



NEW SOUTH WALES

PRIMARY ACTIVITY

HOW DO MARINE ANIMALS ADAPT TO THEIR ENVIRONMENT?

- Syllabus Reference
- Resources
- Activities



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SYLLABUS OUTCOMES

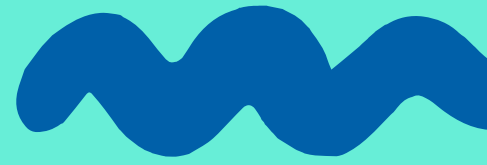
- Plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions **ST3-1WS-S**
- Plans and uses materials, tools and equipment to develop solutions for a need or opportunity **ST3-2DP-T**
- Examines how the environment affects the growth, survival and adaptation of living things **ST3-4LW-S**

INQUIRY QUESTION

How do the structural and behavioural features of living things support survival?

Students:

- describe adaptations as existing structures or behaviours that enable living things to survive in their environment (ACSSU043) SciT
- describe the structural and/or behavioural features of some native Australian animals and plants and why they are considered to be adaptations



ACTIVITIES

BEHAVIORAL ADAPTATIONS



ACTIVITY 1

Define Structural and behavioral adaptations and provide examples of each.

Students watch the video [Types Of Adaptations](#) then as a class come up with a definition for adaptation. Students complete the questions on **student worksheet**.

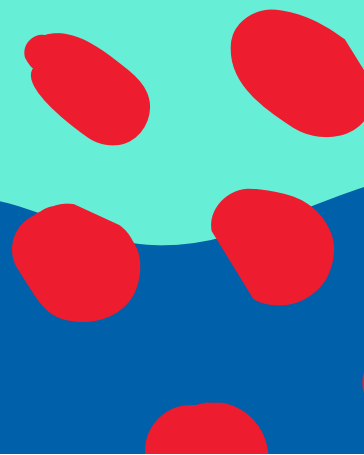
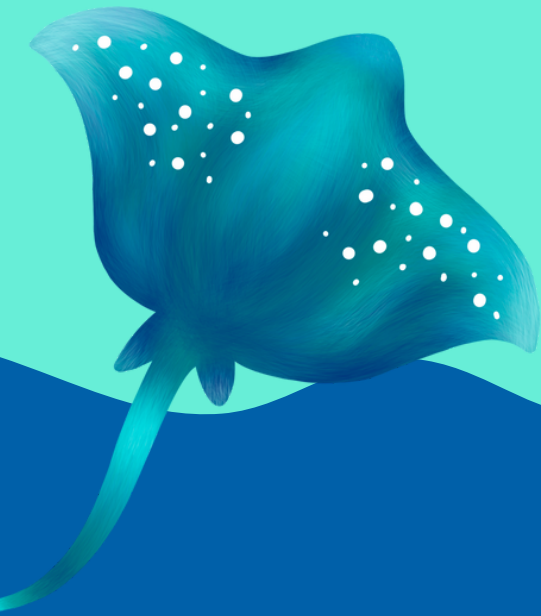
ACTIVITY 2

How can adaptation help an animal survive: coloured sticks pickup.

Students conduct a short experiment that demonstrates the effect of camouflage.

Materials: Coloured toothpicks

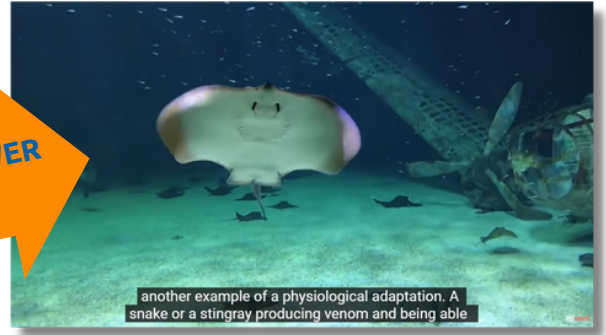
Design your own fish



ACTIVITY 1

STUDENT WORKSHEET

WATCH THE VIDEO TO ANSWER THE QUESTIONS



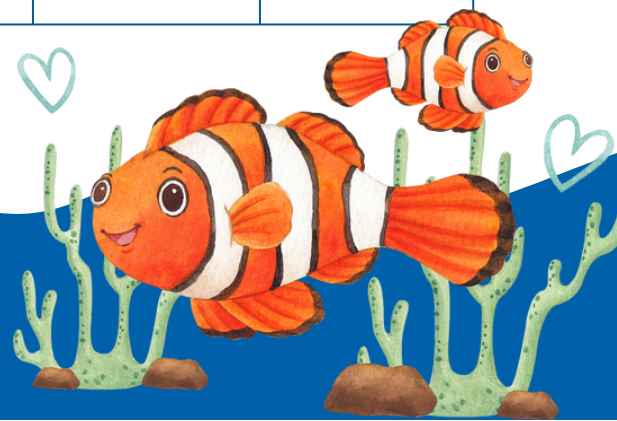
1. Define the term adaptation: _____
2. What is a structural adaptation? _____

3. Provide one example of a structural adaptation: _____
4. What is a behavioral adaptation? _____

5. Provide one example of a behavioral adaptation: _____

6. Put an X in the chart below to show whether each animal adaptation is structural or behavioral.

Adaptation	Behavioral	Structural
Fish have gills so that they can get oxygen from water		
Clownfish live in sea anemones to protect themselves from predators		
Sea turtles have a hard shell to protect them from predators		
Fish travel in schools to protect themselves from predators		
Whales have a layer of fat to help them maintain their body temperature in water		
Whales migrate from Antarctica in the winter to help them find food		



ACTIVITY

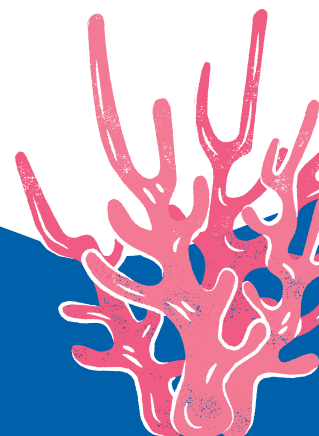
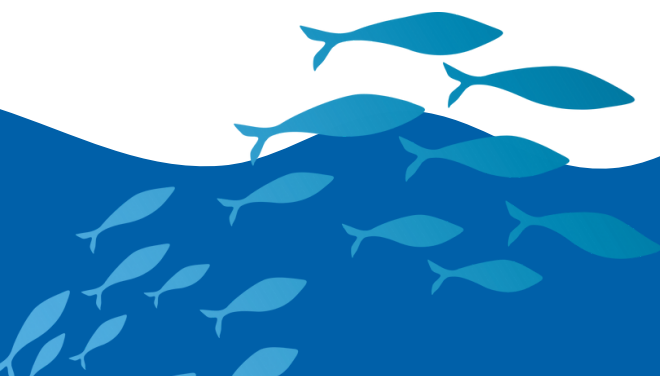
Can animals adapt to climate change?



WATCH THE VIDEO

1. What is the genetically dominant form of plumage for tawny owls?
 - a. Brown
 - b. White
 - c. Gray
 - d. Purple
2. What environmental change has driven pitcher-plant mosquitoes to delay dormancy?
 - a. More water
 - b. Warmer temperatures
 - c. Longer days
 - d. More pitcher-plants
3. How are wild thyme plants evolving in response to climate change?
 - a. Growing higher on the hillside
 - b. Producing more flowers
 - c. Producing more seeds
 - d. Producing more herbivore-repellent oils
4. How many species have been identified as evolving in response to climate change?
 - a. 20
 - b. 55
 - c. 6.7 million
 - d. 200
5. How are humans helping wildlife adapt to climate change?
 - a. Helping species move to better climates
 - b. Setting aside "climate refuges" for protection
 - c. Updating existing parks to account for climate change
 - d. All of the above
6. How do you think "plastic", or non-heritable, changes like those listed in the lesson (changing body sizes, breeding seasons, or flowering dates) could help organisms adapt to climate change? How do you think they may be limited?
7. Some organisms may not be able to evolve fast enough to climate change to survive. How might this affect this biodiversity on Earth and why is this so important to consider?
8. Humans will have to adapt to climate change too. Predict the future for those people living in areas that will be most affected (coastal areas, those in warmer climates, Arctic areas).

QUESTIONS
(FROM
TED-ED)



ACTIVITY 2

PICK UP STICKS

HOW DO ADAPTATIONS HELP ORGANISMS SURVIVE

1. Throw the toothpicks onto the paper so that they are evenly distributed.
2. Pick up as many toothpicks as you can in 10 seconds. You can only pick up one tooth pick at a time. Extra challenge use tweezers to pick up toothpicks.
3. Tally how many toothpicks of each colour you collected.

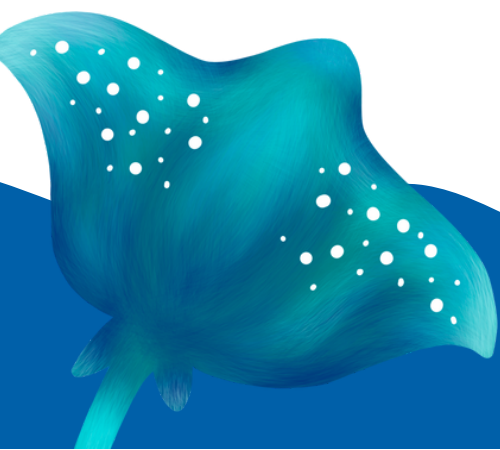
Results

Colour of paper _____

Colour	Number of toothpicks

MATERIALS NEEDED

- Coloured toothpicks (40 per group)
- Coloured paper (1 piece per group)
- Stopwatch
- (1 per group)
Tweezers - optional



DISCUSSION QUESTIONS

WHICH COLOURS
OF TOOTHPICKS
“SURVIVED” THE
BEST?

HOW DID THIS
COMPARE TO
THE
COLOURED
PAPER YOU
WERE USING?

WHICH
COLOURS OF
TOOTHPICKS
WERE “EATEN”
THE MOST?



PICK A MARINE ANIMAL TO RESEARCH

ACTIVITY 2

Design a marine animal adapted to its environment

Name your chosen animal:

What does it eat?
Is it a carnivore,
herbivore or
omnivore?

Do other
animals hunt
it? How does it
protect itself?

How does it
hunt for its
food?

How does this
animal
reproduce?

Design your own marine animal

Start by considering the following questions so that your animal is well designed to live in its environment

1. What does your creature look like? What colours does it have?
2. What kind of covering does it have (fur, feathers, scales, shell or other kinds of body covering?)
3. What are its physical features (How many eyes? Legs? Wings? Heads? Does it have a nose or a beak or something different? Where is its mouth? How big is it?)
4. Where does it live?
5. What structural/physical adaptations does it have and how do these help it survive
6. What behavioural adaptations does your animal have and how do these help them survive
7. Draw your animal



ADDITIONAL RESOURCES

Follow the peppered moth's life cycle from birth to death - all in one year!

PEPPERED MOTHS

Natural selection in action

Peppered Moth
Follow the peppered moth's life cycle from birth to death - all in one year!

Natural Selection
Find out how the peppered moth helped naturalists in England.

Dr. Kettlewell
Scientists must verify their ideas. Learn how Dr. Kettlewell put natural selection to the test.

How to Play
Need to review the basic concepts? Learn how to play here!

Play
See how cartoonish predators protect moths through science and biology? Visit Ask A Biologist!

Ask A Biologist
Want to learn more about science and biology? Visit Ask A Biologist!

Did You Know?
The dark or black peppered moth blends in best against plain dark tree bark.

Peppered Moth

[Peppered Moth](#) | [Natural Selection](#) | [Dr. Kettlewell](#) | [How to Play](#) | [Play Game](#)

Life Cycle / Predators

Peppered moths are a species of moth that live in England, Europe, and North America. They are small moths, only 1.5 to 2.5 inches across. Their wings are peppered with grey spots.

Life Cycle

Peppered moth eggs hatch during mid summer. Larvae (caterpillars) feed on the leaves of trees, bushes, and dog roses. The larvae don't feed for small amounts of time, but each day they eat a lot. They have to come to the leaf frequently. The caterpillars are very good at hiding from predators. They can change their color to match the background. This is called camouflage.

Cold weather is difficult for insects. In cold weather, peppered moth larvae can survive in a state called diapause. They can stay in this state for up to a year. They will only hatch when the weather is warm again. This means that they can survive through the winter.

Predators

Predators of the peppered moth include birds, squirrels, and the European starling. European starlings are native to the United States, but they have spread to other parts of the world. They are very good at finding and eating insects. They can see through the camouflage of the peppered moth. They can also see the pattern on the peppered moth's wings. This pattern is called a peppered pattern. It is very similar to the pattern on the wings of a butterfly.

[Peppered Moth](#) | [Natural Selection](#) | [Dr. Kettlewell](#) | [How to Play](#) | [Play Game](#)



NATURAL SELECTION IN ACTION



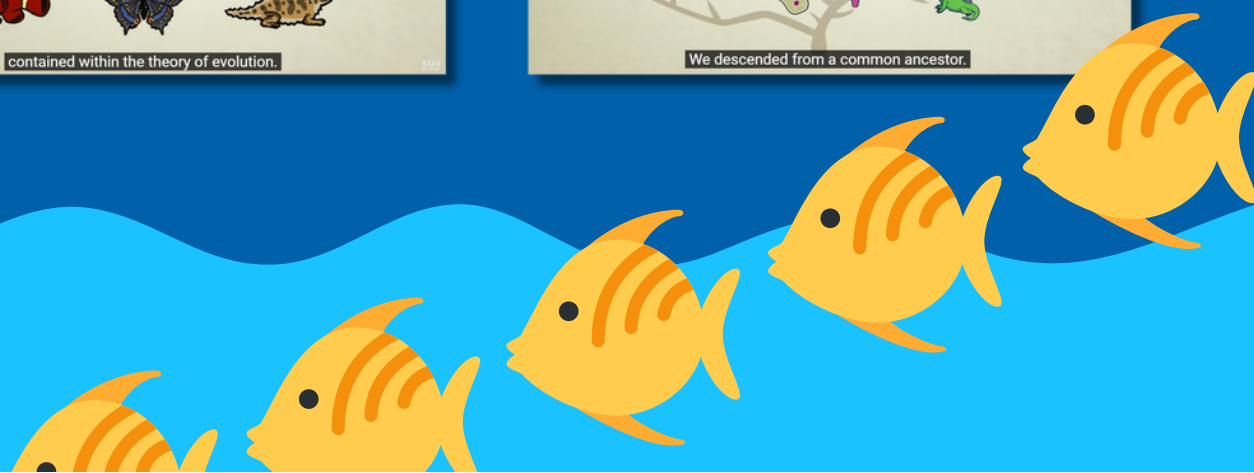
What is NATURAL SELECTION?

EVOLUTION

contained within the theory of evolution.

Common Descent

We descended from a common ancestor.



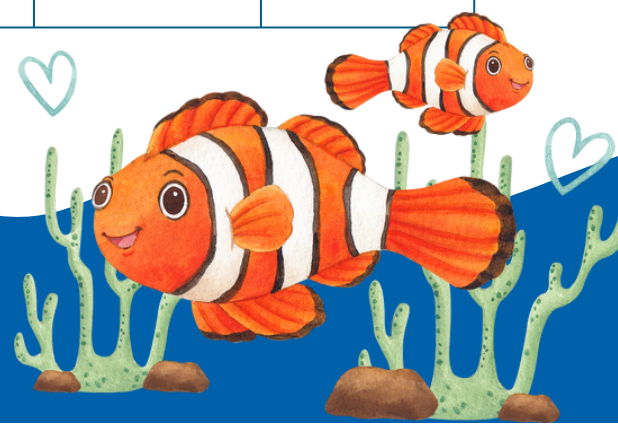
ACTIVITY 1

STUDENT WORKSHEET

ANSWERS

1. Define the term adaptation: *A trait of an organism that gives it some advantage in its environment*
2. What is a structural adaptation? *a physical feature of an organism that helps it to survive*
3. Provide one example of a structural adaptation: *spikes on an echidna protect it from predators*
4. What is a behavioral adaptation? *Things that an organism does that gives helps it to survive*
5. Provide one example of a behavioral adaptation: *herding animals helps protect from predators*
6. Put an **X** in the chart below to show whether each animal adaptation is structural or behavioral.

Adaptation	Behavioral	Structural
Fish have gills so that they can get oxygen from water		x
Clownfish live in sea anemones to protect themselves from predators	x	
Sea turtles have a hard shell to protect them from predators		x
Fish travel in schools to protect themselves from predators	x	
Whales have a layer of fat to help them maintain their body temperature in water		x
Whales migrate from Antarctica in the winter to help them find food	x	





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WALES

**CHECK OUT MORE
PRIMARY TEACHER
RESOURCES ON
OUR HUB!**



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