USING ICTs in the CURRICULUM

NOW and into the FUTURE

Nov 8 2017

RAINWORTH STATE SCHOOL

An Independent Public School

SCHOOL VISION

At Rainworth, each individual achieves the best educational outcomes through a rich, diverse engaging curriculum, in a happy, safe and healthy community.

WHO WE ARE…

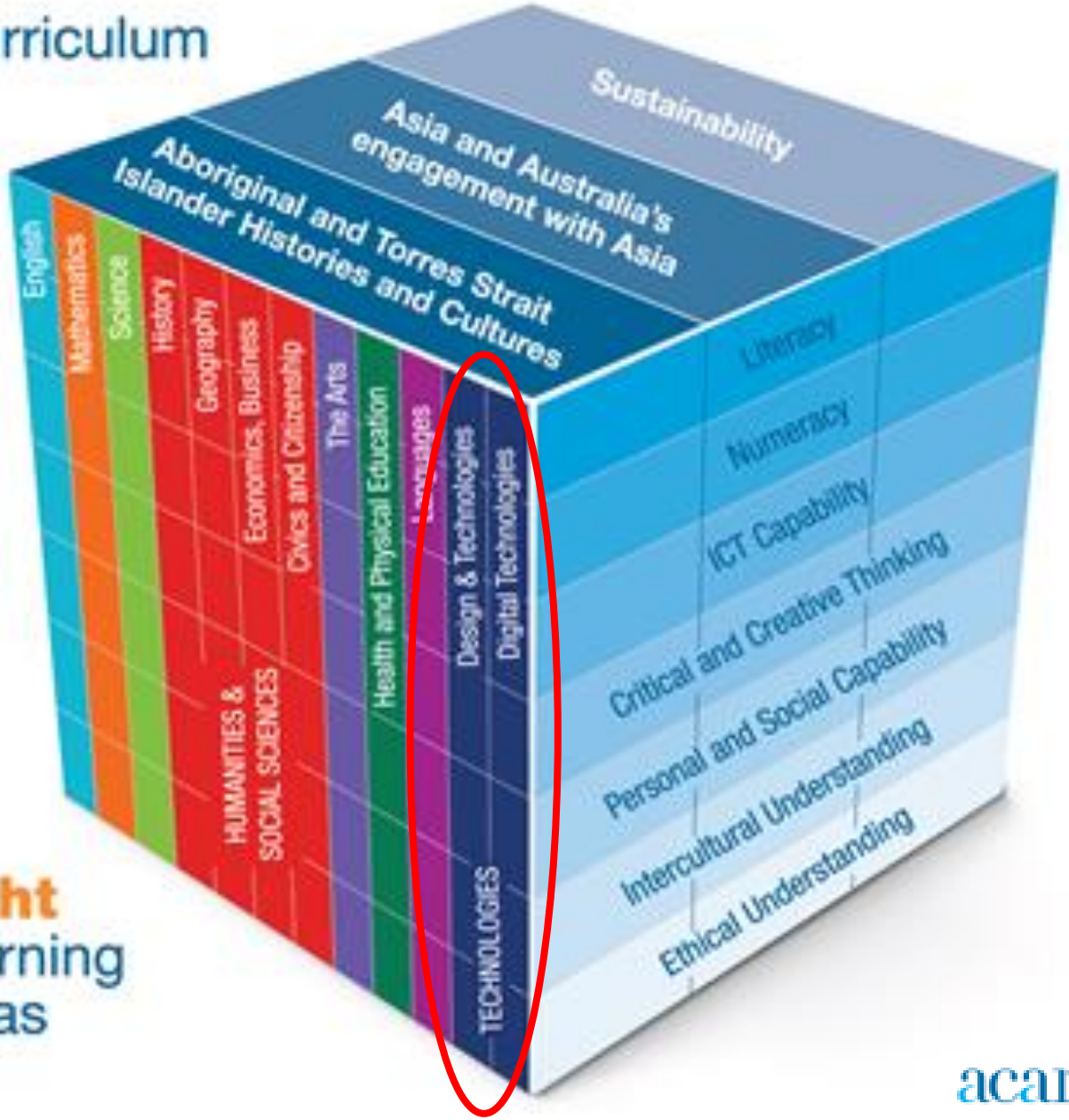
LIVING *reflects* LEARNING

SCHOOL VALUES

- *a holistic approach to childhood development - emotionally, intellectually, physically & socially;*
- *a focus on children reaching their full academic potential;*
- *a balanced curriculum focusing on clever, skilled, creative;*
- *a strong sense of community.*

THE WHAT...

Three
Cross-curriculum
Priorities



Seven
General
Capabilities

Eight
Learning
Areas

acara

Australian CURRICULUM

STATE RAINWORTH SCHOOL
LIVING REFLECTS LEARNING

Prep to Year 6

In Prep to Year 6 the Australian Curriculum learning areas are to be provided each year.

Table 1: Recommended time allocations in Prep to Year 6[4]

Learning areas		Prep	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
English	Hours per year	280	280	280	280	240	240	240
	Per week	7	7	7	7	6	6	6
Mathematics	Hours per year	200	200	200	200	200	200	200
	Per week	5	5	5	5	5	5	5
Science	Hours per year	40	40	40	70	70	70	70
	Per week	1	1	1	1h 45m	1h 45m	1h 45m	1h 45m
Humanities and Social Sciences[5]	Hours per year	40	40	40	60	60	80	80
	Per week	1	1	1	1h 30m	1h 30m	2	2
The following learning areas have curriculum in bands of years. Schools make decisions about when they are to be offered.[6]								
Health and Physical Education	Hours per band	80	160 (80 hours per year)		160 (80 hours per year)		160 (80 hours per year)	
	Per week	2	2		2		2	
The Arts[7]	Hours per band	120 (40 hours per year)			100 (50 hours per year)		100 (50 hours per year)	
	Per week	1			1h 15 m		1h 15m	
Technologies[8]	Hours per band	60 (20 hours per year)			80 (40 hours per year)		120 (60 hours per year)	
	Per week	30 m			1		1h 30m	
Languages[9]	Hours per band	120 (40 hours per year)			120 (60 hours per year)		120 (60 hours per year)	
	Per week	1			1h 30 m		1h 30 m	

TECHNOLOGIES

- Design and Technologies and Digital Technologies under the umbrella of the subject Technology

- Time allocation
  - P – 2 30 min/week
  - 3-4 1hr/week
  - 5/6 1.5hr/week

DIGITAL TECHNOLOGIES

Foundation (Prep) – 2

Recognise and explore digital systems for a purpose.

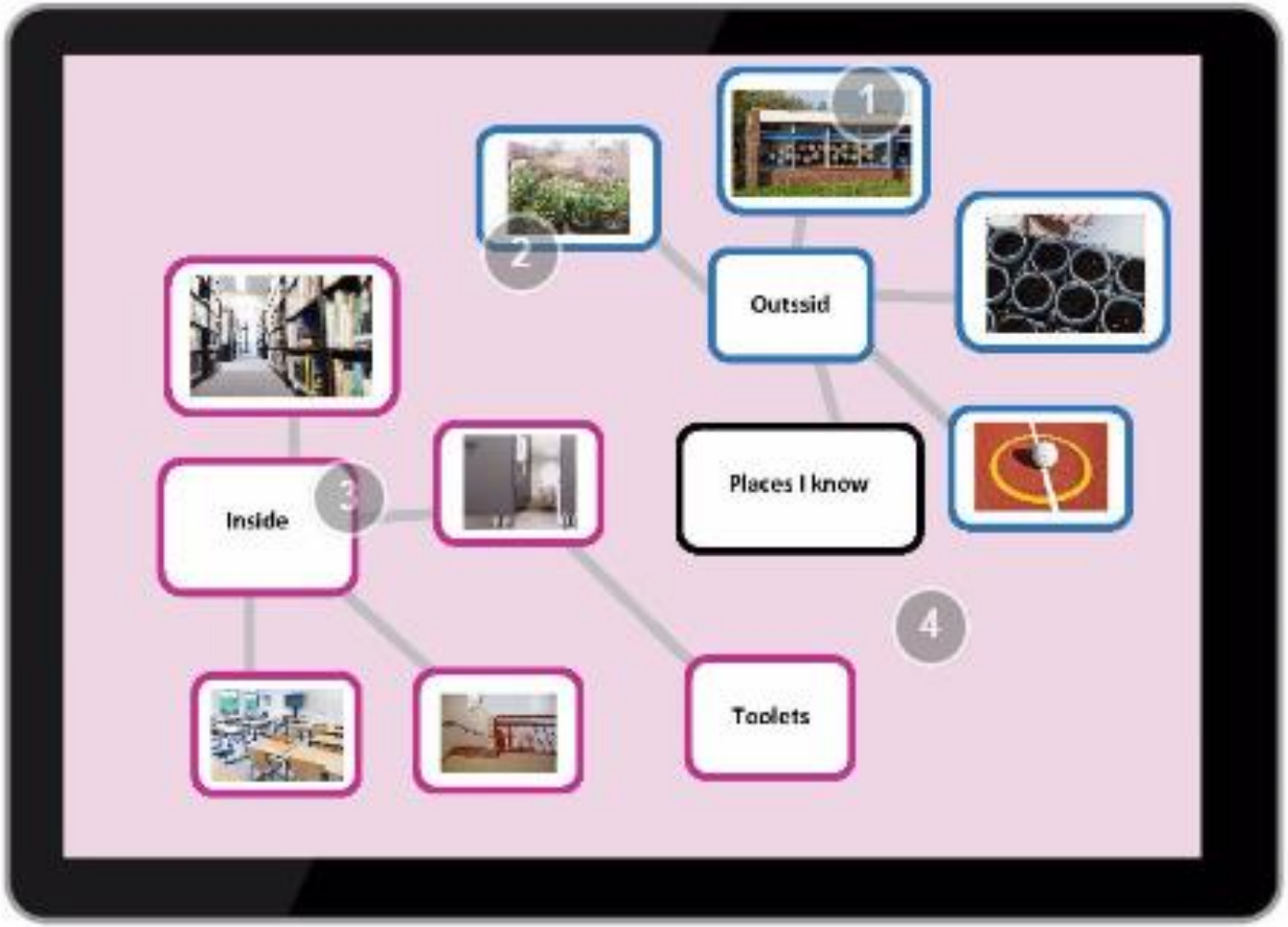
- use a tablet to take a photograph of a grandparent and record an interview with them about life in the past;
- experiment with different ways of providing instructions to games software using a mouse, touch screen, keyboard and use different software to manipulate text, numbers, sound and images;
- instruct robotic toys to perform a function such as a dance movement;

TASK

Foundation to Year 2

Use an app to take digital photos of known places around the school. Create a mind map to be uploaded to the class blog.

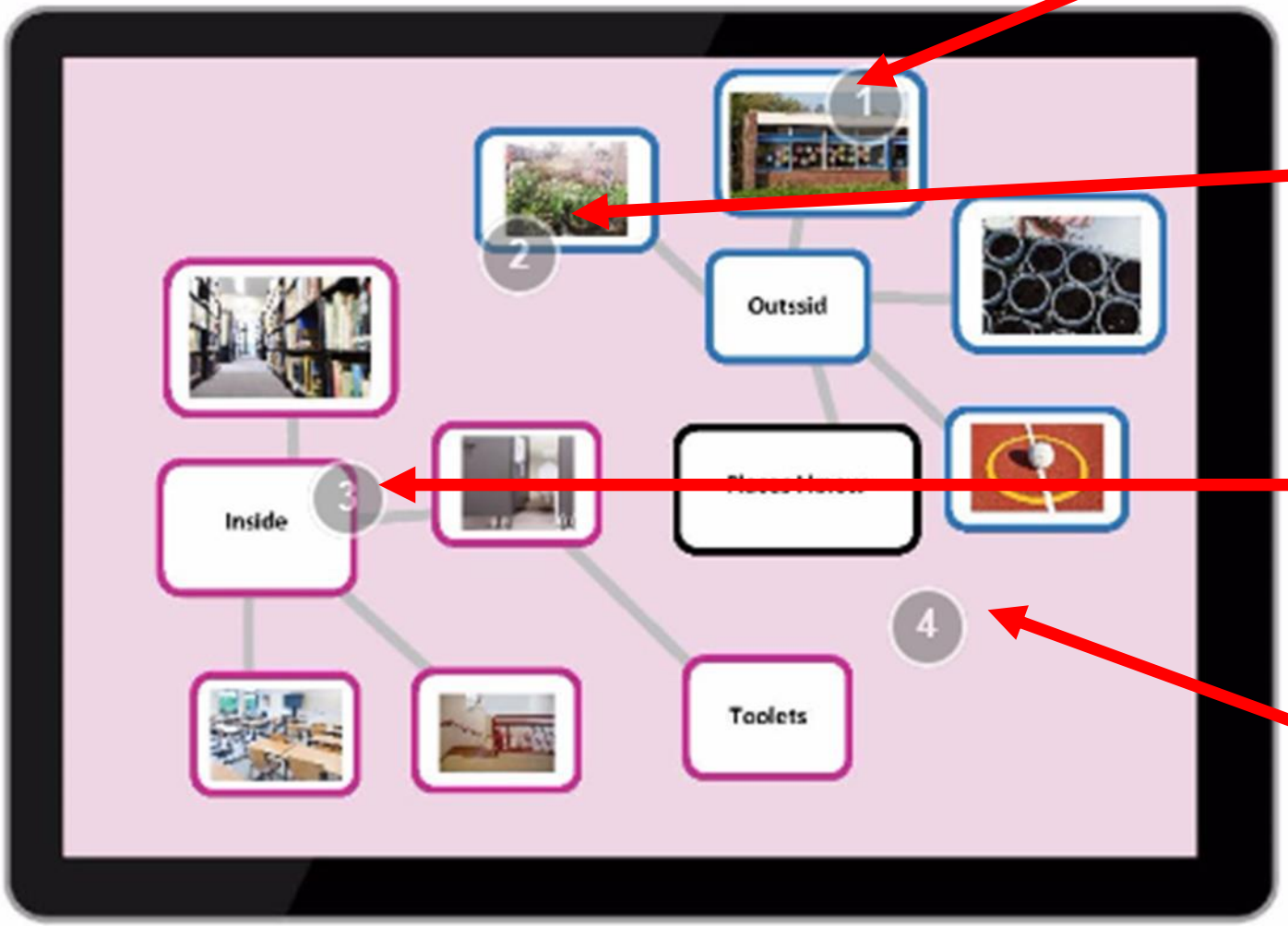
Children use software features to represent the pictorial data in different ways, analyse it and explore how to group and display them creatively.



Work Sample - Satisfactory Level

Foundation (Prep) to Year 2

Satisfactory



Photograph places of interest using a tablet.

Upload images to application.

Group images and link them appropriately to create a digital mind map.

Export mind map as a jpeg.

DIGITAL TECHNOLOGIES

Years 3-4

Collect, access and present different types of data using simple software to create information and solve problems.

- sort numerical and categorical data in ascending or descending order;
- automate simple arithmetic calculations using nearby cells and summing cell ranges in spreadsheet or database software;
- recognise that all types of data are stored in digital systems and may be represented in different ways such as files and folders with names and icons.

TASK

Year 3 - 4

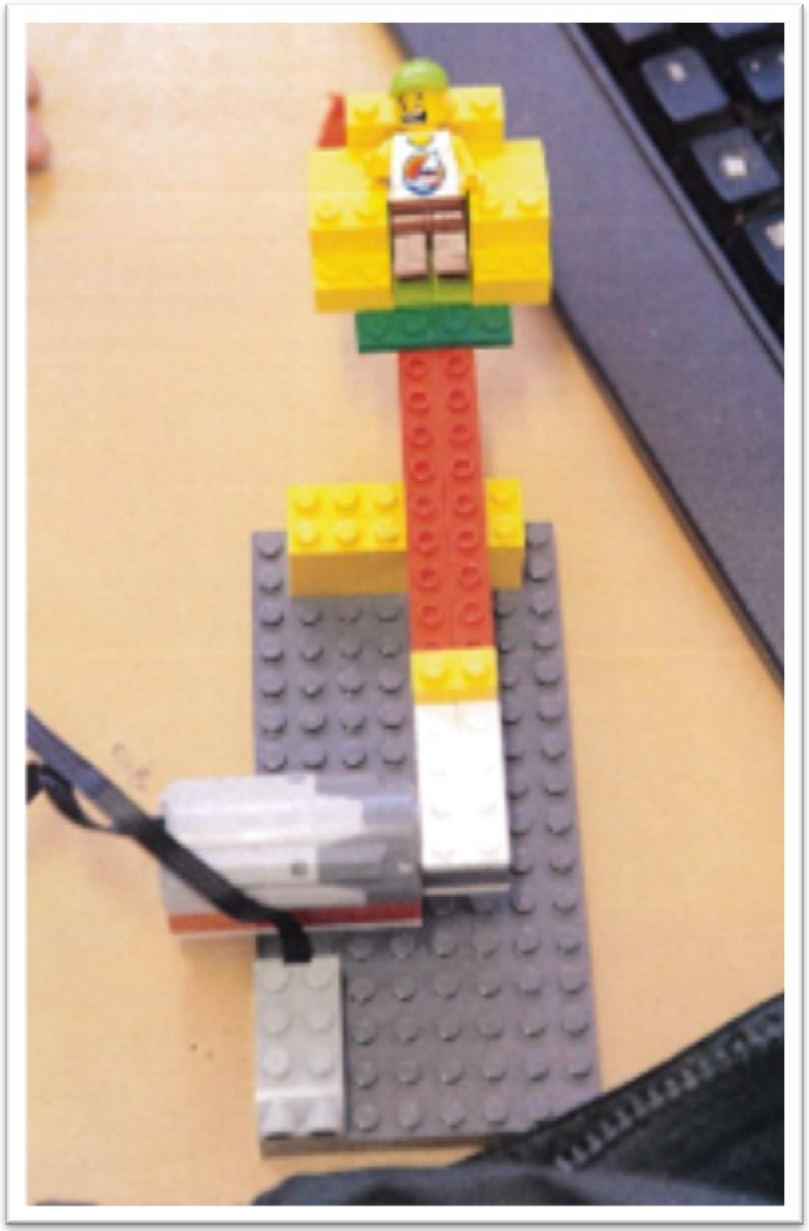
How do you rescue Rapunzel from the tower in 60 seconds?

Students work in teams to design, build and program a device to safely rescue Rapunzel.

Students must use tilt and motion sensors to control the device, use appropriate sounds and backgrounds, create a timer, and use simple engineering principles and systems.

The device must be sturdy, have at least three safety features.

Teams demonstrate their rescue model to the class and explain their science, engineering and programming choices.



Work Sample - Satisfactory Level

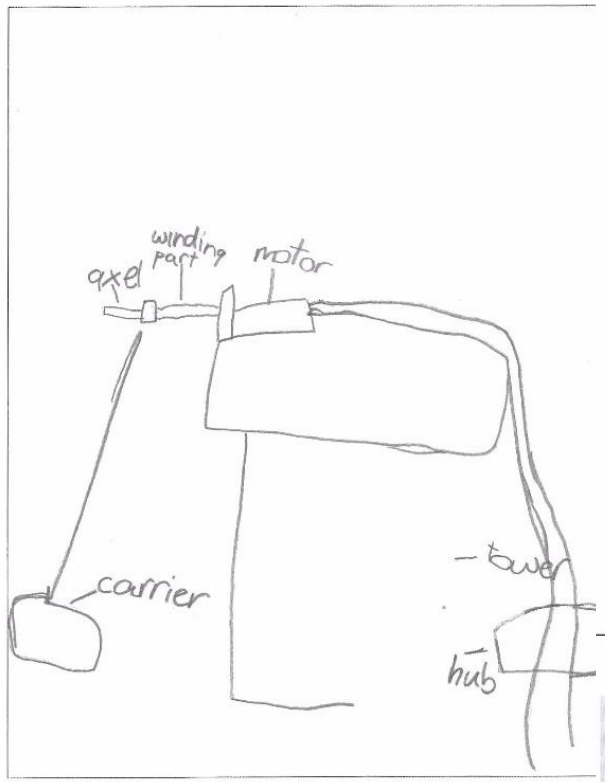
Year 3 / Year 4 *(Satisfactory Level)*

Saving Rapunzel from the tower

Write the design brief in your own words using Word and insert into the document.

The prince wants to save Rapunzel from the tower. He has 60 seconds. We need to build a Lego lifter to save them.

Draw and label your model (use pencil). Include the safety features, gears, pulley, motor, tilt sensor and motion sensor in your answer.



Explain how your model works. (Use the following words: gear, pulley, motor, tilt sensor, motion sensor and safety features).

A string attached to the carrier wound around a twisted part and pulled up the carrier. It then waits because of a timer in the program and ~~goes~~ winds again.

Insert an image of your program code and explain it.

What did you like best about your model and how it worked?

Rapunzel and the Prince had time to get off and on.

What did you find difficult about saving Rapunzel?

At first it would not wind up. It got tangled up in knots and wouldn't wind around. It couldn't go fast enough

If you had more time how would you improve on your attempt to save Rapunzel?

I would make a motion sensor to know when Rupunzel got on. I would also make it go faster so it could only use less than one minute.

Insert an image of the model you created.

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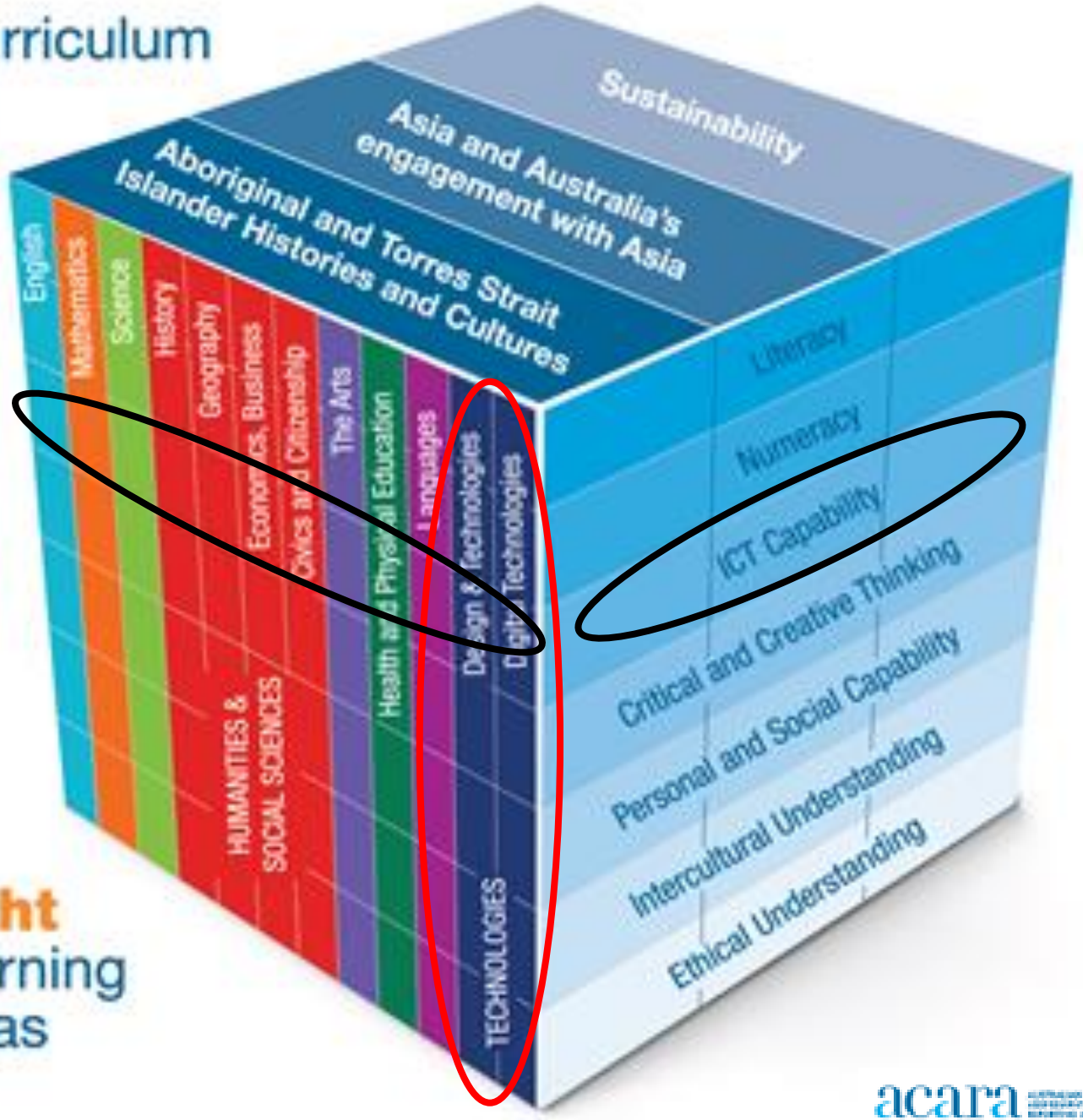

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DIGITAL TECHNOLOGIES HUB

What's the difference between ICT Capability and Digital Technologies?

Information Communication Technology (ICT) Capability

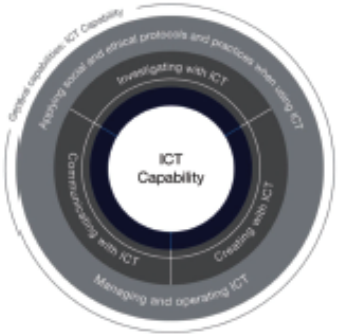
A general capability taught within all curriculum areas for students in years F–10.

Develops skills and understandings in managing and operating ICT to investigate, create and communicate.

Incorporates digital citizenship when considering the ethical and social impacts of using technologies.

Is explicitly planned and taught in all subject areas.

ICT supports students to be effective users of technology.



Digital Technologies

A new subject for F–10 (optional in 9–10) students with new and unique skills and content.

Develops knowledge, understandings and skills of the underlying concepts of information systems, data and computer science.

Encourages students to design and create digital solutions that solve problems taking their preferred futures into consideration.

Must be assessed and reported at least once every two years.

Digital Technologies build on and extend ICT, moving students from technology consumers to creators.

Use ICT

- Presentation tools
- Locate information
- Digital publishing
- Interpret timelines
- Ownership and use
- Managing files
- Mapping and geospatial tools
- Online communication
- Digital music / multimedia


Spreadsheets and graphing


Analyse and visualise data

Cyber safety

Create solutions and learn about Digital Technologies

- Digital systems (networks)
- Robotics and automation


Coding and programming

- Computational thinking


User interface design


Storing and transmitting data (binary numbers)

- Pattern recognition


Algorithms


Programming boards

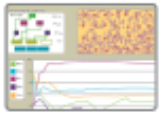
- Data collection

Examples of ICT in action

Use digital concept mapping tools to plan and select research tasks.


Use presentation software to present findings of an inquiry that includes text, images and video.

Use video to analyse a sports performance to provide coaching tips.


Use a computer simulation or game to test predictions and collect data.

Use a search engine effectively as a research tool.


Use spreadsheet functions to create tables, record, sort, calculate and present data to identify trends.

Use an online game that has a grid map system to learn about directions.

Examples of Digital Technologies in action

Create and code an image using black and white squares. Invite a classmate to decode and recreate the image.


Compare a transport network and computer network to explore ideas about pathways, reliability, protocols and security.

Create an interactive story with user-input using a familiar programming language.


Create your own simulation using a visual or text-based programming language.

Explore ways to securely transmit data through techniques of encryption and decryption.


Create network diagrams to identify relationships between different sources of data (eg friends on social media) and analyse this data.

Design your own maze and use an app to program a robot to go through it.

ICT General Capabilities

DEVELOPMENT of SKILLS

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

ICT General Capabilities

ENGLISH

Prep: Understand concepts about print and screen, including how books, film and simple digital texts work. Construct text using software including word-processing programs.

Year 1: Recreate texts imaginatively using drawing, writing, performance and digital forms of communication. Construct texts that incorporate supporting images using software including word-processing programs.
Year 2: Construct texts featuring print, visual and audio elements using software, including word processing programs.

Year 3: Identify the features of online texts that enhance navigation. Elaborations: becoming familiar with the typical features of online texts: navigation bars and buttons, hyperlinks and sitemaps.
Plan, draft and publish imaginative, informative and persuasive texts. Elaborations: using print and digital resources to gather information about a topic.

Year 4: Identify features of online texts that enhance readability including text, navigation, links, graphics and layout. Elaborations: participating in online searches using navigation tools.

Year 5: Use a range of software including word processing programs with fluency to construct, edit and publish written text, and select, edit and place visual, print and audio elements. Elaborations: writing letters in print and by email.

ICT General Capabilities

MATHEMATICS

Year 2: Investigate the effect of onestep slides and flips with and without digital technologies ACMMG045

Year 3: Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies ACMNA057

Year 4: Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data value ACMSP096

Year 5: Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original ACMMG115 –elaboration: using digital technologies to enlarge shapes

Year 6: Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies ACMSP145

ICT skills in English

The table below highlights some examples, within the subject English that embed the use Information Communication Technologies (ICT) skills.

Prep	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understand that screen, including how books, film and simple digital texts work, and know some features of print, for example directionality ACELA1433 – the elaboration says: learning about simple functions of keyboard and mouse including typing letters, scrolling, selecting icons and dropdown menu	Understand concepts about print and screen, including how different types of text are organised using page numbering, tables of content, headings and titles, navigation buttons, bars and links ACELA1450 – the elaborations say: learning about how books and digital texts are organised including page numbers, table of contents, headings, images with captions and the use of scrolling to access digital texts	Know some features of text organisation including page and screen layouts, alphabetical order, and different types of diagrams, for example timelines ACELA1466 – the elaborations say: learning about features of screen texts including menu buttons, drop down menus, links and live Connections	Identify the features of online texts that enhance navigation ACELA1790 – the elaborations say: becoming familiar with the typical features of online texts, for example navigation bars and buttons, hyperl...	Identify features of online texts that enhance readability including text, navigation, links, graphics and layout ACELA1793 – the elaborations say: participating in online searches for information using navigation tools...	Understand how texts vary in purpose, structure and topic as well as the degree of formality ACELA1504 – the elaborations say: becoming familiar with the typical stages and language features of such...	[illegible]
Recognise that texts are created by authors who tell stories and share experiences that may be similar or different to students' own experiences ACELT1575 – the elaboration says: - viewing stories by Aboriginal and Torres Strait Islander storytellers from online sources - engaging with texts that reflect the social and cultural groups to which students belong	Recreate texts imaginatively using drawing, writing, performance and digital forms of communication ACELT1586 – the elaborations say: recalling key events in stories using oral language, arts, digital technologies and performance media	Discuss how depictions of characters in print, sound and images reflect the contexts in which they were created ACELT1587 – the elaborations say: recognising recurring characters, settings and themes in Dreaming stories experienced through texts, films and online sources	[illegible]			
Retell familiar literary texts through performance, use of illustrations and images ACELT1580 – the elaborations says: using digital technologies to recall events and recreate characters from favourite print and film texts	Use comprehension strategies to build literal and inferred meaning about key events, ideas and information in texts that they listen to, view and read by drawing on growing knowledge of context, text structures and language features ACELY1660 – the elaborations say: using elements in books and screen texts, for example illustrations, diagrams, sound and movement, to support reading recalling the events or key information in the text orally, in writing and/or through digital or arts media	Identify aspects of different types of literary texts that entertain, and give reasons for personal preferences ACELT1590 – the elaborations say: drawing, writing and using digital technologies to capture and communicate favourite characters and events	[illegible]			
Use interaction skills including listening while others speak, using appropriate voice levels, articulation and body language, gestures and eye contact ACELY1784 – the elaboration says: listening and responding to oral and multimodal texts including rhymes and poems, texts read aloud and various types of digital texts	Create short imaginative and informative texts that show emerging use of appropriate text structure, sentence-level grammar, word choice, spelling, punctuation and appropriate multimodal elements, for example illustrations and diagrams ACELY1661 Construct texts that incorporate supporting images using software including processing programs ACELY1664 – the elaborations say: creating digital images and composing a story or information sequence on screen using images and captions adding images to digital written communications such as emails with pictures of self, classmates or location	Discuss the characters and settings of different texts and explore how language is used to present these features in different ways ACELT1591 – the elaborations say: investigating Aboriginal stories, found from online sources, that explain physical features of the landscape and identify and describe the common features of language used	[illegible]			
Create texts short texts to explore, record and report ideas and events using familiar words and beginning writing knowledge ACELY1651 – the		Create events and characters using different media that develop key events and characters from	[illegible]			

ICT skills in Mathematics

The table below highlights some examples, within the subject Mathematics that embed the use Information Communication Technologies (ICT) skills.

Prep	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Investigate the effect of one-step slides and flips with and without digital technologies ACMMG045	Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies ACMNA057	Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder ACMNA076	Solve problems involving multiplication of large numbers by one or two digit numbers using efficient mental, written strategies and appropriate digital technologies ACMNA100	Identify and describe properties of prime, composite, and triangular numbers ACMNA122 – the elaboration says - representing composite numbers as a product of their prime factors and using this form to simplify calculations by cancelling common primes
			Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies ACMSP069	Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies ACMNA080	Use efficient mental and written strategies and apply appropriate digital technologies to solve problems ACMNA291	Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers ACMNA123
				Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies ACMMG088	Connect three-dimensional objects with their nets and other two-dimensional representations ACMMG111 – the elaboration says: representing two-dimensional shapes such as photographs, sketches and images created by digital technologies	Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies ACMNA127
				Create symmetrical patterns, pictures and shapes with and without digital technologies ACMMG091	Describe translations, reflections and rotations of shapes. Identify and rotational symmetries ACMMG114 – the elaborations say; identifying and describing the line and rotational symmetry of a range of two-dimensional shapes, by manually cutting, folding and turning shapes and by using digital technologies	Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers ACMNA128
				Compare angles and classify them as equal to, greater than, or less than, a right ACMMG089 – the elaboration says: creating angles and comparing them to a right angle using digital technologies	Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original ACMMG115 – the elaboration says: using digital technologies to enlarge shapes	Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies ACMNA129
				Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data value ACMSP096	Construct displays, including column graphs, dot plots and tables, appropriate for type, with and without the use of digital technologies ACMSP119	Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies ACMNA132
						Solve problems involving the comparison of lengths and areas using appropriate units ACMMG137 – the elaboration says: recognising and investigating familiar objects using concrete materials and digital technologies
						Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies ACMMG142
						Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles ACMMG141
						Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies ACMSP145
						Interpret secondary data presented in digital media and elsewhere ACMSP148

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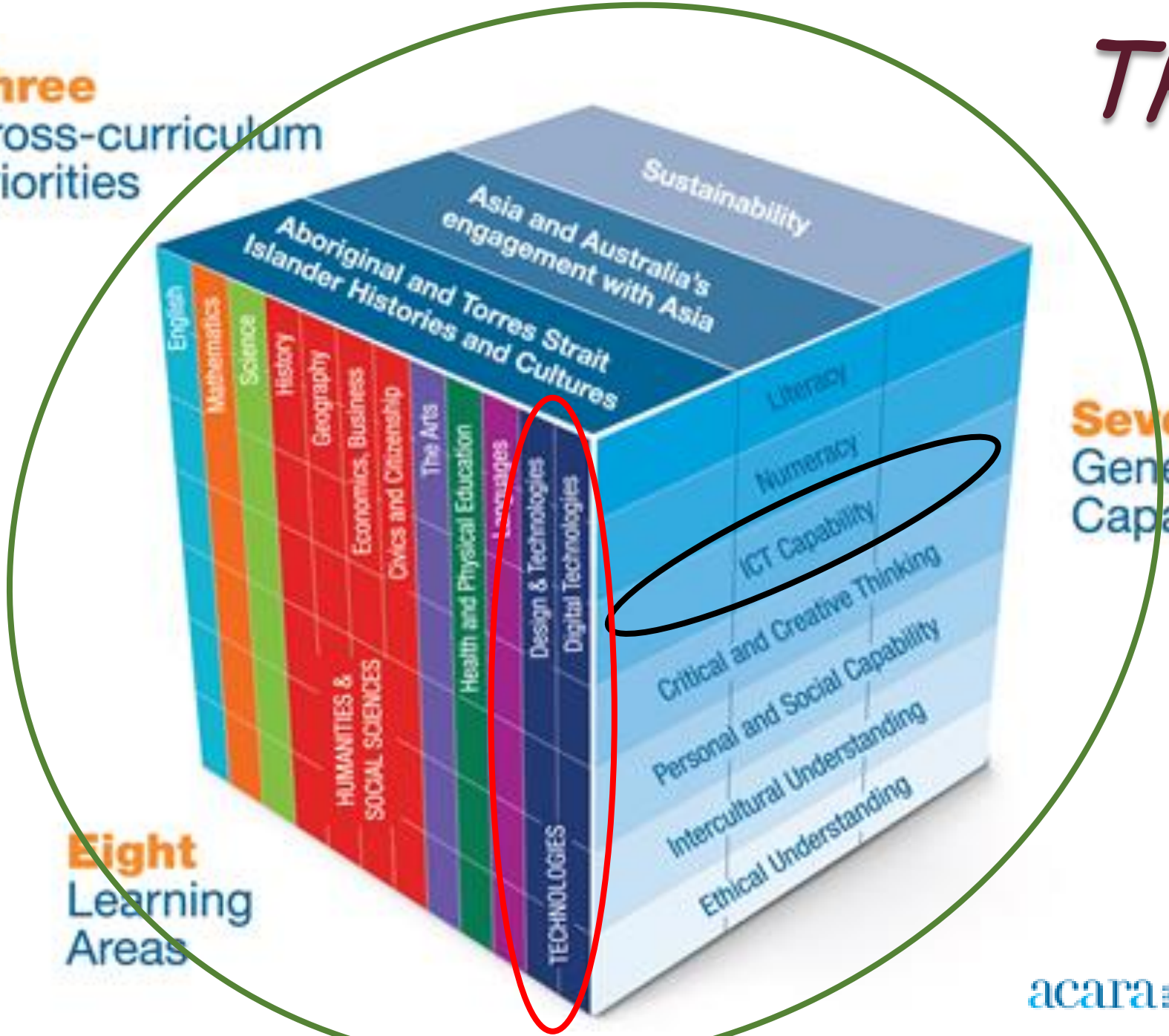

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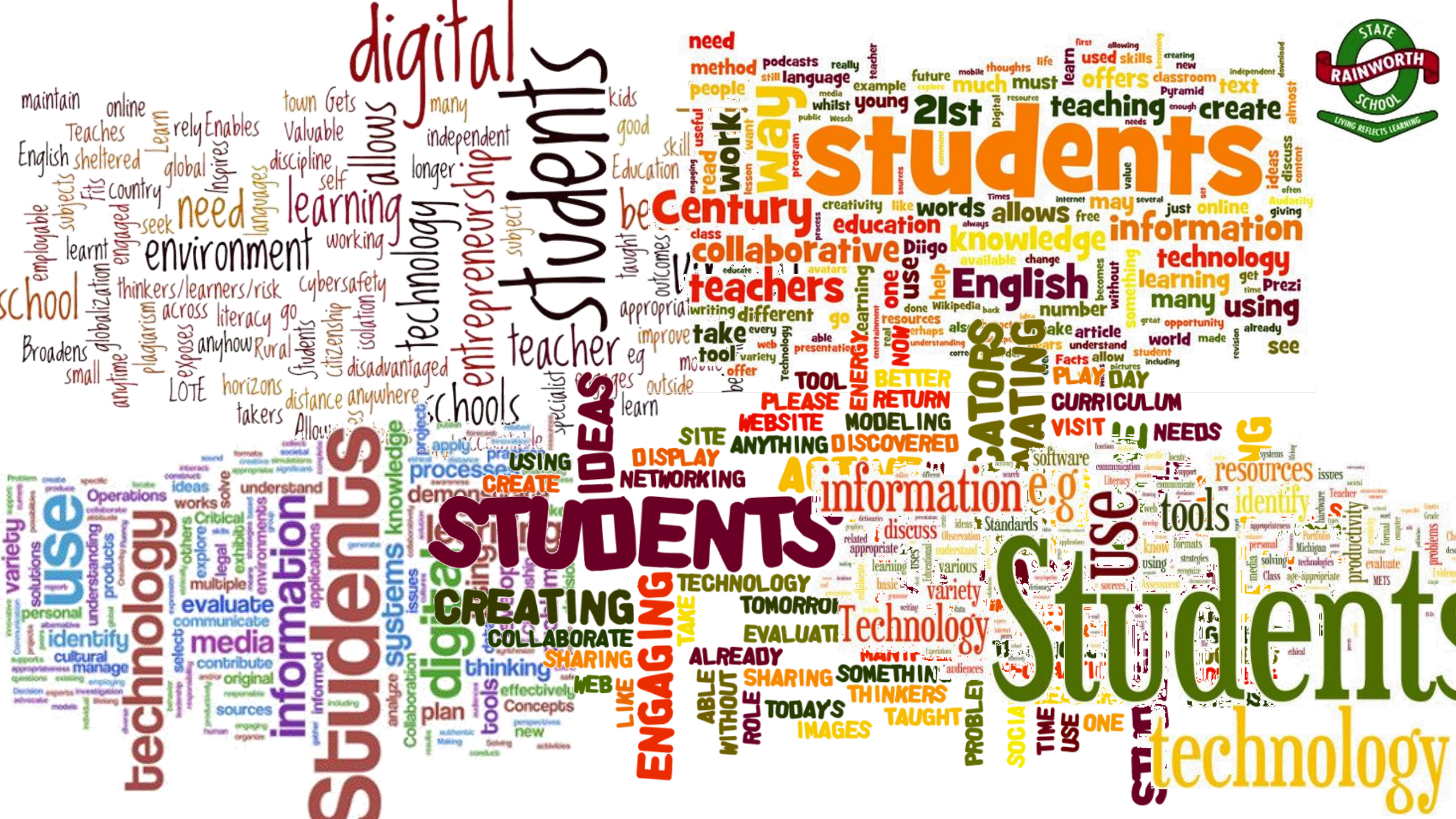
STATE
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LIVING REFLECTS LEARNING
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Cybersafety
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plagiarism
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variety
Observation
appropriate
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various
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productivity
evaluate
problems
Michigan
Portfolio
Class
age-appropriate
technologies
METS
technology

Like the chalkboard of our school days, the best technologies fade into the background – they weave themselves into the fabric of everyday life until they are indistinguishable from it.

Douglas Fisher & Nancy Frey

Chapter 10 – 21st Century Skills

It is better to
KNOW HOW TO LEARN
than to know.

-Dr. Seuss

Q & A