

Name

Date

GCSE Science: Required Practicals Quiz

Topics: Biology, Chemistry, and Physics Practicals Total Marks: 15

1. Osmosis in Potato Tissue

A student investigates the effect of sugar solution concentration on the mass of potato cylinders.

(a) State the independent variable in this investigation. [1mark]

(b) State two variables that the student must control to ensure a fair test. [2 marks]

(c) Why must the student gently dry the potato cylinders with a paper towel before weighing them? [1mark]

2. Chemistry: Rates of Reaction (Disappearing Cross)

A student investigates how temperature affects the rate of reaction between sodium thio- sulfate and hydrochloric acid.

(a) What visual change tells the student that the reaction has reached a certain point? [1 mark]

(b) Explain, in terms of particles and collisions, why increasing the temperature increases the rate of reaction. [3 marks]

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3. Physics: Stretching a Spring

A student investigates the relationship between force and the extension of a spring.

(a) Name the piece of equipment used to measure the extension of the spring. [1mark]

(b) If the spring obeys Hooke's Law, what will the force-extension graph look like? [1 mark]

(c) What term is used to describe the point where the spring no longer goes back to its original shape when the force is removed? [1mark]

4. Chemistry: Making Soluble Salts

A student makes pure, dry crystals of copper sulfate by reacting copper oxide with warm sulfuric acid.

(a) Why does the student add an excess of copper oxide to the acid? [1 mark]

(b) Name the separation technique used to remove the unreacted copper oxide from the mixture. [1 mark]

(c) Describe briefly how the student can obtain dry copper sulfate crystals from the copper sulfate solution. [2 marks]

Mark Scheme

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1. Biology: Osmosis

- (a) Concentration of the sugar/sucrose solution. (1 mark)
- (b) Any two from: Volume of solution / Temperature / Time left in solution / Starting size/shape of potato. (2 marks)
- (c) To remove excess surface water so that it does not add to the mass. (1 mark)

2. Chemistry: Rates of Reaction

- (a) The solution turns cloudy/opaque until the cross drawn underneath the flask can no longer be seen. (1 mark)
- (b) Particles have more kinetic energy/move faster (1 mark). This causes more frequent collisions (1 mark) and more collisions have energy greater than the activation energy (1 mark).

3. Physics: Stretching a Spring

- (a) A ruler / metre rule. (1 mark)
- (b) A straight line passing through the origin. (1 mark)
- (c) Limit of proportionality (or elastic limit).(1 mark)

4. Chemistry: Making Salts

- (a) To ensure all the sulfuric acid has reacted / is neutralized. (1 mark)
- (b) Filtration. (1 mark)
- (c) Gently heat the solution in an evaporating basin to remove some water (1 mark)

Leave the saturated solution to cool and crystallize, then pat dry. (1 mark)

Total: 15 Marks