

EXERCISES ON GENETICS AND CHEMICAL REACTIONS FOR K.O. III

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Tolentino Tuition, Year 10 Science

2 July 2026

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EXERCISE 1

Priya is investigating the rate of reaction between a 3 cm strip of magnesium metal and three solutions containing the same acid solute at different molarities (see Table 1).

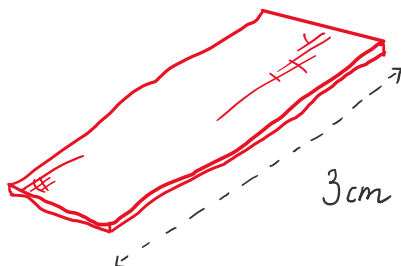


Table 1

Molarities	Hints
1.0 M	1.0 M is read as “1 molar” and means that there is 1 mole of solute dissolved for every 1 litre of solution. A “mole” is a unit of measurement used to quantify a number of atoms, molecules, or ions.
3.0 M	
0.5 M	

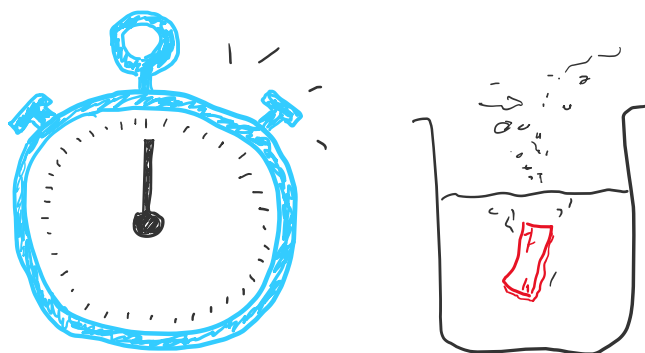
- A. What is the chemical formula for magnesium metal?
- B. Priya observes that the reaction between the 3 cm strips of magnesium metal and the acidic solutions produce the following products:

→ *Magnesium chloride + Hydrogen gas*

What was the acid solute that Priya dissolved in her three solutions?

- C. Please write a balanced chemical equation, including state symbols, for the reaction that Priya observes, for all three acidic solutions, when she places a 3 cm strip of magnesium into them.

EXERCISE 2



The result of Priya's reaction rate tests from **Exercise 1** are shown below:

Table 2

	Solution 1	Solution 2	Solution 3
Time taken for 3 cm magnesium strip to disappear (sec)	16	120	58
Molarity			

- A. Please match each molarity in Table 1 to a solution in Table 2.
- B. Please explain Priya's results using your knowledge of collision theory (3 marks)

EXERCISE 3

The DNA sequence below is a section of the template strand for Gene P:

C A C G G A T C T G A C

- A. Where within an animal cell does transcription occur?
 - i. Given your knowledge of transcription and cell structure, why do you think that transcription occurs at your answer to (A)?
- B. What is the sequence for the **second anticodon** for the complementary mRNA strand to Gene P?
- C. Calculate the percentage of the nucleotides containing the base Thymine for Gene P's DNA sequence.