MATHS IN NATURE & ENVIRONMENT

Explore patterns, numbers and the planet around you

NATURE	GROWTH	RESOURCES	ENERGY

Inside this pack: 12 hands-on activities, real-world environmental challenges, space to show your working and a complete answer key.

OBSERVE • COUNT • MEASURE • PROTECT

Name: _____ Date: _____

Welcome, Nature Explorer!

Maths is all around us—in the shape of leaves, the growth of trees, rainfall, recycling, energy use and the habitats of animals. These activities help you use numbers to understand nature and think about ways to care for our planet.

Remember: Record units carefully, show your calculations and use the information given. For outdoor activities, stay in safe public areas and ask an adult for help when needed. Never climb trees or approach wild animals.

YOUR NATURE MATHS TOOLKIT	
Patterns & symmetry	Notice repeating designs and matching halves in natural forms
Length & area	Measure growth, distances, garden beds and spaces
Data	Use tally marks, tables, totals and graphs to describe observations
Fractions & percentages	Compare parts of a whole, such as recycled materials
Time & rate	Explore growth over time, water flow and energy use
Estimation	Make a sensible estimate, then check it with a calculation or measurement

Nature note: Living things vary. Your own observations may be different from the examples in these worksheets—and that is part of the discovery!

1. Patterns in Leaves & Flowers

Nature is full of repeating patterns and symmetry. Look closely at the examples and solve the pattern puzzles.

NATURE MATHS • THINK IT THROUGH

A leaf pattern has 2, 4, 6, 8, ... small marks. How many marks will the next two leaves have?. 1

_____

A flower has 6 petals. How many petals would 5 identical flowers have altogether?. 1

_____

A garden design repeats this sequence: circle, leaf, leaf, circle, leaf, leaf. What are the next three shapes?. 1

_____

A butterfly drawing has 2 matching wings. If one wing has 4 spots, how many spots are there on both wings?. 1

_____

A plant bed has 4 rows with 7 plants in each row. How many plants are there?. 1

_____

MINI CHALLENGE

Find a natural pattern near you. Sketch it and explain what repeats. Do not pick or damage living plants.

_____

_____

2. Tree Growth Tracker

A young tree was measured at the end of each year. Use the data to explore growth.

NATURE MATHS • THINK IT THROUGH

Data: Year 1: 45 cm; Year 2: 62 cm; Year 3: 80 cm; Year 4: 99 cm.

How tall was the tree at the end of Year 4?. 1

_____

How much did it grow between Year 1 and Year 2?. 1

_____

How much did it grow altogether from Year 1 to Year 4?. 1

_____

Which year-to-year period had the greatest growth?. 1

_____

If it grows another 16 cm, what will its new height be?. 1

_____

MINI CHALLENGE

Create a line graph showing the tree's height at the end of each year. Give your graph a title and label both axes.

_____

_____

3. Biodiversity Count

A nature group counted different creatures in a garden during a short observation period.

NATURE MATHS • THINK IT THROUGH

Data: Butterflies – 8; bees – 12; ladybirds – 5; birds – 7; ants – 18.

Which group was counted most often?. 1

How many butterflies and birds were counted altogether?. 1

How many more ants than ladybirds were counted?. 1

Find the total number of creatures counted.. 1

What fraction of the total were bees? Simplify if possible.. 1

MINI CHALLENGE

Make a bar graph of the counts. Observe wildlife from a distance and do not disturb it.

4. Rainfall Recorder

A rain gauge recorded the rainfall over five days.

NATURE MATHS • THINK IT THROUGH

Data: Monday – 12 mm; Tuesday – 0 mm; Wednesday – 8 mm; Thursday – 15 mm; Friday – 5 mm.

On which day was rainfall highest?. 1

_____

How much rain fell altogether during the five days?. 1

_____

What was the difference between the highest and lowest daily rainfall?. 1

_____

How many days had some rainfall?. 1

_____

What was the average rainfall per day over the five days?. 1

_____

MINI CHALLENGE

Draw a bar graph of the rainfall. Use equal steps on the scale and include the unit mm.

_____

_____

5. Every Drop Counts

A family is finding ways to use water carefully. Study the examples and calculate.

NATURE MATHS • THINK IT THROUGH

A tap drips 200 mL of water in one hour. How much would drip in 5 hours at the same rate?. 1

_____

A watering can holds 4 L. It is filled with 1.5 L. How much more water is needed to fill it?. 1

_____

A shower uses 9 L of water per minute. How much water is used in a 4-minute shower?. 1

_____

A family reduces its daily water use from 150 L to 132 L. How many litres are saved each day?. 1

_____

If the family saves 18 L each day for 7 days, how much water is saved in a week?. 1

_____

MINI CHALLENGE

Write three practical ways to save water at home. Choose one and estimate how you could measure the water saved.

_____

_____

6. Recycling Sort & Calculate

A community collection sorted recyclable materials in one week.

NATURE MATHS • THINK IT THROUGH

Data: Paper – 24 kg; plastic – 16 kg; glass – 20 kg; metal – 10 kg.

How many kilograms of material were collected altogether?. 1

_____

Which material had the greatest mass?. 1

_____

How many more kilograms of paper than metal were collected?. 1

_____

What fraction of the total was glass? Simplify your answer.. 1

_____

If the next collection has twice as much plastic, how many kilograms of plastic will there be?. 1

_____

MINI CHALLENGE

Display the four amounts in a bar graph. Add a sentence explaining which material made up the largest share.

_____

_____

7. Solar Energy Numbers

A set of solar panels produced the following amount of energy over four days.

NATURE MATHS • THINK IT THROUGH

Data: Monday – 8 kWh; Tuesday – 10 kWh; Wednesday – 7 kWh; Thursday – 11 kWh.

On which day was the most energy produced?. 1

_____

Find the total energy produced over the four days.. 1

_____

What is the difference between the highest and lowest daily amounts?. 1

_____

If Friday produces 9 kWh, what will the five-day total be?. 1

_____

What is the average daily energy production over the five days?. 1

_____

MINI CHALLENGE

Draw a bar graph to compare the energy produced each day. Write one observation about the results.

_____

_____

8. Garden Geometry

A community garden is being planned. Use the measurements to work out the space needed.

NATURE MATHS • THINK IT THROUGH

A rectangular vegetable patch is 6 m long and 3 m wide. Find its area.. 1

_____

Find the perimeter of the same patch.. 1

_____

A square flower bed has sides of 2 m. Find its area.. 1

_____

A path is 12 m long. Three-quarters of it has been completed. How many metres are complete?. 1

_____

A garden has 5 rows with 8 seedlings in each row. How many seedlings are planted?. 1

_____

MINI CHALLENGE

Draw a simple garden plan with one rectangular bed, one square bed and a path. Label the dimensions.

_____

_____

9. Seed-to-Sprout Experiment

Four seeds were measured after being planted. Their heights were recorded over three weeks.

NATURE MATHS • THINK IT THROUGH

Data: Week 1: 2 cm, 3 cm, 2 cm, 1 cm. Week 2: 5 cm, 6 cm, 4 cm, 3 cm. Week 3: 8 cm, 9 cm, 7 cm, 6 cm.

What was the height of Seed 2 at the end of Week 3?. 1

How much did Seed 1 grow from Week 1 to Week 3?. 1

Which seed was tallest at the end of Week 3?. 1

Find the total height of all four seedlings at the end of Week 3.. 1

Find the difference between the tallest and shortest seedlings at Week 3.. 1

MINI CHALLENGE

Make a table to record the height of a seedling you grow or observe over three weeks. Record the date and unit each time.

10. Wildlife on the Move

A wildlife centre recorded the distance travelled by three tagged animals in a day. The figures are sample data.

NATURE MATHS • THINK IT THROUGH

Data: Animal A – 3.5 km; Animal B – 2.8 km; Animal C – 4.2 km.

Which animal travelled the greatest distance?. 1

_____

What was the total distance travelled by all three animals?. 1

_____

How much farther did Animal C travel than Animal B?. 1

_____

Write 3.5 km in metres.. 1

_____

If Animal A travels the same distance for 2 days, how far will it travel?. 1

_____

MINI CHALLENGE

Choose a local bird or animal you can observe safely from a distance. Record three observations without following or disturbing it.

_____

_____

11. Reduce, Reuse & Compare

A household is comparing the amount of waste it sends for disposal before and after making changes.

NATURE MATHS • THINK IT THROUGH

Data: Before changes: 18 kg per week. After changes: 12 kg per week.

How many kilograms less waste are produced each week?. 1

_____

What percentage reduction is this compared with the original 18 kg?. 1

_____

If the household keeps saving 6 kg each week for 4 weeks, how much waste is avoided?. 1

_____

If 12 kg is split equally over 6 days, how many kilograms per day is that?. 1

_____

Name one item that could be reused instead of thrown away.. 1

_____

MINI CHALLENGE

Create a two-column table titled 'Before' and 'After'. Add one more example of a waste-reduction action you could measure.

_____

_____

12. The Planet-Friendly Challenge

Plan a small eco-friendly project for a home, school or neighbourhood. Use the information below.

NATURE MATHS • THINK IT THROUGH

A group plants 4 trees each day for 5 days. How many trees are planted?. 1

_____

Each tree is given 3 L of water on planting day. How many litres are needed for all the trees?. 1

_____

The group collects 2.5 kg of litter on Day 1 and 3.2 kg on Day 2. What is the total mass collected?. 1

_____

They want to fill 6 bags equally with 18 kg of sorted recyclables. How many kilograms go in each bag?. 1

_____

Write two measurements or pieces of data the group should record to check whether the project is successful.. 2

_____

MINI CHALLENGE

Design a mini 'Planet-Friendly Maths Plan'. Include a goal, a number you can measure, a simple table or graph and one way to reduce environmental impact.

_____

_____

ANSWER KEY

Suggested answers are listed below. For graphing tasks, check that the graph matches the given data, has a clear title, and uses correctly labelled axes and units. Open-ended challenges will vary.

CHECK YOUR CALCULATIONS

1. Patterns in Leaves & Flowers

1. 10 and 12 marks

2. 30 petals

3. circle, leaf, leaf

4. 8 spots

5. 28 plants

2. Tree Growth Tracker

1. 99 cm

2. 17 cm

3. 54 cm

4. Year 3 to Year 4 (19 cm)

5. 115 cm

3. Biodiversity Count

1. Ants

2. 15

3. 13

4. 50

5. 12/50 = 6/25

4. Rainfall Recorder

1. Thursday

2. 40 mm

3. 15 mm

4. 4 days

5. 8 mm per day

5. Every Drop Counts

1. 1,000 mL (1 L)

2. 2.5 L

3. 36 L

4. 18 L

5. 126 L

6. Recycling Sort & Calculate

1. 70 kg

2. Paper

3. 14 kg

4. 20/70 = 2/7

5. 32 kg

7. Solar Energy Numbers

1. Thursday

2. 36 kWh

3. 4 kWh

4. 45 kWh

5. 9 kWh per day

8. Garden Geometry

1. 18 m²

2. 18 m

3. 4 m²

4. 9 m

5. 40 seedlings

9. Seed-to-Sprout Experiment

1. 9 cm

2. 6 cm

3. Seed 2

4. 30 cm

5. 3 cm

10. Wildlife on the Move

1. Animal C

2. 10.5 km

3. 1.4 km

4. 3,500 m

5. 7 km

11. Reduce, Reuse & Compare

1. 6 kg

2. (6 ÷ 18) × 100 = 33■%

3. 24 kg

4. 2 kg

5. Answers will vary

12. The Planet-Friendly Challenge

1. 20 trees

2. 60 L

3. 5.7 kg

4. 3 kg

5. Answers will vary; e.g. number of trees surviving, litres of water used, or kilograms of litter collected

WELL DONE, NATURE EXPLORER!

You used maths to explore patterns, growth, rainfall, resources and the environment. Small observations can lead to big ideas. Keep measuring, questioning and caring for the world around you!