KS3 Emergency closure work

Maths

You have access to Sparx Maths, which is the online platform you complete your homework on. If you are behind on your compulsory homework which is set each week by your maths teacher you must firstly complete this.

When all homework is completed you will find additional tasks in the 'Target' and 'XP boost' sections on the platform. These tasks allow you to revise content that has been previously taught. The sections are specifically designed to further challenge your understanding of the topics already covered in class. You can select any tasks you would like to attempt in these sections.

Science

Calculating Percentage Changes

Calculating percentage changes is important in science because it helps us compare how much something has increased or decreased in relation to its starting value. This makes it easier to understand changes and patterns.

For example, scientists use percentage changes to measure the growth of plants under different conditions, such as light or water availability. In medicine, doctors may track percentage changes in a patient's heart rate or blood sugar levels to monitor their health. Environmental scientists use percentage changes to study how quickly ice is melting due to climate change. These calculations help us make sense of data and draw conclusions about the world around us.

Instructions for Calculating Percentage Changes in Science

Percentage change is a useful calculation in science for comparing initial and final values. Follow these steps to calculate percentage change:

1. Subtract the starting value from the final value to find the change.

2. Divide the change by the starting value.

3. Multiply the result by 100 to get the percentage change.

$$Percentage\ change = \frac{(final\ value - starting\ value)}{starting\ value} \times 100$$

Example

Calculate the percentage change of a patient who has a heart rate of 75 bpm (beat per minute), which rises to 120 bpm.

$$Percentage\ change = \frac{(120 - 75)}{75} \times 100$$

Use the formula and example to solve the following practice questions (You should show your full workings).

Practice Questions

1. The mass of a chemical changes from 50 g to 75 g. Calculate the percentage increase.

2. A plant's height grows from 10 cm to 15 cm. What is the percentage change?

3. The volume of a liquid decreases from 200 mL to 150 ml. Find the percentage decrease.

4. The speed of a car increases from 60 km/h to 90 km/h. Calculate the percentage increase.

5. The population of bacteria drops from 500 to 350. What is the percentage decrease?

6. A sample's temperature rises from 25°C to 35°C. Calculate the percentage increase.

7. The weight of an object decreases from 100 g to 85 g. What is the percentage change?

8. The concentration of a solution changes from 10% to 15%. Find the percentage increase.

9. The length of a wire increases from 2 m to 3 m. Calculate the percentage increase.

10. A pendulum's swing time decreases from 5 seconds to 4 seconds. What is the percentage decrease?

11. A lightbulb's brightness increases from 800 lumens to 1000 lumens. Find the percentage change.

12. The diameter of a sphere shrinks from 20 cm to 15 cm. Calculate the percentage decrease.

13. The area of a leaf increases from 30 cm^2 to 45 cm^2. What is the percentage change?

14. The energy output of a machine decreases from 120 kJ to 90 kJ. Calculate the percentage decrease.

15. A reaction rate increases from 2.5 mol/s to 4.0 mol/s. What is the percentage increase?

16. The volume of gas expands from 1.2 L to 1.8 L. Find the percentage change.

17. A battery's charge drops from 100% to 75%. Calculate the percentage decrease.

18. The pressure in a container increases from 1.0 atm to 1.5 atm. What is the percentage increase?

19. The mass of an object decreases from 10 kg to 8 kg. Calculate the percentage decrease.

20. The pH of a solution changes from 6.5 to 7.0. What is the percentage increase in pH value?