

Classifying Challenge

The following activity is based on the display cases containing taxidermy specimens of several birds and mammals in the **Inquiry Centre**, at Cobb and Co Museum.

These activities focus on the great diversity of life on Earth, the features used to classify organisms into groups, and how these features adapt animals to their specific environment. The content and aims relate to Year 3, 5 and 7 of the **Australian Science Curriculum**. Different parts of the worksheets can be adapted for different year levels.

Content:

Yr 3: Living things can be grouped on the basis of observable features.

Yr 5: Living things have structural features and adaptations that help them to survive in their environment.

Yr 7: There are differences within and between groups of organisms; classification helps to organise this diversity.

Aims:

- *To group living things on the basis of observable similarities and differences*
- *To investigate the characteristics of living things and how these help them to survive in their particular environment*
- *To group organisms on the basis of structural features such as hair, feathers, number of legs or body segments, and to record these groupings in tables or diagrams to identify similarities and relationships*
- *To develop a dichotomous tree using observable, structural features of supplied specimens*

The specimens:

- Mammals: Water Rat; Brown Bandicoot; Little Eagle; Grey-headed Flying Fox (bat); Common Brushtail Possum; Frogmouth Owl; Greater Bilby; Echidna.
- Birds species: Powerful Owl; Spotted Harrier; Satin Bowerbird; Pacific Black Duck; Brown Honeyeater; Peregrine Flacon; Australian Raven; Straw-necked Ibis

Pre-visit Activity:

Feathers and Fur

1. If we put all the animals with feathers into one group, what sorts of animals would we have?
2. What other features do they have in common?
3. Do any other animals have these features?
4. What sorts of features does this group have that help them to move?
5. Catch their food?
6. Avoid predators?
7. What sorts of animals have fur or hair?
8. Do any other animals have fur?
9. What other features does this group have in common?
10. This group can be further divided up into 3 groups. What are these? (Hint: think of how they reproduce.)
11. Some animals are nocturnal while others are diurnal. Find out what these terms mean.

Post-visit Activities:

1. Discuss the features you noted as adaptations with others in your group. (These were listed in Part A.)
2. Compare your dichotomous key with others in the class. Is yours the same as another class member? How is it different from other students? Why are these keys different? Do you think some keys are better than others? Is there a different feature you could have used to separate the mammals at the first level of sorting?
3. What sorts of features are best to use when producing these keys? Would using colour or size be good features to use? Why or why not?
4. Was it harder or easier to separate the mammals the further you move down the key? Why is that?
5. Why do you think it is important for scientists to be able to identify organisms they find using keys?
6. What features do Mammals and Birds have in common?
7. How are Mammals and Birds different?
8. Draw up a list of features that describe Birds, another list for Reptiles, and one for Mammals.
9. Are there any exceptions? For example, if you said that 'birds can fly' can you think of any birds that *cannot* fly? Can you think of other animals, apart from birds, that *can* fly? Look carefully over your lists for No. 3 and note any exceptions.
10. Can you think of any other animals that are difficult to classify because they seem to have features of different groups? List and describe these.
11. Investigate the three sub-groups of Mammals: Monotremes; Marsupials; and Placentals.

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INQUIRY CENTRE ACTIVITY:

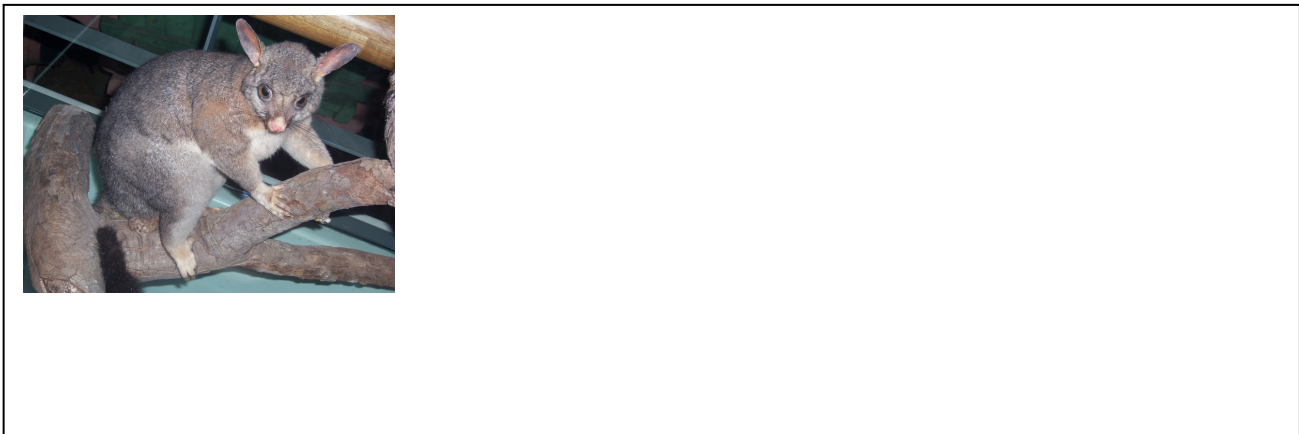
Part A: Visit the Inquiry Centre at Cobb and Co Museum. Examine the display cases and the taxidermy specimens of the *animals* listed below.

Water Rat; Brown Bandicoot; Little Eagle; Grey-headed Flying Fox (bat); Common Brushtail Possum; Frogmouth Owl; Greater Bilby; Echidna.

Select one animal from the list above and draw it. Try to **label** what you see. Not all features may be present in your animal.

- a. Head with eyes, ears, mouth, nose (or snout), whiskers
- b. Arms
- c. Legs
- d. Tail
- e. Gliding membrane
- f. Spines
- i. Opposable thumb

(An example is shown below. It is the Brushtail Possum)



2. Now look carefully at your specimen. Try to work out the **function** (use) of one or two of its features. Summarise your results in the table below.

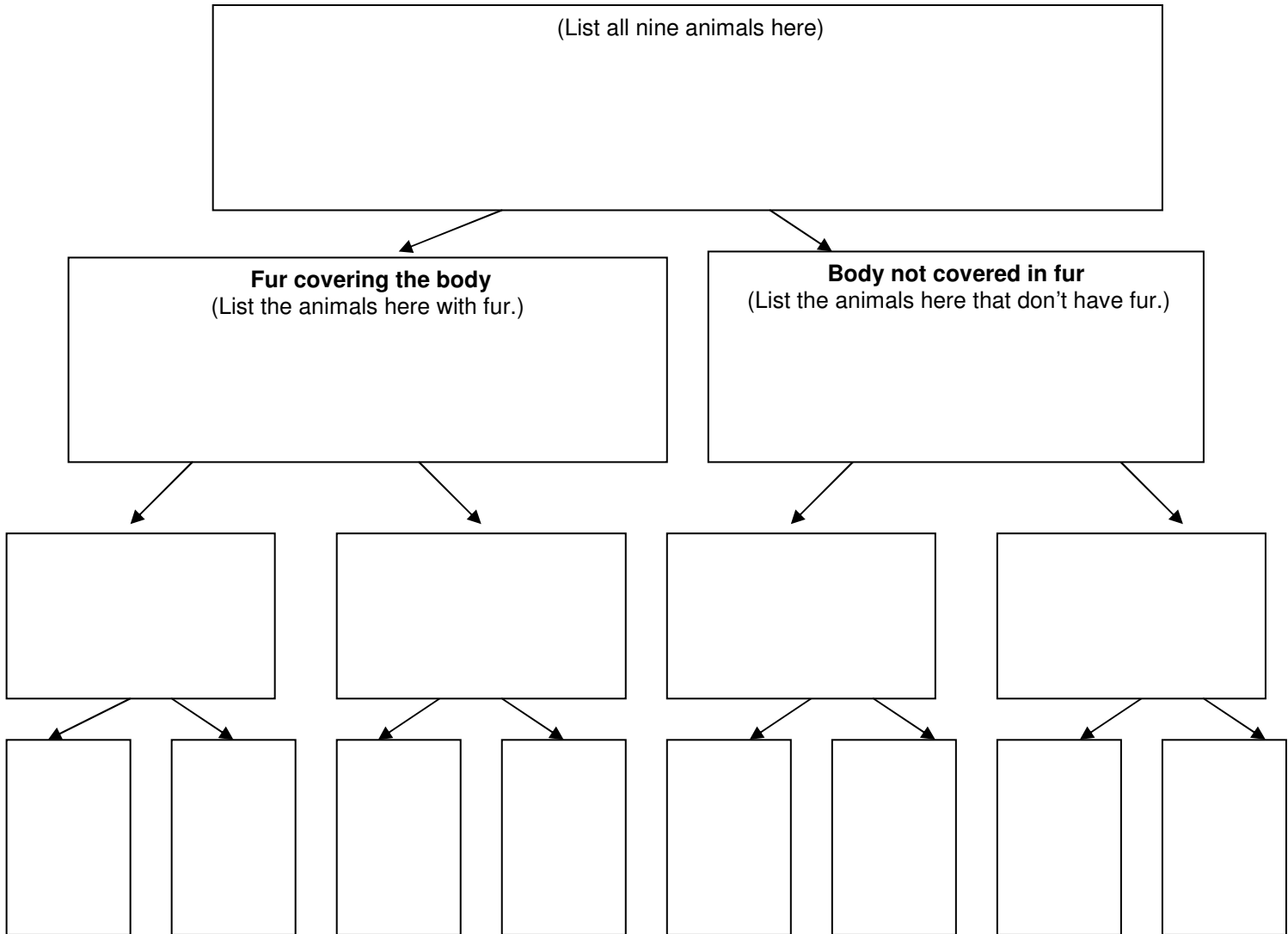
Name of Specimen	Feature	Function

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3. Construct a dichotomous key to separate these eight **animals**. Select a feature to separate the animals into two groups. (You do not need to have the same number of animals in each group.) Try to use features that you can see. Look at the outer covering; hands and feet; size and shape of the ears; nose; tail; and other features. For example, some animals have fur and others do not.

Start making your key using a pencil so you can rub out information later. The diagram below is a guide. One suggestion for the first feature has been done for you. You may like to choose a different one.

Example:



4. Keep going with your key until there is only one animal in its own unique box at the bottom. There does not have to be the same number of animals in the boxes at each stage in the key. You may prefer to make your key on a sheet of A4 or A3 paper. You can add more boxes if you need them.
5. Rub out the list of animals that you have in brackets in each box. Just leave the feature that you used to separate the animals at that stage. Leave the name of the animal in the last box at the bottom. You are left with a dichotomous key. This uniquely separates your eight animals.

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INQUIRY CENTRE ACTIVITY:

Part B: Visit the Inquiry Centre at Cobb and Co Museum. Examine the display cases and the taxidermy specimens of the *birds* listed below.

Powerful Owl; Spotted Harrier; Satin Bowerbird; Pacific Black Duck; Brown Honeyeater; Peregrine Falcon; Australian Raven; Straw-necked Ibis.

Birds have beaks or bills. A **beak, bill** or **rostrum** is an external structure of birds which has many uses: eating; grooming; manipulating objects; killing prey; probing for food; courtship; and feeding young. Note that birds do not have teeth. Different **beaks** are adapted for different ways of getting food. Examples include: insect catching; fruit eating; dip netting; grain eating; surface skimming; aerial feeding; scavenging; filter feeding; probing; raptorial (for seizing prey as seen in birds of prey); and several others.

Different **feet** are adapted for different functions such as: grasping; scratching; swimming; perching; running; and climbing.

1. Select one bird specimen and draw it. Try to **label** what you see. Not all these structures may be seen clearly on your specimen. The term 'mandible' refers to both the upper and lower sections of the beaks of birds. Try to label what you can.
 - a. Wing
 - b. Lower mandible
 - c. Upper mandible (or maxilla)
 - d. Eyes (which may be front-facing or to the side)
 - e. Cere (area above the beak where the nostrils are located)
 - f. Nares (nostrils)
 - g. Feet
 - h. Claws

(An example is shown below. It is the Peregrine Falcon.)



2. Now look carefully at your specimen. Try to work out the **function** (use) of one or two of its features. Summarise your results in the table below.

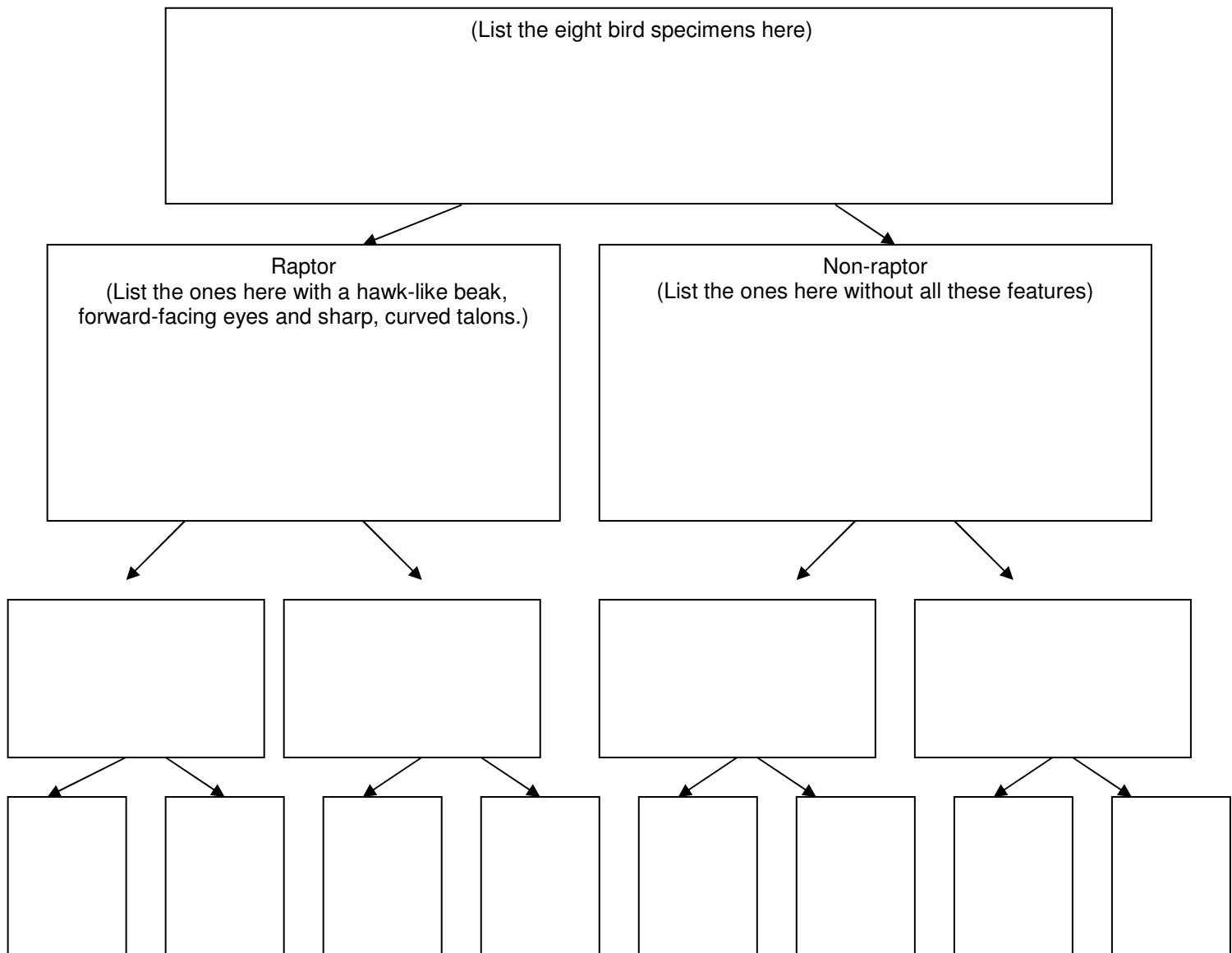
Name of Specimen	Feature	Function

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- Construct a dichotomous key to separate these **birds**. Use features that you can see. Look carefully at the structure of the beaks and feet.

Start making your key using a pencil so you can rub out information later. The diagram below is a guide. One suggestion for the first feature has been done for you. You may like to choose a different one.

Example



- Keep going with your key until there is only one animal in its own unique box at the bottom. There does not have to be the same number of animals in the boxes at each stage in the key. You may prefer to make your key on a sheet of A4 or A3 paper. You can add more boxes if you need them.
- Now rub out the list of animals that you have in brackets in each box. Just leave the feature that you used to separate the animals at that stage. Leave the name of the animal in the last box at the bottom. You are left with a dichotomous key. This uniquely separates your eight bird skulls.