






Structural adaptation 4: Researching adaptations

Components

	NAME	DESCRIPTION	AUDIENCE
	<i>Researching adaptations</i> teachers guide	This guide shows how to use podcasts and a worksheet to encourage elaboration of student knowledge about structural adaptations and function.	teachers
	<i>Spotlight on rakali</i> podcast	Dr Peter Speldewinde, research scientist at The University of Western Australia, describes his research on rakali.	students
	<i>Digging up the truth on the water-holding frog</i> podcast	Dr Victoria Cartledge, research scientist at The University of Western Australia, describes her research on the water-holding frog.	students
	<i>Rebuilding our ocean forests</i> podcast	Dr Marion Cambridge, research scientist at The University of Western Australia, describes her research on seagrass.	students
	<i>Structure and function</i> worksheet	This worksheet encourages wider application of student knowledge of adaptations. Questions extend student knowledge of structural adaptations and function to new circumstances and species.	students

Purpose

To **Elaborate** on structural adaptations of organisms, with an understanding of how structure and function are related. Students gain an appreciation of these concepts at a wider ecological level, in the context of both Australian and introduced organisms.

Outcomes

Students:

- identify structural features that allow plants and animals to perform a key function,
- describe the function of a structural adaptation,
- understand that structure and function are relative to an organism's environment,
- discuss current scientific research relative to the structural adaptations of specified species, and
- understand the scientific process of investigative research.

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Students listen to one or more podcasts individually or as a class. Smaller groups can review each podcast and present pertinent points to the class. Questions for possible discussion are outlined below.	individual or small group
Distribute the worksheet, <i>Structure and function</i> . Students work individually. Information will be required from external sources such as the internet or textbooks. Relevant online references are included in this guide.	individual, useful homework exercise

Technical requirements

The guide and worksheets require Adobe Reader which is a free download from www.adobe.com. The worksheet is also available in Microsoft Word format.

Listening to the podcasts requires podcast subscription software such as iTunes or Doppler. Subscribe to SPICE podcasts in iTunes at the address <itpc://spice.duit.uwa.edu.au/groups/spice/blog/index.it>s

An MP4 version of the podcast is available on CD-ROM and can be viewed with QuickTime Player or RealPlayer (free downloads from www.apple.com/quicktime and www.real.com).

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Using the podcasts

The podcasts, *Spotlight on rakali*, *Digging up the truth on the water-holding frog* and *Restoring our ocean forests*, provide insight into scientific research conducted at The University of Western Australia. Researchers provide an account of their research goals, successes and challenges, along with unique characteristics of each featured species.

The podcasts provide a useful platform for elaboration of student knowledge regarding structural adaptations and function, along with an opportunity to explore techniques of scientific investigation.

Suitable discussion questions include:

Spotlight on rakali

- What can rakali tell us about the wider freshwater environment?
- Why might rakali in Western Australia be different to rakali in the eastern states?
- Are rakali easy to study?
- After listening to this podcast did you learn of any other structural adaptations of rakali?

Digging up the truth on the water-holding frog

- What strategies do frogs use to avoid water loss in arid environments?
- Is there any disadvantage to the water-holding frog's cocoon?
- How do researchers find water-holding frogs in the desert?
- What is aestivation, and how is aestivation different to hibernation?

Restoring our ocean forests

- Why is it important to understand the growth rates of seagrass?
- How important is seagrass to the wider marine environment?
- Why are seagrasses sensitive to environmental disruptions?
- For information on the Rockingham Bay Seagrass Monitoring group visit <http://www.republicofwa.org/seagrass>

General discussion questions on scientific research and investigation

- After listening to the podcasts what did you learn about the scientific process?
- What did you learn about experimental and control groups in scientific investigation?
- Do you have any other suggestions about how scientists might study these species?

Suggested Internet resources for worksheet, *Structure and function*

ADAPTATION	REFERENCE
bird adaptations	http://birdsinbackyards.net http://www.seaworld.org/animal-info/info-books/raptors/adaptations.htm
thorny devil adaptations	http://animaldiversity.ummz.umich.edu/site/
sugar glider adaptations	http://animaldiversity.ummz.umich.edu/site/
mistletoe adaptations	http://www.anbg.gov.au/flora/
<i>Eucalyptus</i> adaptations	http://www.gullivermedia.com.au/bush.html
<i>Acacia</i> adaptations	http://www.mronline.com.au/flowers/wildindex.htm
dromedary (Arabian camel) adaptations	http://animals.howstuffworks.com/mammals/camel-info.htm

Associated SPICE resources

Structural adaptation 4: Researching adaptations may be used with related SPICE resources to address the broader topic of structural adaptation.

DESCRIPTION	LEARNING PURPOSE
<i>Structural adaptation (sequence overview)</i> This learning pathway shows how a number of SPICE resources may be combined to teach the topic of structural adaptation.	
<i>Structural adaptation 1: Teeth, tails and talons</i> A card game engages student interest in structural features of Australian animals.	Engage
<i>Structural adaptation 2: Featured creatures</i> A presentation encourages students to explore environmental conditions of three habitats, and characteristics a plant or animal would need to survive there.	Explore
<i>Structural adaptation 3: Structure and function</i> A video explains adaptations in three organisms: rakali, water-holding frog and seagrass.	Explain
<i>Structural adaptation 4: Researching adaptations</i> In a series of podcasts, three scientists at The University of Western Australia explain their research into Australian animals and plants.	Elaborate

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