



Components

	NAME	DESCRIPTION	AUDIENCE
	<i>Oxidation</i> teacher guide	This guide explains how students explore reactions of organic and inorganic substances with oxygen. It also contains instructions for an investigation on combustion.	teachers
	<i>Exploring combustion</i> procedure sheet	Students investigate combustion reactions. They identify reactants and products, and observe that mass is conserved in chemical reactions.	students

Purpose

Students Explore factors involved in combustion, and address some common misconceptions.

Outcomes

Students:

- understand combustion is a type of chemical reaction;
- understand reactions create new products from reactants;
- identify oxygen as a reactant, and water and carbon dioxide as products, in combustion of organic materials;
- understand that mass is conserved in chemical reactions;
- observe that metals can also burn and react with oxygen to produce metal oxides;
- realise that energy is required for a reaction to begin, and is produced by combustion reactions;
- understand that combustion is one type of oxidation reaction, which occurs rapidly and produces energy;
- write word equations; and
- plan and conduct an investigation in which they apply their knowledge of combustion to a real-life scenario.

Activity summary

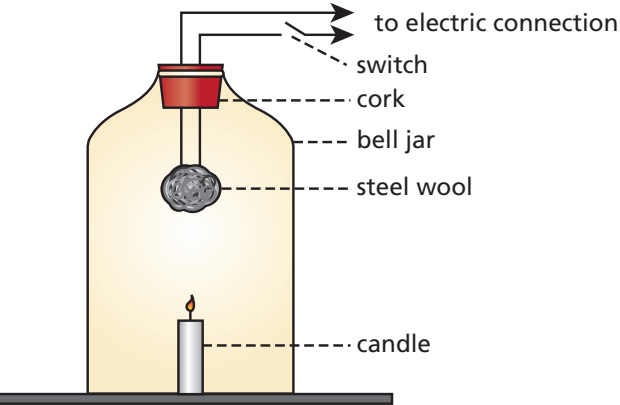
ACTIVITY	POSSIBLE STRATEGY
Students work through the procedure sheet, <i>Exploring combustion</i> . Some parts of this procedure involve teacher demonstrations, as outlined in Notes on demonstrations in Teacher notes below. Teachers should stop students at the appropriate times to show these demonstrations. Procedures should be carried out in the order shown in the procedure sheet. This may take more than one lesson to complete.	whole class and small groups
Discuss student answers to questions in the procedure sheet, <i>Exploring combustion</i> .	whole class
Students work in small groups to perform an investigation. See Investigating combustibility in Teacher notes below. Students will need background knowledge of three regions of Western Australia before attempting this investigation. They can access this through the learning object, <i>Exploring Western Australia</i> , that forms part of <i>Bushfire science 2: Exploring ecosystems</i> .	small groups

Teacher notes

Defining combustion

There are a variety of definitions for combustion throughout science literature. In this sequence, combustion is defined as an oxidation reaction that occurs rapidly and produces energy. Using this definition, respiration is classified as a combustion reaction.

Notes on demonstrations

<p>Part G Burning steel wool Take care —steel wool will become hot.</p>	
<p>Part H Burning steel wool without oxygen This demonstration requires the use of a power supply to heat steel wool electrically.</p> <p>Equipment</p> <ul style="list-style-type: none">• steel wool• power supply and leads• glass bell jar with stopper incorporating leads with alligator clips• petroleum jelly for seal with glass sheet• candle and matches <p>Procedure</p> <ul style="list-style-type: none">• Set up equipment as shown below (do not connect power supply).• Light candle.• When candle has stopped burning, connect power supply to pass electricity into steel wool and observe.	
<p>Part J Reaction of other substances with oxygen The combustion of the substances in the following equipment list may be demonstrated, but care should be taken with magnesium.</p> <p>SAFETY NOTE: Students must be warned not to look directly at burning magnesium as the very bright light can damage eyes.</p> <p>Equipment</p> <ul style="list-style-type: none">• small lump of calcium• small strip of copper• strip of magnesium• metal tongs• Bunsen burner• balloon containing hydrogen• string• taper stuck on metre ruler• matches <p>Method</p> <ul style="list-style-type: none">• Hold each piece of metal in Bunsen burner flame, one at a time, using metal tongs. SAFETY NOTE: Do not look at magnesium directly while it is burning.• Observe flame colour and changes in appearance of the pieces of metal.• Anchor hydrogen balloon with string to a secure place then hold lit taper to it, being careful to stand back. Beware loud ignition. Students may wish to block their ears.	

Associated SPICE resources

Bushfire science 3: Oxidation may be used in conjunction with related SPICE resources to teach aspects of biodiversity and oxidation.

DESCRIPTION	LEARNING PURPOSE
<i>Bushfires (overview)</i>	
<p><i>Bushfires 1: Fiery failures</i></p> <p>A lighthearted look at four environmental catastrophes through history brings out common connections with fire and combustion.</p>	Engage
<p><i>Bushfires 2: Exploring ecosystems</i></p> <p>Students use sampling techniques to investigate a local ecosystem, and an interactive learning object to explore biodiversity in contrasting Western Australian ecosystems.</p>	Explore
<p><i>Bushfires 3: Oxidation</i></p> <p>Students investigate combustion and other oxidation reactions.</p>	Explore
<p><i>Bushfires 4: Fire in Western Australia</i></p> <p>Students use an interactive learning object to examine effects of fire on three Western Australian ecosystems.</p>	Explain
<p><i>Bushfires 5: Oxidation and combustion</i></p> <p>Students use an interactive learning object to visualise oxidation reactions at a molecular level.</p>	Explain
<p><i>Bushfires 6: Fire stories</i></p> <p>Students read three interactive stories about human use of fire and its consequences in different parts of Western Australia.</p>	Elaborate