Teaching About Flying Foxes and Microbats: Arts

About this teaching resource:

The following are teacher resources that align with Year 8 to Year 10 Australian Curriculum Arts. This is one of ten educational resources that provide detailed, teacher-friendly discipline content knowledge and pedagogical content knowledge for all discipline areas (Maths, English, Science, Humanities and the Social Sciences). The goal of these resources is to help teachers, who are already competent, experienced and skilled in teaching, develop the knowledge and confidence to increase awareness and build capacity of communities to understand and effectively live with local Microbats and Flying Foxes (FF), including the nationally vulnerable
Grey-Headed Flying Fox (GHFF).

The teaching resources all offer student-centred, constructivist-based teaching suggestions and have been developed by teachers and overseen by a University academic who specialises in the teaching and learning of Science. Even though school-based education is identified as a key factor in building community capacity, there are few online educational resources promoting the teaching and learning of bats. Those that are available, rarely link to all discipline areas within the Australian Curriculum. Bats Qld believes that any formal education teaching resources must be directly linked to the National Australian Curriculum. This resource provides teacher and student friendly lesson suggestions and resources that directly link to the Australian Curriculum. This teaching resource mobilises expertise and knowledge of Flying Foxes and Microbats in relation to the latest Scientific and Statistical information and Health and Safety information. It improves awareness and understanding of the changing migratory paths of bats and offers support to Scientists' belief that Australian forests will only survive Climate Change with the help of Flying Foxes.

Because of their importance in Australia's ecosystems, and general misunderstandings within the populous, it is imperative that people are informed and well educated around Flying Foxes, so they can support the aim of finding the balance between reducing conflict associated with Flying Foxes roosting in urban areas, and the conservation and the conservation and welfare of these important native species.

The purpose and structure of this teaching resource

Education plays a significant and unique role in constructing public understanding and opinion about Bats, as well as informing policy. Therefore, we developed this teaching resource to support educators who would like to introduce 'Bats' (Flying Foxes and Microbats) to their students while teaching required aspects of the Australian Curriculum. Our goal is to assist you with teaching suggestions: linked to the Australian Curriculum; that provide background Scientific information; that offer activity specific teaching resources; and that present a vast array of web-links all relating to the teaching and learning of Bats.

As you will see in our *Notes for Teachers* (below), Flying Foxes are considered by scientists to be a keystone species (one of the most important species in an ecosystem), and yet in Australian culture, Flying Foxes are misunderstood and vilified. Therefore, we developed these educational resources to promote scientific, as well as Health & Safety knowledge about Bats, and we invite students to challenge erroneous social stereotypes promoted in Australian media and wider society.

This educational resource is structured in the following way:

- An overview of each activity and their links to the Australian Curriculum (our curricular links are not definitive, as you may identify other Content Descriptors these activities are transferable to);
- Scientifically-based background *Notes for Teachers* about Flying Foxes and Microbats;
- A detailed outline of each activity that includes resources and discussion points to guide learning;
- An extensive online resource list; and Attachments of the printable resources suggested for the activities.

This teaching resource was developed by Australian teachers, for Australian teachers, and so we *do* understand that it can be difficult introducing controversial concepts into classrooms. We celebrate your commitment to ecological sustainability, and we stand beside you in your decision to advocate and education for change, not only for these important and wonderful mammals, but for wider Australian Ecosystem. Even though these teaching suggestions present factual information, we believe it is essential for students to emotionally connect with bats in order for them to be open to learning and making a difference. The following video illustrate how cute and wonderful Flying Foxes and Microbats are! We hope you enjoy this resource.

https://www.youtube.com/watch?v=T84jdO8YrYA https://www.youtube.com/watch?v=Uuvaos1WHTk
https://www.youtube.com/watch?v=T84jdO8YrYA https://www.youtube.com/watch?v=aMuWgN2DVD4
https://www.youtube.com/watch?v=Io3yl0OhTSY https://www.youtube.com/watch?v=2GncgfPNNms

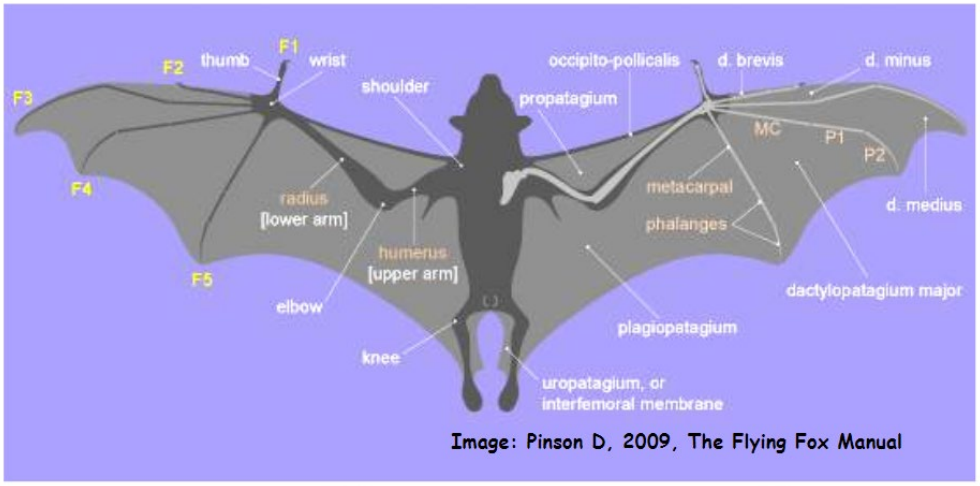
Project Leader and Head developer/writer: Dr. Alison Sammel. *Please reference Dr Alison Sammel when using this material*. Please direct questions to: a.sammel@griffith.edu.au

Dr. Sammel would like to thank the Gold Coast City Council (for the K-10 curriculum) and the Logan City Council (the 11 & 12 curriculum) for supporting this project and the creative teachers who collaborated on the following teaching suggestions for every subject of the Australian Curriculum from Foundation Year to Year 10 and for selected subjects within the Year 11 and 12 curriculum. Thank you Merima Celahmetovic, Cherise Davis, Bonnie Gibson, Tara Hart and Carolyn Keepa.

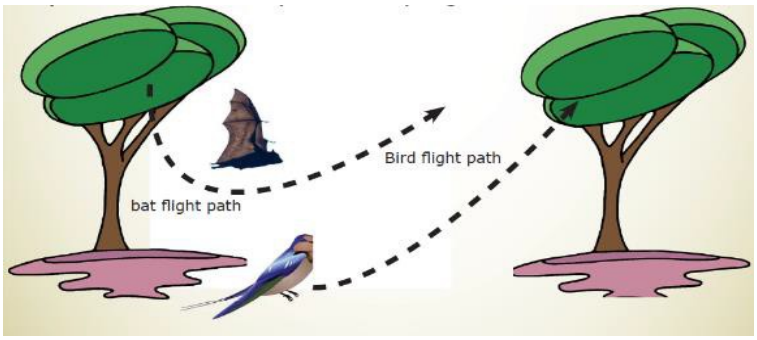
Notes for Teachers about Flying Foxes and Microbats

For far too long, bats have instilled fear and inspired bad omens in many cultures around the world. Vilified in the media, these deeply misunderstood and misrepresented creatures are incredibly unique animals that play a vital role in Australia's ecosystem. In a world where attitudes towards sustainability are continuously changing and evolving, it is vital that students of today move away from misinformed historical stereotypes in order to develop a strong understanding and appreciation for this amazing creature, the only mammal capable of sustained flight.

There are over 1000 different species of bats worldwide. Bats are classified into two major groups: Flying Foxes and Microbats. Both share many similarities with humans: they have a similar skeletal structure (they have elongated fingers, not wings that they fly with), are warm-blooded, give birth and suckle their young, are devoted and caring mothers and even leave their children (called pups) at 'childcare' as they go in search of food! Most species can only give birth to one pup per year. Infants are carried everywhere by their mothers and suckled for up to five months.

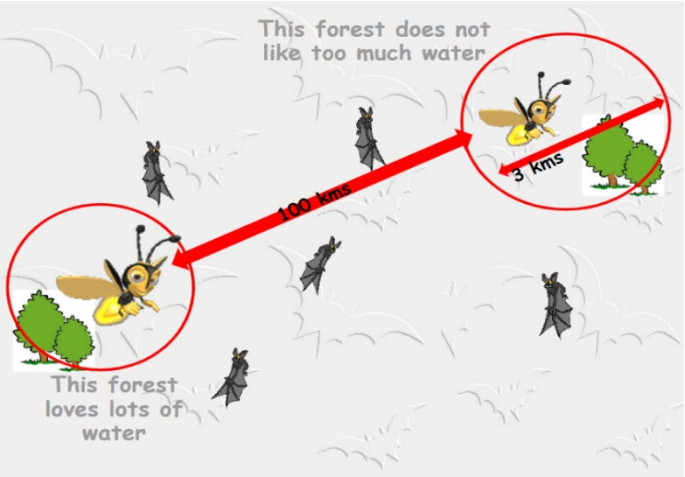


Bats are not aggressive animals. Bats do not 'swoop' or 'attack'. If spooked, a bat will fly away but because they have hands and fingers rather than wings, they must drop or fall in order to catch the wind that will provide them with the lift necessary to sustain their flight.

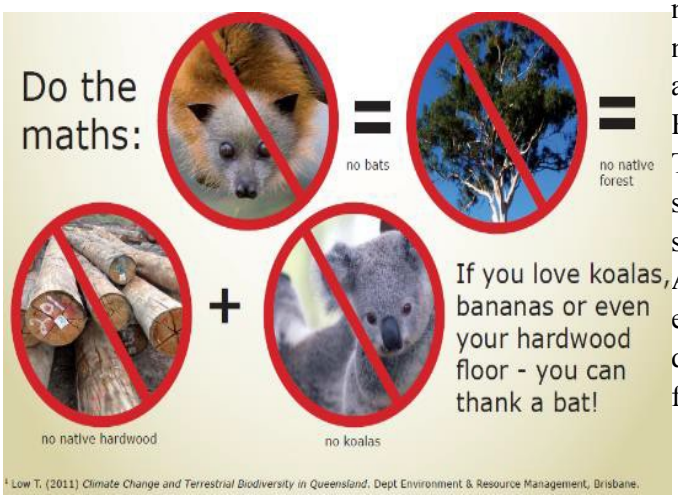


Flying Foxes or Megabats, are the largest sized bats (they also used to be known as Fruit Bats, but Flying Fox is the term that is used today). A Flying Fox has extremely good eyesight (the same as ours during the day and 25% better at night) and hearing and use these, and their strong sense of smell, to navigate the world. They are not blind and do not use echolocation. Flying Foxes are a keystone species in Australia meaning they are one of the most vital animals in our ecosystem. Flying Foxes play a key role in ensuring we have healthy coastal forests. Australian native trees reproduce by releasing and accepting pollen for fertilisation. After a flower on a tree is fertilised via pollination, the new genetic materials combine to produce seeds that then need to be distributed to other locations, away from the parent trees. Flying Foxes play an essential role in these processes. The study of science reveals that Flying Foxes and our native forests work together in an amazing and unique way that enhances the process of forest reproduction. Our native trees only release their flowers' pollen at night, specifically for the Flying Foxes to pick up. Flying Foxes have the exact soft belly fur needed to collect and carry as much pollen as possible while they fly from flower to flower. As the Flying Foxes move from flower to flower, drinking nectar, they pass along the pollen they collect on their bellies. This process fertilises the plant's flowers. Bees also do this role: however, as pollination occurs at night, Flying Foxes are more effective.

Furthermore, bees can only travel up to three kilometres and so cannot introduce new genetic material from other forest locations. The Flying Fox can travel over 100 kilometres per night and can fly from one forest to another, introducing new genetic material that will strengthen the resilience of the new generation of forests. Indeed, it is predicted that Australia's forests will only survive climate change due to Flying Foxes introducing new genetic material to the next generation of trees. For example, one forest might not like much water, and a bee will keep that gene pool the same, but a Flying Fox might fly from a forest that likes lots of water, 100 kilometres away, and introduce this new gene to the area. In doing so, the new generation of trees in that forest will be resilient to both drought or flood conditions.



Not only do Flying Foxes pollinate our native forests, they also eat the seeds from the fruit and disperse them to new areas so that the young trees can grow. Other animals do this, but a Flying Fox can digest the seed in a way that does not harm the seed, and when it is excreted, it can grow into a new plant. The process of chewing and digestion in other animals can ruin the seed, making it unviable for growth. A Flying Fox can distribute up to 3000 seeds in a single night! Their role as a keystone species means that Australian tree species, all Australian mammals such as koalas who seek shelter and food in these trees, Australian fruit trees and the Australian hardwood industry are all reliant upon the existence of the Flying Fox. In this way, humans are also dependent on Flying Foxes via the forests they sustain, as the forests supply us with oxygen, food and resources.



The second category of bat in Australia is the Microbat. This small bat plays an equally important role in the Australian ecosystem. Unlike the Flying Fox, the Microbat has extremely bad eyesight and relies on echolocation for travel and food. Microbats are insectivorous and can catch up to 500 insects per hour. The Microbats' incredible ability to consume large numbers of insects such as mosquitos and fruit flies means that life would be far less tolerable for both humans and plant species without them. It is interesting to know that Microbat boxes are being installed by universities, schools, farmers and the general public to reduce the use of pesticides within the environment and eradicate mosquito related diseases such as ross-river fever.

Considering the key role both Flying Foxes and Microbats play in Australia's ecosystem, it is unfortunate that the biggest threats to the species are habitat loss and ignorance and misinformation leading to poor human perception. People usually hold the misconception that bats carry lots of diseases. This is untrue. Science shows that there is only ONE disease that a human can catch from a bat: the Australian Bat Lyssavirus (ABLV). It is a form of rabies, but it is really, really rare. There have only been three reported cases in Australia. ABLV is very rare in the bat community, and most bats that contract this disease leave the colony and die within a few days. A person would have to be bitten by a bat within a small window of time (within those few days) to become infected. Therefore, the World Health Organisation considers it one of the rarest diseases on the planet! Contact with bat excrement, bat-eaten fruit, or having a bat fly above you will NOT transmit this disease. However, if bitten or scratched by ANY bat, all Australian government departments and bat groups strongly recommend people go to the hospital where they will receive a series of three post-bite injections (free of charge) that will ensure they do not get ABLV. There is no reason why any person should contract or die of ABLV as injections are available in Australia to stop this disease. If you do catch ABLV and do not receive the injections, you WILL die. It is important that students learn that if bitten or scratched by ANY animal, they must tell an adult, and if it is a bat, they should get the injections from the hospital.

It would be interesting to look at the Australian Bureau of Statistics to see the statistics associated with animal related deaths. This investigation would highlight that horses, cows, dogs and cats are dramatically more likely to cause human deaths than bats are. However, the most important message that students need to learn is: never touch a sick or injured bat, tell an adult if you get bitten or scratched by a bat and if you find a bat, it is best to notify your local bat (or animal) rescue and conservation organisation

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This summary was written by Dr. Alison Sammel. If you have any questions, please email a.sammel@griffith.edu.au

Australian Curriculum (The Arts: Dance): Year F – 2 Band

Dance Content:

Explore, improvise and organise ideas to make dance sequences using the elements of dance (ACADAM001)

Present dance that communicates ideas to an audience, including dance used by cultural groups in the community (ACADAM003)

Dance Knowledge and Skills*:
[*The following could be addressed, or some could be omitted. Any of the Fundamental Movement Skills (see Knowledge and Skills section on Australian Curriculum website) could also be addressed if desired.

Space
- level – for example, moving through low (ground), medium (standing) and high (head height) levels
- directions – for example, forwards, backwards, sideways
- shapes – for example, angular, twisted, curved, straight, closed circular

Time
- tempo – for example, fast/slow, slowing down, speeding up, moving versus freezing

Dynamics
- gaining control over own energy levels
- moving to illustrate different environments – for example, melting ice, windy weather
- using different dynamics – for example, heavy/light, sharp/soft movements
- movement qualities – melting, jerky, percussive

Relationships
- groupings – for example, dancing as an individual within a group

Choreographic devices
- selecting meaningful movements
- combining movements

Teaching suggestions and links to curriculum:

Introduce students to the chosen dance knowledge and skills, discussing these and showing or demonstrating examples. This video by the Bangarra Dance Theatre (a contemporary Indigenous Australian dance company) may be viewed and analysed. This dance is about a moth with the dancers imitating its movements and actions. Discuss how these movements make use of elements of dance such as space, movement and dynamics and how this suit what the dancers are trying to communicate. As an optional introductory activ elements of dance in a 'guess who I am' type of game. (Have students think of an animal and then act out its movements while their classmates try to guess what the animal is.)

Teaching Option 1: Microbats

As a class, read the story, *Lucy the Little Brown Bat* which can be found on the savelucythebat.org website along with the following summary:

This is a story about a young Little Brown Bat named Lucy who is growing up in the face of White Nose Syndrome, a devastating fungal disease that is affecting North America's hibernating bat species. The story follows the first months of Lucy's life from birth through hibernation and describes the skills and talents she will need to survive, including flight and echolocation.

Lucy's story is a companion to the Save Lucy Campaign.

Please note and discuss with your students that the Microbats in Australia do not suffer from the White Nose Syndrome; this is only in North America (see Teaching Option 2 for an Australian alternative). As you read this short story as a class, discuss the different things Lucy the bat does. For example, when she is born, she slept a lot. Later she learned to fly and hunt for fruit and insects. Note that there are two kinds of bats, Flying Foxes and Microbats. In this case, 'Lucy' is a Microbat. Discuss these two types with students to help them understand the difference (see teacher's notes above).

Teaching Option 2: Flying Foxes

Read students the story, *Bangu the Flying Fox,* an indigenous Australian tale about how the flying fox came to be a nocturnal creature. Show students a YouTube video of a puppet show version of this story, or read the picture book to the class (see below).

Youtube video found at
https://www.youtube.com/watch?v=8WPdKdwjhFc

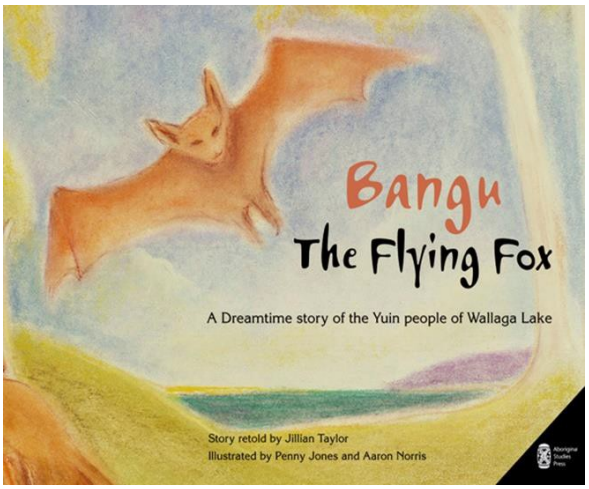


Image retrieved from https://www.newsouthbooks.com.au/books/bangu-the- flying-fox_a-dreamtime-story-of-the-yuin-people-of- wallaga-lake/

Discuss with students some of the things Bangu the Flying Fox does, for example, flying in the race. Also ensure they understand the difference between fictional and non-fictional details. For example, all animals, including Flying Foxes, do not speak English while sitting around a campfire like people, but they do communicate to each other in some way. Bats are very social animals and

the sounds you hear from a Flying Fox or a Microbat are their way of communicating to each other. Bats are also very loyal to their group, and this point can be discussed in relation to the idea in the story about being faithful to one's friends (Bangu the Flying Fox keeps 'changing sides' and so loses friends).

Continued Teaching Sequence for Both Options:

After using one of the above options, play some music and have students practise moving their bodies in ways that represent a Microbat's (or Flying Fox's) movements. Allegro by Mozart may be useful for this as it contains good variety of dynamics. Alternatively, this Minuet could also be used although it has much longer periods of loud and soft dynamics.

Students may first listen to a few minutes of the music before discussing what part of Lucy's or Bangu's story would best suit this (consider tempo and dynamics). Then have the students practise moving to this music imitating a Microbat (or Flying Fox). Consider the use of space, body shapes, dynamics and tempo in these movements (or whatever knowledge and skills you wish to focus on; see examples below).

Cute Microbat: Image credits Australian Bat Clinic

Choose about three or four parts from the chosen story and have small groups of students create some dance movements that would communicate these. You could first do some together as a class. For example, by moving through space from high to low, the students can imitate how a Flying Fox flies down and away from a tree (see teacher's notes above), or how Microbats zoom through the air around street lights, zig-zagging to hunt and catch insects. Then revise and have students share their creations and their representation of Microbats (or Flying Foxes) through the medium of dance. After each performance to the class, ask students to respond to what they saw in the dance, relating this back to something the dancers learned about Microbats or Flying Foxes through the chosen story. Further information about bats that may assist selection of dance movements can be found on the Australian Bat Society website. Examples of such information that could be related to the chosen dance knowledge and skills are given below. The essential role Flying Foxes and Microbats play within the ecosystem as well as what students should do if they find a bat could also be explored. Information sheets available on the Australian Bat Society website could also be read and discussed as further stimulus (see http://ausbats.org.au/about-bats/4551313477).

Movement Suggestions:

Space

- level and directions – move your body quickly from high to low, and then slowly back up (while moving forwards) when representing a Flying Fox 'taking off' (they do this by dropping out of a tree and catching the wind under their arms)
- shapes – fold your arms to represent a Flying Fox or Microbat's position when asleep, and spread your arms out when flying

Image retrieved from http://www.dreamstime.com/stock-images-happy-little-children-dancing-joyful-party-image28165304

Time

- tempo – move fast and changing direction when representing a Microbat hunting for insects, slowly when representing a Flying Fox finding fruit on a plant, and still when sleeping or resting in a tree (interesting details about Microbats' movements when catching food can be found on the Batworld website)

Dynamics

- gaining control over own energy levels (when using dance movements as suggested above)
- moving to illustrate different environments – for example, a Flying Fox or Microbat flying in windy weather
- using different dynamics – for example, heavy/light, sharp/soft movements (according to the dance movements suggested above)
- movement qualities (for example, jerky movements if representing Flying Foxes under stress from landscape changes and habitat loss)

Relationships

- groupings – for example, dancing as an individual within a group (moving as a group to represent a colony of Flying Foxes or Microbats flying or resting in a cave)

Choreographic devices

- selecting and combining meaningful movements that represent different actions of and information about bats

Australian Curriculum (The Arts: Drama): Year 3 – 4 Band

Drama Content:

Explore ideas and narrative structures through roles and situations and use empathy in their own improvisations and devised drama (ACADRM031)

Use voice, body, movement and language to sustain role and relationships and create dramatic action with a sense of time and place (ACADRM032)

Drama Knowledge and Skills*:
[*Almost any drama knowledge and skills could be chosen and the focus of learning and teaching adapted accordingly. The knowledge and skills below are given as an example.]

Role, character and relationships

- Role - adopting a role and maintaining focus in role; character; communicating role traits; relationships; developing relationships between characters in a drama, for example, using dialogue to show relationships

Voice and movement

- Movement – using movement and gesture to create belief in character and situation

Space and time

- Establishing a clear setting and sense of time to create belief in the drama

Teaching suggestions and links to curriculum:

Prepare students for the drama learning experience by first revising known elements of drama, for example, role and character, voice and movement, and space and time. Discuss how these are used to create and communicate ideas through story. After preparing students for process drama,

step in to role of someone who has just received an interesting letter from a friend (details can be adapted, for example, a fictional or real location may be used; the role may be one of a child the same age as the students). Read the letter to the class to begin the drama. A sense of 'What should we do?' should be generated (see below for an example letter or adapt or compose a similar one).

Dear [name],

How have you been enjoying your holidays? Has the warmer weather been pleasant? I know you always hated getting so cold and were looking forward to going swimming at the beach. What is it like being so far away from home?

You might be surprised to hear about the adventures we have been having back at home! Do you remember the lovely trees we have out the back of our house? They grow on the empty patch of land behind our street. Well, did you know that we actually have some little bats living there? A few nights ago, I was wondering about the giant moths that seemed to be flying through the air, but last night, I saw one closer up and was surprised to discover that it was a type of bat! They were really sort of cute zooming around the place. I wonder what they were doing. Do you know much about bats? What are they doing when they are flying around at night? Some people say that we should be careful because bats carry diseases that we could catch. Is this true? The other thing is that there are people who want to build some houses on the patch of land where we see the bats. If they build houses there, what will happen to these little bats? Can you help me figure this out? What do you think?

I hope the rest of your holiday is enjoyable and that you are seeing and learning lots of interesting things. Write and tell me about it.

Your friend, [name]

As a class, in groups or individually, have students read about Flying Foxes and Microbats in general, but also to find out what specific species of bat might be found in their local area. Some excellent websites with information on bat species include:

Wildcare Australia
(http://wildcare.org.au/species-information/bats)

Australian Museum
(http://australianmuseum.net.au/bats-of-queensland)


Cute Microbat: Image credits Australian Bat

Discuss with students the two types of bats (Flying Foxes and Microbats) and ask them which type they think the bat colony described in the letter is (the type of bat mentioned in the letter is the Microbat which is much smaller than the Flying Fox). Have students read about Microbats and find out answers to questions such as:

- 'What are they doing at night when they fly around?' (Microbats eat hundreds of insects such as mosquitoes per hour, hunting for them around the lights to which the insects are drawn.)
- 'What is their role in the ecosystem?' (Microbats play the role of natural pest control as they can eat hundreds of insects an hour and this helps keeps mosquito-carried diseases at bay.)
- What would happened if there were no Microbats in the area?' (Insect populations would increase and hence, mosquito-carried diseases increase.)

- ‘Do lights affect Microbats’ ability to fly or hunt?’ (Microbats have poor eyesight, so the lights do not impact them, but the lights attract the insects which the Microbats find and eat.)
- ‘Do Microbats carry diseases that humans can get?’ (There is only one disease that a human can catch from a Microbat; it is the ABLV. Please see the information above in the information section for teachers and discuss these important ideas with your students.)

Further sources of information include the following websites:

Australian Bat Society (http://ausbats.org.au/bat-fact-packs/4562894228) (here you can find colourful, multimodal short and interesting articles; they could be printed, laminated and passed around from group to group)

Australian Museum (http://australianmuseum.net.au/bats-of-queensland) Bats

Queensland (http://www.batsqld.org.au/)

Ask students to identify and provide information about the kind of bats mentioned in the letter. Have students either write letters to the fictional friend or ‘skype’ (hot seat) the friend (teacher in role as the friend who wrote the letter and is concerned or interested in the Microbats). Have the students ask for details about the Microbats seen and described by the friend. As the teacher in role, answer students’ questions, but also respond with questions such as, ‘Should we scare the Microbats away?’ or ‘I saw a sick Microbat on the ground yesterday. What should I do?’ Students will love this interaction and be quite motivated to engage; they seem to really enjoy providing the requested information and ‘teaching’ the teacher their new-found knowledge.

Before or after each of these process drama sessions, discuss the role of each person and how they might use movement (for example, gestures and body language) to communicate. Also reflect on students’ use of dialogue when in role. (Students may keep a drama journal for this purpose.) To complete the drama, students can hold a ‘meeting’ where they discuss and decide how they are going to live safely with Microbats. Although this may resolve the story/drama, also refer to the local species of Microbat or Flying Fox and discuss practical ways the students themselves can live safely with them (for example, never touch these animals and always tell an adult if scratched or bitten; they do not generally carry diseases, but there is one virus, the Australian Bat Lisavirus, which is deadly if not properly treated).

Australian Curriculum (The Arts: Drama): Year 7 – 8 Band

Drama Content*:
[Almost any Year 7 – 8 drama content descriptors could be addressed; if others are selected, adjust the learning sequence accordingly. The content descriptors below are a suggestion.]

Combine the elements of drama in devised and scripted drama to explore and develop issues, ideas and themes (ACADRM040)

Develop roles and characters consistent with situation, dramatic forms and performance styles to convey status, relationships and intentions (ACADRM041)

Perform devised and scripted drama maintaining commitment to role (ACADRM044)

Drama Knowledge and Skills*:
[*Almost any element of drama could be chosen, and the focus of learning and teaching adapted accordingly.

The knowledge and skills below are one example.]

Role, character and relationships

- Role and character - for example, maintaining commitment to role; exploring motivations and various facets of multidimensional characters; developing and analysing multidimensional relationships in the drama

Voice and movement

- Tension - for example, using foreshadowing and information withholding to create suspense and emphasis

Language, ideas and dramatic action

- For example, manipulating central ideas or themes to give perspectives and ideas to the audience

Teaching suggestions and links to curriculum:

The idea of this learning sequence is to teach students about elements of drama through the writing of an original play or drama. Students will explore and then present information about Flying Foxes and Microbats by creating different characters who have different experiences with their animals. To begin, have students brainstorm any experience they can think of that has involved bats. (Please note that there are two different types of bats: Flying Foxes and Microbats; see teacher's notes above. You could choose to focus on just one of these or both.) For example, students may have once read a newspaper article about a disease carried by Flying Foxes, read a pamphlet from a wildlife centre about what Microbats eat, or read a fictional story such as 'Batman'. The information students brainstorm at this first stage of the learning sequence will be used to create characters for their drama. For example, the students may create a character who is an elderly woman frightened of a colony of bats living nearby her residence. Another character might be a teenage boy whose knowledge about bats is limited to the 'Batman' image and design on his pencil case, lunchbox and school bag. Once students have designed these characters, have them consider how they would present them to an audience. For example, the elderly woman who is frightened of bats may be a generally joyful and pleasant person but adopts a terrified facial expression and cowering body posture when she sees the colony of Flying Foxes. Alternatively, the young boy who is passionate about 'Batman' might be ignorant and enthusiastic and use body language that communicates a relaxed attitude.

In the next part of the learning sequence, have students complete some research about bats (they may do this individually or in small groups). Some excellent sources of information include the following:

- Wildcare Australia (http://wildcare.org.au/species-information/bats/)
- Australasian Bat Society (http://ausbats.org.au/)
- Australian Museum (http://australianmuseum.net.au/bats-of-queensland)
- Management and Restoration of Flying Fox Camps (https://www.environment.nsw.gov.au/resources/animals/flying-fox-2014-subs/flyingfoxsub-jenny- beatson-part3.pdf)

Image retrieved from http://www.sunshinecoastdaily.com.au/news/levy-used-to-target-noisy-bats-under-fire/2677266/.

- Bat Conservation and Rescue QLD, Inc. (http://www.bats.org.au/)
- Bat Zone - Cranbrook Institute of Science (http://science.cranbrook.edu/explore- institute/bat-zone)

Once students have found some accurate information about Flying Foxes and/or Microbats, they can create some additional characters that will be used in the drama. For example, one character could be a middle-aged person who is grateful for the way Microbats control the insect population around his home (they do this by catching and eating large numbers of insects such as mosquitoes and fruit flies: up to 500 insects per hour.) Another example may be a young child who knows that while Flying Foxes and Microbats do not generally carry diseases, it is still very important not to touch them and to immediately see a doctor if scratched or bitten by one. (There is one virus that can be carried by bats, the Australian Bat Lyssavirus; this will kill a person although it is very rare and can be treated.) As before, students may then discuss and plan how they will apply the elements of drama to these characters in order to communicate their ideas to an audience. For example, they may consider the body language or dialogue the young child might have with a friend at school who mentions how much he would like to catch a Microbat for a pet (this is of course, NOT advisable!).

In addition to these activities, students may view videos such as this one by the Australian Bat Clinic and Wildlife Trauma Centre, and discuss the role of wildlife carers. They may then create a character based on this for their drama.

Once students have created a number of characters who have had different experiences with Flying Foxes and/or Microbats, they can begin compiling these into a drama, writing a script and recording other information relevant to the elements of drama involved in playwriting. The way they choose to have these characters interact with one another should reveal and communicate ideas and themes to the audience such as the importance of Flying Foxes and Microbats in our ecosystem and dispel any inaccurate ideas about these creatures (as discussed before and in the teacher's notes above).

http://australianmuseum.net.au/image/best-of-eureka- grey-headed-flying-fox-cool-down.

Australian Curriculum (The Arts: Media Art): Year 3-4 Band

Media Art Content:

Plan, create and present media artworks for specific purposes with awareness of responsible media practice (ACAMAM060)

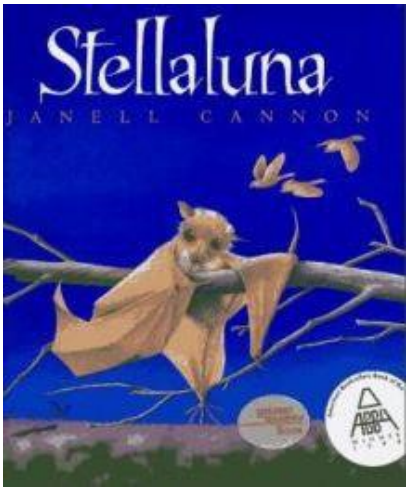
Media Art Knowledge and Skills:

Representation and Story Principles

- structure (using story structures and organising ideas to make clear meaning for an audience)
- settings (familiar, local and imagined environments and situations for characters)
  Time
- the order and duration of ideas and events
  Audience
- recognising the different interests of audience groups
- recognising how meaning is made for audiences

Teaching suggestions and links to curriculum:

Introduce students to the topic of Flying Foxes and Microbats by reading the book *Stellaluna* by Janell Cannon. Initially, ask students what they know about these animals, and then after reading the story, discuss anything new they may have learned. For example, Megabats (or 'Flying Foxes') use their eyes rather than echolocation at night (they are not blind), they live in colonies with other Flying Foxes, and they cannot stand up but only hang by their feet or thumbs (see the Wildcare Australia website for more information). To ensure accurate understanding, also ask students whether there is anything in the story they think is not true. For example, bats and birds do not talk like people (although they do communicate through smell and by making sounds): a mother bird would never let a Flying Fox live with her young; and baby birds would never try hanging out of their nest.



Stellaluna by Janell Cannon; see an informative critique by Friel Babbley

In the story *Stellaluna,* the Flying Foxes do not like to eat insects and grubs, instead eating only fruit. Explore the two main types of bats in Australia, Megabats (Flying Foxes) and Microbats, and investigate their diets (while Flying Foxes eat pollen and nectar from native trees, Microbats eat a wide variety of insects and even some small fish and frogs). Based on this, discuss with students which type of bat they think *Stellaluna* is.

View this short YouTube video (by the Durrell Wildlife Conservation Trust) showing a Flying Fox eating fruit. Students may be surprised by the small size of the Flying Fox (compared with the diameter of the piece of banana it is eating), though Microbats are much smaller still. Like all skills, young Flying Foxes (called pups) start by trying small pieces of fruit and then work their way up to being able to hold a large piece with one foot while hanging from their other foot. Before they are adults, they need to master this skill of holding large pieces of fruit.

Explore some websites such as the following which contain some great information on Flying Foxes and Microbats, as well as different species, what they look like and where they live. For example, Flying Foxes use sense of smell and sight to navigate, not echolocation, and play an important role in pollinating Australian forests. Alternatively, Microbats do use echolocation; they have strong, sharp teeth for eating insects and are much smaller than Flying Foxes. Neither kind tends to carry diseases or is overpopulating Australia despite popular belief (see teacher's notes above).

- Wildcare Australia (http://wildcare.org.au/species-information/bats/)

  Australasian Bat Society (http://ausbats.org.au/)

- Australian Museum (http://australianmuseum.net.au/bats-of-queensland) Bat

  Conservation and Rescue QLD, Inc. (http://www.bats.org.au/)

- Bat Zone - Cranbrook Institute of Science (http://science.cranbrook.edu/explore-institute/bat-zone)

Based on what they have learned about Flying Foxes or Microbats, have students work in groups to write a short story that can be performed as a puppet show for the rest of the class. For example, the story might involve a small colony of Flying Foxes going out at night to find food. Encourage students to include specific details, such as the type of food they are looking for and how the find it (for example, Flying Foxes use sense of smell and sight, not echolocation). Also discuss elements of Media Art (see Steve Parish's work in this area: https://www.steveparish-natureconnect.com.au/nature-centre/15505/) and have students consider what ideas they are trying to portray to their audience (the class) through their selection and sequence of events and settings. For example, groups may be given time to plan their puppet show story, or a story could be jointly constructed as a class with individual groups then taking turns to perform it.

Have students make puppets of Flying Foxes or Microbats using simple materials such as paper bags. Examples of how to do this can be found on this website, while this template may also be useful (please note, some aspects of these may not be accurate; for example, while Microbats do have strong sharp teeth for eating insects, neither Flying Foxes nor Microbats have 'fangs'). There are a variety of different species of bats in Queensland; the Australian Museum website provides a good summary with photographs of different species which may be helpful when designing the Flying Fox and Microbat puppets. Once students have completed these, they may perform their puppet show. Discuss elements of media art such as the sequence of the story they are presenting, and have students comment on each group's presentation.

Image credits: Bats QLD

Australian Curriculum (The Arts: Media Art): Year 7 – 8 Band

Media Art Content:

Experiment with the organisation of ideas to structure stories through media conventions and genres to create points of view in images, sounds and text (ACAMAM066)

Analyse how technical and symbolic elements are used in media artworks to create representations influenced by story, genre, values and points of view of particular audiences (ACAMAR071)

Media Art Knowledge and Skills:

Representation and story principles
- intent (imagining and communicating representations within a local context or popular culture for a specific purpose)
- points of view (perceiving and constructing stories and ideas from different perspectives)

Audience
- examining the ways in which audiences make meaning and how particular audiences engage, interact and share different media artworks

Institutions: individuals, communities and organisations
- the local and cultural contexts shaping purpose and processes to produce media artworks
- the role and ethical behaviour of individuals, communities and organisations making, using and sharing media artworks, and the associated regulatory issues

Teaching suggestions and links to curriculum:

Begin by discussing how something can be portrayed from two different opposite points of view and that people who create media make specific choices about what elements of media to use in order to convey their point of view. Have students view a short video (such as the news report below) which portrays Flying Foxes as pests. Revise some elements of media, such as audience and purpose, use of images and sound. Re-watch the video and discuss how these are used to communicate a point of view, or even just to subtly portray underlying ideas and assumptions about Flying Foxes. Have students brainstorm some of these assumptions. Ask questions such as, 'How do these people consider Flying Foxes fitting into the environment?' and, most importantly, 'Why do you think that? (How is this being communicated through the media?)'. Many of the points raised in this kind of media perspective are not based around the latest science. Have students write down some of the statements or assumptions that are made and investigate whether these points are actually accurate or not. Websites for bat groups should have evidenced-based information. You can also go to your state government website and search for information around Flying Foxes and Microbats. For example, there is some great information at: Department of Environment and Heritage Protection, Australian Bat Society.

Here students can find that there are probably far less Flying Foxes overall than what people imagine since these animals tend to be concentrated around areas with trees where people live (due to reduction of forests). Also, the smell of a Flying Fox colony is not a 'dirty' smell, but only the Flying Foxes' way of communicating with one another. People can live quite safely with Flying Foxes by doing simple things such as bringing washing in overnight, netting fruit trees and avoiding disturbing a colony as this will tend to result in the Flying Foxes creating more noise due to becoming stressed and frightened. Furthermore, there are measures that legally may be taken if large numbers of Flying Foxes really are causing damage or threatening the community, so people such as farmers

need not fear the presence of these colonies.

Similarly, watch other short videos such as the pest removal advertisement (below) and the short informative video about Flying Foxes (from the Cranbrook Institute of Science website). Have students compare these videos, considering their purpose and intended audience, and the various elements of media used to communicate their points of view.

- News report on bats as pests in America
- Advertisement for device to repel pests such as bats
- Interview with Organisation for Bat Conservation

Have small groups of students conduct some research on Flying Foxes and Microbats (including the endangered species in Australia) using books, pamphlets from wildlife centres, and websites and documents such as the following:

- Cranbrook Institute of Science
- Wildcare Australia
- Australian Bat Society
- Australian Museum
- Management and Restoration of Flying Fox Camps

Different groups of students can research different aspects such as species, habitats or environmental factors. Have students each take notes so that they can share these with the class. Based on this research, groups of students can use a storyboard to plan an interview, documentary or advertisement designed to target a specific audience (for example, fellow students, parents, community members or people concerned about living with bats) and portray a specific point of view. Discuss what elements of media would be most effective for this (for example, whether to use music, what images to show and what kind of language to use). Groups of students could then go on to create their media project. Depending on the intended audience and purpose, these media artworks could be sharing with other members of the school or wider community. Alternatively, some groups could design media artworks that demonstrate how inaccurate information about Flying Foxes and Microbats can be portrayed.

Image retrieved from http://science.cranbrook.edu/explore-institute/bat- zone.

Australian Curriculum (The Arts: Music): Year 5-6 Band

Music Content:

- Explore dynamics and expression, using aural skills to identify and perform rhythm and pitch patterns (ACAMUM088)

- Rehearse and perform music including music they have composed by improvising, sourcing and arranging ideas and making decisions to engage an audience (ACAMUM090)

Music Knowledge and Skills:

Elements of Music (Rhythm)
- simple metres and time signatures, bars and bar lines
- semibreve, minim, crotchet, crotchet rest, quaver and associated rests, semiquaver

Elements of Music (Dynamics and expression)
- smoothly (legato), detached (staccato), accent

Skills (Including Aural Skills)
- singing and playing independent parts against contrasting parts
- using available technology and digital media as a tool for music learning
- holding and playing instruments and using their voices safely and correctly
- listening to others controlling volume and tone in ensemble activities

Teaching suggestions and links to curriculum:

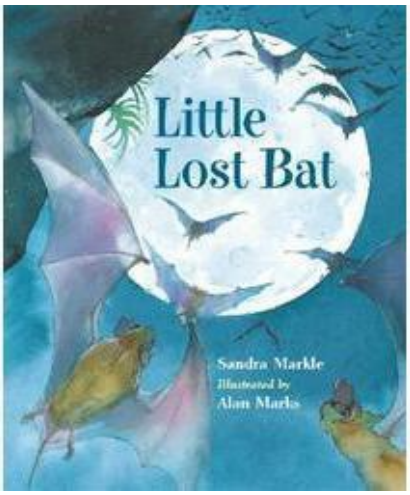


Image retrieved from http://www.scholastic.com/teachers/book/little-lost-bat#cart/cleanup

Teaching Option 1: Mexican Free-Tailed Bat

As a class, read the story *Little Lost Bat* by Sandra Markle (see a video of this book being read here). Although this is a story about a Megabat found in the Americas rather than in Australia, this story provides some lovely information that helps students to appreciate this amazing kind of animal (if you would prefer to read an Australian story, *Bangu the Flying Fox* could be used instead). As you read, discuss with students the different things that the juvenile Mexican Free-Tailed Bat does (some additional helpful information about this species can be found on the Desert Museum website). For example, he lives in a cave with a colony of other Mexican Free-Tailed Bats and he and his mother use a unique call, as well as smell, that enable them to recognise and find one another. The Mexican Free-Tailed Bat's predators include snakes and owls, and when the juvenile bat loses his mother, another mother bat from the colony 'adopts' him. (This part of the story is based on current research.)

Discuss what kind of music could be written to accompany, 'mirror' or 'represent' the story *Little Lost Bat*. Listen to a classical piece with good dynamics such as this Prelude by Mozart and analyse the pitch patterns. For example, this gentle piano music utilises both major and minor keys that develop a feeling of wonder and mystery, feelings that would suit various parts of the story such as when the young Mexican Free-Tailed Bat is born. This other piece is more dramatic and might suit the parts in the story when the mother goes hunting.

Teaching Option 2: Microbats in North America

As a class, read the story, Lucy the Little Brown Bat which can be found on the savelucythebat.org website along with the following summary:

This is a story about a young Little Brown Bat named Lucy who is growing up in the face of White Nose Syndrome, a devastating fungal disease that is affecting North America's hibernating bat species. The story follows the first months of Lucy's life from birth through hibernation and describes the skills and talents she will need to survive, including flight and echolocation. Lucy's story is a companion to the Save Lucy Campaign.

Please note and discuss with your students that the Microbats in Australia do not suffer from White Nose Syndrome; this is only in North America. As you read *Lucy the Little Brown Bat* as a class, discuss the different things Lucy the Microbat does. For example, when she is born, she sleeps a lot. Later she learns to fly and hunt for fruit and insects. Discuss what kind of music could be written to accompany, 'mirror' or 'represent' the story. Listen to a classical piece with good dynamics such as this Allegro by Mozart; analyse the dynamics and pitch patterns and think about what parts of the story they might represent. For example, the first few bars of detached, loud notes might suit the exciting introduction to the world when Lucy is born. This is followed by faster quavers and semiquavers and then a softer section where it could be imagined that Lucy is finding comfort in her mother as she is still only a juvenile Microbat.

Further sections of this piece could be matched to different activities Lucy learns to do, such as flying and hunting for food. Alternatively, 'Summer' from Vivaldi's Four Seasons could be used (especially the first two minutes). This piece begins quite slowly and could represent Lucy gradually growing and learning. This first section is followed by a much faster, louder part in a minor key which could be likened to the disaster of the White Nose Syndrome. Using the chosen piece, analyse elements of music such as dynamics, pitch and rhythm within context of the story.

Continued Teaching Sequence for Both Options:

Have students conduct some research into Flying Foxes and Microbats in Australia using books or any of the following websites:

- Wildcare Australia (http://wildcare.org.au/species-information/bats/)
- Australasian Bat Society (http://ausbats.org.au/)
- Australian Museum (http://australianmuseum.net.au/bats-of-queensland)
- Bat Conservation and Rescue QLD, Inc. (http://www.bats.org.au/)
- Bat Zone - Cranbrook Institute of Science (http://science.cranbrook.edu/explore-institute/bat-zone)
- Management and Restoration of Flying Fox Camps (This document produced by the NSW Office of Environment and Heritage contains some interesting information that may be suitable for more advanced students.)

Have students particularly look for some challenges facing Flying Foxes and Microbats in Australia (for example, deforestation or heat waves) as these will provide a context for the dramatic parts of the pieces they will compose. In groups, students may then begin to compose a short piece using classroom instruments such as xylophone and percussion. Students who play other instruments such as piano, guitar or violin could incorporate these. Have students first plan the dynamics, pitch and rhythms that their piece will contain, mapping these from the information they have researched about Flying Foxes and Microbats in Australia. For example, researchers have found that Long-eared Bats (a type of Flying Fox) avoid the areas of open, artificially-lit suburbs around Sydney, and that they need dark skies in order to hide from predators and not become disorientated (refer to articles on the Australasian Bat Society website).

Then have groups of students compose a short piece of music, choosing dynamics, pitches (minor/major keys) and rhythms that reflect and communicate what they have learned about Flying Foxes and/or Microbats. To complete the learning sequence, have students perform these compositions for the class.

This digital resource (ttp://www.classicsforkids.com/games/compose/compose.html) for composing music could be used in the learning sequence. It has two versions, simple and more advanced, although the programme is quite basic, and all students might not find this level of support necessary.

Australian Curriculum (The Arts: Music): Year 9-10 Band

Music Content Descriptors:

Improvise and arrange music, using aural recognition of texture, dynamics and expression to manipulate the elements of music to explore personal style in composition and performance (ACAMUM099)

Manipulate combinations of the elements of music in a range of styles, using technology and notation (ACAMUM100)

Music Knowledge and Skills:

Pitch

- melodies and chords based on major, minor and modal scales; tonal centres; modulation; consonance and dissonance; chromaticism; pitch devises including riff, ostinato and pedal note

Dynamics and expression

- dynamic gradations; expressive devices and articulations relevant to style such as rubato, ornamentation, terraced dynamics, pitch bending, vibrato, oscillation, filters and pedals

Teaching suggestions and links to curriculum:

Introduce the students to some pieces of music and discuss what dynamics can be heard. Examples include the famous Pachelbel's Canon in D, Vivaldi's Four Seasons or a fuge by Bach. The style of each of these pieces includes an element of repetition. That is, they are carefully composed of a sequence of variations of the same theme, or they involve a second part repeating the first, or they include short sections of *forte* (loud) followed by a quieter 'echo' of the same theme. Discuss this style and the
effect it produces. Is it enjoyable to listen to? Can they hear the separate parts? How do different dynamics and expressions play a role?

Introduce students to the two types of bats, Flying Foxes and Microbats, and discuss how these are very different (see teacher's notes above). Microbats use echolocation while Flying Foxes do not (they rely on eyesight and sense of smell to navigate; however, also note that Microbats make use of these senses as well).

Image retrieved from
http://www.bats.org.uk/pages/echolocation.html

Have students explore some details around echolocation. This UK website has information explaining how, although Microbats can see almost as well as humans, they use echolocation to find their way around and to hunt for insects in the dark. (Note that this website may use the general term 'bat'; please discuss the difference between Flying Foxes and Microbats with your students.) The Microbats send out a very high-pitched sound and then listen to the echo that is sent back to them when these sound waves bounce off an object such as a tree or an insect. These creatures can hear sounds of up to 110 kHz (110,000 Hz) in pitch. Humans can generally hear up to between 15 and 20 kHz (15,000 – 20,000 Hz) while Concert A has a pitch of just 440 Hz.

Have students design a basic environment that a Microbat might be flying in. They could sketch or outline this on a piece of blank paper. For example, it might include several trees, some insects, a cave (although Microbats do not always live in caves!) and some work in pairs or individually to write a short piece of music that follows the form of a simple melody played in *forte* or *fortissimo*, followed by an echo of the same theme played much quieter (for example, at *piano* or *pianissimo*). These short melodies (only a few bars in length) should be composed to reflect or communicate each object in the sketch of the Microbat's environment. For example, the piece might begin with several bars of light, quick notes in a major key, first played loudly, then repeated quietly, thus representing the insects in the Microbat's habitat.

These bars might then be followed by several bars of broader notes in a minor key which might better suit the idea of a cave, once again, followed by a repetition of the same notes in a quieter dynamic; discuss how this effect is characteristic of Baroque music. Examples could first be composed as a class before students try composing music themselves. They may use a program such as GarageBand to record their compositions or write these by hand on manuscript paper. Depending on the complexity of these compositions, students could perform them on class instruments such as percussion or xylophones, although the best effects may be produced by using a program such as GarageBand. Alternatively, if students are competent in an instrument such as violin or piano, they could choose to perform their composition on this.

Australian Curriculum (The Arts: Visual Art): Year F-2 Band

Visual Art Content:

Use and experiment with different materials, techniques, technologies and processes to make artworks (ACAVAM107)

Create and display artworks to communicate ideas to an audience (ACAVAM108)

Visual Art Knowledge and Skills:

Representation
- subject matter (personal observation and sensory expression)
- forms – drawing or painting (or other form of teacher's choice)
- visual conventions – using, identifying and interpreting colour, texture and tone

Practices
- skills – observational: seeing, noticing and viewing critically

Teaching suggestions and links to curriculum:

Introduce the chosen elements of Visual Art (as listed above) by having students view and respond to a variety of artworks of Flying Foxes and Microbats. Such artworks may be found on various websites and in different books; some examples are given below:

This artwork won a wildlife art contest in 2015. Discuss with students the artist's choice of elements, particularly colour. Ask students what they know about Flying Foxes and why they think the artist chose to depict the bat this way (for example, bats are 'scary' and 'mean'). Discuss how these ideas are not always accurate (for example, Flying Foxes play a very important role in controlling insect populations and pollinating various species of trees and plants).

This artwork is by an artist in America whose blog can be found here. She describes how she has painted these Microbats using water colours (note there are only Microbats in North America – not Flying Foxes). Discuss with students the choice of colour, including background (there is no background as the aim of this painting is to focus the viewer on the distinct physical features of a Microbat).

This artwork also won a competition (Centre for Bat Research, Outreach and Conservation). Discuss the interesting and effective use of colour. The background communicates a soft feel with the moon and setting sun. The choice of colours for the Microbat reflect a realistic look and the overall feeling of the artwork is not formidable, which is not surprising considering the context in which the artwork was published.

This artwork once again seems to communicate a dark and dreary feeling of chaos, perhaps something readily associated with bats in popular books and films. Discuss the artist's use of colour (just black, which contrasts with the empty background giving a stark look) and spacing (the Flying Foxes seem to be 'tumbling' down from the sky and the blank background draws all the viewer's

attention to their disorderly descent).

After viewing, analysing and responding to various artists' interpretations and representations of Flying Foxes and Microbats, have the students view some photographs. Steve Parish is Australia's leading wildlife photographer; be inspired by the beautiful photos he takes of these amazing creatures (https://www.steveparish-natureconnect.com.au/nature- centre/15505/).

A good selection of photos can also be found on websites such as the Australian Bat Society or Bat Conservation and Rescue. If possible, arrange for a wildlife carer to bring some Flying Foxes or Microbats to the school to show the students (there are various groups that will do this; for example, see http://www.geckoeswildlife.com.au/presentation-ideas.html). These presentations will also provide some great information and give students the opportunity to ask all kinds of questions about Flying Foxes and Microbats. Have your students look carefully at the animals and think about their body shape and colour, as they will be drawing these later.

Discuss the role of Flying Foxes and Microbats in the Australian ecosystem. For example, Flying Foxes are very important for pollinating various species of trees, Microbats are necessary for insect population control, and, contrary to popular belief, neither kind tend to carry diseases (see teacher's notes above). Have students reconsider their previous thoughts about Flying Foxes and Microbats after having the opportunity to learn about them and observe them. For example, some students might find that while they used to be afraid of bats, they are now thankful for the amazing work that Flying Foxes do in pollinating our Australian forests.

While these thoughts in mind, have students design and create an artwork of a Flying Fox or Microbat, depicting it as an important part of our ecosystem (rather than a 'dark', 'mysterious' character from stories). Discuss colour choices (refer to real photographs and select a species to study and draw) and spacing (draw realistic and pleasant background scenery). After students have completed their artworks, display them in the classroom with a caption explaining their use and choice of elements of Visual Art. To complete the learning sequence, have students share and discuss their work with an audience (their classmates).

Australian Curriculum (The Arts: Visual Art): Year 5-6 Band

Visual Art Content:

Develop and apply techniques and processes when making their artworks (ACAVAM115)

Plan the display of artworks to enhance their meaning for an audience (ACAVAM116)

Visual Art Knowledge and Skills:

Representation

- subject matter such as environment (macro/micro), physical and conceptual properties of materials and technologies
- styles (realism)
- forms – sketching and/or painting (or other form of teacher's choice)
- technique – drawing (according to teacher's choice)

Practices (these are taken from the 'Skills' subset of 'Practices')

- expressive – interpreting subject matter through various contexts and/or viewpoints to enhance understanding and create a personal response to stimuli
- conceptual – developing a thought or idea into a visual representation
- practical – using visual arts materials, equipment and instruments

Teaching suggestions and links to curriculum:

Introduce and discuss the Visual Art techniques and processes according to the knowledge and skills listed above (or others of your choice) by viewing some artworks of Flying Foxes and Microbats. While artworks may be difficult to find, photographs would also provide useful samples for discussing aspects of Visual Art such as colour, texture and subject matter. For example, information books and government and organisation websites contain some good, accurate pictures. Some examples of artworks include the following:

The first artwork (top left) won a wildlife art contest in 2015. Discuss with students the artist's choice of elements, particularly colour. The second artwork (top right) is of a Microbat; notice the different body shape.

Image retrieved from https://img1.etsystatic.com/103/0/6167700/il_214x170.847 054289_nnk1.jpg

Discuss the techniques evident in these and other similar artworks. Also ask students to think about the way the artist has tried to depict the Flying Fox or Microbat. Are they seen as important members of an ecosystem, or gloomy and scary? Ask students what they know about these animals and have them brainstorm a list of ideas on butcher's paper. Discuss whether these points are true or not. For example, Flying Foxes and Microbats are very important for controlling insect populations, pollinating various species of trees and plants, and, contrary to popular belief, do not generally carry deadly diseases (see teacher's notes above). This and other information can be found on websites such as the Australasian Bat Society. You could discuss these points as a class or have students conduct some research on their own. Once students have discovered and discussed some accurate information about Flying Foxes and Microbats, have them revisit the different elements evident in the artworks above and in other similar works (you may select particular works depending on the elements you wish to focus on). Discuss whether they think these are accurate renderings.

Have students observe and analyse the anatomy of a Flying Fox or Microbat in order to be able to draw or sketch one accurately. Some good websites with information and diagrams include the following:

Bat Rescue Incorporated (Australia) (from which the image to the right, and other information, can be retrieved)

Image retrieved from http://www.batrescue.org.au/website/index.php?option=com_content&view=article&id=49&Itemid=55

Animal Diversity Web - Bat Wings and Tails (contains a detailed description of Flying Foxes' wings and tails)

Bat World - Bat Anatomy (Although there are a few advertisements on this website these were not inappropriate.)

Bat Biology 101 (This is a short YouTube clip of a bat handler holding and talking about a Microbat. Ask your students if they can tell whether it is a Microbat.)

Discuss with students the features that they will need to consider when creating their drawings. These will depend on the type of bat chosen (Flying fox or Microbat). For example, Microbats have sharp teeth and strong jaws for catching and eating insects (refer to the Bat Biology 101 video listed above) while Flying Foxes are much larger and have a fox-like face. Students could sketch from a photograph of a bat or use this detailed tutorial (at time of writing, this website has some advertisements but nothing inappropriate for classroom viewing).

To complete the learning experience, have students share their drawings with the class. They can point out the features of a bat in their artworks, ask their classmates whether their drawing depicts a Flying Fox or Microbat, and discuss how the purpose of their work is to create a realistic and accurate representation of this animal.