

# SOUTHERN QUEENSLAND FLYING-FOX EDUCATION KIT

## Year 4: The life cycle of the flying-fox



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Published by SEQ Catchments

Level 2, 183 North Quay Brisbane | PO Box 13204 George St QLD 4003

Phone: +61 7 3211 4404 | Fax: +61 7 3211 4405

Email: [admin@seqcatchments.com.au](mailto:admin@seqcatchments.com.au)

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This resource has been prepared by Peter Coleman, Kelly Coleman and Kitty Janssen of PeeKdesigns for SEQ Catchments.



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COUNTRY

# Flying-fox education kit

## About the education kit

The *Southern Queensland Flying-fox Education Kit* was developed as part of the **Improving Landscape Resilience to Climate Change in SEQ: the flying-fox roost & forage conservation pilot project**. This two-year project, coordinated by SEQ Catchments, aimed to improve the long-term sustainability of flying-fox camp sites in the southern Queensland region and increasing community awareness of the intrinsic value of flying-foxes and the critical ecosystem services they provide.

The project was funded through the Australian Government's Caring for our Country program and supported by Brisbane, Logan and Redland City Councils, Moreton Bay Regional Council, Noah's Ark Wildlife Coalition, Bat Conservation and Rescue Queensland, The Hut Environment and Community Association, the Queensland



Department of Environment and Resource Management and Burnett Mary Regional Group.

The education kit introduces teachers and students to Gracie the grey-headed flying-fox. Gracie's mission is to help save my flying-foxes and get the message out about how important they are in pollinating native trees and dispersing native seed - essential things in keeping our environment healthy!

The All About Bats website is a key component to this education kit - [www.allaboutbats.org.au](http://www.allaboutbats.org.au).

## Year 4: The life cycle of the flying-fox

The *Southern Queensland Flying-fox Education Kit* provides schools of southern Queensland with an opportunity to study flying-foxes in the classroom while achieving outcomes (particularly Biological Sciences) under the Australian Curriculum.

The year 4 unit consists of three lessons that contain a variety of activities. Teachers may choose to complete more than the suggested lessons e.g. a teacher may choose to introduce some of the year 5 activities.

These activities use a range of different learning media to provide an all-round learning experience for their students. This includes printed materials, PowerPoint presentations, YouTube videos and sound files that are all found on the All About Bats website.

The year 4 unit "The life cycle of the flying-fox", introduces students to flying-foxes and their importance in the environment. It introduces flying-foxes as mammals and familiarises students with the life cycle of flying-foxes and native trees. From this, students will come to realise the co-dependency that exists between flying-foxes and native trees and the need to protect both.



# Year 4 The life cycle of the flying-fox



## Rationale

This unit introduces year 4 students to flying-foxes and their importance in the environment. It introduces flying-foxes as mammals and familiarises students with the life cycle of flying-foxes and native trees. From this, students will come to realise the co-dependency that exists between flying-foxes and native trees and the need to protect both.

This unit is divided into three lessons. The aim is that each lesson will take between one and two hours.



### Lesson 4.1 Flying-foxes are mammals, not birds

Students are introduced to flying-foxes and their characteristics. The lesson introduces the flying-fox with a Dreamtime story. It then uses a quiz to ascertain what students already know about flying-foxes. Answers are discussed to ensure all students have the basic facts. Students read a fact sheet about Southern Queensland flying-foxes. They discuss the flying-fox and complete a table in small groups.

### Lesson 4.2 Trees need flying-foxes

Students are introduced to the life cycle of a flying-fox by reading a story and completing a diagram. They are then introduced to the life cycle of a native Australian tree and the importance of flying-foxes in that cycle. They make a flip book of the tree's life cycle to help consolidate their knowledge.

### Lesson 4.3 Protecting flying-foxes and their environment

Students consider the importance of how humans are affecting flying-fox populations. They are encouraged to think about all the ways that humans are changing the life of a flying-fox by reading Gracie's diary entry. This is followed up with a relay game looking at the different impacts that natural and unnatural threats have on flying-foxes and the ecosystem. Students use their newly acquired knowledge to design their own flying-fox fact sheet.

# Year 4 The life cycle of the flying-fox



## National Curriculum

Lesson	4.1	4.2	4.3	Statements
Science understanding (Biological sciences)	✓	✓	✓	Living things have life cycles. (ACSSU072) Living things, including plants and animals, depend on each other and the environment to survive. (ACSSU073)
Science as a human endeavour			✓	Science knowledge helps people to understand the effect of their actions. (ACSHE062)
Science inquiry skills	✓	✓	✓	Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports. (AC SIS071)
English (Literacy)			✓	Plan, draft and publish imaginative, informative and persuasive texts containing key information and supporting details for a widening range of audiences, demonstrating increasing control over text structures and language features. (ACELY1694)
General Capabilities: Literacy	✓	✓	✓	As they become literate students learn to: <ul style="list-style-type: none"> <li>• Interpret, analyse, evaluate, respond to and construct increasingly complex texts. (Comprehension and composition)</li> <li>• Understand, use, write and produce different types of text. (Texts)</li> <li>• Make appropriate word selections and decode and comprehend new (basic, specialised and technical) vocabulary. (Vocabulary)</li> <li>• Use and produce a range of visual materials to learn and demonstrate learning. (Visual information)</li> </ul>
General capabilities: Critical and creative thinking	✓	✓	✓	As they develop critical and creative thinking students learn to: <ul style="list-style-type: none"> <li>• Analyse information logically and make reasoned judgments.</li> <li>• Evaluate ideas and create solutions and draw conclusions.</li> </ul>
Cross-curriculum priority: Sustainability		✓	✓	All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing. (OI.2) Sustainability action is designed to intervene in ecological, social and economic systems in order to develop more sustainable patterns of living. (OI.7)
Cross-curriculum priority: Aboriginal & Torres Strait Islander histories and cultures	✓			Aboriginal and Torres Strait Islander Peoples have unique belief systems and are spiritually connected to the land, sea, sky and waterways. (OI.3)

# Flying-foxes are mammals, not birds



## Objectives

Students will learn about the characteristics of the three different types of flying-foxes found in southern Queensland. They will also learn of the cultural importance of flying-foxes through the Aboriginal Dreamtime story “The little flying-fox”.

## National Curriculum

Activity	4.1A	4.1B	4.1C
Science understanding (Biological sciences)		✓	✓
Science inquiry skills			✓
General capabilities: Literacy	✓	✓	✓
General capabilities: Creative and critical thinking		✓	✓
Cross-curriculum priority: Aboriginal & Torres Strait Islander histories and cultures	✓		

For outcome codes and descriptions of outcomes, see unit overview.

## Background information

Bats are flying mammals who have skin and fur. They give birth to and suckle their young. They are nocturnal animals who hang upside down because their legs have evolved to be small and light enough so that they can fly, therefore they cannot stand upright. They also conserve energy by not using leg muscles during the day.

Flying-foxes are part of a group of bats (mega-bats) that are usually significantly larger than

their counterparts, the micro-bats. Flying-foxes do NOT use echolocation to find their food. Instead, they have a highly developed sense of sight, smell and sound. They eat blossoms, nectar and fruit.

There are three species of flying-foxes in southern Queensland; grey-headed, black and little red. Their main differences are their colouring, weight, size and timing of their life cycles.

## Activity sequence

### 4.1A The little flying-fox – a Dreamtime story

The lesson will start with this Dreamtime story. Students can watch this Dreamtime story being performed by an Aboriginal storyteller located on the Year 4 page of the All About Bats website [www.allaboutbats.org.au](http://www.allaboutbats.org.au). Alternatively they can read the text provided.

### 4.1B What do you know about flying-foxes?

Students complete a quiz to give the teacher an indication of their existing knowledge. Students mark their own quiz as the teacher goes through the answers provided to ensure everyone has the basic facts about flying-foxes.

### 4.1C Flying-foxes of southern Queensland

Students read the fact sheet and fill in the table on the worksheet. In small groups, assign “expert” roles to students. Each “expert” must find information that relates to the worksheet table (i.e. location, colour, weight, food, other facts). Further research can be conducted at [www.allaboutbats.com.au](http://www.allaboutbats.com.au).

# The little flying-fox

## A Dreamtime Story



*This is a Dreamtime story shared by a number of language groups in the far north of NSW and over the Queensland border.*

Watch this story being told by an Aboriginal storyteller at [www.allaboutbats.org.au](http://www.allaboutbats.org.au)

When the world was young, flying-fox thought he was a bird.

He went to the Great Spirit who was here teaching the birds how to be birds, like how to make nests, how to lay eggs, how to find food.

The little flying-fox went over to the Great Spirit and asked him if he would teach him how to be a bird.

The Great Spirit said, "You are not a bird you are a bat. I will teach you how to be a bat."

But the little flying-fox would not listen.



Little flying-fox got under the feet of the Great Spirit and cried out, "Teach me to be a bird, I want to be a bird now!"

Well, the Great Spirit stopped. He picked the little flying-fox up by his feet and hung him upside down in the branch of a tree and left him there to teach him a lesson.

When the Great Spirit had finished with all the birds he went over to the little flying-fox and said, 'Have you learnt your lesson little flying-fox? Do you know that you are a bat and not a bird?'

But little flying-fox had not learnt and he said, "I don't care, I can hang upside down forever if I want to. I still think I'm a bird!"

Well, the Great Spirit left the little flying-fox hanging upside down in the branches of trees forever, to remind him that he is not a bird, but a bat.

And that is the reason why the flying-fox hangs upside down in the branches of trees, instead of sitting the right way around like birds.



*Talking identity: teacher's handbook*  
2002 NSW Department of Education and Training

Taylor, Jillian. 2009. *Bangu the flying fox: a Dreamtime story of the Yuin people of Wallaga Lake*. Aboriginal Studio Press.  
[www.aiatsis.gov.au/asp](http://www.aiatsis.gov.au/asp)

# What do you know about flying-foxes?

## Quiz



1. What is a flying-fox?
  - A. A bird .....
  - B. A bat .....
  - C. A fox .....
  - D. A possum.....
  
2. What covering do flying-foxes have on their bodies?
  - A. Fur .....
  - B. Shell.....
  - C. Feathers .....
  - D. Scales .....
  
3. When do flying-foxes sleep?
  - A. At night .....
  - B. In the morning.....
  - C. At dusk .....
  - D. During the day.....
  
4. Where do flying-foxes sleep?
  - A. In caves.....
  - B. In trees .....
  - C. In burrows.....
  - D. In people's roofs .....
  
5. How do flying-foxes sleep?
  - A. Standing up .....
  - B. Lying down .....
  - C. Hanging upside down .....
  - D. While flying.....
  
6. What type of animal is a flying-fox?
  - A. A reptile .....
  - B. A bird.....
  - C. A mammal .....
  - D. A fish.....
  
7. What does a flying-fox eat?
  - A. Insects.....
  - B. Fruit, blossom and nectar .....
  - C. Blood.....
  - D. Dead animals .....
  
8. Flying-foxes are also called?
  - A. Giant-bats .....
  - B. Mega-bats .....
  - C. Mini-bats .....
  - D. Micro-bats.....
  
9. Echolocation is used by all bats including flying-foxes.
 

True.....

False.....
  
10. Flying-foxes can fly a long way to search for food (up to 20 km away from their roost).
 

True.....

False.....

My quiz score is: 10

# What do you know about flying-foxes?

## Answers



**1. B: Flying-foxes are bats.**

They are called foxes because their faces look a lot like that of a fox. Even though they can fly, they aren't birds because they do not lay eggs or have feathers.

**2. A: Flying-foxes have fur.**

Flying-foxes are mammals that have fur. Have a look at a picture of a bat, they have fur on their bodies. Their wings are made of skin. They do not have feathers like a bird.

**3. D: Flying-foxes sleep during the day and feed at night.**

Flying-foxes are nocturnal. They wake up at dusk and fly to their feeding site and return to the roost early in the morning.

**4. B: Flying-foxes sleep in trees.**

Unlike other bats, flying-foxes sleep in trees, not in caves.

**5. C: Flying-foxes sleep hanging upside down**

Flying-foxes hang upside down using a special claw on their foot which ensures that they won't let go when they're asleep.

**6. C: Flying-foxes are mammals.**

All bats are mammals. Mammals are animals that care for their young after birth by feeding them milk. Most mammals give birth to live young. They all have fur or hair on their bodies. Human beings are mammals as well as dogs, cats, kangaroos and whales. Bats are the only mammal that can fly.

**7. B: Flying-foxes eat fruits, blossom and nectar.**

Flying-foxes are vegetarians. They feed on fruits and the nectar of flowers.

**8. B: Flying-foxes are also called mega-bats.**

There are two main types of bats, mega-bats and micro-bats. Mega-bats are usually bigger (up to 28 cm) and eat fruit and nectar. Flying-foxes are also sometimes referred to as fruit bats. Micro-bats are much smaller and feed mainly on insects.

What other differences do you see between the mega and micro-bats?



**9. FALSE: Echolocation is used by micro-bats, not mega-bats.**

Echolocation is the use of echoes to 'see' in the dark. Micro-bats use echolocation to navigate their way in the dark and to catch insects and other prey. Mega-bats don't use echolocation, they have a heightened sense of sight, smell and taste.

**10. TRUE: Flying-foxes can fly up to 20 km away from their roost to find food.**

Flying-foxes have been recorded flying up 400 km in one night.

# Flying-foxes of southern Queensland



## Black flying-fox

Black flying-foxes (*Pteropus alecto*) are common across northern Australia and along the east coast. They are generally black all over, often with a reddish brown mantle around the back of the neck.



This species lives and feeds mainly in tropical and subtropical forests and woodlands. Females use mangroves and floodplain forests for maternity roosts. Their preferred food is fleshy fruits and blossoms from eucalypts, melaleucas and a variety of other native and introduced species. Black flying-foxes are protected under Queensland and New South Wales legislation. Size: 600-1000 grams.



Photo: L. Hall

## Grey-headed flying-fox

Grey-headed flying-foxes (*Pteropus poliocephalus*) have grey fur on their head with an orange collar around its neck. Their legs also have grey fur. The rest of the body is a dark grey to brown.



This species can form large camps, historically in the hundreds of thousands. Their diet consists of the pollen, nectar, fruit and flowers of over 100 native plant species and many non-native species. This flying-fox is listed as nationally 'vulnerable' to extinction under the *Environment Protection and Biodiversity Conservation Act 1999*. Grey-headed flying-foxes are also protected under Queensland and New South Wales legislation. Size: 600-1000 grams.



Photo: N. Edards

## Little red flying-fox

Little red flying-foxes (*Pteropus scapulatus*) are a nomadic species that can be found across most of Australia's semi-arid and tropical regions. This small reddish-brown species is characterised by its semi-transparent wings when flying during the day. Camps can reach up to 1 million individuals in early summer, the mating season.



Due to their large numbers, they can cause severe damage to camp sites from their combined weight on tree limbs. They feed predominantly on blossom and will travel large distances to following flowering trees. Little red flying-foxes are protected under Queensland and New South Wales legislation. Size: 300-600 grams.



Photo: L. Hall

# Flying-foxes of southern Queensland



In groups of five, you have to read the “Flying-foxes of southern Queensland” fact sheet. Each group member has the job of finding out their own “expert” information to fill in the table.

	Where do they live?	Colour	Weight	Food	Two interesting facts
<p><b>Black flying-fox</b> (<i>Pteropus alecto</i>)</p>					
<p><b>Grey-headed flying-fox</b> (<i>Pteropus poliocephalus</i>)</p>					
<p><b>Little red flying-fox</b> (<i>Pteropus scapulatus</i>)</p>					



Photo: K. Coleman

# Trees need flying-foxes



## Objectives

Students are introduced to the concept of life cycles through learning about the life cycle of a flying-fox and a native Australian tree. Students will start to see that these two organisms are dependent on each other for survival.

### National Curriculum outcomes

Activity	4.2A	4.2B	4.2C
Science understanding (Biological sciences)	✓	✓	✓
Science inquiry skills	✓	✓	✓
General capabilities: Literacy	✓	✓	✓
General capabilities: Critical and creative thinking	✓	✓	✓
Cross-curriculum priority: Sustainability	✓	✓	✓

## Background information

### The life cycle of black and grey-headed flying-fox

A female flying-fox's sexual maturity starts at around 2 years old. Males have to reach about 3 years old before they reach sexual maturity. Mating rituals start in late summer to early autumn (February-March) when males start squabbling over territories and marking them using their scent.

Flying-foxes normally live in mixed groups, except after mating (i.e. from April to September) when males and females live separately. The females lead a nomadic existence and move around depending on where the food is.

The gestation period is around 6 months and young are born in spring (October-November) when food and water is readily available back at camp. Most females only have one offspring, although some do have twins.

Babies are suckled and carried around by their mothers for up to one month after birth. After that, they are left in a crèche at night with other juveniles while the mother finds food. By January the juveniles start living independently and joining the rest of the colony on nightly feeds.

Flying-foxes have been recorded to live up to 23 years in captivity and a probable maximum life span of around 15 years in the wild.

*NOTE: The life cycle of the little red flying-fox has the same sequence, but they mate in spring and have their young in autumn.*

### Flying-foxes and trees have a co-dependent relationship

Flying-foxes are dependent on trees for shelter and food. Trees are dependent on flying-foxes for seed dispersal and pollination that happens when they eat the tree's fruit and lick the nectar from the flowers. There are many species of native trees that flower at night to attract nocturnal feeders like flying-foxes.



## Activity sequence

### 4.2A Gracie's year of changes

Students read a story about Gracie, the grey-headed flying-fox, and use it to complete the life cycle diagram. Answers are discussed.

A classroom discussion is held about the importance of trees in Gracie's life to help introduce the next activity.

### 4.2B The life cycle of a tree

Students have been made aware that flying-foxes need trees. Look at the question "Do trees need flying-foxes?" and discuss this question and the life cycle of a tree using the diagram provided.

### 4.2C Make a life cycle flip book

Students consolidate their knowledge of a tree's life cycle and the role of the flying-fox within it by making a flip book. If there is time, they can draw their own for grey-headed flying-foxes.



# Gracie's year of changes



## Summer

It was near the end of summer and Gracie the Grey-headed flying-fox lived in a large flying-fox camp in southern Queensland. She was only 2 months old.

Gracie started noticing all the adult males in the camp were flapping their wings a lot and squabbling over their branches. They were really smelly too. Her mum told her that it was nearly time to start mating again.

## Autumn

At the beginning of autumn Gracie's mum went off to mate with some of the males in the camp. Gracie was really excited about this because she knew that she would be getting a new baby brother or sister in spring.

Before autumn was over, it was time for all the expecting mothers to move to a new camp site where there was plenty of food and shelter trees for their growing babies. Gracie and all the other young flying-foxes went with them.

## Winter

During winter, Gracie and the other flying-foxes ate nectar and fruit. They did this every night and came back to the camp site to rest during the day.

As they did this they helped pollinate the night flowering eucalypts, rainforest trees and other native trees. They also fed on rainforest fruits and dropped the seeds of fruit around the rainforest. Gracie didn't know this, but they were helping to protect their source of food for many years to come.

## Spring

Spring had come and it was 12 months since Gracie was born. Gracie's mum gave birth to a baby girl bat named Tilly. Tilly was born with little hair on her tummy so she could climb through her mum's belly fur and suckle milk from her teat. Soon every mum had young hanging off their chests.

Gracie was so excited to have a sister to play with. But she couldn't play with her as she knew she would stick with mum all day and night until summer started. So she hung out with other bats her own age.

## Summer

It seemed a long time, but summer finally came. Tilly had been left in the crèche at night with the other youngsters since she was about 1 month. Gracie would go and see her before flying off for their nightly feed to make sure she felt happy and safe. Mum would come along and call for her to give her food every morning at dawn.

## 12 months later...

About 12 months later, when Gracie was just over 2 years old, she realised that she had become an adult.

This time the smells and noise coming from the males had a whole new meaning. She was ready to mate with one of the males.

It was Gracie's time to continue the flying-fox life cycle.



# Gracie's year of changes



What happened to Gracie in the story? Draw or write a life cycle for Gracie by filling in the sections of the diagram below with factual statements (e.g. Young are born). You can either draw pictures or write what happened.



How important are trees in Gracie's life? How do they help Gracie survive?

.....

.....

# Gracie's year of changes

## Answers



- Young are born.
- Young stay attached to the mother for up to 1 month.

SPRING

- Young are old enough to be left in a crèche at night.
- Males form mating territories by squabbling and scent marking.



SUMMER



WINTER

- Females need access to lots of flowers and fruit near the camp while pregnant.

AUTUMN

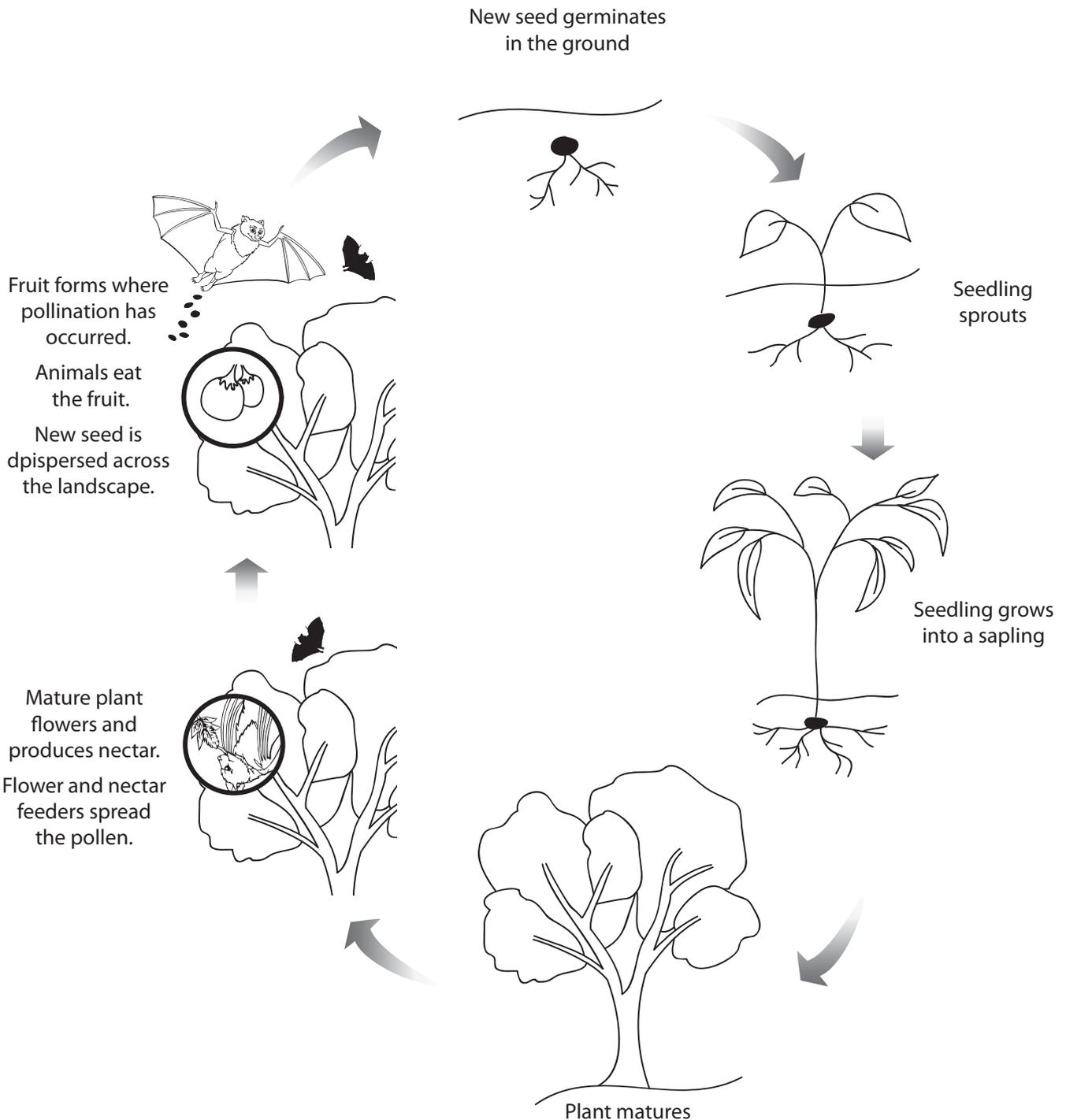
- Mating occurs.
- Females move to a new camp where they intend to give birth.



How important are trees in Gracie's life? How do they help Gracie survive?

Trees are extremely important to Gracie as they provide her with shelter and food. Females like Gracie need lots of food around maternity camps to help nourish their growing young during pregnancy and after their young are born.

# The life cycle of a tree



Why do native trees need flying-foxes to survive?

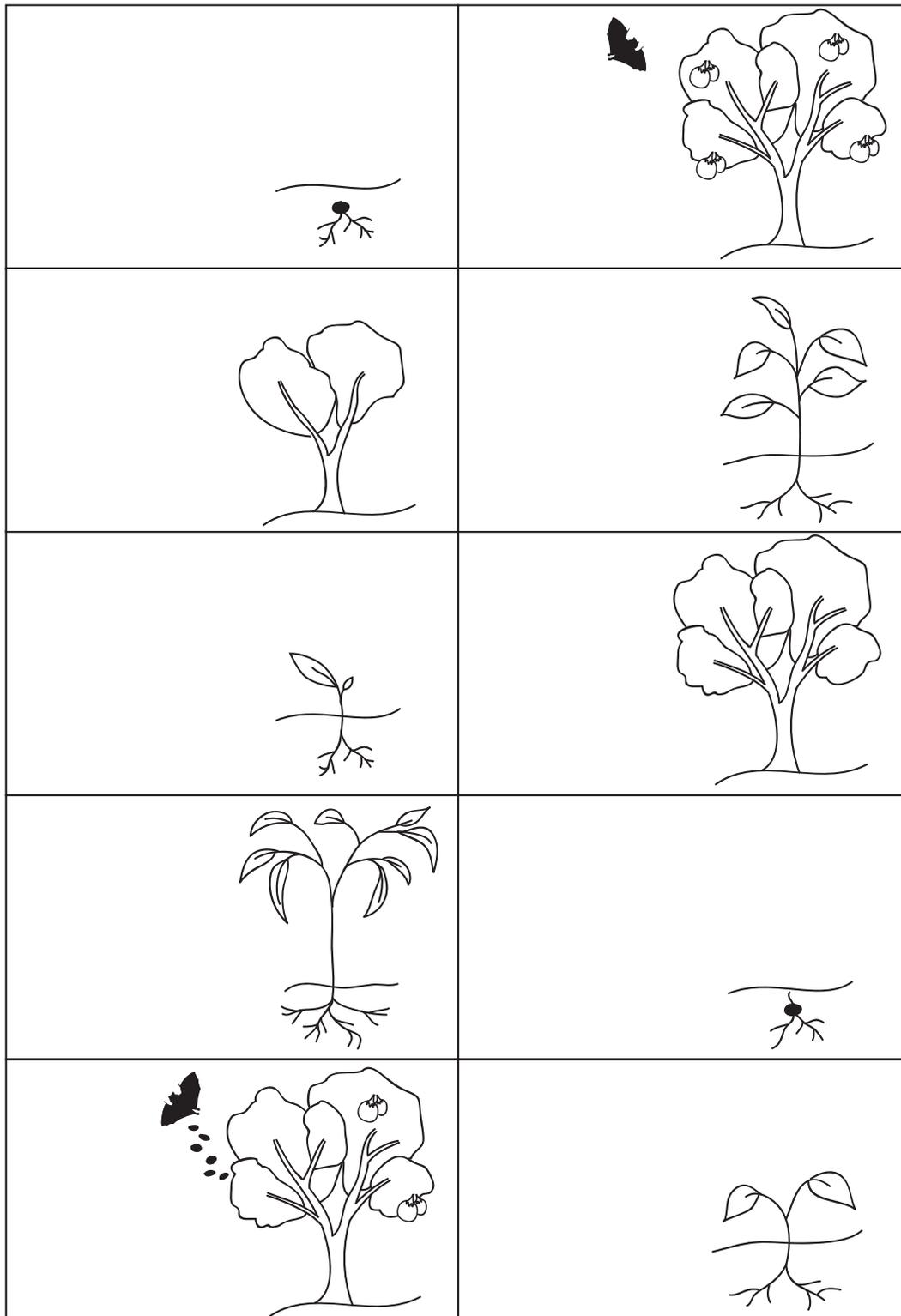
.....

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# Make a life cycle flip book



Use the following pictures to make a flip book of the life cycle of a tree. Colour, cut and paste onto a lightweight cardboard. Put them in reverse order and staple together (seed should be at the back). Flip through the images and watch the tree grow. If you are feeling creative, add more growing or pollinating stages to the tree's life cycle.



# Protecting flying-foxes and their environment



## Objectives

Students will discuss how flying foxes have been affected by humans. They will look at the importance of trees for flying-foxes and how the removal of those trees by humans have impacted their lives. Finally, students will summarise their learning in this unit.

## National curriculum

Activity	4.3A	4.3B	4.3C
Science understanding (Biological sciences)	✓	✓	✓
Science as a human endeavour	✓	✓	✓
Science inquiry skills			✓
English (Literacy)			✓
General capabilities: Literacy	✓		✓
General capabilities: Critical and creative thinking	✓	✓	✓
Cross-curriculum priority: Sustainability	✓	✓	✓

For outcome codes and descriptions of outcomes, see unit overview.

## Background information

Flying-foxes and some native trees rely on each other. Flying-foxes need the trees for food and shelter. The trees need flying-foxes to disperse their seeds and pollinate their flowers. When a good balance is achieved between two populations, the natural ecosystem flourishes.

Since European colonisation, native forests have largely been removed and exotic trees have been introduced. When native trees are in short supply, flying-foxes will turn to the exotic trees for food. As a result, many native trees are no longer having their seeds dispersed and flowers pollinated, especially those that only open at night. This impacts on the flying-foxes and other native animals (like koalas) that rely on our forests for survival.

Flying-fox populations have been in steady decline and the grey-headed flying-fox is now listed as a nationally vulnerable species. All flying-foxes are protected and can not be culled by shooting, poisoning or other means. The best long-term solution for the flying-fox is for areas to be revegetated and their habitats returned.

## Activity sequence

### 4.3A Gracie struggles to find food

Students read Gracie's diary entry and answer discussion questions.

### 4.3B The flying-fox relay

By playing a relay students will see how flying-foxes and trees depend on each other. It shows how natural predators of flying-foxes do not pose a threat to the flying-fox population. The problems for the flying-foxes arise from human interaction. *This may be modified to a drama activity that could be conducted before completing the outdoor relay.*

### 4.3C Make a flying-fox fact sheet

Students (in groups or as individuals) make their own fact sheet on what they have learnt about flying-foxes. They can use information provided in lessons or do research on the Internet. A step-by-step guide on how to draw a flying-fox is provided for students to draw their own flying-fox.

# Gracie struggles to find food



Read Gracie's diary entry and answer the questions.

Dear Diary,

Unfortunately, I'm writing to you today because I'm really sad. My mother died.

Last night we were out looking for food and went to the place we went to last year and something horrible happened. The trees were gone! Just gone! Instead of flowers and nectar we found these poles in the ground with wires across them. My mother happened to touch two of the wires with her wings and it was horrible.... She died on those wires. Just like that.

Now I have to help look after my sister Tilly. I wonder if I'm going to be able to manage it. Luckily Tilly wasn't with her as she would have been stuck on the wires with no way to get down.

Anyway, I couldn't think of anything to do. The others insisted that we had to keep going to find food. We couldn't find any of our normal foods but we did find a tree with these round, crunchy, red and green fruits on them. They filled us up and tasted okay but I could have done with some real food!

Tonight we're going to try a new place, a bit further away. Hopefully we'll find some nice blossoms or nectar. It's a bit of a worry because now that a lot of the trees are gone and there are lights everywhere, we don't have good places to rest or hide if we see an eagle or owl. Let's hope there isn't one tonight.

Wish me luck!

*gracie*

1. How did Gracie's mother die?  
.....
2. Do you think Tilly will be okay? Explain.  
.....
3. What do you think has happened to the trees that Gracie likes to feed on?  
.....  
.....
4. What type of fruit did Gracie find to eat?  
.....
5. What will happen if Gracie doesn't find food tonight?  
.....  
.....
6. What will happen to our native forests if Gracie decides to just eat the new foods she finds?  
.....  
.....
7. How do you think Gracie would feel if farmers started flashing lights at her to stop her from eating their fruit?  
.....  
.....  
.....
8. Scientists say that flying-foxes and trees are co-dependent. What do you think co-dependent means?  
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# The flying-fox relay



This relay demonstrates the following concepts.

- Flying-foxes disperse seeds from native fruits.
- Rainforests rely on flying-foxes to pollinate and disperse seeds.
- Flowering native trees rely on flying-foxes to pollinate flowers from various sources.



## What you need

- Open space e.g. schoolyard or gym
- 5 hula hoops to act as trees
- 4 buckets to hold the fruit and pollen
- Wooden/cardboard disks 5 cm in diameter, or similar, to represent fruit (1 per student)
- Pom pom balls, or similar, to represent pollen (3 per student)
- Bandannas or bibs to represent the threats.
- 14 tennis balls or other soft ball



## Set up

1. Students make the fruit and flowers in the classroom.
2. Go to the playground and set up the trees with their fruit and pollen. The fruit and pollen should be placed in the first and third buckets of the circuit. Set up one tree to be your camp/roosting tree.

(see the following diagram)

## Relay Rules

All flying-foxes start at camp and finish at camp.

The aim is for the flying-fox to get three grains of pollen from the first tree and deposit them in the second tree. They then pick up one fruit and deposit it in the rainforest bucket before heading back to camp and tagging the next person. This represents the successful pollination and seed dispersal of a healthy ecosystem.

In ROUND 1, between the fruiting tree and the rainforest bucket, there will be a student who represents a natural threat like an eagle, owl or python. They only have two balls that they can throw at the flying-foxes. If a flying-fox gets hit then they have been killed and their fruit and pollen is not counted.

Once all students have been through the circuit, count up the number of fruit and pollen in the collecting buckets.

***How many trees have been pollinated or had their seeds dispersed? How many flying-foxes survive?***

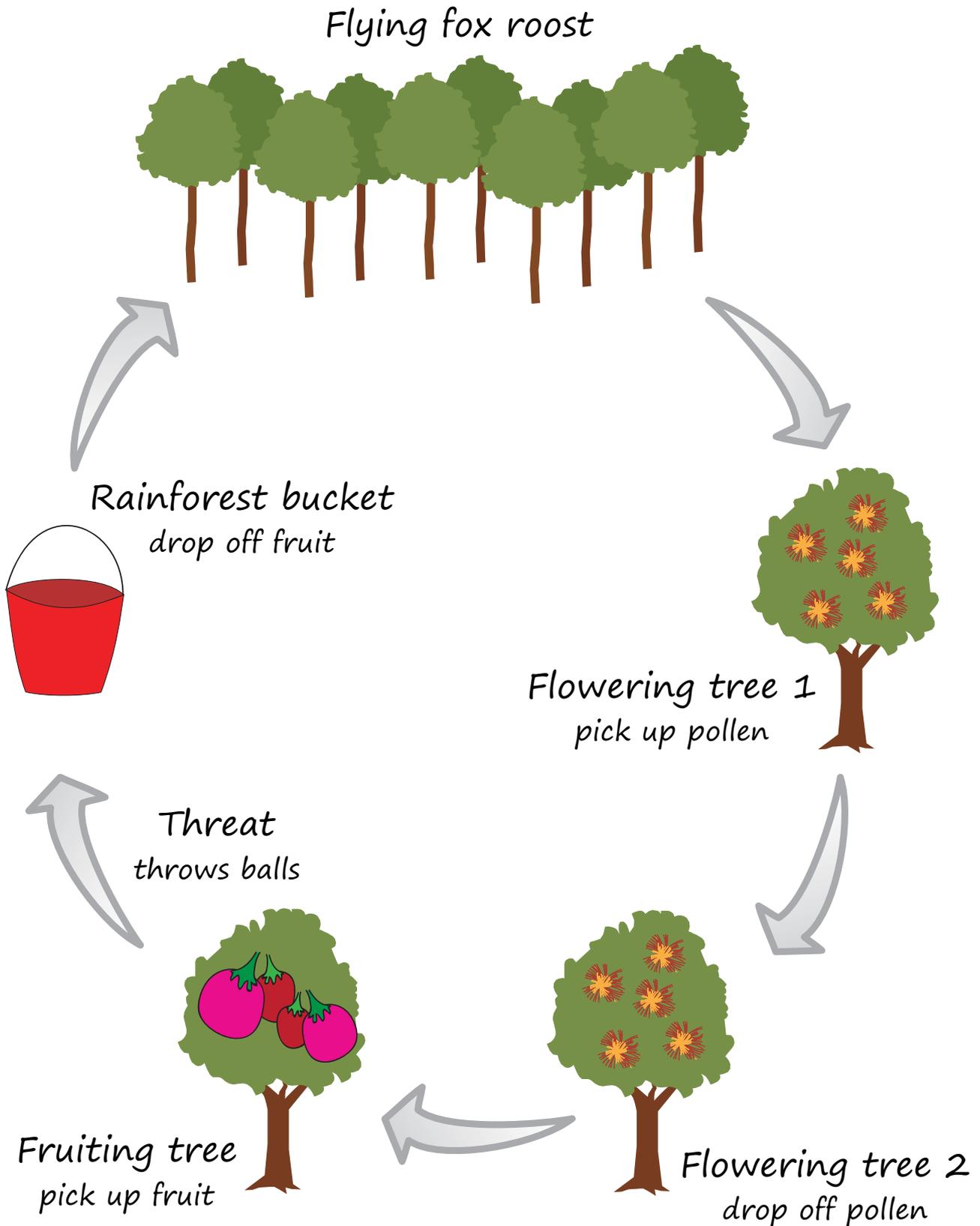
In ROUND 2 you now have an unnatural threat like fruit nets and barbed wire, and still have a natural threat. The threats must remain between the fruiting tree and the rainforest bucket. The unnatural threat gets six balls to throw while the natural threat still only has two.

***How many trees have been pollinated or had their seeds dispersed this time? Did many flying-foxes survive?***

In ROUND 3 you now have one more unnatural threat like power lines or cocos palms. Place this threat between the first flowering tree and the second flowering tree.

***Did many flying-foxes survive? Is this ecosystem healthy? Will the forest survive?***

# The flying-fox race



# Make a flying-fox fact sheet



Make your own fact sheet about flying-foxes. It can be about a particular species of flying-fox (i.e. black flying-fox, grey-headed flying-fox or the little red flying-fox), the life cycle or show how humans have impacted their lives. Make sure you have at least TEN facts as well as an illustration. Follow this step-by-step guide to draw your own flying-fox.

**Step 1:** Draw the shape of the head.



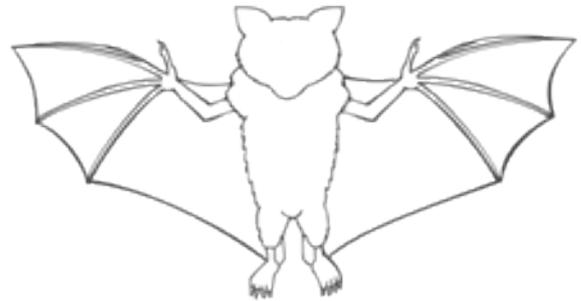
**Step 2:** Draw the arms and fingers that form the structure of the wings.



**Step 3:** Draw in the shape of the body, legs and feet.



**Step 4:** Finish off the wings by drawing the skin membrane.



**Step 5:** Personalise your flying-fox by drawing the face.



## Grey-headed flying-fox



## For more information

All About Bats. ....	<a href="http://www.allaboutbats.org.au">www.allaboutbats.org.au</a>
SEQ Catchments .....	<a href="http://www.seqcatchments.com.au">www.seqcatchments.com.au</a>
Burnett Mary Regional Group .....	<a href="http://www.bmrg.org.au">www.bmrg.org.au</a>
Department of Environment and Resource Management.....	<a href="http://www.derm.qld.gov.au">www.derm.qld.gov.au</a>

### Working with bats

The following organisations can be contacted for more information about bats, or individuals may be willing to speak to your class about what they are doing to help conserve our wildlife.

#### **Bat Conservation & Rescue Inc.**

[www.bats.org.au](http://www.bats.org.au)  
P: 07 0488 228 134  
E: [info@bats.org.au](mailto:info@bats.org.au)

#### **The Hut Environmental and Community Association Inc. (THECA)**

[www.theca.asn.au](http://www.theca.asn.au)  
P: 07 3878 5088  
E: [theca@hotmail.net.au](mailto:theca@hotmail.net.au)

#### **Wildlife Presentation Society Queensland**

[www.wildlife.org.au](http://www.wildlife.org.au)  
P: 07 3221 0194  
E: [wpsq@wildlife.org.au](mailto:wpsq@wildlife.org.au)

#### **Your local council.**

#### **Queensland Parks and Wildlife Services**

[www.derm.qld.gov.au](http://www.derm.qld.gov.au)  
South East P: 07 3512 2300  
Sunshine Coast and Burnett P: 07 5459 6110

#### **SEQ Catchments**

[www.seqcatchments.com.au](http://www.seqcatchments.com.au)  
T: 07 3211 4404  
E: [admin@seqcatchments.com.au](mailto:admin@seqcatchments.com.au)

#### **Burnett Mary Regional Group**

[www.bmrg.org.au](http://www.bmrg.org.au)  
P: 07 4181 2999  
E: [admin@bmrg.org.au](mailto:admin@bmrg.org.au)

### Excursion ideas

The following locations can be used to visit a flying-fox camp where there is interpretive information to learn more about the local camp. There are many more sites out there that have not been represented here. To find your nearest camp site go to:

[www.derm.qld.gov.au/wildlife-ecosystems/wildlife/living\\_with\\_wildlife/flyingfoxes/seq-roost-locations.html](http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/living_with_wildlife/flyingfoxes/seq-roost-locations.html)

#### **Cascade Gardens**

Gold Coast Highway, Broadbeach

#### **Woodend Nature Centre**

35 Williams Street, Coalfalls  
[www.discover-our-ipswich.com/woodendnaturecentre.html](http://www.discover-our-ipswich.com/woodendnaturecentre.html)

#### **Black Swamp Wetland**

Access via Queen Street, Cleveland  
[www.more2redlands.com.au/Explore/Leisure\\_Attractions/Nature%20-%20Wildlife/Mainland/Pages/Black%20Swamp%20Wetlands.aspx](http://www.more2redlands.com.au/Explore/Leisure_Attractions/Nature%20-%20Wildlife/Mainland/Pages/Black%20Swamp%20Wetlands.aspx)

#### **Tooan Tooan Creek**

Cnr Taylor Street and The Esplanade, Hervey Bay

#### **Batty Boat Cruise (Brisbane River)**

[www.wildlife.org.au/news/2011/batty.html](http://www.wildlife.org.au/news/2011/batty.html)  
P: 07 3221 0194  
Although this Batty Boat Cruise is an evening activity with a per person cost, it is recommended for teachers who may like to broaden their knowledge about flying-foxes.

[www.allaboutbats.org.au](http://www.allaboutbats.org.au)

