**ACTIVITY: Classifying bird adaptations**

**Activity idea**

In this activity, students classify the different types of adaptations that New Zealand native birds have.

By the end of this activity, students should be able to:

* classify adaptations of New Zealand native birds as structural, behavioural or physiological.

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**Introduction/background**

Due to geographical isolation, New Zealand’s bird life evolved in the absence of ground-dwelling predators.

Some birds evolved larger body size and loss of flight, as an adaptation to fly was not required to escape these ground-dwelling mammalian predators.

Adaptation is an evolutionary process that results in organisms being increasingly well suited to their habitat or ecological niche.

There are many types of adaptations, but these can be classified into three main categories –structural, behavioural or physiological:

* Structural (or morphological) adaptations are the physical features of the organism. These include things you can see, like its shape or body covering, as well as its internal organisation.
* Behavioural adaptations are learned or inherited behaviours that help organisms to survive.
* Physiological adaptations relate to how an organism’s metabolism works. These adaptations enable the organism to regulate their bodily functions, such as breathing and temperature, and perform special functions like excreting chemicals as a defence mechanism.

In this activity, students classify the structural, behavioural and physiological adaptations of New Zealand native birds that made them suited to their habitat before human-introduced predators arrived. (See [adaptation groupings](#groupings) for appropriate placement, and refer to the article [Native bird adaptations](http://link.sciencelearn.org.nz/resources/1162-native-bird-adaptations) for more information.)

You might like to try this activity near the beginning of your unit to check for knowledge gaps and then repeat it after the students have learned about adaptations.

**What you need**

* Printed copies of the [adaptation cards](#cards).
* Access to or printed copies of [Native bird adaptations](http://link.sciencelearn.org.nz/resources/1162-native-bird-adaptations) (optional)
* Large sheets of paper (A2 or A3 size is preferable)
* Marker pens
* Glue

**What to do**

1. Spend some time with the students discussing adaptations. Use the [introduction/background notes](#Introduction) for information.

1. Discuss the differences between structural, behavioural and physiological adaptations.

1. Using an unrelated animal as an example (for example, cats), encourage the students to brainstorm in small groups the different structural and behavioural adaptations that this animal has. Give the groups the opportunity to feed back to the class their responses. Encourage discussion around why each adaptation is classified as structural, behavioural or physiological.
2. Hand out large sheets of paper and marker pens to each small group of students. Ask the groups to draw up a table consisting of three columns titled ‘structural’, ‘behavioural’ and ‘physiological’
3. Give the students copies of the [adaptation cards](#cards). Facilitate discussion with the students about the category in which various adaptations belong. The students will then need to stick the cards into the various columns of the table where they belong.
4. Discuss the placement of the cards by groups of students.

**Discussion questions**

* What attributes of our native birds make them a ‘vulnerable fauna’? (For example, kiwi are ground-dwelling birds, which exposes them to predation from mustelids – weasels, stoats and ferrets).

**Extension ideas**

* Design a new type of bird that would be well suited to a certain habitat in New Zealand (for example, wetland, alpine, forest or grassland). Include reasons why each adaptation has been included for the animal you have created.
* Find out about the relative time it takes for different types of adaptation to occur.
* Compare and contrast 2 endemic bird species (kiwi and kererū or takahē and tūī). Use a Venn diagram to show the similar and different traits that these two species have.

**Adaptation cards**

|  |  |  |
| --- | --- | --- |
| Birds have different shaped beaks and feet suited to the habitat they live in. | Kiwi hatch with an internal yolk sac. This sustains the chick in its first week of life. | The bill of the takahē extends onto its forehead as a shield. |
| If there is thick snow cover on the ground during winter, takahē will nest in forested areas to provide shelter. | Kiwi have fine whiskers at the base of their beak to aid their navigation in the dark. | The breeding cycle of kākāpō is tightly linked with the fruiting of the rimu tree. In abundant fruiting years, more chicks are often born. |
| Kererū are one of the few birds to produce ‘crop milk’ – a protein-rich milky secretion from the walls of their crops to sustain their chicks. | Kiwi have nostrils at the ends of their beaks | The kākāpō has a ‘freezing’ response to danger. |
| Kererū fledglings spend 1–2 weeks with their parents before becoming independent. | Kiwi plumage blends in with the undergrowth to allow them protection from predators through camouflage. | The kererū has the widest gape of any New Zealand forest bird. This enables it to swallow the large berries of native trees. |
| Kiwi and takahē have vestigial wing buds, which are incapable of flight. | Male kākāpō let out a ‘booming’ noise from dug-out bowls in the earth to attract a female. | The tūī has a long curved beak and a fine brush-tipped tongue that enables it to extract nectar from forest tree flowers. |
| Kiwi are nocturnal birds. | Many birds such as the kererū and tūī perform display dives to attract a mate. | Tūī have hollow bones and no teeth, which makes their body light for flight. |

**Adaptation groupings**

|  |  |  |
| --- | --- | --- |
| **Structural** | **Behavioural** | **Physiological** |
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| Tūī have hollow bones and no teeth, which makes their body light for flight. |  |  |