Sitable for UK KS2 or ages 7-11

Rainfall Now and Then

Student worksheet

Ricky is interested in climate change and how our planet's past can help us to understand its future.

She has been using clues from the past left behind in rocks from South England on the Earth's surface today to try to understand what the climate was like in the Early Cretaceous period, 140 million years ago.

Starter activity: watch the video carefully and fill in the shaded boxes in the table below:

	Units	Now	Then	
Carbon dioxide levels	parts per million	400	1000	How many times higher?
Average ocean surface temperature		17		How many degrees hotter?
Average annual rainfall (South England)	mm	650	1000	Was it wetter or drier in the past?

How does Ricky measure rainfall?

Use the key words below to fill in the blanks in Ricky's **method**.

1. Ricky collects _____ minerals. Her favourite mineral is called _____.
2. She _____ them up.
3. She _____ them in acids.
4. She puts her samples into a _____.
5. The result she gets is a _____ of oxygen-16 to oxygen-18.
6. She _____ how much rainfall there was in the Early Cretaceous period.

siderite **carbonate** **mass spectrometer** **ratio**

dissolves **calculates** **crushes**

Talk to your neighbour. What do you think are some of the **challenges** of Ricky's experiments?

1. _____
2. _____
3. _____

Experimenting with rocks

What happens when you put crushed rocks in acid? Will different rocks do different things?

Make a **prediction**: _____

_____

Take a small spoonful of (a) sand and (b) chalk and place each one on a clean, dry surface. Using a plastic dropping pipette, add a few drops of acid to each one and observe what happens. Record your observations carefully.

Observations with (a) sand: _____

_____

_____

_____

Observations with (b) chalk: _____

_____

_____

_____

Comment on what happened. Is it what you expected?

_____

_____

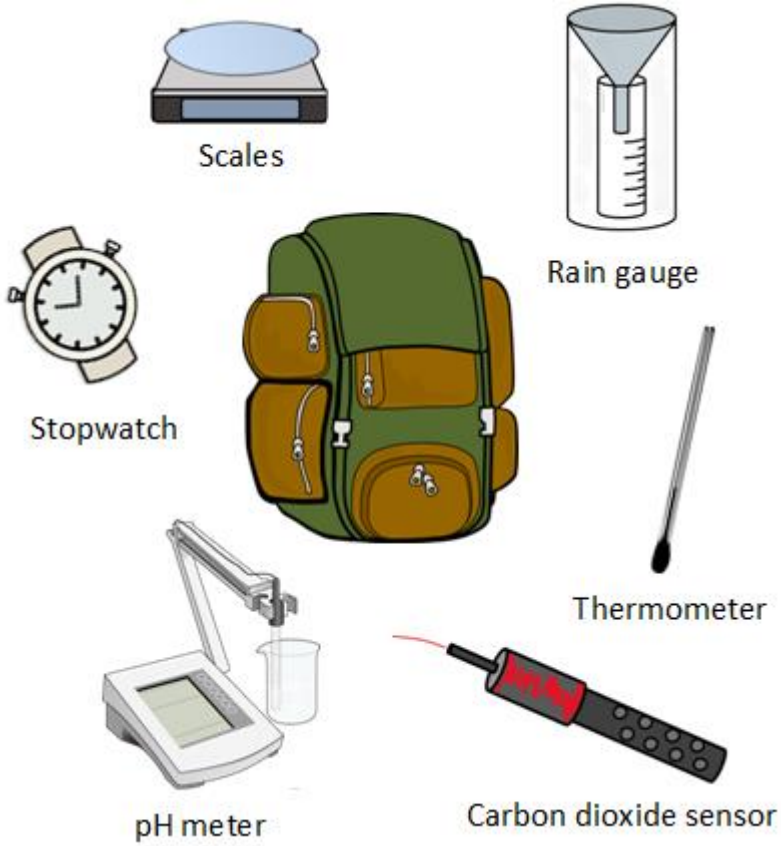
_____

Time-travelling

Ricky sadly does not have a time machine. But what if she DID?

She doesn't have much space in her time machine, but she does have just enough room for a small rucksack filled with essential scientific tools.

What tools should Ricky pack in her bag to measure carbon dioxide levels, ocean surface temperature, and rainfall in the Early Cretaceous period?



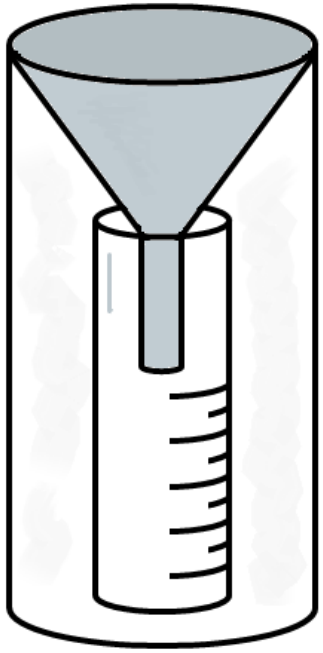
Making a rain gauge

Today, **meteorologists** (weather scientists) measure rainfall using a rain gauge. A rain gauge is made of a circular funnel with a diameter of 203 mm. The funnel drains into a measuring cylinder.

The rain gauge stands 30 cm above the ground.

To make a rain gauge, you will need:

An empty 2 litre plastic bottle
A funnel template
Tape
Scissors
A graduated measuring cylinder about 20 cm tall



Instructions

1. Cut the top and bottom off your plastic bottle, leaving a transparent cylinder.
2. Cut your cylinder to 30 cm tall.
3. Cut out your funnel template, and roll into a funnel. Secure with tape.
4. Place your funnel on the top of your bottle, with the measuring cylinder underneath.
5. Place your rain gauge somewhere to collect rainfall.

Rain gauges are more accurate if they are well away from buildings, fences, trees, and other tall objects. To measure rainfall, you should read of the level of rain in the cylinder by crouching down so that it's at eye level. Take all your measurements at the same time of day, at 9am, then empty it out.

Adaption

140 million years ago, plants and animals were a little different to those found today, just like the climate was different. Look at the pictures on the next page, and label all the features that make them **well-adapted to their environment**. Look for similarities and differences and think about what each animal ate.

You may need to ask some questions, like:

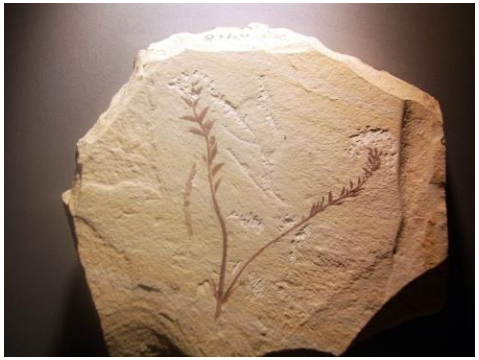
Where would they live?
What colours are they, and why?
Are they predators or prey?

Plants and animals from the Cretaceous period

Shantungosaurus – a duck-billed herbivorous dinosaur

Buccinatormyia magnifica – a type of fly

Archaefructus liaoningensis – a flowering plant



Plants and animals from the modern day

Common house sparrow

Common house fly

Common daisy