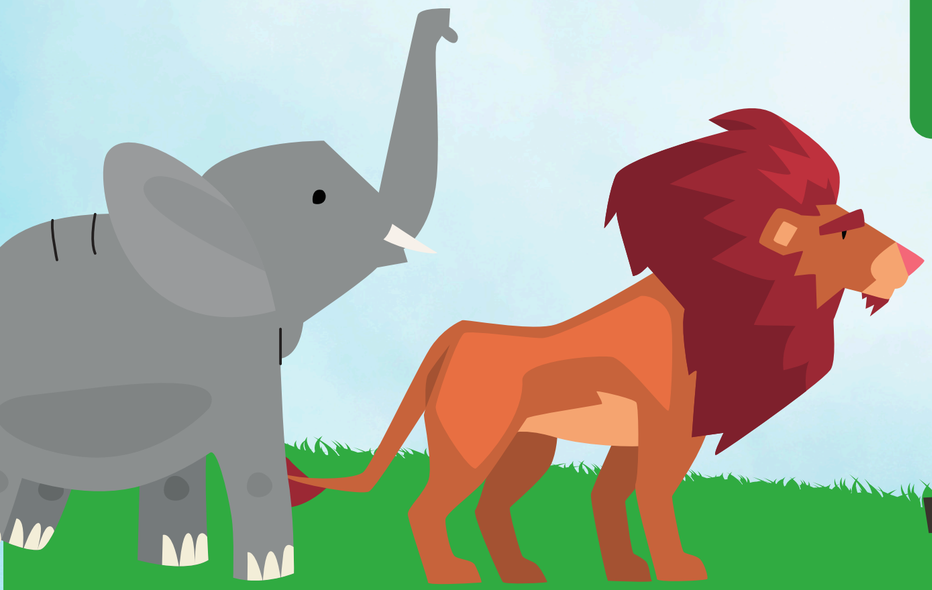

THE ZOO FIELD TRIP
ZOO
MAP
ZOO
By: Jayde, Holly & Adriana

UNIT PLAN INFORMATION

This is a unit plan designed to suit a Zoo Field Trip!
We have selected Year 5 students, completing Primary Maths on the topic of Location with a time frame of 8 lessons.

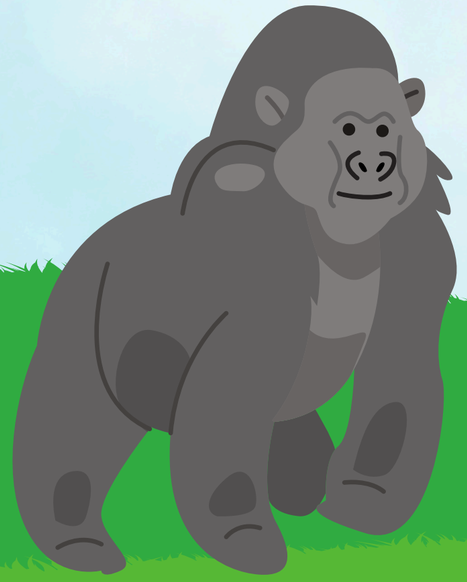


CONTEXT

We will be bringing our Year 5 class to the zoo!

School Context - We are a Foundation to Year 6 public school, situated in Macclesfield, South Australia. We have approximately 250 students in our small country school, with mixed genders and diverse abilities/needs.

Class Context - Our class has 18 year 5 students. We also have Henry who has an Aboriginal background with interest in being active, Jasmine who has Dyslexia and interest in discovery, and Chris who has hearing impairment with an interest in animals.



LOCATION - PRIOR KNOWLEDGE

Year 2 -

AUSTRALIAN CURRICULUM V9

Locate positions in two-dimensional representations of a familiar space; move positions by following directions and pathways (AC9M2SP02).

NUMERACY PROGRESSION

Uses positional terms with reference to themselves (left and right), interprets a simple diagram or picture to describe the position of an object (the house is between the river and the school), gives and follows directions from one place to another (PoL2).

Year 3 -

AUSTRALIAN CURRICULUM V9

Interpret and create two-dimensional representations of familiar environments, locating key landmarks and objects relative to each other (AC9M3SP02).

NUMERACY PROGRESSION

draws an informal map or sketch to provide directions, locates positions on an informal map, orients an informal map using recognisable landmarks and current location, locates self on an informal map to select an appropriate path to given location (PoL3).

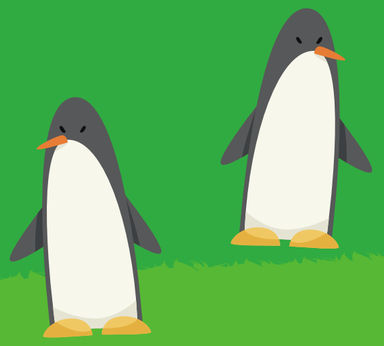
Year 4 -

AUSTRALIAN CURRICULUM V9

Create and interpret grid reference systems using grid references and directions to locate and describe positions and pathways (AC9M4SP02).

NUMERACY PROGRESSION

locates position on maps using grid references, identifies features on maps and plans, describes routes using landmarks and directional language (PoL4).



MISCONCEPTIONS: LOCATION

- Students may be confused between the ‘y' and the ‘x’ axis on a map (latitude and longitude). They may believe that latitude refers to the horizontal line and thinking that the longitude refers to the vertical line on a map.

- Students can get confused on the concept of scales when using maps, they may not understand that maps are not alway accurate representations of ‘real-world’ proportions, distances and sizes.

- When the students start using and explaining directions, more specifically cardinal directions, they may get confused with north, south, east and west- this can impact how they find what they are looking for- for an example, when students use maps at the zoo, they may get lost as they are unable to understand how find the directions.

- Students may assume all maps are the same, meaning that they all include the same proportion, layout, directions and structure.

- When addressing the zoo, students may believe animals are situated in random positions across the zoo, although, the animals are located in specific areas due to their habitat requirements which involves careful planning from the zoo, this can impact how students understand the importance of accurately showing locations on a map and their reasoning why they are situated in a sepcifc area.

DIFFERENTIATION

In our class we have Henry who speaks a different language at home with an interest in being active, Jasmine who has Dyslexia and an interest in discovery, and Chris who has a hearing impairment with an interest in animals.

CLASSROOM ENVIRONMENT

Flexible Seating Arrangements

Noise Cancelling headphones

Appealing Visual Aids/ Cues

SSO will be in the class for extra support, whilst one-on-one time with the teacher

Lighting

Inclusive Environment

CURRICULUM LINKS

Achievement Standard-

Students use grid coordinates to locate and move positions.

Strand -

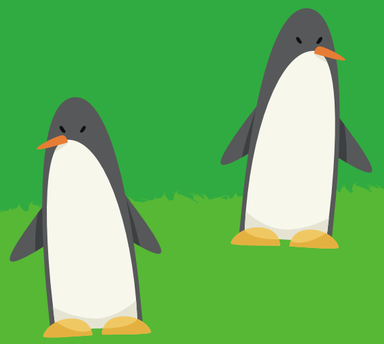
Space

Content Descriptors -

Construct a grid coordinate system that uses corrdinates to locate positions within a space; use coordinates and directional language to describe position and movement (AC9M5SP02).

Key Considerations -

Problem-solving: "providing students with meaningful opportunities to use Mathematics to solve problems from both mathematical and real-world contexts".



NUMERACY PROGRESSION

For the Year 5 students, they will be expected to be in the Numeracy Progression Level of PoL4 and PoL5. This comes under Positioning and Locating, with the subheading of Using Formal Maps and Plans and Interpreting Maps and Plans.

This indicator states students can:

PoL4 - locates position on maps using grid references
- identifies features on maps and plans
- describes routes using landmarks and directional language

PoL5 - uses compass directions, latitude and longitude to locate position

UNIT SEQUENCE

Lesson 1 - Prior Knowledge - Location

Lesson 2 - Exploration - Grids and Location

Lesson 3 - Exploration - Grids and Location

Lesson 4 - Exploration - Mapping

Lesson 5 - Check for Understanding - Location Assessment

Lesson 6 - Pre-Zoo Visit

Lesson 7 - Zoo Visit

Lesson 8 - Post-Zoo Visit

THE AMAZING RACE

Brief Description - We will have multiple Parent volunteers, SSO's and a Teacher to assist the students on locating each Animal on the provided grid map of Adelaide Zoo. There will be a volunteer at each selected animal and they will hand out the next animals location after they answer a question correctly.

ANNOTATION

At the beginning of a unit, students will first brainstorm their prior knowledge on location this can be constructed either in groups, individually or even as a class. Students should have prior knowledge of: Year 2 they located positions and moved positions following directions, in Year 3 students located key landmarks and in Year 4 they understood how to interpret grid reference and its systems to use directions to locate and describe positions.

Then create a class discussion on this brainstorm and allow mathematical location language to be explored.

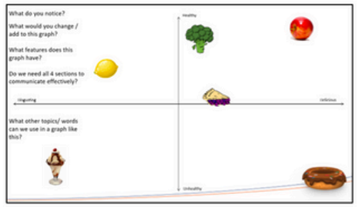
Then move onto slide 2, this will assist students as they will then be refreshed on the topic and allow them to answer the slide questions more accurately rather than just guessing.

As the focus of the Unit Plan is on location and more specifically the positioning of "objects" this slide could be an effective component to have in the lesson, however, possibly change the graph to either a map or grid instead as that is one of the main focal points in this unit as well.

Again, making the slide about ,maps and grids instead of a quadrant graph, this will ensure that the unit sticks to the focus.

By including the Royal Show map, this will be a great link for the students for when we look at the Adelaide Zoo Map. This will assist their understanding of maps that are utilised in the real-world and can also be used for educational purposes. This relates to Mathematics key consideration of Problem Solving as discussed earlier.

Unit sequence	Prior knowledge – Location

Teaching and learning	Teacher tips and alerts	Evidence of understanding
Learning intentions Learning intention 4. Students will know how to read and navigate a grid reference system. Learning intention 5. Students will understand that shapes can be described in terms of their location in a plane. Learning intention 6. Students will explore and create grid reference systems using map references. **Examples of demonstration of the proficiency strands** **Understanding:** Students connect ideas found in multiple grid reference systems. **Reasoning:** Students explain thinking to peers as part of the prior knowledge activity and justify thinking. **Problem solving:** Students apply existing strategies and knowledge to seek common features of grid systems. **Fluency:** Students recall definitions about compass directions and grid systems when engaging with the interactive websites. Use Slides 5 – Prior knowledge grid to guide the learning through this sequence. *Adapted from Jo Boaler* https://www.youcubed.org **Physical resources required:** • internet access • printer. **Slide 2:** Shows students a graph comparing someone's 'taste level' to the 'health level' of particular foods. Let students discover this for themselves, don't tell them anything just yet. With animations, this slide asks students: • What do you notice? • What would you change or add to this graph? • What features does this graph have? • Do we need all 4 sections to communicate effectively? • What other topics or words can we use in a graph like this?  **Slide 3:** Shows the first quadrant of the grid – and asks students (by animation): • How can you describe where the blueberry pie sits on this grid to someone? • How might mathematicians describe the location of something? • Can you remember a time that you've been somewhere and used a grid to locate a place? • Find 5 different examples of grids used in real life, and print them out. • Look for similarities and differences between them. • Do they all share similar features? *If using devices or accessing the internet is difficult, you could collect and photocopy a range of maps for your students to compare and use. **Slide 4:** Shows an example of the Royal Show map – use this if your students are stuck and need guidance.	**Big idea** 'Shapes can be described in terms of their location in a plane or in space. Coordinate systems can be used to describe these locations precisely.' *Van de Walle, 2019*	**Responses to:** Slides 5 – Prior knowledge grid For learning criteria see: Resource 2 - Teacher resource: Assessment rubric

DfE Lesson 1

ANNOTATION

Providing students with a map without any helpful information this will prompt students to think about the best way to describe the journey they would take, encouraging students to discuss if there are any features that could be included on the grid to help describe the journey. Which links really wellto the map students will use when at the zoo.

By then moving on to showing the same map but now including the compass rose, a scale, and a grid reference it will then allow students understand the importance of having them on a map to assist in being able to interpret the map accurately.

Unit sequence	Exploration - grids and location

Teaching and learning	Teacher tips and alerts	Evidence of understanding
Learning intentions Learning intention 4. Students will know how to read and navigate a grid reference system. Learning intention 5. Students will understand that shapes can be described in terms of their location in a plane. Learning intention 6. Students will explore and create grid reference systems using map references. **Examples of demonstration of the proficiency strands** **Understanding:** Students interpret map directions and locational vocabulary. **Reasoning:** Students transfer learning in the website task to creating directions in the 'Holiday task'. **Problem solving:** Students design their investigation when creating a set of directional instructions for a tourist in a foreign city. **luency:** Students carry out procedures accurately when describing location points. **Physical resources required:** • devices for students to access Google maps • post-it notes (or equivalent) for peer feedback. Show Slides 6 – Location exploration on an interactive white board. **Slide 2:** Shows a map with no pieces of helpful information. Ask students: • Describe to a friend how to get from 'My Place' to 'Lake Hut'. • What's the best way you can describe the journey you'd have to take? • Are there any features to include on this grid that would help describe the journey? **Slide 3:** Shows the same map with the compass rose, a scale and grid reference points. Ask students: • What features do you know about this map? **Slide 4:** The next learning activity involves devices. They will explore the 3 interactive activities to learn about grid points, compass directions and scale: • Use a grid map • Use compass points • Make a walking track *If class access to technology is unavailable, an alternative is to show students on the interactive white board and have them work through it as a class.	**Teacher tips** Be aware of students who are unable to make links between scaled images and real-life distances. **Alerts** Monitor student ability to understand that an alphanumeric grid is the whole space not an intersection.	Can students interpret cardinal points (NESW), legends and simple scales to calculate distances? Can students locate landmarks on a map using alphanumeric directions? Response to 'Holiday task': Slides 6 – Location exploration For learning criteria see: Resource 2 - Teacher resource: Assessment rubric.

The use of technology-based tools for learning how to use a grid map, compass points, and make a walking track are effective in this lesson as they can provide instant corrections or feedback to the students. Technology-based tools like these also allow students to work at their own pace and explore the mapping activities individually or in pairs, to assist in accommodating student learning styles to ensure all students are learning how best suits their needs.

DfE Lesson 2

ANNOTATION

Encourage students to describe the route using mathematical language as if they didn't have access to a map. This will assist students to apply their understanding of mapping to a practical task promoting real-world problem-solving and communication. This activity will be very beneficial for when the students are at the zoo as the activity is very similar to this. Therefore ensuring students are grasping this will be a good indicator for what students may need further assistance prior to attending the zoo. This activity will also be beneficial to know where students are at this their understanding for allocating pairs and groups at the zoo.

This activity involves both students in the pair to be engaged at all times. The use of peer feedback will help students to bring different perspectives and insights. As the students share their constructive feedback to their partner it will encourage both students to identify their strengths and areas to improve on in their mapping skills.

The use of an interactive location game allows students to practice their skills in using an alphanumeric grid and assist them in their understanding of coordinates and location in a map context. Which is the grid that students will be using when at the zoo.

Slide 5: Poses the research-based 'Holiday task':

- Choose a city (Adelaide or Tokyo are examples).
- Find a map of the city – locate 5 major tourist attractions in the city.
- Create a route for a tourist to follow if they wanted to visit these 5 attractions.
- Describe the route to them (using mathematical language) as if they didn't have access to a map.
- After, we'll swap directions with a partner and see if they visited the correct locations in that city.

Slide 6: Gives some guidelines for how students could engage with a partner as an opportunity for feedback:

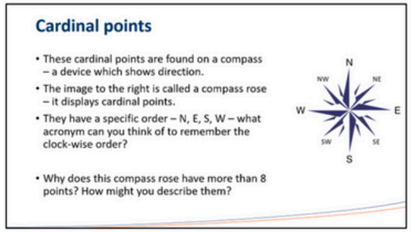
- You need to use post-it notes to comment on the mathematical language your partner has used.
- When they use a new mathematical or location language words – write it on a post-it note.
- Use Google maps to visit the city - label the attractions you visited and the order that you visited them in.
- Give your partner some feedback on their directions – were they specific, did they use landmarks or directional language?

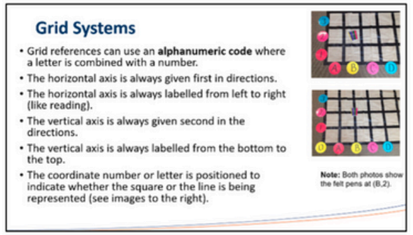
Show students Slides 6a - Explicit location.

Slides 2 to 5: Explain cardinal points and the compass rose.

Slides 6 to 8: Explain the grid reference system.

Slide 9: Introduces a game called Hidden Treasure. It is a coordinate location game using an alphanumeric grid (see Resource 2a –Alphanumeric grid and print 1 for each student). The rules are explained on the slide.





DfE Lesson 2

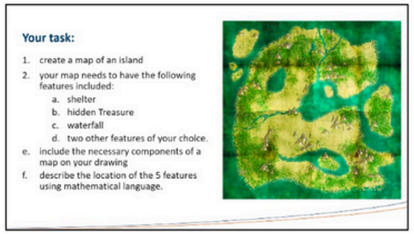
ANNOTATION

Students will have time to reflect and explore what prior knowledge they have of mapping and what is involved. This will support their understanding of the purposes, key features, and how to use a grid and referencing system to further apply to their own work. In the zoo unit plan, students will discuss as a class to listen to different perspectives for a deeper understanding of mapping.

After reflection and discussion, students will be able to apply their knowledge of using grids, and key components, to create their own maps. This will show how they are able to use their imagination whilst also applying mathematical terms and concepts to mapping.

By highlighting the importance of using key components and features in mapping, students will be able to understand why they are used and how they are used. Such as using a compass rose, scale, directional indicators, and 5 features on the map to indicate where something is located. Students will then be able to navigate the map effectively and provide information using mathematical terms.

Unit sequence	Check for understanding - Location assessment

Teaching and learning	Teacher tips and alerts	Evidence of understanding
Learning intentions Learning intention 4. Students will know how to read and navigate a grid reference system. Learning intention 5. Students will understand that shapes can be described in terms of their location in a plane. Learning intention 6. Students will explore and create grid reference systems using map references. **Examples of demonstration of the proficiency strands** **Understanding:** Students represent the different components of a grid system for location representation. **Reasoning:** Students explain thinking when identifying the features of a grid reference system. **Problem solving:** Students verify the reasonableness of answers. **Fluency:** Students recall factual knowledge about grid reference systems. See Slides 7 – Assessment location. **Slide 2:** Describes the task to students: 1. Create a map of an island. 2. Your map needs to have the following features included: a. Shelter b. Hidden treasure c. Waterfall d. Two other features of your choice 3. Include the necessary components of a map on your drawing 4. Describe the location of the 5 features using mathematical language.  Use Resource 2 - Teacher resource: Assessment rubric to help your assessment collection and evidence.	**Teacher tips** Although this is a summative assessment task, it is still a rich learning opportunity. Do not expect students to be able to complete the project without teacher support and conversations with peers. Make a note of any support given and take this into account in your marking. It may be beneficial to conference students about their summative task as they work or at the end. They are likely to be applying appropriate mental strategies that may not be evident in the written response. Students will need to demonstrate the general capabilities of critical and creative thinking skills as well as literacy to be successful. These are both essential aspects of thinking in mathematically but if you have students who struggle with these capabilities then you may need to modify the task and make a note for your own assessment purposes.	**Summative assessment:** Slides 7 – Assessment location For learning criteria see: Resource 2 - Teacher resource: Assessment rubric

This activity is a great way to view the student's understanding of location and mapping which can show their ability to gather information, represent features, use symbols and mathematical terminology. As the students use their imagination to create a map, it requires creative and critical thinking, including decision making.

DfE Lesson 3

AMAZING RACE CARDS

FRONT

BACK

NOW TRAVEL TO (B, 4) ON THE MAP.

NEXT QUESTION:
HOW MANY SQUARES HAVE YOU TRAVELLED
AND IN WHAT DIRECTION?

THANK YOU!

REFERENCE LIST:

Attard, C. (2017, September 6). Technology in the classroom can improve primary mathematics. The Conversation. Retrieved from https://theconversation.com/technology-in-the-classroom-can-improve-primary-mathematics-83431

Bragg, K. (2013). Hide, map and seek: Assessing students' understanding of location and direction. Australian Primary Mathematics Classroom, 18(4), 3-7.

Vatalis, E. (2018). I can locate it! Teaching location with the assistance of digital technologies. Australian Primary Mathematics Classroom, 23(3), 8-11.

Vale, C., Bragg, L, A., Widjaja, W., Herbert, S., & Loong, E, Y, K. (2017). Children's mathematical reasoning: Opportunities for developing understanding and creative thinking. Australia Primary Mathematics Classroom, 22(1), 3-8.

Roberts, J, L., & Inman, T, F. (2023). Strategies for Differentiating Instruction: Best Practices for the Classroom. (4th ed). Taylor & Francis Group. (Chapter 7, pp89-111).

Australian Curriculum (2022). Mathematics - Year 5. https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-5?view=quick&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0

Numeracy Progression