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A student did an experiment to investigate growth in plants. He took 5 seeds and planted them in some compost. They were planted outdoors within 1 square meter

Plant Number	Height (cm)				Growth rate cm/day
	Day 2	Day 4	Day 6	Day 8	
1	2.5	4.0	5.0	6.4	
2	2.0	3.5	4.5	5.6	0.7
3	1.5	2.3	3.0	3.2	0.4
4	2.5	3.5	4.2	4.8	0.6
5	0.5	0.9	1.4	1.6	0.2

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Calculate the mean growth rate per day for plant number 1. [2 marks]

6.4 / 8 [1]

WARNING : Do not add up all the numbers and divide by 4!

Mean growth rate = 0.8 [2] cm/day

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The lowest growth rate recorded by the student was for plant number 5

Give two environmental factors that may have caused plant number 5 to have the lowest growth rate

[2 marks]

Factor 1 lack of nutrients [1]; lack of water [1]; lack of minerals [1] sunlight [1]

Factor 2

TOP TIP: The 'lack of' is very important. Don't just say 'nutrients' or 'water'. you can also say too little or too much

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Suggest a factor other than an environmental one which might have caused the plant to have the lowest growth rate

[1 mark]

genes/DNA/genetics [1]

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Height of the plant may not be the best measure of growth of the plants in the experiment.

Suggest why

[1 mark]

could grow a lot but not always in height/could grow lots of leaves/grow new branches [1]

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The temperatures in the desert can reach up to 60 degrees C with the sand reaching even higher temperatures. The Sahara desert ant is well adapted to survive

Scientists describe the ants as **extremophiles**

What is meant by the term **extremophile** **[2 marks]**
animals/plants that can tolerate extreme conditions [1]; such as very high or low temperatures/pressures or salinity [1]

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Here are some facts about the ants.

- * they deliberately come out at the hottest point in the day to eat insects which have died from the heat exposure
- * they only stay out for short periods
- * they have long legs and move easily across the sand

Explain why these features help the ant to survive **[4 marks]**

hottest part of the day - reduce or avoid competition or other insects cannot tolerate high temperatures. Or hottest part of the day is when insects die [1]

short periods -reduce the amount of time they are in the heat [1]

long legs - to stay higher above the (hot) sand or so body doesn't touch the hot sand [1]

move quickly - reduce amount of time in contact with the sand [1]

TOP TIP: A big question - always important to structure your answer. In this one, the answer is broken down to explain each adaptation