Oxidation: three elements and oxygen

Teacher / technician

YEAR 10 / LESSON 64 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Recorded observations must be labelled as such. No live sulfur/hydrogen combustion or laboratory trial is authorised by this resource.

Coverage and delivery

Shared core: 2.11. Recorded evidence and molecular modelling; this activity does not instruct learners to burn elements.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklet / writing tools	1 per learner	30 sets
Projector / counter sets	Teacher display; set per pair	1 projector; 15 sets

Immediate safety

Recorded evidence only. No burning, gas generation or smelling chemicals. Keep model pieces away from mouths.

Preparation and delivery

Read alongside the student method

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1. Prepare 30 booklets and 15 counter sets. Precheck and cue three short recordings that clearly identify the reagents; use the cited RSC background to select accurate demonstrations.

2. This lesson is deliberately a recorded-evidence workshop. Remove sulfur, oxygen jars, ignition sources and hydrogen generators from its requisition. A live sulfur or hydrogen demonstration needs its own approved local procedure, not this worksheet.

3. Explain the expected observations separately from what a particular recording actually shows. Do not invite pupils to smell sulfur dioxide; it is a respiratory hazard.

4. Use 10 minutes predictions, 15 recorded evidence, 20 equation models, 10 explanations and 5 corrections. Discuss conservation of atoms and product-test evidence.

5. Magnesium oxide is basic; sulfur dioxide gives an acidic aqueous solution. Do not use a bare oxide rule to imply that all metal/non-metal oxides behave identically.

Close of lesson

• Return counters, retain corrected equations and recycle scrap paper.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- $2Mg + O_2 \rightarrow 2MgO$: two Mg and two O atoms on each side.
- $2H_2 + O_2 \rightarrow 2H_2O$. Changing H_2O to H_2O_2 changes the product, rather than balancing the given reaction.
- $S + O_2 \rightarrow SO_2$; sulfur dioxide.
- Each element combines with oxygen; gain of oxygen is oxidation in this context.
- Appearance is nonspecific; known reactants and supporting product tests are needed.
- MgO is basic; H_2O is not an acidic oxide. None of these reactants contains carbon, so carbon dioxide is not their combustion product.

References and provenance

Pearson Chemistry specification

RSC elements reacting with oxygen

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.