Year: 5

Unit: *Measurement: Conversion of Units and Area.* Adapted from the Government of South Australia, Department for Education (2020).

Class Context:

A Year 5 class within a mainstream public school located 22 km south of the Adelaide CBD (metropolitan). The F – 6 Primary School has approximately 600 students enrolled; the Year 5 class consists of 26 students of diverse needs. One student has been diagnosed with the Learning Disability (LD) of Dyscalculia, and another has a moderate vision impairment. Within the Year 5 cohort, one student is from an Aboriginal background and culture.

Name	Description	Interests
Johnathan	Dyscalculia	Animals
William	Moderate Vision Impairment	Arts and Crafts
Elizabeth	Aboriginal Background	Exploring/being active.

Time frame: Two weeks/9 lessons.

Unit Sequence (From EDUC3333 Assessment 3 Part 1: Unit Plan): NOTE: *As this is from another document, the Appendices do not align with those attached to this document. *

#	Lesson Title	Lesson Activities	Resources	Pedagogies and approaches	Assessment
1	**Measurement – Engage.** **What is the size of Uluru?**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of	• Uluru PPT (Appendix 8). • Projector/interactive board.	Teaching through problem solving: Students will learn through inquiry, exploring real contexts, problems,	**Diagnostic/Formative** Self-reflection (Appendix 2).

		objects; use smaller units or a combination of units to obtain a more accurate. AC9M5M02 Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units. **Activities**: Students will be revisiting their prior knowledge of measurement, focusing on comparing an attribute of an item with a unit that shares the same attribute. Following the DfE PowerPoint (see Appendix 8), the class will collectively problem solve how they might measure Uluru using informal units and compare it to other famous monuments.	• blocks. • Paper. • Pens/pencils.	situations, and models (Van de Walle et al., 2019). Based on social-constructivist theories, this lesson will be instructed using cooperative learning strategies to encourage students to build knowledge together, value different experiences and skills, and improve the transfer of learning (Killen, 2015). Cooperative learning can be equally beneficial for students of different	

2	**Measurement – Knowing and Understanding Measurement.**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate. AC9M5M02 Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units. **Activities**: Students will **know** which units of measurement measure different attributes, **understand** why we use standard units of measurement, and **explore** how many ways they can measure an object or area in the classroom.	• Appendix 10. • White board. • Interactive. board/projector. • Paper. • Pens/pencils.	abilities, with weaker students being encouraged to persist and stronger students being able to identify gaps in their understanding (Killen, 2015).	**Formative:** • Self-reflection • Class discussion

		Warm up using Appendix 10. Facilitate classroom discussion about the answers they found for Appendix 10, discuss mathematical approaches, and explore vocabulary. Final activity **Familiar References**, from (Van de Walle., 2019, p. 461).			
3	**Measurement – Using units to find the perimeter of rectangles.**	**Curriculum Connections (Version 9.0)**: AC9M5M02 Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units. **Activities**: Students will demonstrate their prior knowledge (learnings from last three lessons) by discussing what they know about three different shapes with partners in a think-pair-	• Slide 7 – Shape investigation, from the Department of Education, the Government of South Australia (2020). • Whiteboard (and whiteboard markers). • Teacher knowledge of students to determine	Although the DFE unit does not directly foster constructivism, alterations discussed in the comments section ensure this approach is utilised. Real-world problem-solving activities with manipulative and multisensory visuals allow students to 'discover	**Formative Assessment:** A formative assessment will occur through anecdotal notes/records. The teacher will record students' discussion around the listed questions (see lesson plan); for example, 'How do you know that?' Support for anecdotal notes/records

		share activity (Appendix 2). The teacher will conduct a formative assessment with anecdotal notes to determine students' current understandings; questions such as 'How do you know that?" will be utilised. Students will complete a worded problem in small groups; most will use the Rabbit Hutch activity (Appendix 4), and others will choose a task more tailored to student interests. This activity will have students recognise drawn representations of the perimeter. Students will problem-solve to find three ways to find the perimeter (e.g., L + L + W + W; L X 2 = W X 2; L + W X 2). The lesson will conclude with a class discussion (utilising think-pair-share) to consider (a) what was the most effective way for calculating	appropriate groupings. •	mathematics as they vindicate representations of the perimeter, determine, and justify perimeter formulas, and provide explanations and answers to their worded problem (Rabbit Hutch or similar; Appendix 4). Having students active in their learning ensures that learners interact with their environment and link new experiences to prior knowledge (Duchesne et al., 2022; Van de Walle et al., 2019).	comes from Duchesne et al. (2022).

		perimeter, (b) if there is a general rule for calculating perimeter, (c) what methods produced the correct answer of 320cm, and (d) if their methods work with any other shapes.			
4	**Measurement – Using units to find the area of rectangles.**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate. AC9M5M02 Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units. **Activities**: The start of the lesson will use the game (gamification) Scattegories to review prior	• Slide 5 – 'Scattergories' from the Department of Education, the Government of South Australia (2020). • Slide 8 'Court investigation' from the Department of Education, the Government of South Australia (2020). • Access to a school gym, soccer,	According to Van de Walle et al. (2019), "allowing students to collaborate on tasks provides support and challenges, increasing their chance to communicate about mathematics and build understanding" (pp. 79). Constructivism is supported as students work in collaborative teams to measure to confirm their area predictions of the gym/soccer pitch/etc.	**Formative Assessment:** A continual formative assessment occurs in this lesson; students will be assessed on the following... • The use of appropriate units of measurement. • Ability to know how units of measurement represent different attributes (e.g., cm^2 or m^2 is area).

		lesson content and confirm students' current level of understanding (Appendix 3). This will have students describe formal and informal units of measurement in different situations. Students start to investigate area by predicting how by they think certain places, such as the school gym, soccer pitch, classroom, etc., is (Appendix 5). They will have their own cut out of a $1m^2$ in butcher paper to base their predictions on. In groups, students will then confirm their predictions by measuring these spaces. Students will construct appropriate ways to measure the area and have their answers checked by other groups (constructivism). After this activity, the class will discuss the methods used to measure the area and	classroom, or any other school space that is rectangular in shape. • Butchers Paper • Scissors (one per student) Pencils (one per student) Whiteboard (and appropriate markers). • Rulers (for each student). • Tape measures (one per students grouping; about 3 – 5 students per mixed ability grouping).	Students are constructing their knowledge as they brainstorm and test different ways to measure areas. They then build on their prior learning (Duchesne et al., 2022) when applying their strategies to problems in the classroom. This lesson also demonstrates the Sociocultural theory as there is peer-to-peer learning as students work in collaborative groups/teams (Duchesne et al., 2022).	• Their use of a range of strategies to calculate the perimeter and area of their measured area (e.g., school gym or soccer pitch). • Their ability to compare the area of different shapes. The investigation and classroom discussion lessons will be able to detail students' proficiency in these areas. There is also a self-reflection (Appendix 2) that students can complete to show their levels of understanding ('Self

		determine which way was the most effective and if their formulas will work with other shapes. This will be applied in the 'different same explore' activity (Department for Education, the Government of South Australia, 2020) when students determine if two shapes have the same or different areas. The extension will allow students to discover the area of a shape with only the perimeter. Extension (gifted) students would also determine if their formulas work for other shapes besides rectangles. The lesson will conclude with a whole class discussion about what was effective and why; Students will also complete the self-reflection seen in Resource 4 – 'Self Reflection' from the	• Teacher knowledge of students to determine an appropriate grouping. • Resource 3 – 'Different Same Explore' from the Department of Education, the Government of South Australia (2020). • Slides 9 – 'Different same check' from the Department of Education, the Government of South Australia (2020). Resource 4 – 'Self		Reflection' from the Department of Education, the Government of South Australia, 2020).

		Department of Education, the Government of South Australia (2020).	Reflection' from the Department of Education, the Government of South Australia (2020).		
5	**Measurement – Exploring area and Perimeter.**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate. AC9M5M02 Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units.	• Student computers/iPad Minecraft Education for students' computers. • Base 10 blocks (see comments). • Slides 10 - 'Doesn't Belong' from the Department of Education, the	Constructivism is applied in Lesson Six during the 'Doesn't Belong' (Appendix 7) activity with the 'think-pair-share' strategy. This allows students to test their ideas and practice articulating them before sharing them with the class (Van de Walle et al., 2019). 'Think-pair- share' also ensures all students are	**Formative Assessment**: Continual formative assessment occurs in this lesson; students will be assessed on the following... • The use of appropriate units of measurement. • Ability to know how units of measurement represent different

		Activities: Students will recap their prior knowledge of perimeter and area with the 'Doesn't Belong' activity (Appendix 7); this will have students compare three shapes to recognise that two have the same area, despite having different perimeter measurements. Using Minecraft Education, students will try and find the largest possible area with a total perimeter of 50 blocks. After recording results in a table, students will find the possible perimeter lengths if the area is 48 blocks^2. The lesson will be closed by discussing what patterns students noticed whilst engaging in the task.	Government of South Australia (2020). • Whiteboard (and appropriate markers). • Students' writing implements.	engaging in thinking rather than only one student answering the question for the whole class (Van de Walle., 2019). Constructivism can also be seen as the students test the effect perimeter combinations have on an area before constructing knowledge of their relationship with the whole class.	attributes (e.g., cm^2 or m^2 is area). • Their use of a range of strategies to calculate the perimeter and area of their measured area (e.g., school gym or soccer pitch). • Their ability to compare the area of different shapes.

6	**Zoo Preparation.**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate measure. AC9M5M02 solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units. **Activities** Prepare students for the upcoming excursion to the zoo. Inform the students that they will be attending the zoo as mathematicians looking to design a temporary zoo to keep some of	• White board Markers. • Butchers paper. • Pencils/Pens. • Zoo map x26. (Physical copies if students do not have access to a tablet/laptop). • Interactive. board/projector. • Pop-sticks x26.	Teaching through problem solving: Students will learn through inquiry, exploring real contexts, problems, situations, and models (Van de Walle et al., 2019). Students will develop concepts of measurement procedures through problem solving what mathematical data will be collected and how it will be collected (Van de Walle et al., 2019). Based on social-constructivist theories, this lesson will be instructed	**Formative Assessment:** Teacher-student contracts (Cranley et al., 2021) **see Appendix 9.** Teacher contracts will be designed at the end of lesson, with agreed goals for students based off of their groups for the zoo excursion. The goals on the contract can be modified for each student to increase motivation through mutual agreement (can be framed as a working contract to create a temporary zoo for the Adelaide Zoo's residents to stay in, emulating a real-

		Adelaide Zoo's animals whilst they complete renovations. Students Will: **Explore** what needs to be researched at the zoo (i.e., measuring enclosure sizes, visitor paths/viewing areas, storage.) Consider: • Units • Combination of units • Length/width/perimeter/area • **Plan** how the information will be collected. Organise groups. How will tasks be split up? What tools		using cooperative learning strategies to encourage students to build knowledge together, value different experiences and skills, and improve the transfer of learning (Killen, 2015). Cooperative learning can be equally beneficial for students of different abilities, with weaker students being encouraged to persist and stronger students being able to identify gaps in their understanding (Killen, 2015).	world interaction of taking a contract job).

		do we need? Plan a route using the zoo map. Decide on a meeting area. • **Create** task sheet/survey for zoo. The teacher can refine for excursion. Organise groups. Identify clear objectives for the zoo excursion.			
7	**Zoo Excursion.**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate. AC9M5M02 Solve practical problems involving the	**Resources:** • Measuring Equipment such as… ○ Tape Measures (At least 1 per group; therefore 6 needed). ○ Rulers (students to bring; at least 1 per	Teaching through problem solving: Students will learn through inquiry, exploring real contexts, problems, situations, and models (Van de Walle et al., 2019). This lesson demonstrates Sociocultural theory as students are working in	**Formative Assessment:** This lesson sets the foundations for students' summative assignments; therefore, formative feedback will be provided based on this lesson. Students will be provided with clear instructions correlating to the

		perimeter and area of regular and irregular shapes using appropriate metric units. **Activities: Zoo** Students are briefed with the following task: • "Adelaide Zoo has decided it is time for them to renovate some of their enclosures. They have asked for a group of mathematicians to work out how much space the animals and guests will need at the temporary zoo while the enclosures are being renovated." • Students should choose 5-10 animals that can be relocated to their temporary zoo and find/estimate the perimeter and area of the enclosures.	group; therefore 6 needed). ○ Trundle Wheels (at least 1 per group; therefore 6 needed). ○ Zoo Maps (at least 1 per group; therefore 6 needed). • Clipboards one per student (with instructions, see Appendix 8). • Students' lunches. • Student pencils. • Hats (1 per student).	groups and are required to discuss and problem solve together (Duchesne et al., 2022). Constructivism is also used in this lesson as the students are actively engaging and learning with the world around them and connecting their learning to real-world scenarios and locations (Van de Walle et al., 2019).	success criteria from the beginning, so they have clear expectations (Dickson, 2013; Van De Walle et al., 2019). The instructions aim to have student-friendly language and a clear progression of working towards, completing, and extending (Van De Walle et al., 2019).

		• As an extension, students are also encouraged to investigate the size and area of other aspects of the zoo, such as eating areas, paths, and bathrooms.	• School iPad (1 per group → to be looked after by staff member). • Calculators (1 per group). • 1 Student self-reflection per student (Appendix 5). • End of lesson checklist (Appendix 6). • Risk Assessment (Appendix 7).		
8	**Post Zoo – Design your own Zoo.**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of	**Measuring Tools:** • Tape Measures Rulers • Records and feedback from zoo.	Teaching through problem solving: Students will learn through inquiry, exploring real contexts, problems,	**Summative Assessment:** This lesson continues the summative assessment and provides an opportunity for the students to demonstrate

		objects; use smaller units or a combination of units to obtain a more accurate. AC9M5M02 Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units. **Activities**: • As a class, groups can share their findings from the zoo. They can talk about the perimeter and area of different enclosures, the tools they used to measure it, as well as any other findings they had. • Students are then tasked with reconstructing the dimensions of the zoo enclosures that they measured on	**Craft Supplies:** • Paper. • Markers/Pencils. • Glue. • Scissors.	situations, and models (Van de Walle et al., 2019). This lesson is a great opportunity for teachers to provide feedback to their students. By providing effective feedback which targets areas of improvement, the students can then apply it straight into their assessment (Van de Walle et al., 2019).	their findings and learning from the zoo. The students will have to apply their knowledge of perimeter and area as they recreate the enclosures and also be able to choose a realistic measurement to represent it (Van de Walle et al., 2019).

		a smaller scale. They will need to use conversions and scales and can use any materials found within the classroom to design it. • Once students have reconstructed the enclosure, they should then find the perimeter and area of it, if they haven't already.			
9	**Design your own Zoo (Part 2).**	**Curriculum Connections (Version 9.0)**: AC9M5M01 Choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate. AC9M5M02	**Measuring Tools:** • Tape Measures Rulers **Craft Supplies:** • Paper. • Markers/Pencils. • Glue. • Scissors.	The feedback that is provided to the students should be specific, timely and actionable as it is more likely to be effective for the student's learning (Hattie & Timperley, 2019). Using manipulatives such as crafts to represent the	**Summative Assessment:** This is the final lesson for the summative assessment. At the end of the unit students will be handed back a rubric for their completed task outlining their progress and learning so that they can apply it to their future

		Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units. **Activities**: Using the enclosures that the students have recreated, the students must determine how much area that their temporary zoo will need. They will need to represent the areas of the enclosures on a map to justify their reasoning.		mathematical concepts of area and perimeter is a part of constructivism (Van de Walle et al., 2019).	learning (Hattie & Timperley, 2019).

Unit Title: Measurement

Lesson Title: Zoo Preparation

Lesson Sequence: No.6 of 9

Year level: 5

Lesson duration: 45mins

Class Context: 26 students, 3 students with diverse needs.

Name	Description	Interests
Jonathan	Dyscalculia	Animals
William	Moderate Vision impairment	Arts and Craft
Elizabeth	Indigenous background	Exploring/being active

Prior Knowledge:

Students understand the importance of using formal units.

Students know that different units of measurement are used depending on what is being measured and can measure an object or area in multiple ways.

Students can find the perimeter of basic regular and irregular shapes and the area of regular shapes.

Achievement Standard:

Content descriptor:

AC9M5M01

Choose appropriate metric units when measuring the length, mass, and capacity of objects; use smaller units or a combination of units to obtain a more accurate measure.

Learning intentions:

- Identify what objects/areas and their attributes will be measured.
- Describe how to collect measurement information and justify the method.
- Choose appropriate metric units when measuring length to obtain a more accurate measure.

Product Children will Take Home:

Zoo Contract and Survey for excursion

Resources

Zoo maps x26
Student iPads
Interactive board
Whiteboard
Markers
Pencils/pens
Butchers paper
Name pop-sticks
Measurement tools –

- Trundle wheels x4
- Tape measures x4
- Rulers x4

Estimated time	Content/Learning Experiences/Teaching strategies	Teacher Questions: *Questions are developed based on Jenni Way's four types of questions* (Way, 2008, p. 23)	Formative Assessment & Recording Strategies
10min	**Attention gaining strategies throughout the lesson:** Focus Llama, a hand signal made by pinching your middle fingers to your thumb and poking your index and Pinky finger up to make the shape of a llama. Students are used to seeing this being used and know to copy the hand signal and quickly quieten as a game, useful when the room is starting to move off track and you wish to draw the class's attention quietly. No hogging, bogging, or frogging. Don't allow students to hog airtime and ensure that the teacher is not talking at the students for too long. Do not get bogged down on one topic and move on once the class has a good understanding quickly. Do not allow calling out or talking over people in class and group discussions (frogging), everyone's thoughts and feelings are important. ***Introduction (Before-phase):*** ***Teacher will:*** *(Have enlarged digital zoo map on the interactive board)* Inform the students that they will be visiting the zoo as mathematicians employed to design a temporary zoo to house some of Adelaide Zoo's residents whilst they complete renovations. Establish the goals of the lesson (write on the whiteboard along with the learning intentions): 1. Co-construct a class survey for the excursion. 2. Co-construct and sign a zoo contract. Students will be given a contract (Appendix 2) at the end of the lesson to sign, with agreed learning goals co-constructed with the class. ***Students will*** Listen to teacher instructions understand the aim of the lesson (repeat instructions where necessary) and respond to teacher questions. (Record student responses on the whiteboard)	What kind of information will we need to design a zoo? Reflect on what we have learnt so far. What does the markings around the map remind you of? How might we sort our information? What kind of metric units might we use to measure at the zoo?	Teacher observation of students. Photo of student responses on whiteboard
30min	***Body (During-phase):*** **Teacher will:**	**Teacher Questions:** Is there a way to record what you've found?	Photograph students work (butchers' product).

	Organise students into 4 groups of 6-7 using the name pop sticks, ensure that students with diverse needs are split evenly and with students they are comfortable with. These groups will be the same on as on the day of the excursion. Direct student attention to the map (appendix 1) on the board, explain that they need to choose 1 animal from each coloured zone on the map (grey, orange, yellow, green, blue). Ask students to nominate two people from their group to collect supplies from the centre of the room (butchers' paper, markers, pens/pencils, measuring tools, printed maps). Encourage students to collect any other manipulatives in the classroom they identify. Instruct students to work with their group and plan what they will be investigating, what they will use, and how they will do it. Refer to the learning intentions and goals of the lesson on the whiteboard to guide the students. Bring class back together and facilitate a class discussion, sharing student ideas. Record what measurements, units, spaces, or other ideas the students have. Encourage new ideas to be shared as discussion progresses. Negotiate and consolidate with the class the most important parts of each groups findings that they can use on the excursion. This will be used to create the student surveys. **Students Will:** Use the various materials, tools, manipulatives in the classroom to think of what animal residences they will investigate on the excursion, estimate what attributes they might measure, how they will measure those attributes (units maybe?).	What are some things we could try? How can we group our data? Do we think we have found the best solution? Have you thought of any new questions/problems? What made you decide to do it that way? Did anyone create a different solution?	Record survey design digitally to print for the excursion. Record students' coloration using photos or recording videos. These can be reviewed to gain a sense of classroom's knowledge learnt from previous lessons.

	Collaborate and record what they discover on the butcher's paper or create a model of how something might be measured. Contribute to a whole class discussion, sharing what their group created, giving reasons for the decisions and offer new solutions.		
5min	***Conclusion (After-phase/Reflection):*** ***Zoo Contract (Appendix 2)*** **Teacher Will:** Appreciate the class's work and highlight some discoveries/creations the students made and connect their use to the excursion. Hand out the Zoo contract forms, reminding students that they are working with the zoo to re-home the animals while they renovate. Record a copy of the student contracts by taking a photo. These will be printed with the class constructed surveys to use on the excursion. **Students will:** Negotiate and co-create 3 learning goals as a class to record on the Zoo Contracts and sign with the teacher. Types of learning goals that students should create (assisting is ok). - Behaviour based (i.e., I will be respectful of the animals) - Task based (i.e., I will try my best to accurately measure the homes of the animals) - Intrinsic (i.e., I will learn by asking questions at the zoo)	What is the aim of going to the zoo? What is important when we go outside the school as a class? What do you want to improve about yourself?	Teacher contract
Differentiation	**Student A (Indigenous background):** Best supported by giving a clear idea of the 'big picture', having social connection in their learning through group work and collaboration (Foley, 2019, p. 39). A key strength of this lesson for Student A is that it is relevant to the context of exploring the zoo to discover the measurements of enclosures to provide the residents with temporary accommodation in their own zoo (Van de Walle et al., 2019, p. 120)		

	If Student A elects to use Aboriginal English appreciate the language used, negotiate the meaning, and encourage them to use standard Australian English to the whole class if they have something to contribute (Foley, 2019, p.38). **Student B (Dyscalculia):** Student B can use the various manipulatives in the classroom to visualise what mathematical concept is being explored. An important note is that Student B benefits from having a concept like 'measure of a length' being described as a comparison of a length of an object to the length of a unit (Van de Walle et al., 2019, p. 24). **Student C (Vision Impairment):** Manipulatives such as measurement tools or using objects/areas in the classroom to simulate an area or object at the zoo will allow Student B to better experience the mathematical concepts being discussed (Gonzales, 2020). Student B has some vision but requires enlarged text and images to be able to see them properly, for example when using the zoo map in class ensure that it is enlarged on the interactive board so that Student B can see it and also be more inclusive by not highlighting their disability (Graham, 2019, p. 223). The various tasks can be fatiguing for Student B, especially the tactile manipulatives, so it is important that they get multiple break opportunities (Gonzales, 2020). The main task of the lesson relies on co-construction and class discussion which Student B can participate in fully. Any instructions given or written down are either made in large enough font for Student B to see, put on the class iPad or repeated verbally. The exit task of establishing learning goals for the excursion using the 'Zoo Contract' will need to be adjusted for Student B by using a class iPad to record a verbal contract with the teacher.
Pedagogy & Approaches	This lesson caters for multiple learning preferences such as body based and verbal-linguistic learners, by having an open ended task with multiple entry points that students can choose freely (Cranley et al., 2021, p. 92). Teaching through problem solving: Students will learn through inquiry, exploring real contexts, problems, situations, and models (Van de Walle et al., 2019, p. 38) Students will develop concepts of measurement procedures through problem solving what mathematical data will be collected and how it will be collected (Van de Walle et al., pg. 46). Based on social-constructivist theories, this lesson will be instructed using cooperative learning strategies to encourage students to build knowledge together, value different experiences and skills, and improve the transfer of learning (Killen, 2015, p. 213)Cooperative learning can be equally beneficial for students of different abilities, with weaker students being encouraged to persist and stronger students being able to identify gaps in their understanding (Killen, 2015, p. 214).

Reference List:

Cranley, L., Johnson, G., & Wendy, Harmon. (2021). *Assessment, Feedback and Reporting: A Guide to Increasing Student Learning*. Cengage Learning Australia. http://ebookcentral.proquest.com/lib/flinders/detail.action?docID=6914098

Foley, E. (2019). Indigenous learners of mathematics: Reflections from teaching at the top of Australia. *Australian Primary Mathematics Classroom*, *24*(3), 34–40.

Gonzales, M. (2020). *Systems Thinking for Supporting Students with Special Needs and Disabilities: A Handbook for Classroom Teachers*. Springer Singapore. https://doi.org/10.1007/978-981-33-4558-4

Graham, L. (2019). *Inclusive Education for the 21st Century: Theory, Policy and Practice*. Taylor & Francis Group. http://ebookcentral.proquest.com/lib/flinders/detail.action?docID=6215117

Killen, R. (2015). *Effective Teaching Strategies: Lessons from Research and Practice*. Cengage. http://ebookcentral.proquest.com/lib/flinders/detail.action?docID=5215440

Van de Walle, J., Martin, D., Karp, K., Bay-Williams, J., Brass, A., Bentley, B., Ferguson, S., Goff, W., Livy, S., & Marshman, M. (2019). *Primary and Middle Years Mathematics: Teaching Developmentally EBook*. Pearson Education Australia. http://ebookcentral.proquest.com/lib/flinders/detail.action?docID=5830083

Way, J. (2008). Using Questioning to Stimulate Mathematical Thinking. *APMC*, 22–27.

Appendix 1


Torrens River/Kaurna Parri
Frome Rd
Nocturnal House
Central Lawn
Rotunda
Immersion
Envirodome
Nature Theatre
Variety Children's Zoo
Reptile House
Nature's Playground
Bamboo Forest
Fig Tree Cafe and Function Centre
Panda Shop
Walking tour start
Exit
The Zoo Shop
Entry
Plane Tree Centre
Plane Tree Drive
Wisteria Cafe
Zoobarn Hire
Lift code 5000#
Heritage Gates
Historic Elephant House
Tamarins on the Run
Free Flight Bird Show
Pheasantry Path
Colobus Crossing
Mainland Tammar Wallaby
Walk Through South East Asian Aviary
Pygmy Hippopotamus
Australian Native Birds
Dragon Tree
Walk Through Rainforest & Wetlands Aviary
Zoo Learning Centre
Animal Health Centre
Administration (Minchin House)
Farmyard Area
Stairs
Steep gradient
Key
Toilet
Baby change
Parent's room
Drink fountain
SA Water drink bottle refill
Penguin feed location (map ref. X14)
Picnic area
Free wi-fi access is available throughout the zoo. Thanks to swoop
Please do not feed the animals in the zoo as it will harm their health. Reptile House, Nocturnal House, Environdome and Walkthrough aviaries open 10 am daily, close at 4:30 pm weekdays and 4:45 pm weekends and public holidays.
Thank you for not smoking or vaping.
Meet the Keeper
Hear about our animals from their dedicated keepers
All activities are subject to change/cancellation. Listen for announcements.
South East Asia Birds Map ref. X6 10:45am daily
Wildshow Animal Experience Map ref. X4 10:45am daily in the Variety Children's Zoo Nature Theatre
Tiger Map ref. S4 11:00am daily
Free Flight Bird Show Map ref. L5 11:30am daily on the Central Lawn
Sea Lion Map ref. W9 11:45am daily
Giant Panda Map ref. H4 1:15pm daily
Lion Map ref. N4 1:40pm Tuesday, Thursday, weekends & public holidays
Penguin Map ref. X14 2:15pm daily
Orangutan Map ref. S4 2:30pm weekends, public & school holidays
Pelican Map ref. L6 2:30pm daily

Appendix 2

ZOO CONTRACT	
Student Agreement	Sign here……Date……
I agree to these goals….	1. 2. 3.
Teacher Agreement	Sign here……Date……

<table>
<tr><td colspan="3">Lesson Title: Zoo Excursion (Lesson 7).</td></tr>
<tr><td>Unit Title: Measurement: Conversion of Units and Area. Adapted from the Government of South Australia, Department for Education (2020).

Lesson Title: Zoo Excursion (Lesson 7).</td><td>Name: Teacher C

Lesson duration: approximately 4 hours.</td><td>Year level: 5.</td></tr>
<tr><td rowspan="2">Prior Knowledge:
According to the Australian Curriculum Version 9.0 (ACARA, 2023), students have experienced measuring length with formal and informal units (Year 4), approximating and measuring the area and perimeter of shapes with formal and informal units (Year 4), and estimating with metric units (Year 3). Furthermore, the Australian Institute for Teaching and School Leadership Limited [AITSL], National Numeracy Progression (2017) additionally suggests students connect relationships between area and perimeter (UuM5) and use informal and formal units to measure the length, perimeter, and area of objects (UuM4/3). These skills have been confirmed in the diagnostic assessment in Lesson 1 (see sequence). Furthermore, previous lessons have used a constructivist approach in supporting students to develop perimeter and area problem-solving techniques</td><td>Content descriptor(s):

AC9M5M01

“Choose appropriate metric units when measuring the length, mass, and capacity of objects; use smaller units or a combination of units to obtain a more accurate measure” (ACARA, 2023).

AC9M5M02

“Solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units” (ACARA, 2023).

Learning intentions:

By the end of this lesson, students will…
Know:
Students will know how to measure the perimeter and area of large spaces in a ‘real-world’ setting.
Understand:
Students will understand how the measurement of perimeter and area can be used in real-world scenarios.
Do:
During this lesson, students will (do) measure the perimeter and area of enclosures chosen by the teacher. These enclosures will reflect the shape(s)</td><td>Resources:

• Measuring Equipment such as…
○ Tape Measures (At least 1 per group; therefore 6 needed).
○ Rulers (students to bring; at least 1 per group; therefore 6 needed).
○ Trundle Wheels (at least 1 per group; therefore 6 needed).
○ Zoo Maps (at least 1 per group; therefore 6 needed).
• Clipboards one per student (with instructions, see Appendix 8).
• Students’ lunches.
• Student pencils.
• Hats (1 per student).
• School iPad (1 per group → to be looked after by staff member).</td></tr>
</table>

(Lesson Four, Perimeter; Lesson Five, Area; Lesson Six Perimeter and Area in Context).	(i.e., rectangles, and squares) that have been investigated in prior lessons (see prior knowledge).	• Calculators (1 per group). • 1 Student self-reflection per student (Appendix 5). • End of lesson checklist (Appendix 6). • Risk Assessment (Appendix 7).

Achievement Standard:

By the end of Year 5, students use place value to write and order decimals including decimals greater than one. They express natural numbers as products of factors and identify multiples. Students order and represent, add, and subtract fractions with the same or related denominators. They represent common percentages and connect them to their fraction and decimal equivalents. Students use their proficiency with multiplication facts and efficient calculation strategies to multiply large numbers by one- and two-digit numbers and divide by single-digit numbers. They check the reasonableness of their calculations using estimation. Students use mathematical modelling to solve financial and other practical problems, formulating and solving problems, choosing arithmetic operations and interpreting results in terms of the situation. They apply properties of numbers and operations to find unknown values in numerical equations involving multiplication and division. Students create and use algorithms to identify and explain patterns in the factors and multiples of numbers.

They choose and use appropriate metric units to measure the attributes of length, mass, and capacity, and to solve problems involving perimeter and area. Students convert between 12- and 24-hour time. They estimate, construct and measure angles in degrees. Students use grid coordinates to locate and move positions. They connect objects to their two-dimensional nets. Students perform and describe the results of transformations and identify any symmetries.

They plan and conduct statistical investigations that collect nominal and ordinal categorical and discrete numerical data using digital tools. Students identify the mode and interpret the shape of distributions of data in context. They interpret and compare data represented in line graphs. Students conduct repeated chance experiments, list the possible outcomes, estimate likelihoods, and make comparisons between those with and without equally likely outcomes.

From ACARA (2023).

Content/ Learning Experiences:

Lesson Seven takes students to the zoo so they can practically apply their mathematics skills. Students will measure (AC9M5M01) and calculate the perimeter and area of certain animal enclosures in small groups (AC9M5M02). These enclosures have been selected by the teacher as they are all rectangular; this ensures the application of skills practised in the classroom. Students will use their estimation skills and problem-solve how to calculate perimeter and area without being able to measure all four sides (AC9M5M02); they will use methods they constructed in the classroom.

Teaching strategies:

This lesson utilises a combination of Constructivism, Inquiry-Based Learning (IBL), Problem-Based Learning, and the Sociocultural theory. Constructivism is applied as students construct their own knowledge; students will practice strategies and techniques developed in the classroom for their zoo measurements (Duchesne et al., 2022; Van de Walle et al., 2019). For example, students will discuss what methods are appropriate for perimeter in the *before phase;* one group may use W + W + L + L, whereas another may use (W + L) X 2. Both are applications of appropriate strategies constructed by students, yet one group may have to problem solve measurement strategies in the zoo context.

According to Duchesne et al. (2022), "Inquiry-Based Learning is a group of learner-centred practices that reflect a constructivist approach to learning;" (pp. 233) in this, "learn[ers] connect discipline-specific thinking and practical skills by collaboratively investigating and solving a problem" (p. 233). Van de Walle et al. (2019) support IBL as students develop problem-solving skills, fluency, and reasoning. IBL is demonstrated in this lesson as they solve the problem in Appendix 1, applying practical mathematics skills to real-world scenarios (Booker, 2021). IBL is continued into Lesson Eight as students use their measurements to create a temporary zoo.

Problem-based learning (PBL) is similarly reflected in the task depicted in Appendix 1. Duchesne et al. (2022), PBL occurs when students collaboratively (see Appendix 2) use strategies (in this case, mathematical) to solve problems like that shown in Appendix 1.

Finally, this lesson demonstrates Sociocultural theory as students work in groups to discuss and problem-solve together (Duchesne et al., 2022).

Attention gaining strategies throughout the lesson:

Engagement comes from the PBL tasks that connect to real-world activities (Attard, 2018); high levels of engagement should support behaviour and make attention-gaining easier (Attard, 2018). One strategy to gain student attention is through open-ended questions (Van de Walle et al., 2019; Booker, 2021). Booker (2021) highlights that open-ended questions probe students to elicit meaningful responses of their thinking rather than statements such as 'I don't know;' in turn making students actively involved in the learning process.

Combining this strategy with the use of groups and think-pair-share activities means that every student has individual accountability and a shared responsibility to/with their peers (Van de Walle et al., 2019). This encourages students to stay engaged in the task and pay attention to instruction (Van de Walle et al., 2019). Examples of this process (open-ended questions and group work) are detailed in "Teacher Questions."

Estimated time.	***Introduction (Before-phase):***	**Teacher Questions:**	**Formative Assessment & Recording Strategies.**
25m + 15m travel time = 40m.	Students are to arrive at school for the normal 8:45 AM roll call; this will be done in the classroom. The teacher and assisting parents/staff will ensure all students have hats, packed lunches, and water on arrival. The teacher will have groupings written on the board (Appendix 2). Using the following roles established in science class (AAOS, 2023) … • Manager (collects and returns all materials the team needs). • Speaker (Asks the teacher and other team speakers for help).		• Teacher observation of students. Utilise anecdotal notes (Booker, 2021; Duchesne et al., 2022).

	• Director (Makes sure that the team understands the task at hand [at zoo] and completes each step). The groups (see Appendix 2) are not based on ability as suggested by Duchesne et al. (2022), and Van de Walle et al. (2019). Avoiding ability- based grouping ensures that students do not develop low-self views and can fully engage with their peers (Duchesne et al., 2022; Van de Walle et al., 2019). The groups will collect the following materials and organise themselves into lines. • Tape Measures (At least 1 per group; therefore 6 needed). • Rulers (students to bring; at least 1 per group; therefore 6 needed). • Trundle Wheels (at least 1 per group; therefore 6 needed). • Zoo Maps (at least 1 per group; therefore 6 needed). • Clipboards (with instructions, see Appendix 8; one per student). • Calculator (at least 1 per group; therefore 6 needed). • Zoo maps (at least 1 per group; therefore 6 needed). • iPad (One per group; therefore 6 needed). • The iPad will be looked after by the staff member/adult assigned to each group (see Appendix 2). All instructions and required materials will be written on the board, as multiple forms of instruction support students to remember what they must do, particularly students with LDs (AUSPELD, 2014; Dickson, 2013).		

	The teacher (and assisting staff/parents) will check materials before escorting class onto bus. Another role call should be done on the bus. Once in the zoo grounds, the class will have the following task posed to them… *Adelaide Zoo has decided it is time for them to renovate some of their enclosures. They have asked for a group of mathematicians to work out how much space the animals and guests will need at the temporary zoo while the enclosures are being renovated. Your job today is to calculate the area and perimeter of five of the following animal enclosures….* • Australian Native Birds. • Penguins. • Kangaroos. • Emus. • Lions. • Cheetah. • Pelican. • Wombat. • Maned Wolf. See 'Differentiation' for recording of instructions. Using Think-Pair-Share (Van de Walle et al., 2019), students will discuss and share how they can find the perimeter and		

20m.	area of enclosures; particularly when only two sides can be measured. Students will be reminded of the concept of estimation and how they may have to use this when finding measurements for some enclosures; students will also be told to measure in rectangles. Reminding students of their prior learning is supported by Van de Walle et al. (2019) as, in a constructivist lesson, students must access their prior knowledge to build on it; AUSPELD (2014) and Bayetto (2021) details that this is important for students with LDs, such as Dyscalculia (see Differentiation). With their assigned teacher/assisting parent/staff, groups will head out for one hour before touching base at the Rotunda for recess (provide the time e.g., 11:00am). They will be informed to show their estimations before measuring (Van de Walle et al, 2019), show their working out, and use a calculator where necessary; staff will monitor this. Students can record their results and thinking with either pen and paper on the provided instructions (see Appendix 8); or as a recording on the iPad (see differentiation for more).		• The teacher will take anecdotal notes on the students' responses (Booker, 2021; Duchesne et al., 2022). • Students will have multiple similar questions posed to them to ensure errors stem from understanding (Booker, 2021; Hunt, 2015).

		• *How do you know that? How are you sure? Supported by Booker (2021).* • Can you show me a diagram of what you're thinking? • What techniques have you used in the classroom? How did you measure the area/perimeter of the school Gym? Will this help you here?	E.g., *"What techniques have you used in the classroom? How did you measure the area/perimeter of the school Gym? Will this help you here?"* • Providing process feedback will inform students where they were or were not successful, supporting student reflection (Bayetto, 2021; Gerzel -Short & Hedlin, 2022).

		• What regular shapes are the enclosures in general? Are they rectangles, how might you measure the perimeter of a rectangle? Do you need all four sides? How can the perimeter help you to measure the area? • Will the methods you used for one enclosure work with others? • What strategies might you suggest to another group to get them started? • Provide feedback to students on their current working out; continual feedback is supported by Bayetto (2021).	
	Body (During-phase):		

1h. 25m 45m	Students will spend an hour in their groups measuring the perimeter and area of five enclosures of their choice from the list above; they will use clipboards and paper to record their working out. Based on the teacher's observational visit before this excursion, the listed enclosures are identified as rectangular and appropriate for students' mathematics abilities (see Appendix 4). Students will meet for a 20/30-minute recess/lunch break at the Rotunda. Complete a roll call to ensure all students have returned. Proceeding recess, a discussion will occur with the teacher posing the questions aside. An opportunity is provided for students to discuss any difficulties that they have experienced in their measurements. Students will have an additional 45 minutes to finish measuring their choice of five enclosures; an assigned teacher/assisting parent/staff will accompany again for this aspect of group work. Students will meet at the Rotunda at the end to conclude the lesson and revise learnings (provide the time e.g., 12:40pm).	• What tools are you finding effective to use? • How are you calculating the perimeter of shapes? Is there a more effective way to do it? (i.e., W + L + W + L vs. W + L X 2).	• Teacher to observe children's responses and write anecdotal notes. (Duchesne et al., 2022). Please see above justification. • Students will have multiple similar questions posed to them to ensure errors

			stem from understanding (Booker, 2021; Hunt, 2015). E.g., *"What techniques have you used in the classroom? How did you measure the area/perimeter of the school Gym? Will this help you here?"* • Providing process feedback will inform students where they were or were not successful, supporting student reflection (Bayetto, 2021; Gerzel -Short & Hedlin, 2022).

30m 15m	***Conclusion (After-phase/Reflection):*** Student groups will pair up with other groups (see Appendix 2) to share, justify, and check their findings. If students disagree, then the Speaker from one of the groups can approach the teacher for assistance. By the end of this activity, students will have the area and perimeter recorded for five to ten enclosures. A self-reflection will be completed by the students, see Appendix 5. All students will come together to have some reflection questions posed (see aside). Students will line up in their groupings and have another roll call conducted. Groups will hand up their working out from today with all student's names on it; the teacher will use this for a formative assessment and provide process feedback for students to use in their summative assessment (Bayetto, 2021; Gerzel -Short & Hedlin, 2022). In an orderly fashion, students will exit the zoo and board the bus to return to school after 1:00 pm and before 2:00 pm. Ensure a final roll call occurs on the bus so all students are accounted for. Travel time back to school.	• What strategies were effective? • What did you find difficult? Why? • What might you do differently next time? Why? • What measurement tool did you find most effective (trundle wheel/tape measure)? • Did you have to do any problem solving, how did you go about this? What was you solution?	• Teacher to observe children's responses and write anecdotal notes. Please see above justification. • The teacher will collect the student's self-reflections (see Appendix 5) to see how they perceive their own strengths and weaknesses

20m			(Van de Walle et al., 2019). This will be used in combination with a checklist (see Appendix 6) based on what the groups hand up (Van de Walle et al., 2019); students will receive process feedback to use in their summative assessment (Bayetto, 2021; Gerzel -Short & Hedlin, 2022).

Differentiation:

Dyscalculia.

According to Dickson (2013), Dyscalculia is "a difficulty performing or understanding maths-related concepts and activities;" (pp.4). Johnathan, who has Dyscalculia, may have difficulty "completing written maths, word problems, and mental arithmetic" computation, according to Dickson (2013; pp. 4). Having clear and concise instructions represented in multiple modes will support Johnathan (AUSPELD, 2014; Dickson, 2013). Being clear and concise avoids verbal overload (Dickson, 2013). Appendix 8 details this as students receive multiple ways to access the instructions (AUSPELD, 2014; Dickson, 2013). Utilising Appendix 8, students can monitor their progress within the instructions; particularly helpful for students with LDs who may struggle with working memory (AUSPELD, 2014; Dickson, 2013).

Students with LDs may also struggle with pen and paper tasks (Dickson, 2013), for this reason, Johnathan (and other students) can film themselves describing the mathematics with school iPads. Students with Dyscalculia may struggle to come up with different mathematical strategies (AUSPELD), this may be necessary in this activity as only two sides of the enclosure can be measured. By placing students in groups, they can support each other in the problem-solving process (Van de Walle et al., 2019). Finally, prompting questions have been prepared to support students in the problem-solving process (AUSPELD, 2014).

Moderate Vision Impairment.

William has a moderate vision impairment; when at the zoo, he will have his white cane. Furthermore, his mother (Judith) has volunteered to attend the trip; she will be in his group with Mrs McMaugh. Trundle wheels are available for students to use; this may assist William in measuring distances as the tool clicks each meter. Providing multiple modes of instruction is important (AUSPELD, 2014; Dickson, 2013); for William, this could be recorded instructions using the school iPads.

Aboriginal Background.

Students will be involved in confirming their answers as correct or incorrect; Van de Walle et al. (2019) describe this 'power' as being evenly distributed. This balance will empower the students; Van de Walle et al. (2019) highlight this as important for students with Aboriginal backgrounds, as they have a rich, dynamic cultural process that is often not recognised.

Real-world connections highlight activity relevance (Foley, 2019), something important for all students, not just those with LDs, vision impairment and aboriginal backgrounds.

Prompts, as seen in the 'teacher questions' consider students such as Elizabeth as they can support her to (a) engage in questioning and the thought process, and (b) respond in Aboriginal English if that is more appropriate for her (Foley, 2019).

Extension For Gifted Students and Their Groupings.

As an extension, students are also encouraged to investigate the size and area of other aspects of the zoo, such as eating areas, paths, and bathrooms.

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Appendix 1: Inquiry Based Learning Problem

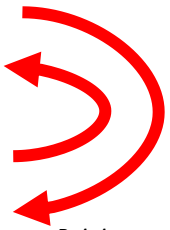
Adelaide Zoo has decided it is time for them to renovate some of their enclosures. They have asked for a group of mathematicians to work out how much space the animals and guests will need at the temporary zoo while the enclosures are being renovated. Your job today is to calculate the area and perimeter of five of the following animal enclosures….

Image from Ross (2019).

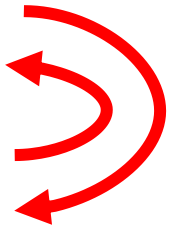
Appendix 2: Student Groupings for Zoo.

Group #	Name	Number in Group	Assigned teacher or assisting parents/staff.
Group 1	Amanda	4	Kelly (Rachel's mum).
	Rachel		
	Alec		
	Johnathan		
Group 2	Rhianna	4	Judith (William's mum) & Mrs Mc Maugh.
	Erin		
	Matt		
	William		
Group 3	Josh	4	Richard (Josh's dad).
	Noah		
	Alex		
	Elizabeth		
Group 4	Steven	5	Mr. Simpson.
	Henry		
	Ella		
	Ebony		
	Chloe		
Group 5	Zac	5	Mr. Burford.
	Ryder		
	Caden		
	Harry		
	Mitch		
Group 6	Oscar	4	Roger (James's dad)
	James		
	Alysha		
	Billy		
	26 students		

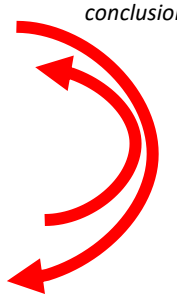
Pair in lesson conclusion.



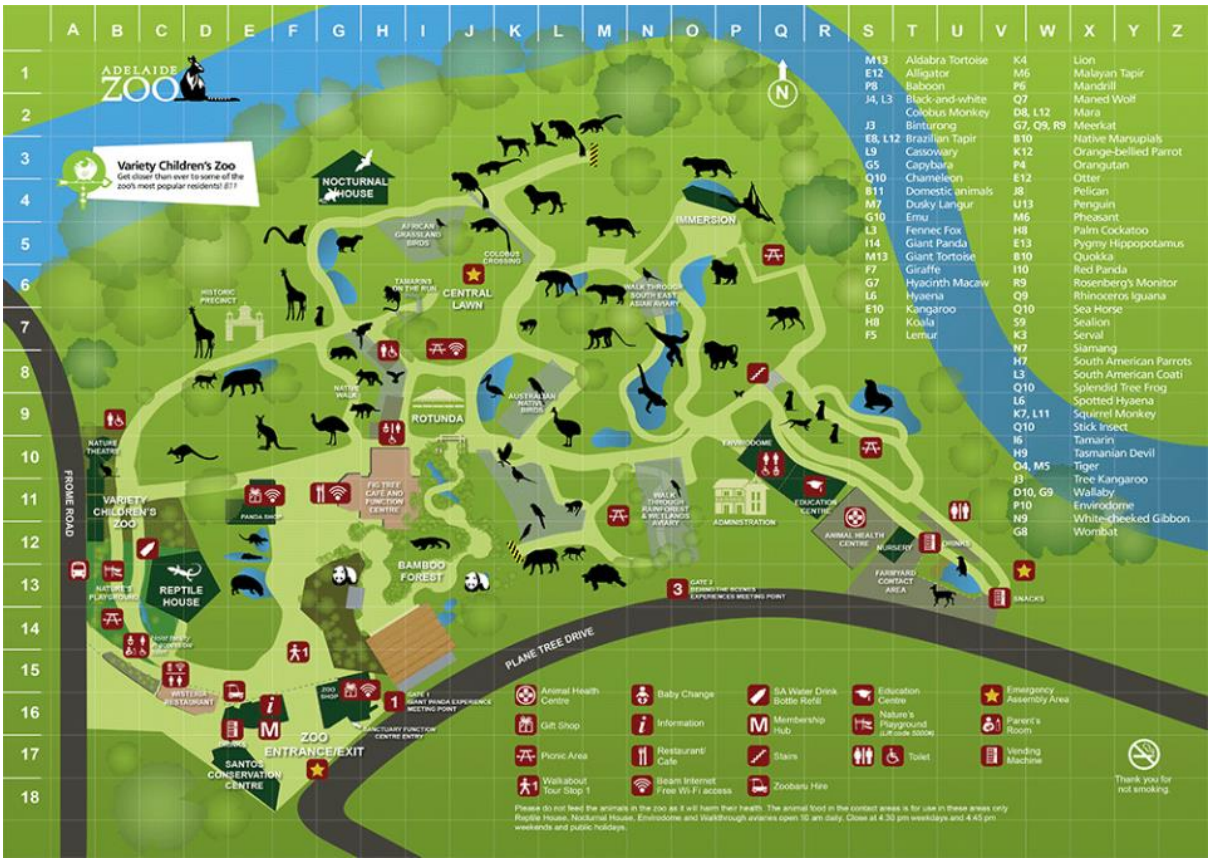
Pair in lesson conclusion.



Pair in lesson conclusion

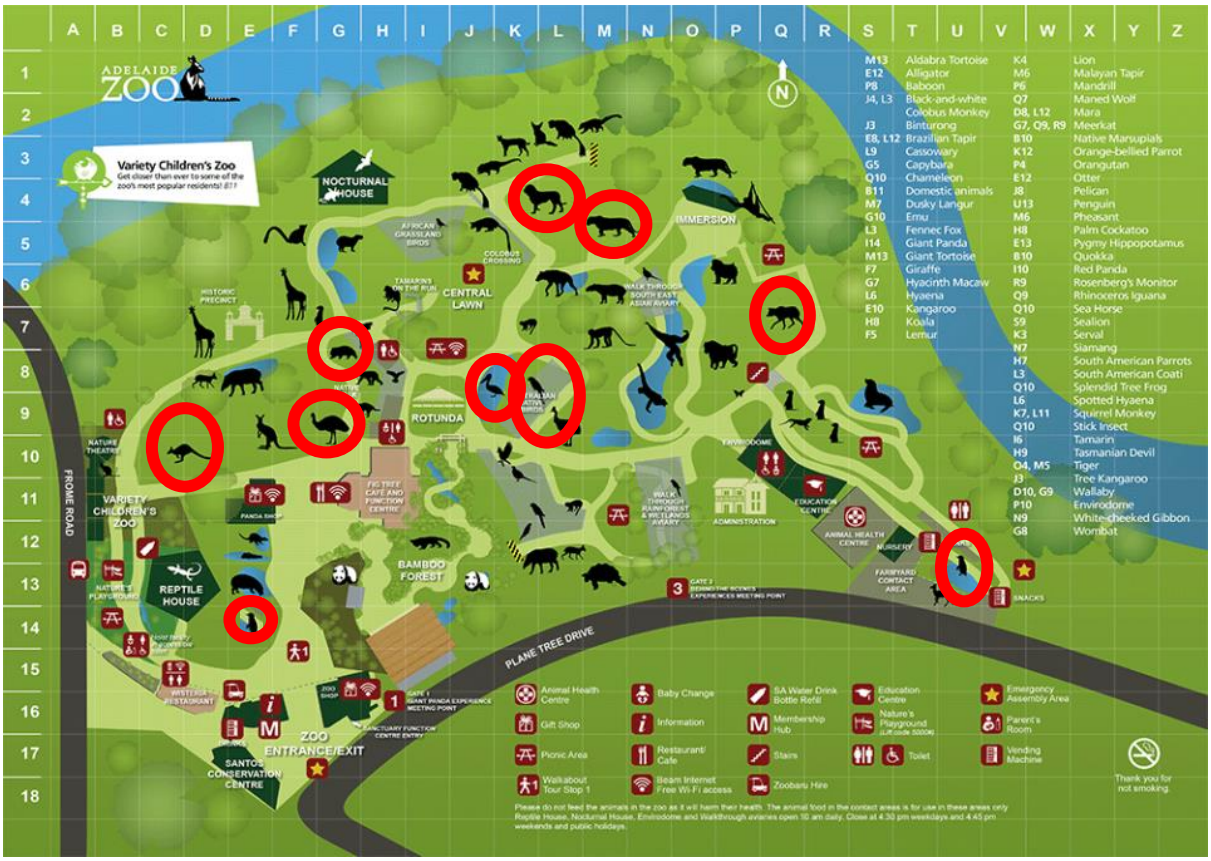


Appendix 3: Zoo Map.



From Zoos South Australia (2023).

Appendix 4: Zoo map with enclosures appropriate for this task.



Added markings from the Zoos South Australia (2023) map.

- Australian Native Birds.
- Penguins.
- Kangaroos.
- Emus.
- Lions.
- Cheetah.
- Pelican.
- Wombat.
- Maned Wolf.

Appendix 5: Student Self Reflection.

Tick the stage you are up to in your learning. Do not forget that everyone is different and that is okay!	Stage 1: I want more help to understand.	Stage 2: I want to start practicing with a friend.	Stage 3: I want to practice independently, and I am getting it.	Stage 4: I am confident, have practice and can now teach others.
I understand what standard units of measurement are and applied them at the zoo.				
I understand what perimeter is and know how to find the perimeter of rectangles with the measurements of only two sides.				
I utilised an effective strategy to find the perimeter of enclosures whilst at the zoo.				
I understand what area is and can define the meaning.				
I could find the area of the rectangular enclosures using estimation and perimeter measurements.				
	Strongly Disagree	Disagree	Agree	Strongly Agree.
I worked with my group well.				
My whole group contributed to the area and perimeter findings.				
My whole group understands the concepts of area and perimeter.				

Interpreted from the Department for Education, the Government of South Australia (2020).

Appendix 6: Checklist.

		Stage 1:	Stage 2:	Stage 3:	Stage 4:
		Students do not understand.	Students need further support.	Students have conceptual understanding.	Students have strong conceptual understanding.
Students understand what standard units of measurement are and applied them at the zoo.					
Students understand what perimeter is and know how to find the perimeter of rectangles with the measurements of only two sides.					
Students utilised an effective strategy to find the perimeter of enclosures whilst at the zoo.					
Students understand what area is and can define the meaning.					
Students could find the area of the rectangular enclosures using estimation and perimeter measurements (at least 3/5 times).					
Students correctly found the perimeter of the chosen enclosure (attach marking).		No		Yes	
	Enclosure 1.				
	Enclosure 2.				
	Enclosure 3.				
	Enclosure 4.				
	Enclosure 5.				
Students correctly found the area of the chosen enclosure (attach marking).	Enclosure 1.				
	Enclosure 2.				
	Enclosure 3.				
	Enclosure 4.				
	Enclosure 5.				

Interpreted from the Department for Education, the Government of South Australia (2020).

Appendix 7: Risk Assessment.

Ref ID #	Name	Date
S333123	Teacher C	15/06/2023

Activity:	Zoo Excursion	**Date:** 31/06/2023

Circle the level of risk in this activity:

	Not Significant	Minor	Moderate	Major	Severe
Highly Unlikely.	Low	Low	Low/Medium	Medium	Medium
Unlikely.	Low	Low/Medium	Low/Medium	Medium	High/Medium
Possible.	Low	Low/Medium	Medium	High/Medium	High/Medium
Likely.	Low	Low/Medium	Medium	High/Medium	High
Highly Likely.	Low/Medium	Medium	High/Medium	High	High

What is the risk level?	**What is the risk?**	**How is the risk mitigated?**
Medium	Missing children on excursion.	• Multiple roll calls. • Appropriate staff to student ratio. • Multiple check ins with all staff and students.

Who is responsible for this activity? Teacher C

Any medical considerations (e.g., Asthma)?

William has a moderate vision impairment, when at the zoo, he will have his white cane with him. Furthermore, his mother (Judith) has volunteered to attend the trip; she will be placed in his group with Mrs McMaugh.

Appendix 8: Instructions Page.

Adelaide Zoo has decided it is time for them to renovate some of their enclosures.

They have asked for a group of mathematicians to work out how much space the animals and guests will need at the temporary zoo while the enclosures are being renovated.

Your job today is to calculate the area and perimeter of five of the following animal enclosures….

Image  from Ross (2019).

Step 1.

Select 5 of the following animals…

- Australian Native Birds.
- Penguins.
- Kangaroos.
- Emus.
- Lions.

- Cheetah.
- Pelican.
- Wombat.
- Maned Wolf.

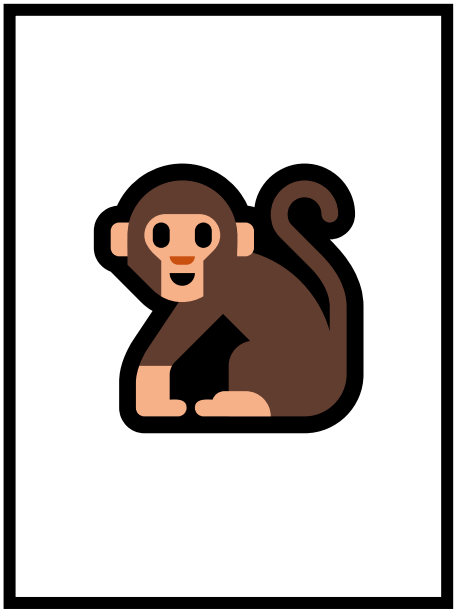
Step 2.

Use the map (and your mapping skills from last term!) to locate your chosen enclosure (staff can help if need be!).

Step 3.

Measure the perimeter of your enclosure. Notice how it is a rectangle? 😉

Record your measurements here…



Have you recorded the units of measurement?

Step 4.

Use your measurements to calculate the area.

Step 5.

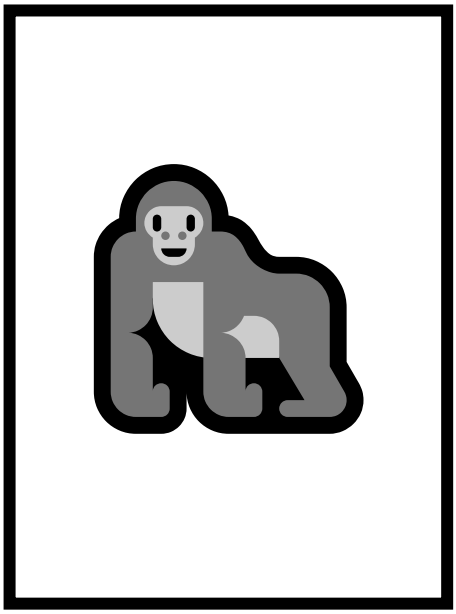
Head to the next enclosure!

Step 6.

Measure the perimeter of your enclosure. Notice how it is a rectangle? 🤔

Record your measurements here…

Have you recorded the units of measurement?



Step 7.

Use your measurements to calculate the area.

Step 8.

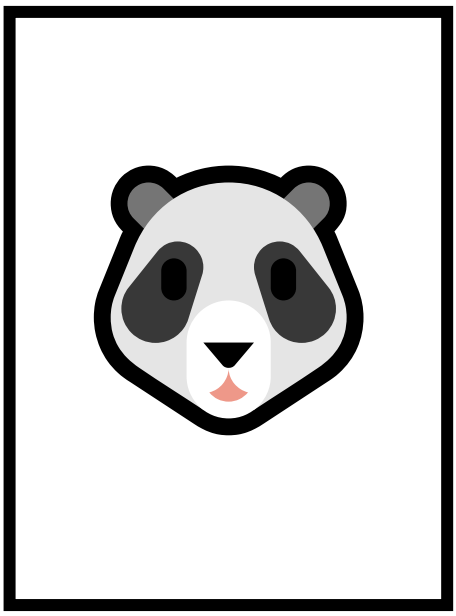
Head to the next enclosure!

Step 9.

Measure the perimeter of your enclosure. Notice how it is a rectangle? 🤔

Record your measurements here…

Have you recorded the units of measurement?



Step 10.

Use your measurements to calculate the area.

Step 11.

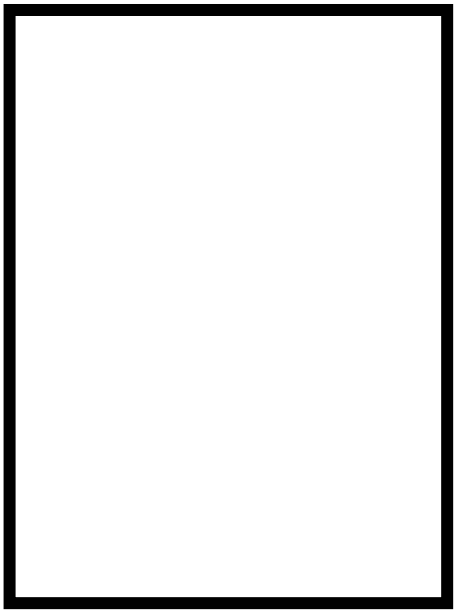
Head to the next enclosure!

Step 12.

Measure the perimeter of your enclosure. Notice how it is a rectangle? 🤔

Record your measurements here…

Have you recorded the units of measurement?



Step 13.

Use your measurements to calculate the area.

Step 14.

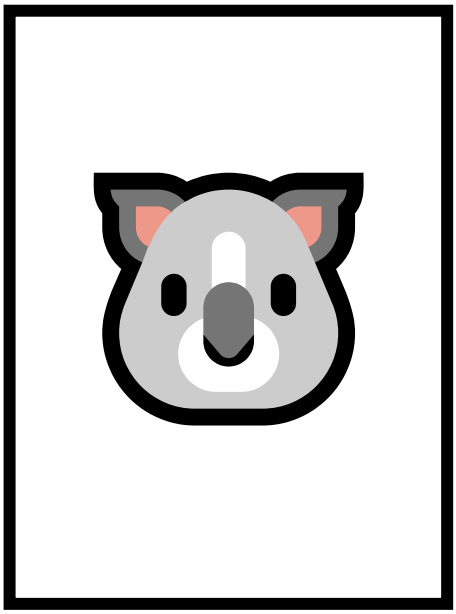
Head to the next enclosure!

Step 15.

Measure the perimeter of your enclosure. Notice how it is a rectangle? 🤔

Record your measurements here…

Have you recorded the units of measurement?



Step 16.

Use your measurements to calculate the area.