Grade 7 Natural Science Worksheet

Assessment Task: Physical Sciences: measurements, mathematics

Measurement of area

Part One: Calculate the tiles needed for your classroom floor

You decide to tile your classroom floor. The tiles you want to use are 30cm x 30cm in size. How many tiles will you need to buy? Show your working out.

[15 marks]

Part Two: A caterpillar eats a leaf

Imagine that you have a pot plant growing on the windowsill. One morning, you notice that a caterpillar is busy eating the leaves of this pot plant. After two hours, you come back and see the caterpillar again – and you are quite sure that it has eaten a whole leaf while you were gone! You decide to investigate just how quickly this caterpillar is eating. You take a leaf off the plant and draw a diagram to show how big the leaf is on square paper with squares of 1 cm x 1 cm. You then place the caterpillar on this leaf and leave it for 30 minutes. You redraw the leaf after 10 minutes.
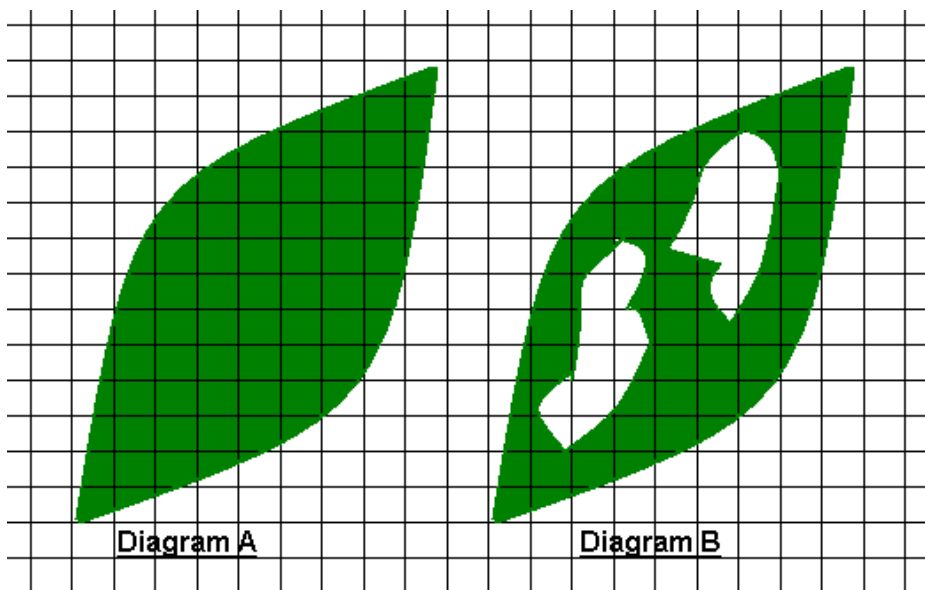
Diagram A shows the leaf before the caterpillar ate it. Diagram B shows the leaf after 10 minutes.

Diagram A

Diagram B

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1. What is the area of the leaf before being eaten? (to the nearest whole cm^2)   [2]
2. What is the area left after 10 minutes?   [2]
3. How many cm^2 have been eaten in 10 minutes?   [2]
4. What fraction or percentage of the leaf has been eaten?   [2]
5. How long would it take the caterpillar to eat the whole leaf?
   [2]
6. How many leaves could the caterpillar eat in 2 hours?   [2]
7. You give the caterpillar the amount of leaves you calculated it would eat in 2 hours. It eats less than that amount in 2 hours. Can you explain why?   [8]

[20 marks]

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Question number	Possible marks	Solution
1	15	1. Calculate the area of floor space that needs tiling. ✓✓✓✓ Divide the area into regular squares or rectangles with masking tape and measure these areas', length and breadth and then multiply them together to give you the area for each section. ✓✓✓✓ Some areas, e.g. the curves around objects, may be difficult to measure, but work in small sections, and estimate. Add all your sections together. ✓✓ 2. If each tile is 30 cm x 30 cm, then each tile has an area of 900 cm^2. ✓ 3. Divide the total floor area by 900. Your answer will be the number of tiles you need to buy. ✓✓✓✓ With a job such as tiling, where tiles could break as you cut them, and other nasty little surprises as you work, it would be wise to buy a couple more than the number that you work out – just in case!
2	20	1. About 64 cm^2 [2] remember that these are estimates and depend on the way the learners counted the squares. 2. About 47 cm^2 [2] 3. About 17 cm^2 [2] 4. 26 % [2] depending on the original figures. 5. About 40 minutes [2] 6. 3 leaves [2] 7. The caterpillar could be reaching capacity and need to rest or slough off its old skin. The time taken for the caterpillar to move from leaf to leaf could also account for a slower consumption time. [8]