

Welcome to the world of Serge and Kim!

A Wild Forest Adventure is an activities-based companion booklet especially designed for use with the Forests NSW website. Our website has an entire section dedicated to children at www.dpi.nsw.gov.au/forests. The education section has a unique, interactive comic book format that explores complicated issues in a fun and imaginative way.

Walking through a State forest is a pleasurable experience to be enjoyed by the whole family. *A Wild Forest Adventure* opens your eyes to issues that you may not have considered before as part of the day-to-day management of State forests.

Serge and Kim, two comic book characters, take you on a wild forest adventure where you choose the forest signpost you wish to follow. There are three adventures from which to select:

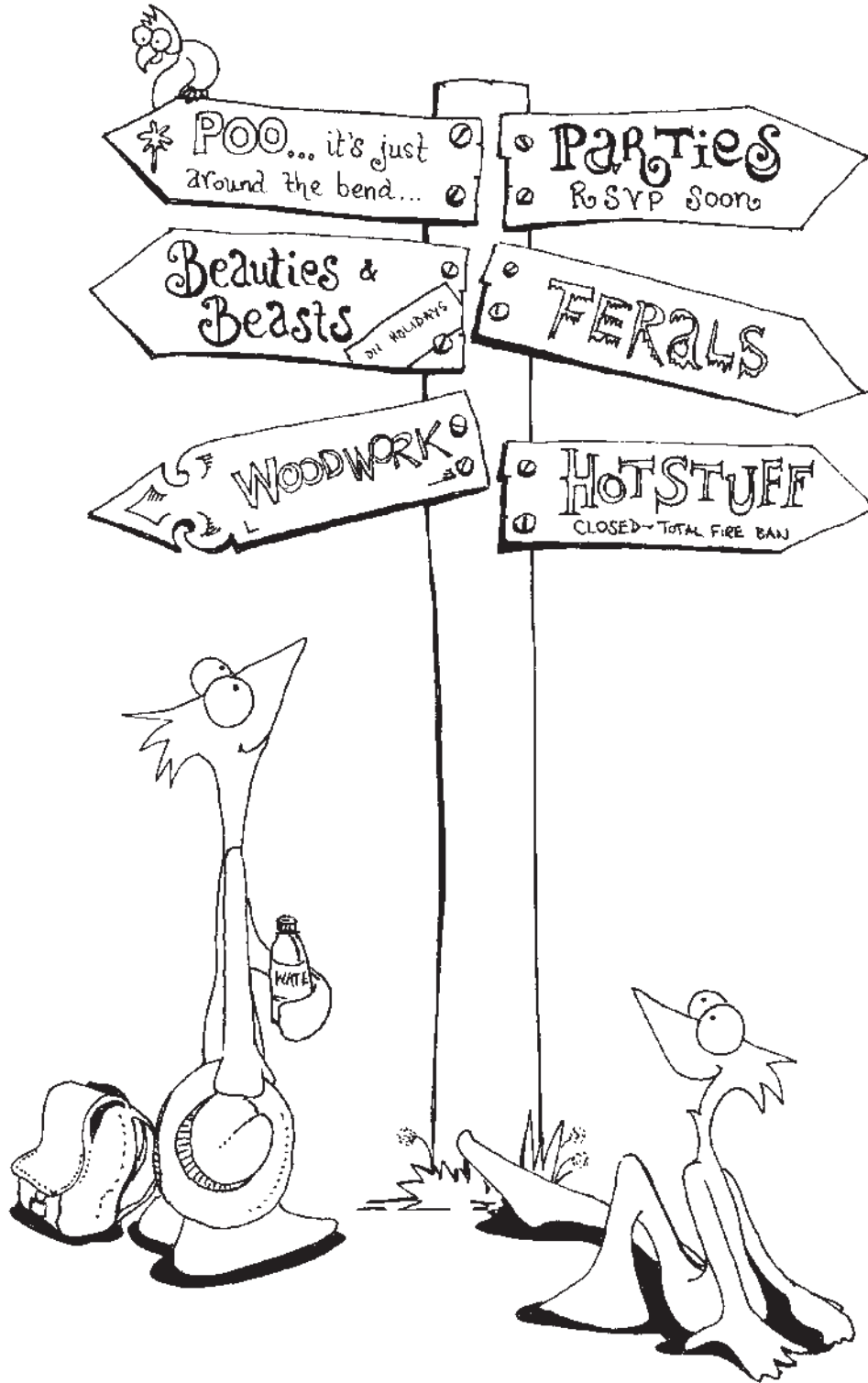
- *Woodwork* is about the management of State forests and the timber products that result. Harvesting plans, tree profiles and forest management are explored.
- *Poo* investigates the making and using of biosolids, a valuable resource used by Forests NSW to boost wood production.
- *Ferals* follows the forest fiends; pig, fox, rabbit, goat and cat. Information on the origin of each animal, the environmental problems they cause, their numbers and control methods are included.

So come along on a wild forest adventure. Whatever path you take, this booklet will challenge you and allow you to keep a record of your journey. If you get really stuck on an activity or just want to check out how you are going, have a look in the answers section on p31. Enjoy!

Teachers please note:

Log onto our website for more information about Forests NSW education services. Start your quest in 'a Note to Teachers' of www.dpi.nsw.gov.au/forests to find:

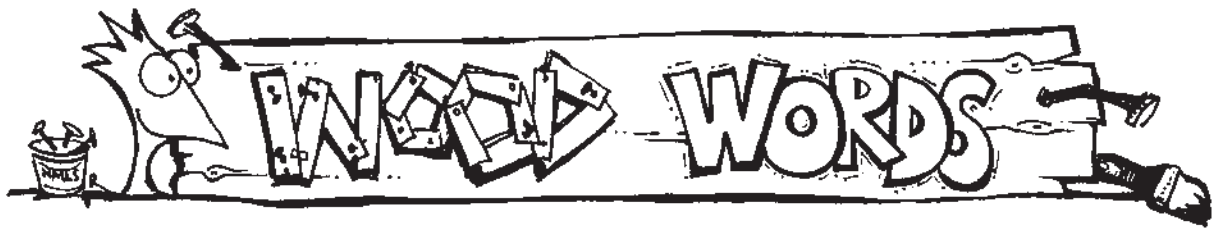
- how the activities relate to NSW Department of Education syllabus documents •
- additional activities for use in the field or classroom •
- professional development days •
- useful publications •
- our education personnel •
- forest excursions.





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The 29 words below appear in the Woodwork adventure. Try to find them hidden in the puzzle below:

most valuable timber new *south wales wood eucalypts
 spotted gum *southern bendable blackbutt northern
 strength building uses native white cypress western
 resists decay introduced radiata pine tableland grows fast

*Hint: the words 'south' and 'southern' appear separately in the puzzle



Mark off the wood words as you find them in either a vertical or horizontal direction, forwards or backwards. Circle the 11 remaining letters. Copy them into the spaces below in order from left to right moving down the puzzle to find out the name that these trees are given on the website.

_____ / _____



Why do you think the trees are called this?

Use the information in the 'supermodels' section of the Woodwork adventure to help you match the timber type to its use.

- | | |
|------------------|--|
| 1) radiata pine | a) regrowth is used for plywood. |
| 2) spotted gum | b) bark used to make adhesive. |
| 3) blackbutt | c) sandarac is used in confectionary making. |
| 4) white cypress | d) used to make axe handles. |



HARDWOODS

Wood is sometimes referred to as softwood or hardwood. A hardwood has leaves, flowers and fruit. Spotted gum and blackbutt are examples of hardwoods that are managed in State forests for their value as timber species. They are also examples of native eucalypts. Not all hardwoods have really hard wood.



Write one interesting fact about spotted gum that you found out on the website:

Write one interesting fact about blackbutt that you found out on the website:

DID YOU KNOW?
Balsa is the softest wood in the world, but is a type of hardwood.

Seeds are found inside the fruit

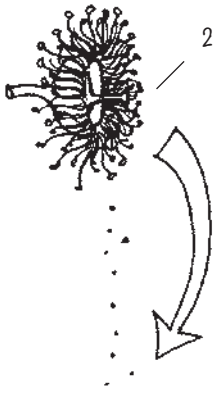
In most hardwood forests in NSW the trees are "self sown". But where are the seeds found and how are the seeds spread?

Referring to the website, fill in the missing information to complete the life cycle below. Use a dictionary to find the meaning of any unfamiliar words.

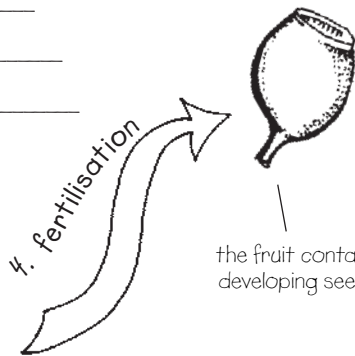


1. Mature trees produce flowers.

5. _____



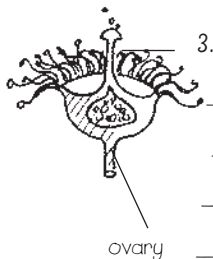
2. _____



6. _____



7. Most seeds fall to the ground.



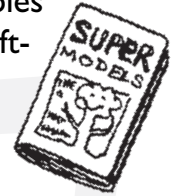
3. _____

The germinated seeds develop into seedlings. Over time, the seedling grows into a mature tree and the cycle begins again.



SOFTWOODS

Wood is sometimes referred to as softwood or hardwood. White cypress and radiata pine are examples of softwoods that are managed in State forests. They are also examples of cone bearing trees (conifers), which are commonly called pine trees. Not all softwoods have really soft wood but all softwoods have needle-like leaves and cones.



Write one interesting fact about white cypress that you found out on the website:

Write one interesting fact about radiata pine that you found out on the website:

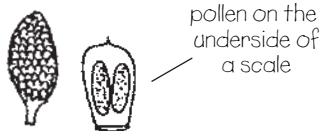
Softwood forests in NSW are often planted. But first, the seeds are collected from pine cones and grown as seedlings in nurseries. How do the seeds get inside the cone?

DID YOU KNOW?
Radiata pine is not a native tree in Australia, but does grow well on the southern tablelands.

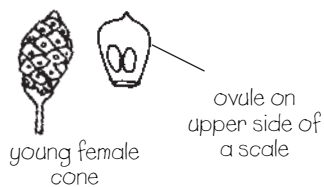
Referring to the website, fill in the missing information to complete the diagram below. Use a dictionary to find the meaning of any unfamiliar words.

1. Mature pine trees produce cones. All pine trees have separate female & male cones.

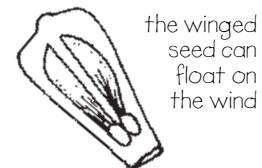
male cone



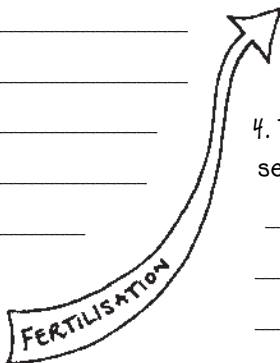
2. _____



open mature female cone



the winged seed can float on the wind



4. The seeds are collected and planted in pots or seedbeds in nurseries. _____

Over time, the seedling grows into a mature tree.



A BUDDING CAREER

When choosing a career it is always best to pick something you are suited to. Everybody has certain talents and these can help you achieve great success in your career. Just like people, trees can have different careers. On the website you will find six types of careers for trees. Click on the letters in 'careers for trees' of the Woodwork adventure to answer the following puzzling questions.



S

is for _____

What important job are seedlings doing while they grow?

D

is for _____

What three products do these make?

H

is for _____

Why is this budding career of particular importance for future generations?

P

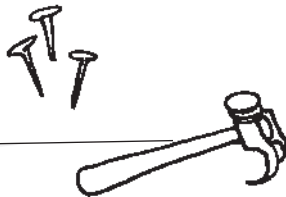
is for _____

Why can you never burn this wood?

T

is for _____

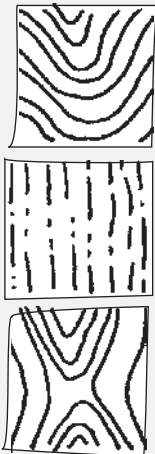
What type of sawing takes high quality timber from faulty logs?



V

is for _____

Why is this like a piece of fruit?



Veneer allows more people to enjoy the beauty of the highest quality timbers because only a thin layer is used on top of other timber layers.

What changes the way a particular grain looks?

What is the difference between coreboard and plywood?



CAREER CHOICE

Different trees are suited to different jobs depending on their natural qualities and how they have developed in their surrounding environment. Generally a tree can be seen to have a particular career based on its most valuable product, and the remainder is used for the next most valuable product, and so on. Every tree is unique and must be individually assessed.



Look at the key and then look at trees 1, 2, or 3. Decide which career choice each tree should make.

HTSVDP

KEY

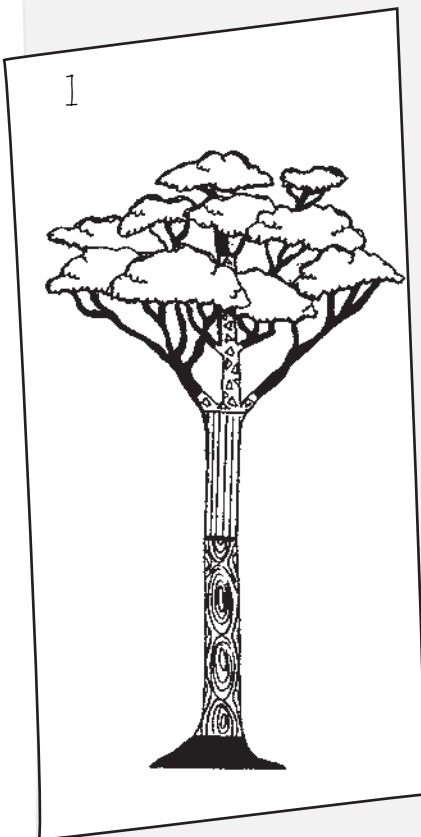


veneer (ply and coreboard)

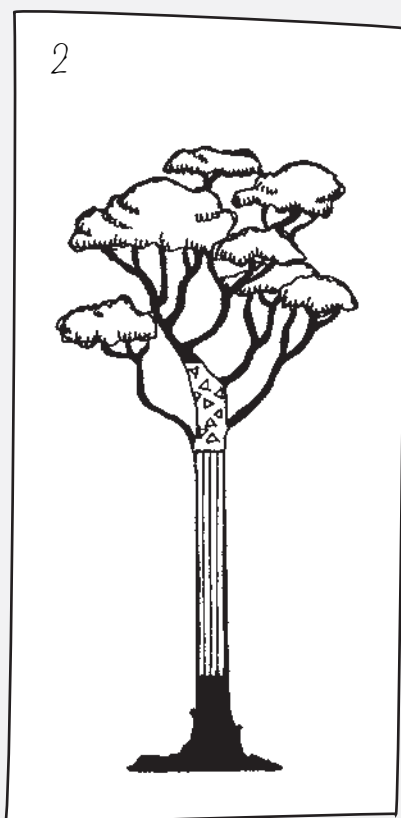
sawlog (timber)

pulpwood and woodchip

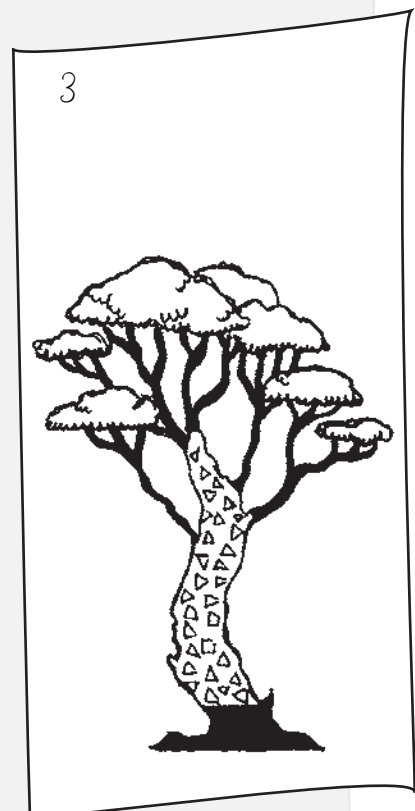
stump (waste)



Tree 1
Career
Choice



Tree 2
Career
Choice



Tree 3
Career
Choice

It takes a lot of skill to be able to choose a particular tree for a particular job. Insect attack and diseased wood can be difficult to detect before a tree is felled, so trees must be carefully selected for harvesting.

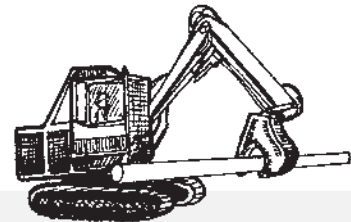
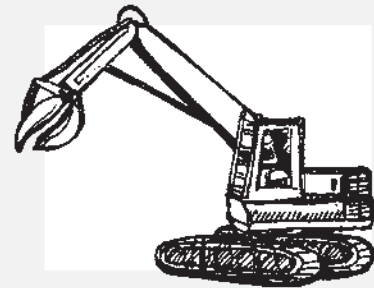
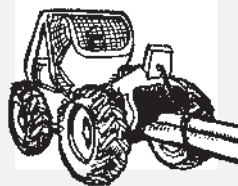
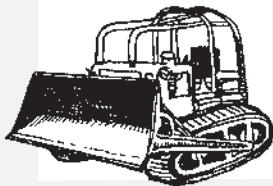


WHAT MACHINE IS THAT?

Several different machines are used in State forests, each designed and built with a particular job in mind. These purpose built machines increase safety for the tree fellers and reduce the impact on the surrounding environment. Some machines are only used in plantations while others are used in areas for more selective logging. Look in 'What Machine is That' in the *Woodwork* adventure to find the answers to the clues below.



1			2							
3						4				
			5							
			6							



Clues:

Across

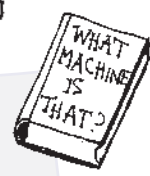
- 2. Carries logs to the log landing.
- 3. _____ logging equipment is used in difficult to access areas.
- 5. Drags logs to the log landing for sorting,
- 6. Takes the bark off the logs and loads them.

Down

- 1. Trims branches and cuts logs into lengths.
- 2. Cuts trees and gathers them into piles.
- 4. The job of this vehicle is similar to your answer for 5. It also drags logs to the log landing.



MACHINE MATCH



Many different machines are used in State forests. Each machine has been designed and built with a particular job in mind.

Look up each of the machines in 'what machine is that?' and write 3 adjectives for each machine in the boxes below. Then connect the parts listed on the right hand side of this page with the machine by drawing a different coloured line for each machine.

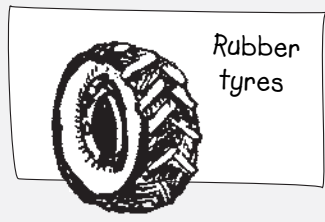
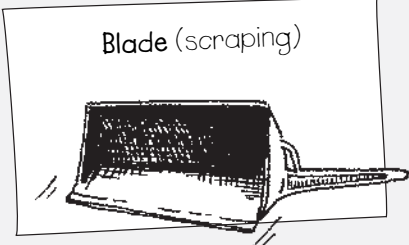
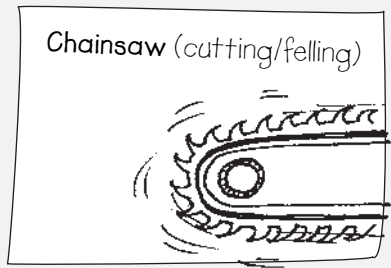
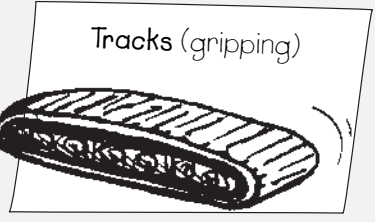
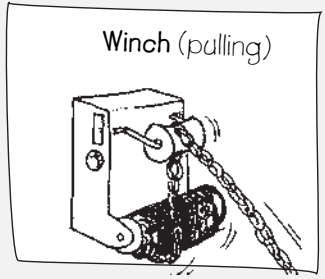
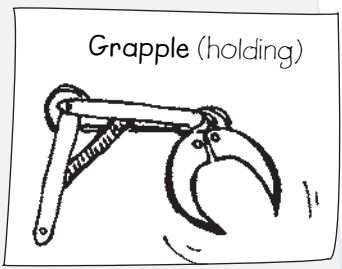
FELLER
BUNCHER

FORWARDER

CABLE
LOGGING
EQUIPMENT

BULLDOZER

EXCAVATOR




Complete these sentences below by filling in the blanks:

1. A skidder is similar to a _____. It can have either _____ or rubber tyres depending on how _____ the land is.
2. A processor picks up trees left by the feller buncher. It removes the _____ and cuts the log into different _____.




PLANNING WITH PURPOSE

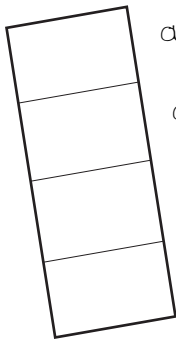
Before any activities such as road building or harvesting can take place in a State forest, detailed investigations into the area occur. This could take some years. The information from this research is simplified and put together into a map called a harvesting plan. The harvesting plans are used for the management of an area, for decisions such as which areas are to be preserved and from where selected trees can be harvested.



THE FIVE MINUTE CHALLENGE:
Click on the harvesting plan in the **Woodwork** adventure to answer the following questions in less than five minutes.



2. What is the symbol on the KEY for:



- a temporary dry log landing
- a research plot
- flora and fauna protection
- a State forest boundary

1. What is one of the rare forest types reserved from logging that is shown on the map?

3. What is the name of the sealed or gravelled road?

4. Look at the scale to see how wide the area shown on the map is.

metres

5. What is the buffer zone near?



How long did you take?



Looking after THE FOREST



State forests are more than just a source of timber. State forests today are important recreation areas, research areas, homes for native animals, and a source of clean water and forest products such as honey, seeds and bushfood. Foresters make sure that all of the values and uses of the forest are looked after and will be around in the future.

The foresters who manage State forests today are highly trained in forest management.



Click on this cartoon in the **Woodwork** section to find out some of the tasks that a forester might do. Choose **two** that you think sound interesting and then write why you chose them.

TASK:

This sounds interesting because:

TASK:

This sounds interesting because:





FIND A FERAL



The 23 words below appear in the *Ferals* adventure. Look for them on the site, then see if you can find them in the puzzle.

introduced domestic gone feral
fox hunts animals
rabbit chews roots tunnels
goat native vegetation
cat kills birds and lizards
pig digs the ground

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

Mark off the feral words as you find them in either a vertical or horizontal direction, forwards or backwards. Circle the 17 remaining letters. Copy them into the spaces below in order from left to right moving down the puzzle to find out the secret message found in the feral file.

_____ / _____

Why do you think this needs to be done?

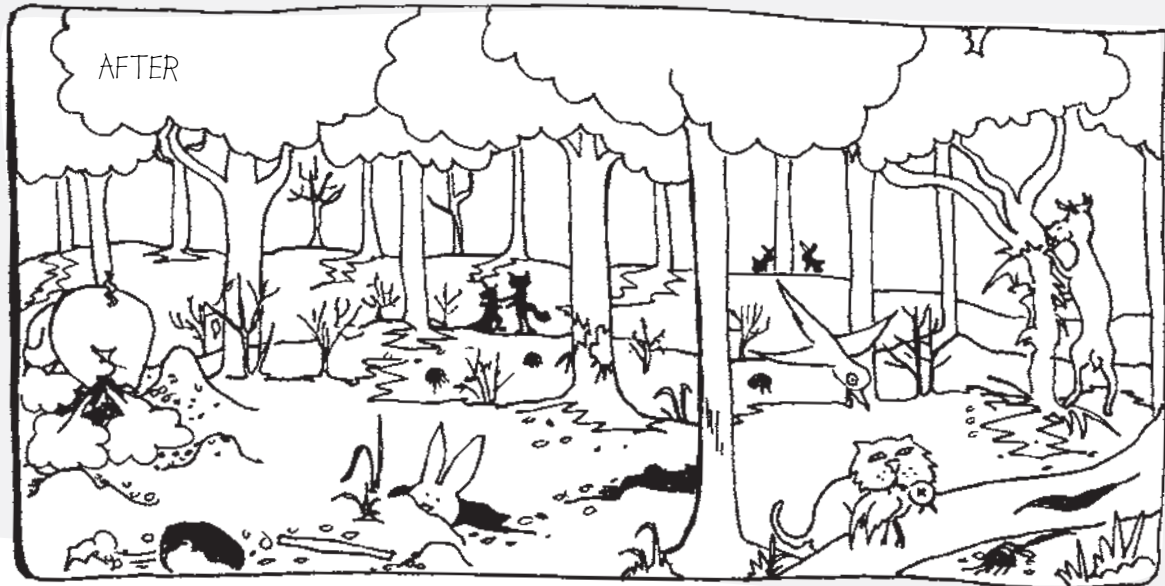
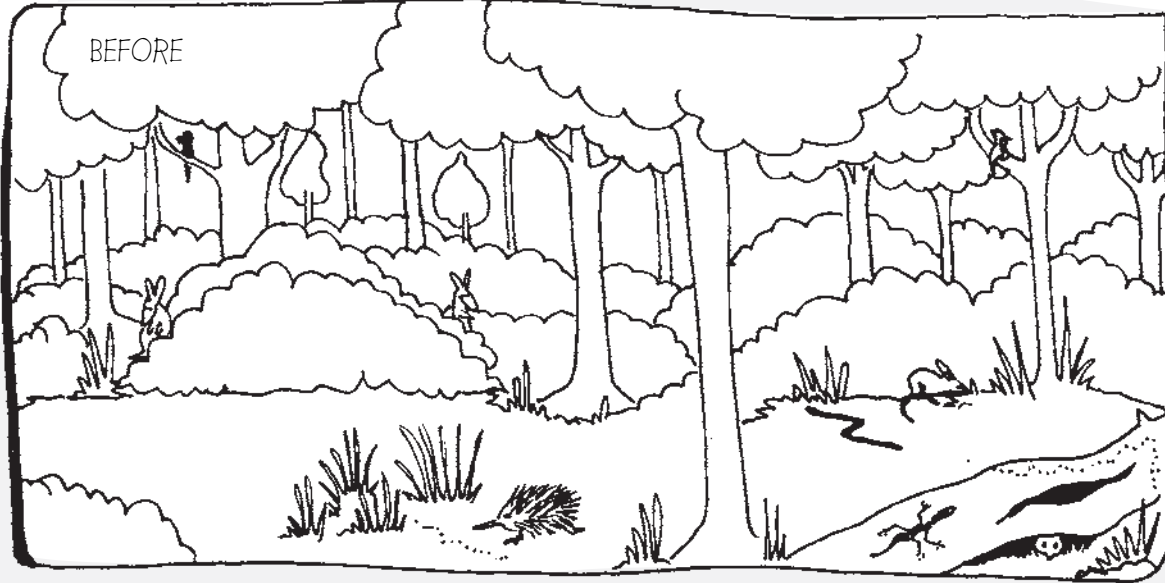
Use the information in the *Ferals* adventure to help you to match the phrase to complete the sentence:

- | | |
|------------------------------|---|
| 1) Kitty relaxing by day | a) soil erosion. Females can have 6 to 7 kittens a month. |
| 2) Foxes are clever | b) shorter than 1.8 metres. |
| 3) Feral pigs are aggressive | c) killer of native birds and animals by night. |
| 4) Feral goats eat any plant | d) cunning and kill. |
| 5) Rabbits tunnel and cause | e) destructive and carry diseases. |



SPOT THE DIFFERENCE

After a feral has taken over an area for a while, it is hard to imagine exactly what the forest looked like before it arrived. Look at the illustrations below to see if you can spot the difference. See if you can find ten differences based on what you have learned from the *Ferals* adventure.



The ten differences between the before and after illustrations are:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____





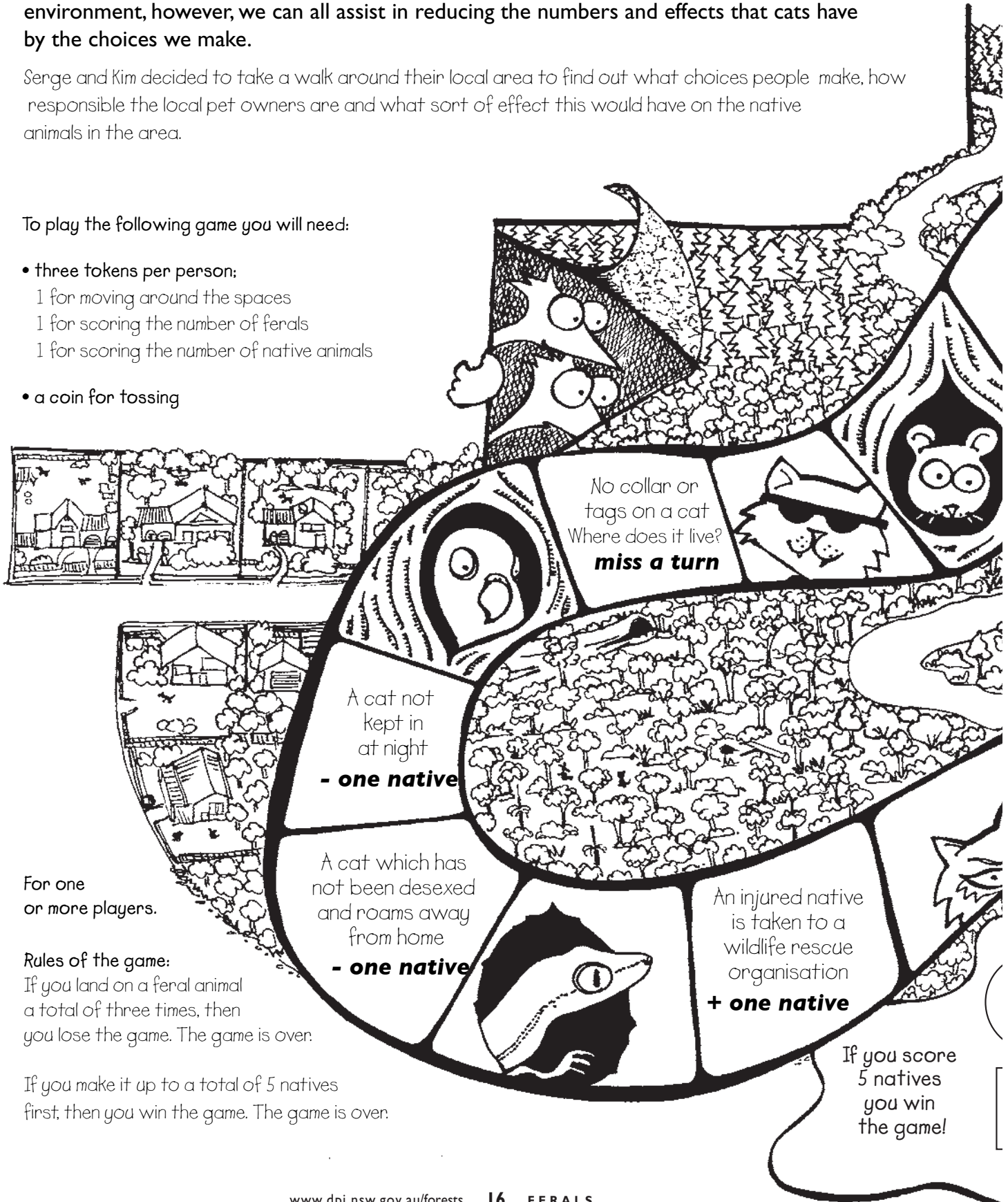
FERAL FIENDS &

Many native animals are described as nocturnal because they sleep in the daytime and hunt during the night. Cats and foxes are also nocturnal. Both are skilled hunters and neither have natural predators in Australia, which means that each can have a disastrous impact within the area that they live. It is difficult for most of us to help in reducing fox numbers in the natural environment, however, we can all assist in reducing the numbers and effects that cats have by the choices we make.

Serge and Kim decided to take a walk around their local area to find out what choices people make, how responsible the local pet owners are and what sort of effect this would have on the native animals in the area.

To play the following game you will need:

- three tokens per person:
 - 1 for moving around the spaces
 - 1 for scoring the number of ferals
 - 1 for scoring the number of native animals
- a coin for tossing



For one or more players.

Rules of the game:

If you land on a feral animal a total of three times, then you lose the game. The game is over.

If you make it up to a total of 5 natives first, then you win the game. The game is over.

If you score 5 natives you win the game!

NATIVE NICE-GUYS



How to play (for one or more players):

1. Choose a native animal space to begin on and place a button, coin or counter to mark it.
2. Toss a coin to see which way you will go and move in that direction and number of spaces.
 - TAILS** - back one space (anticlockwise)
 - HEADS** - forward two spaces (clockwise)

Read any writing in the space and move your scoring tokens.

How to score:

- If you land on a picture of a feral cat or fox, then cover it up on the 'feral' tally.
- If all three spaces are covered, then the game is over. This player loses.
- If you land on a picture of a native animal, then it is a safe space.
- If you land on +one native, or +two natives, then move your token along the 'native' tally by starting at 1 and moving your counter one or two spaces as appropriate.
- If you land on -one native, then go back one space on the 'native' tally.
- If you do not have any natives then stay on zero natives.

Lizards and native birds are visiting the native plants in the garden

+ one native



A cat kept in at night

+ one native



The owners say "our cat can do whatever it likes"

- one native

A cat with a collar and bells

+ one native

The owners have abandoned their cats

- two natives

A desexed cat

+ one native



SCORING:

1 feral 2 feral 3 feral

0 natives	1 natives	2 natives	3 natives	4 natives	5 natives
-----------	-----------	-----------	-----------	-----------	-----------





WHO AM I?



The goat, the fox, the rabbit, the pig and the cat didn't arrive in Australia by accident. They were brought to Australia and over time became feral pests. Follow Serge and Kim through the *Ferals* adventure to uncover facts about each of them. Find out why they were originally brought to Australia and some of the problems they cause today.

Who Am I?

Read the information about each of the ferals on the website, then match the verse to the picture.

I was on the 'First Fleet'
to provide fat and meat.
I cause damage with ease
and carry disease.

I was brought on a boat
to catch rats while afloat.
I am a hunter with skill,
and can climb up to kill.

I was on the 'First Fleet'
for milk, wool, leather and meat.
I eat plants and my hooves
cause lots of soil to move.

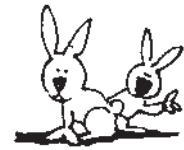
I was brought
for cruel sport.
I have cunning and skill.
I'm clever and kill.

Brought for hunting,
Breed like lightning
Fancy that!
My skin's used for felt hats!





HOW MANY?



The problem with feral animals in Australia is that there are just so many. Feral animals are successful because they are able to survive and adapt to a range of conditions, which would prove difficult for many Australian native animals. But how successful are they? How many...

How many minutes will it take you to find the answers to these questions on the website?

Time started:

Time finished:

How many minutes?

1. Follow each of the feral agents on the website to find out how many millions there are estimated to be in Australia.



2a) List ways that are used to try to control the number of feral animals in State forests.

b) How many did you list?

3a) How many babies can a rabbit have in a month?

b) Based on this, calculate how many babies the rabbit could have in a year.

4a) Which secret feral agents kill native animals?

b) How many did you list?

5a) Which secret feral agents eat the food supplies of native animals?

b) How many did you list?





SUPER SPY



Each one of the five feral agents has the ability to survive in the Australian environment. With no natural predators, these pests multiply at an alarming rate. In order to defeat a feral, it must be studied so that its weaknesses may be uncovered. Forests NSW research methods to try to manage the numbers of feral animals in forests.

Unscramble the following to find five feral animals found in State forests in NSW:

tca ___ xfo ___ atog _____
batrib _____ igp ___



Choose one feral animal to concentrate on and read the facts about it from the website:

Write three interesting facts that you found.



Use your imagination and pretend that you are Serge or Kim 'The Super Spy'. Your undercover mission is to follow your chosen feral. Write down what the feral gets up to in 24 hours, while you are spying on it:



A FERAL TALE

Using the information from the *Ferals* adventure, choose one feral animal and write a short play about it. Consider: Why are ferals a problem? Where do ferals live? How do ferals impact on native animals? What can people do?

1. Preparation

Ask yourself: What is the play about?

Is there a moral? Is the play a comedy or drama?

Choose your characters: other feral animals, native animals, forester, pet owner, bird watchers, bush walkers.

The characters are:

2. Writing your play

Think about:

Orientation (setting the scene)

Complication (what happens)

Resolution (how it ends)

3. How will you perform the play?

Design a poster to advertise your performance and educate the reader about what they can do to help control the effect this animal has on the environment.

Making Masks

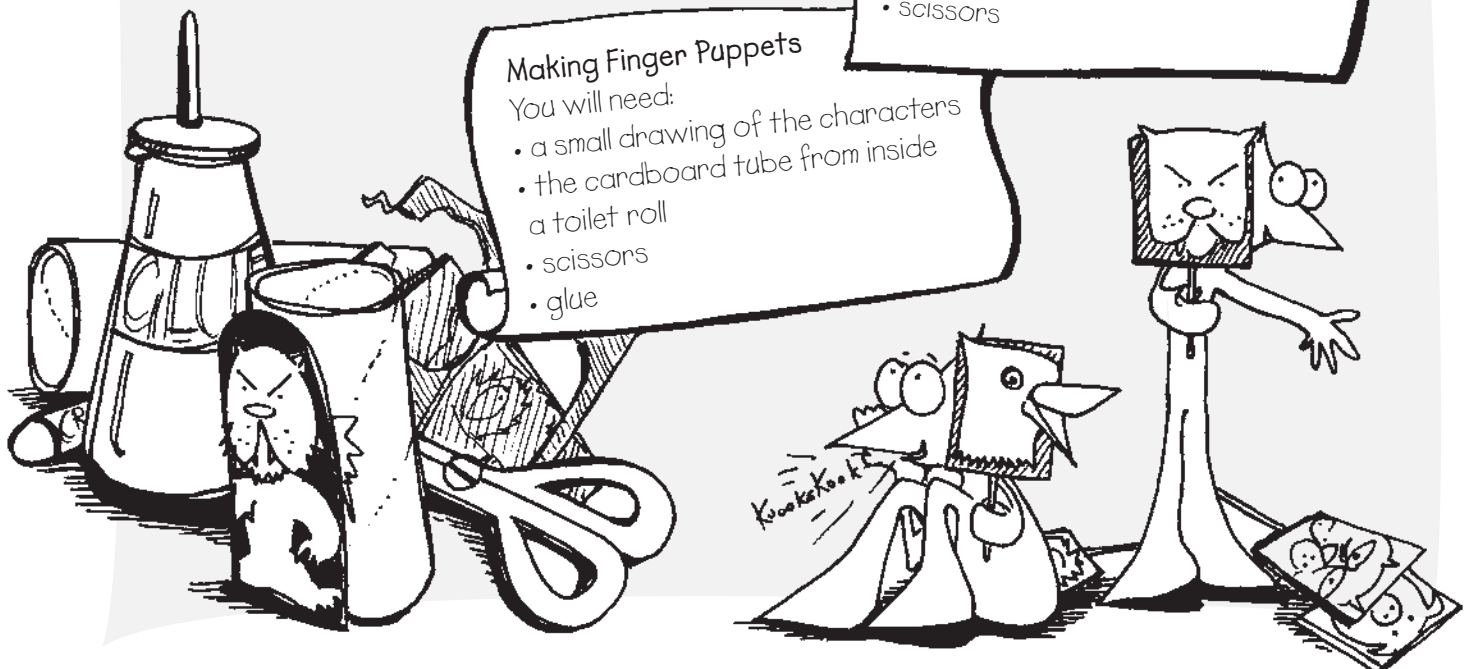
You will need:

- a large drawing of the characters
- a strip of elastic & stapler or a chopstick to attach the mask
- cardboard
- glue
- scissors

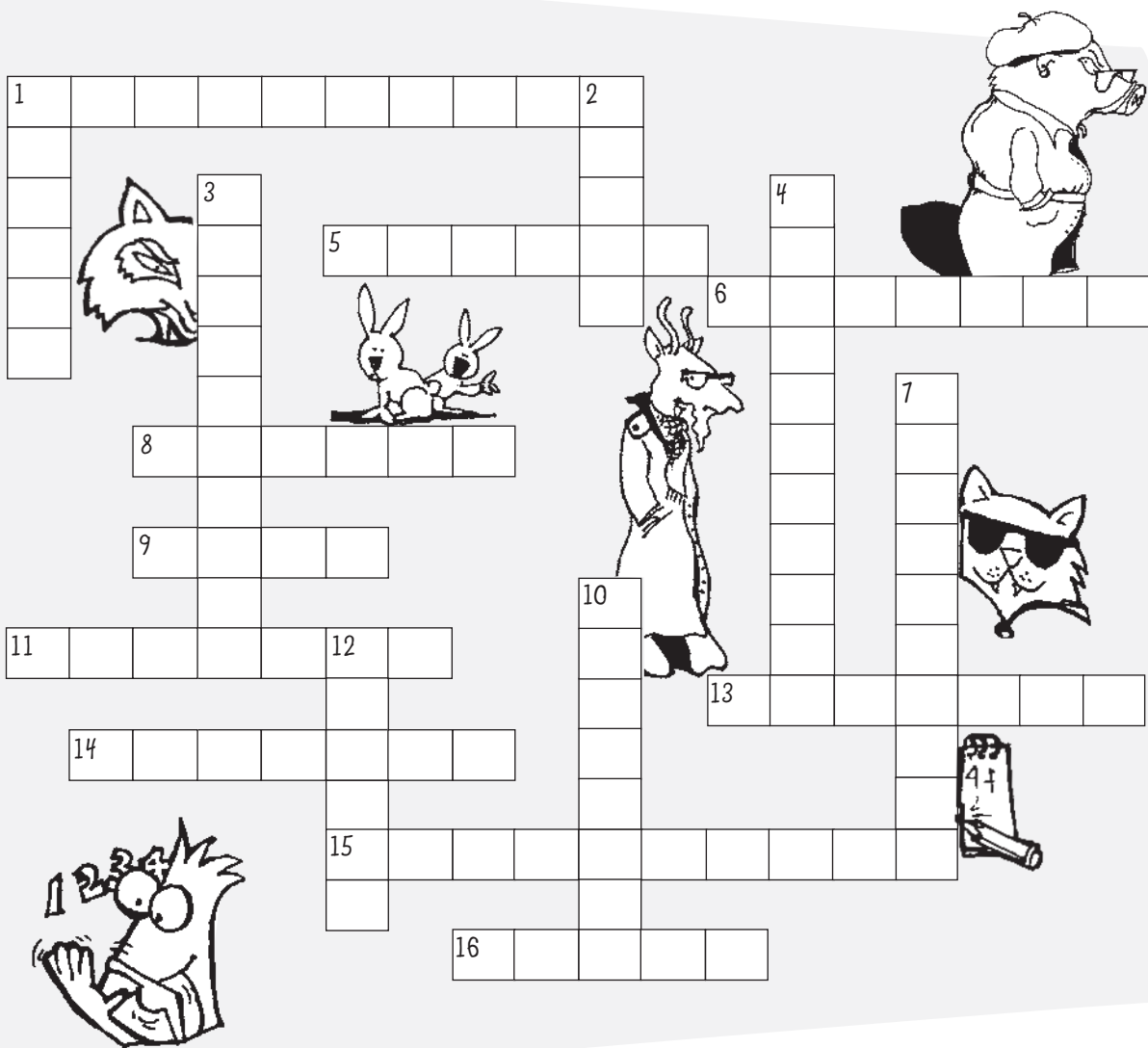
Making Finger Puppets

You will need:

- a small drawing of the characters
- the cardboard tube from inside a toilet roll
- scissors
- glue



FERAL X WORD



Across

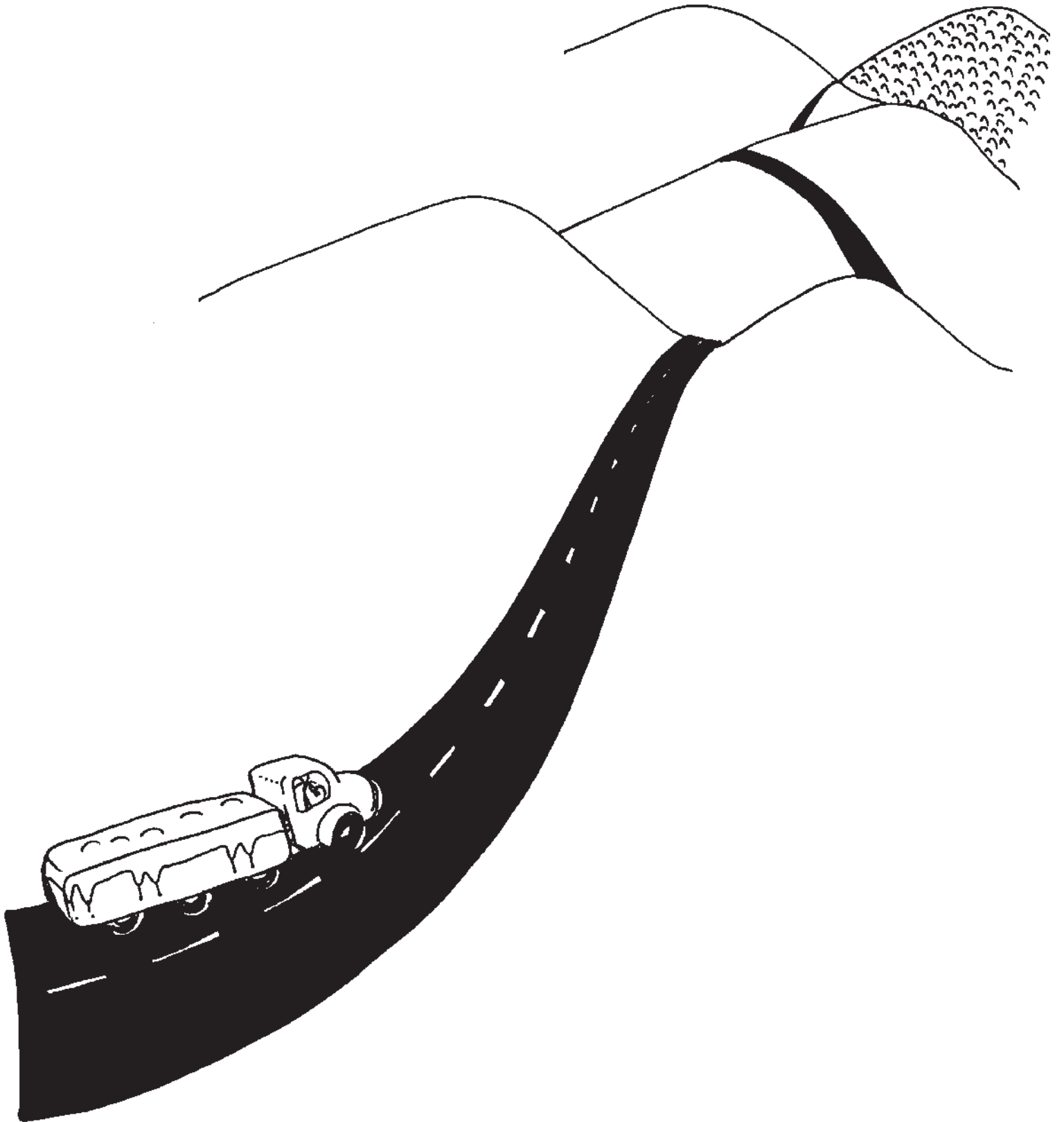
1. When something has been put into new surroundings, it has been _____.
5. An animal that searches for prey.
6. A detailed plan to be followed.
8. Another word for break.
9. The usual food an animal eats.
11. To be crafty and sneaky.
13. To demolish or ruin.
14. Where an animal or plant lives.
15. The plant life of an area.
16. An introduced plant or animal.

Down

1. To take over an area in a troublesome manner.
2. All responsible pet owners should _____ their pets.
3. This helps an animal or plant survive in its environment.
4. The cultivation of land, such as farming.
7. The number of animals or plants in a particular place.
10. An animal which preys upon other animals.
12. Plant or animal which occurs naturally in Australia.

Here are the words from the *Ferals* adventure to help you complete the crossword: adaptation, agriculture, cunning, damage, desex, destroy, diet, feral, habitat, hunter, infest, introduced, native, population, predator, program and vegetation.

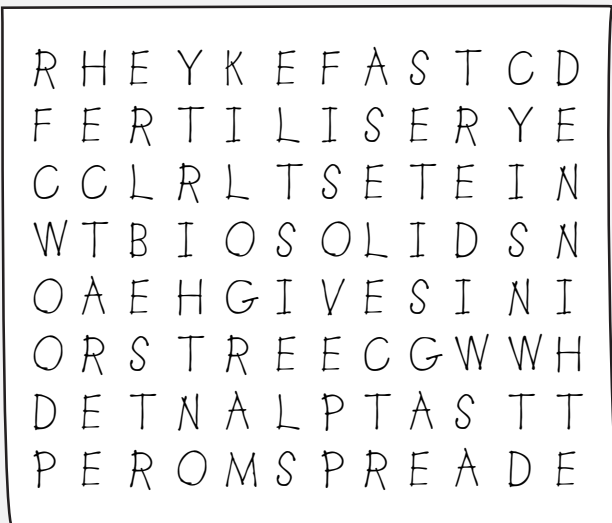




Poo Words

The 20 words below appear in the Poo adventure. Look for them on the site, then see if you can find them in the puzzle.

select best planted sites thinned test safe spread fertiliser thirty kilogram biosolids per hectare fast gives more wood wider tree



Mark off the poo words as you find them in either a vertical or horizontal direction, forwards or backwards. Circle the 14 remaining letters then copy them into the spaces below in order from left to right moving down the puzzle:

Using biosolids to increase wood production has another benefit to the community:

_____ /



Use the information in the Poo adventure to help you to match the time to the task.

- | | |
|------------|---|
| 1) 12 | a) Pine plantations should grow for this many years, before thinning and biosolids are added. |
| 2) 15 - 20 | b) After spreading, any compost-like smell disappears in this number of weeks |
| 3) 2 - 6 | c) 30 kilograms of biosolid can be made from the poo of one person in this number of months. |



Get the Message

Follow the poo signpost, then take the 'making biosolids' option. Read each of the questions below as you go and then circle the correct answer. Look up the symbol in the table to give the corresponding letter of the alphabet. Write the letter in the numbered box to complete the message.



















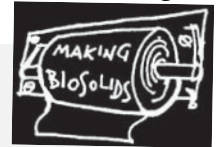
















A B C D E F G H I J K L M N O P Q R S T U V W X Y Z







1. On average, a person can do enough poo in one year to make:

-  3 tonnes of biosolids
-  30kg of biosolids
-  300kg of biosolids
-  30 tonnes of biosolids





2. A sewage treatment plant is:

-  a type of tree
-  where treated sewage goes
-  a herbal medicine
-  a factory that processes sewage





3. Rubbish is removed using:

-  a shower screen
-  a rubbish bin
-  a screen with small holes
-  tongs

4. Sludge is a mix of:

-  slime and mud
-  slugs and mud
-  rubbish and water
-  grease, oils and heavy waste





5. Spinning removes:

-  water
-  sludge
-  unwanted visitors
-  rubbish

6. Any harmful bacteria (germs) in poo like the environment of the intestines. These germs die in either the heat of the composting pile or on contact with:

-  water
-  sludge
-  sunlight and air
-  air and water

7. Sludge is stockpiled in giant heaps to compost. The longer the time it is composted:

-  the poorer the quality
-  the greater the quantity
-  the better the quality
-  the lesser the quantity





8. The composting sludge is tested by a:

-  sludgologist
-  scientist
-  visitor
-  truck

9. The stockpiled, composted, sludge is called:

-  barometers
-  beautiful
-  biosolids
-  biology

10. Biosolids are only used in State forests in NSW if:

-  there is little or no bacteria, pesticides or metals
-  there are unacceptable levels of bacteria
-  there are unacceptable levels of pesticides
-  someone has poured chemicals down the toilet

The message is:

If poo is processed, composted and passes the test, it can make great...

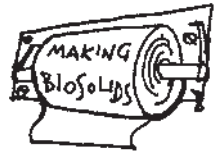
1	2	3	4	5	6	7	8	9	10
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In the Picture

After finding out how biosolids were made, Serge and Kim looked at the 'Big Picture' and decided to draw the steps. Unfortunately, a gust of wind scattered the drawings. Serge and Kim now need help to find the correct order of the pages to make a poster.

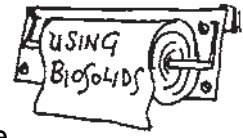
Cut out the squares below then look at the 'Big Picture' in the 'Making Biosolids' option in the *Poo* adventure. Paste the squares in the correct order onto a sheet of paper, then colour in your picture showing how biosolids are made.





Using it

Serge and Kim learned on their *Wild Forest Adventure* that Forests NSW only use biosolids in suitable planted forests. They found this out by following the *Poo* sign along to 'using biosolids' and then stumbling upon the 'puzzling post'.



Serge and Kim enjoyed the challenge of the puzzling post so much that they copied down the pictures and verse to try on their friends. Use the website to check your answers.

Match the verse to the correct picture. Colour only the correct pictures.

When it's thinned,
You can see,
More Sun, more
Room,
More Quality!

1 =

Come on, now,
Use your head,
Which would you
use
To have biosolids
spread?

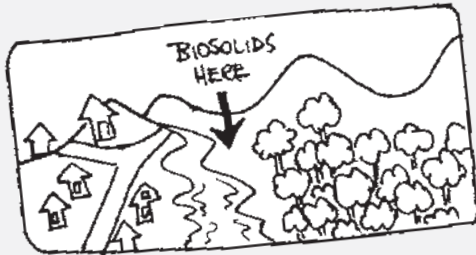
2 =

Biosolids have been
added
To which of these,
The trunks are
much wider....
There's more Wood
in these trees!

3 =

Biosolids aren't
used
Just anywhere,
The site is
selected
With considerable
care....

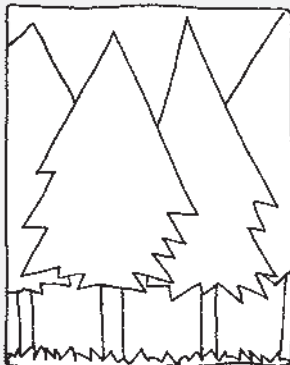
4 =



A



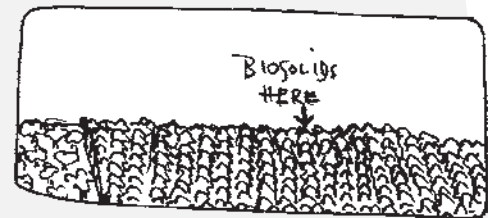
B



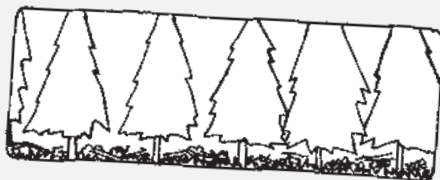
C



D



E



F



G

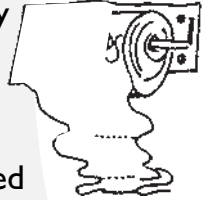


H



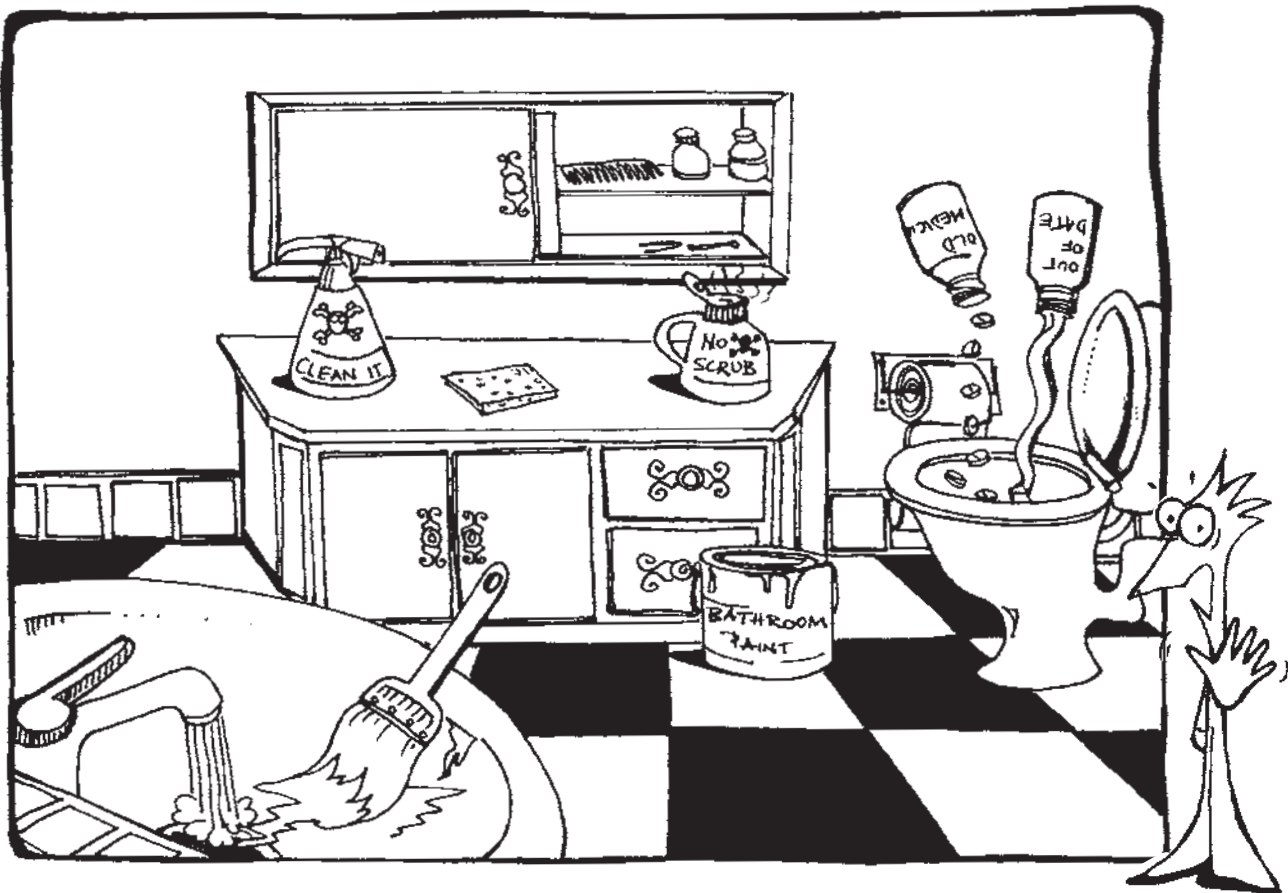
Stop the Waste

Even after careful processing, there are some biosolids which cannot be used. These are wasted, because people have polluted the sewerage in the sewage system. It may sound a little crazy that sewerage can be polluted. Unfortunately sewerage can be polluted and often is.



Solid pollutants are removed by the screens, however, chemicals are not removed by the simple settling, separating and spinning. If the levels of chemicals are too high in the biosolids then the whole pile is rejected and cannot be used as composted material on gardens or in forests. In the *Poo* adventure, choose 'biosolids and you' to find out more...

Kim has posed near this picture to show you some of the things that you should not do. List the mistakes can you see in the picture below:



Mistake	Use the website to find out what should have been done instead




Presenting The Poo




After visiting the Poo adventure, Serge and Kim wondered how much biosolids would be needed to fertilise all of Forests NSW planted forests in NSW. They also wondered how many people are needed to make this much biosolids. Help them answer these and other interesting questions by completing the problems below:

1. If 30 tonnes of biosolids are needed to fertilise one hectare of forest, then how many tonnes are needed for 250,000 hectares of planted forests managed by Forests NSW _____ tonnes.

2. Look up "making biosolids" on the website to find out how much biosolids an average person's poo can make each year = _____ kilograms.

 Stinker: Calculate how many people are needed to make 30 tonnes of biosolids. $1000\text{kg} = 1\text{ tonne}$


3. How many kilograms of biosolids could your household's poo make each year? _____ kilograms.

 Stinker: Calculate how much biosolids Australia's population could produce each year. Australia's population is about 19 million.

4. Forests NSW scientists have found that when biosolids are used the growth of a planted forest increases by 30%. Rewrite 30% in a different way.

5. A hectare is an area which fills a space 100 metres wide by 100 metres long. If Serge's step is exactly one metre, then it will take 100 steps to travel 100 metres. If Kim takes smaller steps of 50 cm then it takes 200 steps to travel 100 metres. Measure your step _____ cm. Is it closer to Serge's or Kim's?

Go to your nearest sports field and measure out one hectare square using your steps.

 Stinker: Calculate how many times your house, local swimming pool, or school fit into one hectare.

WARNING: Look out for the stinkers!

Present your answers as a poster so others can learn these interesting facts about POO!



OTHER USEFUL REFERENCES

BIOSOLIDS

CSIRO Forestry and Forest Products Sustainable Use of Biosolids (Sewage Sludge) in Plantation Forests
<http://www.ffp.csiro.au/pff/biosolids>

Sydney Water
<http://www.sydneywater.com.au>

The Official Web Site of the Water Environment Federation (WEF)
<http://www.wef.org>

Wagga Wagga Effluent Plantation Project
<http://www.csiro.au>

Pennsylvania's Department of Environmental Protection - Biosolids Home Page
<http://www.dep.state.pa.us/dep/biosolids/biosolids.htm>

Department of the Environment and Heritage. Environment Australia Online
<http://www.deh.gov.au>

WASTEWATER TREATMENT

Hunter Water Corporation
<http://www.hunterwater.com.au>

TREES FOR TIMBER

Australian Timber Information
<http://www.naturallyaust.com.au>

Timber Sawing
<http://www.anu.edu.au/Forestry/>

General Site for Timber Information
<http://www.timber.net.au>

Forests NSW
<http://www.dpi.nsw.gov.au/forests>

Forestry Australia
<http://www.nafi.com.au>

Additional Web References

Timber Building in Australia
<http://oak.arch.utas.edu.au>

Forest and Wood Products Research and Development Corporation
<http://www.fwprdc.org.au>

National Forests and Timber
<http://www.australiaforest.com>

Tasmanian Timber
<http://www.tastimber.tas.gov.au>

Timber Queensland
<http://www.timberqueensland.com.au>

The Australian Woodworker
<http://www.skillspublish.com.au>

Agriculture, Forestry and Fisheries Australia
<http://www.affa.gov.au>

The Institute of Foresters of Australia
<http://www.forestry.org.au>

Resource and Conservation Assessment Council
<http://www.racac.nsw.gov.au>

Australian Bureau of Agriculture and Resource Economics
<http://www.abareconomics.com>

Additional Non-Web Reference

Australian Timber Industry Directory - 2000
Colourscan, Newmarket QLD

FERAL ANIMALS

Wildlife Australia - Pest Animals
<http://www.deh.gov.au/biodiversity/invasive/ferals/>

Agriculture, Forestry and Fisheries Australia
<http://www.affa.gov.au>



ANSWERS

Wood words

'Super models': these trees are called this because they are four of the most valuable trees in Forests NSW for their timber and other uses. 1.b), 2.d), 3.a), 4.c)

Hardwoods

2. Pollen is released from the flower stamens, 3. Pollen attaches to the stigma, 5. The flower loses its stamens and a dry woody fruit forms, 6. When the seeds are mature the fruit opens and the tiny seeds are released, 7. The seeds which reach the soil and have adequate growing conditions germinate.

Softwoods

2. In Springtime, pollen is released from the scales on a male cone and blown onto a female cone, 3. The female cone remains tightly closed until the seeds are ready to be released, 4. The germinated seeds develop into seedlings. These are planted in rows, in selected areas of forest.

A budding career

S is for small tree or seedling; as they grow seedlings are helping the environment by taking carbon dioxide out of the atmosphere, D is for defective trees; they are used to produce paper, greenpower, and medium density fibreboard, H is for habitat; these trees are important as homes for birds and animals, and also as seed producers to grow more trees; P is for poles and posts; treated timber is poisonous, T is for timber; back sawing takes high quality timber from faulty logs, V is for veneer; a thin slice of wood that has been peeled off the tree, or "peeled like an orange".

The look of the grain is different for different types of timber and also looks different depending on the way the timber is cut. Coreboard is different from plywood because it has a solid timber core.

Career choice

Tree 1 - veneer, Tree 2 - sawlog, Tree 3 - pulpwood and woodchip

What machine is that?

Across - 2. forwarder, 3. cable, 5. bulldozer, 6. excavator

Down - 1. processor, 2. feller buncher, 4. skidder

Machine match

Feller buncher - chainsaw and tracks

Forwarder - grapple and rubber tyres

Cable logging equipment - winch

Bulldozer - blade, winch and tracks

Excavator - grapple and tracks

1. bulldozer, tracks, steep 2. branches, lengths

Planning with purpose

1) scribbly gum, bloodwood, 2) circle with dot; green circle with 'R'; dark green shading; black dotted line, 3) Jacks Ridge Road 4) 3000 metres, 5) wetlands

Find a feral

STOP FERAL INVASION

1.c), 2.d), 3.e), 4.b), 5.a)

Spot the difference

pig digging; rabbit tunnelling; pair of rabbits; fox attacking kangaroo; cat eating bird; goat damaging tree; soil damaged by hooves and digging; trees dying or dead; animal under log missing; echidna gone; bilby gone; other natives have left

Who am I?

1st verse - pig, 2nd verse - cat, 3rd verse - goat, 4th verse - fox, 5th verse - rabbit

How many?

1. Fox - 5, Rabbit - 200, Goat - 7, Cat - 10, Pig - 11

2. There are eight ways listed on the website,

3. a) 6 - 7, b) 72 - 84, a) cat, fox, b) 2, 5. a) rabbit, goat, b) 2

Super spy

Cat, fox, goat, rabbit, pig

Feral X word

Across - 1. introduced, 5. hunter, 6. program, 8. damage, 9. diet, 11. cunning, 13. destroy, 14. habitat, 15. vegetation, 16. feral

Down - 1. infest, 2. desex, 3. adaptation, 4. agriculture, 7. population, 10. predator, 12. native

Poo words

RECYCLING WASTE 1.c), 2.a), 3.b)

Get the message

1. 30kg of biosolids, 2. a factory that processes sewage, 3. a screen with small holes, 4. grease, oils and heavy waste, 5. water, 6. sunlight and air, 7. the better the quality, 8. scientist, 9. biosolids, 10. there is little or no bacteria, pesticides or metals. FERTILISER

Using it

1. F, 2. D, 3. H, 4. E

Stop the waste

1. Using the toilet as a rubbish bin - help by only putting your personal waste in the toilet and taking unused medicines to the pharmacy
2. Disposing of chemicals and paint down the sink - use your sink only for washing
3. Nasty cleaning products - use environmentally friendly products in your home

Presenting the poo

1. $30 \times 250,000 = 7,500,000$ tonnes,
2. 30 kilograms, 30,000 divided by 30 = 1000 people
3. $19,000,000 \times 30 \text{ kg} = 570,000,000$
4. 30/100 or 30 hundredths or 0.30

