

# GCSE Science: Re-quired Practicals Quiz

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Topics: Biology, Chemistry, and Physics Practicals

Total Marks: 15

## Biology: 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. [1 mark]

(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? [1 mark]

1.

**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]**

2.

# GCSE Science Practicals (Continued)

## 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. **[1 mark]**

(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? **[1 mark]**

3.

**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]**

4.

## Mark Scheme

### 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**