

Part A: SI Unit Conversions

1. Convert the Following

Show your work and include units.

1. 4.5 km = _____ m
2. 3200 m = _____ km
3. 7.2 mg = _____ g
4. 0.45 g = _____ mg
5. 3.6×10^3 m = _____ km
6. 0.00045 m = _____ μm
7. 5.2×10^6 g = _____ Mg
8. 250 cm = _____ m
9. 0.0034 L = _____ mL
10. 6.8×10^{-9} m = _____ nm

Part B: Scientific Notation

1. Write in Scientific Notation

1. 45 000
2. 0.00072
3. 6 340 000
4. 0.00981
5. 120 000 000 000

2. Write in Standard Form

1. 3.4×10^5
2. 7.2×10^{-3}
3. 9.1×10^6
4. 5.6×10^{-4}
5. 8.0×10^0

Part C: The Scientific Method

1. Define the Following Terms

- Hypothesis
- Independent variable
- Dependent variable
- Controlled variables
- Qualitative data
- Quantitative data
- Theory

2. Identify the Variables

A student wants to test how fertilizer affects plant growth. They use 3 different fertilizer amounts and measure plant height after 4 weeks.

1. Independent variable: _____
2. Dependent variable: _____
3. Two controlled variables: _____

3. Experimental Design Question

Write a hypothesis for the experiment above.

Part D: Graphing and Linear Equations

1. Independent vs Dependent Variables

For each situation, identify the independent (**IV**) and dependent (**DV**) variable.

1. The effect of study time on test scores.
2. The effect of temperature on the rate of evaporation.
3. The effect of speed on stopping distance.

2. Graphing Basics

1. Which variable goes on the x-axis?
2. Which variable goes on the y-axis?
3. What does the slope of a graph represent?

3. Slope-Intercept Form

The slope-intercept form of a line is:

$$y = mx + b$$

Define:

- $m =$ $b =$

4. Write the Equation of a Line

1. A line has a slope of 3 and a y-intercept of -2 .

Equation: _____

2. A line passes through $(0, 5)$ and has a slope of -4 .

Equation: _____

5. Solve Using Line Equations

1. If $(y = 2x + 1)$, find y when $x = 4$.
2. If $(y = 3x - 5)$, find y when $x = -2$.
3. If $(y = 4x + 6)$ and $y = 22$, solve for x .
4. If $(y = -2x + 8)$ and $y = 0$, solve for x .

6. Interpreting a Real-World Graph (Challenge question)

A taxi charges \$4 initial fee plus \$2 per kilometer.

1. Write the equation in slope-intercept form.
2. Determine the slope. What does it represent?
3. Identify the y-intercept. What does it represent?
4. How much would a 6 km ride cost?

Unit 1 Science 10 Review #2 – Answer Key

1. Conversions

1. 4.5 km = **4500 m**
2. 3200 m = **3.2 km**
3. 7.2 mg = **0.0072 g**
4. 0.45 g = **450 mg**
5. 3.6×10^3 m = **3.6 km**
6. 0.00045 m = **450 μ m**
7. 5.2×10^6 g = **5.2 Mg**
8. 250 cm = **2.5 m**
9. 0.0034 L = **3.4 mL**
10. 6.8×10^{-9} m = **6.8 nm**

Part B: Scientific Notation

1. Write in Scientific Notation

1. 45,000 = **4.5×10^4**
2. 0.00072 = **7.2×10^{-4}**
3. 6,340,000 = **6.34×10^6**
4. 0.00981 = **9.81×10^{-3}**
5. 120,000,000,000 = **1.2×10^{11}**

2. Write in Standard Form

1. 3.4×10^5 = **340,000**
2. 7.2×10^{-3} = **0.0072**
3. 9.1×10^6 = **9,100,000**
4. 5.6×10^{-4} = **0.00056**
5. 8.0×10^0 = **8**

Part C: Scientific Method

1. Definitions

- **Hypothesis:** An educated guess about how something in the natural world works.
- **Independent variable:** The variable that is changed by the experimenter.
- **Dependent variable:** The variable that is measured or observed.
- **Controlled variables:** Variables kept the same to ensure a fair test.
- **Qualitative data:** Descriptive, non-numerical observations (i.e., based on your senses).
- **Quantitative data:** Numerical measurements.
- **Theory:** A well-tested explanation supported by extensive evidence.

2. Fertilizer Experiment

1. Independent variable: **Amount of fertilizer**
2. Dependent variable: **Plant height**
3. Controlled variables:
 - Type of plant
 - Amount of water
 - Sunlight
 - Soil type(Any two acceptable)

4. Hypothesis Example

Increasing fertilizer will increase plant height

Prediction: “If the amount of fertilizer increases, then plant height will increase because plants need nutrients to grow.”

(Any logical, testable statement is acceptable.)

Part D: Graphing and Linear Equations

1. Independent vs Dependent Variables

1. Study time (IV), Test score (DV)
2. Temperature (IV), Rate of evaporation (DV)
3. Speed (IV), Stopping distance (DV)

2. Graphing Basics

1. Independent variable $\rightarrow$ **x-axis**
2. Dependent variable $\rightarrow$ **y-axis**
3. Slope represents **rate of change**

3. Slope-Intercept Form

$$y = mx + b$$

- $m = \text{slope (rate of change)}$
- $b = \text{y-intercept (value when } x = 0)$

4. Write the Equation

1. Slope = 3, y-intercept = -2
 $y = 3x - 2$
2. Passes through (0,5), slope = -4
 $y = -4x + 5$

5. Solve Using Line Equations

1. $y = 2(4) + 1 = 9$
2. $y = 3(-2) - 5 = -11$
3. $22 = 4x + 6$
 $16 = 4x$
 $x = 4$
4. $0 = -2x + 8$
 $-8 = -2x$
 $x = 4$

6. Taxi Problem

1. Equation: $y = 2x + 4$
2. Slope = **2** (cost per kilometre)
3. y-intercept = **4** (starting fee)
4. $y = 2(6) + 4$
 $y = 12 + 4$
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