

Teacher and technician notes TC1.15  
Lesson reference: C1.15 Burning dilemmas

Book links: Page 118  
Specification links: C1.4.3 a, c, d

## Burning dilemmas

### Equipment required per group:

#### Starter demonstration

Two boiling tubes  
Glass funnel, 6 cm diameter  
Rubber bungs with two holes to fit boiling tubes, and fitted with glass tubing (see diagram)  
Glass tubing (see diagram)  
Filter pump  
Three retort stands and clamps to support apparatus  
Nightlight candle  
Blue cobalt chloride paper (**toxic**)  
Freshly made limewater, about 20 cm<sup>3</sup>

**Student activities AC1.15.1 Burning dilemmas – acid rain, AC1.15.2 Burning dilemmas – acid rain and AC1.15.2 Burning dilemmas – killer gas**

Student book

Access to the Internet

**Student activities AC1.15.4 Burning dilemmas – summary**

Summary sheets produced by other student groups during their earlier research activity

### Controlled Assessment:

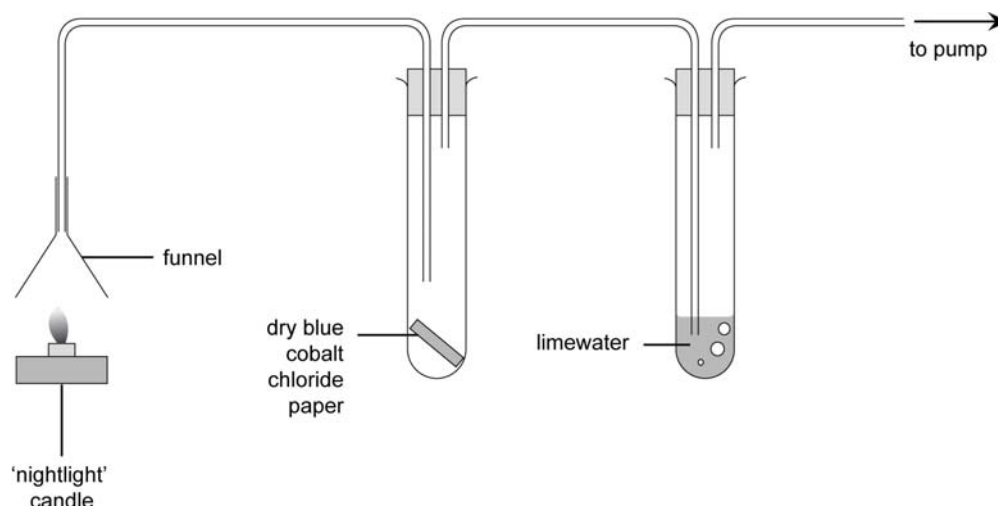
SA4.5.4

### Health and Safety notes:

- Wear eye protection for the demonstration.

### Starting off

#### Demonstration





- 1 Set up the apparatus as shown on the previous page, ideally before the lesson.
- 2 Place cobalt chloride paper and limewater in the boiling tubes, as shown.
- 3 Turn on the pump to draw a stream of air gently through the apparatus.
- 4 Light the nightlight. After a few minutes, the cobalt chloride paper turns pink, indicating the presence of water. The limewater becomes milky, indicating the presence of carbon dioxide.
- 5 Elicit that the demonstration shows that candle wax (a mixture of hydrocarbons) burns to make carbon dioxide and water vapour. Soot may also be visible on the inside of the funnel.

### Main ideas

**Student activities AC1.15.1 *Burning dilemmas – acid rain*, AC1.15.2 *Burning dilemmas – acid rain*, AC1.15.2 *Burning dilemmas – killer gas* and AC1.15.4 *Burning dilemmas – summary***

- Give out Student activities (AC1.15.1, AC1.15.2, and AC1.15.3) *Burning dilemmas*, so that a third of the pairs tackles each topic. Keep the groups focused so that they produce a summary sheet of their findings at least ten minutes before the end of the lesson.
- Display the summary sheets they produce, ideally keeping those of the same topic together.
- Give each student a copy of Student activity (AC1.15.4) *Burning dilemmas – summary*. They use the summary sheets displayed to help them fill in the table.

### Homework opportunities

#### Homework task HC1.15.1 *Burning dilemmas*

This is an opportunity for students to study in greater detail one of the topics that they did not research during the lesson.