MATH TRAIL - SELF GUIDE

Stage: 3

Taronga Western Plains Zoo is trialling a new inquiry-based mathematics program in which students will develop their working mathematical skills in a real-life context that is both meaningful and engaging.

This resource has been designed to provide you and your students with a comprehensive kit of information and activities to ensure that you gain the maximum benefit from your zoo excursion.

It is suggested that you read through the resource and select activities that are relevant to your students.

TARONGA WESTERN PLAINS ZOO DUBBO

For the Wild

NOTE: Students are to work in groups of 2-3 to complete these tasks.

You could print off ONE leaflet per group OR ONE leaflet per student.

SUGGESTED ACTIVITIES

Learning Intention:

- I am learning about nature and function of ecosystems and how they are interrelated.
- I am learning to ask questions and undertake investigations and problem solving strategies to demonstrate mathematical techniques.

Success Criteria:

- I can use mathematical terminology.
- I can give valid reasons when comparing and selecting from possible solution, making connections with my existing knowledge and understanding.

STUDENTS REQUIRE

- Photocopied Worksheets (working in groups of 2 or 3)
- Clipboard
- Pencil
- Coloured Pencils
- Calculator

GROUP REQUIREMENTS

- 100m tape measure or trundle wheel
- 1m length of string
- 1m ruler or small tape measure
- Stopwatches

PROPOSED ITINERARY

TIME	Activity	Location
9:15 – 9:30	Education Centre Welcome	Education Centre
9:30 – 10:15	Map, Time & Data Activities to be completed	Playground
10:15 – 10:45	Walk to White Rhino	Zoo Circuit
10:45 – 11:30	Measurement Height Activity & Measurement Volume Activity 1 to be completed	White Rhino Enclosure
11:30 – 11:50	Walk to Elephant Enclosure and complete Measurement Volume Activity 2	Elephant Enclosure
11:50 – 12:30	Walk to Waterhole Café and complete Waterhole Map Activity	Waterhole Cafe
12:30 – 1:00	Lunch	Waterhole Cafe
1:00 – 2:00	Walk to Aussie Walkthrough	Zoo Circuit
2:00 – 2:30	Complete Shape Activity	Aussie Walkthrough
2:30 – 3:15	Walk to Galapagos Tortoise and Complete Weight Activity	Galapagos Tortoise Enclosure

OUTCOMES - STAGE 3

NUMBER AND ALGEBRA

- Selects and applies appropriate strategies for addition and subtraction with counting numbers of any size MA3-5NA
- Selects and applies appropriate strategies for multiplication and division, and applies the order of operations to calculations involving more than one operation MA3-6NA

MEASUREMENT AND GEOMETRY

- Locates and describes position on maps using a grid-reference system MA3-17MG
- Manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties MA3-15MG
- Selects and uses the appropriate unit and device to measure lengths and distances, calculates perimeters, and converts between units of length MA3-9MG
- Selects and uses the appropriate unit to estimate, measure and calculate volumes and capacities, and converts between units of capacity MA3-11MG
- Selects and uses the appropriate unit and device to measure the masses of objects, and converts between units of mass MA3-12MG
- Uses 24-hour time and am and pm notation in real-life situations, and constructs timelines MA3-13MG

STATISTICS & PROBABILITY

- Uses appropriate methods to collect data and constructs, interprets and evaluates data displays, including dot plots, line graphs and two-way tables MA3-18SP

WORKING MATHEMATICALLY

- Gives a valid reason for supporting one possible solution over another MA3-3WM
- Selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations MA3-2WM
- Describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions MA3-1WM

MAP

Map Activity

Collect your zoo map from the Amarti Education Center and say hello to the Education team ☺

Go to the **grass area** between the Safari Park Playground and the Savannah Plaza.

TASK:

Using your **zoo map** answer the following questions:

In what direction are the … 	**Answers** *(North, North East)*
Galapagos Tortoise from the Savannah Plaza	
Asian Elephant from the Ostrich	
Lion Prides Lands from the Australia exhibit	

How far around the zoo circuit are the …	**Answers** *(kilometers)*
White Rhinoceros	
Emu	
Addax	

What grid reference is the …	**Answers** *(G, 10)*
Cheetah	
Camel	
African Wild Dog	

TIME: KEEPER ACTIVITIES

TASK:
Using the timetable of Keeper Activities choose **FIVE** activities and convert the times from 12-hour time to 24-hour time.

12-hour time	24-hour time	Activities
9:30am-10:00am		Ring-tailed Lemur/Spider Monkey Feed (@ Savannah Visitor Plaza, Keeper on Lemur Island)
9:25am		Black Rhino Keeper Talk
10:00am		Giraffe Activity - plenty to see at this time of day as the herd heads to the platform for a feed and the Giraffe Encounter.
11:20am		Hippo Activity – see the Hippos out of the pond as the Hippo Encounter takes place.
11:40am		Cheetah Keeper Talk
12:00pm		Asian Elephant Keeper Talk
12:30pm		Deer Feed
12:40pm		Barbary Sheep Feed (@ Waterhole)
12:45pm		Meerkat Feed (@ Waterhole)
12:30pm-1:00pm		Spider Monkey Feed (@Savannah Visitor Plaza)
12:30pm-1:00pm		Goat Feed
2:10pm		Otter Keeper Talk
2:35pm		Galapagos Tortoise Keeper Talk

TASK:
Are there any activities that occur at the same time? If so place a STAR next to them.

Circle the Keeper Activities on the table that you might like to attend while you are here ☺

DATA

SUMMER: Do this at the beginning of your self-guide.
WINTER: Complete this at the end of your self-guide.

Go to the Safari Park Playground with your class.

TASK:

- Ask **TWO** students to complete the following activities.
- Use a **stopwatch** to time how long it takes each student to complete the following activities.

Activity	TIME TAKEN		Difference between the student times
	Student 1	Student 2	
Traveling on Flying Fox (start the time once both feet are off the ground till you reach the end)			
Climb across the Monkey Bars.			
Swing 10 times on the swing.			
Slide down the slippery dip.			
Walk across the rope bridge.			

TASK:

Which activity to the least amount of time? _____

Which activity took the greatest amount of time? _____

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MEASUREMENT HEIGHT

White Rhinos are the second-largest land mammal and their name comes from the Afrikaan's, a West Germanic language, word "weit" which means wide and refers to the animal's mouth. Let's see how we measure up against our beautiful White Rhinos.

TASK:
Measure your height and your teacher's height using the chart located at the White Rhino enclosure.
Convert the heights you record from centimeters into meters.

Height	Centimeters CM	Meters M
My height		
Teacher's height		

1. Which **Rhino Species** is the closest to **your height** and your **teacher's height**?

Me: _____ Teacher: _____

2. What is the **height difference** between the Greater One-Horned Rhino and a White Rhino Calf?

_____

3. What is the height difference between your teacher and yourself?

_____

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MEASUREMENT & VOLUME

Sometimes animals at the Zoo need to be transported from one place to another.
The size of the transport box (crate) is determined by the animal.
Let's find out the volume of some of these crates.

TASK:
BEFORE you measure the following animal transport crate **estimate** (CM or M) the **height**, **length**, and **width** of each object.

White Rhinoceros Crate	Estimation	Centimeters CM	Meters M
Internal Height:			
Internal Length:			
Internal Width:			

Calculate the **internal** volume of the crate used to transport our White Rhinoceros.

REMEMBER: Length x Width x Height = Volume

NOTE: use your Meter results

White Rhinoceros Crate Volume	

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MEASUREMENT & VOLUME

Can we do it again?
This one will be TRICKY and we are looking to take our measurements from the **outside** (**external**) of the crate.

TASK:
BEFORE you measure the following animal transport crate **estimate** (CM or M) the **height**, **length**, and **width** of each object.

Asian Elephant Create	Estimation	Centimeters CM	Meters M
External Height:	*Use the squares on the outside to help measure this.*		
External Length:			
External Width:			

Calculate the volume of the crate used to transport our Asian Elephants.

REMEMBER: Length x Width x Height = Volume

NOTE: use your Meter results

Asian Elephant Crate Volume	

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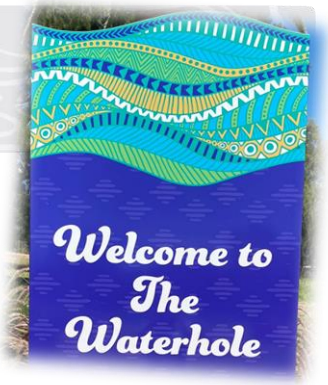
WATERHOLE MAP



Located halfway around the zoo the waterhole is a café next to our Meerkat and Tortoise habitats. It has a water play area featuring animals' sculptures.

TASK:

- Draw a map of this area in the space below.
- Be sure to add a KEY to your map of this area (hint look at your zoo map KEY for ideas)

KEY			

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SHAPE

Go to the **Aussie Walkthrough** and explore all the signs **outside** the enclosure.

TASK:

While you are at the Aussie Walkthrough

- make a list of all the two-dimensional (2D) shapes you see
- the three-dimensional (3D) objects it creates and
- identify the physical object.

See the example below.

2D Shape	**3D Object**	**Object**
Rectangle	Rectangular Prism	Door

WEIGHT

Go to the Zoo's oldest residents.

Meet Taronga Western Plains Zoo's **Galapagos Tortoises.**

They can live to over 150 years and weigh up to 300kgs!

TASK: Using the images on the display board complete the table below.

Galapagos Tortoise	Weight in Grams (g)	Weight in Kilograms (kg)	Draw which scale you would use to weigh each size tortoise?
Hatchling			
5 Year Old			
Adult Female			
Adult Male			

SCALES:

Kitchen Scales 

Large Kitchen Scale 

Industrial Pallet Scale 

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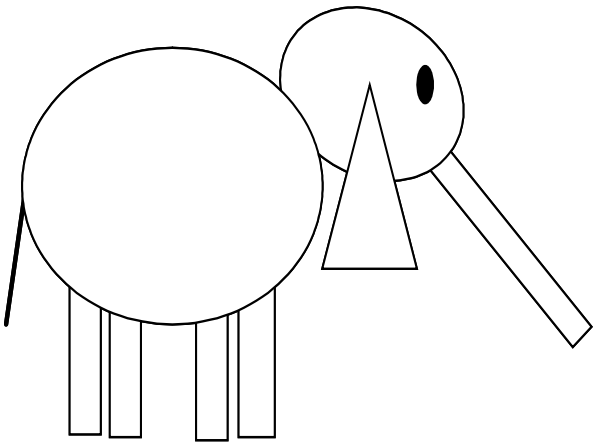
AFTER THE ZOO: SHAPE

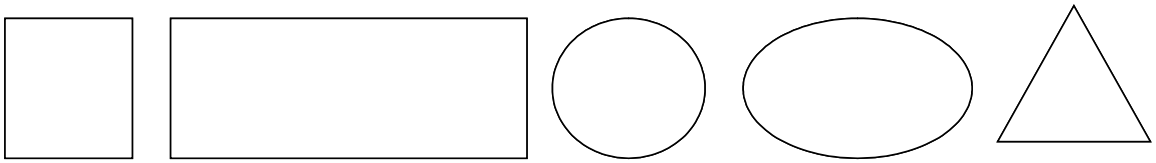
2D Animals

You can make your own 2D animals using a range of shapes. An elephant has been drawn for you

FOR EXAMPLE:

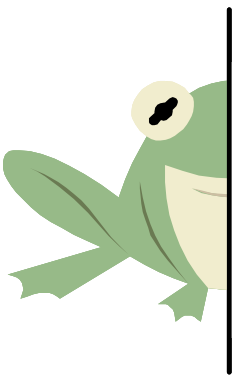


TASK:
Choose from these 2D shapes to make an animal you can seen on your **zoo map**.
Draw your animal in the space below.



AFTER THE ZOO

TASK:
Draw the other half of the animal below.



Choose an animal you have seen today and **draw half of it.**

Ask another person in your class to finish the other half for you.

AFTER THE ZOO: GRAPH

TASK:

Use your **data** results from the **Safari Park** task to **construct** a graph to show your stopwatch results for **Student 1** and **Student 2**.

AFTER THE ZOO:
ADDITION AND SUBTRACTION

Zookeepers prepare food for animals in their care.
Food preparation for animals at the zoo is often organised one week in advance.

TASK:

Your job is to calculate the food items needed for the TWO Ringtail Possums (Hush and Poss) on a **Monday** at the Armati Education Centre.

Weekly Diet	Amount (per possum)	Day possums receives food item	Amount for TWO possums on a Monday
Pellets	30g	Everyday	
Spinach	15g	Everyday	
Endive	15g	Everyday	
Lettuce	15g	Everyday	
Broccoli	1g	Everyday	
Corn	5g	Everyday	
Carrot	30g	Tuesday, Thursday, Saturday	
Sweet Potato	30g	Monday, Wednesday, Friday, Sunday	
Peas	5g	Thursday, Saturday	
Eggplant	5g	Monday	
Capsicum	5g	Tuesday	
Fennel	5g	Wednesday	
			TOTAL:

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