

GCSE Combined Science Mixed Revision

Multiple-choice and calculation practice across biology, chemistry and physics.

Name _____ Date _____ Class _____

Learning objective: I can recall key facts and apply equations across GCSE biology, chemistry and physics.

✓ I can recall key facts ✓ I can rearrange and use equations ✓ I can explain using scientific vocabulary

1 Biology Circle the correct answer.

- Osmosis is the movement of...
☐ (A) water across a partially permeable membrane ☐ (B) glucose into the blood
☐ (C) any particle from low to high concentration
- Which organelle is the site of protein synthesis?
☐ (A) ribosome ☐ (B) nucleus ☐ (C) vacuole
- Which hormone lowers blood glucose concentration?
☐ (A) glucagon ☐ (B) insulin ☐ (C) adrenaline
- An enzyme stops working at high temperature because...
☐ (A) its active site changes shape (it is denatured) ☐ (B) it is killed ☐ (C) it runs out of substrate

2 Chemistry Circle the correct answer.

- An atom of sodium has 11 protons and a mass number of 23. How many neutrons does it have?
☐ (A) 11 ☐ (B) 12 ☐ (C) 23
- Which type of bonding is found in sodium chloride?
☐ (A) ionic ☐ (B) covalent ☐ (C) metallic
- Increasing the temperature increases the rate of reaction because particles...
☐ (A) collide more often and with more energy ☐ (B) get bigger ☐ (C) become more concentrated
- What is the test for hydrogen gas?
☐ (A) a lit splint gives a squeaky pop ☐ (B) limewater turns milky ☐ (C) a glowing splint relights

3 Physics Circle the correct answer.

- Which of these is a vector quantity?
☐ (A) speed ☐ (B) velocity ☐ (C) mass
- In a series circuit, adding another resistor makes the total resistance...
☐ (A) increase ☐ (B) decrease ☐ (C) stay the same
- Which type of radiation is stopped by a sheet of paper?
☐ (A) alpha ☐ (B) beta ☐ (C) gamma

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4 Physics calculations Show your working and give units.

- 1 A 60 kg runner moves at 5 m/s. Calculate the kinetic energy. ($KE = \frac{1}{2}mv^2$) [2 marks]

- 2 A kettle draws 10 A from a 230 V supply. Calculate its power. ($P = IV$) [2 marks]

- 3 A wave has frequency 50 Hz and wavelength 4 m. Calculate its speed. ($v = f\lambda$) [2 marks]

- 4 A block has mass 540 g and volume 200 cm³. Calculate its density in g/cm³. ($\rho = m \div V$) [2 marks]

- 5 A cell is 30 mm in an image magnified $\times 1500$. Calculate its real size in μm . [2 marks]

5 Explain

- 1 Explain why a person with type 1 diabetes needs to inject insulin. [3 marks]

- 2 Explain why metals conduct electricity. [2 marks]

Answer Key

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Question	Answers
1 Biology	1 A (water across a partially permeable membrane); 2 A (ribosome); 3 B (insulin); 4 A (its active site changes shape (it is denatured))
2 Chemistry	1 B (12); 2 A (ionic); 3 A (collide more often and with more energy); 4 A (a lit splint gives a squeaky pop)
3 Physics	1 B (velocity); 2 A (increase); 3 A (alpha)
4 Physics calculations	1. $\frac{1}{2} \times 60 \times 5^2 = 750 \text{ J}$ 2. 2300 W (2.3 kW) 3. 200 m/s 4. 2.7 g/cm^3 5. $30 \div 1500 = 0.02 \text{ mm} = 20 \text{ }\mu\text{m}$
5 Explain	1. Their pancreas does not produce (enough) insulin, so blood glucose cannot be lowered; injected insulin makes cells take up glucose / the liver store it as glycogen. 2. They contain delocalised electrons that are free to move through the structure and carry charge.

Teaching note: content is common to the main combined science specifications (AQA, Edexcel and OCR). Check your board's equation sheet; some equations must be recalled.