

Evolution – Adaptation

Name _____

Class _____

What you will need for this lesson: some coloured pencils, some Blu-Tack, tweezers, scissors and the printout of the moths.

You will also need a pen, a pencil and if you have it, access to a computer, tablet or iPad.

LESSON STARTER

Look at the pictures below. These animals have developed certain features to help them survive in their habitat. Features like this are called adaptations.

Can you work out what adaptations the animals in the pictures may have developed? How has this feature helped the animal to survive?

Animal	Adaptation	How has it helped them to survive?
		
		

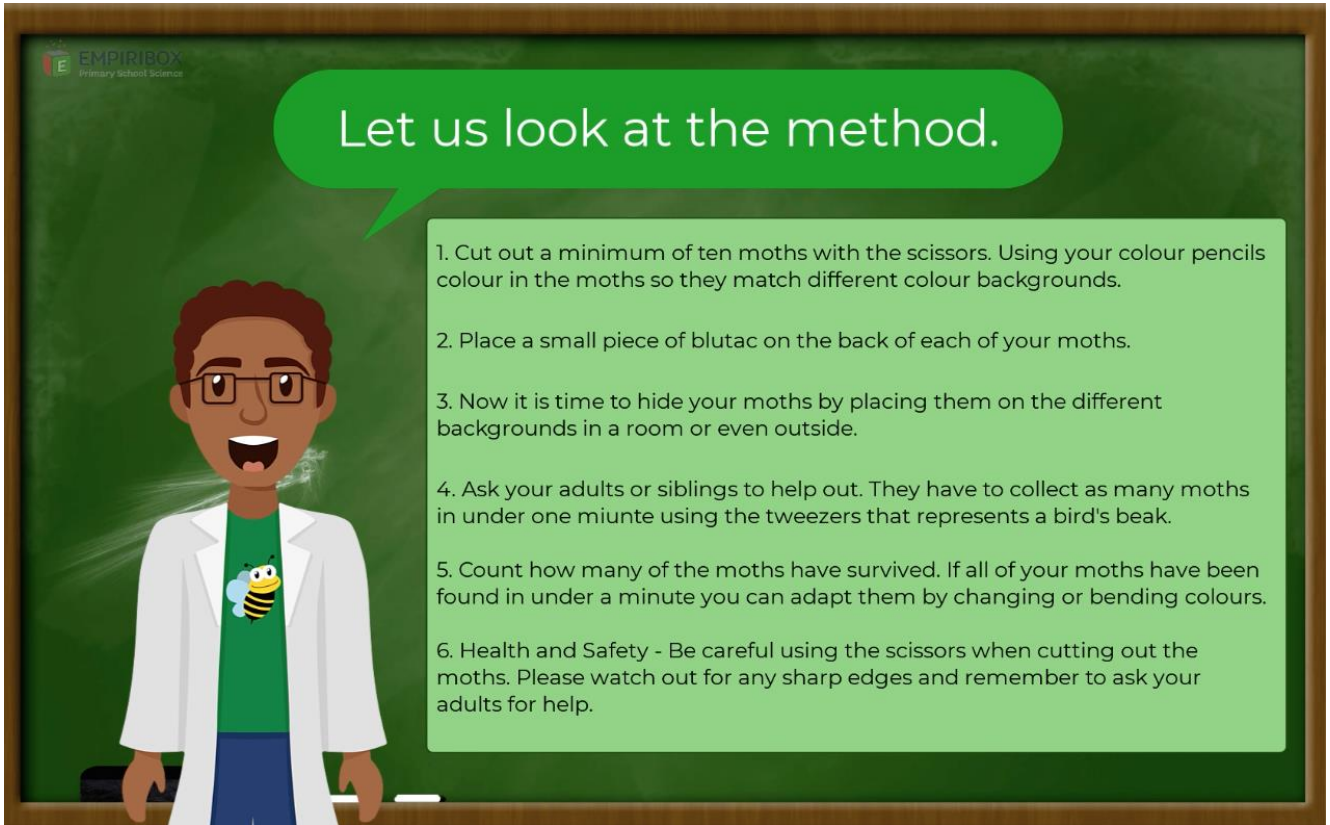
Animal	Adaptation	How has it helped them to survive?
		
		
		



When you've finished, watch the video to learn more!

The Investigation

You are going to do an investigation into adaptation! You will need to ask an adult for some help!



Let us look at the method.

1. Cut out a minimum of ten moths with the scissors. Using your colour pencils colour in the moths so they match different colour backgrounds.
2. Place a small piece of blutac on the back of each of your moths.
3. Now it is time to hide your moths by placing them on the different backgrounds in a room or even outside.
4. Ask your adults or siblings to help out. They have to collect as many moths in under one minute using the tweezers that represents a bird's beak.
5. Count how many of the moths have survived. If all of your moths have been found in under a minute you can adapt them by changing or bending colours.
6. Health and Safety - Be careful using the scissors when cutting out the moths. Please watch out for any sharp edges and remember to ask your adults for help.

How many moths survived without being found?

Draw below the best camouflaged moth you created and explain where you put it.

WORKING SCIENTIFICALLY

Our next focus is about working scientifically. All scientists apply these principles whenever they are investigating anything and we've divided them into different skill units.

Find the section your teacher has asked you to focus on and answer the questions in the relevant section.

A. Planning or

B. Presenting and analysing data or

C. Evaluation

A. Planning

Every scientist wants to solve a problem and so takes the following steps

1. **Decides on a question that needs answering.** e.g. does the size of the coloured moth affect how long it survived without being seen?
2. **Decides what the independent variable (the thing that is changed) might be in order to work out the answer to the question** e.g. we will use different sized moths with the same colour camouflage.
3. **Decides what the dependent variable might be (how to measure the differences in each different example)** e.g. we will time how quickly each moth is found.
4. **Last of all decide what elements have to stay the same in order to make it a fair test** e.g. we would keep the time allowed for finding the moths exactly the same.

Now using this knowledge, see if you can answer the questions below!

Write below one or more examples of a question you might want to find the answers to.

Year 3 -What might be the independent variable you would use in your investigation, in other words what would be the thing that you would change to investigate your question?

Year 3 - What would be your dependent variable, in other words what would you measure to record the difference?

Year 3 -What was your control variable, in other words what did you keep the same to make sure that it was a fair test?

Year 4 and 5 – Design the question you would ask if the following were your independent and dependent variables.

The independent variable is **the colour of the moths.**

The dependent variable is **the number of moths found.**

Planning continued...

My question is: _____

Year 6 - Read the following question:

Does the type the type of colour used to colour in the moths affect their survival rate (or how well they are hidden)?

What do you think will happen? Write your **prediction** below.

Scientists will always write a **prediction** when they are carrying out an investigation.

My prediction is:

B. PRESENTING & ANALYSING DATA

When scientists carry out investigations, it is really important that they capture data to make sure they can then answer the questions that they have set themselves. The scientist on the video has asked you to complete the following:

Year 3 pupils – You are carrying out experiments to answer the following question:

Does the colour of the moths affect the number of moths found?

What kind of data would you capture to show what happens and why?

Year 4 & 5 pupils – You are carrying out experiments to answer the following question:

Does the length of the moths affect the number of moths found?

What kind of data table would you use and why? Draw it below.

PRESENTING & ANALYSING DATA continued

Year 6 – This is your question:

Does the colour of the background affect the number of moths found?

Design a suitable data table to present your investigation results. Use the space below to draw your table. Then carry out the investigation and fill in your table!

My Table

Can you spot a trend in your data? _____

C. EVALUATION

Evaluating how an investigation went as well as the data that comes from a science experiment is a really important part of science. It may be that you feel your experiment could have been done better or more thoroughly and it is important to understand this.

Answer the question below and then explain why you came to this answer:

Year 3 pupils: Did your experiment work?

Year 3 pupils: Why? Try and explain your answer using diagrams if it helps.

Year 4, 5 and 6: Carry out an investigation **and** record your data. Try to spot any anomalies.

An anomaly is an odd result. Make a note of them below.

EVALUATION continued

Year 5 & 6 Can you work out why there were any anomalies? Explain below what you think caused those anomalies.

The science behind the investigation



Living things have to **adapt** to their environment in order to survive. This is true of both **animals and plants**. If they don't adapt over time, then they will not survive.

Here are pictures of two moths. They are the same species, but one is black. And the other is a mottled brown and cream colour.

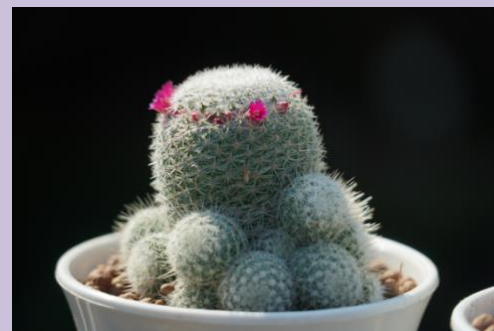


These adaptations happen as a part of evolution. The species adapt to help them survive by making them difficult to see and be caught as food. The ones that didn't adapt would be less likely to survive.

The black moths are those found in London where the dark walls of the city made it difficult for birds to see and then eat them.

The mottled brown and cream moths are found in the country and they evolved to hide among the white spruce tree's bark.

Plants also adapt and the species evolve. Can you work out how a cactus has adapted to survive in the desert?



Your challenge!

A time traveller has arrived in your town from the year 5020. Although you can see the time traveller is human, there are definite differences between you and them.

On the next page can you draw the time traveller and include all the adaptations that our species has undergone?



My time traveller with adaptations.



What was your score?



