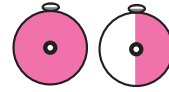


# Oo-Roo!



90 mins

**S**tudents explore the relationship between the size of a population and the available food, water, shelter and space within an ecosystem. By playing a game and graphing the results, students investigate the dynamic balance that exists between the number of kangaroos and available resources.



## At a glance

Student book pages 23–27

- Discuss the factors that influence the survival of kangaroos.
- Explain and play the game of 'Oo-roo'.
- Discuss the results of the game.
- Students graph the data.
- Discuss questions in the student book.

## Explore





## Lesson outcomes

- 1 Students recognise that a change in available resources in an ecosystem will have an effect on an animal population.**

They show their recognition by:

- describing the decrease in the number of kangaroos when food, water, shelter and space become limited; and
- describing the increase in the number of kangaroos when food, water, shelter and space become plentiful.

- 2 Students are able to make and interpret a line graph.**

They show their ability by:

- drawing a line graph of the data recorded in the class game; and
- explaining how the graph shows that the population of kangaroos fluctuates between a higher and a lower number as the kangaroos use the available resources.

- 3 Students are able to identify interactions between living and non-living components within an ecosystem.**

They show their ability by identifying interactions that kangaroos have with components of an ecosystem as they search for food, water, shelter and space.



## Equipment and preparation

**For the class** paper, for a chart  
marker pen  
chalk

**For each student** 1 worksheet, 'Graphing the data' (BLM 7.6)

**Preparation** This lesson could be divided into two sessions.

Rule up a chart to record results of the game, for example:

Year	Number of kangaroos
1	
2	
3	
4	

Your filled-in chart will be used by students when they are graphing the data so make sure the results are legible from a distance.

You will need an area large enough for students to run between two lines that are at least 8 metres apart. Expect students to be noisy during this game.

**BLM** Make one copy of 7.6 for each student.



## Teaching strategies

1 Discuss briefly:

**How many of you have seen kangaroos in the wild?**

**What sorts of interactions might kangaroos have with living and non-living things?**

**What do kangaroos need to survive?**

- 2 Explain that the class will play a game about kangaroos in the wild to see how kangaroo numbers change year by year depending on the availability of resources such as food, water, shelter and space.
- 3 Read 'The game of Oo-Roo' in the student book and explain that students will discover how the game is played as they go through the first round (which represents one year).

Your class will play a game to find out how the number of kangaroos changes each year. Some students will pretend to be the food, water, shelter or space that the kangaroos need for survival. Other students will pretend to be kangaroos. A few students will also pretend to be a disease or a predator that can kill kangaroos. Each round of the game will represent one year.

Each year, the kangaroos will search for the food, water, shelter and space they need for survival. Those kangaroos that find what they need and avoid disease and predators will live and produce joeys that survive. Any that do not find what they need will die. A few might also die each year because of diseases or predators.

During the next round of the game, the unsuccessful kangaroos will become food, water, shelter or space for the remaining kangaroos in the mob. At the end of each round (or year), your class will count how many kangaroos survived and reproduced successfully.

As you play this game, watch how the number of kangaroos changes year by year as the amount of available food, water, shelter or space changes.

#### Getting ready to play the game

Your teacher will tell you whether you will begin the game as a kangaroo or as an available resource.

Kangaroos will stand along one line and the resources will stand along the other line. All players will stand with their backs to the opposite line.

#### What the kangaroos do

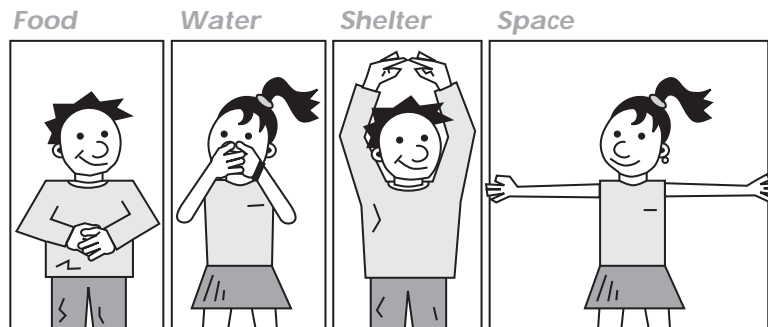
Before each round of the game, each kangaroo will decide whether to look for food, water, shelter or space and will make the sign of that need. Once the sign is made, a kangaroo cannot change what it will look for.

#### What the resources do

Before each round of the game, each student who represents a resource will choose to be food, water, shelter or space and will make the sign of that resource.

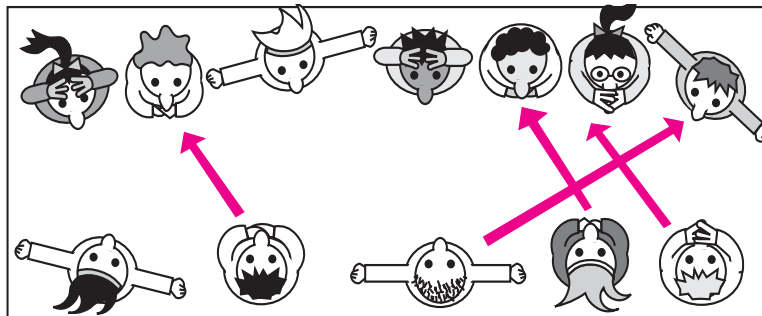
Once the signs are made, students cannot change what they represent. Your teacher will secretly assign one student to represent a disease and another student to represent a 'roo shooter in addition to representing a resource.

### Signs



### Playing the game

When your teacher says 'go', both lines will turn and face each other. Still making the sign of what they need, kangaroos will run across the playing area and try to collect those resources from the opposite line.



When a kangaroo finds a matching sign for food, water, shelter or space, it will take its match back to the kangaroo side of the playing area. This will show that the kangaroo met its need and successfully reproduced that year.

Any kangaroo that doesn't find a matching sign for food, water, shelter or space will die and become part of the resources in the next round. If a kangaroo finds a matching resource that also represents a disease or a

**'roo shooter, that kangaroo will die and become part of the resources in the next round.**

**Those students who represent the resources will stay in line until a kangaroo needs them. If no kangaroo needs a particular resource during any round, those students will continue to be resources in the next round.**

**After each round, your teacher will count and record how many kangaroos are left. Then everyone chooses a different sign, and your teacher assigns different students to be a disease and a 'roo shooter.**

- 4** Before you begin the game, prepare the lines by chalking two parallel lines at either side of the playing area (at least 8 metres apart).

Select approximately a quarter of the students to be the kangaroos. Line them up along one line. Record the number of kangaroos for Year 1.

The other students are the resources. Line them up on the other line.

Instruct all students to stand with their backs to the opposite line so that they can't see each other.

Secretly assign one of the students in the resource line to represent a disease and another to represent a 'roo shooter.

- 5** Proceed with round 1 of the game by asking students to make the sign for a resource or a need.
- 6** The round ends when there are no more resources to match the kangaroos' needs or when the needs of all the kangaroos have been met.

*As you look at the two lines, you should see a variety of signs. After several rounds of the game, students might confer with one another and all decide to make the same sign. If they all decided to be water, for example, this would represent a flood, with no available food, shelter or space, and it might*

Begin the next round with the new number of kangaroos recorded and each student choosing a different sign. Choose two different students to be the disease and 'roo shooter.

*eliminate almost the entire kangaroo population for that year. While this approach is acceptable, don't encourage it until the class has played 10 or more rounds so that they can see 'normal' interactions at work. In the same way, in some years you might decrease the number of 'roo shooters and diseases to zero, or increase their number to represent a plague or planned culling. Explain that failure to obtain a matching resource represents a kangaroo starving or dying from thirst, lack of shelter or loss of habitat. Such things happen in the wild.*

**7** Repeat until at least ten rounds have been completed.

*The population of kangaroos will increase in size for the first few rounds until the resources are depleted and there is not enough food, water, shelter or space to support the size of the mob. When this happens, the population will decrease for one or more rounds until the resources increase again.*

**8** Discuss the questions in the student book:

- 1** In your game, what happened to the number of kangaroos when there was plenty of food, water, shelter and space?
- 2** What happened to the number of kangaroos when there was a shortage of food, water, shelter or space?

*The size of the mob increases when resources are plentiful and it decreases when resources are limited. This is exactly what happens in the bush. The size of a population constantly changes in relation to the amount*

**In the bush, what would kangaroos use for food, water and shelter?**

*Kangaroos eat grasses (including crops if they can get to them); they drink fresh water from lakes, streams and rivers; they use trees, tall grasses and rocks for shelter and camouflage.*

**4 What might cause the availability of food, water and shelter to change from year to year?**

*The availability of resources might be affected by droughts, floods, fires, severe winters and human activity.*

**5 Which kangaroos would be the most likely to be killed by diseases or by predators?**

*Very young, very old, ill or malnourished animals are the likely victims of disease or predators.*

**6 Do you think that the number of kangaroos would change or remain steady each year?**

**7 Could the number of kangaroos change for reasons other than births or deaths?**

*Movements of animals into and out of the mob can change its size. When they are stressed, animals either move away or die. In some areas of the country, kangaroos can easily find all the food and space they need; but in other areas, people have taken over much of the land where they used to live.*

**9** Distribute worksheets.

Display the chart showing the kangaroo numbers you recorded during the game.

**10** Ask students to construct their graphs on the worksheet by following 'Graphing the data' in the student book.

*Make sure that students understand the term 'data'.*

Your class counted and recorded the number of kangaroos in the mob at the beginning of each round of the game of 'Oo-roo'. These numbers are called data. Just looking at the numbers might not tell you much. A better way to look at these data is to graph the numbers. A graph can help you see patterns in the data.

- 1 Put a cross on the worksheet to mark the number of kangaroos there were at the beginning of Year 1 (round 1 of your game).
- 2 Repeat step 1 for each round (year) of your game.
- 3 Draw a line to connect the crosses.

**11** In small groups, or as a class, discuss the questions in the student book:

- 1 What was the highest number of kangaroos that survived in your game?
- 2 What happened to the number of kangaroos the year after the mob was at its largest?
- 3 What was the lowest number of kangaroos that survived?
- 4 What happened to the number of kangaroos the year after the mob was at its smallest?
- 5 Why does the pattern on your graph go up and down instead of remaining in a straight line?

*The number of kangaroos fluctuates because they are constantly reproducing or dying or moving from one mob to another in relation to available resources. Such a dynamic balance exists in an ecosystem. Later lessons will explain this concept more fully to students.*



## Extensions

Discuss the need to control numbers of animals (such as kangaroos, foxes and rabbits), and the factors that scientists could consider when they look for ways to carry out such controls.

Read about and discuss the effects of natural disasters (eg, fires and floods) on native and introduced animal populations.

Read about and discuss the effects of droughts and famines on human populations. 🌀

# Graphing the data

Name: .....

Date: .....

