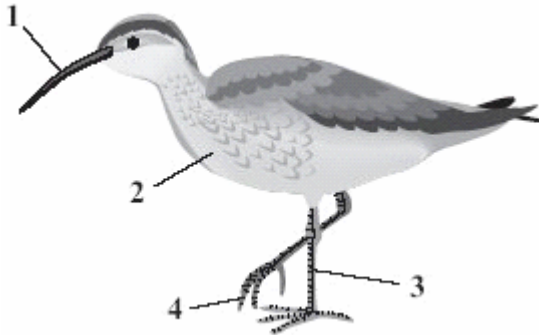


Adaptations

1. The picture shows a bird which lives on sandy beaches. It feeds on animals that burrow into the sand.



Match adaptations, **A, B, C** and **D**, with the labels **1–4** on the diagram.

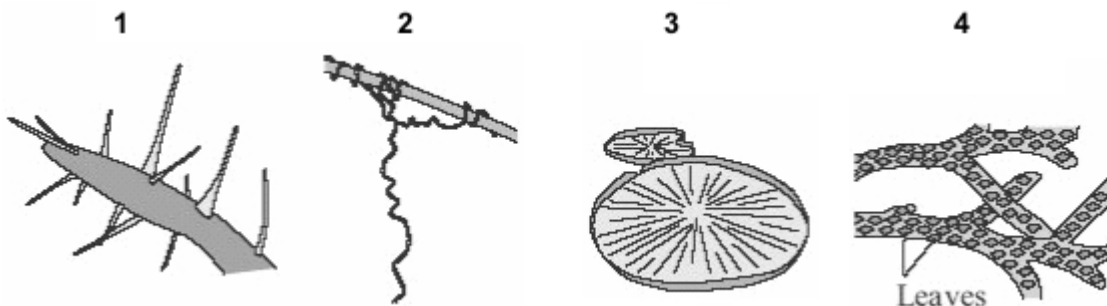
- A** wide, to stop the bird from sinking into the sand
- B** long, to reach animals buried deep in the sand
- C** long, to help the bird to see predators approaching
- D** thick, to provide an insulating layer

2. The plants shown in drawings 1 – 4 are adapted in different ways for survival.

Match statements, **A, B, C** and **D**, with the drawings **1 – 4**.

The plant has leaves adapted . . . layout four items across the page

- A** for floating.
- B** to deter predators.
- C** for climbing.
- D** for reducing water loss.



3. Limpets can be found attached to rocks on beaches around Britain.

A group of students on a field trip measured the height and width of 10 limpets on a shore exposed to strong waves, then a further 10 limpets on a very sheltered shore.

The tables show their results.

Limpets from an exposed shore											
	1	2	3	4	5	6	7	8	9	10	Mean
Height in cm	1.7	0.9	1.4	1.7	1.2	1.9	1.7	1.2	1.9	0.9	1.5
Width in cm	2.4	1.9	2.8	3.1	2.1	2.2	3.1	2.4	3.1	1.9	2.5

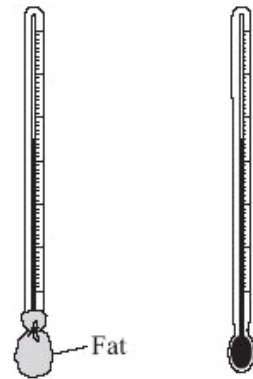
Limpets from an exposed shore											
	1	2	3	4	5	6	7	8	9	10	Mean
Height in cm	1.7	1.4	1.4	2.0	2.3	1.9	2.0	3.2	2.7	3.0	2.2
Width in cm	2.8	2.1	2.8	2.3	2.6	1.9	2.5	2.6	2.5	2.9	2.5

- (a) The students wanted to draw a graph or chart to show all the data.
The best graph or chart to do this would be a . . .
- 1 bar chart.
 - 2 line graph.
 - 3 pie chart.
 - 4 scattergram.
- (b) What was the range in height of the limpets from the sheltered shore?
- 1 0.9 to 1.9
 - 2 1.4 to 3.2
 - 3 1.4 to 2.7
 - 4 1.7 to 3.2
- (c) The data in the table shows that . . .
- 1 the biggest limpets are the oldest.
 - 2 most of the limpets on sheltered shores are taller than those on exposed shores.
 - 3 on both shores the tallest limpets are the widest.
 - 4 there is more food available to limpets on exposed shores.
- (d) From the information given, what is the most likely reason for the difference in the heights of the two populations of limpets?
- 1 On exposed shores waves are likely to dislodge taller limpets.
 - 2 There is more food available to limpets on exposed shores.
 - 3 There are fewer predators on sheltered shores.
 - 4 By random chance students selected older limpets on sheltered shores.

4. A student investigated fat as an insulator:
- he used two thermometers
 - he wrapped fat around one thermometer
 - the other thermometer had no fat wrapped around it
 - he left both thermometers in a freezer set at $-20\text{ }^{\circ}\text{C}$.

The drawing shows the two thermometers before being put in the freezer.

The table shows his results.



	Temperature before placing in freezer in $^{\circ}\text{C}$	Temperature after being in freezer in $^{\circ}\text{C}$
Thermometer with no fat	20	-20
Thermometer wrapped in fat	20	7

- (a) Which idea was the student testing in this investigation?
- 1 Animals that live in the Arctic are better insulated.
 - 2 Fat reduces heat loss.
 - 3 The thicker the layer of fat, the better the insulation.
 - 4 Animals with fat can survive lower temperatures.
- (b) The student wanted to calculate the rate of temperature change of the two thermometers. To do this, he would also need to measure . . .
- 1 the temperature of the room.
 - 2 the mass of the piece of fat.
 - 3 the length of time that the thermometers were in the freezer.
 - 4 the temperature of the freezer.
- (c) A scientist decided to investigate whether there was a link between where polar bears live and the thickness of their body fat. To obtain reliable results, the scientist should survey . . .
- 1 polar bears of the same age.
 - 2 polar bears and brown bears.
 - 3 only polar bears living in the coldest temperatures.
 - 4 polar bears at different times of the year.
- (d) Which one of the following would you expect the scientist to find in this survey?
- 1 There is no link between thickness of body fat and environmental temperature.
 - 2 Lower environmental temperatures cause polar bears to put on weight.
 - 3 The colder the environmental temperature, the thicker the layer of fat.
 - 4 The warmer the environmental temperature, the thicker the layer of fat.

Unit B1, B1.4.1

5. Students investigated competition between cress seedlings.
- Five dishes of different widths were filled with soil to the same depth.
 - Six cress seeds were planted, evenly spread out, in each dish.
 - The dishes were kept in the same place in a laboratory and the seedlings were watered with the same amount of nutrient solution each day.

The height of each cress seedling was measured after ten days. The results are shown in the table.

Width of dish in cm	Height of cress seedlings in cm						Mean height of cress seedlings in cm
5	7.8	7.3	7.6	7.2	8.0	7.7	7.6
10	7.0	7.0	7.1	6.9	6.9	7.1	7.0
15	6.5	6.7	6.9	6.7	6.6	6.7	6.7
20	6.6	6.3	6.6	6.4	6.5	6.4	6.4
25	6.1	5.9	6.0	6.3	6.1	6.2	6.1

- (a) Why was the same number of cress seeds planted in each dish?
- 1 so that the results would be accurate
 - 2 in order to calculate a mean
 - 3 to make the experiment a fair test
 - 4 so that the seeds would not be overcrowded
- (b) In which dish was there the greatest range of seedling heights?
- 1 5 cm dish
 - 2 10 cm dish
 - 3 15 cm dish
 - 4 20 cm dish
- (c) Which pattern is supported by the data in the table?
- 1 The wider the dish, the taller the cress plants.
 - 2 The narrower the dish, the greater the mass of the cress plants.
 - 3 The narrower the dish, the shorter the cress plants.
 - 4 The narrower the dish, the taller the cress plants.
- (d) The main reason for the differences in the mean heights of the seedlings was competition for . . .
- 1 light.
 - 2 nutrients.
 - 3 space.
 - 4 water.