DTiF
Digital Technologies in focus
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Australian Curriculum: Digital Technologies

Years 7–8

Sample assessment task

Evaluating the liveability of a city/town

Assessment focus: Australian Curriculum: Digital Technologies (Data, Investigating and defining, Evaluating)

About this assessment task

This sample assessment task has been prepared to assist teachers with the implementation of the Australian Curriculum: Digital Technologies, with a particular focus on *data*. It shows how aspects of the Digital Technologies curriculum related to data can be assessed using contexts from other learning areas and subjects. These contexts may be content that students have recently completed or are learning concurrently. This approach should enhance the manageability of the curriculum while still providing a targeted focus on Digital Technologies.

Purpose

The sample task aims to:

- demonstrate meaningful curriculum links to:
  - Digital Technologies curriculum:
    - achievement standard
    - content descriptions
    - content strands
    - key concepts
    - key ideas (Technologies)
  - general capabilities
  - cross-curriculum priorities
  - other learning areas. See Appendix 1 for detailed links.
- provide teacher support materials, suggested adjustments for students with diverse needs, and resources. See Appendix 2.
- provide a template to create your own assessment task. See Appendix 3.

How to use this sample task

The sample task can be implemented as a standalone task, or it can be used to inform planning of a:

- unit of work that might accompany the sample task
- similar task and/or unit of work with a focus on data.

Title: Evaluating the liveability of a city/town

Assessment focus: Australian Curriculum: Digital Technologies (Data, Investigating and defining, Evaluating). This task is also linked to Geography. Depending on modifications made, opportunities may exist to link this task to Numeracy.

Band: Years 7 and 8 (intended cohort Year 7)

Duration: Dependent on how the task is to be implemented

Prior learning: As this task is planned for a Year 7 cohort it is anticipated that students will have created and evaluated digital solutions and existing examples. They will have created presentations of data in other learning areas such as Mathematics and Science.

In Year 6 Digital Technologies students will have had the opportunity to:

- acquire, store and validate different types of data, and use a range of software to interpret and visualise data to create information (ACTDIP016)
- define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017)
- explain how student solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021).

Task summary

Using a newspaper article as stimulus material, students will investigate the validity of claims about the extent to which their city/town is liveable, using measures they define. As an extension, students could develop a liveability app that could direct users to appropriate community resources.

Students will:

- investigate how digital systems represent text, image and audio data in binary (ACTDIK024)
  - Investigate how text in datasets is represented and how that representation affects the design of digital solutions that rely on qualitative data; for example, addresses that don't have a postcode in a different column or field cannot be sorted on postcode, hence making comparisons difficult or impossible. Postcodes may be interpreted as text, making numerical operations very difficult. Upper case text will sort differently to lower case, as the numbers representing that case differ in a typical (ASCII) code.
- define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
  - Decompose a situation that requires the analysis of data. A sample inquiry may have students presented with a scenario from a local newspaper indicating dissatisfaction with the local community including the provision of suitable activities for young people. A question could be posed: What could be done to test if the claim is truthful?
  - Define the specifications for the inquiry question. Students should investigate the situation and identify the key elements and constraints.

- acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
  - Acquire data. Download survey data from a source, e.g. Australian Bureau of Statistics, My School.
  - Consider its authenticity: Who provided data? Are they authoritative for those data? Perhaps lead a discussion regarding biases, e.g. Might surveying people on Saturday morning at the shopping centre only get those who are not playing sport?
  - Consider accuracy: What can I use to measure an entity? Is the sample size sufficient? Are questions ambiguous? How might we represent data as a number?
  - Consider timeliness: Are the data current? That is, has something changed that may have influenced the data? Has something happened to invalidate trends/analysis?
- analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
  - Analyse structured data. Spreadsheet and other computer-based analyses require structured data; for example, an address of '127 Eel St Parramatta 2150' is not useful if the addresses are to be sorted on postcode. If I want to send a paper mail to all people in a region, then I find them only if the postcode is numeric and in a separate column. If I want to sort on family name, I need it separately as well.

Name	**Address**
Ray Price	127 Eel St Parramatta 2150

Figure 1: unstructured data example

FirstName	**FamilyName**	**Number**	**Street**	**Suburb**	**Postcode**
Ray	Price	127	Eel St	Parramatta	2150

Figure 2: structured data example

  - Review unstructured data and consider what problems made analysis impossible. If available, use unstructured data in a task which students have to convert, or perhaps have structured data available to skip the conversion step. Students should use a spreadsheet to bring structure to data; for example, by using formulas to separate addresses into discrete street, suburb and postcode fields. Some examples of suitable formulas that perform part of this task could be given to students. Discuss the assumptions on the format of the original data and identify exceptions.

  - Analyse trends. Consider measures of uncertainty and central tendency; for example, mean, median, mode and range. What can be done with outliers? Would a pivot table be a better way of analysing?
  - Visualise data, possibly as charts, animations, infographic or cartographic presentations. Students should give reasons for the chosen approach. Consider the suitability of the visualisation for the data and the audience. Are x, y scales appropriate?
  - Model trends. Chart data to determine a trend and, consider whether a trend only exists for a few data points, for example the number of ice creams plotted against temperature may only show an upward trend between 10 °C and 40 °C.
- evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)
  - Define the 'need' from a teacher-supplied specification.
  - Identify risks from a trend analysis for a range that is out of scope. For example, ice cream sales increase in a linear fashion with temperature, but this trend won't continue much past 40 °C.
  - Use their data analyses to establish the level of support for a hypothesis.
  - Use basic statistical measures, such as average, on data to support or challenge the stated hypothesis.
- plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)
  - Plan how the task will be done, including how time will be allocated, which people need to be involved and what other resources may be needed.
  - Create a database from a range of sources. This will present a liveability index and propose action(s) in response to their geographical inquiry question.
  - A spreadsheet or database engine could be used to average elements of the index, perhaps with weighting of each element. This could be used to answer questions such as: Should I buy real estate in my town? How does my town/city compare with a neighbouring town/city?

The process will be documented using the structure of the Digital Technologies processes and production skills strand for Years 7–8: investigating and defining; generating and designing; producing and implementing; evaluating; collaborating and managing.

Background information

Datasets can be sourced from a variety of places. See Appendix 2.

Teacher guidance and support

Teachers should:

- lead discussion on:
  - where data can be found (for example Figure 3)
  - their reliability, their form
  - analysis techniques
  - how data can inform decisions
- provide guidance in evaluation of datasets
- provide guidance on planning and recording the use of time, people and resources for this project.

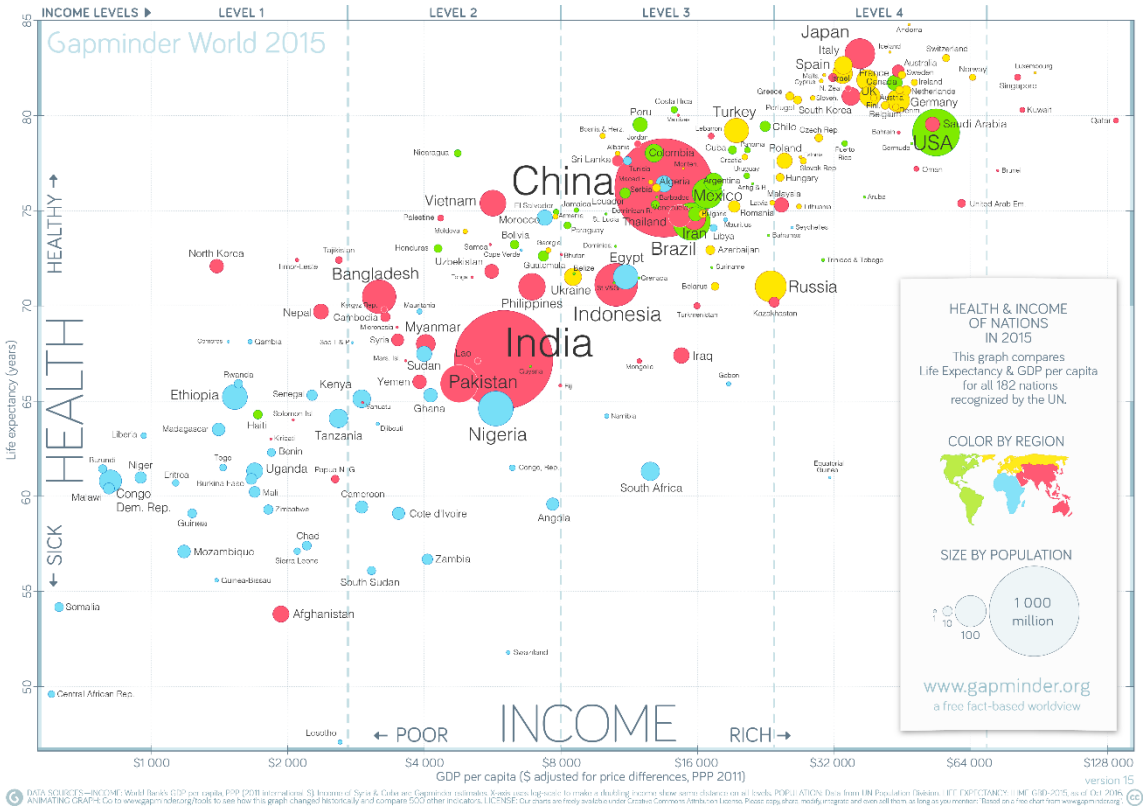

Figure 3: Bubble chart showing liveability data in various countries around the world
Source: www.gapminder.org (Creative Commons CC BY licence)

Links to the Australian Curriculum

Table 1 shows the related Australian Curriculum links to this task. For a more in-depth exploration of the links to the curriculum, see Appendix 1.

Table 1: Links from the task to the Australian Curriculum

Digital Technologies ***Achievement standard*** Aspects addressed by this task are highlighted.	By the end of Year 8, students distinguish between different types of networks and defined purposes. They explain how text, image and audio data can be represented, secured and presented in digital systems. Students plan and manage digital projects to create interactive information. They define and decompose problems in terms of functional requirements and constraints. Students design user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. They evaluate information systems and their solutions in terms of meeting needs, innovation and sustainability. They analyse and evaluate data from a range of sources to model and create solutions. They use appropriate protocols when communicating and collaborating online.
Content strands	Digital Technologies knowledge and understanding • Representation of data Digital Technologies processes and production skills • Collecting, managing and analysing data • Creating designed solutions by – investigating and defining – evaluating – collaborating and managing
Content descriptions	• Investigate how digital systems represent text, image and audio data in binary (ACTDIK024) • Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025) • Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026) • Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027) • Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031) • Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

Key concepts	• specification • data collection • data representation • data interpretation • algorithms • implementation • impact	***Key ideas***	• Thinking in Technologies – computational thinking – design thinking – systems thinking
Cross-curriculum priorities	• Sustainability	***General capabilities***	• Information and Communication Technology (ICT) Capability • Ethical Understanding • Personal and Social Capability

Assessment

Assessment planner

Achievement standard (relevant aspect of the achievement standard to be assessed)	**Student evidence** (what student evidence will be considered to judge if the achievement standard aspect has been met)
Digital Technologies	Student:
explain how text, image and audio data can be represented, secured and presented in digital systems	• explains the relationship between text data and how they are represented and presented in digital systems (qualitative data such as Likert scale presented as numeric data)
define and decompose problems in terms of functional requirements and constraints	• creates a mind map of the decomposition of the situation and identifying key elements and constraints • identifies the evaluation criteria for a solution
plan and manage digital projects	• creates a database from two or more datasets related to liveability • calculates a liveability index (a value) from the collected data • creates an appropriate visualisation of the data analysis to meet the specifications*

evaluate information systems and their solutions in terms of meeting needs, innovation and sustainability	• identifies limits and assumptions of their analysis • describes how their database solution meets identified needs • explains the innovative features of the proposed solution
analyse and evaluate data from a range of sources to model and create solutions	• responds to questions about their datasets; for example, authenticity, accuracy and timeliness • analyses trends, including measures of uncertainty and central tendency presented as statements • describes how they reviewed unstructured data to meet specifications • creates an appropriate visualisation of the data analysis to meet the specifications* • justifies the appropriateness of the conclusion for the defined purpose of the geographical inquiry

* Specifications of the task as agreed between the student and the teacher

Sample assessment rubric Years 7–8 (Data)

The rubric below shows only Digital Technologies achievement standard. **Note:** Not all rubric entries included may be needed. Teachers should choose only those that apply to their situation. There are opportunities to include Geography and Numeracy in the assessment.

Digital Technologies Processes and production skills	**Above standard** Students:	**At standard** Students:	**Below standard** Students:
Collecting, managing and analysing data (Authenticity)	identify sources and confirm data with another authoritative source	identify sources and describe why they are authoritative for the data	identify source and state or assume that it is authoritative
(Accuracy)	compare statements made by data provider with other providers to check accuracy and validity	refer to statements by the supplier of the data and make their own statement to verify/support the claim	record a personal statement about accuracy
(Timeliness)	describe how the collection time is relevant to the questions asked of the data and explain how data are only truly reflective of the current time	describe how the collection time is relevant to the questions asked of the data	make inaccurate statements about the importance of timeliness
(Analyse data)	identify trends and relationships between datasets using visualisation tools and examine correlations with other datasets	identify trends and relationships between datasets using visualisation tools	identify some trends and relationships between datasets
(Visualise data)	create effective visualisation for an identified audience (chart, trend line, cartographic, heat map with appropriate scales on all axes) and justify how the visualisation aids interpretation	create appropriate visualisation (chart, trend line, cartographic, heat map with appropriate scales on all axes) and explain how the visualisation aids interpretation	create a visualisation with limited features and explanation

Digital Technologies Processes and production skills	**Above standard** Students:	**At standard** Students:	**Below standard** Students:
(Structured data)	plan and organise data to enhance collection and analysis of data	explain how the structure of the data aids analysis	use data that are unstructured without attempting to structure them
(Model)	describe and justify any processes used to alter, simplify or otherwise improve the provided structure to enable alternative analysis techniques identify and explain the different ways trends can be mapped from the existing datasets	describe any processes used to alter, simplify or otherwise change the provided structure to enable alternative analysis techniques identify the extent to which trends can be mapped from the existing datasets	list steps to analyse data identify a trend
Investigating and defining **(Define and decompose)**	decompose the situation and identify key elements and constraints including justification identify a comprehensive set of evaluation criteria	decompose the situation and identify key elements and constraints identify the evaluation criteria for a solution	decompose the situation and identify some elements and constraints identify some appropriate evaluation criteria for a solution
Evaluating	outline possible data inconsistencies and suggest improvements to collection and/or analysis	relate findings to specification and present a conclusion	give findings but do not relate or make minimal reference to specifications

Appendix 1

Australian Curriculum links (in detail)

Links to the Australian Curriculum

Digital Technologies

Achievement standard

By the end of Year 8, students distinguish between different types of networks and defined purposes. They explain how text, image and audio data can be represented, secured and presented in digital systems.

Students plan and manage digital projects to create interactive information. They define and decompose problems in terms of functional requirements and constraints. Students design user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. They evaluate information systems and their solutions in terms of meeting needs, innovation and sustainability. They analyse and evaluate data from a range of sources to model and create solutions. They use appropriate protocols when communicating and collaborating online.

Content descriptions

Investigate how digital systems represent text, image and audio data in binary (ACTDIK024)

Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)

Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)

Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)

Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)

Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

Content strands

Digital Technologies knowledge and understanding		Digital Technologies processes and production skills	
Representation of data	X	Collecting, managing and analysing data	X
Digital systems		Creating digital solutions by: • investigating and defining	X
		• generating and designing	
		• producing and implementing	
		• evaluating	X
		• collaborating and managing	X

Links to the key ideas

Creating preferred futures	Students develop solutions to meet needs considering impacts on liveability, economic prosperity and environmental sustainability.	
Project management	Students will develop skills to manage projects to successful completion through planning, organising and monitoring timelines, activities and the use of resources.	
Thinking in Technologies • Systems thinking	Systems thinking is a holistic approach to the identification and solving of problems where the focal points are treated as components of a system, and their interactions and interrelationships are analysed individually to see how they influence the functioning of the entire system.	X
• Design thinking	Design thinking involves the use of strategies for understanding design needs and opportunities, visualising and generating creative and innovative ideas, planning, and analysing and evaluating those ideas that best meet the criteria for success.	X
• Computational thinking	Computational thinking is a problem-solving method that is applied to create solutions that can be implemented using digital technologies. It involves integrating strategies, such as organising data logically, breaking down problems into parts, interpreting patterns and models and designing and implementing algorithms.	X

Read more about the key ideas in the Australian Curriculum: Technologies.

Links to the key concepts

The key concepts that underpin the Digital Technologies curriculum establish a way of thinking about problems, opportunities and information systems and provide a framework for knowledge and practice. (Colour coding is based on the Australian Computing Academy scheme.)

	abstraction	underpins all content, particularly the content descriptions relating to the concepts of data representation, and specification, algorithms and implementation	
	data collection	(properties, sources and collection of data)	
	data representation	(symbolism and separation) • Likert scale or similar	X
	data interpretation	(patterns and contexts) • visualisation and drawing conclusion(s)	X
	specification	(descriptions and techniques) • design of data flow from collection through to representation and interpretation; that is, what data will be collected and in what form it will be collected to inform the final decision	X
	algorithms	(following and describing) • clean-up of datasets	X
	implementation	(translating and programming) • final report/presentation/recommendations	X
	digital systems	(hardware, software, and networks and the internet)	
	interactions	(people and digital systems, data and processes)	
	impact	(sustainability and empowerment) • evaluating hypothesis in light of data	X

Cross-curriculum priorities Read more …

Aboriginal and Torres Strait Islander histories and cultures	Asia and Australia's engagement with Asia	Sustainability
		X

General capabilities Read more …

Literacy	Numeracy	ICT Capability	Critical and Creative Thinking	Ethical Understanding	Personal and Social Capability	Intercultural Understanding
X	X	X		X	X	

Links to ICT Capability continuum: Level 5 Read more …

Depending on the year level, please adjust content to appropriate level.

Applying social and ethical protocols and practices when using ICT	
apply practices that comply with legal obligations regarding the ownership and use of digital products resources	X
independently apply strategies for determining the appropriate type of digital information suited to the location of storage and adequate security for online environments	
identify and value the rights to identity, privacy and emotional safety for themselves and others when using ICT and apply generally accepted social protocols when using ICT to collaborate with local and global communities	X
explain the benefits and risks of the use of ICT for particular people in work and home environments	
Investigating with ICT	
use a range of ICT to analyse information in terms of implicit patterns and structures as a basis to plan an information search or generation	X
locate, retrieve or generate information using search facilities and organise information in meaningful ways	X
assess the suitability of data or information using appropriate own criteria	X
Creating with ICT	
use appropriate ICT to collaboratively generate ideas and develop plans	X
design and modify simple digital solutions, or multimodal creative outputs or data transformations for particular audiences and purposes following recognised conventions	X
Communicating with ICT	
select and use appropriate ICT tools safely to lead groups in sharing and exchanging information, and taking part in online projects or active collaborations with appropriate global audiences	

understand that there are various methods of collaboration through computer mediated communications that vary in form and control	
Managing and operating ICT	
independently select and operate a range of devices by adjusting relevant software functions to suit specific tasks, and independently use common troubleshooting procedures to solve routine malfunctions	X
identify and compare networked ICT system components including between hardware, software and data	
manage and maintain data for groups of users using a variety of methods and systems	X

Links to Literacy

In this Year 7–8 task in Digital Technologies, students have the opportunity to develop literacy by comprehending texts through listening, reading and viewing; composing texts through speaking, writing and creating; and using grammar, word and visual knowledge. They practise literacy skills as they listen to instructions and identify and respond to key information in spoken and multimodal texts, compose and edit learning area texts, and use language to interact with others. As students record observations, connect and express ideas, and make comparisons, they apply their knowledge of grammar and use subject-specific vocabulary. Students also use language to evaluate an object, action or text, and language that is designed to persuade the reader/viewer.

Visit Literacy general capability https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/literacy/

Visit National Literacy Learning Progression
https://www.australiancurriculum.edu.au/resources/national-literacy-and-numeracy-learning-progressions/national-literacy-learning-progression/

Links to Numeracy

In this Year 7–8 task in Digital Technologies, students have the opportunity to develop numeracy by identifying trends using number rules and relationships.

In using software, materials, tools and equipment, students have opportunities to model, represent, order and use numbers in real-life situations. They gather, record and display data as tables, diagrams and graphs; explain findings; and recognise patterns. They compare, interpret and assess the effectiveness of different data displays of the same information.

Visit Numeracy general capability https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/numeracy/

Visit National Numeracy Learning Progression
https://www.australiancurriculum.edu.au/resources/national-literacy-and-numeracy-learning-progressions/national-numeracy-learning-progression/

Links to other learning areas

HASS: Geography

Links to the Year 7 Geography achievement standard (Aspects addressed by the task are highlighted.)

- describe geographical processes that influence the characteristics of places and how the characteristics of places are perceived and valued differently
- explain interconnections within people and places and environments and between people and places and describe how these interconnections change places and environments
- describe alternative strategies to a geographical challenge referring to environmental, economic and social factors
- identify geographically significant questions to frame an inquiry
- evaluate a range of primary and secondary sources to locate useful information and data
- record and represent data and the location and distribution of geographical phenomena in a range of forms, including large-scale and small-scale maps that conform to cartographic conventions
- interpret and analyse geographical maps, data and other information to propose simple explanations for spatial distributions, patterns, trends and relationships, and draw conclusions
- present findings and arguments using relevant geographical terminology and digital technologies in a range of communication forms
- propose action in response to a geographical challenge, taking account of environmental, economic and social factors, and describe the expected effects of their proposal

Content descriptions: Geographical Inquiry and Skills

Collecting, recording, evaluating and representing

Evaluate sources for their reliability and usefulness and select, collect and record relevant geographical data and information, using ethical protocols, from appropriate primary and secondary sources (ACHGS048)

Interpreting, analysing and concluding

- Interpret geographical data and other information using qualitative and quantitative methods, and digital and spatial technologies as appropriate, to identify and propose explanations for spatial distributions, patterns and trends, and infer relationships (ACHGS051)

Communicating

- Present findings, arguments and ideas in a range of communication forms selected to suit a particular audience and purpose; using geographical terminology and digital technologies as appropriate (ACHGS053)

Reflecting and responding

- Reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic and social considerations, and predict the expected outcomes of their proposal (ACHGS054)

Appendix 2

Support materials

Things to think about

Rich questions and discussion starters

Students with diverse needs

Resources

Support materials

Things to think about

Rich questions and discussion starters

Teachers could have students consider/lead discussion on:

- Who provided the data? Are they authoritative? What criteria do we apply to ensure authority?
- What might cause biases in the data?
- Are the data current? That is, has something changed that may have influenced the data?
- Could something happen to invalidate trends/analysis?

Students with diverse needs

Students who may need simplified, scaffolded support materials might benefit from adjustments such as:

- making the dataset much smaller; that is, taking a subset of records as well as a subset of the fields provided
- providing the data in a more structured form.

Students who need opportunities for extension might benefit from adjustments such as:

- combining datasets together to create data visualisations
- working with datasets that are of interest to them and which may give extra or more diverse information.

Resources

- ACARA Year 7 Geography unit – thematic area 1: Living in a metropolis (see next page) suggests where students might look for an appropriate dataset and criteria to assess the liveability of a city etc.
- The traditional task is followed by a modified version which incorporates Digital Technologies.
- Links to suggested datasets:
  - Australian Bureau of Statistics https://www.abs.gov.au
  - My School https://myschool.edu.au/

Year 7 Geography unit – thematic area 1: Living in a metropolis
Traditional and modified units of study

Links to the Australian Curriculum Year 7 content descriptions	
Geographical inquiry and skills	*Unit 2: Place and liveability*
Observing, questioning and planning Develop geographically significant questions and plan an inquiry, using appropriate geographical methodologies and concepts (ACHGS047) **Collecting, recording, evaluating and representing** Represent spatial distribution of different types of geographical phenomena by constructing appropriate maps at different scales that conform to cartographic conventions, using spatial technologies as appropriate (ACHGS050) **Interpreting, analysing and concluding** Interpret geographical data and other information using qualitative and quantitative methods, and digital and spatial technologies as appropriate, to identify and propose explanations for spatial distributions, patterns and trends, and infer relationships (ACHGS051) **Communicating** Present findings, arguments and ideas in a range of communication forms selected to suit a particular audience and purpose; using geographical terminology and digital technologies as appropriate (ACHGS053)	• Factors that influence the decisions people make about where to live and their perceptions of the liveability of places (ACHGK043) • The influence of accessibility to services and facilities on the liveability of places (ACHGK044) • The influence of environmental quality on the liveability of places (ACHGK045) • The influence of social connectedness and community identity on the liveability of place (ACHGK046) • Strategies used to enhance the liveability of places, especially for young people, including examples from Australia and Europe (ACHGK047)

Links to the Australian Curriculum Year 7 achievement standard

- Describe geographical processes that influence the characteristics of places and how the characteristics of places are perceived and valued differently
- Explain interconnections between people and places and environments
- Identify geographically significant questions to frame an inquiry
- Record and represent data and the location and distribution of geographical phenomena in a range of forms, including large-scale and small-scale maps that conform to cartographic conventions
- Present findings and arguments using relevant geographical terminology and digital technologies in a range of communication forms

Traditional final (summative) assessment task*

In 2016, The Economist Intelligence Unit released a ranking of 140 cities from around the world based on their 'liveability'. Melbourne, Australia, was ranked 1; Lagos, Nigeria, was ranked 138. However, some people disagreed with these rankings.

Read the following two articles:

www.thecable.ng/world-worst-city-ranking-lagos-liveable (which is pro-Lagos) and

www.smh.com.au/comment/melbourne-the-most-liveable-city-in-the-world-tell-em-theyre-dreamin-20160818-gqvn5z.html (which is anti-Melbourne).

Write two blog entries – one which is anti-Lagos and one which is pro-Melbourne – in which you counter the arguments put forward in these two articles using examples to support each of the following liveability criteria:

- stability
- healthcare
- culture and environment
- education
- infrastructure.

As well as being very careful and accurate in your writing, include at least two visual images in each blog entry and make sure that you acknowledge the source of each image.

* An alternative modified summative task to better suit an integrated Digital Technologies approach is available on page 24.

Teaching strategies for traditional assessment task
Students brainstorm a list of things they do NOT want in the places they live (pollution, noise, crime, traffic congestion, danger, emptiness, extreme heat or cold, isolation etc.) – teacher poses question: Why do people live in places which have these characteristics? – discussion of similarities and differences between urban and non-urban places – teacher facilitates development of 'liveability criteria' (safety, environmental quality, connectedness, cultural identity etc.) by which places (and cities in particular) can be judged – students view a series of teacher-selected images of urban landscapes (streets, buildings, transport services, recreation spaces etc.) and students rank each on an agreed liveability scale) – discussion of factors which cannot be viewed in an image which may have an influence on the liveability rating – students complete a 'Neighbourhood Liveability Survey' of their local community/street (use the template from http://www.geogspace.edu.au/verve/_resources/2.3.3.6_1_assessing_liveability_survey.pdf) and write a scaffolded report of their findings (formative assessment) Students view a collection of aerial images/views/vistas of Noumea and metropolitan Paris: What is similar? What is different? – students complete a comparison chart for Noumea and Paris: population; area/size; climate; services/infrastructure; popular culture Students view video showing historical development of cities, e.g. TedEd: Urbanisation and the future of cities (https://www.youtube.com/watch?v=fKnAJCSGSdk – teacher presents definition of 'metropolis': 'mother city' (Greek) of a region, and how it has become a synonym for 'capital city', 'a large and busy city' – students use Google Earth with the 'Earth at Night' layer turned on to view the spread and intensity of the light emitted by cities around the world: What does this show about the nature and distribution of 'metropolitan areas'? – students use Google Earth to 'fly' to a range of different locations: Melbourne, Lagos, Rio de Janeiro, Tokyo, New York, Paris and complete a chart detailing what they observe: nature and distribution of buildings; patterns of streets; location of commercial centres; location of residential centres; location of transport hubs such as rail, water, air; location of open or recreational areas and facilities – students brainstorm a list of characteristics of a present-day metropolis – link back to the characteristics of liveability

Modified final (summative) assessment task

In 2016, The Economist Intelligence Unit released a ranking of 140 cities from around the world based on their 'liveability'. Melbourne, Australia, was ranked 1; Lagos, Nigeria, was ranked 138. However, some people disagreed with these rankings.

Students read the following two articles:

https://www.thecable.ng/world-worst-city-ranking-lagos-liveable (which is pro-Lagos) and http://www.smh.com.au/comment/melbourne-the-most-liveable-city-in-the-world-tell-em-theyre-dreamin-20160818-gqvn5z.html (which is anti-Melbourne),

and design a survey that they can use to collect data from residents of their neighbourhood to assess how liveable it is. The survey needs to cover the following areas:

- stability
- healthcare
- culture and environment
- education
- infrastructure.

They justify the number and range of people surveyed and analyse the results to prepare a news piece for your local newspaper, radio or television station.

Teaching strategies for modified assessment task

Using the exemplar from:
http://www.geogspace.edu.au/verve/_resources/2.3.3.6_1_assessing_liveability_survey.pdf,
students brainstorm a list of things they want to find out about in the places they live (pollution, noise, crime, traffic congestion, danger, emptiness, extreme heat or cold, isolation, number of doctors per head of population, available jobs etc.).

Under the guidance of the teacher, students design their own survey, adding demographics such as age profile, gender, family income range.

Students use this 'Neighbourhood Liveability Survey' of their local community/street to prepare a news piece reporting their findings.

Appendix 3

Data task planning template

This template is a suggested step-by-step approach that teachers might use to consider whether *all* or *any* of these links apply to an assessment task they develop themselves to better reflect the learning needs of their students and the context of their classroom and school.

Planning template suggested approach

Below is a broad outline of how to use the assessment task planning template on the following pages. It reflects the work of Wiggins and McTighe (2012) on Understanding by Design, which features a backward design approach.

1. Begin with Digital Technologies:
    a. determine the aspects of the achievement standard that will be the focus of the task
    b. highlight the relevant aspects of the standard
    c. identify what knowledge and skills students will need in order to demonstrate the achievement standards (content descriptions)
    d. identify the strands and threads that will need to be addressed.
2. As Digital Technologies is the driving learning area, it is suggested that only the key ideas for this learning area be identified.
3. Indicate the key concepts of Digital Technologies that will be addressed and how.
4. Scan the Australian Curriculum to find meaningful connections between:
    a. learning areas (two learning areas helps keep learning focused, avoid more than three)
    b. general capabilities
    c. cross-curriculum priorities.

    For example, connections could be established on the grounds of:

    a. common concepts/key ideas such as data/design/ways of thinking
    b. common words, such as ‘create’, ‘communicate’ and ‘control’
    c. contexts, from learning areas such as Science, HASS, HPE, The Arts.
5. Indicate what general capabilities and cross-curriculum priorities can be meaningfully addressed in the assessment task.
6. Construct a task that allows for discrimination in performance and includes:
    - title
    - band level
    - duration
    - task summary, including prior learning
    - achievement standards and content descriptions
    - task
    - assessment rubric.

Search for xxxx and replace with your own text.

Title: xxxx

Assessment focus: Australian Curriculum: Digital Technologies (Data). This task is also linked to xxxx. Depending on modifications made, opportunities may exist to link this task to other learning areas.

Band: Years 7 and 8 (intended cohort Year x)

Context: xxxx

Duration: xxxx

Prior learning: Students will have:

- completed activities to acquire, store and validate different types of data, and used a range of software to interpret and visualise data to create information (ACTDIP016)
- defined problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017)
- recognised different types of data and explored how the same data can be represented in different ways (ACTDIK008)
- explained how student solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021).

Task summary

Students will:

- investigate how digital systems represent text, image and audio data in binary (ACTDIP024)
  - investigate how text in datasets is represented and how that representation affects the design of digital solutions that rely on qualitative data.
- acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
  - acquire data
  - consider authenticity
  - consider accuracy
  - consider timeliness.
- analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
  - analyse structured data
  - review unstructured data and consider what problems made analysis impossible
  - analyse trends
  - visualise data

  - model trends.
- define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
  - decompose a situation that requires the analysis of data
  - define the specifications for the inquiry question.
- evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)
  - define the ‘need’ from a specification
  - identify risks from a trend analysis for a range that is out of scope.
- use their data analyses to establish the level of support for a hypothesis
- plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)
  - create a database from a range of sources.

The process will be documented using the structure of the Digital Technologies processes and production skills strand for Years 7–8: investigating and defining; generating and designing; producing and implementing; evaluating; collaborating and managing.

Digital Technologies

Achievement standard

By the end of Year 8, students distinguish between different types of networks and defined purposes. They explain how text, image and audio data can be represented, secured and presented in digital systems.

Students plan and manage digital projects to create interactive information. They define and decompose problems in terms of functional requirements and constraints. Students design user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. They evaluate information systems and their solutions in terms of meeting needs, innovation and sustainability. They analyse and evaluate data from a range of sources to model and create solutions. They use appropriate protocols when communicating and collaborating online.

Content descriptions

Investigate how digital systems represent text, image and audio data in binary (ACTDIK024)

Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)

Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)

Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)

Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)

Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

Content strands [X any that apply]

Digital Technologies knowledge and understanding		Digital Technologies processes and production skills	
Digital systems Representation of data		Collecting, managing and analysing data Creating digital solutions by: • investigating and defining • generating and designing • producing and implementing • evaluating • collaborating and managing	

Links to the key ideas [X any that apply]

Read more about the key ideas in the Australian Curriculum: Technologies.

Creating preferred futures	Students develop solutions to meet needs considering impacts on liveability, economic prosperity and environmental sustainability.	
Project management	Students will develop skills to manage projects to successful completion through planning, organising and monitoring timelines, activities and the use of resources.	
Thinking in Technologies		
• Systems thinking	Systems thinking is a holistic approach to the identification and solving of problems where the focal points are treated as components of a system, and their interactions and interrelationships are analysed individually to see how they influence the functioning of the entire system.	
• Design thinking	Design thinking involves the use of strategies for understanding design needs and opportunities, visualising and generating creative and innovative ideas, planning, and analysing and evaluating those ideas that best meet the criteria for success.	
• Computational thinking	Computational thinking is a problem-solving method that is applied to create solutions that can be implemented using digital technologies. It involves integrating strategies, such as organising data logically, breaking down problems into parts, interpreting patterns and models and designing and implementing algorithms.	

Links to the key concepts

[X any that apply and insert ideas about how they could be addressed]

The key concepts that underpin the Digital Technologies curriculum establish a way of thinking about problems, opportunities and information systems and provide a framework for knowledge and practice. (Colour coding is based on the Australian Computing Academy scheme.)

	abstraction	underpins all content, particularly the content descriptions relating to the concepts of data representation; and specification; algorithms; and implementation	
	data collection	(properties, sources and collection of data)	
	data representation	(symbolism and separation)	
	data interpretation	(patterns and contexts)	
	specification	(descriptions and techniques)	
	algorithms	(following and describing)	
	implementation	(translating and programming)	
	digital systems	(hardware, software, and networks and the internet)	
	interactions	(people and digital systems, data and processes)	
	impact	(sustainability and empowerment)	

Cross-curriculum priorities [X any that apply] Read more …

Aboriginal and Torres Strait Islander histories and cultures	Asia and Australia's engagement with Asia	Sustainability

General capabilities [X any that apply] Read more …

Literacy	Numeracy	ICT Capability	Critical and Creative Thinking	Ethical Understanding	Personal and Social Capability	Intercultural Understanding

Links to ICT Capability continuum: Level [insert] [X any that apply] Read more …

Depending on the year level this activity is being used with, adjust content to the appropriate level.

Applying social and ethical protocols and practices when using ICT	
apply practices that comply with legal obligations regarding the ownership and use of digital products resources	
independently apply strategies for determining the appropriate type of digital information suited to the location of storage and adequate security for online environments	
identify and value the rights to identity, privacy and emotional safety for themselves and others when using ICT and apply generally accepted social protocols when using ICT to collaborate with local and global communities	
explain the benefits and risks of the use of ICT for particular people in work and home environments	
Investigating with ICT	
use a range of ICT to analyse information in terms of implicit patterns and structures as a basis to plan an information search or generation	
locate, retrieve or generate information using search facilities and organise information in meaningful ways	
assess the suitability of data or information using appropriate own criteria	
Creating with ICT	
use appropriate ICT to collaboratively generate ideas and develop plans	
design and modify simple digital solutions, or multimodal creative outputs or data transformations for particular audiences and purposes following recognised conventions	
Communicating with ICT	
select and use appropriate ICT tools safely to lead groups in sharing and exchanging information, and taking part in online projects or active collaborations with appropriate global audiences	

understand that there are various methods of collaboration through computer mediated communications that vary in form and control	
Managing and operating ICT	
independently select and operate a range of devices by adjusting relevant software functions to suit specific tasks, and independently use common troubleshooting procedures to solve routine malfunctions	
identify and compare networked ICT system components including between hardware, software and data	
manage and maintain data for groups of users using a variety of methods and systems	

Links to Literacy and Numeracy

Depending on the year level this activity is being used with, adjust content to appropriate level.

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