

## Pine cone investigation

We are all familiar with a pine cone's distinctive conical shape and scales. But have you ever wondered why pine cones are shaped the way they are? Go on a walk outdoors and collect some pine cones – you may notice that some are closed and some are open. With an adult's help, carry out an investigation to uncover the clever ways that pine cones have adapted to survive.

### Materials:

- Two pine cones
- Two jars
- Cold water
- Warm water
- Kitchen towel
- Tape measure or ruler
- Pen or pencil for recording

**1** Go for a walk in your local park or woodland and collect two or more pine cones that have fallen to the ground. Try to find open pine cones, as the closed cones aren't mature yet.

☆ **Top tip:** If you're unsure of the difference between fir, pine and spruce trees, look for trees with long needles growing in clusters – those are pines!

**2** At home, examine your pine cones and note down any observations in the section below.

Think about the shape of a pine cone and its function.

🔗 Do the scales remind you of a hedgehog's protective armour?

🔗 What might the cone be protecting inside?

☆ **Hint:** Gently shake a cone upside down.



### Pine cone observations:

Note down some adjectives or draw and label a diagram.

**3** Before setting up your experiment, use a tape measure or ruler to measure the width of each pine cone and record in the section below.

### Measure and record:

Width of pine cone 1:

Width of pine cone 2:



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4 Put one pine cone in a jar full of cold water and one in a jar of warm water (remember to note down which pine cone you put in each jar).

! **Safety first:** Ask for an adult's help when handling warm water.

Think like a scientist and make a prediction in the section to the right:

? What do you think will happen to the pine cone in cold water?

? What do you think will happen to the pine cone in warm water?

5 Leave one pine cone in cold water and one in warm water for at least an hour and observe the changes over time.

Record these changes in the section to the right: you could draw a diagram, take a photo or note down your observations.

6 After an hour or more, remove both pine cones from water and place on kitchen towel.

Take a final measurement of each pine cone's width and record using the section to the right.

### Taking it forwards:

What do you think would happen to the pine cones if you placed them somewhere warm?

Design your own experiment and test your prediction.

☆ **Top tip:** Ask for an adult's help when using an oven!

### Predictions:

Predict what will happen to each pine cone and why.

### Record the changes that you see:

Pine cone in cold water:

Pine cone in warm water:

### Results:

What happened to each pine cone? Are the results as you expected?