2)
- **Applying safe and ethical protocols and practices when using ICT,** focusing on safe and responsible information consumption with ICT (Aspect 4.1) and responsible digital solution and information production with ICT (Aspect 4.2).

NAP–ICT Literacy and the Australian Curriculum

The NAP–ICT Literacy Assessment Framework guides the development of the assessment and positions it in the broader context of the Australian Curriculum: ICT Capability and the Australian Curriculum: Digital Technologies.

In 2020, revisions to the NAP–ICT Literacy Assessment Framework were undertaken to more clearly articulate its alignment with these areas of the Australian Curriculum. The framework is highly congruent with the Australian Curriculum: ICT Capability. The 2 share common conceptualisations of the purpose of ICT literacy and describe very similar and largely overlapping processes. Similarly, the Australian Curriculum: Digital Technologies shares a common core with what is assessed in NAP–ICT Literacy through the creation of digital solutions to real-world problems.

Further information about the relationship between NAP–ICT Literacy and the Australian Curriculum is provided in Chapter 1.

Assessment instrument

The 2022 assessment instrument consisted of 8 discrete online modules, each with a 20-minute time limit. Every module followed a linear narrative sequence designed to reflect typical real-world use of ICT. All the modules included large tasks to be completed using purpose-built software applications.

Three of the 8 modules were “trend” modules that were used in at least one of the previous assessment cycles. The inclusion of trend modules allowed direct comparisons to be made between the students' achievement in 2022 and in previous cycles of NAP–ICT Literacy. The remaining 5 modules were newly developed for use in the 2022 assessment.

The full set of assessable content was distributed across a series of test forms using a rotated module design. Every student was assigned one test form containing a total of 4 modules, appropriate to their year level.

Following the test, all students completed a survey designed to measure their access to and use of ICT devices in and outside of school, as well as their attitudes towards using ICT devices.

Assessment administration

The assessment instrument was administered online to representative, random samples of students in Year 6 and Year 10 in Term 4, 2022. Data were provided by 5,412 Year 6 students in 325 schools and 4,569 Year 10 students in 311 schools.

Detailed descriptions of the methods used to develop and administer the assessment are provided in Chapter 2.

NAP–ICT Literacy scale

The NAP–ICT Literacy scale comprises 6 proficiency levels that are used to describe students’ achievement for both Year 6 and Year 10. The scale was set in 2005, with a mean score of 400 and standard deviation of 100 scale points for the national Year 6 sample. NAP–ICT Literacy scale scores from both year levels and all subsequent assessment cycles are reported on this same metric.

Two proficient standards – one for Year 6 and one for Year 10 – were also established in 2005 on the NAP–ICT Literacy scale. Each standard is a point on the scale that represents a "challenging but reasonable" expectation of student achievement at that year level. The proficient standard for Year 6 is the boundary between levels 2 and 3 on the NAP–ICT Literacy scale. The proficient standard for Year 10 is the boundary between levels 3 and 4 on the scale. The proportion of students attaining at or above each proficient standard is the key performance measure for ICT literacy at each year level.

Chapter 3 discusses the NAP–ICT Literacy scale and its properties. It outlines the 6 proficiency levels used to describe the achievement of students. Student achievement for Year 6 and for Year 10 is reported at the national level and by the following population sub-group categories: gender, Indigenous status, language spoken at home, school geographic location, and parental occupation and education. Exemplar assessment items for each proficiency level are also provided in Chapter 3.

KPM: Performance against the Year 6 proficient standard

At the national level in 2022, 55% of Year 6 students attained the proficient standard. This is not significantly different from the percentage achieved in any of the previous NAP–ICT Literacy cycles, except for 2011, at 62% (Table ES 1).

There has been little variation in the percentage of Year 6 students attaining the proficient standard within each state and territory since 2005.

Table ES 1: Percentages of Year 6 students attaining the proficient standard nationally and by state and territory since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	55 (±5.3)	51 (±4.2)	55 (±4.9)	▲ 66 (±4.1)	55 (±5.7)	51 (±6.6)
VIC	61 (±4.2)	62 (±4.5)	64 (±4.5)	64 (±3.8)	66 (±6.5)	58 (±6.3)
QLD	52 (±5.0)	47 (±5.8)	48 (±5.8)	55 (±4.8)	48 (±5.3)	▼ 38 (±5.3)
SA	51 (±5.2)	53 (±6.5)	59 (±4.3)	▲ 62 (±4.9)	▲ 64 (±5.3)	52 (±5.0)
WA	50 (±4.5)	54 (±4.5)	52 (±4.8)	59 (±5.5)	51 (±4.1)	▼ 40 (±5.4)
TAS	49 (±6.5)	49 (±5.9)	46 (±5.4)	51 (±5.5)	52 (±7.0)	49 (±9.0)
NT	39 (±8.6)	35 (±11.5)	43 (±6.3)	42 (±9.2)	42 (±10.6)	36 (±10.0)
ACT	70 (±6.4)	65 (±8.4)	58 (±10.6)	74 (±8.3)	75 (±6.6)	58 (±12.5)
Aust.	55 (±2.4)	53 (±2.4)	55 (±2.5)	▲ 62 (±2.0)	57 (±2.8)	49 (±3.0)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Year 6 average score achievement

At the national level in 2022, the average scale score of students in Year 6 was 414 scale score points. This was significantly lower than in 2011, but not significantly different from the average in any other cycle (Table ES 2).

Table ES 2: NAP–ICT Literacy average scale scores nationally and by state and territory for Year 6 since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	416 (±12.8)	404 (±11.9)	412 (±12.0)	▲ 445 (±12.5)	413 (±14.5)	405 (±12.9)
VIC	428 (±10.1)	432 (±9.4)	437 (±9.6)	448 (±9.3)	447 (±15.1)	424 (±13.7)
QLD	403 (±16.0)	399 (±12.4)	393 (±13.7)	415 (±14.0)	392 (±11.8)	▼ 370 (±12.3)
SA	405 (±11.7)	405 (±14.9)	421 (±10.3)	▲ 436 (±10.3)	▲ 439 (±12.5)	412 (±11.4)
WA	404 (±10.1)	406 (±10.3)	404 (±13.2)	424 (±13.5)	403 (±11.5)	379 (±10.8)
TAS	394 (±15.0)	390 (±12.9)	385 (±15.1)	405 (±12.4)	408 (±16.4)	404 (±19.4)
NT	350 (±32.0)	335 (±43.5)	361 (±20.5)	367 (±37.5)	364 (±49.8)	346 (±53.7)
ACT	452 (±13.7)	437 (±17.3)	429 (±26.0)	466 (±22.8)	472 (±13.9)	428 (±22.1)
Aust.	414 (±6.0)	410 (±5.4)	413 (±5.7)	▲ 435 (±5.7)	419 (±6.9)	400 (±6.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

KPM: Performance against the Year 10 proficient standard

At the national level in 2022, 46% of Year 10 students attained the proficient standard. This is significantly lower than the percentage achieved in 2017 and all previous cycles of NAP–ICT Literacy (Table ES 3).

At the state and territory level, there was a significant decline in the percentage of Year 10 students attaining the proficient standard in Western Australia, New South Wales and South Australia. In other states and territories, there was no significant change from 2017 in the proportion of students attaining the proficient standard.

Table ES 3: Percentages of Year 10 students attaining the proficient standard nationally and by state and territory since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	44 (±8.3)	▲ 57 (±6.8)	50 (±5.5)	▲ 66 (±5.3)	▲ 67 (±5.4)	▲ 61 (±7.6)
VIC	50 (±5.6)	55 (±5.0)	55 (±5.9)	▲ 68 (±4.9)	▲ 70 (±6.7)	▲ 67 (±4.8)
QLD	45 (±6.0)	47 (±6.6)	47 (±5.6)	▲ 63 (±4.3)	▲ 62 (±6.2)	▲ 60 (±7.4)
SA	46 (±5.7)	▲ 56 (±4.6)	▲ 57 (±5.9)	▲ 63 (±5.6)	▲ 65 (±4.9)	▲ 61 (±5.4)
WA	46 (±4.5)	▲ 62 (±4.0)	▲ 57 (±5.8)	▲ 61 (±4.0)	▲ 65 (±5.9)	▲ 56 (±6.1)
TAS	31 (±6.3)	39 (±5.6)	▲ 51 (±5.8)	▲ 54 (±7.1)	▲ 58 (±7.4)	▲ 56 (±6.4)
NT	34 (±18.9)	27 (±8.4)	43 (±9.1)	48 (±8.8)	46 (±13.4)	49 (±13.2)
ACT	56 (±9.6)	54 (±8.4)	60 (±9.1)	▲ 72 (±7.0)	▲ 77 (±6.1)	66 (±11.4)
Aust.	46 (±3.2)	▲ 54 (±3.0)	▲ 52 (±2.5)	▲ 65 (±2.3)	▲ 66 (±3.0)	▲ 61 (±3.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Year 10 average score achievement

At the national level in 2022, the average scale score of students in Year 10 was 503 score points. This was significantly lower than in 2017, 2011, 2008 and 2005 but not significantly different from the average reported in 2014.

For New South Wales and Western Australia, the average scale scores for Year 10 students in 2022 were significantly lower than the averages reported in the previous cycle of NAP–ICT Literacy in 2017.

Table ES 4: NAP–ICT Literacy average scale scores nationally and by state and territory for Year 10 since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	499 (±18.0)	▲ 531 (±16.4)	512 (±13.7)	▲ 565 (±12.8)	▲ 564 (±13.7)	▲ 551 (±13.1)
VIC	515 (±12.0)	530 (±10.6)	532 (±14.3)	▲ 568 (±12.5)	▲ 569 (±18.1)	▲ 565 (±9.8)
QLD	498 (±14.5)	505 (±13.1)	504 (±16.8)	▲ 553 (±9.5)	▲ 549 (±14.0)	▲ 547 (±11.6)
SA	504 (±14.9)	524 (±11.0)	▲ 532 (±15.8)	▲ 552 (±14.8)	▲ 560 (±11.5)	▲ 547 (±11.0)
WA	507 (±11.6)	▲ 539 (±10.4)	▲ 539 (±11.8)	▲ 548 (±10.8)	▲ 559 (±12.1)	▲ 535 (±11.8)
TAS	449 (±27.4)	480 (±13.0)	▲ 514 (±15.6)	▲ 534 (±15.5)	▲ 539 (±16.3)	▲ 538 (±11.8)
NT	473 (±47.9)	447 (±30.3)	501 (±19.9)	490 (±49.5)	466 (±71.5)	515 (±28.2)
ACT	526 (±25.6)	530 (±21.2)	536 (±26.2)	▲ 582 (±16.1)	▲ 598 (±14.5)	▲ 572 (±17.8)
Aust.	503 (±7.2)	▲ 523 (±6.6)	520 (±6.7)	▲ 559 (±5.7)	▲ 560 (±7.1)	▲ 551 (±5.7)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Achievement by background characteristics

Differences in ICT literacy achievement by gender

Consistent with previous cycles, female students had higher levels of ICT literacy in comparison to male students in both Year 6 and Year 10.

Differences in ICT literacy achievement by Indigenous status

The gap in ICT literacy based on Indigenous status remained large. At both year levels, a higher proportion of non-Indigenous students attained the proficient standard in comparison to Indigenous (First Nations Australian) students, a difference of around 30 percentage points across the 3 most recent assessment cycles.

Differences in ICT literacy achievement by language spoken at home

Students at the Year 6 level who speak a language other than English at home had higher levels of ICT literacy than students who speak English, a finding that is consistent with the previous cycle. There was no difference in achievement by language spoken at home for Year 10 students, consistent with the findings from the previous 2 cycles.

Differences in ICT literacy achievement by geographic location

School geographic location was classified as metropolitan, regional and remote, as specified by the Australian Statistical Geography Standard Remoteness Structure. Students from a metropolitan location tended to have higher levels of ICT literacy than students from a regional location, a finding consistent across both year levels.

Differences in ICT literacy achievement by parental occupation and education

ICT literacy achievement gradually increased with increasing levels of parental occupation and parental education. This resulted in large, significant differences in student achievement between the highest and lowest parental occupational and educational groups.

Results of the student survey

Chapters 5, 6 and 7 provide the results of the student survey. The key findings from these chapters are summarised below. See Appendix B for the survey questions.

Student use of ICT devices

- The majority of students were familiar with ICT devices and experienced in their use, particularly in Year 10.
- Higher levels of experience with ICT devices were associated with higher NAP–ICT Literacy achievement scores, particularly in Year 10.
- More frequent ICT device use was associated with higher NAP–ICT Literacy achievement scores, particularly in Year 10.

- Most students indicated that they used an ICT device for remote or home learning between the years of 2020 and 2022 (91% for Year 6 students and 95% for Year 10 students). Students were more likely to use an ICT device from home that was their own to use.
- Most students indicated that they felt well prepared to use ICT devices for remote learning in the future.
- Students' confidence in using ICT devices to complete tasks, also known as ICT device self-efficacy, was significantly higher in Year 10 than in Year 6, and significantly higher for male students than female students.
- Higher levels of self-efficacy were associated with higher NAP–ICT Literacy achievement scores, especially for Year 10 male students.
- Students' ratings of the importance of using ICT devices were significantly higher in Year 10 than Year 6, and higher for males than females.
- Higher ratings of the importance of using ICT devices were significantly associated with higher NAP–ICT Literacy scores, particularly for Year 10 students, and particularly for male students.

Student use of applications

- The most frequently reported study activity was searching the internet for information for study or schoolwork. This was true for both Year 6 and Year 10 students, both at school and outside of school.
- Students rarely reported undertaking other study activities at school or outside of school, such as recording their reflections on learning (e.g. through a blog) and listening to podcasts or audiobooks to support their learning. Outside of school, students from both Year 6 and Year 10 rarely used and created spreadsheets.
- When both at and outside of school, Year 10 students reported making more use of ICT-based study utilities than Year 6 students. Differences between female and male students on study utility use were negligible.
- Year 10 students with higher ICT literacy achievement were more likely to report frequent use of study utilities on their ICT devices outside of school. This was particularly true for male students.
- Entertainment applications were used more often by students in Year 10 than by students in Year 6, both at school and outside of school. Significant differences in entertainment application use between the genders were found outside of school, where male students reported slightly higher use of these applications at both year levels.
- Year 6 students with lower ICT achievement reported more frequent use of entertainment applications at school than students with higher ICT achievement.
- At school, two-thirds of Year 10 students reported using email frequently, with 40% frequently using chat or messaging apps. In contrast, almost all Year 6 students reported rarely using their devices for communication purposes when at school.
- Year 10 students reported significantly higher use of ICT devices for communication purposes than Year 6 students. This was particularly true when these behaviours took place at school.

- At school, lower achieving Year 6 students reported more frequent use of communication applications than did students achieving above the proficient standard.
- Across both year levels, students reported undertaking technological activities far less frequently than activities for the purposes of study, entertainment or communication.
- Female students in Year 6 reported completing technological tasks more often than female students in Year 10 in all settings, but particularly when outside of school. At Year 10, male students reported completing technological tasks more often than female students in both school and non-school settings.

Student experience of ICT at school

- Word processing software, presentation software, and text and video-based information were the most frequently reported ICT-related tools used for school-related purposes. Year 10 students reported more frequent use of all ICT-related tools for school-related purposes, with the exception of robotic devices, which were more frequently used by Year 6 students.
- Achievement in NAP–ICT Literacy was positively associated with the frequency of use of productivity applications (such as word processing and spreadsheet applications) for school-related purposes. The more frequent use of specialist applications (such as concept mapping or simulations and modelling applications) was negatively associated with achievement.
- Over 80% of students at both year levels had learnt at school how to identify cyberbullying and where they could seek reliable information and assistance to deal with cyberbullying and suspicious online contact.
- At Year 6, a weak but significant association was found between achievement and ICT learning for school purposes. A weak association was also found for male Year 10 students. However, no association between achievement and ICT learning for school purposes was found for female students in Year 10.
- ICT devices were used more frequently by Year 10 students in comparison to Year 6 students. The most frequent use of ICT devices in the classroom was by teachers and students to present information to the class.
- Students reported increased instruction in Digital Technologies overall in comparison to the 2017 cycle.
- Many students at both year levels reported participating in Digital Technologies activities at school, with higher participation typically reported at the Year 6 level. At the Year 10 level, more male students reported participation in several of the activities in comparison to female students.

Chapter 1: Introduction

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The National Assessment Program (NAP) began as an initiative of ministers of education in Australia to monitor outcomes of schooling specified in the 1999 Adelaide Declaration on National Goals for Schooling in the 21st Century (Adelaide Declaration). The NAP was established to measure student achievement and to report this against key performance measures in relation to the national goals. It was agreed that nationally comparable data across jurisdictions would be collected in the domains of literacy, numeracy, science literacy, information and communication technology (ICT) literacy, and civics and citizenship.

Literacy and numeracy achievements are measured and reported via the National Assessment Program – Literacy and Numeracy (NAPLAN). Achievement in science literacy, civics and citizenship, and ICT literacy are assessed under the NAP sample assessment program. These assessments are developed and managed by the Australian Curriculum, Assessment and Reporting Authority (ACARA) under the auspices of the Education Ministers Meeting.

For the National Assessment Program – ICT Literacy (NAP–ICT Literacy), the first collection of data from students was in 2005. Subsequent cycles of assessment have been conducted in 2008, 2011, 2014, 2017 and 2022. The 5-year gap between 2017 and 2022 was a result of disruptions caused by the COVID-19 pandemic. This report documents findings from NAP–ICT Literacy 2022 and includes comparisons, as appropriate, with findings from previous assessment cycles.

ICT Literacy as an Educational Goal for Young Australians

In 2008, the Adelaide Declaration was superseded by the Melbourne Declaration on Educational Goals for Young Australians. The Melbourne Declaration was then superseded by the Alice Springs (Mparntwe) Education Declaration (the Declaration) in 2019. Throughout this time, the work of the NAP has continued.

As part of its preamble, the Declaration asserts:

> ... [our education system] must also prepare young people to thrive in a time of rapid social and technological change, and complex environmental, social and economic challenges. Education plays a vital role in promoting the intellectual, physical, social, emotional, moral, spiritual and aesthetic development and wellbeing of young Australians, and in ensuring the nation's ongoing economic prosperity and social cohesion. They need to deal with information abundance and navigate questions of trust and authenticity. They need flexibility, resilience, creativity, and the ability and drive to keep on learning throughout their lives.
>
> Education Council 2019, p. 2

Goal 2 of the Declaration states, among other things, that all young Australians should "become confident and creative individuals, successful lifelong learners, and active and informed members of the community". The declaration goes on to elaborate that:

> successful lifelong learners … are productive and informed users of technology as a vehicle for information gathering and sharing, and are able to adapt to emerging technologies into the future.
>
> Education Council 2019, p. 7

In the “A Commitment to Action” section, the Declaration highlights the need to promote and deliver a world-class curriculum and assessment. It states that the Science, Technology, Engineering and Mathematics (STEM) learning area is a key national focus for school education in Australia. It is critical to equipping students with the skills needed to engage productively in the world due to rapid changes in technology.

These aspects of the Declaration highlight the importance of young Australians’ digital and ICT literacy in a rapidly evolving technological landscape. Furthermore, the goals outlined in the Declaration establish the context and rationale for monitoring and reporting on student achievement and progress in this area.

The NAP–ICT Literacy Assessment Framework

The development of NAP–ICT Literacy 2022 was based on the NAP–ICT Literacy Assessment Framework (2020). The definition and conceptual structure of ICT literacy in the 2020 Assessment Framework has been revised from the previous NAP–ICT Literacy assessments in 2017, 2014, 2011, 2008 and 2005.

The revised NAP–ICT Literacy construct for 2022 is designed to keep pace with rapid technological growth and establish stronger connections with the Australian Curriculum. Drawing inspiration from the International Computer and Information Literacy Study (ICILS) and the 2018 US National Assessment of Educational Progress (NAEP) Technology and Engineering Framework, NAP–ICT Literacy content is organised into 4 strands. Each strand represents a category of knowledge, skills, processes, understanding and actions. They each comprise a series of aspects, which represent different categories of content within each strand. This revised definition and the associated structural components of the NAP–ICT Literacy construct are outlined in the sections that follow.

ICT literacy definition

The definition of ICT literacy used in NAP–ICT Literacy 2022 is:

> the ability to use ICT appropriately and safely to access, manage and evaluate information; develop new understandings; apply computational, design and systems thinking to create solutions; communicate and collaborate with others; and engage productively with emerging and future technologies.
>
> ACARA 2020, p. 13

This revised definition was made in consultation with the NAP–ICT Literacy Working Group and ACARA curriculum specialists. It strongly references the previous definition[1] by continuing to present the use of ICT as a medium for demonstrating information literacy competencies but expands the scope of ICT literacy to include a wider range of digital contexts and processes. This expansion helps to keep the NAP–ICT Literacy assessment current and relevant in today's rapidly evolving technological landscape. It further includes reference to the concepts of computational thinking, design thinking and systems thinking, which underpin the content associated with the Australian Curriculum: Digital Technologies. The concluding clause of the revised definition includes the ability to engage productively with emerging and future technologies, in line with the Declaration.

[1] The definition of ICT literacy underpinning all previous cycles of NAP–ICT Literacy was “the ability of individuals to use ICT appropriately to access, manage and evaluate information, develop new understandings, and communicate with others in order to participate effectively in society” (ACARA 2020, p. 13).

ICT literacy strands

The NAP–ICT Literacy Assessment Framework (2020) organises ICT literacy into 4 strands, each divided into aspects representing different categories of content within each strand.

The strands are:

1. **Understanding ICT and digital systems,** which includes Managing information and operating ICT (Aspect 1.1) and Understanding digital systems (Aspect 1.2)
2. **Investigating and planning solutions with ICT,** encompassing Accessing and evaluating information (Aspect 2.1), Collecting and representing data (Aspect 2.2), and Formulating problems and planning solutions (Aspect 2.3)
3. **Implementing and evaluating digital solutions,** which involves Communicating with digital information products (Aspect 3.1) and Developing algorithms, programs and interfaces (Aspect 3.2)
4. **Applying safe and ethical protocols and practices when using ICT,** focusing on Safe and responsible information consumption with ICT (Aspect 4.1) and Responsible digital solution and information production with ICT (Aspect 4.2).

ICT literacy processes

The NAP–ICT Literacy 2022 construct has been revised to align with the Australian Curriculum: ICT Capability and the Australian Curriculum: Digital Technologies, Version 8.4.

The construct is closely related to the 5 interrelated elements of the Australian Curriculum: ICT Capability:

1. Applying social and ethical protocols and practices when using ICT
2. Investigating with ICT
3. Creating with ICT
4. Communicating with ICT
5. Managing and operating ICT.

Whilst there is not always a one-to-one relationship between these elements and the individual aspects of the NAP–ICT Literacy construct, there is a clear thematic correspondence at the strand level. This can largely be summarised as follows:

- Strand 1 (Understanding ICT and digital systems) aligns with Managing and operating ICT.
- Strand 2 (Investigating and planning solutions with ICT) corresponds with Investigating with ICT.
- Strand 3 (Implementing and evaluating digital solutions) is associated with Creating with ICT and Communicating with ICT.
- Strand 4 (Applying safe and ethical protocols and practices when using ICT) focuses on Applying social and ethical protocols and practices when using ICT.

Once we drill down to the different aspects within each strand of the NAP–ICT Literacy construct, we can see an alignment to different and, at times, multiple elements of the Australian Curriculum: ICT Capability. This is outlined in Table 1.1: Mapping the NAP–ICT Literacy processes against the Australian Curriculum.

The Australian Curriculum: Digital Technologies focuses on the development of technical skills and knowledge related to computational thinking and digital systems. While the NAP–ICT Literacy construct does not have a one-to-one correspondence with the Australian Curriculum: Digital Technologies elements, it incorporates relevant content from the Australian Curriculum: Digital Technologies, aligning it with the ICT literacy processes. This alignment ensures a comprehensive approach to the development of ICT literacy skills and competencies, integrating the technical aspects of the Australian Curriculum: Digital Technologies with the broader ICT capabilities.

The NAP–ICT Literacy assessment instrument requires students to apply these ICT literacy processes within real-world contexts that represent the 4 strands in the assessment framework. The assessment instrument is described in detail in Chapter 2.

NAP–ICT Literacy and the Australian Curriculum

In 2012, ACARA released the ICT Capability as one of 7 general capabilities of the Australian Curriculum. The Australian Curriculum: ICT Capability conceptualises ICT as a cross-disciplinary capability that comprises a broad set of interrelated organising elements. These organising elements describe how to use ICT effectively and appropriately to access, create and communicate information and ideas, solve problems and work collaboratively in all learning areas at school and in their lives beyond school (ACARA 2012).

As discussed in the previous section, the purpose of ICT use outlined in the Australian Curriculum: ICT Capability is consistent with the definition established for NAP–ICT Literacy. The organising elements are also highly congruent with the processes defined in the NAP–ICT Literacy Assessment Framework.

In 2015, ACARA released the Australian Curriculum: Digital Technologies (ACARA 2015). While the structure and focus of the Australian Curriculum: Digital Technologies are different from those of the Australian Curriculum: ICT Capability and NAP–ICT Literacy (which is conceptualised as a learning area), the content of some of the strands are complementary and, in some areas, overlapping.

In 2020, the NAP–ICT Literacy Assessment Framework was revised to describe and represent its relationship to the Australian Curriculum: ICT Capability and the Australian Curriculum: Digital Technologies. Content from the Australian Curriculum: Digital Technologies that was related to ICT, as conceptualised by NAP–ICT Literacy, was summarised and aligned with the processes from the NAP–ICT Literacy Assessment Framework.

Table 1.1 shows the relationships between the organising elements of the Australian Curriculum: ICT Capability, the summarised Australian Curriculum: Digital Technologies and the processes assessed in the NAP–ICT Literacy Assessment Framework.

Table 1.1: Mapping the NAP–ICT Literacy processes against the Australian Curriculum

NAP–ICT Literacy Assessment Framework (2020) strands and aspects	Australian Curriculum: ICT Capability elements	Australian Curriculum: Digital Technologies process summaries
Strand 1: Understanding ICT and digital systems		
Aspect 1.1: Managing information and operating ICT	• Managing and operating ICT	• Digital systems
Aspect 1.2: Understanding digital systems	• Managing and operating ICT	• Digital systems
Strand 2: Investigating and planning solutions with ICT		
Aspect 2.1: Accessing and evaluating information	• Investigating with ICT	• Data and information
Aspect 2.2: Collecting and representing data	• Investigating with ICT	• Data and information
Aspect 2.3: Formulating problems and planning solutions	• Investigating with ICT • Communicating with ICT	• Computational thinking and algorithms
Strand 3: Implementing and evaluating digital solutions		
Aspect 3.1: Communicating with digital information products	• Communicating with ICT	• Creating digital solutions
Aspect 3.2: Developing algorithms, programs and interfaces	• Creating with ICT • Applying social and ethical protocols and practices when using ICT	• Computational thinking and algorithms • Creating digital solutions
Strand 4: Applying safe and ethical protocols and practices when using ICT		
Aspect 4.1: Safe and responsible information consumption with ICT	• Applying social and ethical protocols and practices when using ICT	• Data and information • Digital systems
Aspect 4.2: Responsible digital solution and information production with ICT	• Applying social and ethical protocols and practices when using ICT	• Data and information • Digital systems

It is important to note that the processes for the Australian Curriculum: Digital Technologies shown in Table 1.1 are summarised for the purpose of comparison. A full explanation of the method used to map the NAP–ICT Literacy Assessment Framework processes against the elements of the Australian Curriculum: ICT Capability and the summarised Australian Curriculum: Digital Technologies is available in the NAP–ICT Literacy Assessment Framework 2017.

In summary, the NAP–ICT Literacy 2020 Assessment Framework is highly congruent with the Australian Curriculum: ICT Capability. The 2 share common conceptualisations of the purpose of ICT literacy and describe very similar and largely overlapping processes. The Australian Curriculum: Digital Technologies shares a common core with what is assessed in NAP–ICT Literacy through the creation of digital solutions to real-world problems. However, while tasks relating to NAP–ICT Literacy and the Australian Curriculum: Digital Technologies can make use of similar contexts and software application, the 2 have different conceptual emphases. The emphasis in NAP–ICT Literacy is on information processing in a digital environment, whereas the emphasis in the Australian Curriculum: Digital Technologies is on creating digital solutions to achieve outcomes.

Stages of development for NAP–ICT Literacy

The first stage of NAP–ICT Literacy 2022 involved the conduct of a review in response to changes in technology and education, leading ACARA to consider revising the assessment framework. A forum was held in 2018 to discuss the scope of the assessment and explore how various general capabilities, including ICT Capability, relate to the Digital Technologies curriculum.

In 2019, a working group of experts was established to review feedback from the forum and develop a revised assessment framework, as well as review the 2022 assessment and survey instruments. The revised NAP–ICT Literacy 2022 construct definition and structure were then developed by the Australian Council for Educational Research (ACER), incorporating feedback and recommendations from the Working Group and ACARA curriculum specialists.

The second stage of the study consisted of the development of instruments and technologies for delivery. For NAP–ICT Literacy 2022, 5 new test modules were developed to complement the inclusion of 3 secure assessment modules that had been used in previous cycles. At the same time, the student survey was updated and revised to remain relevant and reflect changes in ICT use over time.

The third stage involved the field trial of the instruments and associated operational procedures. The first field trial was conducted in June 2021 with 847 students from 29 schools taking part. Seven Victorian schools were unable to participate due to ongoing COVID-19 restrictions. A second field trial was necessary to collect data on a module that required significant contextual edits after a widely reported incident deemed the content unusable. This second field trial took place in June 2022 and involved 861 students from 43 schools. As in previous cycles, both field trials included schools from only the larger jurisdictions to avoid burdening the comparatively oversampled schools from the smaller jurisdictions.

The fourth stage involved a revision of the instruments based on the analysis of field trial data. This activity involved an evaluation of the characteristics of each item to determine whether it should be removed from the scaling, removed from the main study test or, in the case of partial credit items, have the scoring categories modified.

The fifth stage included the preparation, delivery and scoring of the main study assessment. Preparation began in June 2022, with the main study conducted from 10 October to 11 November 2022. Scoring took place in November, with data files compiled, checked and cleaned for analysis in December. Student background data were collected from schools and education systems during main study administration period.

The assessment survey achieved a nationally representative sample, after removal of exclusions, of 9,981 students, comprising 5,412 Year 6 students and 4,569 Year 10 students. These students were sampled randomly from 636 schools across Australia.

The sixth and final stage involved the analysis of data and writing the reports for the study. This final stage took place from January to May 2023.

The publicly available materials developed for NAP–ICT Literacy are:

- this public report containing findings from NAP–ICT Literacy 2022, including comparisons, where appropriate, with findings from previous assessment cycles
- a technical report that provides more detailed information about the processes and analytical procedures applied in the implementation of NAP–ICT Literacy 2022
- a set of school release materials that include sample assessment tasks and scoring guidelines for NAP–ICT Literacy 2022.

Chapter 2:
Assessing ICT Literacy

Chapter 2: Assessing ICT Literacy

Chapter highlights

- The assessment instrument for NAP–ICT Literacy 2022 consisted of 8 discrete test modules. Participating students were administered 4 modules appropriate to their year level. Each module followed a linear narrative sequence and had a time limit of 20 minutes.
- Five of the modules (Fundraiser, Park design, Robodog, Interactive story, Water quality) were newly developed for the 2022 cycle. They covered skills such as collaboration and teamwork, algorithm creation and data analysis, project management and user interface design, simulation software analysis, and online information management and communication.
- Three of the modules (Technology on the go, Acceptable use agreement, School website) were used in previous cycles and were included in the 2022 instrument so that changes in student achievement over time could be measured.
- Modules were classified as either Information Communication Technology (ICT) or Digital Technologies (DT). The ICT modules presented students with information literacy and communication problems, such as the need to research and present digital information on a given topic. The focus of the Digital Technologies (DT) modules was on developing technical skills and knowledge related to computational thinking and digital systems.
- After completing the assessment modules, students undertook a survey to identify the contexts in which their ICT education occurs. The survey also measured student behaviours and attitudes towards ICT use in school and non-school settings.
- In total, 5,412 Year 6 students from 325 schools and 4,569 Year 10 students from 311 schools across every Australian state and territory participated in the NAP–ICT Literacy 2022 assessment.
- School and student sampling procedures followed established NAP sample assessment processes, which are designed to minimise any potential bias and to maximise the precision of estimates.

Assessment instrument

The assessment instrument used in NAP–ICT Literacy 2022 was based on the design principles established for NAP–ICT Literacy 2005 and continued through the assessment cycles in 2008, 2011, 2014 and 2017.

The assessment instrument consisted of 8 discrete test modules. Each student was assigned 4 of these modules. A time limit of 20 minutes per module was enforced by the testing software. Each module followed a linear narrative sequence designed to reflect students' typical, real-world use of ICT. The modules included a range of school-based and out-of-school-based themes. All the modules included large tasks to be completed using purpose-built software applications.

Three modules were trend modules that were used in at least one of the previous assessment cycles. Five modules were newly developed for use in the 2022 assessment.

The newly developed modules covered skills such as:

- collaboration and teamwork
- algorithm creation and data analysis
- project management and user interface design
- analysis and application of simulation software
- online information management and communication.

The full set of assessable content was distributed across a number of test forms using a rotated module design. Every student was assigned one test form containing a total of 4 modules, appropriate to their year level.

Trend modules: a basis for measuring change

The use of trend modules enables direct comparisons between the performance of students in 2022 with those of previous cycles of NAP–ICT Literacy. The 3 trend modules – Technology on the go (Year 6, from NAP–ICT Literacy 2014 and 2017), Acceptable use agreement (Year 10, from NAP–ICT Literacy 2017) and School website (Year 6 and Year 10, from NAP–ICT Literacy 2017) – were included in the 2022 instrument. The modules were selected after confirming that the contexts and contents of their component items had maintained relevance over time. The comparability of data collected for these modules in 2022 with that collected in previous cycles was confirmed in the Field trial phase (see the NAP–ICT Literacy Technical Report for more detail on these empirical analyses).

Further detail about the content of each of these 3 trend modules is given below.

- **Technology on the go (Year 6 only):** Students took a borrowed tablet on a 2-week school trip to Central Australia. The students were asked to set up the tablet to access the internet, install a number of applications, configure one of the applications to collect weather data and use software to create visualisations of the data.
- **Acceptable use agreement (Year 10 only):** Students were asked to use internet search engines and resources to find information about acceptable-use agreements for schools. Students then reflected on some of the requirements of an agreement, such as the permission required for the distribution of images on social media, and created a digital poster to promote positive ICT use.
- **School website (Year 6 and Year 10):** Students were required to analyse website analytics reports to identify problems with a school webpage and make suggestions to improve the website's navigation structure. Students then had to construct a webpage that promoted a sports event, including creating a web form for event registration.

New ICT modules: providing for developments in ICT

In addition to enabling comparisons between cycles, it was also important to ensure that the NAP–ICT Literacy assessment instrument referenced more recent developments in the types of software students use. For this reason, 2 new ICT modules were developed: Fundraiser and Park design.

- **Fundraiser (Year 6 and Year 10):** Students were required to create a 4-slide presentation recommending a sponsored walkathon as a fundraising activity, covering the survey results, benefits and organising tips. Students engaged with various aspects of online information management, including survey administration, evaluating content and sources, and effective communication. They assessed the pros and cons of sharing methods, examined the reliability of search results and interpreted survey outcomes.
- **Park design (Year 6 and Year 10):** Students were asked to design a park for a competition, adhering to a $4,000 budget and incorporating group ideas while following council guidelines. They formed teams within a collaboration app, addressing user editing concerns, and added members. Students engaged in team communication, welcomed new members, and shared resources such as webpages and documents to effectively edit documents based on team input.

New Digital Technologies modules: exploring a new content area

The focus of Digital Technologies (DT) is on developing technical skills and knowledge related to computational thinking and digital systems to create digital solutions. DT items were developed to keep NAP–ICT Literacy up to date with technological advancements and broaden the scope of ICT literacy to cover more contexts and processes. Three new modules were developed: Robodog, Interactive story and Water quality.

- **Robodog (Year 6 only):** Students used simulation software to test and analyse robotic toy components, focusing on sensor functionality, design features and control mechanisms. They developed web forms to gather user feedback and explored various input field types, ultimately employing a digital remote controller for practical application.
- **Interactive story (Year 6 and Year 10):** Students developed an interactive story, employing project management tools like Gantt charts and task assignments. They optimised data sorting tools and focused on user interface design elements for improved usability, created choice-based stories with decision trees and devised algorithms for dynamic scene changes.
- **Water quality (Year 10 only):** Students were required to develop an algorithm that could be used for assessing water quality data. They analysed flowcharts, configured databases and processed data. They identified disadvantages of offline data analysis, issues with data collection and storage, and determined optimal sorting methods. Students created Structured Query Language (SQL) queries, selected suitable charts, inferred missing values, and devised formulas and algorithms to classify and calculate data based on numerical ranges.

Survey of ICT experience and use

An important aspect of the investigation of ICT literacy outcomes for students is to identify the contexts in which ICT education occurs, as well as measuring students' behaviours and attitudes regarding the use of ICT for school and non-school purposes.

The first cycle of NAP–ICT Literacy in 2005 incorporated a survey asking students to respond to questions on their experience using ICT, frequency of use, their use of different types of ICT and attitudes towards ICT. The content of the survey was designed to collect contextual information that complemented the ICT literacy processes that were described in the NAP–ICT Literacy Assessment Framework. ACER worked with the NAP–ICT Literacy Working Group and ACARA curriculum experts across subsequent cycles to review and revise the material so that it remains relevant and reflects changes in ICT use over time.

Since 2005, the survey has evolved to collect information on the following topics:

- students' experience using ICT
- types of ICT used and where these are used
- perceptions of importance and self-efficacy of using ICT
- frequency of using ICT for study, entertainment, communication and technological applications both at school and outside of school
- what ICT applications are used for school-related purposes
- how ICT is used in the classroom environment
- types of ICT activities undertaken at school
- what ICT-related issues are being taught to students
- the extent to which instruction is given for ICT-related coding and problem-solving activities.

In addition to some minor revisions to individual items, several major changes were made to the survey content for NAP–ICT Literacy 2022. These included:

- changing the terminology of "digital devices" to "ICT devices", reflecting the evolution of types of ICT commonly used across time
- adding new content about undertaking activities related to DT in schooling
- adding new content on exposure to learning about appropriate social behaviours using ICT and how to appropriately use online sources for schoolwork
- adding new content to reflect software that is more widely used since the previous cycle
- adding new content on student use of ICT for remote or home learning.

The student survey was completed by all Year 6 and Year 10 students immediately following the assessment. It was designed to be completed by most students in about 20 minutes. Unlike the assessment, the student survey was not timed, and students could take as long as they needed to complete it.

Assessment administration

The NAP–ICT Literacy 2022 assessment was conducted within a 5-week period at the beginning of Term 4, 2022. Schools generally undertook the test session on one day within the testing window, though a small number nominated to run the test with smaller groups of students over several days for logistical or technical reasons.

To maximise student participation, schools were asked to administer follow-up sessions in cases where a significant proportion (more than 20%) of students were absent on the scheduled assessment day. This helped ensure a minimum student participation rate of 80% at most participating schools.

Nominated staff at participating schools administered the assessment to their students. These test administrators were trained in specific NAP–ICT Literacy assessment administration procedures and were provided with a detailed manual, an instructional video and a script for use during the assessment session. A support service was also maintained for these teachers via a 1800 number and dedicated email address. The training and associated resources provided to test administrators helped ensure the smooth operation of the assessment delivery system while also maintaining the high level of data quality and uniformity of participant test experience achieved in previous cycles.

Flexible administration

Flexible administration was a practice initiated in NAP–ICT Literacy 2011 for a small number of very remote schools. It was initiated to better target the instrument and to provide an opportunity to maximise participation rates in those schools. The provisions included modifications to the assessment and to the method of administration.

For NAP–ICT Literacy 2022, flexible administration was undertaken in 9 schools in very remote locations. For these schools, the number of modules to be completed by each student was reduced from 4 to 2 and the time allocation for each module was doubled to allow students additional time to complete the tasks.

Test administrators in flexible administration schools were permitted to read all instructions and test questions to students, which was similar to the provision in all schools for test administrators to read instructions and questions to students requiring support.

Delivery method

Assessment system in 2022

All participating schools undertook the NAP–ICT Literacy 2022 assessment via an online delivery system. Students completed their assessment using desktop, laptop or tablet devices that were provided by the school or, in some cases, by the students themselves[2].

[2] The use of either school- or student-provided devices depended on the device-use policies in effect at each participating school.

In preparation for the actual assessment, schools carried out an online technical readiness test (TRT) on a sample of assessment-designated devices to check that they met minimum assessment specifications. A technical support service was provided to all schools with troubleshooting assistance in the lead-up to the assessment. This service aimed to resolve any technical issues in a timely manner and helped ensure the smooth running of the assessment on test day. During the assessment period, this support service was also available to schools to assist with any technical, logistical or administrative issues that arose during the conduct of the assessment.

Consistency of the assessment experience over time

To enable comparisons of student achievement within and across assessment cycles, participating students must have a uniform test-taking experience. While the test development team made improvements to the user interface for the 2022 assessment, the overall user experience for participating students remained consistent with previous cycles.

As per previous cycles, the student interface had 3 main sections:

1. a surrounding border of test-taking information and navigation facilities
2. a central information section that contained either stimulus materials for students to read or (simulated or live) software applications
3. a lower section containing instructional text and a response area for multiple-choice and short answer response items.

The assessment items were presented in a linear sequence to students. As in previous cycles, students were not permitted to return to previously completed items because in some cases later items in a sequence provided clues or even answers to earlier items.

The administration for each student involved completing:

- a 10-minute tutorial and a series of practice questions that provided an introduction to the system
- 4 test modules, each with a time limit of 20 minutes
- the untimed student survey (approximately 20 minutes in duration).

Provision was also made for short breaks between test modules.

Sample

Sample design

The NAP–ICT Literacy 2022 assessment was administered to a representative sample of Year 6 and Year 10 students across Australia. A 2-stage sampling design was implemented following sampling procedures established in previous NAP–ICT Literacy cycles as well as the other 2 NAP sample assessments in the program (NAP – Civics and Citizenship and NAP – Science Literacy). These sampling procedures are designed to minimise any potential bias and to maximise the precision of estimates.

The first sampling stage involved selecting a sample of schools within explicit strata[3] formed by state or territory and school sector. Within each explicit stratum, school type (primary, secondary, combined), average school performance in NAPLAN 2021, a measure of school socio-economic status[4], and school geographic location were all used for implicit stratification[5]. A school's probability of selection was proportional to the number of students enrolled in the relevant year level (either Year 6 or Year 10), which meant that schools with larger numbers of students at the relevant year level were more likely to be selected for participation. The school samples for Year 6 and Year 10 were drawn independently of each other. Up to 2 substitute schools were assigned to each sampled school at the time of sampling to enable the sample size and representativeness to be maintained if a sampled school was unable to participate. These substitute schools were located contiguous to the corresponding sampled school in the sorting order given by the implicit stratification variables, so as to be as similar as possible to the sampled school. To maintain the integrity of the original sample as much as possible, the use of substitute schools was kept to a minimum.

The second sampling stage involved selecting students within the participating schools. For this purpose, a random sample of 20 students was drawn from the target year level in each school, making sure the gender composition was kept constant between sample and cohort. If fewer than 20 eligible students were enrolled in the target grade (in smaller schools, for instance), all students in the year level were selected to participate.

School and student exclusions

At the school level, exclusions from the target population included:

- schools that had participated in the Trends in International Mathematics and Science Study (TIMSS) field trial
- non-mainstream schools (such as schools for students with intellectual disabilities)
- very remote schools (in all states and territories except the Northern Territory[6])
- schools with fewer than 5 students at the target year level.

[3] Explicit strata means that separate school samples were drawn for each sector within each jurisdiction.

[4] The Australian Bureau of Statistics (ABS) Index of Education and Occupation was used. This is one of the ABS Socio-Economic Indexes for Areas (SEIFA).

[5] Implicit stratification means that, within the sampling frame, schools were grouped and sorted by implicit stratification variables so that adjacent schools were similar to each other.

[6] Very remote schools were included in the Northern Territory sample to better reflect its whole school population.

In each of the sampled schools, individual students were exempted from the assessment if they met any one of the following criteria:

- Severe functional disability: the student had a moderate to severe permanent physical disability such that they could not be expected to perform in the assessment situation.
- Severe intellectual disability: the student had a mental or emotional disability and cognitive delay such that they could not be expected to perform in the assessment situation.
- Very limited assessment language proficiency: the student was unable to read or speak the language of the assessment (English) and would not be expected to overcome the language barrier in the assessment situation. Typically, a student who had received less than one year of instruction in English would be exempted.

More information about the sample design and its implementation, together with further details on school and student exclusions, is provided in the NAP–ICT Literacy 2022 Technical Report.

Achieved sample

Table 2.1 presents the number of schools in both the target and achieved samples. The target sample refers to those schools and students sampled using the sampling procedures described previously, after the removal of any school-level exclusions. The achieved sample denotes the number of schools and students that participated in the assessment.

At a Year 6 level, 5,412 students from 325 schools participated in the NAP–ICT Literacy 2022 assessment. At Year 10, 4,569 students from 311 schools took part. More information about participation rates is provided in the NAP–ICT Literacy 2022 Technical Report.

Table 2.1: Numbers of students and schools in the target and achieved samples

	Year 6				Year 10			
	Schools		Students		Schools		Students	
State/territory	Target sample	Achieved sample	Target sample	Achieved sample	Target sample	Achieved sample	Target sample	Achieved sample
NSW	51	51	1004	882	50	48	979	726
VIC	49	49	962	851	50	47	990	727
QLD	50	50	987	845	50	49	954	715
SA	46	44	872	719	50	50	988	714
WA	48	48	932	806	50	50	1000	788
TAS	44	43	861	683	35	33	700	441
NT	23	20	409	299	15	13	262	150
ACT	20	20	386	327	21	21	420	308
Aust.	**331**	**325**	**6413**	**5412**	**321**	**311**	**6293**	**4569**

Participating sample characteristics

To construct a profile of the students participating in the NAP–ICT Literacy 2022 assessment, schools and education systems were required to provide background data for each of the participating students. The specific student background variables collected in 2022 aligned with standard NAP protocols as set out in ACARA's *Data Standards Manual* (ACARA 2022).

These variables were:

- age
- gender
- Indigenous status
- parental occupation
- parental education
- main language spoken at home.

Geographic location was inferred from the location of the school the student attended.

The relationships between student background characteristics and NAP–ICT Literacy achievement are explored more fully in Chapter 4, but some preliminary descriptive analyses of the student background data are provided here.

Table 2.2 presents the background characteristics of the Year 6 and Year 10 students that participated in the NAP–ICT Literacy 2022 assessment. Two sets of percentages are reported for each background variable by year level. The first column denotes the various percentages for all participating students (including those with missing data for a given background variable), while the second column provides these figures based only on students with a valid response to the background variable being examined.

As was the case for previous cycles, the parental occupation and parental education variables showed the highest levels of missing data (approximately 7% and 5% respectively at both year levels). For the Year 6 cohort, this was a similar proportion of missing data in these variables to the previous cycle. For the Year 10 cohort, however, it was a reduction in missing data from the previous cycle of approximately 2% for both variables.

Other variables reported in this chapter did not show such substantial improvements in data availability. The variable language spoken at home showed an increase in missing data of around 2 percentage points at the Year 10 level.

With regard to the parental occupation variable, schools and educational authorities were asked to provide data about the occupational groups of both parent/guardian 1 and parent/guardian 2 of participating students. For the parental education variables, schools and central authorities were similarly asked to provide data about the highest level of both school and non-school education achieved by both parents/guardians. For students who did not have a second parent/guardian, the variable was coded as missing. For the purposes of analysis, parental occupation and parental education for both parents/guardians were presented as combined variables that represented the highest parental occupation or education group indicated by either parent/guardian.

For the purposes of this report, geographic location refers to whether a student attended school in a metropolitan, regional or remote zone. The constituent areas that comprise each zone are informed by the Australian Statistical Geography Standard (ASGS) Remoteness Structure, whereby:

- metropolitan zones include all major cities of Australia
- regional zones include all inner regional and outer regional areas in Australia
- remote zones include all remote and very remote areas in Australia.

Table 2.2: Distribution of student background characteristics (weighted)

Student background characteristic	Year 6		Year 10	
	All students (%)	Students with valid responses (%)	All students (%)	Students with valid responses (%)
Student Gender				
Male	52	52	51	51
Female	48	48	49	49
Other	0	0	0	0
Total	**100**	**100**	**100**	**100**
Missing	0		0	
Parental Occupation				
Senior Managers and Professionals	31	34	32	34
Other Managers and Associate Professionals	22	24	23	25
Skilled trades, clerical and sales	20	22	21	22
Unskilled manual, office & sales	12	12	11	12
Not in paid work for 12 months	7	8	6	6
Total	**93**	**100**	**93**	**100**
Missing	7		7	
Parental Education				
Year 9 or equivalent or below	2	2	2	3
Year 10 or equivalent	2	3	2	3
Year 11 or equivalent	2	2	1	1
Year 12 or equivalent	6	6	6	6
Certificate I to IV (inc trade cert)	23	24	25	26
Advanced Diploma/Diploma	15	16	15	16
Bachelor degree or above	45	47	43	45
Total	**95**	**100**	**95**	**100**
Missing	5		5	
Indigenous Status				
Non Aboriginal or Torres Strait Islander	92	94	95	96
Aboriginal or Torres Strait Islander	5	6	4	4
Total	**98**	**100**	**99**	**100**
Missing	2		1	
Language spoken at home				
English only	70	73	71	74
Language other than English	26	27	25	26
Total	**96**	**100**	**95**	**100**
Missing	4		5	
Geographic Location				
Metropolitan	70	70	75	75
Regional	28	28	24	24
Remote	2	2	1	1
Total	**100**	**100**	**100**	**100**
Missing	0		0	

Because results are rounded to the nearest whole number some totals may appear inconsistent.

Notes on reading the tables and figures in this report

Rounding

In this report, percentages and scale scores are presented to the nearest whole number. Sums and differences of percentages and scale scores are calculated using their unrounded values. Slight differences between sums and differences calculated using the unrounded values and those shown in the tables are due to rounding. For example, the percentages reported in tables may not always add up to 100% and reported differences between average scores may not exactly match differences calculated using the rounded values shown in the tables.

Calculating the precision of estimates

For any sample survey, there is a level of uncertainty regarding the extent to which an estimate measured from the sample of students is the same as the true value for the population (that is, all students). An estimate derived from a sample is subject to uncertainty because data from the sample may not reflect the population precisely.

Throughout this report, data are reported with confidence intervals that comprise the range in which one can have 95% confidence the true value of the reported figure is located. The magnitude of the confidence intervals varies depending on the exact ways in which the data have been collected. For example, in this report, larger confidence intervals are consistently seen around estimates based on smaller numbers of students (such as from the smaller states and territories). Further information about how the confidence intervals are calculated can be found in the NAP–ICT Literacy 2022 Technical Report.

Reporting the size of differences between groups and measures of association

In large samples, it is possible that relatively small differences are statistically significant, even if the differences themselves have little educational importance. In this report, the term “significant” refers only to differences that are statistically significant. If a difference is significant, the size of the difference (the effect size) can be considered. Effect size is useful when considering the differences between measured scores (such as NAP–ICT Literacy scale scores and survey scale scores) across groups.

Effect size provides a comparison of the difference in average scores between 2 groups with reference to the degree to which the scores vary within the groups. When the effect size is large, it means that the difference between average scores is large relative to the spread of the scores. The difference could therefore be considered as “important”. Conversely, when the effect size is small, it means that the observed difference is relatively small compared with the spread of the scores and thus arguably less “important”. The effect size is the difference between group means divided by the standard deviation. We use fractions for approximate estimates.

Following the precedent of other NAP sample assessments and considering the spread of significant mean differences in NAP–ICT Literacy, this report has adopted the following categories as descriptors:

- effect sizes of 1 or greater are very large (or very strong associations)
- effect sizes between 0.5 and less than 1 are large (or strong associations)
- effect sizes between 0.3 and less than 0.5 are moderate (or moderate associations)
- effect sizes above 0.1 and less than 0.3 are small (or weak associations).

Descriptors relating scale score differences to standard deviations are used in the report when regarded as informative.

The NAP–ICT Literacy achievement scale was established with a Year 6 standard deviation of 100 points. Consequently, a moderate effect on the NAP–ICT Literacy scale corresponds to approximately 30 scale points, which is equivalent to the average learning growth of about one year between Year 6 and Year 10.

For the survey scales, a moderate effect is approximately 3 scale points given the Year 6 standard deviation was set at 10 scale points.

In chapters 5, 6 and 7 of this report, the Pearson's correlation coefficient (*r*) is reported as a measure of the association between scale scores for student responses to selected questions on the student survey and student achievement. Where the Pearson's correlation coefficient (*r*) is statistically significant, the strength of the association is described as:

- strong if the magnitude of the coefficient (*r*) is 0.5 or greater
- moderate if the magnitude of the coefficient (*r*) is greater than 0.2 and less than 0.5
- weak if the magnitude of the coefficient (*r*) is between 0.1 and 0.2
- negligible if the magnitude of the coefficient (*r*) is less than 0.1.

Chapter 3:
The NAP–ICT Literacy scale

Chapter 3: The NAP–ICT Literacy scale

Chapter highlights

- The NAP–ICT Literacy scale was established in 2005 using the Rasch model and consists of 6 proficiency levels for Year 6 and Year 10 students. The scale has a mean score of 400 and a standard deviation of 100 for the national Year 6 sample, and scores for all assessment cycles are reported on the same metric.
- Proficiency levels were established at equally spaced intervals across the scale, with each level spanning 120 points and providing a description of the knowledge, skills and understandings that a student at that level can demonstrate.
- The level descriptors refer to information search and evaluation, familiarisation and use of digital technologies, software applications, and the ethical use of ICT, allowing them to remain relevant and applicable despite evolving software contexts.
- The NAP–ICT Literacy scale represents a hierarchy of knowledge, skills and understanding, and is developmental in nature, with students assumed to be able to demonstrate achievements at their measured level and below.
- The proficient standards for Year 6 and Year 10 provide reference points of "challenging but reasonable" expectations of student achievement at each year level. The proficient standard for Year 6 is 409 scale points, which is the boundary between levels 2 and 3 on the NAP–ICT Literacy scale. The proficient standard for Year 10 is 529 scale points, which is the boundary between levels 3 and 4 on the scale.
- Exemplar items are provided in this chapter. These items are representative of Levels 1 through 6 of the NAP–ICT Literacy achievement scale.

Developing the NAP–ICT Literacy scale

The NAP–ICT Literacy scale was established based on the test content and psychometric data collected during the inaugural NAP–ICT Literacy assessment in 2005. The scale comprises 6 proficiency levels that are used to describe the achievement of students in both Year 6 and Year 10. The scale descriptors have been reviewed following each subsequent cycle of NAP–ICT Literacy to ensure the accurate reflection of the NAP–ICT Literacy test contents.

The empirical scale

The Rasch model was used to establish the empirical component of the scale. This is the same model that has also been used to establish the empirical scales in the National Assessment Program – Science Literacy (NAP–SL) and Civics and Citizenship (NAP–CC), and in the National Assessment Program – Literacy and Numeracy (NAPLAN). More information about the scaling model and procedures is provided in the NAP–ICT Literacy 2022 Technical Report.

The 2022 NAP–ICT Literacy assessment includes a proportion of questions that were used in 2017 and previous cycles. Common questions were also included between the assessments of Year 6 and Year 10 in 2022 and in all previous NAP–ICT Literacy cycles. In 2005, data from the common questions at Year 6

and Year 10 were used to establish a single NAP–ICT Literacy scale, which was used to report achievement across both year levels. In all subsequent cycles, data from the common items between year levels and across assessment cycles were used to equate the scales and derive comparable student achievement scores on the established NAP–ICT Literacy scale. The scale was set in 2005, with a mean score of 400 and standard deviation of 100 scale points for the national Year 6 sample. NAP–ICT Literacy scale scores from all 5 assessment cycles are reported on this same metric.

The proficiency levels

Six proficiency levels were established at equally spaced intervals across the NAP–ICT Literacy scale in 2005. Each proficiency level spans 120 scale points. Each level description provides a synthesised overview of the knowledge, skills and understandings that a student working within the level is able to demonstrate. The levels are set so that a student with an achievement scale score at the bottom of a level has a 62% chance of correctly answering any question at the bottom of that level and a 38% chance of correctly answering any question at the top of that level, and would be expected to correctly answer about half of the questions in a set of questions evenly spaced across the level. The cut-points for the proficiency levels are shown in Figure 3.1

Level	Cut-point in scale score
Level 6	769
Level 5	649
Level 4	529
Level 3	409
Level 2	289
Level 1	

Figure 3.1: Cut-points for proficiency levels

Describing the NAP–ICT Literacy scale

Summary descriptions for all 6 levels were established in 2005 based on expert judgements of the contents of the questions situated within each level. These descriptions were confirmed against the new test content developed for each new assessment cycle and extended to incorporate DT elements in the 2022 cycle (ACARA, 2020).

Broadly, across the 6 proficiency levels, the level descriptors included reference to the 4 strands of the progress map in the NAP–ICT Literacy Assessment Framework (2020):

- Understanding ICT and digital systems
- Investigating and planning solutions with ICT
- Implementing and evaluating digital solutions
- Applying safe and ethical protocols and practices when using ICT.

Consequently, the descriptors have continued to be relevant and applicable to demonstrations of ICT literacy achievement even though different software contexts have evolved over the 5 cycles of NAP–ICT Literacy.

The assessment modules, and the tasks those modules contain, were updated to reflect new software contexts and applications, but the underlying conceptualisation of ICT literacy measured in NAP–ICT Literacy has remained constant. This principle is followed in most assessment studies that extend over several cycles and are concerned with measuring change. It is accepted that changes in methods and content are necessary for assessments to remain relevant, but that maintaining the meaning of the construct is a necessary condition for measuring change (von Davier and Mazzeo 2009).

The NAP–ICT Literacy scale represents a hierarchy of the knowledge, skills and understanding included in the construct of ICT literacy. Overall, higher levels on the scale refer to more complex applications of knowledge, skills and comprehension in ICT literacy. The scale is developmental in the sense that students are assumed to be typically able to demonstrate achievement of the skills and cognition described in the scale, below as well as at their measured level of achievement.

Table 3.1 shows the described NAP–ICT Literacy scale together with examples of student achievement at each proficiency level. The proficient standards and student achievement in relation to the proficiency levels are discussed in the following sections.

Table 3.1: NAP–ICT Literacy proficiency level descriptions with examples

Proficiency level	Proficiency level description	Examples of student achievement at this level
Level 6	Students working at level 6 create information products that show evidence of technical proficiency, careful planning and review, and digital technologies skills. They use software features to organise information, and to synthesise and represent data as integrated complete information products, and develop algorithms and apply computational thinking. They design information products consistent with the conventions of specific communication modes and audiences, and use available software features to enhance the communicative effect of their work.	• Create an information product in which the flow of information is clear, logical and integrated to make the product unified and complete. • Select appropriate key points and data from available resources and use their own words to include and explicate them in an information product. • Use graphics and text software editing features, such as font formats, colour, animations and page transitions, in ways that enhance the structure and communicative purpose of an information product. • Include relevant tables and charts to enhance an information product and support these representations of data with text that clearly explains their purpose and contents. • Apply computational thinking and algorithm development to solve complex problems in various contexts. • Design and create digital solutions using various software tools, programming languages and platforms, focusing on user experience and interface design.

Proficiency level	Proficiency level description	Examples of student achievement at this level
Level 5	Students working at level 5 evaluate the credibility of information from electronic sources and select the most relevant information to use for a specific communicative purpose. They create information products that show evidence of planning and technical competence, and digital technologies understanding. They use software features to reshape and present information graphically consistent with presentation conventions. They design information products that combine different elements and accurately represent their source data, and apply computational thinking to develop digital solutions. They use available software features to enhance the appearance of their information products and user interfaces. They employ file management practices to support workflow management when creating information products. They can explain how components of a digital system are connected to transmit data and interpret the data outputs.	• Create an information product in which the information flow is clear and logical, and the tone and style are consistent and appropriate to a specified audience. • Use video/animation editing techniques to control the timing of events and transitions to create a sense of continuity. • Select and include information from electronic resources in an information product to suit an explicit communicative purpose. • Use graphics and text software editing features such as font formats, colour and animations consistently within an information product to suit a specified audience. • Create tables and charts that accurately represent data and include them in an information product with text that refers to their contents. • Apply specialised software and file management functions such as using the history function on a web browser to return to a previously visited page or moving and organising image files into a dedicated folder for the purpose of importing the images into an application. • Explain the advantages and disadvantages of different file formats (e.g. PDF or DOCX). • Demonstrate an understanding of basic programming concepts and apply them to develop digital solutions in various contexts. • Design and implement simple digital solutions such as designing user interfaces, using a variety of software tools and platforms that ensure the solution is easy to navigate and interpret for the user. • Explain how data is transferred between components of a digital system to perform a given function e.g. how wi-fi can be used to communicate with a device.

Proficiency level	Proficiency level description	Examples of student achievement at this level
Level 4	Students working at level 4 generate simple general search questions and select the best information source to meet a specific purpose. They retrieve information and interpret data reports from given electronic sources to answer specific, concrete questions. They can implement solutions to collect information from users. They assemble information in a simple linear and logical order to create information products. They use conventionally recognised software commands to edit and reformat information products, and begin to explore digital technologies concepts. They recognise common examples in which ICT misuse may occur and suggest ways of avoiding them.	• Create an information product in which the flow of information is clear and the tone is controlled to suit a specified audience. • Generate searches that target relevant resources, apply search engine filtering parameters to improve search results and then select relevant sections of these resources to include, with some modification and supporting text, in an information product. • Use simple web forms to collect information from users. • Apply graphics and text software editing features, such as font formats, colour and image placement, consistently across a simple information product. • Apply specialised file management and software functions, such as sorting files by type and date, locating an appropriate folder location for software installation or enabling a specified hidden toolbar in a word processor. • Explain basic digital technologies concepts, such as simple programming and algorithm design, in the context of problem-solving tasks. • Begin to develop digital solutions, using a variety of software tools and platforms, with guidance and support.
Level 3	Students working at level 3 generate simple general search questions and select the best information source to meet a specific purpose. They retrieve information and interpret data reports from given electronic sources to answer specific, concrete questions. They can use simple digital forms and identify mistakes in software tools used to collect information from users. They assemble information in a simple linear and logical order to create information products. They use conventionally recognised software commands to edit and reformat information products and begin to explore basic digital technologies concepts. They can correctly connect components of a simple digital system.	• Create an information product that follows a prescribed explicit structure. • Identify the difference between paid and nonpaid search engine generated results when conducting research. • Select clear, simple, relevant information from given information sources and include it in an information product. • Collect information from users. • Make recommendations to improve the navigability of a website. • Identify a potential problem with a website based on a web traffic report. • Use design software editing features to manipulate aspects such as colour, image size and placement in simple information products. • Identify problems with the features employed in a user interface. • Apply software and file management functions, using common conventions such as left aligning selected text, adding questions to an online survey, or creating and naming a new file on the desktop.

Proficiency level	Proficiency level description	Examples of student achievement at this level
	They can use a range of communication tools for participating in collaborative online environments. They recognise common examples in which ICT misuse may occur and suggest ways of avoiding them.	• Recognise the potential for ICT misuse, such as plagiarism, computer viruses and deliberate identity concealment, and suggest measures to protect against them. • Develop an understanding of foundational digital technologies concepts, such as basic programming structures and digital systems, in a guided setting. • Create simple digital solutions with support, using a limited range of software communication tools (e.g. interactive charts and presentations) and platforms. • Identify how components of a simple digital system are connected.
Level 2	Students working at level 2 locate simple, explicit information from within a given electronic source. They add content to and make simple changes to existing information products when instructed. They edit information products to create products that show limited consistency of design and information management. They recognise and identify basic ICT electronic security and health and safety usage issues and practices, and gain exposure to basic digital technologies concepts. They can interpret data represented in a range of communication tools for participating in collaborative online environments. They examine the main components of familiar digital systems and identify their functions.	• Locate explicit relevant information or links to information from within a webpage. • Use metadata, such as date, to help identify and select relevant files. • Make changes to some presentation elements in an information product. • Apply simple software and file management functions, such as copying and pasting information from one column of a spreadsheet to another column, adding a webpage to a list of favourites (bookmarks) in a web browser or opening an email attachment. • Recognise common computer-use conventions and practices, such as the use of the .edu suffix in the URL of a school's website, the need to keep anti-virus software up-to-date and the need to maintain good posture when using a computer. • Explain the purpose of specific school ICT use and social media use policies. • Identify basic digital technologies concepts, such as simple programming structures and digital systems, in a guided setting. • Explore simple digital solutions with support, using a limited range of software communication tools (e.g. interactive charts and presentations) and platforms. • Examine components of familiar digital systems and their function (e.g. microphones, wi-fi devices, sensors).

Proficiency level	Proficiency level description	Examples of student achievement at this level
Level 1	Students working at level 1 perform basic tasks using computers and software. They implement the most commonly used file management and software commands when instructed. They recognise the most commonly used ICT terminology and functions, and gain initial exposure to basic digital technologies concepts.	• Apply graphics editing software functions, such as adding and moving predefined shapes and adjusting property sliders, to control the basic appearance of an image. • Apply basic file and computer management functions, such as opening, and dragging and dropping files on the desktop. • Apply generic software commands, such as the "save as" and "paste" functions, clicking on a hyperlink to go to a webpage or selecting all the text on a page. Recognise basic computer-use conventions, such as identifying the main parts of a computer and that the "shut-down" command is a safe way to turn off a computer. • Become familiar with simple digital technologies concepts, such as basic programming structures and digital systems, in a highly guided setting (e.g. decision trees). • Participate in guided activities to explore simple digital solutions, using a limited range of software tools and platforms.

The proficient standards

One of the purposes of the NAP sample assessments (in ICT literacy, civics and citizenship and science literacy) is to monitor and report on student attainment of key performance measures (KPMs) defined for each area. The proportion of students achieving at or above the proficient standard for each of Year 6 and Year 10 is the national KPM for ICT literacy specified in the Measurement Framework for Schooling in Australia (ACARA 2019).

The proficient standards "represent a 'challenging but reasonable' expectation of student achievement at a year level, with students needing to demonstrate more than elementary skills expected at that year level" (ACARA 2015, p. 5). This is different from the definition of either a benchmark or a national minimum standard, which refers to minimum competence. The proficient standards in NAP–ICT Literacy (one for Year 6 and one for Year 10) were established as a result of consultations with ICT experts and representatives from all states and territories and all school sectors as part of the inaugural assessment in 2005. The standards-setting group included practising teachers with specific ICT expertise, ICT curriculum experts and educational assessment experts. The procedures followed by the group are outlined in the NAP–ICT Literacy Public Report (MCEETYA 2007, pp. 46–7).

The proficient standard for Year 6 and the proficient standard for Year 10 were established in 2005 on the NAP–ICT Literacy scale. The proficient standard for Year 6 is 409 scale points, which is the boundary between levels 2 and 3 on the NAP–ICT Literacy scale. The proficient standard for Year 10 is 529 scale points, which is the boundary between levels 3 and 4 on the scale. Year 6 students performing at level 3 and above and Year 10 students performing at level 4 and above have consequently met or exceeded their relevant proficient standard.

Exemplar items

This section provides sample questions that are representative of the NAP–ICT Literacy achievement scale.

The scale represents increasing levels of knowledge, skills and understanding across all strands of the NAP–ICT Literacy Assessment Framework. This assessment framework is closely aligned to the AC: ICT Capability and the AC: Digital Technologies. With opportunities to use ICT across learning areas, and to use and apply the content of the AC: Digital Technologies, students' ICT literacy should improve.

The scale is developmental in the sense that students are assumed to be typically able to demonstrate achievement of the content described in the scale, below as well as at their measured level of achievement.

Summary indicators of each proficiency level are provided below, together with a range of exemplar items to illustrate performance at each level. Each exemplar item from the NAP–ICT Literacy assessment is presented together with the percentage of students nationally (Year 6 and/or Year 10, as appropriate) who answered the item correctly. In addition, these items are presented with references to the NAP–ICT Literacy Assessment Framework (one strand and one process per item), which the items were developed to assess. Also included are indicative references to the AC: Digital Technologies and the AC: ICT Capability, including one knowledge and one skills reference per item.

The items are presented as screen shots from the 2022 NAP–ICT Literacy online tests themselves. Given the close alignment between the NAP–ICT Literacy Assessment Framework, AC: Digital Technologies and ICT Capability, teachers, schools and systems may find these items useful to support the development of students' ICT literacy in Year 6 and Year 10.

ICT scale: level 1

Exemplar item 1 is at level 1 and is shown in Figure 3.2. This item from the Park design module requires a one-click response and was answered correctly by 81% of Year 6 students and 90% of Year 10 students.

Students are required to click on a hyperlink within a message in a team-based collaboration application. This demonstrates their understanding of ICT systems, and their ability to find information and data through a variety of processes. This is an example of a basic information task that requires students to apply their knowledge of the display and functionality conventions used across ICT applications.

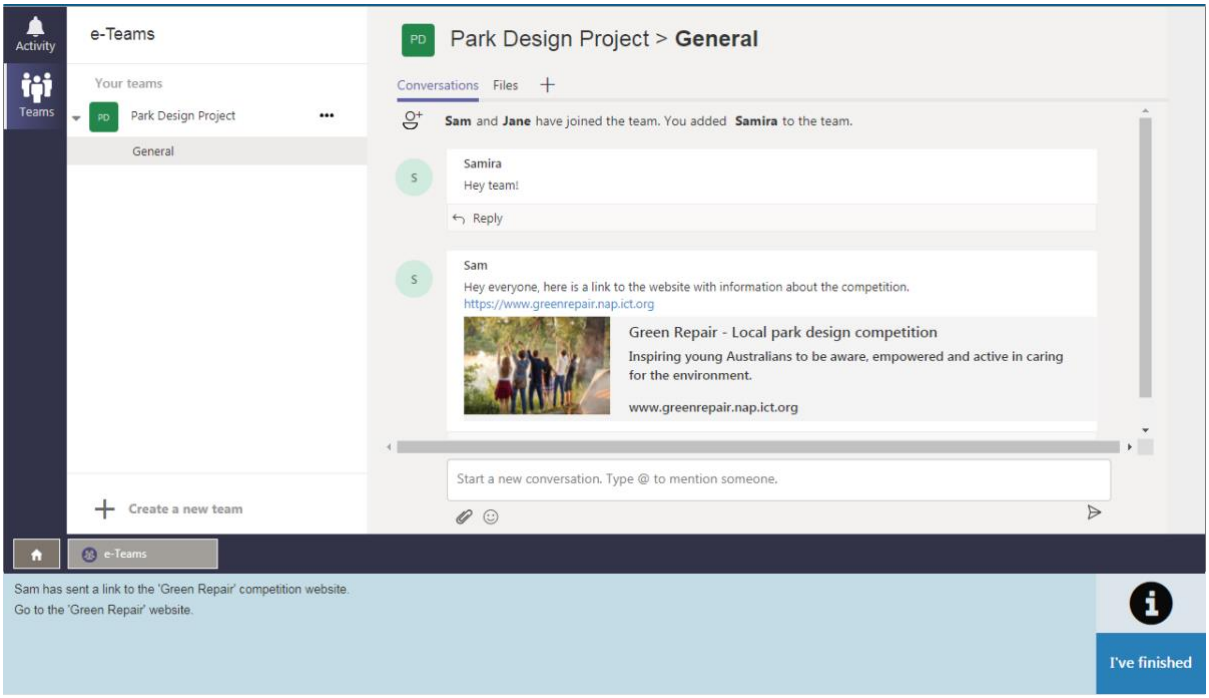

Figure 3.2: Exemplar item 1

To complete the task, students need to be aware of the convention for anchor text and links to be displayed using alternative (blue) fonts to the body text and furthermore to recognise the convention for an icon (the folder) to be displayed as an indication of the relationship of the link to an external website. Successful completion of this task is indicative of students' capacity to navigate web applications.

The item descriptor, percentage of achievement and references to the assessment framework and the Australian Curriculum can be seen below.

Table 3.2: Descriptor and percentage of achievement for Exemplar item 1

Descriptor	Y6	Y10
Locates and clicks a link to a website embedded in a post in a collaboration application.	81%	90%

Table 3.3: Framework and curriculum references for Exemplar item 1

NAP–ICT Literacy Assessment Framework reference	
Strand	Investigating and planning solutions with ICT
Aspect	Accessing and evaluating information
Australian Curriculum: Digital Technologies indicative reference	
Skills	Years 5 and 6 – Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols (ACTDIP022) Years 7 and 8 – Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)
Australian Curriculum: ICT Capability reference	
Element	Managing and operating ICT (Understand ICT systems)

ICT scale: level 2

Exemplar Item 2, displayed in Figure 3.3 is part of the Interactive story module.

In this series of tasks, students are required to actively engage with basic digital planning tools. This item is at level 2 and requires students to observe the planning document (a Gantt chart) and identify the tasks that have been allocated a duration of 2 weeks.

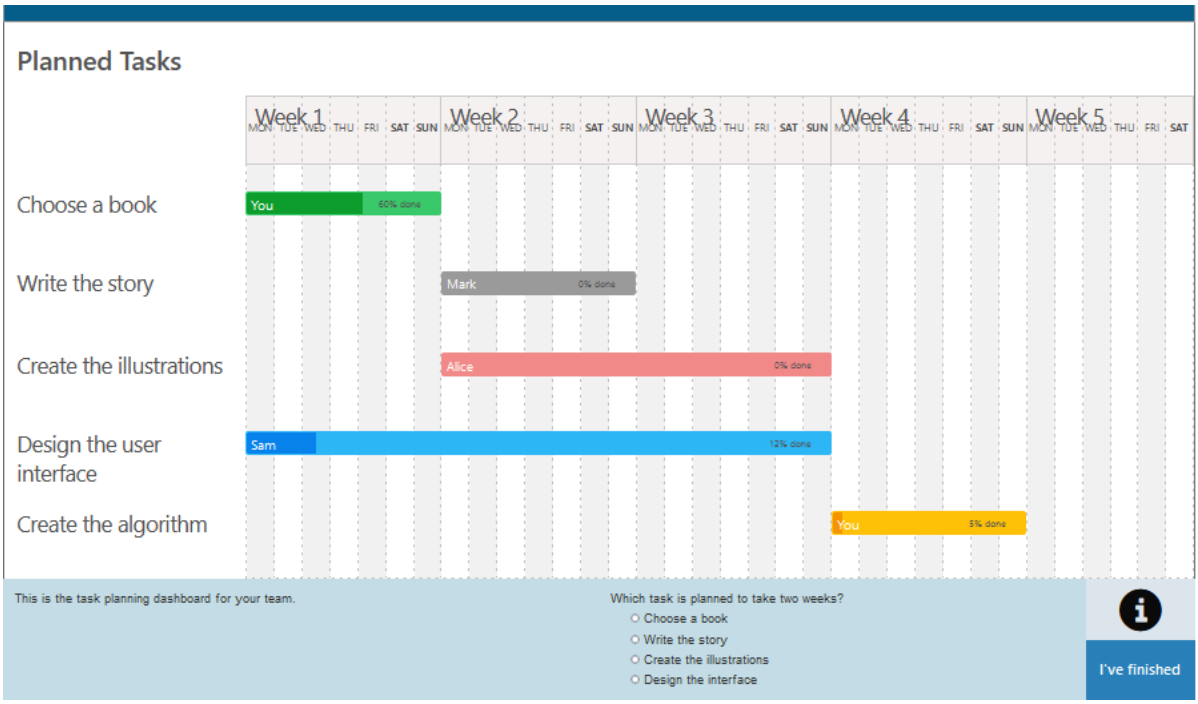

Figure 3.3: Exemplar item 2

This item was successfully completed by 63% of Year 6 students and 83% of Year 10 students. To complete the task, students must be able to accurately ascertain the duration of tasks on a Gantt chart by identifying task lengths based on observed patterns in the chart. Students must demonstrate a foundational understanding of project management concepts and an aptitude for interacting with planning software tools and electronic resources, and cultivate the skills necessary to locate and manipulate explicit information within a given project timeline. The descriptor, percentage of achievement by year level and curriculum references for this item can be seen below.

Table 3.4: Descriptor and percentage of achievement for Exemplar item 2

Descriptor	Y6	Y10
Identifies a task according to its duration in a Gantt chart.	63%	83%

Table 3.5: Framework and curriculum references for Exemplar item 2

NAP–ICT Literacy Assessment Framework reference	
Strand	Understanding ICT and digital systems
Aspect	Managing information and operating ICT
Australian Curriculum: Digital Technologies indicative reference	
Skills	Years 5 and 6 – Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols (ACTDIP022) Years 7 and 8 – Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)
Australian Curriculum: ICT Capability reference	
Element	Managing and operating ICT (understand ICT systems)

ICT scale: level 3

Exemplar item 3 is part of the Interactive story module. The item is at level 3 and is shown in Figure 3.4.

Forty-nine per cent of Year 6 students and 71% of Year 10 students correctly responded to this item. This item requires students to understand file-naming conventions and select a filename for a file, which is consistent with the naming of other files.

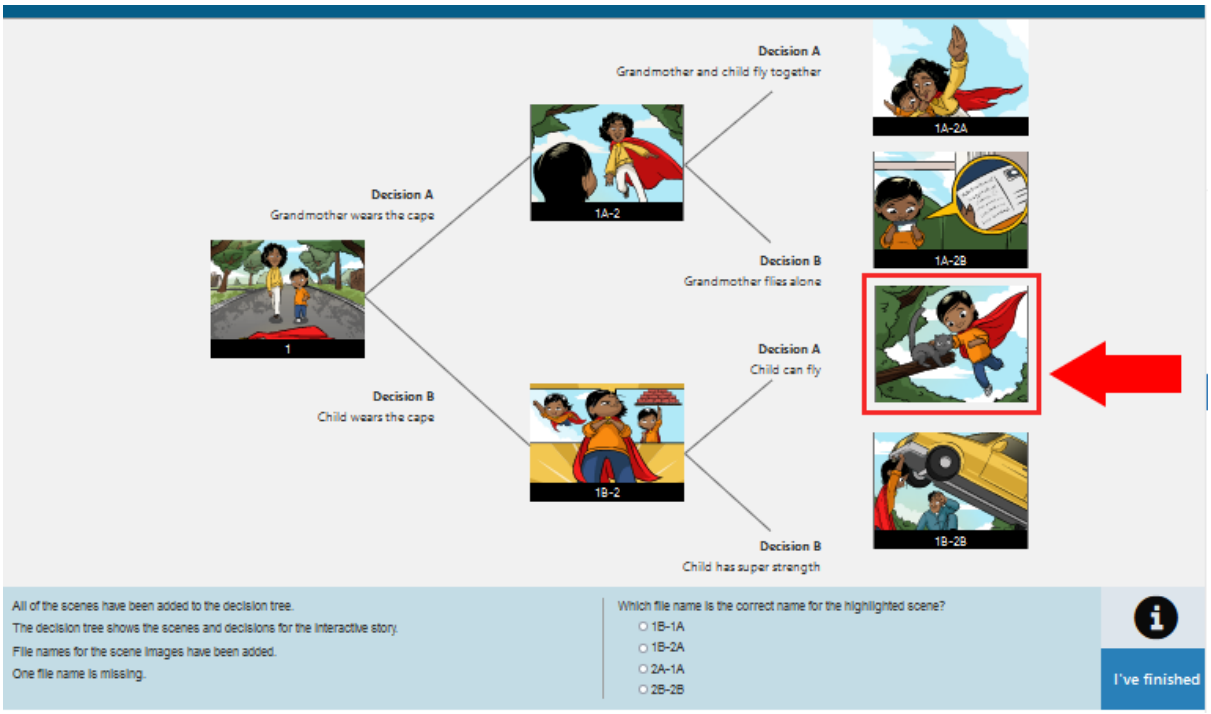

Figure 3.4: Exemplar item 3

To correctly answer this item, students must be able to select a filename that aligns with an existing naming structure used for other files. This requires attention to patterns, an understanding of the logic behind file-naming conventions and the ability to apply this understanding in a practical setting. Students must demonstrate a foundational understanding of digital organisational principles and ability to interact with file management systems.

The item descriptor, percentage of achievement by year level and curriculum references can be seen below.

Table 3.6: Descriptor and percentage of achievement for Exemplar item 3

Descriptor	Y6	Y10
Infers the file name for a scene based on other file names.	49%	71%

Table 3.7: Framework and curriculum references for Exemplar item 3

NAP–ICT Literacy Assessment Framework reference	
Strand	Understanding ICT and digital systems
Aspect	Understanding digital systems
Australian Curriculum: Digital Technologies indicative reference	
Skills	Years 5 and 6 – Acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information (ACTDIP016) Year 7 and 8 – Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)
Australian Curriculum: ICT Capability reference	
Element	Managing and operating ICT (Manage digital data)

ICT scale: level 4

Exemplar item 4 (Figure 3.5) is a level 4 item and is shown in Figure 3.5. This item is from the Park design module and was answered correctly by 40% of Year 6 students and 62% of Year 10 students. This task involves selecting text from a website and sending it to fellow members for collaborative work.

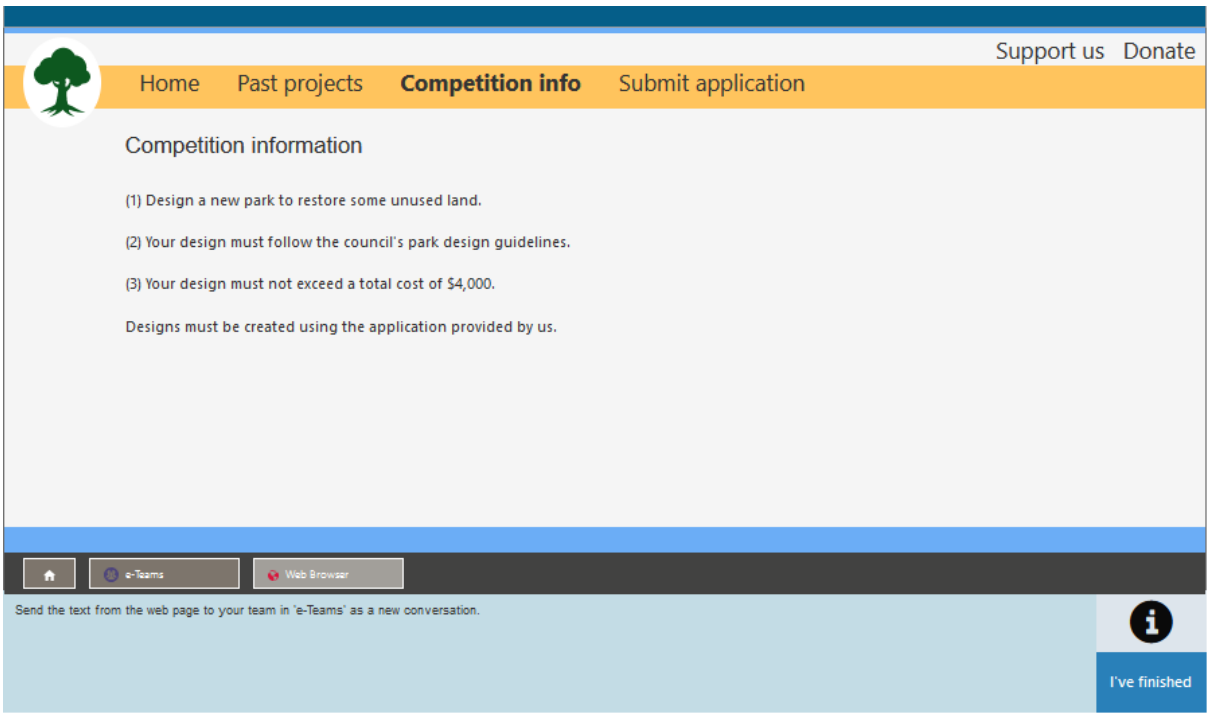

Figure 3.5: Exemplar item 4

To accomplish this task, students need to be familiar with the norms of interacting with website interfaces and team-based platforms. Successful completion of this task signifies students' ability to navigate between source materials to extract relevant information and transmit this information in a collaborative tool (“e-Teams”).

The item descriptor, percentage of achievement and curriculum references can be seen below.

Table 3.8: Descriptor and percentage of achievement for Exemplar item 4

Descriptor	Y6	Y10
Posts text from a webpage as a conversation thread in a collaboration application.	40%	62%

Table 3.9: Framework and curriculum references for Exemplar item 4

NAP–ICT Literacy Assessment Framework reference	
Strand	Understanding ICT and digital systems
Aspect	Managing information and operating ICT
Australian Curriculum: Digital Technologies indicative reference	
Skills	Years 5 and 6 – Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols (ACTDIP022) Years 7 and 8 – Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032) Years 9 and 10 – Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability (ACTDIP044)
Australian Curriculum: ICT Capability reference	
Element	Managing and operating ICT (Understand ICT systems)

ICT scale: level 5

Exemplar item 5 (Figure 3.6) shows a task from the Interactive story module.

This is an example of a task that requires students to apply their knowledge of digital systems and the communication conventions used in user interfaces. Successful completion of this task is indicative of students' ability to make connections between user interface and user experience.

Student responses to this task were assessed using 2 criteria. One criterion had a maximum of 2 score points, and one had a maximum of one score point. It is the first criterion (i.e. "Move the buttons to make the design of the interface easier to use") that exemplifies a level 5 item and is described below.

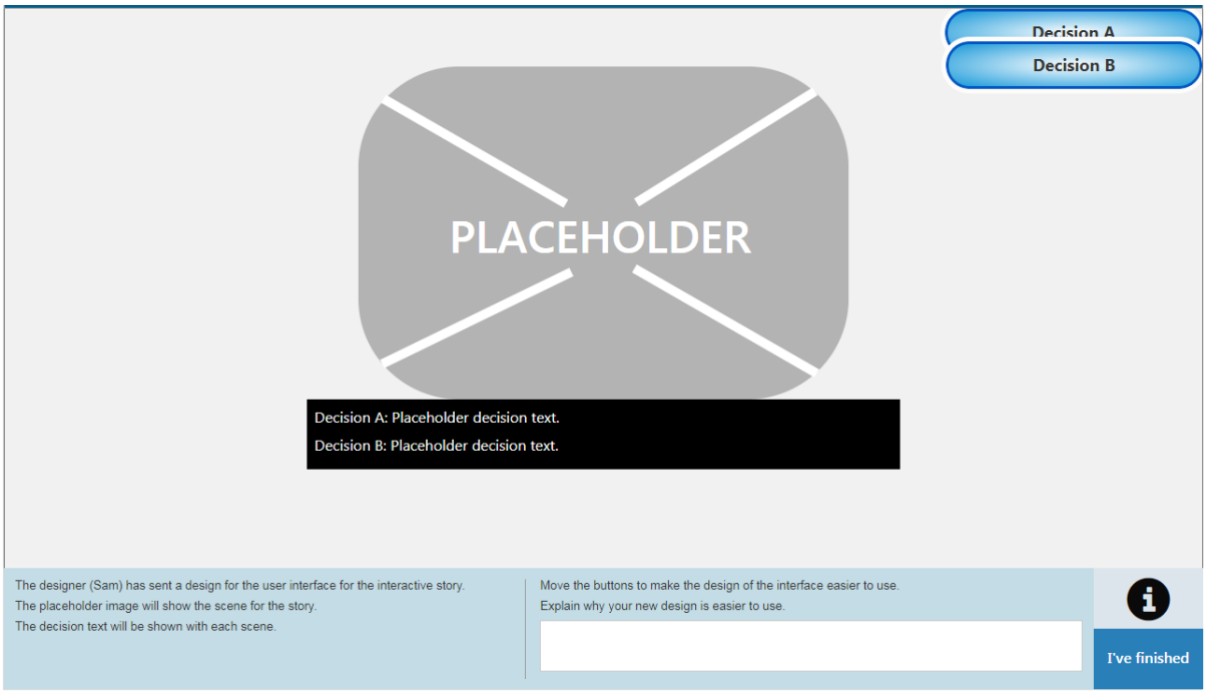

Figure 3.6: Exemplar item 5

For this item, students are required to undertake multiple steps to improve the user interface to be "easier to use". Students are required to change the location of the buttons so that they do not overlap and so that they are placed conventionally with respect to the content. Full credit (2 marks) was awarded to students who met both of these requirements (i.e. buttons not overlapping and also placed conventionally). Partial credit (1 mark) was awarded to students who met only one of these requirements.

The descriptors and the achievement percentages for both full and partial credit can be seen below.

Table 3.10: Descriptor and percentage of achievement for Exemplar item 5

Descriptor	Y6	Y10
Arranges buttons in a user interface to improve usability (full credit).	3%	8%
Arranges buttons in a user interface to partially improve usability (partial credit).	17%	28%

Table 3.11: Framework and curriculum references for Exemplar item 5

NAP–ICT Literacy Assessment Framework reference	
Strand	Implementing and evaluating digital solutions
Aspect	Developing algorithms, programs and interfaces
Australian Curriculum: Digital Technologies indicative reference	
Skills	Years 5 and 6 – Design a user interface for a digital system (ACTDIP018) Years 7 and 8 – Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028) Years 9 and 10 – Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics (ACTDIP039)
Australian Curriculum: ICT Capability reference	
Element	Communicating with ICT (understand computer-mediated communications)

ICT scale: level 6

Exemplar item 6 (Figure 3.7) shows the large task from the slide show test module in the 2017 assessment cycle. In this module, students complete a class project about the Tasmanian Devil Program on Maria Island. The module involves opening and saving files, searching websites for information on the topic, creating a short slide show about the Tasmanian Devil Program on Maria Island and scripting notes to go with the slide show.

Student responses to this task were assessed using 6 criteria (one criterion had a maximum of 2 score points and 5 had a maximum of one score point). This is an example of a task that requires students to apply their knowledge of digital applications and how the importance of editing effectively enhances communication on a given topic. To complete the task, students need to be aware of the conventions for creating effective factual presentations through a digital lens and the importance of user experience with applications such as font and image choice, and background colour. Successful completion of this task is indicative of students' capacity to create a short presentation with effective execution of continuity and information.

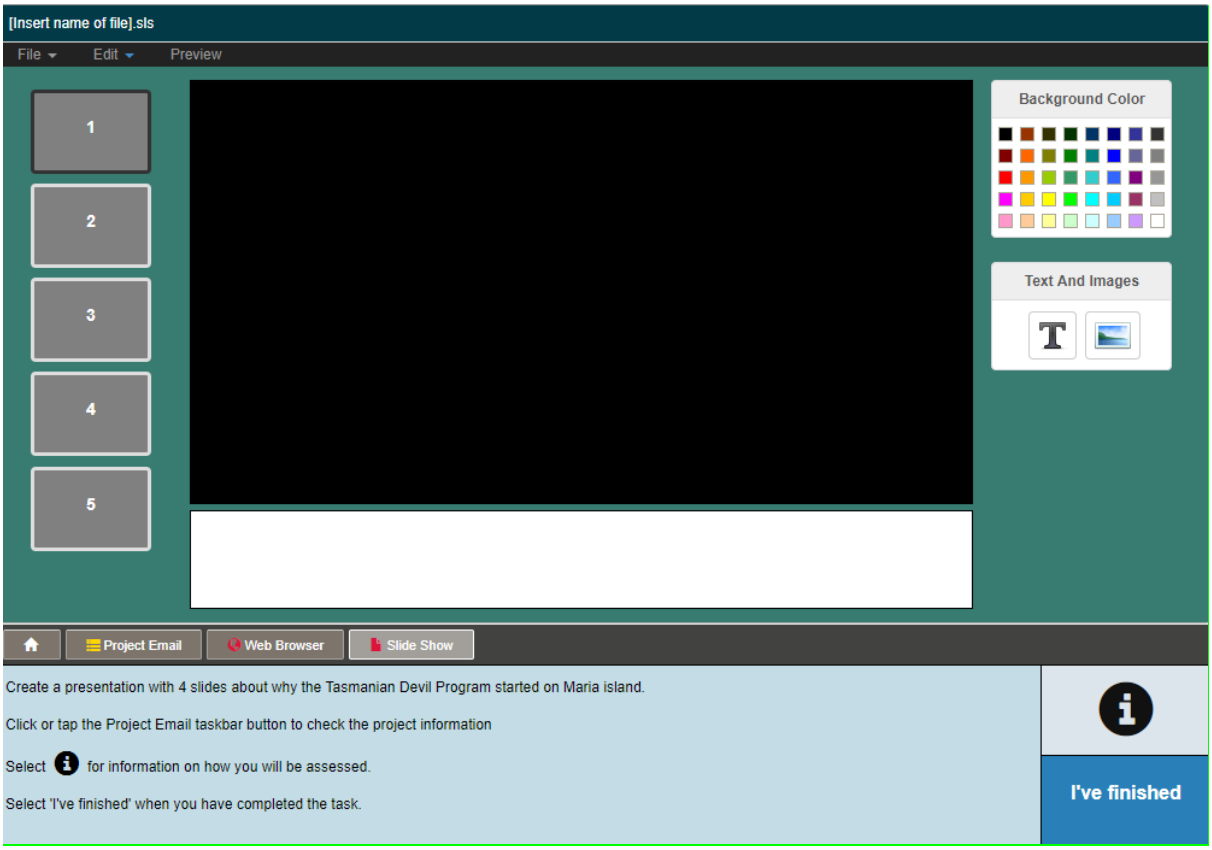

Figure 3.7: Exemplar item 6

For this task, students were required to undertake multiple steps, such as: include a relevant and identifiable title in a presentation, select and edit information and images that are relevant to the topic and target audience, ensure the information in each script note section supports and expands on the content of the slide, design a layout for images and text in a slide show, select font size and style to suit a slide show presentation, and select colour of text and background.

Students who demonstrated all of these elements gained full credit for this task. They demonstrated high technical proficiency, careful planning, and an ability to review their work and use software features to enhance the communicative effect of their work.

To achieve level 6, students are required to demonstrate a high level of ICT literacy. An example of achievement against one descriptor is shown below.

Table 3.12: Descriptor and percentage of achievement for Exemplar item 6

Descriptor	Y6	Y10
Selects and edits all relevant information and images in a way that enhances communication on the topic for the target audience.	1%	9%

Table 3.13: Framework and curriculum references for Exemplar item 6

NAP-ICT Literacy Assessment Framework reference	
Strand	Implementing and evaluating digital solutions
Aspect	Communicating with digital information products
Australian Curriculum: Digital Technologies indicative reference	
Skills	Years 5 and 6 – Explain how student solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021) Years 7 and 8 – Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028) Years 9 and 10 – Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics (ACTDIP031)
Australian Curriculum: ICT Capability reference	
Element	Creating with ICT (Generate ideas, plans and processes)

Chapter 4:
ICT Literacy achievement

Chapter 4: ICT Literacy achievement

Chapter highlights

- Fifty-five percent of all Year 6 students and 46% of all Year 10 students performed at or above the proficient standard in 2022.
- The average achievement score for Year 6 students was 414 scale points, and 503 scale points for Year 10 students: a difference of 89 scale points between the year levels. This difference is statistically significant but less than the width of a proficiency level on the NAP–ICT Literacy scale.
- There was no change in achievement for Year 6 students; however, there was a significant drop in ICT literacy for Year 10 students since the 2017 cycle.
- A decline in Year 10 achievement since the previous cycle was seen in Western Australia, New South Wales and South Australia. There was no difference in achievement since 2017 for Year 6 students in any jurisdiction.
- Consistent with previous cycles, female students had higher levels of ICT literacy in comparison to male students in both Year 6 and Year 10.
- The gap in ICT literacy between Indigenous and non-Indigenous students remained significant and very large in 2022.
- Students at the Year 6 level who speak a language other than English at home had higher levels of ICT literacy than students who speak English, a finding that is consistent with the previous cycle.
- Students from a metropolitan location tended to have higher levels of ICT literacy than students from a regional location.
- ICT literacy achievement gradually increased with increasing levels of parental occupation and parental education. This resulted in large, significant differences in student achievement between the highest and lowest parental occupational and educational groups.

Introduction

In this chapter, the NAP–ICT Literacy results for the 2022 cycle are presented and discussed. Results are first described for 2022 before they are compared with results from previous cycles, where appropriate. The percentages of students attaining the proficient standard are presented first in each section, followed by distributions of students across proficiency levels and average student scores on the NAP–ICT Literacy scale. All results are presented with 95% confidence intervals, meaning that whenever results are described as significant, the findings are statistically significant at the 0.05 level.

Results are presented both in percentage of students attaining the proficient standard and in mean performance. Tests of statistical significance are used to compare performance over time.

Achievement by year level in 2022

Fifty-five per cent of Year 6 students and 46% of Year 10 students met or exceeded the relevant proficient standard for NAP–ICT Literacy in 2022.

The percentages of students demonstrating proficiency at each proficiency level in Year 6 and Year 10 are presented in Table 4.1. These percentages are also displayed graphically in Figure 4.1, together with the location of the proficient standard for each year level. Appendix D records the distribution of students across proficiency levels for each jurisdiction.

Table 4.1: Percentages of Year 6 and Year 10 students at each proficiency level in 2022

Proficiency level	Year 6		Year 10	
Level 6				
Level 5			6	(±1.1)
Level 4	13	(±1.6)	40	(±2.7)
Level 3	42	(±1.9)	37	(±2.8)
Level 2	32	(±2.0)	13	(±1.9)
Level 1	13	(±1.8)	5	(±1.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.

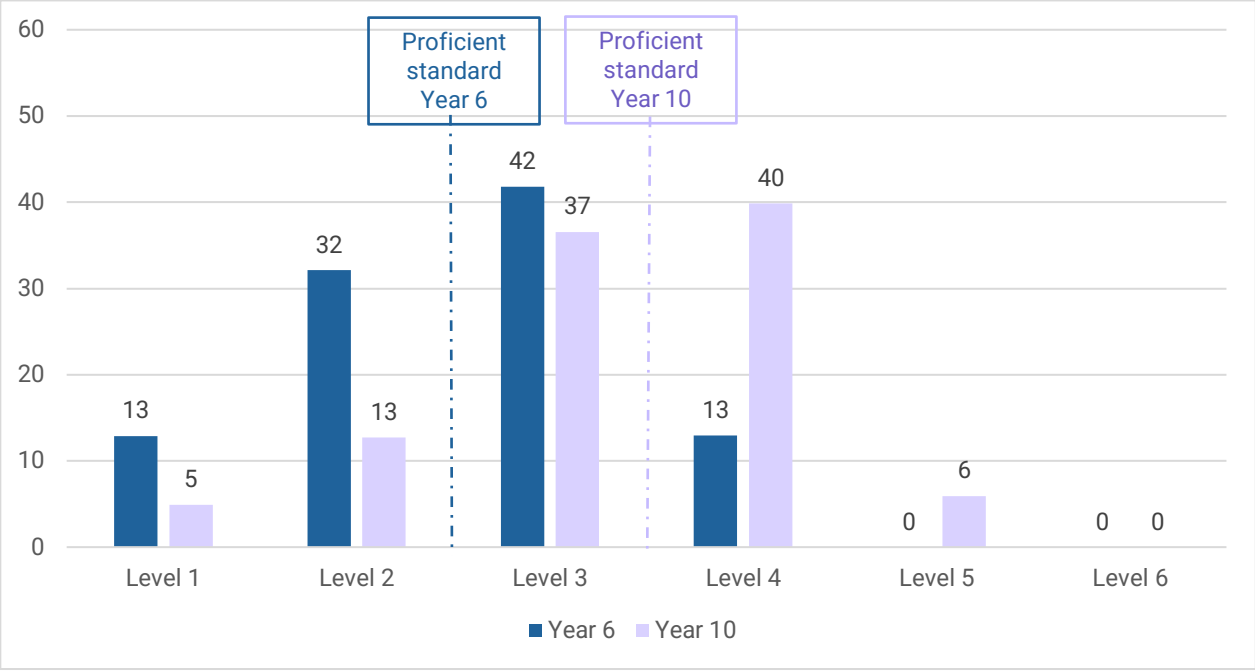

Figure 4.1: Percentages of Year 6 and Year 10 students across proficiency levels in 2022

Figure 4.1 shows that there is a concentration of student achievement at Year 6 in levels 2 and 3, with 74% of Year 6 students achieving within these 2 levels. At Year 10, the concentration of achievement is at levels 3 and 4, with 77% of students achieving within these 2 levels. Figure 4.1 shows that the distribution of achievement of Year 10 students is centred approximately one proficiency level above that of Year 6. Figure 4.1 also illustrates the overlap in achievement between Year 6 and Year 10. This overlap is most concentrated at Level 3, with 42% of Year 6 students and 37% of Year 10 students.

In 2022, the average achievement score for Year 6 students was 414 scale points, and 503 scale points for Year 10 students: a difference of 89 scale points between the year levels. This difference is statistically significant but less than the width of a proficiency level on the NAP–ICT Literacy scale (100 scale points).

The averages, their confidence intervals and selected percentiles are presented in Figure 4.2. The 90th percentile gives the value above which the highest 10% of students scored, the 75th gives the value above which the highest 25% of students scored, and so on. The difference in the scale scores associated with equivalent percentiles between Year 6 and Year 10 is consistent across the scale (approximately between 80 and 90 score points). This shows that, in broad terms, the distributions of Year 6 and Year 10 student achievement across the scale are similar but separated by an amount equivalent to the difference in the average scores between Year 10 and Year 6. Figure 4.2 also shows that the average Year 6 student performs at the bottom of level 3. The average Year 10 student performs near the top of level 3.

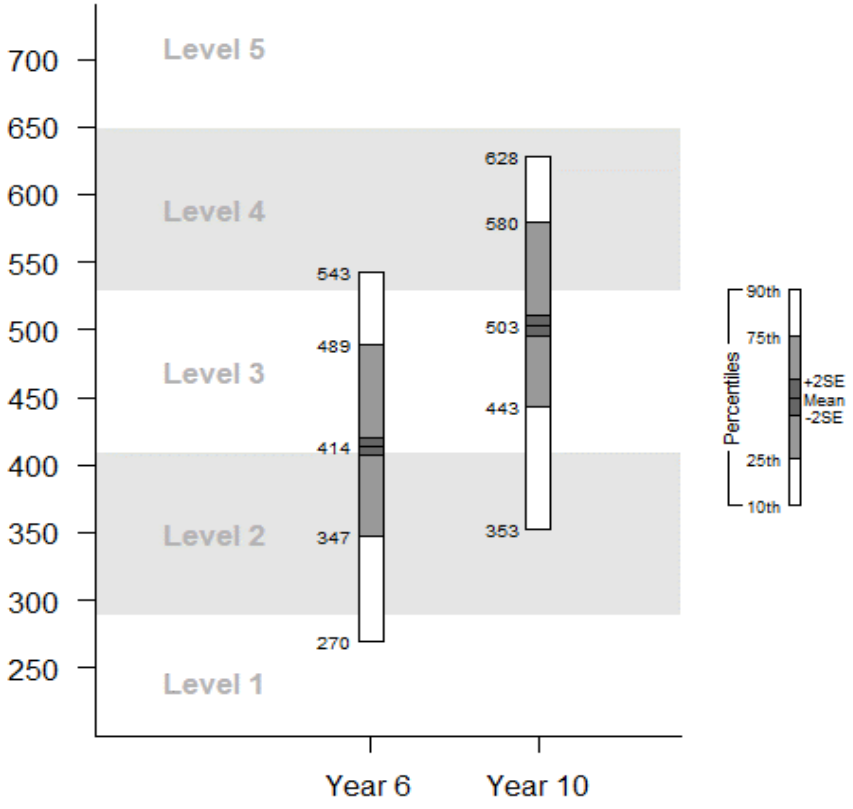

Figure 4.2: NAP–ICT Literacy average scale scores and distributions for Year 6 and Year 10 in 2022

Changes in achievement since 2005

Table 4.2 shows the percentage of students at or above the proficient standard for Year 6 and Year 10 across the 6 assessment cycles. In 2022, fewer Year 10 students achieved at or above the proficient standard than in any previous cycle. For Year 6 students, there was no significant change in the percentage of students attaining the proficient standard in comparison to either of the previous 2 cycles (in 2014 and 2017). However, the percentage of Year 6 students achieving the standard in 2022 was significantly lower than in 2011.

Table 4.2: Percentages of Year 6 and Year 10 students attaining the proficient standard since 2005

Year	2022	2017	2014	2011	2008	2005
Year 6	55 (±2.4)	53 (±2.4)	55 (±2.5)	▲ 62 (±2.0)	57 (±2.8)	49 (±3.0)
Year 10	46 (±3.2)	▲ 54 (±3.0)	▲ 52 (±2.5)	▲ 65 (±2.3)	▲ 66 (±3.0)	▲ 61 (±3.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Table 4.3 shows the percentage of Year 6 and Year 10 students in each proficiency level across the 6 assessment cycles. As in 2022, Year 6 students were most likely to achieve at level 3, and Year 10 students were more likely to achieve at level 4 across all previous cycles of the study.

Table 4.3: Percentages of Year 6 and Year 10 students at each proficiency level since 2005

	Achievement level	2022	2017	2014	2011	2008	2005
Year 6	**Level 6**		0 (±0.0)	0 (±0.0)	0 (±0.1)	0 (±0.1)	0 (±0.1)
	Level 5		0 (±0.2)	1 (±0.3)	1 (±0.6)	1 (±0.5)	0 (±0.1)
	Level 4	13 (±1.6)	13 (±1.4)	13 (±1.3)	20 (±1.8)	15 (±1.6)	8 (±1.5)
	Level 3	42 (±1.9)	41 (±1.9)	42 (±2.5)	40 (±2.0)	41 (±2.3)	41 (±2.7)
	Level 2	32 (±2.0)	33 (±2.2)	31 (±2.4)	27 (±1.7)	30 (±2.1)	39 (±2.3)
	Level 1	13 (±1.8)	13 (±1.6)	14 (±1.9)	11 (±1.6)	13 (±1.7)	13 (±1.5)
Year 10	**Level 6**		0 (±0.1)	0 (±0.3)	2 (±0.6)	1 (±0.6)	0 (±0.4)
	Level 5	6 (±1.1)	8 (±1.3)	9 (±1.3)	19 (±1.6)	18 (±2.1)	12 (±1.7)
	Level 4	40 (±2.7)	46 (±2.6)	43 (±2.0)	44 (±2.4)	47 (±3.0)	49 (±2.7)
	Level 3	37 (±2.8)	33 (±2.5)	33 (±2.1)	25 (±1.8)	26 (±2.2)	32 (±2.9)
	Level 2	13 (±1.9)	10 (±1.5)	11 (±1.4)	8 (±1.1)	7 (±1.5)	6 (±1.2)
	Level 1	5 (±1.1)	3 (±1.0)	4 (±1.1)	2 (±0.7)	2 (±0.5)	0 (±0.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.

Table 4.4 shows the average performance on the ICT Literacy scale for Years 6 and 10 across the 6 cycles of NAP–ICT Literacy since 2005 and compares the average achievement of Year 6 and Year 10 students in 2022 with previous cycles.

Table 4.4: ICT literacy average scales scores for Year 6 and Year 10 since 2005

	2022		2017		2014		2011		2008		2005	
Year 6	414	(±6.0)	410	(±5.4)	413	(±5.7) ▲	435	(±5.7)	419	(±6.9)	400	(±6.3)
Year 10	503	(±7.2) ▲	523	(±6.6)	520	(±6.7) ▲	559	(±5.7) ▲	560	(±7.1) ▲	551	(±5.7)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

After a significant decline between 2011 and 2014, the average performance of Year 6 students did not change between 2017 and 2022. This suggests that the results in 2011 may have been a blip for Year 6 students. When excluding the 2011 results for Year 6, the results are trending flat. The performance of Year 10 students declined from 2017 and is also significantly lower than all other cycles of the study, except for the 2014 cycle.

Student achievement across the states and territories

Comparisons of 2022 student achievement across the states and territories

Table 4.5 shows the percentages of students attaining the proficient standard for each state and territory. The percentage of Year 10 students attaining the proficient standard ranged from 31 in Tasmania to 56 in the Australian Capital Territory. In comparison, the percentage of Year 6 students attaining the proficient standard was 39 in the Northern Territory and 70 in the Australian Capital Territory.

Table 4.5: Percentages of Year 6 and Year 10 students attaining the proficient standard nationally and by state and territory in 2022

State/territory	Year 6		Year 10	
NSW	55	(±5.3)	44	(±8.3)
VIC	61	(±4.2)	50	(±5.6)
QLD	52	(±5.0)	45	(±6.0)
SA	51	(±5.2)	46	(±5.7)
WA	50	(±4.5)	46	(±4.5)
TAS	49	(±6.5)	31	(±6.3)
NT	39	(±8.6)	34	(±18.9)
ACT	70	(±6.4)	56	(±9.6)
Aust.	55	(±2.4)	46	(±3.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table 4.6 shows the percentages of Year 6 and Year 10 students at proficiency levels 1 to 6 across the states and territories. While some differences in percentages appeared large between states and territories, the uncertainties in the estimated percentages (that is, the confidence intervals) were large. As a result, the percentages and differences among them need to be interpreted with caution and are only included for descriptive purposes. The pattern of results varied across jurisdictions.

Table 4.6: Percentages of Year 6 and Year 10 students at each proficiency level nationally and by state and territory in 2022

Year 6					
State/territory	Level 1	Level 2	Level 3	Level 4 or above	
NSW	12 (±3.6)	33 (±3.9)	41 (±4.2)	14 (±3.7)	
VIC	11 (±3.3)	29 (±4.1)	43 (±4.6)	17 (±3.9)	
QLD	16 (±5.4)	32 (±4.3)	41 (±4.9)	11 (±2.9)	
SA	14 (±3.7)	35 (±4.0)	41 (±4.9)	10 (±3.4)	
WA	13 (±3.5)	37 (±3.8)	42 (±4.2)	9 (±2.6)	
TAS	17 (±4.7)	34 (±5.2)	39 (±6.3)	9 (±2.9)	
NT	30 (±10.9)	31 (±6.8)	31 (±7.6)	8* (±3.2)	
ACT	6 (±3.1)	24 (±6.7)	51 (±6.5)	19 (±6.0)	
Aust.	13 (±1.8)	32 (±2.0)	42 (±1.9)	13 (±1.6)	
Year 10					
State/territory	Level 1	Level 2	Level 3	Level 4	Level 5 or above
NSW	5* (±2.0)	14 (±4.3)	38 (±6.3)	38 (±7.2)	6 (±2.7)
VIC	3* (±2.1)	12 (±3.4)	35 (±5.7)	43 (±5.1)	7 (±2.7)
QLD	6 (±2.7)	13 (±4.0)	36 (±4.2)	40 (±6.1)	5 (±1.8)
SA	5* (±2.8)	13 (±3.0)	36 (±5.0)	40 (±5.1)	7 (±2.7)
WA	4 (±2.7)	11 (±2.9)	39 (±4.5)	39 (±4.6)	7 (±2.6)
TAS	13 (±7.5)	19 (±5.3)	37 (±6.2)	29 (±5.2)	3* (±2.3)
NT	6* (±6.5)	19* (±12.1)	41 (±12.8)	30 (±17.4)	4* (±4.5)
ACT	4* (±3.9)	7* (±3.9)	32 (±5.3)	47 (±8.4)	9* (±4.9)
Aust.	5 (±1.1)	13 (±1.9)	37 (±2.8)	40 (±2.7)	6 (±1.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
** indicates insufficient data to provide reliable estimates*

Table 4.7 records the average NAP–ICT Literacy scores at both year levels across jurisdictions. There is some variation in the 95% confidence intervals and therefore level of precision across states and territories, resulting from variation in sample sizes as well as variation in test performance across the jurisdictions (see Chapter 2 for more details on sample sizes and the NAP–ICT Literacy 2022 Technical Report for sample participation rates).

Table 4.7: NAP–ICT Literacy average scale scores nationally and by state and territory for Year 6 and Year 10 in 2022

State/territory	Year 6		Year 10	
NSW	416	(±12.8)	499	(±18.0)
VIC	428	(±10.1)	515	(±12.0)
QLD	403	(±16.0)	498	(±14.5)
SA	405	(±11.7)	504	(±14.9)
WA	404	(±10.1)	507	(±11.6)
TAS	394	(±15.0)	449	(±27.4)
NT	350	(±32.0)	473	(±47.9)
ACT	452	(±13.7)	526	(±25.6)
Aust.	414	(±6.0)	503	(±7.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

The jurisdictional averages for Year 6 ranged from 350 in the Northern Territory to 452 in the Australian Capital Territory. The averages for Year 10 ranged from 449 in Tasmania to 526 in the Australian Capital Territory. As can be seen from the size of the confidence intervals, the precision for smaller jurisdictions was less than for larger jurisdictions. It is important to take these differences in precision into account when interpreting the results from this assessment and comparing test performance across jurisdictions.

Table 4.8 shows pair-wise comparisons between jurisdictional average scale scores for Year 6. The results show that Year 6 students in the Australian Capital Territory had significantly higher average scores than all other jurisdictions, while students in Victoria had significantly higher average scores than all jurisdictions except for the Australian Capital Territory and New South Wales. Students from New South Wales on average outperformed students from Tasmania and the Northern Territory but average scores were lower than the average in the Australian Capital Territory. The average score recorded for the Northern Territory was significantly lower than in all other jurisdictions. Students in the remaining jurisdictions (Queensland, South Australia and Western Australia) performed equally well.

Table 4.8: Pair-wise comparisons of Year 6 students' NAP–ICT Literacy average scale scores between the states and territories in 2022

State/territory	Mean scale score		ACT	VIC	NSW	SA	WA	QLD	TAS	NT
ACT	452	(±13.7)		▲	▲	▲	▲	▲	▲	▲
VIC	428	(±10.1)	▼		•	▲	▲	▲	▲	▲
NSW	416	(±12.8)	▼	•		•	•	•	▲	▲
SA	405	(±11.7)	▼	▼	•		•	•	•	▲
WA	404	(±10.1)	▼	▼	•	•		•	•	▲
QLD	403	(±16.0)	▼	▼	•	•	•		•	▲
TAS	394	(±15.0)	▼	▼	▼	•	•	•		▲
NT	350	(±32.0)	▼	▼	▼	▼	▼	▼	▼	

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *Mean scale score significantly higher than in comparison State/Territory*

▼ *Mean scale score significantly lower than in comparison State/Territory*

At Year 10, the average achievement of students in New South Wales, Victoria, Queensland, South Australia, Western Australia and the Australian Capital Territory were not significantly different from one another (see Table 4.9). The average achievement of students in each of these jurisdictions was significantly higher than that of students in Tasmania. There was no statistically significant difference in achievement between students from Tasmania and the Northern Territory.

Table 4.9: Pair-wise comparisons of Year 10 students' NAP–ICT Literacy average scale scores between the states and territories in 2022

State/territory	Mean scale score		ACT	VIC	WA	SA	NSW	QLD	NT	TAS
ACT	526	(±25.6)		•	•	•	•	•	•	▲
VIC	515	(±12.0)	•		•	•	•	•	•	▲
WA	507	(±11.6)	•	•		•	•	•	•	▲
SA	504	(±14.9)	•	•	•		•	•	•	▲
NSW	499	(±18.0)	•	•	•	•		•	•	▲
QLD	498	(±14.5)	•	•	•	•	•		•	▲
NT	473	(±47.9)	•	•	•	•	•	•		•
TAS	449	(±27.4)	▼	▼	▼	▼	▼	▼	•	

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *Mean scale score significantly higher than in comparison State/Territory*

▼ *Mean scale score significantly lower than in comparison State/Territory*

Student achievement across the states and territories since 2005

Student achievement across the states and territories since 2005 is reported for each of Year 6 and Year 10 using both the percentage of students attaining the proficient standard and the average NAP–ICT Literacy scale scores. These are shown in Table 4.10 to Table 4.14 including indications of whether data from each previous cycle are significantly different from those collected in 2022. In most but not all cases, when a difference in the percentage of students attaining the proficient standard is significantly different between a previous NAP–ICT Literacy cycle and 2022, the corresponding difference in average achievement is also significant. Any apparent inconsistencies in reported significance are a result of the differences in the 2 measures of achievement.

At Year 6, variations in achievement within each state and territory across the NAP–ICT Literacy cycles are very similar to the national trend (Table 4.10 and Table 4.11). On average, across jurisdictions, fewer Year 6 students met the proficient standard in 2022 than they did in comparison to the 2011 cycle. At the jurisdiction level, only a few differences with previous cycles are observed in some jurisdictions, but no differences were observed between students from the current cycle and from the 2 previous cycles of NAP–ICT Literacy by either measure of achievement.

Table 4.10: Percentages of Year 6 students attaining the proficient standard nationally and by state and territory since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	55 (±5.3)	51 (±4.2)	55 (±4.9)	▲ 66 (±4.1)	55 (±5.7)	51 (±6.6)
VIC	61 (±4.2)	62 (±4.5)	64 (±4.5)	64 (±3.8)	66 (±6.5)	58 (±6.3)
QLD	52 (±5.0)	47 (±5.8)	48 (±5.8)	55 (±4.8)	48 (±5.3)	▼ 38 (±5.3)
SA	51 (±5.2)	53 (±6.5)	59 (±4.3)	▲ 62 (±4.9)	▲ 64 (±5.3)	52 (±5.0)
WA	50 (±4.5)	54 (±4.5)	52 (±4.8)	59 (±5.5)	51 (±4.1)	▼ 40 (±5.4)
TAS	49 (±6.5)	49 (±5.9)	46 (±5.4)	51 (±5.5)	52 (±7.0)	49 (±9.0)
NT	39 (±8.6)	35 (±11.5)	43 (±6.3)	42 (±9.2)	42 (±10.6)	36 (±10.0)
ACT	70 (±6.4)	65 (±8.4)	58 (±10.6)	74 (±8.3)	75 (±6.6)	58 (±12.5)
Aust.	55 (±2.4)	53 (±2.4)	55 (±2.5)	▲ 62 (±2.0)	57 (±2.8)	49 (±3.0)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Table 4.11: NAP–ICT Literacy average scale scores nationally and by state and territory for Year 6 since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	416 (±12.8)	404 (±11.9)	412 (±12.0)	▲ 445 (±12.5)	413 (±14.5)	405 (±12.9)
VIC	428 (±10.1)	432 (±9.4)	437 (±9.6)	448 (±9.3)	447 (±15.1)	424 (±13.7)
QLD	403 (±16.0)	399 (±12.4)	393 (±13.7)	415 (±14.0)	392 (±11.8)	▼ 370 (±12.3)
SA	405 (±11.7)	405 (±14.9)	421 (±10.3)	▲ 436 (±10.3)	▲ 439 (±12.5)	412 (±11.4)
WA	404 (±10.1)	406 (±10.3)	404 (±13.2)	424 (±13.5)	403 (±11.5)	379 (±10.8)
TAS	394 (±15.0)	390 (±12.9)	385 (±15.1)	405 (±12.4)	408 (±16.4)	404 (±19.4)
NT	350 (±32.0)	335 (±43.5)	361 (±20.5)	367 (±37.5)	364 (±49.8)	346 (±53.7)
ACT	452 (±13.7)	437 (±17.3)	429 (±26.0)	466 (±22.8)	472 (±13.9)	428 (±22.1)
Aust.	414 (±6.0)	410 (±5.4)	413 (±5.7)	▲ 435 (±5.7)	419 (±6.9)	400 (±6.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Table 4.12 and Table 4.13 report Year 10 students' attainment of the proficient standard and average achievement since 2005. At the national level, student achievement was significantly lower in 2022 in comparison to the previous cycles of NAP–ICTL. The decline in achievement at the national level was not reported for all jurisdictions (e.g. the Australian Capital Territory, the Northern Territory, Queensland), although the statistical power may have been too small (i.e. the confidence intervals too large) to detect real changes in some of the jurisdictions (e.g. Tasmania, South Australia).

Table 4.12: Percentages of Year 10 students attaining the proficient standard nationally and by state and territory since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	44 (±8.3)	▲ 57 (±6.8)	50 (±5.5)	▲ 66 (±5.3)	▲ 67 (±5.4)	▲ 61 (±7.6)
VIC	50 (±5.6)	55 (±5.0)	55 (±5.9)	▲ 68 (±4.9)	▲ 70 (±6.7)	▲ 67 (±4.8)
QLD	45 (±6.0)	47 (±6.6)	47 (±5.6)	▲ 63 (±4.3)	▲ 62 (±6.2)	▲ 60 (±7.4)
SA	46 (±5.7)	▲ 56 (±4.6)	▲ 57 (±5.9)	▲ 63 (±5.6)	▲ 65 (±4.9)	▲ 61 (±5.4)
WA	46 (±4.5)	▲ 62 (±4.0)	▲ 57 (±5.8)	▲ 61 (±4.0)	▲ 65 (±5.9)	▲ 56 (±6.1)
TAS	31 (±6.3)	39 (±5.6)	▲ 51 (±5.8)	▲ 54 (±7.1)	▲ 58 (±7.4)	▲ 56 (±6.4)
NT	34 (±18.9)	27 (±8.4)	43 (±9.1)	48 (±8.8)	46 (±13.4)	49 (±13.2)
ACT	56 (±9.6)	54 (±8.4)	60 (±9.1)	▲ 72 (±7.0)	▲ 77 (±6.1)	66 (±11.4)
Aust.	46 (±3.2)	▲ 54 (±3.0)	▲ 52 (±2.5)	▲ 65 (±2.3)	▲ 66 (±3.0)	▲ 61 (±3.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Table 4.13: NAP–ICT Literacy average scale scores nationally and by state and territory for Year 10 since 2005

State/territory	2022	2017	2014	2011	2008	2005
NSW	499 (±18.0)	▲ 531 (±16.4)	512 (±13.7)	▲ 565 (±12.8)	▲ 564 (±13.7)	▲ 551 (±13.1)
VIC	515 (±12.0)	530 (±10.6)	532 (±14.3)	▲ 568 (±12.5)	▲ 569 (±18.1)	▲ 565 (±9.8)
QLD	498 (±14.5)	505 (±13.1)	504 (±16.8)	▲ 553 (±9.5)	▲ 549 (±14.0)	▲ 547 (±11.6)
SA	504 (±14.9)	524 (±11.0)	▲ 532 (±15.8)	▲ 552 (±14.8)	▲ 560 (±11.5)	▲ 547 (±11.0)
WA	507 (±11.6)	▲ 539 (±10.4)	▲ 539 (±11.8)	▲ 548 (±10.8)	▲ 559 (±12.1)	▲ 535 (±11.8)
TAS	449 (±27.4)	480 (±13.0)	▲ 514 (±15.6)	▲ 534 (±15.5)	▲ 539 (±16.3)	▲ 538 (±11.8)
NT	473 (±47.9)	447 (±30.3)	501 (±19.9)	490 (±49.5)	466 (±71.5)	515 (±28.2)
ACT	526 (±25.6)	530 (±21.2)	536 (±26.2)	▲ 582 (±16.1)	▲ 598 (±14.5)	▲ 572 (±17.8)
Aust.	503 (±7.2)	▲ 523 (±6.6)	520 (±6.7)	▲ 559 (±5.7)	▲ 560 (±7.1)	▲ 551 (±5.7)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Student achievement and background characteristics

Student background characteristics were originally collected as part of the student survey. In 2011, this information was collected directly from the schools, which resulted in much higher levels of missing data. In the last 3 cycles, background data was again collected from the schools, but the amount of missing data has been substantially reduced.

Given the change in source (from students to schools) and the changes in the amount of missing data across earlier cycles, comparisons in performance can only be made from 2014 to 2022. The exception to this is gender, for which complete data is available from all 5 cycles, and it is unlikely to show much variation caused by change in source.

Differences in achievement by gender since 2005

Table 4.14 and Table 4.15 show the achievement of male and female students in Year 6 and Year 10 at the national level with results from previous assessment cycles. Consistent with the results from the previous 4 cycles, female students outperformed male students at both year levels. There was no difference in the proportion of either gender at the Year 6 level who attained the proficient standard in 2022 compared to the previous cycle; however, the decline in performance at the Year 10 level is observed for both males and females.

Table 4.14: Percentages of students attaining the proficient standard by gender since 2005

	Gender	2022	2017	2014	2011	2008	2005
Year 6	Male	51 (±3.2)	51 (±2.8)	51 (±3.3)	58 (±2.7)	52 (±3.0)	45 (±4.9)
	Female	59 (±2.9)	56 (±3.5)	60 (±2.9)	66 (±2.5)	62 (±3.6)	52 (±4.1)
Year 10	Male	45 (±4.4)	▲ 51 (±3.6)	47 (±3.4)	▲ 62 (±2.7)	▲ 63 (±3.9)	▲ 60 (±4.2)
	Female	47 (±3.8)	▲ 58 (±4.1)	▲ 58 (±3.3)	▲ 67 (±3.3)	▲ 70 (±3.2)	▲ 63 (±3.5)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

While the average scale scores of female students were significantly higher than those of male students at both year levels, this difference was small in 2022 (18 score points for Year 6; 14 score points for Year 10).

Table 4.15: NAP–ICT Literacy average scale scores by gender since 2005

	Gender	2022	2017	2014	2011	2008	2005
Year 6	Male	405 (±7.6)	403 (±7.0)	402 (±7.2)	425 (±7.2)	410 (±7.3)	393 (±9.2)
	Female	423 (±6.3)	417 (±6.7)	424 (±6.4)	▲ 446 (±6.7)	429 (±9.0)	407 (±6.5)
	Difference (M – F)	**-18** (±7.3)	**-14** (±8.4)	**-23** (±7.6)	**-22** (±7.7)	**-19** (±8.9)	**-15** (±11.3)
Year 10	Male	497 (±10.4)	▲ 514 (±8.4)	506 (±9.0)	▲ 553 (±7.3)	▲ 554 (±9.1)	▲ 546 (±7.6)
	Female	510 (±7.7)	▲ 533 (±8.8)	▲ 535 (±7.4)	▲ 566 (±7.5)	▲ 570 (±7.1)	▲ 555 (±6.9)
	Difference (M – F)	**-14** (±11.2)	**-19** (±11.3)	**-29** (±10.3)	**-14** (±9.3)	**-16** (±9.8)	**-9** (±10.3)

*Confidence Intervals (1.96*SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Statistically significant differences are in bold.

When compared with previous assessment cycles, the difference in achievement of female students and male students has remained fairly equivalent.

Differences in achievement by Indigenous status since 2014

Table 4.16 and Table 4.17 display achievement of non-Indigenous and Indigenous (First Nations Australian) students at both year levels in 2022 in comparison to the previous 2 cycles of the study from 2017 and 2014. There were considerable differences in achievement between non-Indigenous and Indigenous students at both year levels. At both year levels, the difference between the percentages of non-Indigenous students and Indigenous students attaining the proficient standard was around 30 percentage points across all 3 assessment cycles. The significant difference in average achievement was about 100 scale score points for Year 6 students, which is large (approximately one standard deviation). A smaller but still considerable difference in average achievement was observed for Year 10 students (86 scale score points) in 2022.

Table 4.16: Percentages of students attaining the proficient standard by Indigenous status since 2014

	Indigenous status	2022	2017	2014
Year 6	Non-Indigenous students	57 (±2.3)	55 (±2.4)	57 (±2.5)
	Indigenous students	23 (±7.9)	24 (±7.0)	22 (±8.1)
Year 10	Non-Indigenous students	47 (±3.3)	▲ 55 (±3.1)	▲ 53 (±2.6)
	Indigenous students	19 (±8.2)	24 (±9.5)	20 (±8.8)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Table 4.17: NAP–ICT Literacy average scale scores by Indigenous status since 2014

	Indigenous status	2022	2017	2014
Year 6	Non-Indigenous students	420 (±5.3)	415 (±4.9)	417 (±5.5)
	Indigenous students	313 (±32.5)	311 (±30.4)	318 (±19.8)
	Difference (Non-Indigenous – Indigenous)	**107** (±32.8)	**103** (±30.3)	**99** (±20.3)
Year 10	Non-Indigenous students	507 (±7.3)	▲ 526 (±6.9)	522 (±6.6)
	Indigenous students	420 (±24.4)	424 (±29.3)	428 (±26.5)
	Difference (Non-Indigenous – Indigenous)	**86** (±23.6)	**101** (±30.2)	**94** (±25.4)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Statistically significant differences are in bold.

Differences in achievement by language spoken at home since 2014

Table 4.18 and Table 4.19 show the NAP–ICT Literacy achievement of students who speak only English at home and those who speak another language at home in 2022 in comparison to 2017 and 2014. Consistent with the 2017 cycle, but not the 2014 cycle, Year 6 students who speak a language other than English at home significantly outperformed students who speak only English at home. The difference in average achievement scores was small. The difference in the proportion of students attaining the proficient standard was 8 percentage points. There was no difference in achievement by language spoken at home for Year 10 students, consistent with the findings from 2017 and 2014.

Table 4.18: Percentages of students attaining the proficient standard by language spoken at home since 2014

	Language spoken at home	2022	2017	2014
Year 6	English	53 (±2.9)	52 (±2.6)	55 (±2.7)
	Language other than English	61 (±5.1)	58 (±5.1)	58 (±5.5)
Year 10	English	44 (±3.5)	▲ 55 (±3.1)	▲ 52 (±2.7)
	Language other than English	51 (±6.6)	51 (±6.0)	51 (±6.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Table 4.19: NAP–ICT Literacy average scale scores by language spoken at home since 2014

	Language spoken at home	2022	2017	2014
Year 6	English	407 (±6.9)	407 (±6.3)	412 (±6.2)
	Language other than English	431 (±11.2)	420 (±10.1)	417 (±15.2)
	Difference (English – Other)	**-24** (±12.9)	**-13** (±11.6)	**-5** (±16.5)
Year 10	English	501 (±7.7)	▲ 526 (±5.9)	▲ 520 (±7.2)
	Language other than English	515 (±13.8)	516 (±15.6)	520 (±16.9)
	Difference (English – Other)	**-14** (±14.5)	▲ **11** (±15.3)	**0** (±18.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Statistically significant differences are in bold.

Differences in achievement by geographic location in 2022

Table 4.20 and Table 4.21 show achievement by students according to geographic location (metropolitan, regional and remote) of the school for the 2022 and 2017 cycles. The results show that, at both year levels, students at metropolitan schools had about twice as many students who attained the proficient standard in comparison to remote schools. The difference in achievement between metropolitan and regional schools was significant (30 scale score points at Year 6 and 51 scale score points at Year 10). These differences were moderate in size. There was no significant difference in achievement between regional and remote schools at either year level[7].

[7] The confidence interval for remote schools is very large given the few students/schools that participated, making significant differences across sub-groups hard to achieve.

Table 4.20: Percentages of students attaining the proficient standard by geographic location in 2022

	Geographic location	2022			2017	
Year 6	Metropolitan	59	(±3.1)		58	(±2.8)
	Regional	48	(±5.0)		43	(±4.0)
	Remote	28	(±21.2)		35	(±21.6)
Year 10	Metropolitan	51	(±4.0)	▲	57	(±3.7)
	Regional	31	(±6.0)	▲	48	(±4.7)
	Remote	23*	(±9.1)		31	(±14.5)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Statistically significant differences are in bold.

**indicates insufficient data to provide reliable estimates*

Table 4.21: NAP–ICT Literacy average scale scores by geographic location in 2022

	Geographic location	2022			2017	
Year 6	Metropolitan	425	(±7.0)		422	(±5.9)
	Regional	394	(±12.7)		381	(±11.4)
	Remote	312	(±108.9)		336	(±34.4)
	Difference (Met – Reg)	**30**	(±15.4)		**41**	(±13.0)
	Difference (Reg – Rem)	82	(±109.7)		**45**	(±36.1)
Year 10	Metropolitan	516	(±8.9)		531	(±8.6)
	Regional	465	(±15.4)	▲	507	(±9.7)
	Remote	451	(±30.0)		464	(±44.2)
	Difference (Met – Reg)	**51**	(±18.8)	▼	**24**	(±13.0)
	Difference (Reg – Rem)	14	(±34.0)		43	(±45.0)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Statistically significant differences are in bold.

For Year 10, only the difference between metropolitan and regional schools was significant. The difference was small (24 scale score points between averages).

Compared to 5 years ago, there were no changes in achievement for Year 6. For Year 10, however, the average achievement declined significantly in regional areas, making the gap between metropolitan and regional areas larger in 2022 than in 2017.

Differences in achievement by parental occupation since 2014

Achievement in NAP–ICT Literacy tended to be higher for students with at least one parent working in in a higher ranked occupation group (see Table 4.22 and Table 4.23). This pattern is observed across both year levels and is consistent with findings from the previous 2 cycles of the study. Between half and two-thirds of the students whose parents were employed at one of the 2 highest occupation groups met this standard, whereas less than half of students whose parents were of other occupation groups met the standard. Only around one-in-three students at the Year 6 level, and one-in-four students at the Year 10 level met the standard if their parents were not in paid work in the last 12 months.

Table 4.22: Percentages of students attaining the proficient standard by parental occupation since 2014

	Highest parental occupation	2022	2017	2014
Year 6	Senior Managers and Professionals	65 (±3.8)	68 (±3.3)	72 (±4.0)
	Other Managers and Associate Professionals	61 (±3.9)	61 (±3.9)	63 (±5.0)
	Tradespeople & skilled office, sales and service staff	49 (±3.8)	48 (±5.3)	52 (±4.2)
	Unskilled labourers, office, sales and service staff	44 (±5.9)	38 (±5.1)	42 (±4.9)
	Not in paid work in last 12 months	34 (±7.5)	33 (±6.5)	30 (±7.4)
Year 10	Senior Managers and Professionals	59 (±4.4)	▲ 69 (±3.8)	65 (±4.5)
	Other Managers and Associate Professionals	50 (±4.8)	▲ 61 (±4.3)	56 (±4.1)
	Tradespeople & skilled office, sales and service staff	37 (±5.7)	▲ 46 (±5.4)	▲ 50 (±5.5)
	Unskilled labourers, office, sales and service staff	30 (±6.0)	▲ 43 (±6.0)	▲ 40 (±6.0)
	Not in paid work in last 12 months	25 (±8.2)	29 (±7.3)	29 (±6.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
▲ *if significantly higher than in 2022*
▼ *if significantly lower than in 2022*

Table 4.23: NAP–ICT Literacy average scale scores by parental occupation since 2014

	Highest parental occupation	2022	2017	2014
Year 6	Senior Managers and Professionals	440 (±8.3)	449 (±7.5)	456 (±7.6)
	Other Managers and Associate Professionals	428 (±8.2)	425 (±7.1)	431 (±8.3)
	Tradespeople & skilled office, sales and service staff	402 (±7.8)	396 (±9.4)	408 (±8.7)
	Unskilled labourers, office, sales and service staff	390 (±13.3)	371 (±12.8)	377 (±11.9)
	Not in paid work in last 12 months	347 (±18.8)	353 (±19.4)	343 (±16.4)
Year 10	Senior Managers and Professionals	538 (±8.1)	▲ 561 (±8.9)	555 (±9.4)
	Other Managers and Associate Professionals	516 (±9.2)	▲ 540 (±8.2)	532 (±9.0)
	Tradespeople & skilled office, sales and service staff	483 (±13.0)	▲ 507 (±8.4)	▲ 515 (±10.5)
	Unskilled labourers, office, sales and service staff	466 (±17.4)	▲ 496 (±11.9)	485 (±15.3)
	Not in paid work in last 12 months	437 (±23.0)	458 (±21.2)	451 (±17.9)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
▲ *if significantly higher than in 2022*
▼ *if significantly lower than in 2022*

Year 6 students with parents who were senior managers or professionals had NAP–ICT Literacy scale scores that were 50 score points higher than those with parents in the category for unskilled labourers, office, sales or service staff. Among Year 10 students, the difference between students in these 2 groups was 72 score points.

Differences in achievement by parental education since 2014

The relationship between the highest parental education of students and performance on the NAP–ICT Literacy assessment is displayed in Table 4.24 and Table 4.25. In general, student achievement increased with increasing levels of parental education. Approximately two-thirds of Year 6 students and three-fifths of Year 10 students with at least one parent who had a bachelor's degree or above attained the proficient standard. By comparison, one quarter or less of students whose highest parental education was at Year 9 or equivalent or below, met this standard at either year level.

Table 4.24: Percentages of students attaining the proficient standard by parental education since 2014

	Highest parental education	2022		2017			2014		
Year 6	Bachelor degree or above	68	(±3.4)		68	(±3.1)		73	(±3.7)
	Advanced Diploma/Diploma	53	(±4.2)		55	(±4.4)		56	(±5.3)
	Certificate I to IV (inc trade cert)	42	(±3.6)		44	(±3.9)		47	(±4.1)
	Year 12 or equivalent	44	(±6.7)		46	(±5.7)		44	(±6.1)
	Year 11 or equivalent	40	(±15.1)		36	(±10.5)		40	(±9.3)
	Year 10 or equivalent	29	(±11.0)		23	(±7.8)		30	(±7.2)
	Year 9 or equivalent or below	22*	(±15.7)		22	(±10.9)		39	(±14.1)
Year 10	Bachelor degree or above	60	(±4.3)	▲	70	(±3.2)	▲	69	(±4.3)
	Advanced Diploma/Diploma	42	(±5.7)	▲	52	(±5.4)	▲	51	(±5.3)
	Certificate I to IV (inc trade cert)	32	(±4.8)	▲	44	(±4.8)	▲	45	(±4.3)
	Year 12 or equivalent	30	(±8.0)	▲	47	(±7.7)	▲	48	(±7.8)
	Year 11 or equivalent	28*	(±14.4)		42	(±10.1)		39	(±8.1)
	Year 10 or equivalent	21*	(±12.8)		22	(±7.6)		32	(±7.7)
	Year 9 or equivalent or below	25*	(±13.2)		26	(±12.1)		32	(±12.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

**indicates insufficient data to provide reliable estimates*

Table 4.25: NAP–ICT Literacy average scale scores by parental education since 2014

	Highest parental education	2022		2017		2014	
Year 6	Bachelor degree or above	445	(±7.6)	449	(±6.9)	457	(±6.8)
	Advanced Diploma/Diploma	410	(±8.7)	411	(±9.6)	416	(±9.4)
	Certificate I to IV (inc trade cert)	381	(±9.1)	387	(±8.4)	394	(±8.6)
	Year 12 or equivalent	385	(±13.8)	392	(±13.6)	387	(±11.6)
	Year 11 or equivalent	349	(±48.1)	358	(±26.3)	373	(±21.0)
	Year 10 or equivalent	342	(±22.3)	322	(±24.6)	347	(±16.9)
	Year 9 or equivalent or below	336	(±27.7)	320	(±26.6)	357	(±38.6)
Year 10	Bachelor degree or above	541	(±7.9)	▲ 562	(±7.4)	▲ 561	(±9.6)
	Advanced Diploma/Diploma	492	(±12.4)	▲ 520	(±10.3)	▲ 520	(±10.9)
	Certificate I to IV (inc trade cert)	472	(±10.8)	▲ 499	(±8.6)	▲ 503	(±10.4)
	Year 12 or equivalent	456	(±21.2)	▲ 515	(±11.7)	▲ 503	(±17.4)
	Year 11 or equivalent	447	(±36.5)	▲ 498	(±21.6)	486	(±19.5)
	Year 10 or equivalent	441	(±27.1)	443	(±19.4)	465	(±23.8)
	Year 9 or equivalent or below	417	(±38.7)	430	(±41.5)	▲ 468	(±28.0)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

▲ *if significantly higher than in 2022*

▼ *if significantly lower than in 2022*

Students who had a parent with a bachelor's degree or above, on average, scored more than 100 scale score points (almost one proficiency level) higher than students whose parent completed Year 10 or Year 9 as their highest education. The pattern of differences in achievement according to highest parental education groupings is similar across the previous 2 cycles.

Chapter 5:
Student use of ICT devices

Chapter 5: Student use of ICT devices

Chapter highlights

- The majority of students were familiar with ICT devices and experienced in their use, particularly by Year 10.
- Higher levels of experience with ICT devices were associated with higher NAP–ICT Literacy achievement scores, particularly in Year 10.
- More frequent ICT device use was associated with higher NAP–ICT Literacy achievement scores, particularly in Year 10.
- The majority of students indicated that they felt well prepared to use ICT devices for remote learning in the future.
- Students' confidence in using ICT devices to complete tasks, also known ICT device self-efficacy, was significantly higher in Year 10 than in Year 6, and significantly higher for male students than female students.
- Higher levels of self-efficacy were associated with higher NAP–ICT Literacy achievement scores, especially for Year 10 male students.
- Students' ratings of the importance of using ICT devices were significantly higher in Year 10 than Year 6, and higher for males than females.
- Higher ratings of the importance of using ICT devices were significantly associated with higher NAP–ICT Literacy scores, particularly for Year 10 students, and particularly for male students.

Introduction

After completing the NAP–ICT Literacy assessment modules, students were administered a survey asking about their experience of using ICT, their use of ICT devices in different locations, how frequently they use ICT devices, their use of ICT devices for remote learning and their attitudes towards ICT devices. See Appendix B for the survey questions. Results from the survey provide contextual information about Australian students' experience with, access to and use of ICT devices.

Many questions in the survey refer to use and engagement with ICT devices in different settings. Given the evolving nature of the use of ICT devices over time, it has been necessary to revise these questions to ensure they remain relevant. In prior cycles, ICT devices were referred to as either digital devices (2017 cycle) or computers (prior to the 2017 cycle). The NAP–ICT Literacy survey updated this definition to reflect the evolution of the types of ICT commonly used and to incorporate all the types of devices now available to students and teachers for ICT-related activities.

In 2022, students were asked about their use of, experience with and access to ICT devices. The definition of ICT devices in the 2022 survey included:

- desktop computers
- laptop computers (including notebooks and netbooks)
- tablets
- smartphones (to access the internet or use apps).

Where comparisons have been drawn to similar items from previous cycles, any differences to the wording of questionnaire items have been noted.

Access to and use of ICT devices

Experience of using ICT

Students were first asked how long they had been using ICT devices. Response options ranged from (1) "Never or less than one year" to (5) "Seven years or more"[8].

Table 5.1: Distributions of students' years of experience using ICT devices shown as percentages for each category

Years of experience	Year 6		Year 10	
Never or less than one year	9	(±1.3)	6	(±1.3)
At least one year but less than three years	9	(±1.1)	5	(±1.0)
At least three years but less than five years	20	(±1.6)	15	(±1.5)
At least five years but less than seven years	29	(±2.2)	24	(±1.7)
Seven years or more	33	(±2.2)	49	(±2.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.

The data in Table 5.1 represents the length of time for which students in Year 6 and Year 10 reported using ICT devices. In both year levels, a large majority (more than 80%) of students had at least 3 years' experience using ICT devices. Approximately half of all Year 6 students reported having at least 5 years' experience, and approximately half of all Year 10 students indicated they had 7 or more years' experience.

On the other hand, between 5% and 10% of the students had never used ICT devices or had less than 1 year's experience (9% in Year 6 and 6% in Year 10). The following table further describes the extent of students' familiarity with ICT devices.

[8] Prior to 2017, students were asked how long they had been using computers, and in 2017 students were asked how long they had been using a) computers (desktop or portable) and b) tablets.

Table 5.2 shows the percentages of students with at least 5 years' experience using ICT devices or computers, across all cycles of NAP–ICT Literacy since 2005, noting that in cycles prior to 2017 students were asked about their experience with computers only, and in 2017 they were asked about their experience using "digital devices".

Table 5.2: Percentages of students with at least 5 years' experience using ICT devices across all cycles of NAP–ICT Literacy since 2005

Cycle	Year 6		Year 10	
2022*	62	(±2.4)	73	(±2.4)
2017**	64	(±1.7)	79	(±1.5)
2014	64	(±1.9)	84	(±1.3)
2011	62	(±1.6)	76	(±1.5)
2008	56	(±2.3)	70	(±2.0)
2005	54	(±2.7)	64	(±2.3)

*Confidence intervals (1.96*SE) are reported in brackets.*

** This question asked about use of 'ICT devices', all the other questions asked about 'computers' or 'digital devices'.*

*** This question asked about use of 'digital devices', all the other questions asked about use of 'computers' or 'ICT devices'.*

In 2022, 2017 and 2014, 5 years of experience was included, while in previous cycles only students with more than 5 years of experience were counted.

Despite changes in the definitions of the categories and the changes to the wording of the question across cycles to widen the scope of devices considered (see the footnotes to the table), it appears that while the percentage of experienced users of ICT devices grew in the first few cycles of this program, the change in experience is small in Year 6 since 2011 and appears to be decreasing in Year 10 since 2014.

Table 5.3 shows differences in experience with ICT devices by state or territory in the top half of the table, and socioeconomic group – based on parental occupation – in the bottom half. The top section of the table shows that the majority of students in all states and territories had at least 5 years' experience using ICT devices. Percentages ranged from 53% (Australian Capital Territory) to 66% (Tasmania) for Year 6 students, and from 64% (Queensland) to 83% (Tasmania) for Year 10 students.

Table 5.3: Percentages of students with at least 5 years' experience using ICT devices by state or territory and parental occupation

State/territory	Year 6		Year 10	
NSW	65	(±4.2)	71	(±5.4)
VIC	64	(±6.0)	82	(±4.6)
QLD	58	(±5.2)	64	(±5.1)
SA	56	(±6.3)	77	(±4.1)
WA	64	(±5.2)	73	(±3.7)
TAS	66	(±5.1)	83	(±4.6)
NT	58	(±10.0)	73	(±8.1)
ACT	53	(±8.0)	76	(±6.2)
Highest parental occupation	**Year 6**		**Year 10**	
Senior managers and professionals	63	(±4.0)	79	(±2.9)
Other managers and associate professionals	64	(±3.7)	75	(±3.6)
Tradespeople & skilled office, sales and service staff	63	(±4.4)	70	(±4.1)
Unskilled labourers, office, sales and service staff	62	(±5.0)	68	(±5.9)
Not in paid work in last 12 months	58	(±5.8)	67	(±7.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

The bottom section of Table 5.3 shows that percentages of Year 10 students with at least 5 years' experience using ICT devices were relatively high among students whose parents' occupations would be expected to have higher levels of responsibility and education (79% of students whose parents were senior managers and professionals, and 75% of students whose parents were other managers and associate professionals).

After the demographic characteristics of the students with more (and less) experience using ICT devices were examined, the relationship between students' experience using ICT devices and their ICT literacy achievement scores was described. Table 5.4 shows the NAP–ICT Literacy scale scores for students with at least 5 years' experience and less than 5 years' experience using ICT devices.

Table 5.4: Average NAP–ICT Literacy scale scores for students with at least and less than 5 years' experience using ICT devices

Years of experience	Year 6		Year 10	
At least 5 years' experience	434	(±5.7)	528	(±6.6)
Less than 5 years' experience	395	(±7.2)	450	(±10.1)
Difference (5 minus less)	**39**	(±7.8)	**79**	(±10.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

In both year levels, students with at least 5 years' experience using ICT devices achieved significantly higher NAP–ICT Literacy scale scores than students with less experience. The difference for Year 10 students (79 points) was approximately double the size of the difference for Year 6 students (39 points). In other words, greater experience using ICT devices is associated with higher levels of ICT literacy, especially for Year 10 students.

Device use by location

After describing their experience with ICT devices, students were then asked to provide information about where they used those devices. Students were asked about the type of ICT devices they used: computer (desktop or portable), tablet, smartphone or none, and in each case whether they used them at school or outside of school.

The results are summarised in Table 5.5. At school, the most widely used device was the desktop or portable computer (over 75% in Year 6 and over 90% in Year 10). These percentages were lower outside of school (56% for Year 6 and 75% for Year 10). For all other devices, percentages were higher for use outside of school compared to use at school. Overall, smartphones (to access the internet or use apps) were the most used device outside of school.

Table 5.5: Percentages of device use at school and outside of school

	Year 6				Year 10			
Type of ICT device	At school		Outside of school		At school		Outside of school	
Computer (desktop or portable)	78	(±3.7)	56	(±2.1)	92	(±1.4)	75	(±2.1)
Tablet	41	(±4.0)	60	(±1.9)	13	(±2.1)	31	(±2.0)
Smartphone (to access the internet or use apps)	4	(±0.7)	64	(±1.9)	40	(±2.8)	89	(±1.7)
None	1	(±0.5)	4	(±0.6)	1	(±0.4)	2	(±0.6)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Tablet use among Year 6 students was relatively common, both at school (41%) and outside of school (60%), while smartphone[9] use for these students was common outside of school (64%), but not at school (4%). Conversely, but not unexpectedly, among Year 10 students, smartphone[10] use was common both at school (40%) and outside of school (89%), while tablet use was not as common (13% at school and 31% outside of school).

Students were also asked whether or not they brought a portable ICT device to school for use in class and, if they did, whether it was provided by the school or the students' families (i.e. BYOD). The 2 types of portable ICT devices listed were laptop computer and tablet.

Table 5.6: Percentages of students with access to their own ICT devices for use in class

	Access to their own portable ICT device	Year 6		Year 10	
Laptop computer	My school provides me with device	57	(±3.8)	32	(±3.5)
	The school tells me what brand or model of device I may bring	6	(±1.7)	15	(±2.7)
	I can bring any brand or model of device to school	9	(±2.7)	41	(±4.3)
Tablet	My school provides me with device	35	(±4.0)	6	(±1.4)
	The school tells me what brand or model of device I may bring	8	(±2.6)	5	(±1.4)
	I can bring any brand or model of device to school	9	(±2.3)	11	(±1.8)
	No access to a personal portable device	18	(±2.6)	10	(±1.6)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Categories do not add up to 100 per cent.

In both year levels, the majority of students had access to their own ICT device(s) for use in class, with only 18% of Year 6 students and 10% of Year 10 students indicating they did not have access to either a laptop computer or tablet. Seventy-two per cent of Year 6 students and 88% of Year 10 students indicated they had access to a laptop computer. For Year 6 students, the laptop computer was more commonly provided by the school (57%). The majority of Year 10 students indicated that they provided their own laptop, with brand or model specified by the school (15%) or the choice left to the student's family (41%).

Fifty-two per cent of Year 6 students also had access to their own tablet, and again this was more commonly provided by the school (35%). Tablet use among Year 10 students was less common, with only 22% indicating they had access to their own tablet in class.

[9] At the time of data collection in 2022, a ban on mobile phone use was in place at some schools (such as all government schools in Tasmania). The aggregated data provided in *Table* 5.5 should be interpreted with this in mind.

[10] As above.

Frequency of using ICT devices

Students were also asked how often they used each type of ICT device (desktop or laptop computer, or tablet) both at school and outside of school. Response options ranged from (1) several times a day to (6) never. Students were classified as having used an ICT device in each location if they indicated that they used either a desktop or laptop computer, or a tablet.

At a national level, nearly half of Year 6 students and more than two-thirds of Year 10 students reported using an ICT device at least once a day at school (see Table 5.7). The percentages for students in Year 6 ranged from 34% in Tasmania to 56% in South Australia. In Year 10, the percentages ranged from 41% in the Northern Territory to 85% in South Australia and the Australian Capital Territory. Nationally, approximately half of both Year 6 students and Year 10 students reported using an ICT device once or day or more outside of school (both 51%). The percentages for students in Year 6 ranged from 45% in Queensland to 57% in the Australian Capital Territory, while for Year 10 students they ranged from 37% in the Northern Territory to 58% in Victoria and the Australian Capital Territory.

Table 5.7: Percentages of students using ICT devices once a day or more at school and outside of school nationally and by state and territory

State / Territory	Year 6		Year 10	
	At school	Outside of school	At school	Outside of school
NSW	42 (±6.2)	52 (±3.9)	62 (±7.3)	54 (±5.8)
VIC	47 (±7.3)	55 (±4.2)	78 (±2.8)	58 (±3.9)
QLD	40 (±6.7)	45 (±3.6)	65 (±4.0)	41 (±3.5)
SA	56 (±6.6)	49 (±5.3)	84 (±4.2)	51 (±4.3)
WA	40 (±6.6)	50 (±4.6)	53 (±7.7)	52 (±4.5)
TAS	34 (±5.1)	47 (±3.7)	58 (±5.8)	42 (±6.1)
NT	39 (±10.4)	49 (±5.5)	41 (±13.5)	37 (±6.3)
ACT	50 (±11.9)	57 (±5.3)	85 (±4.7)	58 (±6.7)
Aust.	43 (±3.1)	51 (±1.9)	68 (±2.6)	51 (±2.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

After the frequency with which students in Australian states are using ICT devices at school was examined, the relationship between frequent ICT device use and students' NAP–ICT Literacy scale scores was examined.

Table 5.8: Average NAP–ICT Literacy scale scores for students who use ICT devices at least once a day compared to less than once a day

Frequency of use	Year 6		Year 10	
Once a day or more	425	(±6.3)	523	(±6.8)
Less than once a day	407	(±6.5)	458	(±11.3)
Difference (more - less)	**18**	(±7.9)	**65**	(±10.5)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

Students who reported using ICT devices at least once a day achieved significantly higher NAP–ICT Literacy scale scores than students who reported using ICT devices less than once a day. This occurred across both year levels, although the difference was much more pronounced at Year 10 (65 scale points) compared to Year 6 (18 scale points). In other words, students who were using computers or tablets more frequently had higher levels of achievement, particularly among the older students (Year 10).

Use of ICT devices for remote learning

When the COVID-19 pandemic reached Australia in early 2020, many schools across the country were suddenly forced to switch from standard face-to-face teaching methods to a remote learning, or home learning, structure. The degree to which this was necessary across the various Australian states and territories varied considerably, and in some jurisdictions remote or home learning was the primary mode of learning for much of the 2020 and 2021 school years. Naturally, there was a heavy reliance on ICT devices for many students to effectively participate in remote learning.

To capture the extent to which ICT devices were used for previous periods of remote learning, and students' preparedness to use ICT devices for remote learning in the future, 3 new questions were added to the NAP–ICT Literacy survey in 2022. Students were first asked whether they used ICT for remote or home learning between 2020 and 2022 (yes or no), and which of the following responses applied to them about which ICT device (computer, laptop or tablet) they used during this period:

1. I did not use an ICT device for remote or home learning.
2. An ICT device supplied to me by my school.
3. An ICT device from home which was my own to use.
4. An ICT device from home that was shared with others in my family.

Most students indicated that they did, in fact, use an ICT device for remote or home learning between the years of 2020 and 2022 (91% for Year 6 students and 95% for Year 10 students; see Table 5.9). Across Australia, on average, the majority of both Year 6 and Year 10 students indicated most frequently that they had their own ICT device at home for remote learning (52% and 62%, respectively). A higher proportion of Year 6 students shared their ICT device with other members of their family (between 8% and 18%, by jurisdiction) compared to Year 10 (between 4% and 16%, by jurisdiction).

Table 5.9: Percentages of students using ICT for remote learning and type of device used in past 2 years nationally and by state and territory

State/ Territory	Year 6			
	I did not use an ICT device for remote or home learning	An ICT device supplied to me by my school	An ICT device from home which was my own to use	An ICT device from home that was shared with others in my family
NSW	7 (±2.5)	17 (±3.8)	58 (±4.5)	18 (±3.4)
VIC	5 (±2.5)	32 (±7.6)	53 (±6.4)	11 (±3.6)
QLD	12 (±3.3)	29 (±8.0)	45 (±6.8)	14 (±3.3)
SA	8 (±2.7)	28 (±10.2)	45 (±9.2)	18 (±5.1)
WA	17 (±3.4)	16 (±3.5)	52 (±4.6)	15 (±2.7)
TAS	19 (±3.4)	21 (±4.6)	43 (±5.4)	18 (±3.3)
NT	46 (±7.6)	18 (±4.8)	28 (±7.6)	8 (±3.1)
ACT	5 (±2.8)	37 (±9.4)	48 (±8.0)	10 (±1.8)
Aust.	9 (±1.3)	24 (±2.8)	52 (±2.7)	15 (±1.6)
State/ Territory	Year 10			
	I did not use an ICT device for remote or home learning	An ICT device supplied to me by my school	An ICT device from home which was my own to use	An ICT device from home that was shared with others in my family
NSW	4 (±1.9)	15 (±3.5)	74 (±4.7)	8 (±2.2)
VIC	2 (±1.4)	33 (±7.7)	61 (±7.1)	4 (±1.8)
QLD	8 (±3.5)	36 (±6.4)	51 (±6.9)	4 (±1.5)
SA	3 (±1.2)	34 (±9.0)	59 (±8.6)	4 (±2.1)
WA	12 (±3.3)	21 (±6.4)	58 (±6.5)	10 (±2.5)
TAS	8 (±2.4)	27 (±9.5)	52 (±9.3)	12 (±4.0)
NT	19 (±7.7)	14 (±6.4)	52 (±7.8)	16 (±8.7)
ACT	3 (±1.8)	40 (±7.5)	51 (±7.2)	5 (±2.5)
Aust.	5 (±1.1)	27 (±2.8)	62 (±3.0)	6 (±0.9)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Students were also asked how prepared they felt to use ICT to participate in remote or home learning if necessary. Response options ranged from (1) not at all prepared to (4) very prepared. The pattern of responses was similar for both levels, across most states and Australia as a whole (see Table 5.10). The majority of students indicated that they were “quite” or “very” prepared (78% in Year 6, 81% in Year 10). Across the states and territories, the percentages of students indicating they were “quite” or “very” prepared ranged from 67% (Tasmania) to 83% (Victoria) in Year 6, and from 67% (Northern Territory) to 86% (South Australia and the Australian Capital Territory) in Year 10.

About one in 3 students in the Northern Territory (32% in Year 6, 33% in Year 10) and one-third of Year 6 students in Tasmania (33%) indicated they were “not very” or “not at all” prepared to use ICT for remote learning. However, as a whole, students across Australia appear to believe that they are well prepared to take on the challenge of using ICT devices for remote learning, if it is required of them in the future.

Table 5.10: Percentages of students’ preparedness to use ICT for remote learning in the future, nationally and by state and territory

State/ Territory	Year 6				Year 10			
	Not at all prepared	Not very prepared	Quite prepared	Very prepared	Not at all prepared	Not very prepared	Quite prepared	Very prepared
NSW	6 (±1.8)	15 (±1.9)	45 (±2.8)	34 (±3.9)	5 (±2.1)	12 (±3.2)	39 (±4.4)	43 (±4.7)
VIC	4 (±1.6)	13 (±2.1)	45 (±4.0)	39 (±4.7)	3 (±1.6)	12 (±2.5)	36 (±4.2)	49 (±4.4)
QLD	7 (±2.8)	19 (±3.4)	46 (±3.9)	28 (±3.7)	6 (±2.3)	16 (±3.6)	41 (±3.5)	37 (±4.2)
SA	5 (±1.4)	16 (±3.1)	48 (±3.7)	31 (±4.4)	4 (±2.3)	11 (±2.8)	44 (±3.8)	42 (±4.3)
WA	6 (±1.6)	23 (±3.3)	50 (±3.5)	20 (±3.8)	6 (±2.3)	18 (±3.4)	45 (±4.3)	30 (±4.9)
TAS	10 (±3.1)	23 (±3.2)	44 (±5.1)	23 (±3.7)	4 (±2.5)	17 (±5.0)	47 (±5.4)	32 (±6.4)
NT	9 (±3.0)	24 (±5.7)	46 (±6.6)	22 (±4.0)	9 (±5.9)	24 (±11.7)	31 (±8.0)	36 (±7.6)
ACT	5 (±2.9)	15 (±6.1)	44 (±3.2)	36 (±7.3)	6 (±1.6)	9 (±4.8)	41 (±7.7)	45 (±5.4)
Aust.	6 (±1.0)	16 (±1.1)	46 (±1.6)	32 (±2.0)	5 (±1.0)	14 (±1.5)	40 (±2.0)	41 (±2.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Student attitudes towards ICT devices

ICT device self-efficacy

Students were asked how well they could do certain tasks on an ICT device[11]. In previous cycles of NAP–ICT Literacy, students’ confidence in completing tasks using these devices has been positively associated with students’ NAP–ICT Literacy scale scores. Table 5.11 provides a complete list of the tasks for both Year 6 and Year 10.

[11] In previous cycles they were asked how well they could complete given tasks on a computer (pre-2017) or digital device (2017).

Table 5.11: Category percentages for responses to questions about self-efficacy in using ICT devices in 2022 and in comparison with 2017 and 2014

	How well can you do each of these tasks on a ICT device?*	2022				2017				2014			
		I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means	I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means	I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means
Year 6	Edit digital photographs or other graphic images	45 (±2.0)	38 (±1.8)	13 (±1.3)	4 (±0.7)	47 (±1.9)	35 (±1.7)	13 (±1.1)	5 (±0.9)	45 (±2.0)	36 (±1.8)	16 (±1.4)	4 (±0.6)
	Create a database (e.g. using Microsoft Access, FileMaker)	17 (±1.4)	32 (±1.5)	27 (±1.8)	24 (±1.7)	19 (±1.3)	33 (±1.6)	25 (±1.6)	23 (±1.6)	21 (±1.7)	25 (±1.4)	30 (±1.4)	24 (±1.6)
	Enter data in a spreadsheet (e.g. using Microsoft Excel)[1]	35 (±1.8)	33 (±1.9)	17 (±1.5)	15 (±1.4)	33 (±1.8)	31 (±1.5)	17 (±1.4)	19 (±1.7)	- -	- -	- -	- -
	Plot a graph using spreadsheet software (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)[2]	30 (±2.0)	35 (±1.8)	19 (±1.8)	17 (±1.5)	32 (±1.8)	32 (±1.5)	19 (±1.5)	18 (±1.5)	32 (±2.0)	31 (±1.5)	20 (±1.5)	17 (±1.4)
	Download music from the Internet	54 (±2.0)	26 (±1.8)	17 (±1.4)	4 (±0.7)	55 (±1.9)	23 (±1.4)	19 (±1.5)	3 (±0.7)	59 (±1.5)	22 (±1.3)	16 (±1.2)	3 (±0.5)
	Create a multi-media presentation (with sound, pictures, video)	43 (±2.1)	33 (±2.0)	15 (±1.4)	9 (±1.0)	44 (±1.9)	33 (±1.6)	15 (±1.4)	8 (±1.2)	48 (±2.4)	29 (±1.6)	16 (±1.3)	7 (±0.9)
	Use a website builder to create or edit websites	20 (±1.7)	28 (±1.5)	39 (±1.8)	13 (±1.1)	16 (±1.7)	28 (±1.6)	44 (±2.0)	12 (±1.3)	18 (±1.8)	25 (±1.4)	46 (±1.9)	11 (±1.0)
	Post content (e.g. comments, images, videos) on social media (e.g. Kidzworld, Popjam, LegoLife or similar)	45 (±1.8)	24 (±1.5)	22 (±1.6)	9 (±1.0)	40 (±1.8)	26 (±1.5)	28 (±1.6)	7 (±1.1)	41 (±1.9)	26 (±1.4)	27 (±1.8)	7 (±1.0)
	Use a collaborative workspace (e.g. Google G Suite, Microsoft Teams or Microsoft Office 365) to work with others on a shared project	39 (±2.2)	29 (±1.7)	18 (±1.4)	14 (±1.3)	- -	- -	- -	- -	- -	- -	- -	- -
	Use videoconferencing software (e.g. Zoom, MS teams, Webex) for communication purposes	47 (±2.3)	27 (±1.7)	16 (±1.3)	10 (±1.1)	- -	- -	- -	- -	- -	- -	- -	- -
	Using an online learning management system (e.g. Moodle, Google Classroom, ClassDojo)	57 (±2.3)	24 (±1.6)	12 (±1.3)	7 (±1.0)	- -	- -	- -	- -	- -	- -	- -	- -

Table 5.11 (continued)

	How well can you do each of these tasks on a digital device?*	2022				2017				2014			
		I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means	I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means	I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means
Year 10	Edit digital photographs or other graphic images	41 (±1.9)	43 (±1.8)	13 (±1.4)	3 (±0.6)	50 (±1.8)	39 (±1.7)	9 (±1.0)	2 (±0.4)	50 (±1.7)	38 (±1.6)	10 (±1.0)	1 (±0.5)
	Create a database (e.g. using Microsoft Access, FileMaker)	16 (±1.5)	33 (±2.0)	31 (±1.9)	20 (±1.6)	16 (±1.4)	31 (±1.5)	31 (±1.6)	22 (±1.5)	16 (±1.3)	27 (±1.6)	35 (±1.6)	21 (±1.4)
	Enter data in a spreadsheet (e.g. using Microsoft Excel)[1]	40 (±2.4)	44 (±2.1)	13 (±1.4)	4 (±0.7)	44 (±2.2)	39 (±1.9)	13 (±1.4)	4 (±0.7)	- -	- -	- -	- -
	Plot a graph using spreadsheet software (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)[2]	38 (±2.4)	42 (±2.0)	15 (±1.6)	5 (±0.8)	42 (±2.2)	39 (±1.8)	14 (±1.3)	4 (±0.7)	40 (±2.4)	40 (±1.9)	15 (±1.2)	5 (±0.9)
	Download music from the Internet	64 (±2.1)	25 (±1.7)	9 (±1.2)	2 (±0.6)	77 (±1.6)	16 (±1.4)	7 (±0.9)	1 (±0.3)	80 (±1.6)	14 (±1.3)	5 (±0.8)	1 (±0.4)
	Create a multi-media presentation (with sound, pictures, video)	54 (±2.3)	34 (±2.0)	10 (±1.1)	3 (±0.6)	60 (±2.0)	30 (±1.7)	8 (±1.0)	2 (±0.6)	63 (±2.0)	27 (±1.6)	8 (±1.2)	2 (±0.5)
	Use a website builder to create or edit websites	23 (±1.9)	36 (±1.8)	34 (±1.9)	8 (±1.1)	21 (±1.6)	37 (±1.8)	36 (±1.5)	5 (±0.8)	18 (±1.4)	35 (±1.8)	42 (±1.9)	6 (±0.8)
	Post content (e.g. comments, images, videos) on social media (e.g. Instagram, Snapchat, X (formerly Twitter), Facebook or similar)[3]	70 (±2.2)	21 (±1.7)	7 (±1.2)	2 (±0.7)	91 (±1.2)	6 (±0.9)	2 (±0.6)	1 (±0.4)	89 (±1.3)	7 (±0.9)	3 (±0.6)	2 (±0.5)
	Use a collaborative workspace (e.g. Google G Suite, Microsoft Teams or Microsoft Office 365) to work with others on a shared project	51 (±2.6)	30 (±2.1)	14 (±1.4)	5 (±0.9)	- -	- -	- -	- -	- -	- -	- -	- -
	Use videoconferencing software (e.g. Zoom, MS teams, Webex) for communication purposes	52 (±2.7)	31 (±2.0)	12 (±1.5)	5 (±1.0)	- -	- -	- -	- -	- -	- -	- -	- -
	Using an online learning management system (e.g. Moodle, Google Classroom, ClassDojo)	52 (±2.3)	29 (±1.9)	13 (±1.4)	6 (±0.9)	- -	- -	- -	- -	- -	- -	- -	- -

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
** In 2014 and 2017 'computer' and 'digital device' were used respectively instead of 'ICT device'.*

[1]*Question not asked in 2014*
[2]*Question text in 2014: 'Use a spreadsheet to plot a graph'*
[3]*Question text in 2014: 'Use social media'*

For the majority of tasks, the distribution of student responses did not vary considerably between 2017 and 2022, and differences were more apparent at the Year 10 level. Fewer Year 10 students indicated they could (easily by themselves) post content to social media like Instagram (70%) or download music from the internet (64%) compared to 2017 (91% and 77%, respectively). However, for both of these items there were more students indicating they could do these tasks with a bit of effort in 2022 compared to 2017: 21% compared to 6% (posting to social media); and 25% compared to 16% (downloading music).

A scale was derived based on all items in this question to compare student self-efficacy in using ICT devices across different subgroups. Item response theory was used to derive weighted likelihood estimates for this index.

Scale scores were transformed to a metric where the national mean score for Year 6 students was 50 with a standard deviation of 10. The scaling analyses and procedures for these items, as well as information about reliabilities, are detailed in the NAP-ICT Literacy 2022 Technical Report.

Table 5.12 shows the scale scores for the index of ICT device self-efficacy for male and female students in both year levels. Overall, Year 10 students showed significantly higher levels of self-efficacy than Year 6 students, which was largely driven by Year 10 female students who scored an average of 3.2 scale points higher than Year 6 female students. While Year 6 female students had significantly lower self-efficacy ratings than their male counterparts (by 1.7 scale points), there was no difference between Year 10 male and female students' ratings of self-efficacy.

Table 5.12: Average scores on index of ICT device self-efficacy for male and female students (2022 only)

Self-efficacy	All Students		Male		Female		Difference (M-F)	
Year 6	50.0	(±0.4)	50.9	(±0.6)	49.1	(±0.6)	1.7	(±0.8)
Year 10	52.4	(±0.4)	52.4	(±0.7)	52.3	(±0.6)	0.1	(±1.0)
Difference (Year 10-Year 6)	**2.4**	(±0.6)	**1.5**	(±0.9)	**3.2**	(±0.8)	**-1.7**	(±1.2)

*Confidence Intervals (1.96 * SE) are reported in brackets. Statistically significant differences are in bold.*

For the exploration of the association between students' attitudes towards ICT devices and NAP–ICT Literacy scale scores, 2 methods of association are reported. The first presents average attitude scale scores for students who are either below the proficient standard for NAP–ICT Literacy or above it. This helps to explain whether students with a greater level of ICT knowledge have different attitudes towards ICT devices in comparison to those with less developed levels of knowledge.

The second method reports the correlation between each attitude of interest and NAP–ICT Literacy scale scores. Pearson's correlation coefficients can assume values between –1 and +1. A positive correlation between the NAP–ICT Literacy scale and an attitudinal measure scale would mean that an increase in student achievement corresponds to an increase in the attitudinal scale score, while a negative correlation indicates an association in which an increase in one measure corresponds to a decrease in the other measure.

Students above the proficient standard had significantly higher levels of self-efficacy than students below the proficient standard (see Table 5.13). The gap was slightly larger for Year 10 students (4.3 scale points) than Year 6 students (3.6 scale points) overall, but this was mostly attributable to Year 10 male students above the proficient standard outperforming their counterparts below the proficient standard by 5.0 scale points.

Table 5.13: Average scores on index of ICT device self-efficacy for students above and below the proficient standard overall and by gender (2022 only)

	Proficient standard	All students		Male		Female	
Year 6	Above	51.5	(±0.5)	52.4	(±0.8)	50.6	(±0.6)
	Below	47.9	(±0.6)	48.9	(±1.0)	46.6	(±1.0)
	Difference	**3.6**	(±0.8)	**3.5**	(±1.3)	**4.0**	(±1.2)
	Correlation	**0.22**	(±0.04)	**0.20**	(±0.07)	**0.25**	(±0.05)
Year 10	Above	54.6	(±0.5)	55.0	(±0.8)	54.2	(±0.7)
	Below	50.3	(±0.6)	50.0	(±1.0)	50.5	(±0.9)
	Difference	**4.3**	(±0.8)	**5.0**	(±1.3)	**3.6**	(±1.1)
	Correlation	**0.29**	(±0.04)	**0.33**	(±0.06)	**0.25**	(±0.06)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

The correlation between self-efficacy and achievement was significant and moderate in size (between 0.20 and 0.33). This relationship was similar for male and female students in Year 6 (0.20 and 0.25, respectively), but in Year 10 was slightly stronger for male students than female students (0.33 and 0.25, respectively). While this difference has not been tested for significance, it is consistent with the comparisons of self-efficacy ratings for students above and below the proficient standard. Taken together, these results demonstrate that students with higher ICT device self-efficacy had greater levels of achievement, and this relationship was stronger for Year 10 male students.

Importance of ICT devices

Students were asked how much they agreed with certain statements about the importance of using ICT devices (see Table 5.14 for a full list of the statements). As with the items about self-efficacy, similar items were included in the 2017 and 2014 NAP–ICT Literacy student surveys, relating to the importance of using computers or digital devices (rather than ICT devices). The 2017 and 2014 results have also been included for reference, as the student responses are still relevant to the description of students' ratings of the importance of ICT. Due to the change in wording in the question stem across cycles, however, any changes between 2014 and more recent cycles should be interpreted with caution.

Table 5.14: Category percentages for students' recognition of the importance of working with ICT devices in 2022, and percentages of agreement in comparison with 2017 and 2014

	Importance of working with ICT devices	Strongly agree		Agree		Disagree		Strongly disagree		% Agreement 2022		% Agreement 2017		% Agreement 2014	
Year 6	I like using ICT devices* because they help me improve the quality of my work	32	(±1.6)	60	(±1.6)	7	(±1.0)	1	(±0.5)	92	(±1.2)	88	(±1.2)	82	(±1.3)
	I like using ICT devices* because they make work easier	40	(±2.1)	49	(±1.7)	9	(±1.1)	2	(±0.4)	90	(±1.2)	86	(±1.2)	83	(±1.3)
	I enjoy using ICT devices* because they help me to work with others.	26	(±2.3)	47	(±1.8)	24	(±1.6)	3	(±0.5)	73	(±1.7)	70	(±1.7)	66	(±1.8)
	I like using ICT devices because I prefer to work alone	18	(±1.4)	33	(±1.5)	40	(±1.5)	9	(±1.1)	51	(±1.8)	-	-	-	-
	I enjoy using ICT devices* because they help me communicate with my friends	47	(±2.0)	37	(±1.5)	13	(±1.2)	3	(±0.7)	84	(±1.4)	82	(±1.3)	74	(±1.7)
	I like using ICT devices* to find new ways to do things	39	(±2.0)	51	(±2.0)	9	(±1.0)	2	(±0.4)	90	(±1.0)	89	(±1.0)	82	(±1.5)
	It is very important to me to work with a ICT device*	24	(±1.5)	41	(±1.7)	30	(±1.8)	6	(±0.9)	65	(±1.8)	55	(±2.1)	77	(±1.9)
Year 10	I like using ICT devices* because they help me improve the quality of my work	41	(±2.2)	52	(±2.2)	5	(±0.9)	2	(±0.5)	93	(±1.0)	91	(±1.1)	87	(±1.4)
	I like using ICT devices* because they make work easier	48	(±2.1)	45	(±1.9)	5	(±0.8)	2	(±0.5)	93	(±0.8)	91	(±1.1)	89	(±1.2)
	I enjoy using ICT devices* because they help me to work with others	31	(±2.2)	52	(±2.1)	15	(±1.5)	2	(±0.5)	83	(±1.7)	76	(±1.5)	66	(±2.1)
	I like using ICT devices because I prefer to work alone	23	(±1.6)	42	(±1.7)	30	(±1.9)	5	(±0.9)	66	(±2.0)	-	-	-	-
	I enjoy using ICT devices* because they help me communicate with my friends	45	(±1.9)	41	(±1.8)	11	(±1.2)	2	(±0.5)	87	(±1.4)	91	(±1.1)	84	(±1.4)
	I like using ICT devices* to find new ways to do things	38	(±2.1)	50	(±2.3)	10	(±1.3)	2	(±0.6)	88	(±1.3)	90	(±0.9)	77	(±1.7)
	It is very important to me to work with a ICT device*	30	(±1.9)	44	(±1.9)	21	(±1.6)	5	(±0.8)	75	(±1.7)	66	(±1.9)	79	(±1.7)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
** In 2014 and 2017 'computer' and 'digital device' were used respectively instead of 'ICT device'.*

In 2022, students were likely to express high levels of agreement at both year levels for the majority of items, especially Year 10 students. The percentage of Year 6 students indicating they agreed with each statement ranged from 51% ("I like using ICT devices because I prefer to work alone") to 92% ("I like using ICT devices because they help me improve the quality of my work"). While the percentage of Year 10 students indicating agreement with each statement ranged from 66% ("I like using ICT devices because I prefer to work alone") to 93% (both "I like using ICT devices because they help me improve the quality of my work" and "I like using ICT devices because they make work easier"). Previous cycles showed similarly high levels of agreement.

Following the same procedure used for the ICT device self-efficacy scale, all 6 items in the question were used to derive a scale on the importance of ICT devices (see Table 5.15 for scale scores for male and female students in both year levels). Similar to the findings for self-efficacy, Year 10 students showed significantly higher ratings of the importance of ICT devices than Year 6 students. Again, this difference was larger for female students (2.5 scale points) than male students (1.9 scale points). Males at both year levels showed significantly higher ratings of the importance of ICT devices than females, but the difference was larger for Year 6 students (2.0 scale points compared to 1.4 scale points at Year 10).

Table 5.15: Average scores on index of importance of ICT devices for male and female students (2022 only)

Importance of digital devices	All Students	Male	Female	Difference (M-F)
Year 6	50.0 (±0.4)	51.0 (±0.6)	49.0 (±0.5)	**2.0** (±0.7)
Year 10	52.2 (±0.5)	52.9 (±0.7)	51.5 (±0.6)	**1.4** (±0.9)
Difference (Year 10-Year 6)	**2.2** (±0.7)	**1.9** (±0.9)	**2.5** (±0.8)	**-0.6** (±1.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

As evident in Table 5.16, both male and female Year 6 students above the proficient standard rated the importance of ICT devices more highly than their lower performing counterparts (by 2.0 and 1.8 scale points, respectively). These differences effectively doubled in size for Year 10 students, where male and female students above the proficient standard rated the importance of ICT devices an average of 4.5 and 3.8 scale points higher, respectively, than their lower performing counterparts.

Table 5.16: Average scores on index of importance of ICT devices for students above and below the proficient standard overall and by gender (2022 only)

	Proficient standard	All students	Male	Female
Year 6	Above	50.7 (±0.6)	51.9 (±0.8)	49.7 (±0.7)
	Below	49.0 (±0.6)	49.9 (±0.7)	47.9 (±0.9)
	Difference	**1.7** (±0.8)	**2.0** (±1.0)	**1.8** (±1.1)
	Correlation	**0.12** (±0.04)	**0.13** (±0.05)	**0.13** (±0.06)
Year 10	Above	54.4 (±0.7)	55.3 (±0.9)	53.4 (±1.0)
	Below	50.2 (±0.7)	50.8 (±0.9)	49.7 (±0.9)
	Difference	**4.1** (±1.1)	**4.5** (±1.2)	**3.8** (±1.6)
	Correlation	**0.22** (±0.04)	**0.27** (±0.06)	**0.18** (±0.06)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

The correlation between students' ratings of the importance of ICT devices and achievement was significant but weak (0.12) for Year 6 students and tending towards moderate for Year 10 students (0.22). As with ICT device self-efficacy, the relationship was stronger for Year 10 students than Year 6 students, particularly for male students where the correlation for Year 10 male students (0.27) was twice as strong as the correlation for Year 6 male students (0.13). These findings demonstrate that students who rated the importance of ICT devices highly had greater knowledge of ICT literacy.

Chapter 6:
Student use of applications

Chapter 6: Student use of applications

Chapter highlights

- As was the case in previous cycles, the most frequently reported ICT-related study activity was searching the internet for information for study or schoolwork. This was true for both Year 6 and Year 10 students, both at school and outside of school.
- Study activities that the majority of students reported as rarely doing, either at school or outside of school, were recording their reflections on learning (e.g. through a blog) and listening to podcasts or audiobooks to support their learning. Outside of school, the use and creation of spreadsheets was also rare for both Year 6 and Year 10 students.
- When both at and outside of school, Year 10 students reported making more use of ICT-based study utilities than Year 6 students. Differences between female and male students in study utility use were negligible.
- Year 10 students with higher ICT literacy achievement were more likely to report frequent use of study utilities on their ICT devices outside of school. This was particularly true for male students.
- Entertainment applications were used more often by students in Year 10 than by students in Year 6, both at school and outside of school. Significant differences in entertainment application use between the genders were found outside of school, where male students reported slightly higher use of these applications at both year levels.
- Year 6 students with lower ICT achievement reported more frequent use of entertainment applications at school than students with higher ICT achievement. This was true for both female and male students.
- At school, two-thirds of Year 10 students reported using email frequently, with 40% frequently using chat or messaging apps. In contrast, almost all Year 6 students reported rarely using their devices for communication purposes when at school.
- Year 10 students reported significantly higher use of ICT devices for communication purposes than Year 6 students. This was particularly true when these behaviours took place at school.
- At school, lower achieving Year 6 students reported more frequent use of communication applications than did students achieving above the proficient standard.
- Across both year levels, students reported undertaking technological activities far less frequently than activities for the purposes of study, entertainment or communication.
- Female students in Year 6 reported completing technological tasks more often than female students in Year 10 both at and outside school, but particularly when outside of school. At Year 10, male students reported completing technological tasks more often than female students both at and outside of school.

Introduction

This chapter examines students' use of applications on ICT devices and how this is associated with their achievement in NAP–ICT Literacy. As in previous cycles, the student survey (see Appendix B) in 2022 asked students to specify the extent to which they completed a range of tasks on ICT devices, both at school and outside of school. Students were, for example, asked how often they undertook a particular task on a device (such as how often they searched the internet for information for schoolwork) or how often they used a particular piece of software (such as a communication tool like WhatsApp or FaceTime).

The specific tasks students were asked about were grouped according to the types of application use they represented. These were:

- use of study utilities on ICT devices
- use of entertainment applications on ICT devices
- use of ICT devices for communication purposes
- completion of technological tasks using ICT devices.

Students indicated the frequency with which they performed tasks relating to each type of application use, both at school and outside of school. For each task, students selected one response from the 6 categories ("At least once every day", "Almost every day", "A few times each week", "Between once a week and once a month", "Less than once a month", "Never").

Based on the frequencies of student responses by category, these 6 categories were reclassified into the following 3 categories for the purposes of reporting:

- "Rarely" (less than once per month or never)
- "Occasionally" (between a few times per week and once a month)
- "Frequently" (almost every day or more frequently).

To compare the types of application use by different sub-groups of students, scaled indices were derived for each of the 4 application use types (study utilities, entertainment, communication and technological uses) by combining the responses on each set of questions about one type of application use into one score for activities at school and one score for activities outside of school. The resulting scores were standardised to provide a metric in which the national average score for Year 6 students was 50, with a standard deviation of 10[12]. More information about these indices is provided in the technical report. For each index, average scale scores were compared between year levels and gender groups for both at school and outside of school.

In order to explore the associations between students' reported use of applications on ICT devices and their achievement in the NAP–ICT Literacy assessment, 2 methods of association are reported in this section. The first method compares the average survey scale scores between students who are above and below the NAP–ICT Literacy proficient standard. These scores are presented for each of the 4 application use types discussed in this chapter. This method helps to explain whether students with

[12] Further information about how these scaling analyses were performed, together with information about reliabilities and related analytic procedures, are provided in the NAP–ICT Literacy 2022 Technical Report.

greater achievement in ICT report different frequencies of application use on ICT devices, as compared to those with lower ICT achievement.

The second method reports the correlation between NAP–ICT Literacy scale scores and each of the 4 "use of application" indices. Pearson's correlation coefficients assume values between –1 and +1. A positive correlation between NAP–ICT Literacy scale scores and the "use of application" index would mean that any increase in student achievement corresponds to an increase in the "use of application" scale score, while a negative correlation indicates an association in which an increase in one measure corresponds to a decrease in the other measure.

While there are no scientific rules for interpreting the strength of correlation coefficients[13], for the purposes of survey data in social research, statistically significant coefficients below ±0.1 are typically described as "not substantial", between ±0.1 and ±0.2 as "weak", greater than ±0.2 and less than ±0.5 as "moderate" and ±0.5 or greater as "strong".

Frequency of use of applications at school and outside of school

Use of study utilities on ICT devices

The student survey asked students to consider the frequency with which they performed ICT-based tasks that were typically associated with study activities. Table 6.1 presents the frequency with which Year 6 and Year 10 students reported undertaking each study utility task, both at school and outside of school.

[13] When reporting correlation coefficients, an assumption is made that the relationship between the 2 measures is linear.

Table 6.1: Frequency percentages of use of study utilities on ICT devices

	Use of study utilities on ICT devices	Year 6			Year 10		
		Rarely	Occasionally	Frequently	Rarely	Occasionally	Frequently
At school	Search the Internet for information for study or school work	5 (±1.0)	37 (±3.0)	58 (±3.2)	3 (±0.8)	16 (±1.9)	81 (±2.3)
	Use word processing software or apps to create documents	17 (±1.8)	51 (±2.2)	32 (±2.3)	7 (±1.2)	31 (±2.3)	62 (±2.7)
	Use spreadsheets to create a graph or perform calculations	43 (±2.2)	44 (±2.1)	13 (±1.6)	36 (±2.0)	51 (±1.9)	13 (±1.3)
	Use mathematics, language or other learning programs on a computer	18 (±2.0)	47 (±2.2)	35 (±2.6)	27 (±1.9)	44 (±1.8)	29 (±1.8)
	Enter data in a spreadsheet	47 (±2.4)	41 (±2.1)	12 (±1.3)	49 (±2.2)	41 (±2.1)	10 (±1.3)
	Create presentations for school projects	25 (±2.0)	62 (±1.8)	13 (±1.3)	20 (±1.8)	66 (±2.3)	15 (±1.5)
	Watch online videos to support your own learning	23 (±1.8)	54 (±2.0)	23 (±1.7)	19 (±1.8)	52 (±2.2)	29 (±1.8)
	Listen to podcasts or audiobooks to support your own learning	69 (±2.0)	22 (±1.6)	8 (±1.0)	69 (±1.8)	20 (±1.5)	11 (±1.4)
	Organise your school work using a learning management or school management system (e.g. a Moodle, Compass)	30 (±2.6)	35 (±2.2)	35 (±3.1)	27 (±2.5)	25 (±2.0)	48 (±3.3)
	Record your reflections on learning (e.g. through a blog)	64 (±2.4)	26 (±1.7)	10 (±1.3)	78 (±2.0)	14 (±1.5)	8 (±1.3)

Table 6.1 (continued)

	Use of study utilities on ICT devices	Year 6			Year 10		
		Rarely	Occasionally	Frequently	Rarely	Occasionally	Frequently
Outside school	Search the Internet for information for study or school work	25 (±2.0)	41 (±2.3)	35 (±2.4)	12 (±1.5)	32 (±2.0)	56 (±2.5)
	Use word processing software or apps to create documents	53 (±2.5)	33 (±2.2)	14 (±1.4)	30 (±2.5)	44 (±1.9)	27 (±2.2)
	Use spreadsheets to create a graph or perform calculations	77 (±1.9)	17 (±1.5)	6 (±1.0)	70 (±2.0)	23 (±1.8)	7 (±1.1)
	Use mathematics, language or other learning programs on a computer	52 (±2.6)	33 (±2.0)	15 (±1.5)	53 (±2.1)	32 (±1.7)	15 (±1.4)
	Enter data in a spreadsheet	79 (±1.6)	16 (±1.3)	5 (±1.0)	74 (±1.8)	20 (±1.5)	6 (±0.9)
	Create presentations for school projects	61 (±2.5)	32 (±2.1)	7 (±1.1)	47 (±2.2)	45 (±2.2)	8 (±1.1)
	Watch online videos to support your own learning	53 (±2.3)	32 (±1.7)	15 (±1.4)	37 (±2.3)	41 (±2.0)	22 (±1.6)
	Listen to podcasts or audiobooks to support your own learning	71 (±1.8)	18 (±1.5)	11 (±1.3)	66 (±1.7)	20 (±1.3)	13 (±1.2)
	Organise your school work using a learning management or school management system (e.g. a Moodle, Compass)	60 (±2.7)	27 (±1.6)	13 (±2.1)	42 (±2.9)	28 (±1.9)	30 (±3.3)
	Record your reflections on learning (e.g. through a blog)	82 (±1.7)	13 (±1.4)	4 (±0.8)	84 (±1.6)	11 (±1.3)	5 (±1.0)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
Rarely = less than once a month or never
Occasionally = between a few times each week and once a month
Frequently = almost every day or more

Students reported frequently using various study utilities both at school and outside of school. The most frequently reported activity was searching the internet for information for study or schoolwork. Over 80% of Year 10 students and 58% of Year 6 students reported that they frequently did this at school, and 56% of Year 10 and 35% of Year 6 students reported that they frequently did this outside of school.

At Year 10, using word-processing software or apps to create documents was also reported as one of the most frequent activities engaged in by students: 62% of students indicated they did this. The reported frequency dropped to 27% for the same cohort outside of school. For Year 6 students, the at school and outside of school figures were 32% and 14% respectively, showing a substantial difference in the frequency of word processing software use when compared to their Year 10 counterparts.

Study utilities that the majority of students rarely used either at school or outside of school were recording their reflections on learning (e.g. through a blog) and listening to podcasts or audiobooks to support their learning. Outside of school, the use and creation of spreadsheets was also rare for both Year 6 and Year 10 students.

An index was created for the items measuring use of study utilities on ICT devices at school and outside of school. Average scale scores on these indices are recorded in Table 6.2.

At school, differences in the use of study utilities were significant between the 2 cohorts, with Year 10 students making more use of study utilities than Year 6 students. This difference between year levels appeared larger for reported behaviours outside of school, with a statistically significant difference of 3.3 scale points between Year 10 and Year 6. Differences between the genders were largely negligible, although female students at Year 6 reported higher use of study utilities outside of school than male students at Year 6.

Table 6.2: Average scores on use of study utilities on ICT devices at school and outside of school overall and by gender

		All Students		Male		Female		Difference (M-F)	
At school	Year 6	50.0	(±0.6)	50.1	(±0.8)	49.9	(±0.6)	0.2	(±0.7)
	Year 10	51.9	(±0.6)	52.3	(±0.7)	51.4	(±0.8)	0.9	(±1.0)
	Differences (Year 10-Year 6)	**1.9**	(±0.8)	**2.2**	(±1.1)	**1.5**	(±1.0)		
Outside of school	Year 6	50.0	(±0.5)	49.5	(±0.6)	50.5	(±0.6)	**-1.0**	(±0.7)
	Year 10	53.3	(±0.5)	53.5	(±0.7)	53.0	(±0.7)	0.5	(±1.0)
	Differences (Year 10-Year 6)	**3.3**	(±0.7)	**4.0**	(±1.0)	**2.5**	(±1.0)		

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

Table 6.3 presents the average study utility scale score for groups of students above and below the NAP–ICT Literacy proficient standard for both year levels and by gender. Perhaps unsurprisingly, higher average scale scores for use of study utilities outside of school were evident for those students above the proficient standard in the Year 10 cohort.

This implies that Year 10 students with higher ICT literacy achievement were more likely to report frequent use of study utilities on their ICT devices outside of school. This was particularly true for male students in Year 10, with a 2.9 scale point difference between those above and below the proficient standard. The correlations for each category at a Year 10 level outside of school were statistically significant but the strength of the association was weak (0.15).

Table 6.3: Average scores on use of study utilities on ICT devices for students above and below the proficient standard, overall and by gender

		At school			Outside school		
	Proficient standard	All Students	Male	Female	All Students	Male	Female
Year 6	Above	49.7 (±0.6)	49.5 (±0.9)	49.9 (±0.7)	50.5 (±0.6)	50.0 (±0.8)	50.9 (±0.7)
	Below	50.4 (±0.8)	50.8 (±1.1)	49.9 (±0.9)	49.3 (±0.8)	48.9 (±1.1)	49.8 (±0.9)
	Difference	-0.7 (±0.9)	**-1.3** (±1.3)	-0.1 (±1.2)	**1.2** (±0.9)	1.1 (±1.5)	**1.2** (±1.0)
	Correlation	**-0.05** (±0.0)	**-0.07** (±0.1)	-0.02 (±0.1)	**0.07** (±0.0)	0.06 (±0.1)	**0.06** (±0.1)
Year 10	Above	52.0 (±0.6)	52.3 (±0.9)	51.7 (±0.8)	54.5 (±0.5)	55.1 (±0.8)	54.0 (±0.8)
	Below	51.8 (±0.9)	52.4 (±1.0)	51.1 (±1.3)	52.1 (±0.8)	52.2 (±1.0)	52.1 (±1.2)
	Difference	0.2 (±1.0)	-0.1 (±1.4)	0.6 (±1.5)	**2.4** (±0.8)	**2.9** (±1.3)	**1.9** (±1.3)
	Correlation	0.04 (±0.1)	0.02 (±0.0)	0.07 (±0.1)	**0.15** (±0.0)	**0.15** (±0.1)	**0.14** (±0.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences and statistically significant correlations in bold.

When at school, no associations between study utility scale scores and ICT achievement were found for the Year 10 cohort. For male Year 6 students, higher scale scores for use of study utilities at school were evident for those students below the proficient standard, but the strength of the association was not substantial.

Use of entertainment applications on ICT devices

The NAP–ICT Literacy survey also asked students to report on the frequency with which they conducted entertainment-related activities on ICT devices. Students reported doing these activities more frequently when outside of school than at school, and this was true across both year levels (Table 6.4).

Most Year 6 and Year 10 students reported that they rarely used entertainment applications at school, with the exception of searching for online information about topics of interest and listening to music in Year 10.

Outside of school, the percentages varied by activity and by year level. Year 6 students reported most frequently watching videos for entertainment (71%) and listening to music for entertainment (63%). These activities were undertaken even more frequently by Year 10 students, with 78% of Year 10 students reporting that they frequently used ICT devices to watch videos for entertainment and 83% reporting that they frequently listened to music for entertainment purposes. A sizeable proportion of Year 10 students (62%) also reported frequently searching for online information about things they were interested in, with just 9% reporting that they rarely performed this activity.

Table 6.4: Frequency percentages of use of entertainment applications on ICT devices

	Use of entertainment applications on ICT devices	Year 6			Year 10		
		Rarely	Occasionally	Frequently	Rarely	Occasionally	Frequently
At school	Watch videos for entertainment	75 (±2.3)	19 (±1.8)	6 (±1.3)	49 (±2.2)	31 (±1.9)	20 (±1.6)
	Play video games	72 (±2.9)	23 (±2.4)	6 (±1.0)	58 (±2.4)	26 (±1.4)	16 (±1.8)
	Use software to create sounds/music, movies, animations or artwork	59 (±2.5)	35 (±2.2)	6 (±1.1)	61 (±1.8)	27 (±1.7)	12 (±1.5)
	Listen to music for entertainment	66 (±3.0)	23 (±2.0)	10 (±1.7)	26 (±2.3)	24 (±2.0)	51 (±2.9)
	Listen to podcasts, audiobooks or internet radio for entertainment	83 (±1.8)	12 (±1.5)	4 (±0.9)	74 (±2.1)	17 (±1.6)	9 (±1.3)
	Search for online information about things you are interested in	43 (±1.9)	39 (±1.7)	18 (±1.9)	18 (±1.9)	37 (±1.6)	46 (±2.3)
	Use of entertainment applications on ICT devices	**Year 6**			**Year 10**		
		Rarely	**Occasionally**	**Frequently**	**Rarely**	**Occasionally**	**Frequently**
Outside school	Watch videos for entertainment	7 (±0.8)	22 (±1.7)	71 (±1.7)	5 (±0.8)	17 (±1.5)	78 (±1.7)
	Play video games	13 (±1.2)	31 (±1.8)	56 (±1.8)	24 (±1.7)	30 (±2.0)	46 (±2.0)
	Use software to create sounds/music, movies, animations or artwork	46 (±1.8)	30 (±1.9)	24 (±1.7)	56 (±2.3)	22 (±1.4)	22 (±1.7)
	Listen to music for entertainment	11 (±1.0)	26 (±1.4)	63 (±1.6)	5 (±0.9)	12 (±1.2)	83 (±1.5)
	Listen to podcasts, audiobooks or internet radio for entertainment	55 (±1.7)	23 (±1.5)	22 (±1.5)	54 (±2.2)	26 (±1.9)	20 (±1.5)
	Search for online information about things you are interested in	19 (±1.6)	41 (±1.7)	40 (±1.9)	9 (±1.2)	29 (±1.8)	62 (±2.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
Rarely = less than once a month or never
Occasionally = between a few times each week and once a month
Frequently = almost every day or more

Average scale scores on the indices that were created for these questions showed that, at school, entertainment applications were significantly more often used by students in Year 10 than by students in Year 6 (see Table 6.5). The size of the difference was substantial at 7.2 scale points and demonstrated an almost doubling of the 3.7 scale point difference between year levels reported in the 2017 cycle (ACARA 2018, p. 67). No significant differences were observed between the genders at either year level with respect to use of entertainment applications at school.

Table 6.5: Average scores on use of entertainment applications on ICT devices at school and outside of school, overall and by gender

		All Students		Male		Female		Difference (M-F)	
At school	Year 6	50.0	(±0.6)	50.0	(±0.8)	50.0	(±0.6)	0.0	(±0.7)
	Year 10	57.2	(±0.6)	57.6	(±0.6)	56.9	(±0.8)	0.7	(±0.8)
	Differences (Year 10-Year 6)	**7.2**	(±0.9)	**7.6**	(±1.0)	**6.9**	(±1.0)		
Outside of school	Year 6	50.0	(±0.4)	50.5	(±0.5)	49.5	(±0.5)	**0.9**	(±0.7)
	Year 10	51.1	(±0.5)	52.0	(±0.5)	50.2	(±0.7)	**1.7**	(±0.7)
	Differences (Year 10-Year 6)	**1.1**	(±0.6)	**1.5**	(±0.8)	0.7	(±0.8)		

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

Outside of school, students in Year 10 reported more frequent use of entertainment applications than Year 6 students (1.1 scale point difference). Differences in the use of entertainment applications between the genders were small but significant in both Year 6 (0.9 scale points) and Year 10 (1.7 scale points), with male students reporting slightly higher use in both cases.

Table 6.6 shows the average survey scale scores on the entertainment index for different subsets of students both above and below the proficient standard. At a Year 6 level, significantly higher average scale scores for use of entertainment applications at school were apparent for students below the proficient standard compared with those for students above the proficient standard. What this means is that Year 6 students with lower ICT achievement reported more frequent use of entertainment applications at school (51.3 scale points) than students with higher ICT achievement (49 scale points). This was true for both genders, with a difference of -3.1 and -1.4 found for male and female students, respectively. The strength of the correlation was significant but weak for both groups.

Outside of school, there was no discernible association between Year 6 students' use of entertainment applications and their ICT achievement. At Year 10, students with higher ICT achievement reported more frequent use of entertainment applications, and this was more apparent in female students. While the correlation in this instance was significant, its strength of association was again weak (0.11).

Table 6.6: Average scores on use of entertainment applications on ICT devices for students above and below the proficient standard, overall and by gender

		At school			Outside school		
	Proficient standard	All Students	Male	Female	All Students	Male	Female
Year 6	Above	49.0 (±0.6)	48.6 (±0.8)	49.4 (±0.8)	50.1 (±0.5)	50.5 (±0.7)	49.7 (±0.7)
	Below	51.3 (±0.9)	51.7 (±1.2)	50.9 (±1.1)	49.9 (±0.7)	50.4 (±0.9)	49.2 (±1.0)
	Difference	**-2.3** (±0.9)	**-3.1** (±1.2)	**-1.4** (±1.4)	0.2 (±1.0)	0.1 (±1.2)	0.5 (±1.4)
	Correlation	**-0.16** (±0.0)	**-0.18** (±0.1)	**-0.15** (±0.1)	0.02 (±0.0)	0.03 (±0.1)	0.03 (±0.1)
Year 10	Above	56.8 (±0.7)	56.9 (±0.9)	56.6 (±0.9)	51.6 (±0.6)	52.2 (±0.8)	51.1 (±0.8)
	Below	57.7 (±0.8)	58.2 (±0.9)	57.1 (±1.1)	50.6 (±0.6)	51.7 (±0.8)	49.4 (±0.9)
	Difference	-0.9 (±1.0)	-1.2 (±1.3)	-0.5 (±1.3)	**1.0** (±0.7)	0.5 (±1.1)	**1.7** (±1.1)
	Correlation	-0.04 (±0.0)	**-0.07** (±0.1)	-0.01 (±0.1)	**0.09** (±0.0)	**0.08** (±0.1)	**0.11** (±0.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences and statistically significant correlations in bold.

Use of ICT devices for communication

Students were asked about the frequency with which they used ICT devices for the purposes of communication.

Table 6.7 shows the percentages of Year 6 and Year 10 students who reported how often they performed each of these activities, both at school and outside of school[14].

When at school, almost all Year 6 students reported rarely using their devices for most of these communication purposes. For Year 10 students, however, device use for communication purposes was reported as more frequent, with 66% of Year 10 students using email frequently and 40% frequently using chat or messaging apps when at school.

Outside of school, both Year 6 and Year 10 students reported using chat or messaging apps most frequently (67% and 85%, respectively). A similar proportion of Year 6 and 10 students used voice or video calling frequently (approximately 40%), while writing or replying to blogs or forum posts had the least frequently reported use for both year levels.

[14] The wording for one item in this index varied between Year 6 and Year 10 survey instruments. For the "Create and share content with others on social media" item, the specific examples provided to students changed depending on what was considered to be more familiar to a Year 6 or Year 10 audience. For Year 6 students, Kidzworld, Popjam and LegoLife were provided as examples of common social media applications. For Year 10 students, Instagram, Snapchat, X (formerly Twitter) and Facebook were listed as social media examples.

Table 6.7: Frequency percentages of use of ICT devices for communication

	Use of ICT devices for communication purposes	Year 6			Year 10		
		Rarely	Occasionally	Frequently	Rarely	Occasionally	Frequently
At school	Use email	40 (±2.9)	37 (±2.8)	23 (±2.4)	8 (±1.3)	27 (±2.1)	66 (±2.5)
	Use chat or messaging apps	86 (±1.5)	9 (±1.1)	5 (±0.8)	37 (±2.7)	22 (±1.5)	40 (±2.4)
	Write or reply to blogs or forum posts	88 (±1.3)	8 (±1.0)	3 (±0.7)	83 (±1.8)	11 (±1.4)	6 (±1.3)
	Use voice or video calls to communicate with people online (e.g. Skype, WhatsApp, FaceTime)	92 (±1.1)	5 (±0.8)	3 (±0.6)	74 (±2.2)	14 (±1.4)	11 (±1.7)
	Create and share content with others on social media (e.g. Instagram, Snapchat, X, Facebook or similar)				69 (±2.3)	15 (±1.3)	17 (±1.8)
	Create and share content with others on social media (e.g. Kidzworld, Popjam, LegoLife or similar)	93 (±1.3)	5 (±1.1)	3 (±0.6)			
	Use of ICT devices for communication purposes	Year 6			Year 10		
		Rarely	Occasionally	Frequently	Rarely	Occasionally	Frequently
Outside school	Use email	42 (±1.9)	35 (±1.7)	24 (±1.7)	14 (±1.5)	36 (±1.8)	50 (±2.3)
	Use chat or messaging apps	13 (±1.1)	20 (±1.4)	67 (±1.8)	6 (±0.8)	9 (±1.1)	85 (±1.6)
	Write or reply to blogs or forum posts	72 (±1.7)	16 (±1.3)	12 (±1.1)	76 (±2.1)	14 (±1.4)	11 (±1.4)
	Use voice or video calls to communicate with people online (e.g. Skype, WhatsApp, FaceTime)	21 (±1.4)	39 (±1.7)	40 (±1.8)	22 (±1.6)	37 (±1.8)	41 (±2.1)
	Create and share content with others on social media (e.g. Instagram, Snapchat, X, Facebook or similar)				26 (±1.8)	25 (±1.6)	49 (±2.0)
	Create and share content with others on social media (e.g. Kidzworld, Popjam, LegoLife or similar)	65 (±1.7)	20 (±1.5)	15 (±1.2)			

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
Rarely = less than once a month or never
Occasionally = between a few times each week and once a month
Frequently = almost every day or more

Similar to previous cycles, Year 10 students reported substantially higher use of ICT devices for communication purposes than Year 6 students. The difference between year levels was particularly large when these behaviours took place at school. As shown in Table 6.8, the scale point difference between Year 10 and Year 6 for this index was 11.8, which was statistically significant. Within each year level, there were no significant differences found between male and female students for this index.

Outside of school, the difference between year levels was significant and moderate in size (3.5 scale points). A small but significant difference was also found between the genders at Year 10, with a slightly higher scale score on this index for female students.

Table 6.8: Average scores on use of ICT devices for communications at school and outside of school, overall and by gender

		All Students		Male		Female		Difference (M-F)	
At school	Year 6	50.0	(±0.6)	50.2	(±0.6)	49.8	(±0.7)	0.3	(±0.6)
	Year 10	61.8	(±0.5)	61.8	(±0.6)	61.9	(±0.7)	-0.1	(±0.7)
	Differences (Year 10-Year 6)	**11.8**	(±0.8)	**11.6**	(±0.9)	**12.0**	(±0.9)		
Outside of school	Year 6	50.0	(±0.3)	49.9	(±0.5)	50.1	(±0.4)	-0.3	(±0.6)
	Year 10	53.5	(±0.4)	53.0	(±0.5)	54.0	(±0.6)	**-1.0**	(±0.7)
	Differences (Year 10-Year 6)	**3.5**	(±0.6)	**3.1**	(±0.7)	**3.8**	(±0.7)		

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

Table 6.9 shows the relationship between students' use of ICT devices for communication purposes and students' levels of ICT literacy achievement. At school, lower achieving Year 6 students reported more frequent use of communication applications than did students achieving above the proficient standard. The association was statistically significant, though weak, for both genders and overall.

No statistically significant difference in device use for communication purposes outside school was found between lower and higher achieving students in Year 6. This was also true for Year 10 students, with no differences found in use of ICT devices for communication either at or outside of school for both lower and higher achieving students.

Table 6.9: Average scores on use of ICT devices for communication for students above and below the proficient standard, overall and by gender

		At school			Outside school		
	Proficient standard	All Students	Male	Female	All Students	Male	Female
Year 6	Above	49.1 (±0.6)	49.1 (±0.7)	49.2 (±0.7)	49.7 (±0.5)	49.5 (±0.7)	49.9 (±0.6)
	Below	51.2 (±0.9)	51.5 (±1.2)	50.9 (±1.1)	50.4 (±0.7)	50.3 (±0.9)	50.6 (±0.9)
	Difference	**-2.1** (±1.1)	**-2.4** (±1.4)	**-1.8** (±1.2)	-0.7 (±0.9)	-0.7 (±1.3)	-0.7 (±1.1)
	Correlation	**-0.14** (±0.0)	**-0.15** (±0.1)	**-0.12** (±0.1)	-0.03 (±0.0)	-0.04 (±0.1)	-0.03 (±0.1)
Year 10	Above	61.6 (±0.5)	61.3 (±0.7)	61.8 (±0.7)	53.2 (±0.5)	52.9 (±0.6)	53.6 (±0.8)
	Below	62.1 (±0.7)	62.2 (±0.9)	61.9 (±0.9)	53.7 (±0.6)	53.1 (±0.8)	54.3 (±0.8)
	Difference	-0.5 (±0.7)	-0.9 (±1.0)	-0.1 (±1.0)	-0.4 (±0.7)	-0.3 (±1.0)	-0.6 (±1.0)
	Correlation	**-0.06** (±0.1)	**-0.10** (±0.1)	-0.02 (±0.1)	-0.03 (±0.0)	-0.02 (±0.1)	-0.04 (±0.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences and statistically significant correlations in bold.

Completion of technological tasks using ICT devices

Students were asked to indicate the frequency with which they used ICT devices to engage in a range of technological tasks using ICT devices. For the purposes of NAP–ICT Literacy, technological tasks are defined as tasks requiring some level of specialised technical skill to undertake. The student response data for these items are presented in Table 6.10.

Across both year levels, students reported undertaking technological tasks far less frequently than activities for the purposes of study, entertainment or communication. This was true both at school and outside of school, with the majority of students reporting that they rarely engaged in these activities in either setting.

Table 6.10: Frequency percentages of completion of technological tasks using ICT devices

	Completion of technological tasks using ICT devices	Year 6			Year 10		
		Rarely	Occasionally	Frequently	Rarely	Occasionally	Frequently
At school	Create programs with a visual programming tool (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	73 (±2.3)	23 (±2.1)	4 (±0.9)	83 (±1.9)	13 (±1.5)	4 (±0.9)
	Write code, programs or macros (e.g. HTML, JavaScript, Swift, Python, Visual Basic, .NET)	78 (±2.3)	17 (±2.0)	4 (±0.7)	82 (±1.8)	12 (±1.3)	5 (±1.0)
	Publish media you have created on a website (e.g. to YouTube, SoundCloud)	91 (±1.2)	5 (±0.9)	3 (±0.7)	87 (±1.7)	8 (±1.2)	5 (±1.1)
	Create or edit a website using a website editor	88 (±1.4)	9 (±1.1)	3 (±0.8)	84 (±1.7)	11 (±1.2)	5 (±0.9)
	Use drawing, painting or graphics programs	64 (±2.7)	29 (±2.0)	6 (±1.4)	71 (±1.9)	22 (±1.5)	6 (±1.1)
	Change application settings to suit your purposes	75 (±2.1)	20 (±1.8)	5 (±0.9)	58 (±2.0)	32 (±1.8)	10 (±1.3)
	Combine music, video, or images to create digital content	84 (±1.7)	13 (±1.5)	3 (±0.9)	78 (±2.2)	16 (±1.7)	6 (±1.2)
	Completion of technological tasks using ICT devices	**Year 6**			**Year 10**		
		Rarely	**Occasionally**	**Frequently**	**Rarely**	**Occasionally**	**Frequently**
Outside school	Create programs with a visual programming tool (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	81 (±1.8)	14 (±1.5)	6 (±1.0)	87 (±1.5)	9 (±1.2)	5 (±1.0)
	Write code, programs or macros (e.g. HTML, JavaScript, Swift, Python, Visual Basic, .NET)	83 (±1.7)	11 (±1.4)	5 (±0.9)	86 (±1.7)	9 (±1.2)	5 (±1.0)
	Publish media you have created on a website (e.g. to YouTube, SoundCloud)	73 (±1.6)	18 (±1.3)	9 (±0.9)	83 (±1.7)	10 (±1.2)	6 (±1.3)
	Create or edit a website using a website editor	84 (±1.5)	11 (±1.2)	6 (±0.8)	86 (±1.6)	9 (±1.2)	5 (±0.9)
	Use drawing, painting or graphics programs	52 (±1.9)	32 (±1.6)	15 (±1.5)	71 (±1.9)	20 (±1.5)	9 (±1.2)
	Change application settings to suit your purposes	59 (±2.1)	29 (±1.9)	12 (±1.1)	57 (±2.2)	30 (±2.1)	12 (±1.3)
	Combine music, video, or images to create digital content	67 (±2.0)	23 (±1.7)	10 (±1.1)	74 (±1.9)	18 (±1.7)	8 (±1.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
Rarely = less than once a month or never
Occasionally = between a few times each week and once a month
Frequently = almost every day or more

About one-third of Year 6 and Year 10 students reported that they used drawing, painting or graphics programs at least occasionally at school. Outside of school, this rose to 47% for Year 6 students. Forty-two per cent of Year 10 students also reported that they occasionally or frequently (i.e. once a month or more) change application settings to suit their purposes on an ICT device both at school and outside of school. In Year 6, only 25% of students reported changing application settings at school, a figure which rose to 41% when outside of school.

For female students, those in Year 6 reported completing technological tasks more often than those in Year 10, as shown in Table 6.11. The difference was small but significant when at school (–1.9 scale points) and increased when outside of school (–4.6 scale points). This trend was also apparent for male students outside of school (–1.9 scale points) but was not seen for male students when at school.

At Year 10, male students reported completing technological tasks more often than female students. This difference was significant both at school (2.5 scale points) and outside of school (2.9 scale points).

Table 6.11: Average scores on completion of technological tasks at school and outside of school, overall and by gender

		All Students		Male		Female		Difference (M-F)	
At school	Year 6	50.0	(±0.6)	50.0	(±0.7)	50.0	(±0.6)	0.0	(±0.7)
	Year 10	49.4	(±0.6)	50.6	(±0.8)	48.1	(±0.8)	**2.5**	(±0.9)
	Differences (Year 10-Year 6)	-0.6	(±0.8)	0.6	(±1.0)	**-1.9**	(±1.0)		
Outside of school	Year 6	50.0	(±0.4)	50.1	(±0.6)	49.9	(±0.5)	0.2	(±0.8)
	Year 10	46.7	(±0.6)	48.2	(±0.7)	45.3	(±0.8)	**2.9**	(±0.9)
	Differences (Year 10-Year 6)	**-3.3**	(±0.7)	**-1.9**	(±1.0)	**-4.6**	(±1.0)		

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences are in bold.

The relationship between students' ICT literacy achievement and their reported completion of technological tasks is shown in Table 6.12. For Year 6 students, there was a significant scale score difference for this index between students above and below the proficient standard (–1.2 scale point difference). This difference was significant for male students (–2.0 scale points), but no difference was observed for female students. This means that the lower achieving male students in Year 6 reported more frequent completion of technological tasks when at school than did the higher achieving male students at that year level. The strength of the association was significant but weak. For Year 10 students, although there was no significant difference between students above and below the proficient standard, there was a weak but significant association between more frequent completion of these tasks and ICT literacy achievement.

There was no relationship between completion of technological tasks and ICT literacy outside of school.

Table 6.12: Average scores on completion of technological tasks using ICT devices for students above and below the proficient standard, overall and by gender

		At school			Outside school		
	Proficient standard	All Students	Male	Female	All Students	Male	Female
Year 6	Above	49.5 (±0.6)	49.1 (±0.7)	49.9 (±0.7)	50.1 (±0.5)	50.1 (±0.8)	50.0 (±0.6)
	Below	50.7 (±0.9)	51.1 (±1.2)	50.3 (±1.0)	49.9 (±0.8)	50.0 (±1.0)	49.7 (±1.1)
	Difference	**-1.2** (±1.0)	**-2.0** (±1.3)	-0.4 (±1.2)	0.2 (±1.0)	0.1 (±1.3)	0.3 (±1.3)
	Correlation	**-0.09** (±0.0)	**-0.11** (±0.1)	**-0.07** (±0.1)	0.02 (±0.0)	0.02 (±0.1)	0.01 (±0.1)
Year 10	Above	49.2 (±0.7)	50.2 (±0.9)	48.2 (±1.0)	46.9 (±0.7)	48.2 (±0.9)	45.6 (±1.0)
	Below	49.5 (±0.9)	50.9 (±1.2)	48.0 (±1.1)	46.6 (±0.9)	48.2 (±1.2)	44.9 (±1.2)
	Difference	-0.3 (±1.1)	-0.8 (±1.5)	0.3 (±1.4)	0.3 (±1.1)	0.1 (±1.5)	0.7 (±1.5)
	Correlation	**-0.06** (±0.1)	**-0.09** (±0.1)	-0.02 (±0.1)	-0.04 (±0.1)	-0.05 (±0.1)	0.00 (±0.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences and statistically significant correlations in bold.

Chapter 7:
Student experience of ICT at school

Chapter 7: Student experience of ICT at school

Chapter highlights

- Students reported that word processing software, presentation software, and text and video-based information were the most frequently used ICT-related tools for school-related purposes.
- Achievement in NAP–ICT Literacy was positively associated with the frequency of use of productivity applications (such as word processing and spreadsheet applications) for school-related purposes. The more frequent use of specialist applications (such as concept mapping or simulations and modelling applications) was negatively associated with achievement.
- Eighty-three per cent of students in Year 6 and 87% of students in Year 10 reported learning at school how to identify cyberbullying, and where they could seek reliable information and assistance to deal with it and/or suspicious online contact. Eighty-nine per cent of students in Year 10 reported learning how to report cyberbullying or image-based abuse.
- Eighty-five per cent and 87% of Year 6 and Year 10 students respectively reported learning about the problems of using software to illegally copy or download games or videos for free (e.g. copyright, viruses).
- One of the topics less commonly learnt about at both year levels was checking where a message was from before clicking on a link.
- At Year 6, a weak but significant association was found between achievement and ICT learning for school purposes. A weak association was also found for male Year 10 students. However, no association between achievement and ICT learning for school purposes was found for female students in Year 10.
- The most frequent use of ICT devices in the classroom was by teachers and students to present information to the class. The least frequent uses of ICT devices at Year 6 were to contact external experts or students from other schools about projects, while at Year 10 it was for creating or programming robotic devices.
- Many students at both year levels reported participating in activities related to Digital Technologies at school, with higher participation typically reported at the Year 6 level.

Introduction

Continuing from the previous chapters that delve into the results of the student survey that looked at access to ICT devices and use of applications on ICT devices, this chapter explores ICT learning, experiences, and the use of ICT-related devices, tools and applications at school and for school-related purposes. We also investigate associations between student achievement and reported use of ICT devices for school-related purposes, and the frequency of participation in activities related to Digital Technologies.

Use of ICT-related tools for school-related purposes

Students were asked to report how often they used ICT-related tools for school-related purposes (see Table 7.1). The NAP–ICT Literacy 2022 survey included some new ICT-related tools to examine how frequently software for the creation and execution of text-based programs, 3D design, and visual programming were used.[15] In addition, names of popular tools and software were added as examples to some of the tool categories and a slight modification to one item was made this cycle[16].

Two scales were reported for ICT tool use for school-related purposes: a productivity application scale[17] and a specialist application scale[18].

[15] The following items were added:
- 3D design software (e.g. SketchUp, Blender, Maya, 3ds Max)
- Visual programming tools (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)
- Software to create, compile and execute text-based programs (e.g. Microsoft Visual Studio, Atom, Sublime Text, Notepad++)

[16] The item "Reflecting on your learning experiences (e.g. through a blog)" was updated to "Digital journals (e.g. to reflect on your learning)".

[17] The use of productivity applications for school-related purposes scale included "word processing software (e.g. Microsoft Word, Apple Pages, Google Docs", "spreadsheet software (e.g. Microsoft Excel, Apple Numbers, Google Sheets)", "presentation software (e.g. Microsoft Powerpoint, Apple Keynote, Google Slides)", "text-based information websites (e.g. Wikipedia)", "video-based information resources (e.g. YouTube, Khan Academy)", "communications software (e.g. Skype)".

[18] The use of specialist applications for school-related purposes scale included "software for capturing and editing media (e.g. Apple iMovie, Audacity)", "graphic design or drawing software (e.g. Microsoft Paint, Adobe Photoshop, Sketch)", "digital journals (e.g. to reflect on your learning), data logging or monitoring tools", "concept mapping software (e.g. Inspiration, Lucidchart)","simulations and modelling software (e.g. FlexSim, Labster)", "robotic devices (e.g. Bee-Bots, Sphero or similar)", "3D printers", "computer-aided drawing (CAD) software (e.g. TinkerCAD, BlocksCAD, FreeCAD)", "3D design software (e.g. SketchUp, Blender, Maya, 3ds Max)", "visual programming tools (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)", "softwareb to create, compile and execute text-based programs (e.g. Microsoft Visual Studio, Atom, Sublime Text, Notepad++".

Table 7.1: Frequency percentages for use of ICT-related tools for school-related purposes

	How often do you use the following tools for school-related purposes?	Never	Less than once a month	At least once a month but not every week	At least once a week
Year 6	Word processing software (e.g. Microsoft Word, Apple Pages, Google Docs)	16 (±1.7)	17 (±1.5)	25 (±2.0)	42 (±2.5)
	Spreadsheet software (e.g. Microsoft Excel, Apple Numbers, Google Sheets)	25 (±1.9)	33 (±1.7)	27 (±2.0)	16 (±1.5)
	Presentation software (e.g. Microsoft Powerpoint, Apple Keynote, Google Slides)	12 (±1.4)	23 (±1.7)	36 (±1.8)	28 (±2.1)
	Software for capturing and editing media (e.g. Apple iMovie, Audacity)	35 (±2.5)	31 (±1.9)	21 (±1.6)	13 (±1.6)
	Graphic design or drawing software (e.g. Microsoft Paint, Adobe Photoshop, Sketch)	36 (±2.4)	26 (±1.6)	23 (±1.7)	14 (±1.5)
	Text-based information websites (e.g. Wikipedia)	22 (±1.6)	23 (±1.7)	30 (±1.8)	25 (±1.9)
	Video-based information resources (e.g. YouTube, Khan Academy)	22 (±1.9)	23 (±1.7)	27 (±1.7)	28 (±1.7)
	Digital journals (e.g. to reflect on your learning)	47 (±2.3)	24 (±1.3)	17 (±1.5)	12 (±1.4)
	Data logging or monitoring tools	49 (±2.8)	22 (±1.6)	19 (±1.8)	11 (±1.4)
	Concept mapping software (e.g. Inspiration, Lucidchart)	58 (±2.5)	19 (±1.4)	14 (±1.6)	9 (±1.3)
	Simulations and modelling software (e.g. FlexSim, Labster)	61 (±2.4)	18 (±1.6)	13 (±1.4)	8 (±1.2)
	Social media (e.g. Kidzworld, Popjam, LegoLife or similar)	56 (±2.1)	18 (±1.8)	14 (±1.5)	12 (±1.6)
	Robotic devices (e.g. Bee-Bots, Sphero or similar)	41 (±3.0)	33 (±2.5)	17 (±1.7)	9 (±1.3)
	3D printers	63 (±2.9)	19 (±2.3)	11 (±1.3)	7 (±0.9)
	Computer-aided drawing (CAD) software (e.g. TinkerCAD, BlocksCAD, FreeCAD)	58 (±2.8)	20 (±1.8)	13 (±1.6)	8 (±1.3)
	Communications software (e.g. Skype)	52 (±2.0)	22 (±1.6)	15 (±1.4)	12 (±1.5)
	3D design software (e.g. SketchUp, Blender, Maya, 3ds Max)	62 (±2.4)	18 (±1.7)	12 (±1.2)	8 (±1.3)
	Visual programming tools (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	52 (±2.3)	25 (±1.7)	15 (±1.5)	9 (±1.3)
	Software to create, compile and execute text-based programs (e.g. Microsoft Visual Studio, Atom, Sublime Text, Notepad++)	60 (±2.4)	19 (±1.8)	12 (±1.3)	8 (±1.1)

Table 7.1(continued)

	How often do you use the following tools for school-related purposes?	Never		Less than once a month		At least once a month but not every week		At least once a week	
Year 10	Word processing software (e.g. Microsoft Word, Apple Pages, Google Docs)	6	(±0.8)	9	(±1.2)	16	(±1.8)	69	(±2.5)
	Spreadsheet software (e.g. Microsoft Excel, Apple Numbers, Google Sheets)	11	(±1.5)	32	(±2.1)	35	(±2.1)	21	(±1.8)
	Presentation software (e.g. Microsoft PowerPoint, Apple Keynote, Google Slides)	5	(±0.8)	16	(±1.4)	41	(±2.1)	38	(±2.0)
	Software for capturing and editing media (e.g. Apple iMovie, Audacity)	29	(±2.1)	35	(±1.9)	23	(±1.8)	13	(±1.6)
	Graphic design or drawing software (e.g. Microsoft Paint, Adobe Photoshop, Sketch)	32	(±2.1)	32	(±1.8)	22	(±1.5)	14	(±1.4)
	Text-based information websites (e.g. Wikipedia)	10	(±1.1)	16	(±1.7)	30	(±1.9)	44	(±2.3)
	Video-based information resources (e.g. YouTube, Khan Academy)	10	(±1.1)	17	(±1.5)	32	(±1.6)	40	(±2.1)
	Digital journals (e.g. to reflect on your learning)	48	(±2.5)	25	(±1.6)	17	(±1.5)	10	(±1.6)
	Data logging or monitoring tools	48	(±2.3)	24	(±1.7)	18	(±1.6)	10	(±1.3)
	Concept mapping software (e.g. Inspiration, Lucidchart)	57	(±2.5)	21	(±1.5)	14	(±1.4)	8	(±1.4)
	Simulations and modelling software (e.g. FlexSim, Labster)	60	(±2.6)	19	(±1.4)	12	(±1.4)	8	(±1.4)
	Social media (e.g. Instagram, Snapchat, Twitter, Facebook)	34	(±2.1)	17	(±1.4)	16	(±1.5)	33	(±2.0)
	Robotic devices (e.g. Bee-Bots, Sphero or similar)	63	(±2.7)	19	(±1.6)	12	(±1.5)	7	(±1.4)
	3D printers	62	(±2.5)	17	(±1.6)	13	(±1.5)	7	(±1.3)
	Computer-aided drawing (CAD) software (e.g. TinkerCAD, BlocksCAD, FreeCAD)	61	(±2.6)	17	(±1.4)	13	(±1.6)	9	(±1.5)
	Communications software (e.g. Skype)	48	(±2.3)	21	(±1.6)	17	(±1.4)	14	(±1.6)
	3D design software (e.g. SketchUp, Blender, Maya, 3ds Max)	62	(±2.8)	17	(±1.6)	13	(±1.4)	9	(±1.4)
	Visual programming tools (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	63	(±2.7)	17	(±1.6)	12	(±1.5)	8	(±1.5)
	Software to create, compile and execute text-based programs (e.g. Microsoft Visual Studio, Atom, Sublime Text, Notepad++)	62	(±2.6)	17	(±1.7)	13	(±1.4)	9	(±1.4)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.

Overall, productivity applications were the most frequently used ICT tools at both year levels for school-related purposes. Word processing software, presentation software, text-based information websites such as Wikipedia and video-based information resources such as YouTube and Khan Academy were the most commonly used ICT tools for school-related work. More than 50% of students in Year 6 and more than 70% of Year 10 students reported using each of these tools at least once a month.

More than 60% of students in Year 6 reported having never used 3D printers or 3D design software (e.g. SketchUp, Blender, Maya, 3ds Max) for school related purposes. At Year 10, the less frequently used tools included robotic devices (e.g. Bee-Bots, Sphero or similar) and visual programming tools (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch), both of which were reported as having never been used for school related purposes by more than 60% of Year 10 students.

Student achievement in NAP–ICT Literacy and its association with students' reported use of ICT-related applications was explored *(*see Table 7.2). At both Year 6 and Year 10 levels, there was a significant positive association between achievement in NAP–ICT Literacy and the use of productivity applications for school-related purposes. This was apparent for both female and male students. Students who reported more frequent use of productivity applications were more likely to have achieved at the proficient standard.

Table 7.2: Average scores on indices of use of ICT-related tools for school-related purposes for students above and below the proficient standard overall and by gender

Use of productivity applications for school-related purposes	Proficient standard	Overall	Male	Female
Year 6	Above	51.4 (±0.5)	51.6 (±0.9)	51.2 (±0.6)
	Below	47.9 (±0.8)	48.0 (±1.0)	47.8 (±0.9)
	Difference	**3.5** (±0.9)	**3.6** (±1.2)	**3.4** (±1.1)
	Correlation	**0.21** (±0.0)	**0.20** (±0.1)	**0.22** (±0.1)
Year 10	Above	57.2 (±0.5)	57.8 (±0.9)	56.6 (±0.6)
	Below	53.0 (±0.6)	53.0 (±0.9)	53.1 (±0.8)
	Difference	**4.2** (±0.8)	**4.8** (±1.2)	**3.5** (±1.1)
	Correlation	**0.27** (±0.0)	**0.29** (±0.1)	**0.25** (±0.1)
Use of specialist applications for school-related purposes	**Proficient standard**	**Overall**	**Male**	**Female**
Year 6	Above	49.0 (±0.6)	49.5 (±0.8)	48.6 (±0.7)
	Below	51.5 (±0.7)	51.8 (±0.9)	51.1 (±1.1)
	Difference	**-2.5** (±0.9)	**-2.3** (±1.2)	**-2.6** (±1.3)
	Correlation	**-0.13** (±0.0)	**-0.11** (±0.0)	**-0.15** (±0.1)
Year 10	Above	47.7 (±0.7)	48.9 (±1.0)	46.5 (±1.0)
	Below	50.9 (±0.8)	52.2 (±1.0)	49.6 (±1.2)
	Difference	**-3.2** (±0.9)	**-3.2** (±1.4)	**-3.1** (±1.6)
	Correlation	**-0.17** (±0.0)	**-0.14** (±0.1)	**-0.19** (±0.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences and statistically significant correlations are in bold.

In contrast, the scale measuring the use of specialist applications for school-related purposes reveals a significant negative association between student achievement and increased use of these applications. This suggests that students who reported greater use of specialist applications for school-related work were inclined to have lower levels of ICT literacy. This is further supported by the findings that show that students whose results were above average were less likely to have used specialist applications for school-related purposes.

This finding might be partially interpreted by the fact that NAP–ICT Literacy focuses heavily on measuring ICT skills that are closely associated with the skills required to use productivity applications.

ICT learning at school

To investigate the scope of student ICT learning at school, students were asked in previous NAP–ICT Literacy cycles to report if they had learnt about 10 different issues related to ICT use. In the 2022 NAP–ICT Literacy cycle, this list was expanded to include [19] issues to better align with relevant areas of ICT learning (see Table 7.3). Some of the items carried over from previous cycles were slightly modified[19] and one item was removed[20].

[19] The items modified from 2017 are:

- the need to know whether you have copyright permission to download music or video
- the problems of using software to copy or download files for free (such as games or videos) that you otherwise would have to pay for
- changing your password for internet services (e.g. email) regularly
- use software to find and get rid of computer viruses.

These have been modified to the following respectively:

- the need to know whether you have copyright permission to share music or video
- the problems of using software to illegally copy or download games or videos for free (e.g. copyright, viruses)
- how to create secure passwords for internet services (e.g. email)
- security risks when using the internet (e.g. viruses, malware, phishing).

[20] The item "Checking the credentials of software patches before downloading and accepting them" was removed from this cycle.

Table 7.3: Percentages of students attributing ICT learning to school in 2022 and in comparison with 2017 and 2014

	At school, have you learnt about the following issues? (Proportion of students selecting Yes)	2022		2017		2014	
Year 6	The need to provide references to content from webpages that you include in your schoolwork	75	(±1.7)	69	(±1.8)	73	(±1.9)
	Where you can get reliable information and help about dealing with cyberbullying and/or suspicious online contact	85	(±1.5)	-	-	-	-
	How to protect your personal safety when communicating with strangers online	83	(±1.5)	-	-	-	-
	The need to know whether you have copyright permission to share music or video	79	(±1.4)	66	(±1.9)	66	(±1.9)
	The problems of using software to illegally copy or download games or videos for free (e.g. copyright, viruses)	85	(±1.4)	52	(±1.9)	53	(±2.0)
	Reading licence or usage agreements before you click on "I agree" to install new software	63	(±2.1)	63	(±1.8)	66	(±1.9)
	Opening email attachments from safe sources	60	(±2.3)	-	-	-	-
	Checking where a message is from before clicking on links	63	(±1.8)	-	-	-	-
	Reporting spam to an authority (such as a teacher or parent)	72	(±1.8)	58	(±2.1)	62	(±1.9)
	How to create secure passwords for internet services (e.g. email)	72	(±1.8)	-	-	-	-
	Security risks when using the internet (e.g. viruses, malware, phishing)	69	(±1.6)	-	-	-	-
	How to decide where to look for information about an unfamiliar topic	78	(±1.6)	73	(±1.5)	74	(±1.8)
	How to look for different types of digital information on a topic	74	(±1.7)	75	(±1.3)	74	(±1.6)
	How to judge the relevance of information to include in school work	74	(±1.8)	-	-	-	-
	How to judge whether information on the internet can be trusted	76	(±1.7)	-	-	-	-
	Responsible use of social media	70	(±1.7)	-	-	-	-
	Respectful online relationships	80	(±1.6)	-	-	-	-
	How to spot cyberbullying	84	(±1.2)	-	-	-	-
	How to report cyberbullying or image based abuse	79	(±1.6)	-	-	-	-

Table 7.3 (continued)

	At school, have you learnt about the following issues?	2022		2017		2014	
Year 10	The need to provide references to content from webpages that you include in your schoolwork	91	(±1.2)	91	(±1.2)	89	(±1.3)
	Where you can get reliable information and help about dealing with cyberbullying and/or suspicious online contact	88	(±1.4)	-	-	-	-
	How to protect your personal safety when communicating with strangers online	87	(±1.4)	-	-	-	-
	The need to know whether you have copyright permission to share music or video	85	(±1.6)	72	(±1.6)	71	(±1.7)
	The problems of using software to illegally copy or download games or videos for free (e.g. copyright, viruses)	87	(±1.4)	60	(±2.0)	58	(±1.5)
	Reading licence or usage agreements before you click on "I agree" to install new software	71	(±2.0)	61	(±1.9)	61	(±1.9)
	Opening email attachments from safe sources	70	(±1.9)	-	-	-	-
	Checking where a message is from before clicking on links	64	(±1.8)	-	-	-	-
	Reporting spam to an authority (such as a teacher or parent)	74	(±1.5)	52	(±2.0)	55	(±1.9)
	How to create secure passwords for internet services (e.g. email)	71	(±1.7)	-	-	-	-
	Security risks when using the internet (e.g. viruses, malware, phishing)	64	(±2.0)	-	-	-	-
	How to decide where to look for information about an unfamiliar topic	77	(±1.7)	74	(±1.7)	74	(±1.8)
	How to look for different types of digital information on a topic	76	(±1.8)	76	(±1.6)	74	(±1.7)
	How to judge the relevance of information to include in school work	77	(±1.7)	-	-	-	-
	How to judge whether information on the internet can be trusted	79	(±1.7)	-	-	-	-
	Responsible use of social media	81	(±1.8)	-	-	-	-
	Respectful online relationships	85	(±1.4)	-	-	-	-
	How to spot cyberbullying	88	(±1.5)	-	-	-	-
	How to report cyberbullying or image based abuse	89	(±1.4)	-	-	-	-

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.
[1] 2014 wording: The problems of using software to copy computer files for free (such as games or videos) that you otherwise would have to pay for
[2] 2014 wording: Keeping anti-virus software up to date

Over 84% of students in Year 6 reported learning in school about where they could get reliable information about and help to deal with cyberbullying and/or suspicious online contact, as well as the problems of using software to illegally copy or download games or videos for free (e.g. copyright, viruses). At Year 10, the issues reported as most commonly learnt at school were the need to provide references to content from webpages included in schoolwork, cyberbullying and/or suspicious online contact, how to spot cyberbullying and how to report cyberbullying or image-based abuse. All of these issues were reported to have been learnt by more than 87% of students in Year 10.

Some of the less frequently learnt about topics at Year 10 were checking where a message is from before clicking on a link and security risks when using the internet (e.g. viruses, malware, phishing). At Year 6, the topics less frequently learnt about were opening email attachments from safe sources, checking where a message is from before clicking on a link, and reading licence or usage agreements before clicking on "I agree" to install new software.

Table 7.4: Average scores on index of attributing ICT learning to school for students above and below the proficient standard overall and by gender

	Proficient standard	Overall		Male		Female	
Year 6	Above	51.8	(±0.5)	51.2	(±0.7)	52.3	(±0.6)
	Below	47.4	(±0.6)	47.1	(±0.8)	47.7	(±0.8)
	Difference	**4.4**	(±0.8)	**4.1**	(±1.1)	**4.6**	(±1.1)
	Correlation	**0.26**	(±0.0)	**0.24**	(±0.0)	**0.27**	(±0.0)
Year 10	Above	52.9	(±0.6)	53.1	(±0.9)	52.8	(±0.9)
	Below	51.7	(±0.8)	51.0	(±1.1)	52.5	(±0.9)
	Difference	**1.2**	(±1.1)	**2.1**	(±1.5)	0.3	(±1.4)
	Correlation	**0.12**	(±0.0)	**0.18**	(±0.1)	0.05	(±0.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Statistically significant differences and statistically significant correlations are in bold.

A scale on students' attribution of learning ICT to school was created from the 19 issues in this question. When looking at the relationship between this scale and achievement (see Table 7.4), students who attributed more learning about these topics at school were more likely to have greater levels of ICT literacy (the strength of this association was moderate). Accordingly, those students whose achievement met the proficient standard were more likely to report learning about the different topics in comparison to students who failed to meet the proficient standard. This finding did not extend to female students in Year 10, where no association between achievement and scale scores for this index was found.

The association between achievement and learning of ICT issues at school was more pronounced for Year 6 students for both female and male students than it was at Year 10.

Use of ICT devices in class

Students were asked to indicate how frequently 16 different activities related to the use of ICT devices took place during their lessons ("Never", "Less than once a month", "At least once a month but not every week", "At least once a week but not every day", "At least once a day") (see Table 7.5).

Table 7.5: Frequency percentages of use of ICT devices in classroom learning activities

	How often do the following activities take place in your lessons?	Never	Less than once a month	At least once a month but not every week	At least once a week but not every day	At least once a day
Year 6	My teacher uses ICT devices to present information to the class	8 (±1.0)	7 (±1.1)	9 (±1.1)	18 (±1.8)	58 (±2.2)
	We use ICT devices to present information to the class	8 (±0.9)	16 (±1.5)	24 (±1.9)	26 (±1.7)	27 (±2.1)
	My teacher uses ICT devices to provide feedback on our work	13 (±1.2)	15 (±1.5)	20 (±1.5)	26 (±1.5)	26 (±2.3)
	We use ICT devices to collaborate with each other on projects	13 (±1.5)	16 (±1.5)	22 (±1.7)	27 (±1.9)	21 (±1.9)
	We use ICT devices to collaborate with students from other schools on projects	48 (±2.9)	12 (±1.3)	12 (±1.3)	13 (±1.4)	15 (±1.9)
	We use ICT devices to complete tests	8 (±1.1)	20 (±1.9)	27 (±1.7)	25 (±1.8)	19 (±1.8)
	We use ICT devices to work on short assignments (i.e. within one week)	11 (±1.4)	17 (±1.7)	25 (±2.0)	26 (±1.5)	21 (±2.0)
	We use ICT devices to work on extended projects (i.e. projects that last longer than one week)	12 (±1.3)	19 (±1.7)	25 (±1.7)	24 (±1.5)	20 (±2.0)
	We use the internet to contact students from other schools about projects	54 (±2.8)	12 (±1.3)	12 (±1.4)	11 (±1.4)	12 (±1.4)
	We use the internet to contact experts outside the school	48 (±2.6)	17 (±1.7)	13 (±1.6)	12 (±1.4)	11 (±1.6)
	We use ICT devices to collect data for a project	12 (±1.4)	18 (±1.5)	25 (±1.7)	25 (±1.7)	21 (±1.9)
	We use ICT devices to analyse data	21 (±1.8)	19 (±1.6)	23 (±2.0)	20 (±1.6)	17 (±1.6)
	We use ICT devices to produce or edit audio	36 (±2.6)	22 (±1.6)	16 (±1.5)	14 (±1.4)	12 (±1.6)
	We create or edit visual products (e.g. animations, videos, 3D drawings)	39 (±2.7)	21 (±1.8)	16 (±1.6)	13 (±1.2)	11 (±1.5)
	We create or program robotic devices (e.g. Bee-Bots, Sphero or similar)	38 (±3.0)	24 (±1.8)	16 (±1.4)	13 (±1.6)	10 (±1.4)
	We use ICT devices to submit assessments and gather feedback from my teacher	18 (±1.8)	17 (±1.6)	22 (±1.5)	24 (±2.0)	20 (±2.0)

Table 7.5 (continued)

	How often do the following activities take place in your lessons?	Never	Less than once a month	At least once a month but not every week	At least once a week	At least once a week
Year 10	My teacher uses digital devices to present information to the class	5 (±0.9)	5 (±0.9)	8 (±1.3)	16 (±1.6)	66 (±2.8)
	We use digital devices to present information to the class	5 (±0.9)	11 (±1.4)	20 (±1.6)	23 (±1.7)	40 (±2.2)
	My teacher uses digital devices to provide us feedback on our work	5 (±0.9)	6 (±1.0)	16 (±1.5)	29 (±1.8)	43 (±2.1)
	We use digital devices to collaborate with each other on projects	6 (±1.0)	8 (±1.2)	18 (±1.7)	29 (±1.8)	40 (±2.5)
	We use digital devices to collaborate with students from other schools on projects	36 (±2.4)	9 (±1.1)	12 (±1.4)	17 (±1.7)	26 (±1.9)
	We use digital devices to complete tests	9 (±1.1)	19 (±1.7)	25 (±1.9)	23 (±1.8)	24 (±1.9)
	We use digital devices to work on short assignments (i.e. within one week)	5 (±0.9)	8 (±1.1)	18 (±1.6)	31 (±2.0)	38 (±2.3)
	We use digital devices to work on extended projects (i.e. projects that last longer than one week)	5 (±0.9)	8 (±1.1)	19 (±1.5)	29 (±1.9)	39 (±2.2)
	We use the Internet to contact students from other schools about projects	40 (±2.6)	9 (±1.2)	12 (±1.5)	16 (±1.6)	22 (±1.8)
	We use the Internet to contact experts outside the school	35 (±2.6)	15 (±1.4)	15 (±1.5)	15 (±1.6)	20 (±1.8)
	We use digital devices to collect data for a project	8 (±1.1)	11 (±1.4)	21 (±1.5)	27 (±1.7)	34 (±2.1)
	We use digital devices to analyse data	10 (±1.3)	12 (±1.5)	22 (±1.7)	26 (±1.9)	29 (±1.9)
	We use digital devices to produce or edit audio	27 (±2.3)	18 (±1.5)	18 (±1.7)	17 (±1.7)	20 (±1.7)
	We create or edit visual products (e.g. animations, videos, 3D drawings)	33 (±2.3)	18 (±1.5)	17 (±1.7)	16 (±1.5)	16 (±1.6)
	We create or program robotic devices	46 (±2.9)	14 (±1.5)	12 (±1.5)	13 (±1.6)	14 (±1.7)
	We use ICT devices to submit assessments and gather feedback from my teacher	9 (±1.2)	8 (±1.2)	18 (±1.8)	27 (±1.6)	38 (±2.4)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.

Overall, similar patterns of ICT device use in the classroom were observed at both Year 6 and Year 10. The most frequent use of ICT devices in both Year 6 and Year 10 classrooms was by the teacher to present information to the class. This was reported as occurring more than once a week by more than 75% of students at both year levels. The largest discrepancies in the frequency of ICT device use between Year 6 and Year 10 classrooms were identified in the use of ICT devices to work on both short assignments and longer projects that lasted more than a week. For these, Year 10 students reported a more than 20 percentage point higher frequency of use than Year 6 students.

The 16 different uses of ICT devices in the classroom in this question were used to derive 2 scales. The first scale related to use of the ICT devices for general classroom activities[21] while the second scale related to the use of ICT devices for specialised classroom activities[22].

In comparison with the previous cycle, the reported frequency of ICT device use in the classroom at least once a month or more showed a significant increase for some activities at Year 6 and Year 10. For Year 6 students, teachers' use of ICT devices to provide feedback on student work presented the highest increase in frequency, with a 22 percentage point increase in students recording that their teacher uses ICT devices to provide feedback at least once a month or more in the classroom. For Year 10 students, the use of ICT devices to complete tests observed a 26 percentage point increase in frequency of use at least once a month or more compared to the last cycle.

Digital Technologies–related school and classroom experience

Students were given a question that was first introduced in the 2017 cycle, which explores the extent of instruction received on topics that relate to the Australian Curriculum: Digital Technologies, with special focus on computational thinking.

Overall, and compared to the previous cycle, the percentage of students who reported not receiving any instruction decreased for both year levels in most areas. The exceptions to this were the extent of instruction received on use of ICT devices to present information and create visual displays of information or processes (such as graphs, flowcharts and decision trees), which remained largely unchanged from the previous cycle. Additionally, students at both year levels reported substantial increases in receiving instruction "to a large extent" in most of the areas.

The largest difference between Year 10 and Year 6 was for the reported extent of instruction received for developing algorithms (e.g. instructions for a program like Scratch), where at least 47% of Year 6 students had received at least a moderate extent of instruction compared to 37% at Year 10. This finding is consistent with the previous cycle.

[21] The scale related to use of the ICT devices for general classroom activities included: "My teacher uses ICT devices to present information to the class", "We use ICT devices to present information to the class", "My teacher uses ICT devices to provide feedback on our work", "We use ICT devices to collaborate with each other on projects", "We use ICT devices to complete tests", "We use ICT devices to work on short assignments (i.e. within one week)", "We use the internet to contact experts outside the school", "We use ICT devices to collect data for a project", "We use ICT devices to submit assessments and gather feedback from my teacher".

[22] The scale relating to the use of ICT devices for specialised classroom activities included the following items: "We use ICT devices to collaborate with students from other schools on projects", "We use ICT devices to work on extended projects (i.e. projects that last longer than one week)", "We use the internet to contact students from other schools about projects", "We use ICT devices to analyse data", "We use ICT devices to produce or edit audio", "We create or edit visual products (e.g. animations, videos, 3D drawings)", "We create or program robotic devices (e.g. Bee-Bots, Sphero or similar)".

Table 7.6: Frequency percentages of instruction in Digital Technologies–related tasks

	In your lessons in the current school year, to what extent have you received instruction on how to do the following tasks?	To a large extent	To a moderate extent	To a small extent	Not at all
Year 6	Breaking a complex problem into smaller parts	24 (±1.6)	42 (±1.7)	20 (±1.4)	14 (±1.4)
	Planning tasks by setting out the steps needed to complete them	24 (±1.5)	46 (±1.7)	19 (±1.5)	11 (±1.4)
	Developing algorithms (e.g. instructions for a program like Scratch)	15 (±1.3)	32 (±2.0)	29 (±2.0)	24 (±2.1)
	Using ICT devices to present information to the class	31 (±2.2)	39 (±1.8)	20 (±1.6)	10 (±1.1)
	Writing code, programs or macros	14 (±1.5)	25 (±1.9)	28 (±1.9)	33 (±2.8)
	Checking code, programs or macros	12 (±1.3)	24 (±1.9)	26 (±1.8)	37 (±2.6)
	Developing applications (apps)	11 (±1.3)	21 (±1.7)	22 (±1.6)	45 (±2.5)
	Making changes to code to improve efficiency	12 (±1.4)	25 (±2.1)	24 (±1.7)	39 (±2.7)
	Debugging code	11 (±1.3)	20 (±1.7)	23 (±1.7)	46 (±2.7)
	Creating visual displays of information or processes (such as graphs, flow charts and decision trees)	15 (±1.6)	33 (±2.0)	28 (±1.9)	24 (±1.8)
	Displaying data to help understand and solve problems	18 (±1.6)	37 (±2.2)	25 (±1.7)	20 (±1.8)
	Making sense of data to help understand and solve problems	21 (±1.6)	36 (±2.0)	24 (±1.5)	19 (±1.7)
Year 10	Breaking a complex problem into smaller parts	21 (±1.8)	44 (±1.9)	24 (±1.6)	11 (±1.4)
	Planning tasks by setting out the steps needed to complete them	23 (±2.2)	46 (±2.1)	20 (±1.5)	10 (±1.4)
	Developing algorithms (e.g. instructions for a program like Scratch)	10 (±1.6)	27 (±2.2)	24 (±1.9)	39 (±2.6)
	Using ICT devices to present information to the class	30 (±2.4)	39 (±2.1)	19 (±1.5)	12 (±1.5)
	Writing code, programs or macros	10 (±1.2)	22 (±1.8)	22 (±1.6)	47 (±2.7)
	Checking code, programs or macros	9 (±1.4)	22 (±1.9)	21 (±1.6)	48 (±2.7)
	Developing applications (apps)	9 (±1.3)	22 (±2.0)	21 (±1.5)	48 (±2.7)
	Making changes to code to improve efficiency	10 (±1.5)	21 (±1.9)	20 (±1.5)	49 (±2.8)
	Debugging code	8 (±1.2)	20 (±2.0)	20 (±1.6)	52 (±2.8)
	Creating visual displays of information or processes (such as graphs, flow charts and decision trees)	15 (±1.5)	38 (±2.0)	24 (±1.7)	23 (±1.8)
	Displaying data to help understand and solve problems	17 (±1.6)	36 (±2.1)	25 (±1.7)	23 (±1.9)
	Making sense of data to help understand and solve problems	19 (±1.6)	37 (±2.0)	23 (±1.6)	21 (±1.8)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.

The 2022 cycle also introduced a new question asking students about their participation in activities related to Digital Technologies during the school year (see Table 7.7). At both year levels, students reported that the most common activities that they participated in at school were working with others to create a digital solution to a problem, and using tools to organise and make sense of data (e.g. spreadsheets). In general, Year 6 students tended to report higher participation in these activities in comparison to the Year 10 students. Forty-four per cent of students or more reported participating in 7 out of the 9 activities at the Year 6 level, whereas this was true for only one activity at the Year 10 level (using tools to organise and make sense of data).

Table 7.7: Frequency percentages of student participation in Digital Technologies–related activities at school overall and by gender

	During the current school year, have you participated in any of the following activities at school?	Overall		Male		Female	
		Yes	No	Yes	No	Yes	No
Year 6	Creating programs with a visual coding tool (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	53 (±3.0)	47 (±3.0)	55 (±3.6)	45 (±3.6)	51 (±3.3)	49 (±3.3)
	Creating a digital game	44 (±3.5)	56 (±3.5)	47 (±4.1)	53 (±4.1)	42 (±3.8)	58 (±3.8)
	Working with others to create a digital solution to a problem	59 (±2.2)	41 (±2.2)	58 (±2.7)	42 (±2.7)	59 (±2.7)	41 (±2.7)
	Designing a program to control a robotic device	48 (±3.2)	52 (±3.2)	49 (±3.7)	51 (±3.7)	46 (±3.5)	54 (±3.5)
	Using a virtual reality (VR) program	25 (±2.5)	75 (±2.5)	26 (±2.7)	74 (±2.7)	24 (±3.2)	76 (±3.2)
	Using an augmented reality (AR) program	20 (±2.2)	80 (±2.2)	24 (±2.7)	76 (±2.7)	17 (±2.4)	83 (±2.4)
	Using tools to organise and make sense of data (e.g. spreadsheets)	59 (±2.3)	41 (±2.3)	59 (±3.1)	41 (±3.1)	60 (±2.7)	40 (±2.7)
	Learning about the components of a digital system	53 (±2.5)	47 (±2.5)	54 (±3.3)	46 (±3.3)	52 (±2.8)	48 (±2.8)
	Examining the way big data are being used to inform decisions	48 (±2.2)	52 (±2.2)	49 (±2.8)	51 (±2.8)	47 (±2.9)	53 (±2.9)
	During the current school year, have you participated in any of the following activities at school?	**Overall**		**Male**		**Female**	
		Yes	**No**	**Yes**	**No**	**Yes**	**No**
Year 10	Creating programs with a visual coding tool (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	29 (±2.2)	71 (±2.2)	35 (±2.6)	65 (±2.6)	22 (±2.9)	78 (±2.9)
	Creating a digital game	26 (±2.2)	74 (±2.2)	30 (±2.4)	70 (±2.4)	21 (±3.1)	79 (±3.1)
	Working with others to create a digital solution to a problem	42 (±2.2)	58 (±2.2)	46 (±2.8)	54 (±2.8)	37 (±3.2)	63 (±3.2)
	Designing a program to control a robotic device	25 (±2.2)	75 (±2.2)	30 (±2.7)	70 (±2.7)	20 (±2.9)	80 (±2.9)
	Using a virtual reality (VR) program	20 (±1.9)	80 (±1.9)	23 (±2.5)	77 (±2.5)	16 (±2.5)	84 (±2.5)
	Using an augmented reality (AR) program	15 (±1.7)	85 (±1.7)	18 (±2.1)	82 (±2.1)	13 (±2.5)	87 (±2.5)
	Using tools to organise and make sense of data (e.g. spreadsheets)	61 (±2.2)	39 (±2.2)	61 (±2.8)	39 (±2.8)	61 (±2.9)	39 (±2.9)
	Learning about the components of a digital system	36 (±2.4)	64 (±2.4)	42 (±2.8)	58 (±2.8)	30 (±3.2)	70 (±3.2)
	Examining the way big data are being used to inform decisions	41 (±2.2)	59 (±2.2)	44 (±2.7)	56 (±2.7)	37 (±3.2)	63 (±3.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
Because results are rounded to the nearest whole number some totals may appear inconsistent.

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Appendices

Appendix A: Ordered map of NAP–ICT Literacy 2022 item descriptors

Table A 1: Ordered map of NAP–ICTL 2022 items

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Year 6	909	6	Creates a title that refers to the type of data and data collection period.	3.1
Year 6	899	6	Labels graph axis with description and unit.	3.1
Year 6	871	6	Labels graph axis with unit of measurement.	3.1
Year 6	860	6	Creates a graph title that refers to rainfall and data collection period.	3.1
Link	806	6	Formats text to support meaning.	3.1
Link	788	6	Creates a form with appropriate field types and labels.	2.2
Link	784	6	Creates a presentation to support a school activity, adapting information from resources.	3.1
Year 6	771	6	Creates a presentation to support a school activity, explaining data collection and use.	3.1
Link	739	5	Arranges buttons in a user interface to improve usability.	1.2
Year 6	726	5	Creates a presentation to support a school activity, explaining the choice of activity.	3.1
Link	706	5	Develops an algorithm to change the scene of an interactive story, consistent with the content of a decision tree.	3.2
Year 10	698	5	Uses persuasive language to support a digital poster.	4.2
Year 10	693	5	Creates an SQL query that sorts records by 2 columns with sort ordering.	1.1
Year 6	687	5	Explains how wi-fi and a motion sensor could be used to control a robot toy's actions.	2.3
Year 6	686	5	Explains why “Ad” results are shown first in a set of search results.	2.1
Year 10	684	5	Creates a presentation to support a school activity, explaining data collection and use.	3.1
Year 6	683	5	Arranges the buttons on a remote controller to improve the usability.	3.2
Year 6	682	5	Creates a presentation to support a school activity, using a consistent style and using text features.	3.1

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Year 6	682	5	Creates a presentation to support a school activity, using choice of font to enhance readability.	3.1
Year 6	677	5	Creates a presentation to support a school activity, appropriately using images to support other content.	3.1
Year 10	677	5	Creates a presentation to support a school activity, explaining the choice of activity.	3.1
Year 6	671	5	Uses simulation software to identify the source of sensor readings.	2.3
Year 6	663	5	Creates a presentation to support a school activity, using choice of text colour and background colour to enhance readability.	3.1
Link	658	5	Explains a benefit of using a .pdf format instead of a .doc format.	2.1
Year 10	657	5	Selects appropriate images/shapes to support information in a digital poster.	3.1
Link	657	5	Creates a presentation to support a school activity, adapting information from resources.	3.1
Year 10	655	5	Explains with multiple examples why file versioning is useful.	2.1
Year 10	654	5	Creates an algorithm to classify data records conditional on numerical ranges.	3.2
Year 10	653	5	Creates a formula to calculate a total from 3 numerical values.	1.1
Year 10	637	4	Identifies the type of analysis enabled when records are sorted by date.	2.1
Year 6	636	4	Creates a title that refers to the type of data.	3.1
Year 10	630	4	Creates an algorithm to classify data records conditional on numerical ranges.	3.2
Link	628	4	Creates appropriate captions to support images.	3.1
Year 10	628	4	Creates a presentation to support a school activity, appropriately using images to support other content.	3.1
Link	626	4	Uses software to solve a design brief.	3.1
Year 10	621	4	Creates a formula to calculate a total from 3 numerical values.	1.1
Year 6	620	4	Identifies a basic weakness of 4-digit passcodes.	4.1
Year 10	619	4	Creates a presentation to support a school activity, using a consistent style and using text features.	3.1
Link	617	4	Arranges buttons in a user interface to partially improve usability.	3.2

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Year 10	617	4	Explains why “Ad” results are shown first in a set of search results.	2.1
Link	616	4	Configures the word lists of a sorting tool to correctly label texts as positive and negative.	1.2
Year 10	612	4	Creates a presentation to support a school activity, using choice of font to enhance readability.	3.1
Link	610	4	Uses data to identify a trend in website traffic.	2.1
Year 10	610	4	Positions images/shapes to support meaning in a digital poster.	3.1
Year 10	608	4	Creates a presentation to support a school activity, using choice of text colour and background colour to enhance readability.	3.1
Year 10	608	4	Identifies a flowchart that represents a verbally expressed process.	2.1
Link	607	4	Locates an upload button on a webpage.	1.1
Year 6	598	4	Labels graph axis with limited description or unit.	3.1
Link	597	4	Explains the characteristics of a webpage that are evidence of an affiliate advertisement.	2.1
Link	596	4	Explains how a sorting tool works.	1.2
Year 10	595	4	Sizes images/shapes appropriately for a digital poster.	3.1
Year 10	590	4	Selects appropriate images/shapes that reflect information in a digital poster.	3.1
Year 6	585	4	Labels graph axis with unit of measurement.	2.2
Link	580	4	Lists methods to share information from a webpage with a team in a collaboration application.	2.1
Link	578	4	Identifies the disadvantage of sending a link in a group chat.	2.1
Year 10	576	4	Chooses the most relevant search result for a specified topic.	2.1
Year 10	566	4	Replies to a direct message with relevant information.	3.1
Year 10	566	4	Evaluates the reliability of information presented in a website.	2.1
Year 10	565	4	Identifies relevant search engine filtering tools for improving search results.	2.1
Year 10	564	4	Adapts information appropriately for a digital poster.	4.2

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Link	559	4	Explains why the choice of background for a user interface could cause a problem for the user.	3.2
Year 10	556	4	Identifies the column by which data records are sorted.	1.1
Year 10	556	4	Explains how technology can improve reporting processes.	2.3
Year 6	553	4	Writes questions that can be used to collect user feedback for improving a robotic toy's quality and safety.	2.3
Year 10	551	4	Identifies a disadvantage of analysing data offline when the data is sourced from a shared remote database.	2.3
Year 6	551	4	Navigates to a specified webpage.	1.1
Link	544	4	Creates a form with entry field type.	3.2
Link	535	4	Locates and uploads a file from a nested folder structure.	1.1
Year 10	535	4	Uses data to support the overall purpose of a digital poster.	3.1
Link	534	4	Analyses a website and explains why a webpage has reduced engagement.	2.1
Year 6	523	3	Sets graph to appropriate time scale.	3.1
Year 10	522	3	Inputs missing numerical and categorical values in a data table by inferring the values from other records.	2.3
Link	519	3	Creates a relevant title.	3.1
Year 6	518	3	Explains the disadvantages of text entry fields and radio fields for collecting user feedback.	2.2
Year 6	511	3	Explains why a link to activate an account is sent by email rather than being displayed on screen.	4.1
Year 6	509	3	Configures an app to collect data daily and between a given date range.	2.2
Link	509	3	Explains how an arrangement of buttons in a user interface is an improvement.	2.3
Year 6	508	3	Explains the advantages of text entry fields and radio fields for collecting user feedback.	2.2
Link	507	3	Explains the accuracy of information in a comment to a social media post independent of the emoji reactions.	2.1
Year 6	506	3	Sets graph to appropriate time scale.	3.1
Link	506	3	Uses software to solve a design brief.	3.1

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Link	505	3	Posts text from a webpage as a conversation thread in a collaboration application.	3.1
Link	502	3	Creates a presentation to support a school activity, using a relevant title.	3.1
Year 10	502	3	Identifies an appropriate chart for representing variations in numerical data by date.	2.2
Year 6	499	3	Creates a title that refers to limited data.	3.1
Link	497	3	Edits the settings for an online survey.	1.1
Year 10	497	3	Identifies advantages of sending a link in a group chat.	2.1
Year 6	495	3	Identifies a problem of using one's own name as a username.	4.1
Year 6	495	3	Uses simulation software to identify the source of a sensor reading.	2.3
Link	495	3	Creates a balanced design with images and text.	3.1
Link	491	3	Configures the start and end dates for an online survey.	1.1
Year 6	490	3	Selects an appropriate graph type to display rainfall data.	2.2
Year 6	486	3	Replies to a direct message with relevant information.	3.1
Year 6	482	3	Explains how wi-fi or a motion sensor could be used to control a robot toy's actions.	2.3
Link	482	3	Configures the word lists of a sorting tool to improve the labelling of texts as positive and negative.	1.2
Link	481	3	Explains some reasons why the choice of background for a user interface could cause a problem for the user.	3.2
Year 6	476	3	Constructs a web form and configures the form fields according to specified criteria.	1.1
Link	474	3	Creates a team in a collaboration application.	3.1
Link	474	3	Changes the duration of a task in a Gantt chart according to criteria.	1.1
Year 6	473	3	Explains the advantages of text entry fields or radio fields for collecting user feedback.	2.2
Year 6	472	3	Locates a browser's bookmarks menu and selects a specified bookmark.	1.1
Year 10	471	3	Navigates to a specified webpage.	1.1

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Year 6	469	3	Connects a mobile device to a nominated network.	1.1
Year 6	465	3	Explains the disadvantages of text entry fields or radio fields for collecting user feedback.	2.2
Year 6	462	3	Sets rainfall data as the source for a graph.	3.1
Year 10	457	3	Identifies comments incorrectly labelled by a sorting tool.	1.2
Year 10	455	3	Explains why file versioning is useful.	2.1
Year 6	453	3	Changes the passcode on a tablet computer.	1.1
Link	452	3	Selects relevant images to support information on a webpage.	3.1
Year 6	450	3	Writes questions that can be used to collect user feedback for improving a robotic toy's quality or safety.	2.3
Year 10	448	3	Inputs some missing numerical and categorical values in a data table by inferring the values from other records.	2.3
Link	445	3	Infers the filename for a scene based on other filenames.	1.2
Link	444	3	Explains how to improve a website menu design for navigability.	2.3
Year 6	442	3	Identifies an advantage of sending a link in a group chat.	2.1
Year 10	442	3	Identifies some comments incorrectly labelled by a sorting tool.	1.2
Year 6	440	3	Configures a digital representation of a remote controller for a robot toy.	1.2
Year 6	437	3	Sets temperature data as the source for a graph.	3.1
Link	437	3	Uses a single piece of data to identify a trend in website traffic.	2.1
Link	436	3	Identifies a method to share information from a webpage with a team in a collaboration application.	2.1
Year 10	436	3	Uses software to solve a design brief.	3.1
Year 10	434	3	Identifies a disadvantage of collecting categorical data using a text entry field.	2.3
Year 6	432	3	Selects an appropriate graph type to display temperature data.	2.2
Link	430	3	Identifies the most relevant search result according to criteria.	2.1

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Link	423	3	Uses software to solve a design brief.	3.1
Link	422	3	Identifies a text phrase that would be incorrectly labelled by a sorting tool.	1.2
Year 6	416	3	Identifies an advantage of storing data locally rather than in cloud storage.	2.1
Year 10	409	3	Explains how to use the features of a collaboration application to make another member feel welcome.	2.1
Year 10	408	2	Uses software to solve a design brief.	3.1
Year 10	407	2	Locates a browser's bookmarks menu and selects a specified bookmark.	1.1
Link	404	2	Edits a document according to a conversation thread by team members.	1.1
Year 6	400	2	Identifies comments incorrectly labelled by an incorrectly configured sorting tool.	1.2
Year 6	398	2	Identifies the electrical components used for a robotic toy's actions.	2.3
Link	397	2	Creates a team in a collaboration application.	3.1
Link	394	2	Navigates to a specified webpage in a website.	1.1
Link	388	2	Identifies a task according to its duration in a Gantt chart.	1.1
Year 6	387	2	Modifies screen settings on a tablet computer.	1.1
Year 6	385	2	Identifies some comments incorrectly labelled by an incorrectly configured sorting tool.	1.2
Year 10	381	2	Distinguishes between paid search results and non-paid search results.	2.1
Year 6	381	2	Uses software to solve a design brief.	3.1
Link	377	2	Uses software to solve a design brief.	3.1
Link	370	2	Identifies the month for Term 3 from a school webpage.	1.1
Year 6	368	2	Categorises the design features of a robotic toy into the categories: fun factor, quality and safety.	2.3
Year 6	368	2	Selects a specified hyperlink.	2.1
Year 6	368	2	Clicks on an icon that will provide access to stored data.	1.1

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Year 10	363	2	Clicks on a hyperlink embedded in a paragraph.	2.1
Year 6	363	2	Explains how to use the features of a collaboration application to make another member feel welcome.	2.1
Link	359	2	Identifies the day for Term 3 from a school webpage.	1.1
Link	359	2	Identifies the source of a video embedded in a social media post.	2.1
Year 10	359	2	Uses software to solve a design brief.	3.1
Link	357	2	Identifies why hiding voters' profiles can improve quality of the results of an online survey.	2.1
Year 10	357	2	Uses the date modified property to identify the relevant file.	1.1
Link	350	2	Interprets the results of an online survey.	2.1
Link	349	2	Uses software to solve a design brief.	3.1
Year 6	348	2	Uses software to solve a design brief.	3.1
Link	347	2	Identifies a disadvantage of allowing any user to edit documents in a collaboration application.	2.3
Year 10	341	2	Explains the right to control personal information.	4.1
Link	336	2	Adds a specified person as a member to a team in a collaboration application.	1.1
Year 6	334	2	Locates a data file within a folder tree based on the source of the data.	1.1
Year 6	331	2	Constructs a web form and configures some of the form fields according to specified criteria.	1.1
Year 6	329	2	Configures an app to collect data from a specified location.	2.2
Year 6	322	2	Identifies multiple weaknesses of 4-digit passcodes.	4.1
Year 6	314	2	Clicks on a hyperlink embedded in a paragraph.	1.1
Link	313	2	Identifies the channel to which a video is posted.	2.1
Year 6	306	2	Uses software to solve a design brief.	3.1
Link	305	2	Identifies a file with slowest load time.	2.1
Link	300	2	Identifies who is assigned to a task in a Gantt chart.	1.1

Year level	Scale score	Proficiency level	Task descriptor	Aspect
Link	293	2	Chooses text colour with appropriate contrast.	3.1
Link	292	2	Opens a document embedded in a conversation thread in a collaboration application.	1.1
Link	289	2	Formats text.	3.1
Link	288	1	Locates an edit button on a webpage.	1.1
Link	284	1	Selects the correct edit button on a webpage.	1.1
Link	277	1	Locates and clicks a link to a website embedded in a post in a collaboration application.	1.1
Link	274	1	Adds scenes for a choice-based story into a decision tree.	2.3
Link	268	1	Identifies a method to improve file transfer speed.	2.3
Year 6	227	1	Categorises some of the design features of a robotic toy into the categories: fun factor, quality and safety.	2.3
Year 6	225	1	Identifies some of the electrical components used for a robotic toy's actions.	2.3
Link	212	1	Locates a button on a webpage.	1.1

Appendix B: Student questionnaire

All questions are for both Year 6 and Year 10 unless otherwise stated.

INSTRUCTIONS

This questionnaire is about your use of Information and Communication Technology (ICT). In this questionnaire ICT devices are:

- desktop computers
- laptop computers (including notebooks and netbooks)
- tablets
- smartphones (to access the internet or use apps).

Some questions will ask about your use of ICT at school. This is intended only to focus on use while physically present at school, and not for school-related work at home or during periods of remote learning.

Q1 **How long have you been using ICT devices?**

	Never or less than one year	At least one year but less than three years	At least three years but less than five years	At least five years but less than seven years	Seven years or more
	○	○	○	○	○

Q2 **What type of ICT devices do you use in the following places?**
(Select as many responses as are relevant to you for each place.)

	Computer (desktop or laptop)	Tablet	Smartphone (to access the internet or use apps)	None
At school	☐	☐	☐	☐
Outside of school	☐	☐	☐	☐

Q3 **Do you have your own portable ICT device for use in class?**
(Select one response for each device.)

	No	Yes, my school provides me with the device	Yes, the school tells me what brand or model of device I may bring	Yes, I can bring any brand or model of device to school
Laptop computer	○	○	○	○
Tablet	○	○	○	○

Q4 **How often do you use each type of ICT device in the following places?**
(Select one response for each place.)

	At school	Outside of school
Desktop or laptop computer		
Tablet		

Q5 **To what extent do you agree or disagree with each of the following statements?**
(Select one response for each statement.)

	Strongly agree	Agree	Disagree	Strongly disagree
I like using ICT devices because they help me improve the quality of my work.	○	○	○	○
I like using ICT devices because they make work easier.	○	○	○	○
I enjoy using ICT devices because they help me to work with others.	○	○	○	○
I like using ICT devices because I prefer to work alone.	○	○	○	○
I enjoy using ICT devices because they help me communicate with my friends.	○	○	○	○
I like using ICT devices to find new ways to do things.	○	○	○	○
It is very important to me to work with an ICT device	○	○	○	○

Q6 **How often do you use an ICT device to do each of the following?**
(Use the drop-down menu to select one option for each of **At school** and **Outside of school**.)

	At school	Outside of school
Search the Internet for information for study or school work		
Use word processing software or apps to create documents		
Use spreadsheets to create a graph or perform calculations		
Use mathematics, language or other learning programs on a computer		
Enter data in a spreadsheet		
Create presentations for school projects		
Watch online videos to support your own learning		
Listen to podcasts or audiobooks to support your own learning		
Organise your school work using a learning management or school management system (e.g. a Moodle, Compass, Canvas, Google Classroom, Apple Classroom)		
Record your reflections on learning (e.g. through a blog)		

Q7 **How often do you use an ICT device to do each of the following?**
(Use the drop-down menu to select one option for each of **At school** and **Outside of school**.)

	At school	Outside of school
Watch videos for entertainment		
Play video games		
Use software to create sounds, music, movies, animations or artwork		
Listen to music for entertainment		
Listen to podcasts, audiobooks or internet radio for entertainment		
Search for online information about things you are interested in		

Q8 Y6 version

Q8 **How often do you use an ICT device to do each of the following?**
(Use the drop-down menu to select one option for each of **At school** and **Outside of school**.)

	At school	Outside of school
Use email		
Use chat or messaging apps		
Write or reply to blog or forum posts		
Use voice or video calls to communicate with people online (e.g. Skype, WhatsApp, FaceTime)		
Create and share content with others on social media (e.g. Kidzworld, Popjam, LegoLife or similar)		

Q8 Y10 version

Q8 **How often do you use an ICT device to do each of the following?**
(Use the drop-down menu to select one option for each of **At school** and **Outside of school**.)

	At school	Outside of school
Use email		
Use chat or messaging apps		
Write or reply to blog or forum posts		
Use voice or video calls to communicate with people online (e.g. Skype, WhatsApp, FaceTime)		
Create and share content with others on social media (e.g. Instagram, Snapchat, Twitter, Facebook or similar)		

Q9 **How often do you use an ICT device to do each of the following?**
(Use the drop-down menu to select one option for each of **At school** and **Outside of school**.)

	At school	Outside of School
Create programs with a visual programming tool (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)		
Write code, programs or macros (e.g. HTML, Javascript, Swift, Python, Visual Basic, .NET)		
Publish media you have created on a website (e.g. to YouTube, SoundCloud)		
Create or edit a website using a website editor		
Use drawing, painting or graphics programs		
Change application settings to suit your purposes		
Combine music, video or images to create digital content		

Q10 Y6 version

Q10 **How well can you do each of these tasks on an ICT device?**
(Select one response for each task.)

	I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means
Edit digital photographs or other graphic images	○	○	○	○
Create a database (e.g. using Microsoft Access, FileMaker, SQL)	○	○	○	○
Enter data in a spreadsheet (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)	○	○	○	○
Plot a graph using spreadsheet software (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)	○	○	○	○
Download music from the internet	○	○	○	○
Create a multimedia presentation (with sound, pictures, video)	○	○	○	○
Use a website builder to create or edit websites	○	○	○	○
Post content (e.g. comments, images, videos) on social media (e.g. Kidzworld, Popjam, LegoLife or similar)	○	○	○	○
Use a collaborative workspace (e.g. Google G Suite, Microsoft Teams or Microsoft Office 365) to work with others on a shared project	○	○	○	○
Use videoconferencing software (e.g. Zoom, MS teams, Webex) for communication purposes	○	○	○	○
Using an online learning management system (e.g. Moodle, Google Classroom, ClassDojo)	○	○	○	○

Q10 Y10 version

Q10 **How well can you do each of these tasks on an ICT device?**
(Select one response for each task.)

	I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means
Edit digital photographs or other graphic images	○	○	○	○
Create a database (e.g. using Microsoft Access, FileMaker, SQL)	○	○	○	○
Enter data in a spreadsheet (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)	○	○	○	○
Plot a graph using spreadsheet software (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)	○	○	○	○
Download music from the internet	○	○	○	○
Create a multimedia presentation (with sound, pictures, video)	○	○	○	○
Use a website builder to create or edit websites	○	○	○	○
Post content (e.g. comments, images, videos) on social media (e.g. Instagram, Snapchat, Twitter, Facebook or similar)	○	○	○	○
Use a collaborative workspace (e.g. Google G Suite, Microsoft Teams or Microsoft Office 365) to work with others on a shared project	○	○	○	○
Use videoconferencing software (e.g. Zoom, MS teams, Webex) for communication purposes	○	○	○	○
Using an online learning management system (e.g. Moodle, Google Classroom, ClassDojo)	○	○	○	○

Q10 Y10 version (continued)

Q11 **In your schooling, have you learnt about the following issues?**
(Select one response for each issue.)

	Yes	No
The need to provide references to content from webpages that you include in your schoolwork	○	○
The need to know whether you have copyright permission to share music or video	○	○
The problems of using software to illegally copy or download games or videos for free (e.g. copyright, viruses)	○	○
Reading licence or usage agreements before you click on 'I agree' to install new software	○	○
Opening email attachments from safe sources	○	○
Checking where a message is from before clicking on links	○	○
Reporting spam to an authority (such as a teacher or parent)	○	○
How to create secure passwords for internet services (e.g. email)	○	○
Security risks when using the internet (e.g. viruses, malware, phishing)	○	○
How to decide where to look for information about an unfamiliar topic	○	○
How to look for different types of digital information on a topic	○	○
How to judge the relevance of information to include in school work	○	○
How to judge whether information on the internet can be trusted	○	○
Responsible use of social media	○	○
Respectful online relationships	○	○
How to spot cyberbullying	○	○
How to report cyberbullying or image based abuse	○	○
Where you can get reliable information and help about dealing with cyberbullying and/or suspicious online contact	○	○
How to protect your personal safety when communicating with strangers online	○	○

Q12 **During the current school year, have you participated in any of the following activities at school?**
(Select one response for each activity.)

	Yes	No
Creating programs with a visual coding tool (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	○	○
Creating a digital game	○	○
Working with others to create a digital solution to a problem	○	○
Designing a program to control a robotic device.	○	○
Using a virtual reality (VR) program	○	○
Using an augmented reality (AR) program	○	○
Using tools to organise and make sense of data (e.g. spreadsheets)	○	○
Learning about the components of a digital system	○	○
Examining the way big data can be used to inform decisions	○	○

Q13 Y6 version

Q13 **How often do you use the following tools for school-related purposes?**
(Select one response for each purpose.)

	Never	Less than once a month	At least once a month but not every week	At least once a week
Word processing software (e.g. Microsoft Word, Apple Pages, Google Docs)	○	○	○	○
Spreadsheet software (e.g. Microsoft Excel, Apple Numbers, Google Sheets)	○	○	○	○
Presentation software (e.g. Microsoft Powerpoint, Apple Keynote, Google Slides)	○	○	○	○
Software for capturing and editing media (e.g. Apple iMovie, Audacity)	○	○	○	○
Graphic design or drawing software (e.g. Microsoft Paint, Adobe Photoshop, Sketch)	○	○	○	○
Text-based information websites (e.g. Wikipedia)	○	○	○	○
Video-based information resources (e.g. YouTube, Kahn Academy)	○	○	○	○
Digital journals (e.g. to reflect on your learning)	○	○	○	○
Data logging or monitoring tools	○	○	○	○
Concept mapping software (e.g. Inspiration, Lucidchart)	○	○	○	○
Simulations and modelling software (e.g. FlexSim, Labster)	○	○	○	○
Social media (e.g. Kidzworld, Popjam, LegoLife or similar)	○	○	○	○
Robotic devices (e.g. Bee-Bots, Sphero or similar)	○	○	○	○
3D printers	○	○	○	○
Computer-aided drawing (CAD) software (e.g. TinkerCAD, BlocksCAD, FreeCAD)	○	○	○	○
Communications software (e.g. Skype)	○	○	○	○
3D design software (e.g. SketchUp, Blender, Maya, 3ds Max)	○	○	○	○
Visual programming tools (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	○	○	○	○
Software to create, compile and execute text-based programs (e.g. Microsoft Visual Studio, Atom, Sublime Text, Notepad++)	○	○	○	○

Q13 Y10 version

Q13 **How often do you use the following tools for school-related purposes?**
(Select one response for each purpose.)

	Never	Less than once a month	At least once a month but not every week	At least once a week
Word processing software (e.g. Microsoft Word, Apple Pages, Google Docs)	○	○	○	○
Spreadsheet software (e.g. Microsoft Excel, Apple Numbers, Google Sheets)	○	○	○	○
Presentation software (e.g. Microsoft Powerpoint, Apple Keynote, Google Slides)	○	○	○	○
Software for capturing and editing media (e.g. Apple iMovie, Audacity)	○	○	○	○
Graphic design or drawing software (e.g. Microsoft Paint, Adobe Photoshop, Sketch)	○	○	○	○
Text-based information websites (e.g. Wikipedia)	○	○	○	○
Video-based information resources (e.g. YouTube, Kahn Academy)	○	○	○	○
Digital journals (e.g. to reflect on your learning)	○	○	○	○
Data logging or monitoring tools	○	○	○	○
Concept mapping software (e.g. Inspiration, Lucidchart)	○	○	○	○
Simulations and modelling software (e.g. FlexSim, Labster)	○	○	○	○
Social media (e.g. Instagram, Snapchat, Twitter, Facebook)	○	○	○	○
Robotic devices (e.g. Bee-Bots, Sphero or similar)	○	○	○	○
3D printers	○	○	○	○
Computer-aided drawing (CAD) software (e.g. TinkerCAD, BlocksCAD, FreeCAD)	○	○	○	○
Communications software (e.g. Skype)	○	○	○	○
3D design software (e.g. SketchUp, Blender, Maya, 3ds Max)	○	○	○	○
Visual programming tools (e.g. Alice, GameMaker, Kodu, Lego Mindstorms, MIT App Inventor, Scratch)	○	○	○	○
Software to create, compile and execute text-based programs (e.g. Microsoft Visual Studio, Atom, Sublime Text, Notepad++)	○	○	○	○

Q14 **How often do the following activities take place in your lessons?**
(Select one response for each activity.)

	Never	Less than once a month	At least once a month but not every week	At least once a week but not every day	At least once a day
My teacher uses ICT devices to present information to the class.	○	○	○	○	○
We use ICT devices to present information to the class.	○	○	○	○	○
My teacher uses ICT devices to provide feedback on our work.	○	○	○	○	○
We use ICT devices to collaborate with each other on projects.	○	○	○	○	○
We use ICT devices to collaborate with students from other schools on projects.	○	○	○	○	○
We use ICT devices to complete tests.	○	○	○	○	○
We use ICT devices to work on short assignments (i.e. within one week).	○	○	○	○	○
We use ICT devices to work on extended projects (i.e. projects that last longer than one week).	○	○	○	○	○

Q13 Y10 version (continued)

We use the Internet to contact students from other schools about projects.	○	○	○	○	○
We use the Internet to contact experts outside the school.	○	○	○	○	○
We use ICT devices to collect data for a project.	○	○	○	○	○
We use ICT devices to analyse data.	○	○	○	○	○
We use ICT devices to produce or edit audio.	○	○	○	○	○
We create or edit visual products (e.g. animations, videos, 3D drawings).	○	○	○	○	○
We create or program robotic devices (e.g. Bee-Bots, Sphero or similar).	○	○	○	○	○
We use ICT devices to submit assessments and gather feedback from my teacher.	○	○	○	○	○

Q15 **In your lessons in the current school year, to what extent have you received instruction on how to do the following tasks?**
(Select one response for each task.)

	To a large extent	To a moderate extent	To a small extent	Not at all
Breaking a complex problem into smaller parts	○	○	○	○
Planning tasks by setting out the steps needed to complete them	○	○	○	○
Developing algorithms (e.g. instructions for a program like Scratch)	○	○	○	○
Using ICT devices to present information to the class	○	○	○	○
Writing code, programs or macros	○	○	○	○
Checking code, programs or macros	○	○	○	○
Developing applications (apps)	○	○	○	○
Making changes to code to increase efficiency	○	○	○	○
Debugging code	○	○	○	○
Creating visual displays of information or processes (such as graphs, flow charts and decision trees)	○	○	○	○

Q13 Y10 version (continued)

Displaying data to help understand and solve problems	○	○	○	○
Making sense of data to help understand and solve problems	○	○	○	○

Between 2020 and 2022, many students in Australia were required to use ICT to participate in remote or home learning (where they undertook their schooling from home) due to the impact of COVID-19.

Q16 **Did you use ICT for remote or home learning between 2020 and 2022?**

Yes	No
○	○

Q17 **What ICT device (computer, laptop or tablet) did you mostly use for remote or home learning since 2020?**

I did not use an ICT device for remote or home learning	An ICT device supplied to me by my school	An ICT device from home which was my own to use	An ICT device from home that was shared with others in my family
○	○	○	○

Q18 **How prepared do you feel to use ICT to participate in remote or home learning if necessary?**

Not at all prepared	Not very prepared	Quite prepared	Very prepared
○	○	○	○

Appendix C: Sample characteristics by state and territory

Table A 2: Age – percentages of students by year level, nationally and by state and territory

	Mode	10	11	12	13	14	15	16	17	18	Missing
Year 6											
NSW	12	0.1	44.1	55.5	0.4						
VIC	12		33.7	62.7	1.3						2.3
QLD	11	0.2	62.4	37.2	0.2						
SA	12		45.2	54.7							0.1
WA	11	0.3	61.4	37.3	0.1						0.9
TAS	12	0.5	14.9	83.1	0.9	0.2					0.5
NT	11		47.8	47.7	0.3	0.3					3.9
ACT	12		40.8	58.6	0.6						
Aust.	12	0.1	46.6	52.0	0.5	0.0					0.7
Year 10											
NSW	16					0.1	46.7	52.4	0.8		
VIC	16				0.2	0.2	32.4	63.3	1.2	0.1	2.6
QLD	15					0.7	61.5	34.9	0.6		2.3
SA	16				0.1		48.7	50.2	0.8		0.2
WA	15					0.3	65.4	34.1	0.1		
TAS	16					0.5	18.2	78.9	1.5		0.9
NT	15				0.4		53.1	35.5	0.6		10.4
ACT	16						44.9	54.4	0.7		
Aust.	16				0.1	0.3	47.8	49.8	0.8	0.0	1.2

Because results are rounded to one decimal place, some totals may appear inconsistent.

Table A 3: Gender – percentages of students by year level, nationally and by state and territory

	Gender	Aust.	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Year 6	Male	51.7	53.3	50.8	50.6	49.4	51.9	55.6	45.6	53.4
	Female	48.2	46.7	49.0	49.4	50.4	48.0	44.3	54.4	46.6
	Other	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0
Year 10	Male	51.1	49.1	53.2	50.1	53.0	52.8	48.5	41.0	55.8
	Female	48.8	50.9	46.8	49.9	47.0	47.0	48.5	59.0	43.2
	Other	0.1	0.0	0.0	0.0	0.0	0.1	3.1	0.0	0.9

Because results are rounded to one decimal place, some totals may appear inconsistent.

Table A 4: Parental occupation – percentages of students by year level, nationally and by state and territory

	Parental occupation	Aust.	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Year 6	Senior Managers and Professionals	31.2	31.1	31.7	29.4	32.0	32.1	25.1	33.1	42.5
	Other Managers and Associate Professionals	22.3	22.2	22.5	22.9	23.9	20.9	22.7	16.0	21.7
	Skilled trades, clerical and sales	20.3	22.3	17.7	23.0	15.8	18.4	22.0	27.1	13.8
	Unskilled manual, office & sales	11.6	11.0	13.1	10.2	10.6	12.7	18.8	11.8	4.4
	Not in paid work for 12 months	7.2	8.4	9.0	5.9	5.0	4.7	5.8	5.7	3.7
	Missing data	7.3	5.0	5.9	8.6	12.8	11.3	5.5	6.3	13.9
Year 10	Senior Managers and Professionals	31.8	33.7	30.3	29.0	30.2	33.2	31.7	32.4	47.6
	Other Managers and Associate Professionals	23.2	22.3	25.6	20.8	26.4	23.8	26.3	13.3	18.1
	Skilled trades, clerical and sales	21.0	21.4	19.0	23.8	19.2	20.6	22.1	29.7	13.2
	Unskilled manual, office & sales	11.3	10.9	13.0	11.3	10.7	10.0	13.6	5.8	4.3
	Not in paid work for 12 months	6.0	7.4	6.6	4.9	5.9	4.0	4.7	4.5	2.0
	Missing data	6.7	4.2	5.4	10.2	7.6	8.3	1.6	14.3	14.9

Because results are rounded to one decimal place, some totals may appear inconsistent.

Table A 5: Parental education – percentages of students by year level, nationally and by state and territory

	Parental education	Aust.	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Year 6	Year 9 or equivalent or below	1.6	2.3	1.8	0.6	0.8	1.5	1.2	1.3	0.0
	Year 10 or equivalent	2.5	2.4	1.9	1.9	2.8	3.9	5.7	4.7	2.1
	Year 11 or equivalent	1.8	1.2	1.1	2.6	2.7	2.3	3.8	4.1	0.3
	Year 12 or equivalent	5.8	4.8	5.7	6.9	7.1	6.8	4.8	4.2	3.4
	Certificate I to IV (inc trade cert)	23.1	20.5	20.7	30.4	24.0	22.9	34.5	22.6	14.3
	Advanced Diploma/Diploma	15.4	17.1	13.8	16.0	14.6	15.3	13.2	10.1	9.4
	Bachelor degree or above	45.1	46.8	48.5	40.6	44.1	40.0	32.0	44.1	67.6
	Missing data	4.7	4.8	6.3	1.0	3.9	7.2	4.8	9.0	2.8
Year 10	Year 9 or equivalent or below	2.5	3.4	3.2	1.4	3.0	0.5	1.3	0.4	0.3
	Year 10 or equivalent	2.4	3.2	1.4	2.1	1.7	3.3	6.5	1.6	0.9
	Year 11 or equivalent	1.3	0.5	1.4	1.0	2.7	3.2	1.3	1.8	0.0
	Year 12 or equivalent	5.7	5.3	5.3	5.9	7.9	7.0	4.3	5.4	3.5
	Certificate I to IV (inc trade cert)	24.9	24.1	21.8	29.1	26.9	25.3	36.4	24.3	12.1
	Advanced Diploma/Diploma	15.0	12.8	15.2	18.2	14.6	14.8	12.4	18.9	14.2
	Bachelor degree or above	43.1	47.1	44.9	36.6	40.1	40.6	33.7	35.7	64.5
	Missing data	5.1	3.6	6.8	5.6	3.0	5.4	4.1	12.0	4.4

Because results are rounded to one decimal place, some totals may appear inconsistent.

Table A 6: Indigenous status – percentages of students by year level, nationally and by state and territory

	Indigenous status	Aust.	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Year 6	Non-Aboriginal or Torres Strait Islander	92.3	92.4	95.7	89.3	85.5	96.0	85.3	69.6	96.3
	Aboriginal or Torres Strait Islander	5.4	5.7	1.7	10.3	3.6	3.4	9.9	26.8	2.8
	Missing data	2.3	2.0	2.6	0.4	10.8	0.6	4.7	3.6	0.9
Year 10	Non-Aboriginal or Torres Strait Islander	94.9	95.7	96.3	95.0	91.9	95.3	83.7	70.9	95.4
	Aboriginal or Torres Strait Islander	3.7	4.3	0.8	5.0	3.4	4.4	11.2	15.9	1.9
	Missing data	1.4	0.0	3.0	0.0	4.7	0.3	5.0	13.2	2.8

Because results are rounded to one decimal place, some totals may appear inconsistent.

Table A 7: Language spoken at home – percentages of students by year level, nationally and by state and territory

	Language spoken at home	Aust.	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Year 6	English only	69.8	62.7	67.3	86.9	83.4	56.6	93.6	59.1	69.0
	Language other than English	25.8	37.1	24.5	13.0	15.8	25.1	5.3	37.3	30.4
	Missing data	4.3	0.2	8.2	0.0	0.8	18.2	1.1	3.6	0.6
Year 10	English only	70.6	64.1	68.4	82.9	82.6	59.3	92.9	53.9	74.9
	Language other than English	24.9	35.5	25.9	14.8	17.1	19.7	6.2	35.0	24.6
	Missing data	4.5	0.4	5.6	2.3	0.2	21.0	0.9	11.1	0.5

Because results are rounded to one decimal place, some totals may appear inconsistent.

Table A 8: Geographic location – percentages of students by year level, nationally and by state and territory

	Geographic location	Aust.	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Year 6	Metropolitan	69.8	74.7	69.8	65.3	72.1	74.6	0.0	0.0	100.0
	Regional	28.3	25.3	30.2	30.0	27.9	19.5	100.0	65.9	0.0
	Remote	1.9	0.0	0.0	4.8	0.0	5.9	0.0	34.1	0.0
Year 10	Metropolitan	74.8	83.4	75.8	63.6	82.3	80.2	0.0	0.0	100.0
	Regional	24.3	16.6	24.2	36.4	15.9	14.8	100.0	84.2	0.0
	Remote	0.8	0.0	0.0	0.0	1.8	5.0	0.0	15.8	0.0

Because results are rounded to one decimal place, some totals may appear inconsistent.

Appendix D: Reporting of results

The students assessed in NAP–ICT Literacy 2022 were selected using a 2-stage cluster sampling procedure. At the first stage, schools were sampled from a sampling frame with a probability proportional to their size as measured by student enrolments in the relevant year level. In the second stage, 20 students at each year level were randomly sampled within schools (see Technical Report Chapter 3 on sampling and weighting). Applying cluster sampling techniques is an efficient and economical way of selecting students in educational research. However, as these samples were not obtained through (one-stage) simple random sampling, standard formulae to obtain sampling errors of population estimates are not appropriate. In addition, NAP–ICT Literacy estimates were obtained using plausible value methodology (see Technical Report Chapter 6 on scaling procedures), which allows for estimating and combining the measurement error of achievement scores with their sampling error.

Reporting of results by subgroups of interest becomes more limited as group sizes decrease due to the increase in error that accompanies this. For this cycle of NAP–ICT Literacy, the gender category "other" is not reported because there are fewer than 30 students or fewer than 5 schools with valid data.

This appendix describes the method applied for estimating sampling as well as measurement error. In addition, it contains a description of the types of statistical analyses and significance tests that were carried out for reporting of results in this report.

Computation of sampling and measurement variance

Unbiased standard errors from studies should include both sampling variance and measurement variance. One way of estimating sampling variance on population estimates from cluster samples is by utilising the application of replication techniques (Wolter 1985). The sampling variances of population means, differences, percentages and correlation coefficients in NAP–ICT Literacy studies were estimated using the jackknife repeated replication technique (JRR). The other component of the standard error of achievement test scores, the measurement variance, can be derived from the variance among the 5 plausible values for NAP–ICT Literacy. In addition, for comparing achievement test scores with those from previous cycles (2005, 2008, 2011, 2014 and 2017), an equating error was added as a third component of the standard error.

Replicate weights

When applying the JRR method for stratified samples, primary sampling units (PSUs) – in this case schools – are paired into pseudo-strata, also called sampling zones. The assignment of schools to these sampling zones needs to be consistent with the sampling frame from which they were sampled (to obtain pairs of schools that were adjacent in the sampling frame), and zones are always constructed within explicit strata of the sampling frame. This procedure ensures that schools within each zone are as similar to each other as possible.[23] For NAP–ICT Literacy 2022, 172 sampling zones were used in Year 6 and 163 in Year 10.

Within each sampling zone, one school was randomly assigned a value of 2, whereas the other one received a value of zero. To create replicate weights for each of these sampling zones, the jackknife

[23] In the case of an odd number of schools within an explicit stratum on the sampling frame, the remaining school is randomly divided into 2 halves and each half assigned to the 2 other schools in the final sampling zone to form *pseudo-schools*.

indicator variable was multiplied by the original sampling weights of students within the corresponding zone so that one of the paired schools had a contribution of zero and the other school a double contribution, whereas schools from all other sampling zones remained unmodified.

At each year level, 172 replicate weights were computed. In Year 10, which had only 163 sampling zones, the last 10 replicate weights were equal to the final sampling weight. This was done in order to have a consistent number of replicate weight variables in the final database.

Standard errors

In order to compute the sampling variance for a statistic *t*, *t* is estimated once for the original sample *S* and then for each of the jackknife replicates J_h. The JRR variance is computed using the formula:

$$Var_{jrr}(t) = \sum_{h=1}^{H} [t(J_h) - t(S)]^2$$

where *H* is the number of replicate weights, *t(S)* the statistic *t* estimated for the population using the final sampling weights, and $t(J_h)$ the same statistic estimated using the weights for the h^{th} jackknife replicate. For all statistics that are based on variables other than student test scores (plausible values) the standard error of *t* is equal to:

$$\sigma(t) = \sqrt{Var_{jrr}(t)}$$

The computation of JRR variance can be obtained for any statistic. However, many standard statistical software packages like *SPSS®* do not generally include any procedures for replication techniques. Therefore, specialist software, the *SPSS®* replicates add-in, was used to run tailored *SPSS®* macros to estimate JRR variance for means and percentages.[24]

Population statistics for NAP–ICT Literacy scores were always estimated using all 5 plausible values with standard errors reflecting both sampling and measurement error. If *t* is any computed statistic and t_i is the statistic of interest computed on one plausible value, then:

$$t = \frac{1}{M} \sum_{i=1}^{M} t_i$$

with *M* being the number of plausible values.

The sampling variance *U* is calculated as the average of the sampling variance for each plausible value U_i:

$$U = \frac{1}{M} \sum_{i=1}^{M} U_i$$

[24] Conceptual background and application of macros with examples are described in the *PISA Data Analysis Manual SPSS®*, Second Edition (OECD 2009b).

Using 5 plausible values for data analysis allows the estimation of the error associated with the measurement of NAP–ICT Literacy due to the lack of precision of the test instrument. The measurement variance or imputation variance B_M was computed as:

$$B_m = \frac{1}{M-1}\sum_{i=1}^{M}\left(t_i - t\right)^2$$

To obtain the final standard error of NAP–ICT Literacy statistics, the sampling variance and measurement variance were combined as:

$$SE = \sqrt{U + \left(1 + \frac{1}{M}\right)B_m}$$

with *U* being the sampling variance.

The 95% confidence interval, as presented in this report, is computed as 1.96 times the standard error. The actual 95% confidence interval of a statistic is between the value of the statistic *minus* 1.96 times the standard error and the value of the statistic *plus* 1.96 times the standard error.

Reporting of mean differences

Chapter 4 includes comparisons of achievement test results across states and territories; that is, means of scales and percentages is compared in graphs and tables. Each population estimate is accompanied by its 95% confidence interval. In addition, tests of significance for the difference between estimates are provided, to flag results that are significant at the 5% level ($p < 0.05$), which indicates a 95% probability that these differences are not a result of sampling and measurement error.

The following types of significance tests for achievement mean differences in population estimates are reported:

- between states and territories
- between student subgroups
- between this assessment cycle and previous ones in 2017, 2014, 2011, 2008 and 2005.

Mean differences between states and territories and year levels

Pairwise comparison charts allow the comparison of population estimates between one state or territory and another or between Year 6 and Year 10. Differences in means were considered significant when the test statistic *t* was outside the critical values ±1.96 ($\alpha = 0.05$). The *t* value is calculated by dividing the difference in means by its standard error, which is given by the formula:

$$SE_{dif\_ij} = \sqrt{SE_i^2 + SE_j^2}$$

where SE_{dif_ij} is the standard error of the difference and SE_i and SE_j are the standard errors of the 2 means *i* and *j*. This computation of the standard error was only applied for comparisons between 2 samples that had been drawn independently from each other (for example, jurisdictions or year levels).

In this report, differences are also estimated between percentages attaining the proficient standards in states and territories. The method for estimating the standard error of the difference between percentages is identical to the procedure described for mean differences.

Mean differences between dependent sub-groups

The formula for calculating the standard error described in the previous section is not appropriate for sub-groups from the same sample (see OECD, 2009 for more detailed information). Here, the covariance between the 2 standard errors for sub-group estimates needs to be taken into account and JRR should be used to estimate correct sampling errors of mean differences. Standard errors of differences between statistics for subgroups from the same sample (for example, groups classified according to student background characteristics) were derived using the *SPSS®* replicates add-in. Differences between subgroups were considered significant when the test statistic *t* was outside the critical values ±1.96 (α = 0.05). The value *t* was calculated by dividing the mean difference by its standard error.

Mean differences between assessment cycles (2005, 2008, 2011, 2014, 2017 and 2022)

Chapter 4 also includes comparisons of achievement results across assessment cycles. The process of equating tests across different achievement cycles introduces a new form of error when comparing population estimates over time: the equating or linking error. When computing the standard error, equating error as well as sampling and measurement error were taken into account. The computation of equating errors is described in Chapter 6 of the Technical Report.

The value of the equating error between 2022 and the previous assessment in 2017 is 4.87 score points on the NAP–ICT Literacy scale for both year levels. When testing the difference of a statistic between these 2 assessment cycles, the standard error of the difference was computed as follows:

$$E(t_{22} - t_{17}) = \sqrt{SE_{22}^2 + SE_{17}^2 + EqErr_{22\_17}^2}$$

where *t* can be any statistic in units on the NAP–ICT Literacy scale (mean, percentile, gender difference, but *not* percentages), SE_{22}^2 is the respective standard error of this statistic in 2022, SE_{17}^2 the corresponding standard error in 2017 and $EqErr_{22\_17}^2$ the equating error for comparing 2022 with 2017 results.

When comparing population estimates between 2022 and the fourth assessment in 2014, 2 equating errors (between 2022 and 2017, and between 2017 and 2014) had to be taken into account. This was achieved by applying the following formula for the calculation of the standard error for differences between statistics from 2022 and 2014:

$$SE(\mu_{22} - \mu_{14}) = \sqrt{SE_{22}^2 + SE_{14}^2 + EqErr_{22\_14}^2}$$

where $EqErr^2_{22\_14}$ reflects the uncertainty associated with the equating between the assessment cycles of 2022 and 2017 (4.87 score points) as well as between 2017 and 2014 (5.52 score points). This combined equating error was equal to 7.36 score points and was calculated as:

$$EqErr_{22\_14} = \sqrt{EqErr^2_{22_{17}} + EqErr^2_{17_{14}}}$$

Similarly, for comparisons between 2022 and the first NAP–ICT Literacy assessment in 2005, the equating errors between each adjacent pair of assessments had to be taken into account and standard errors for differences were computed as:

$$SE(\mu_{22} - \mu_{05}) = \sqrt{SE^2_{22} + SE^2_{05} + EqErr^2_{22\_05}}$$

$\mathrm{EqErr}^2_{22\_05}$ reflects the uncertainty associated with the equating between the assessment cycles of 2022 and 2017 (4.87 score points), between 2017 and 2014 (5.52 score points), between 2014 and 2011 (4.01 score points), between 2011 and 2008 (5.71 score points) and between 2008 and 2005 (4.3 score points). The combined equating error was equal to 11.02 score points, and was calculated as:

$$EqErr_{22\_05} = \sqrt{EqErr^2_{22_{17}} + EqErr^2_{17_{14}} + EqErr^2_{14_{11}} + EqErr^2_{11_{08}} + EqErr^2_{08_{05}}}$$

To report the significance of differences between percentages at or above proficient standards, the corresponding equating error had to be estimated using a different approach. To obtain an estimate, the following replication method was applied to estimate the equating error for percentages at the proficient standards.

For the cut-point that defines the corresponding proficient standard at each year level (409 for Year 6 and 529 for Year 10), a number of *n* replicate cut-points were generated by adding a random error component with a mean of 0 and a standard deviation equal to the estimated equating error of 4.87 score points for comparisons between 2022 and 2017, 7.36 score points for comparisons between 2022 and 2014, 8.38 score points for comparisons between 2022 and 2011, 10.14 score points for comparisons between 2022 and 2008, and 11.02 score points for comparisons between 2022 and 2005. Percentages of students at or above each replicate cut-point (ρ_n) were computed and the equating error was estimated as:

$$EquErr(\rho) = \sqrt{\frac{(\rho_n - \rho_o)^2}{n}}$$

where ρ_o is the percentage of students at or above the (reported) proficient standard. The standard errors of the differences in percentages at or above proficient standards between 2022 and 2017 were calculated as:

$$SE(\rho_{22} - \rho_{17}) = \sqrt{SE(\rho_{22})^2 + SE(\rho_{17})^2 + EqErr(\rho_{22\_17})^2}$$

where ρ_{22} is the percentages at or above the proficient standard in 2022 and ρ_{17} in 2017, $SE(\rho_{22})$ and $SE(\rho_{17})$ their respective standard errors, and $EqErr(\rho_{22\_17})$ the equating error for comparisons. For estimating the standard error of the corresponding differences in percentages at or above proficient standards between 2022 and 2014, the following formula was used:

$$SE(\rho_{22} - \rho_{14}) = \sqrt{SE(\rho_{22})^2 + SE(\rho_{14})^2 + EqErr(\rho_{22\_14})^2}$$

Likewise, for estimating the standard error of the corresponding differences in percentages at or above proficient standards between 2022 and 2008 and between 2022 and 2005, the following formulas were used:

$$SE(\rho_{22} - \rho_{08}) = \sqrt{SE(\rho_{22})^2 + SE(\rho_{08})^2 + EqErr(\rho_{22\_08})^2}$$

$$SE(\rho_{22} - \rho_{05}) = \sqrt{SE(\rho_{22})^2 + SE(\rho_{05})^2 + EqErr\left(\rho_{22\_05}\right)^2}$$

For NAP–ICT Literacy 2022, 5000 replicate cut-points were created. Equating errors on percentages were estimated for each sample or subsample of interest. Table A 9 and Table A 10 show the values of these equating errors of Year 6 and Year 10 respectively.

Table A 9: Year 6 equating errors for comparisons between percentages

Group	2022/2017	2022/2014	2022/2011	2022/2008	2022/2005
Aust	1.63	2.54	2.92	3.58	3.91
NSW	1.54	2.42	2.78	3.4	3.71
VIC	1.58	2.48	2.86	3.54	3.89
QLD	2.03	3.05	3.46	4.15	4.49
SA	1.61	2.52	2.89	3.55	3.87
WA	1.44	2.42	2.82	3.53	3.88
TAS	1.95	2.73	3.06	3.64	3.94
NT	1.82	2.5	2.77	3.27	3.52
ACT	1.28	1.89	2.16	2.63	2.88
Female	1.65	2.65	3.06	3.76	4.1
Male	1.61	2.45	2.81	3.42	3.73
Non-Indigenous	1.68	2.63	3.02	3.7	4.04
Indigenous	1.06	1.47	1.65	1.96	2.12
English only	1.75	2.68	3.07	3.74	4.07
Language other than English	1.24	2.12	2.48	3.1	3.41
Metropolitan	1.65	2.56	2.94	3.58	3.9
Regional	1.59	2.53	2.92	3.62	3.97
Remote	1.69	2.33	2.58	3.06	3.33
Senior Managers and Professionals	1.59	2.39	2.72	3.28	3.57
Other Managers and Associate Professionals	1.55	2.38	2.75	3.4	3.73
Tradespeople & skilled office, sales and service staff	1.67	2.76	3.2	3.95	4.32
Unskilled labourers, office, sales and service staff	1.84	3.09	3.59	4.43	4.84
Not in paid work in last 12 months	1.87	2.59	2.9	3.47	3.77
Year 9	3.51	5.29	5.89	6.81	7.21
Year 10	1.33	2.04	2.39	3.01	3.32
Year 11 or equivalent	2.06	2.88	3.26	3.9	4.2
Year 12 or equivalent	1.88	2.85	3.23	3.9	4.25
Certificate I to IV (including trade cert)	1.83	2.85	3.29	4.03	4.39
Advanced Diploma/Diploma	1.57	2.61	3.05	3.8	4.16
Bachelor degree or above	1.44	2.25	2.59	3.16	3.46

Table A 10: Year 10 equating errors for comparisons between percentages

Group	2022/2017	2022/2014	2022/2011	2022/2008	2022/2005
Aust	0.97	1.47	1.67	2	2.16
NSW	0.91	1.34	1.51	1.79	1.94
VIC	1.03	1.55	1.75	2.09	2.26
QLD	1.03	1.64	1.88	2.28	2.47
SA	0.87	1.21	1.36	1.63	1.76
WA	1.07	1.64	1.85	2.19	2.36
TAS	1.34	1.89	2.11	2.48	2.66
NT	2	2.95	3.33	3.94	4.22
ACT	0.7	0.93	1.03	1.19	1.27
Female	1.02	1.59	1.79	2.14	2.3
Male	0.95	1.38	1.57	1.88	2.04
Non-Indigenous	0.97	1.47	1.66	1.98	2.15
Indigenous	1.54	2.31	2.59	3.05	3.29
English only	1.1	1.64	1.85	2.19	2.36
Language other than English	0.66	1.04	1.2	1.46	1.6
Metropolitan	0.71	1.11	1.28	1.56	1.7
Regional	1.75	2.49	2.76	3.2	3.42
Remote	3.28	5.39	6.18	7.36	7.88
Senior Managers and Professionals	0.5	0.81	0.94	1.15	1.27
Other Managers and Associate Professionals	0.76	1.22	1.41	1.72	1.87
Tradespeople & skilled office, sales and service staff	1.2	1.81	2.05	2.47	2.68
Unskilled labourers, office, sales and service staff	1.95	2.71	2.96	3.36	3.56
Not in paid work in last 12 months	1.3	1.95	2.22	2.71	2.95
Year 9	3.29	4	4.27	4.68	4.88
Year 10	3.28	4.08	4.34	4.78	5
Year 11 or equivalent	1.72	2.54	2.82	3.23	3.44
Year 12 or equivalent	2.26	3.22	3.54	4.03	4.25
Certificate I to IV (including trade cert)	1.26	1.95	2.23	2.7	2.94
Advanced Diploma/Diploma	0.84	1.31	1.5	1.82	1.99
Bachelor degree or above	0.56	0.86	0.98	1.2	1.31

Appendix E: Mean scores on survey indices by year level and state and territory

Table A 11: Student perception of the importance of ICT use

State/territory	Year 6		Year 10	
NSW	52	(±1.0)	53	(±1.1)
VIC	50	(±0.8)	54	(±1.0)
QLD	49	(±0.8)	50	(±1.0)
SA	50	(±0.9)	53	(±0.9)
WA	48	(±0.9)	52	(±1.0)
TAS	48	(±0.9)	50	(±1.4)
NT	48	(±1.4)	51	(±2.3)
ACT	49	(±1.0)	53	(±1.7)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 12: Student frequency of using study utilities on ICT devices – at school

State/territory	Year 6		Year 10	
NSW	51	(±1.0)	52	(±1.4)
VIC	50	(±1.5)	54	(±0.9)
QLD	49	(±1.1)	50	(±1.2)
SA	51	(±1.1)	54	(±0.6)
WA	48	(±0.9)	48	(±1.1)
TAS	48	(±1.0)	50	(±1.2)
NT	48	(±2.2)	52	(±2.1)
ACT	52	(±1.6)	54	(±0.9)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 13: Student frequency of using study utilities on ICT devices – outside school

State/territory	Year 6		Year 10	
NSW	51	(±1.1)	54	(±1.3)
VIC	50	(±1.0)	54	(±0.7)
QLD	49	(±0.9)	51	(±1.0)
SA	50	(±1.1)	53	(±0.8)
WA	50	(±1.0)	53	(±0.9)
TAS	46	(±0.8)	49	(±0.8)
NT	48	(±2.0)	52	(±5.1)
ACT	50	(±1.9)	55	(±1.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 14: Student frequency of using ICT devices for entertainment purposes – at school

State/territory	Year 6		Year 10	
NSW	50	(±1.5)	58	(±1.3)
VIC	50	(±1.1)	59	(±1.0)
QLD	50	(±1.0)	55	(±1.2)
SA	50	(±1.2)	59	(±0.9)
WA	50	(±1.3)	55	(±1.2)
TAS	51	(±1.0)	57	(±1.2)
NT	51	(±1.3)	58	(±4.3)
ACT	51	(±1.7)	59	(±0.6)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 15: Student frequency of using ICT devices for entertainment purposes – outside school

State/territory	Year 6		Year 10	
NSW	50	(±0.6)	51	(±1.3)
VIC	50	(±0.9)	52	(±0.7)
QLD	50	(±0.8)	50	(±0.8)
SA	50	(±1.2)	51	(±0.6)
WA	50	(±0.6)	52	(±1.0)
TAS	49	(±0.7)	51	(±1.1)
NT	50	(±2.2)	52	(±0.9)
ACT	49	(±2.1)	51	(±1.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 16: Student frequency of using ICT devices for communication activities – at school

State/territory	Year 6		Year 10	
NSW	51	(±1.0)	63	(±1.3)
VIC	48	(±1.3)	63	(±0.7)
QLD	51	(±1.2)	61	(±1.2)
SA	50	(±1.2)	62	(±0.8)
WA	48	(±1.6)	58	(±1.0)
TAS	49	(±1.1)	59	(±1.1)
NT	47	(±2.4)	65	(±3.4)
ACT	52	(±1.2)	63	(±0.8)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 17: Student frequency of using ICT devices for communication activities – outside school

State/territory	Year 6		Year 10	
NSW	51	(±0.6)	54	(±1.2)
VIC	50	(±0.8)	54	(±0.7)
QLD	49	(±0.9)	52	(±0.6)
SA	49	(±1.0)	53	(±0.6)
WA	50	(±0.8)	54	(±0.7)
TAS	49	(±0.9)	52	(±1.2)
NT	49	(±1.8)	53	(±2.6)
ACT	50	(±1.4)	52	(±1.0)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 18: Student frequency of completing technological tasks using ICT devices – at school

State/territory	Year 6		Year 10	
NSW	50	(±1.2)	50	(±1.7)
VIC	49	(±1.2)	50	(±0.9)
QLD	51	(±1.1)	48	(±0.9)
SA	49	(±1.0)	50	(±1.0)
WA	51	(±1.1)	49	(±1.0)
TAS	49	(±1.5)	47	(±1.3)
NT	50	(±1.3)	51	(±3.6)
ACT	51	(±0.8)	50	(±1.1)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 19: Student frequency of completing technological tasks using ICT devices – outside school

State/territory	Year 6		Year 10	
NSW	50	(±0.8)	47	(±1.6)
VIC	49	(±0.8)	47	(±1.0)
QLD	50	(±1.0)	46	(±0.7)
SA	49	(±1.2)	46	(±1.0)
WA	51	(±0.9)	47	(±1.1)
TAS	49	(±0.9)	45	(±0.9)
NT	49	(±1.0)	49	(±3.9)
ACT	49	(±1.1)	48	(±1.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 20: Student ICT self-efficacy

State/territory	Year 6		Year 10	
NSW	51	(±0.8)	54	(±1.0)
VIC	50	(±1.0)	53	(±0.8)
QLD	49	(±0.8)	50	(±0.9)
SA	49	(±1.2)	52	(±1.0)
WA	48	(±0.7)	51	(±0.8)
TAS	48	(±1.0)	50	(±1.3)
NT	47	(±1.4)	52	(±2.2)
ACT	51	(±1.1)	54	(±1.0)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 21: Student ICT learning at school

State/territory	Year 6		Year 10	
NSW	51	(±0.8)	53	(±1.0)
VIC	50	(±0.9)	52	(±0.9)
QLD	50	(±1.0)	52	(±1.0)
SA	48	(±1.1)	52	(±1.2)
WA	49	(±1.1)	52	(±1.0)
TAS	49	(±0.8)	52	(±1.2)
NT	48	(±2.3)	51	(±1.5)
ACT	52	(±1.7)	54	(±1.5)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 22: Use of productivity applications for school-related purposes

State/territory	Year 6		Year 10	
NSW	51	(±1.1)	55	(±0.9)
VIC	50	(±0.8)	56	(±0.6)
QLD	49	(±0.8)	55	(±1.1)
SA	50	(±1.0)	57	(±1.0)
WA	49	(±1.1)	52	(±0.8)
TAS	49	(±1.3)	54	(±0.9)
NT	46	(±1.6)	56	(±3.5)
ACT	51	(±1.5)	56	(±1.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 23: Use of specialist applications for school-related purposes

State/territory	Year 6		Year 10	
NSW	51	(±0.9)	50	(±1.4)
VIC	49	(±1.1)	49	(±1.2)
QLD	50	(±1.0)	49	(±1.3)
SA	50	(±1.0)	49	(±0.9)
WA	50	(±1.2)	49	(±0.7)
TAS	49	(±1.5)	48	(±1.6)
NT	50	(±1.3)	49	(±1.3)
ACT	49	(±1.1)	51	(±1.6)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 24: Use of digital devices in general classroom activities

State/territory	Year 6		Year 10	
NSW	52	(±1.0)	56	(±1.2)
VIC	50	(±1.0)	56	(±0.8)
QLD	49	(±1.2)	54	(±1.0)
SA	50	(±1.1)	57	(±1.4)
WA	47	(±0.9)	51	(±1.1)
TAS	48	(±1.3)	54	(±1.1)
NT	47	(±1.4)	53	(±1.4)
ACT	51	(±1.7)	57	(±1.5)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 25: Use of digital devices in specialised classroom activities

State/territory	Year 6		Year 10	
NSW	51	(±1.3)	54	(±1.1)
VIC	49	(±1.3)	53	(±1.4)
QLD	50	(±1.2)	52	(±1.6)
SA	49	(±1.2)	54	(±0.9)
WA	48	(±1.0)	51	(±0.9)
TAS	49	(±1.4)	52	(±1.5)
NT	49	(±1.1)	50	(±1.2)
ACT	51	(±1.3)	55	(±2.2)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 26: Student computational thinking–related learning at school

State/territory	Year 6		Year 10	
NSW	50	(±1.1)	47	(±1.7)
VIC	49	(±1.3)	47	(±1.1)
QLD	51	(±1.2)	47	(±1.0)
SA	49	(±1.4)	48	(±1.1)
WA	51	(±1.4)	47	(±1.3)
TAS	49	(±1.3)	46	(±1.6)
NT	49	(±1.2)	47	(±2.6)
ACT	49	(±1.3)	49	(±1.7)

*Confidence Intervals (1.96 * SE) are reported in brackets.*

Table A 27: Student learning of coding at school

State/territory	Year 6		Year 10	
NSW	50	(±0.8)	50	(±1.3)
VIC	50	(±0.8)	50	(±0.8)
QLD	50	(±1.1)	50	(±1.2)
SA	50	(±1.2)	51	(±1.3)
WA	50	(±0.9)	49	(±0.9)
TAS	49	(±1.1)	48	(±1.2)
NT	49	(±1.3)	50	(±1.9)
ACT	50	(±1.3)	51	(±1.3)

*Confidence Intervals (1.96 * SE) are reported in brackets.*