Percentage change and osmosis

Biology calculations | AQA Combined Science 8464 and AQA GCSE Biology 8461 | 12 questions, 34 marks

GCSE science calculations

Scan for the solutions

Equations for this topic (cover this box to practise recalling them)

- percentage change = $\frac{\text{(final value - initial value)}}{\text{initial value}} \times 100$ learn this one
- mean = $\frac{\text{sum of values}}{\text{number of values}}$ learn this one

Name: _____ **Date:** _____ **Score:** _____ **/ 34**

1 A potato cylinder has a mass of 2.50 g. It is left in distilled water for 40 minutes. Its mass is then 2.80 g.

Calculate the percentage change in mass of the potato cylinder. (2 marks)

Answer _____

2 A carrot cylinder has a mass of 3.20 g. After an hour in a strong salt solution its mass is 2.72 g.

Calculate the percentage change in mass of the carrot cylinder. (2 marks)

Answer _____

3 Grace measures a beetroot cylinder before and after leaving it in a weak sugar solution.

	Before	After
Length in mm	30	31
Mass in g	1.60	1.84

Calculate the percentage change in mass of the beetroot cylinder. (2 marks)

Answer _____

4 A slice of apple has a mass of 2.4 g. After 30 minutes in a concentrated sugar solution, its mass is 2150 mg.

Calculate the percentage change in mass of the apple slice. Give your answer to 3 significant figures. (3 marks)

Answer _____

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5 A small disc of cucumber has a mass of 850 mg. It is placed in distilled water. Later its mass is 1.02 g.

Calculate the percentage change in mass of the cucumber disc.

(3 marks)

Answer _____

6 Kwame repeats his osmosis experiment four times with potato cylinders in the same salt solution.

Repeat	1	2	3	4
Percentage change in mass	−6.4	−6.8	−2.1	−6.6

Repeat 3 is anomalous.

Calculate the mean percentage change in mass. Do not include the anomalous result.

(2 marks)

Answer _____

7 A radish slice has a mass of 3.50 g. In distilled water its mass increases by 8%.

Calculate the mass of the radish slice after it has been in the water.

(2 marks)

Answer _____

8 A piece of sweet potato loses 20% of its mass in a salt solution. Its final mass is 2.24 g.

Calculate the mass of the sweet potato before it was put in the solution.

(3 marks)

Answer _____

9 Five potato cylinders are weighed together. Their total mass is 6.20 g. After a day in a strong sugar solution, the percentage change in their total mass is −15%.

a. Calculate the mass the cylinders lost.

b. Calculate their total mass at the end.

(3 marks)

Answer _____

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10 Aisha puts cubes of swede into sucrose solutions of different concentrations. Each cube has a different starting mass. Her results are in the table.

Concentration in mol/dm^3	Mass before in g	Mass after in g	Percentage change in mass
0.0	2.40	2.76	+15.0
0.2	2.20	2.31	+5.0
0.4	2.60	2.47	
0.6	2.50	2.25	−10.0

a. Calculate the missing percentage change in mass for 0.4 mol/dm^3.

b. The percentage change goes down evenly between 0.2 mol/dm^3 and 0.4 mol/dm^3. Estimate the concentration of sucrose solution that would give no change in mass.

Show your working.

(4 marks)

Answer _____

11 Amara writes her results like this.

Mass after 45 minutes in g	Mass at the start in g
3.06	3.40

a. Calculate the change in mass.

b. Calculate the percentage change in mass.

Show your working.

(3 marks)

Answer _____

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12 Ravi compares potato and sweet potato in distilled water.

Tissue	Mass at the start in g	Mass at the end in g
potato	1.85	2.03
sweet potato	2.60	2.79

Ravi says: "The sweet potato gained more mass, so it took in water faster."

a. Calculate the percentage change in mass of the potato. Give your answer to 2 significant figures.

b. Calculate the percentage change in mass of the sweet potato. Give your answer to 2 significant figures.

c. Which tissue had the larger percentage change in mass?

Show your working.

(5 marks)

Answer _____

End of questions | Total 34 marks

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