Weeks 1-3: Atoms and Elements

Week 2: Chemical reactions

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Lesson 3
Describing reactions
Unit 8E.5

Objectives
To be able to write word equations to illustrate chemical reactions.

To be able to identify which elements are in compounds

Resources
8E.f.2 - Traffic light statements
Pages 58-59
Practical equipment (see *Notes to the teacher*)
Plasticine and matchsticks or cocktail sticks for making models

Homework Resources
8E.f.3M - Homework
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Starter
Ask your teacher to read the statements from Worksheet 8E.f.2. Put your thumb up if the statement is true or down if it is false.

Main Activity

- Read the section at the top of *page 58*. Use the cards supplied to reconstruct the word equation for yourself, making sure you understand what are the reactants and what are the products. Do question 1 on *page 59.*
- With your teacher, you are going to carry out some reactions of elements. Record your observations in a table:

	Reactant 1	Reactant 2	Product
Name			
Appearance			

- Try to write word equations for the reactions you saw. Remember your work from last lesson about drawing atoms and molecules and for each word equation draw diagrams of the atoms and molecules involved (like the ones on *page 59*). If you like, you can also make plasticine models of the molecules like you did in the last lesson.
- Add the reaction between sulphur and oxygen to your results table; it is shown on *page 58.* (You can't do this at home because sulphur dioxide is a poisonous gas.)
- Do questions 2 and 3 on *page 59.*
- **Keep your notes on the experiment and answers to the questions to send to your tutor** after you have completed the end of unit test in Week 6. You might want to fill in your comments on the assignment sheet now.

Plenary
Write a poem about atoms, elements compounds mixtures or molecules. Use this structure:

Reaction
Chemical change
Makes new substances
Fizz for frothy foam

Homework
Complete Worksheet 8E.f.3M.
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Notes to the teacher

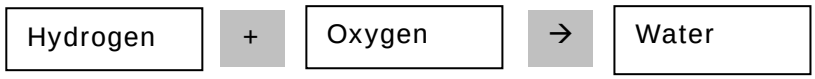
Week 2

Lesson 3: Describing reactions

This lesson is based on *pages 58-59* in the textbook. It is important to do the practical work, if at all possible and to work slowly through the lesson, allowing the student plenty of time to make his own suggestions. These are demanding concepts; if the student has problems visualising what is happening, then spend lots of time making models and relating them to the reactions you do.

Starter
This is a chance to review earlier work. Read the statements one by one; try to make this a fun activity. You could ask the student to stand up if the statement is true, or to move to one side of the room.
Answers to Worksheet 8E.f.2: F, F, T, T, T, F, T, T, F, T. Give the right answer after each one.

Main Lesson
This builds directly on the previous lesson, the first activity reviews the theory and vocabulary needed later in the lesson and introduces the idea of a word equation. Make sure the student understands the words 'reactants' and 'products'. Make simple cards (one word on each card) for him to assemble like this:



REACTANTS PRODUCTS

Equipment Required

From the home	Supplied by WES
Charcoal or carbon	Magnesium strip (from Chemistry set)
Steel wool	Safety glasses
	Metal tweezers
	Copper strip

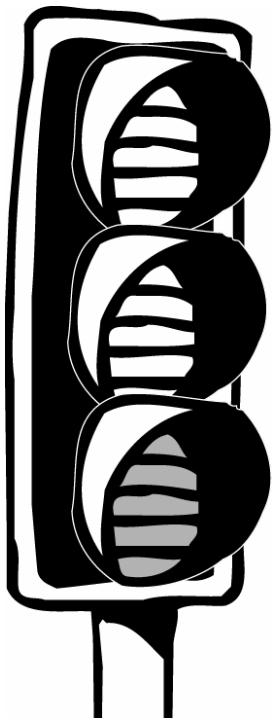
You will need to decide for yourself which of these suggestions for practical work you can do safely and comfortably. Try to do at least two.

Start by burning carbon, either on a fire or by holding a small piece in a gas flame on the cooker. Make sure you wear safety specs and have a heatproof surface to put the carbon down on when you have finished. The student should note the appearance of the carbon. It is reacting with oxygen (a colourless gas) in the air to make carbon dioxide (another colourless gas!) This is an example of two elements reacting together to make a compound.
Note this down and do the word equation for this reaction, making and drawing models of the molecules and reviewing how carbon dioxide is named (the 'di' bit means that there are 2 carbon atoms).

You could also burn steel wool (holding it in a flame with tweezers). Alternatively, use the strip of copper metal that comes with the science kit. Show that the black powder is NOT SOOT by heating another metal strip. You can hold the metal strips in tongs or tweezers in a gas flame on the cooker. BE VERY CAREFUL!!! EMPHASISE THAT THE STUDENT SHOULD NOT DO THIS BY HIMSELF. Both of these react with oxygen to make the oxide. (Iron oxide is rust; copper oxide is a black powder.)

Then go on to burn magnesium ribbon. This is another element reacting with oxygen. Ask the student to predict the name of the compound formed. Magnesium burns violently with a brilliant white light. DO NOT LOOK DIRECTLY AT THE LIGHT. Wear safety specs and look out of the corner of your eyes. Make sure the student understands the dangers of burning magnesium and is not tempted to repeat this experiment when unsupervised!

Traffic light statements



1 A compound contains only one type of atom.

2 The symbol for Potassium is P.

3 Hydrogen atoms go around in pairs – this is a molecule.

4 The symbol for chlorine is Cl.

5 When magnesium burns in oxygen, it forms magnesium oxide.

6 In a word equation, the substances on the left-hand side are called the products.

7 Carbon dioxide is an example of a compound.

8 The person who thought up the periodic table was Mendeleev, a Russian scientist.

9 Mercury and water are the only liquids in the periodic table.

10 A molecule formed when two atoms of chlorine join together is still called chlorine.