

Australian Teacher

Worksheets & Ideas

Years 3 and 4

Teachers may choose to use these ideas
in any way they like.



The Penny-farthing Bicycle

Reading comprehension exercise -includes vocabulary building.



The Penny-Farthing bicycle was named after the old British penny and farthing coins, one much larger than the other, so that the side view resembles a penny leading a farthing.

Mounting requires skill. One foot is placed on a peg above the back wheel. The rider grasps the handlebar and lifts himself/herself onto the seat.

In the old days unpaved roads were more common than smooth roads. The large wheel of the Penny-farthing rolled more easily over cobbles and stones making a more comfortable ride than if the front wheel were smaller.

Although easy to ride slowly the Penny-farthing was prone to accidents. Any sudden stop or collision with a pothole or rock could send the rider over the handle bars, head-first (“coming a cropper”). On long down-hills, some riders hooked their feet over the handlebars. Though this ensured good speed it gave no chance of stopping.

With their iron frames Penny-farthing bicycles were very heavy but they rarely broke down. For example, when Thomas Stevens rode around the

world in the 1880s, he reported no mechanical problems in his 20 000 km journey.

In 1888 John Dunlop used air-filled tyres for his son's tricycle. The idea caught on and Penny-farthings were made obsolete.

Today, enthusiasts ride restored Penny-farthings, and a few manufacturers build new ones.

Talk about or Write about

1. What does the word *resembles* (1st paragraph) mean?
2. In what ways is mounting a Penny-farthing bicycle similar to, and different from, mounting a horse?
3. Can you see and understand that the large wheel of a Penny-farthing would roll more easily over cobbles and stones than would a smaller wheel? Try to explain why.
4. The Penny-farthing was prone to accidents. What do you think *prone* means?
5. In what way(s) would 'coming a cropper' off a Penny-farthing be different from falling off *your* bike?
6. Why do you think that hooking the feet over a Penny-farthing's handlebars while going downhill made the bicycle go faster?
7. What parts does your bike have that a Penny-farthing doesn't?
8. The use of air-filled tyres caused Penny-farthings to become obsolete. What does *obsolete* mean?
9. What is a Penny-farthing enthusiast?
10. If you were given a Penny-farthing for a day where would you like to ride it? (*you might like to give a humorous answer to this question*)



Grammar

Nouns

Common Nouns

A common noun is something you can put the word 'the' in front of, e.g. the *table*.

Some nouns (such as table) can be seen and felt. Some can be seen, felt, smelt and tasted e.g. *soup*.

Some can only be seen e.g. *sky*.

Others can only be heard e.g. *music*.

Others may only be thought about e.g. *dream*.

1) Write out all the common nouns in this sentence:

Across the street is an old house with broken windows.

Proper Nouns

Proper nouns are names.

People have names so these (people's names) are proper nouns e.g. *Peter Smith*. Cities have names so these too are proper nouns e.g. *Sydney*. Stories have titles and they are proper nouns as well e.g. *Snow White and the Seven Dwarves*. Movies have names; they are proper nouns also, e.g. *Lion King*.

2) Write out all the proper nouns in this sentence:

Emma told us that she was born in London but grew up in Perth.

Pronouns

Pronouns are small words used in the place of common nouns or proper nouns.

The word *she* is a pronoun. Instead of saying *Anne opened the door and then Anne walked inside* we say *Anne opened the door and then **she** walked inside*.

The word *it* is a pronoun. Instead of saying *As the table got older the table faded* we say *As the table got older **it** faded*.

Some other pronouns are *our, he, we, they*. There are many more.

3) Write out all the pronouns in this sentence:

My brother said he will go fishing with his friend on Sunday.

4) Write 8 common nouns, 8 proper nouns and 4 pronouns that are not mentioned here. (put them in lists)



Classifying

*Classifying is an important skill used in Science and Maths.
'Shopping at the Markets' gives practise in developing this skill.*

Shopping at the Markets

Benjamin and his sister Sarah went to the markets with their parents.

When they arrived home Sarah said, "Let's make a list of everything Mum and Dad bought."

Benjamin agreed and added, "We'll also write down the colours."



Here is the list they made:

hair brush (brown), shirt (white), umbrella (blue), laundry mop (brown), book (red), vegetables (green), trousers (black), desk (brown), jacket (yellow), shoes (black), carpet (red), bathroom shells (white), soaps (yellow), cutlery (silver)

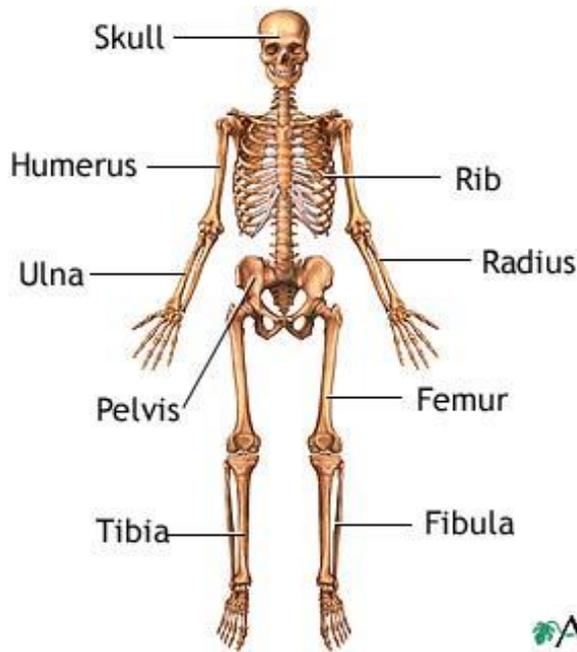
The children showed the list to their parents who were very pleased.

Father then asked the children to record the characteristics of the market items like this:
(A) things found in kitchens (B) things whose colour begins with b (C) things to wear
(D) things whose colour doesn't begin with b

Your task....

List all of the things bought at the markets under the four headings above. (you will see that some items will appear under more than one heading).

Science Our Bones



Background Information:

The skeleton is made up of 206 bones in the adult and contributes to the form and shape of the body.

The skeleton has several important functions for the body.

The bones of the skeleton provide support for the soft tissues. For example, the rib cage supports the wall of the thorax (the thoracic wall).

Most muscles of the body are attached to bones which act as levers to allow movement of body parts.

The bones of the skeleton also serve as a home for minerals, such as calcium and phosphate.



Lastly, most of our blood cells are formed within the marrow of certain bones.

1. Where are the following bones?

- skull and jaw bones
- backbone
- shoulder and hip bones
- ribs
- arm and leg bones

2. What are the functions of these bones? *The skull protects the brain. The jaws move the mouth and the teeth are attached to them. Backbones join to form the spine that connects all the bones. The shoulder and hip bones connect arms and legs to the spine. The ribs protect the lungs and heart, and allow the chest to get bigger and smaller. The arm and leg bones allow movement of arms and legs.*

3. Draw and label some of these bones.

Extra Activity: How is a young bone different from an old bone? *The young bone is softer and contains soft material that makes blood; old bones are strong and may contain fat.*



Octopus



An octopus's beak is similar in shape to a parrot's beak and is the only hard part of its body. Octopuses have no internal or external skeleton, allowing them to squeeze through tight places.

They are highly intelligent animals, with excellent memories. Young octopuses learn almost no behaviours from their parents, with whom they have very little contact.

The octopus inhabits many different regions of the ocean, including the ocean floor. It moves about by crawling or swimming, all the time trailing its eight arms behind it.

Octopuses have developed several ways of defending themselves against predators, including the squirting of a dark blue ink, moving swiftly (jet-like) through the water, and hiding in places where they are extremely difficult to find. Octopuses also use camouflage: for example some species can take on the spiky look of seaweed while others can give themselves the scraggly, bumpy appearance of a rock.

Of the 300 or so octopus species all are venomous but only one kind, the blue-ringed octopus, is deadly to humans.

Octopuses have three hearts. Two hearts pump blood through the gills, while the third pumps blood through the body.

Though octopuses can be difficult to keep in captivity, some people keep them as pets.

Talk about or Write about

1. What would you say is the most amazing thing about octopuses?
2. An octopus is easily able to move in and out between undersea rocks that are close together. What enables them to do this?
3. Young octopuses learn almost no behaviours from their parents. Is this true of other animals? What kinds of behaviours do adult humans teach their children?
4. Apart from the ocean floor what are some other regions of the ocean?
5. Sharks have many sharp teeth, stingrays have a lethal sting, and swordfish have a razor-sharp sword on their snout. Octopuses have no such weapons. What *do* they have that protects them from their enemies?
6. Can you think of any reason(s) why octopuses need three hearts while we humans need just one?
7. Why do you think it is difficult to keep octopuses in captivity?
8. Would you like to have a pet octopus? Why/Why not?



Transport



Here are some different types of transport: *bus, train, tram, ship/boat, plane, motorcycle, car, bicycle*. There are others too.

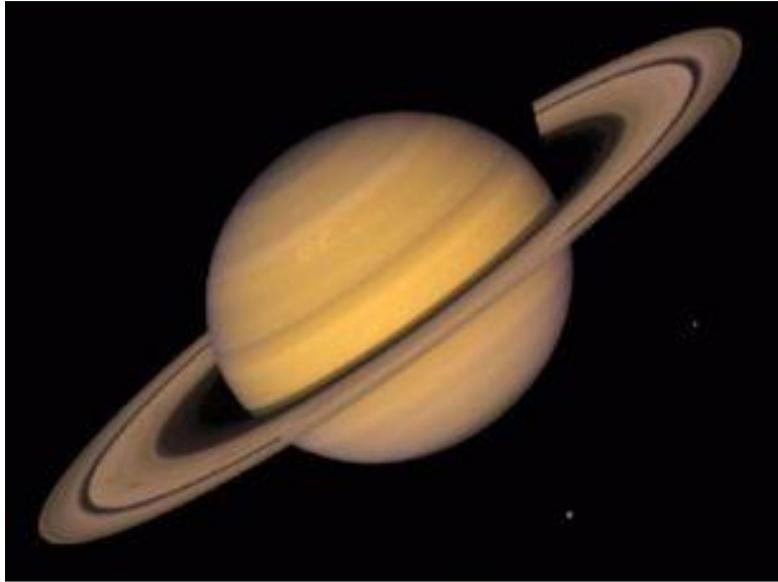
Talk about or Write about

1. Which of the above forms of transport do you most enjoy travelling in/on? Why?
2. Which do you think is used by the most people?
3. Some are used mainly to take people away on their holidays. Which ones are these?
4. Which do you think is the cleverest invention, and why?
5. Which can carry the most people at a time?
6. Which is the fastest? The slowest?
7. Which can be used to take children to school?
8. Which can be used to take people to work?
9. Which costs the most to make? Why is it so expensive to build one?

10. What would it be like if none of the above forms of transport existed?
11. Which can go faster than the fastest animal (mammal)?
...that's about 80 km/hr
12. Most of the above forms of transport have what is known as 'horse power'. Do you know what that is?
13. Which animals have been, and still are, used to transport humans?
14. What would be some reasons that camels are still used to carry people across desert lands?
15. Why are donkeys suitable for carrying people up and down steep hills, along narrow paths?
16. Why do you think horses were used to carry warriors into battle?
17. Elephants are sometimes ridden. When and by whom?
18. What advantages do modern vehicles have over animals as means of transport?
19. What advantage(s) does animal transport have over modern vehicles?
20. Which animals, if any, have you ridden? Describe your experience. If you have never ridden any animal which one would you most like to ride?



Saturn



Saturn is the 6th planet from the sun. It has rings made of ice and rock. Saturn has (as of 2011) 62 moons.

This means if you were on Saturn and looked up into the sky at night you would see many moons (not just one like we do here on Earth). You wouldn't see all 62 moons because some would be on the other side of Saturn.

Saturn's atmosphere contains gases that are poisonous to us; humans and animals like cats, dogs and all others could not survive there. Anyway, we couldn't live on Saturn because it is too cold ... the average temperature there is around -185°C ! Another thing we know about Saturn is that it has extremely violent thunderstorms.

Our planet, Earth, takes one year to go around (revolve around) the sun but it takes Saturn 29 years to orbit the sun just once. This means that if you lived on Saturn you would have to wait 29 years between birthdays!

Saturn is a long, long way from us. A very fast rocket travelling at 10 000 km/hr would take 16 years to reach Saturn from Earth.

Talk about or Write about

1. How many planets are between the sun and Saturn?
2. Saturn's rings are made of rock and ice but they look like curved lines in photos. Why do you think this is?
3. If you were on Saturn and it was night time why wouldn't you see all 62 moons?
4. What are two reasons we could not survive on planet Saturn?
5. What does *orbit the sun* mean?
6. If a baby was born on Saturn how many years would it have to wait for its first birthday?
7. How long would it take a rocket travelling at 10 000 km/hr to get *half way* to Saturn after leaving Earth?
8. Nobody knows if anything lives on Saturn. There are probably no people or animals and maybe no plants. But who knows? Try to think of something that *might* live on Saturn. What is it? What does it look like? What does it do? (maybe you could sketch it)



Interesting Number: 8



October (from the Latin “octo” meaning “eight”) was the *eighth month* in the old Roman calendar. The ancient Romans inserted two months in the middle of the year to make what is now known as the Julian calendar. Why? Because July (for Julius Caesar) and August (for Augustus Caesar) were added between June and September. Speaking of the Romans, the Roman numeral for eight is VIII (5+3 more).

Each atom of oxygen, the gas we breathe, has eight electrons whizzing around the nucleus.

In music an octave consists of eight notes.

Those who follow the Buddhist doctrine believe it wise to follow the “eight-fold noble path”.

Eight major planets revolve around our sun.

An octagon is a plane shape with eight sides.

Lucky Number: The number eight is considered to be a lucky number in Chinese and other Asian cultures. That’s because the Chinese word for ‘eight’ sounds similar to words which mean ‘prosper’, ‘wealth’, or ‘fortune’. The opening ceremony of the Olympic Games in Beijing, China began on 8/8/08 at 8 minutes and 8 seconds past 8 pm (local time).

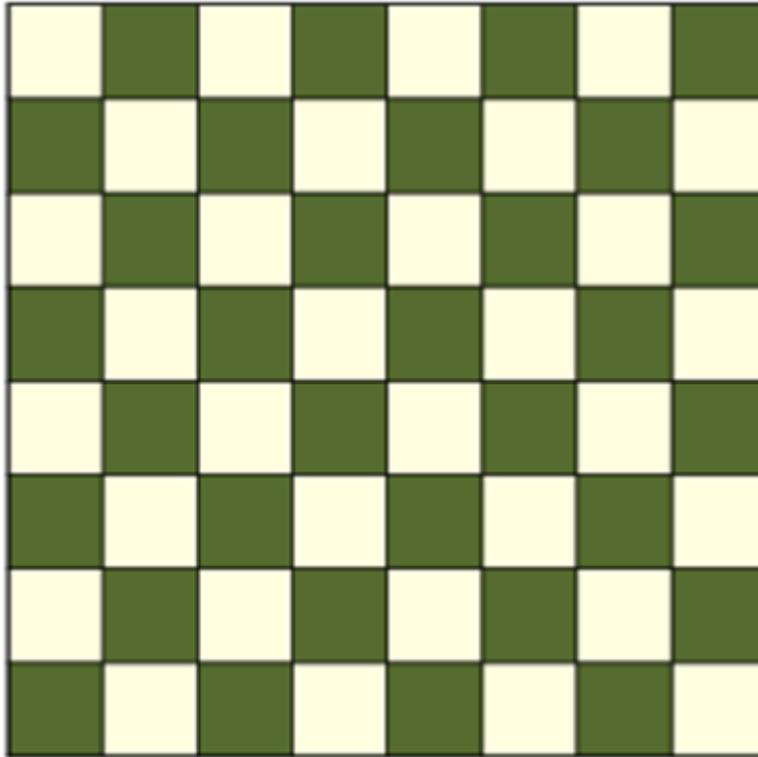
The Jewish Festival holiday Hanukkah lasts eight days and eight nights.

Living Things: Arachnids, such as spiders and scorpions, have eight legs. Octopuses have eight arms (tentacles). A moth called *Alypia* has black wings with eight brilliant white spots. The eighth tooth from the front in adult humans is the so-called wisdom tooth. Eight babies delivered in one birth are called octuplets.

Sport: There is a rowing event involving a crew of eight oarsmen, car racing for V8s (eight cylinder cars) and a routine in ice-skating called the ‘Figure-8’.

Chess Board: A chess board has sixty-four squares: 8 x 8. And by the way, did you know that if a \$1 coin is placed on the 1st square of a chess board, \$2 on the 2nd square, \$4 on the 3rd, \$8 on the 4th, and so on, doubling like this all the way to the last square, the amount of money on that 64th square would be \$9 223 372 036 854 775 808...

9 quintillion, 223 quadrillion, 372 trillion, 36 billion, 854 million, 775 thousand, 808 dollars!



Can this really be true?

Activity:

Take out your calculator. Begin with 1 (1st square of chess board) and double it; record your results as below. Go as far as you can (your calculator won't be able to handle the bigger numbers but you'll at least see the power of doubling).

1st square = **1**; 2nd square = **2**; 3rd square = **4**; 4th square = **8**;
5th square = **16**; 6th square = **32**; 7th square = **64**; 8th square = **128**;
9th square = **256**; 10th square = **512**; 11th square = **1 024**;
12th square = **2 048**; 13th square = **4 096**; 14th square = **8 192**;
15th square = **16 384**; 16th square = **32 768**



Lines of Symmetry

Learning about symmetry gives children a good sense of geometric principles and calls on their mathematical reasoning abilities.

A shape is symmetrical if it can be cut along a straight line into two halves that are mirror images of each other.

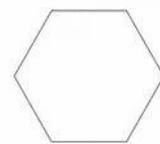
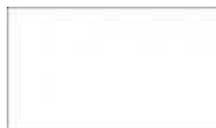
Have your students print the alphabet carefully, neatly and accurately in capital letters (upper case). Then ask them to find a letter that has only one line of symmetry—only one way to be divided in half. (*B has one*)

A B C D E F
G H I J K L
M N O P Q R
S T U V W X Y Z

Ask class to find a letter that has two lines of symmetry -two ways to be divided in half. (*H has two*)

Ask which letters look the same when they're turned upside down. (*H, I, N, O, S, X and Z*)

Challenge:



A rectangle has two lines of symmetry. A square has four.
How many lines of symmetry does a (regular) hexagon have? (*six*)



Chance and Data



Playing games that involve chance is one way to introduce children to the concept of probability. For this game you will need ‘pretend’ money (coins), pencils and paper. Students work in pairs.

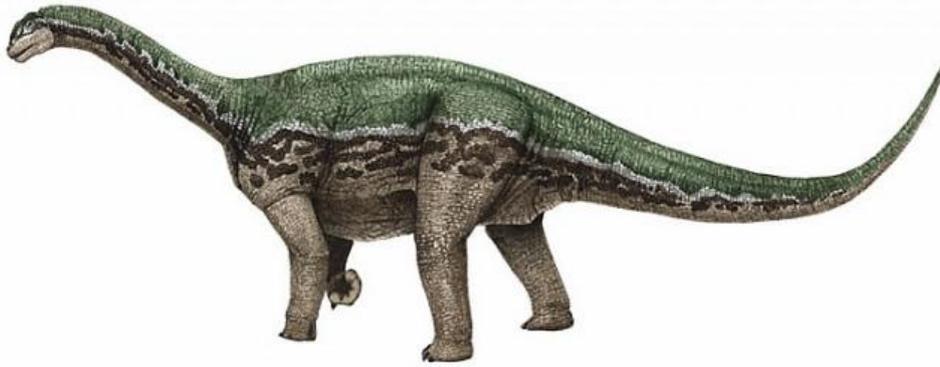
★ Flip one coin. Every time it comes up heads, you get 1 point. Every time it comes up tails, your partner gets 1 point. Flip the coin 50 times. Tally by 5s to make it easier to keep track of scores. The player with the most points wins. Any player who has 10 points more than the other person scores an extra 10 points. Ask children to notice how often this happens. (*Not very often!*)

★ Flip two coins. If the coins come up two tails or two heads, you score 1 point. If it comes up heads and tails, your partner gets 1 point. After 50 flips, see who has more points. Ask students if they think this game is fair. What would happen if one player received 2 points for every double heads and the other player received 1 point for everything else. Would that be fair?

★ Flip one coin. Then flip the other. If the second coin matches the first coin, you score 1 point. If the second coin doesn't match the first coin, your partner receives 1 point. Try this 50 times. Is the result the same as in the previous game?



Barosaurus



Barosaurus, meaning ‘heavy lizard’, was a giant plant eater, perhaps 26 m in length (as long as two buses). Around 80% of its length was neck and tail. When standing on its hind legs this beast would have been as tall as a five story building.

Although Barosaurus had just 15 neck bones some of these were more than one metre long. However its neck bones were hollow and very light, making the neck easy to move about.

Barosaurus was discovered in the 1890s by the American paleontologist Othniel Marsh.

Talk about or Write about

1. Barosaurus was a giant plant eater. Plant eaters are called what, beginning with ‘h’?
2. This animal had a rather long neck. Why do you think its neck needed to be long?
3. What % (percentage) of barosaurus’ body was *not* neck and tail?
4. Some very tall people are around 2m in height. How many such people would be needed to lie head-to-toe on the ground to achieve the same length as a barosaurus?
5. Humans and giraffes have the same number of neck bones (seven) yet barosaurs had fifteen. However barosaurs had little trouble moving their head about. Why was this?
6. What are some similarities and differences between barosaurs and giraffes?

