


| Learning areas:  | science health and physical education   | Key competencies:  | relating to others participating and contributing   |
|--|---|--|---|
| <b>Science</b>   |   |  |   |
| <b>Strand</b>  | <b>Achievement objectives*</b>  | <b>Learning outcomes</b>   | <b>Suggested activities for teaching and learning</b>   |
| Material World: <ul style="list-style-type: none"> <li>Chemical reactions.</li> </ul>                          | Students can: <ul style="list-style-type: none"> <li>identify the different ways in which materials can undergo permanent or temporary changes and relate these changes to everyday situations (Levels 3 and 4).</li> </ul>                                 | At the end of these activities, students will be able to: <ul style="list-style-type: none"> <li>explain what fire is and why it is dangerous</li> <li>understand how and why fire can spread</li> <li>demonstrate their personal knowledge and experience of fire.</li> </ul>   | <b>Topic</b><br><b>Description</b> <ul style="list-style-type: none"> <li>What is fire? Definition of fire, see page 3</li> <li>Fire triangle game on the blackboard</li> <li>How fast does fire spread? Photographs of a fire in a house showing the speed of fire, page 3</li> <li>A firefighter's story Questions and answers with a career firefighter, page 3</li> <li>Candles Photocopiable fact sheet, page 5</li> <li>Fireworks Photocopiable fact sheet, page 6</li> <li>Discussion question Is fire a living thing? Make analogy with people, animals and plants – they need the right balance of heat, food and oxygen to survive, otherwise they will die.</li> </ul> |
| <b>Health and physical education</b>   |   |  |   |
| Personal Health and Physical Development: <ul style="list-style-type: none"> <li>Safety management.</li> </ul> | Students can: <ul style="list-style-type: none"> <li>identify risks and their causes and describe safe practices to manage these (Level 3)</li> <li>access and use information to make and action safe choices in a range of contexts (Level 4).</li> </ul> | At the end of these activities, students will be able to: <ul style="list-style-type: none"> <li>recognise potential fire hazards in the home and school and take appropriate action to eliminate or minimise them</li> <li>describe safe behaviour with candles and fireworks</li> <li>recognise that fires can have long-term consequences and effects on people's lives.</li> </ul> | Identifying common causes of fire in the home and in the classroom <ul style="list-style-type: none"> <li>Spot the potential fire hazard Game, page 10</li> <li>Reducing the risk of fires at home Take home activity – fire safety check for the home with follow-up class post box activity, page 10</li> <li>Media clip – Belinda's story A story on the consequences of a candle fire for a 13-year-old girl, page 11</li> <li>Media clip – Stop the home fires burning Follow a family cat around its home, pointing out the fire dangers along the way</li> </ul>   |

\* from *The New Zealand Curriculum: Draft for consultation 2006*

 = supplemented by the student CD-ROM

| Assessment suggestions   |   |                |
|--|---|----------------|
| <u>Activity</u><br>In a safe and controlled environment, the teacher puts containers of differing sizes over a flame to test how quickly the flame goes out. Students should be able to conclude that the more oxygen available, the longer the flame burns for. | <u>Activities</u><br>Observe fire and make observations<br>In a safe and controlled environment, the teacher demonstrates the hottest place in a fire by putting an ice block stick into a flame at different heights and timing combustion speeds. |                |
| <u>Assessment</u><br>Students can identify that fire needs oxygen to burn.   | <u>Assessment</u><br>Student can extrapolate safe practices in a fire based on experiments conducted.   |                |
| <b>Student self-assessment</b>   |   |                |
| Students can self- or peer-assess against set criteria. This could be done verbally or in writing.   |   |                |
| <b>Success criteria</b>  | <b>Continuum</b>  | <b>Comment</b> |
| I can recognise the three elements of the fire triangle.   | 1 2 3 4 5   |                |
| I know what to do in a fire.   | 1 2 3 4 5   |                |
| <b>CD-ROM quiz</b>   |   |                |
| Each section of the CD-ROM has a quiz to check that students understand the content.   |   |                |

## What is fire?

Fire is an uninhibited chemical chain reaction, when **fuel**, **heat** and **oxygen** are combined:

- **fuel** is the substance that can burn or is flammable, eg wood, fabric, plastic, glue, petrol, rubbish, grass, trees and people
- **heat** can be direct flame, eg open fire, lighter, candle or match, or other types of heat
- **oxygen** is supplied from the air.

The *Fire triangle game on the blackboard* on the student CD-ROM gets students to identify the three components of fire.

## How fast does fire spread?

The *How fast does fire spread?* activity on the student CD-ROM reinforces the message that fire spreads very quickly – you have less than two minutes to escape from a burning room.

## A firefighter's story

### 1. What kind of training do you need before you become a firefighter?

You not only need to be strong and fit to be a firefighter, but you need to have a fast mind that can analyse emergencies and act quickly to find a good outcome. The best tool a firefighter has is his brain.

### 2. What's it like being in a fire?

To feel like a firefighter in a fire put on 4 pairs of trousers, 4 thick woolly jumpers, 2 pairs of thick gloves, block your ears and blindfold yourself. Turn on all the heaters and run on the spot for 10mins, crawl around on the ground. Imagine that 10 times harder. That is as close as you will ever get to feeling like a firefighter in a fire. Seriously, you can't see, feel or hear. All of your senses are taken away and all you are left with is your training and fire fighting partner.

### 3. How do you fight fires?

Knowing that heat and smoke rises, we fight nearly all fires on our hands and knees and a lot of the time on our tummies. It can be over 1000 degrees in the top part of a room and 350 degrees in the middle so that leaves the bottom of the room, which is around 200 degrees - good for cooking scones but no good for people!

## Learning about fire

### 4. Is it ever scary?

Sometimes it's scary. Firefighters spend a lot of time training our bodies and minds to cope with the stress we are under in these situations. Although it's dangerous we are confident in our training and our abilities.

I have been to many hundreds of emergencies from rescuing cats from trees to people from buildings. The one thing I can say with absolute certainty about the experiences I have had is that the people I've worked with are professional and committed to serving the public to the best of their abilities. We are like a second family to each other.

### 5. What thoughts would you like to share with us in the light of your experience?

Be prepared – make sure your home has working smoke alarms, you have all practised your escape plan. Lastly, if you discover a fire or are warned of a fire in your home, shout '**FIRE! – FIRE! – FIRE!**' loudly, close the door to the room on fire then get out of the house quickly, go to the safe place where you assemble. Call the Fire Brigade from a neighbour by dialling 1-1-1.

Never, never go back into the burning house – that is our job – we have the training, the equipment and team skills to put the fire out quickly.

## **Candles fact sheet**

Many fires in the home are started by candles. We use candles to supply light in emergencies when the power is off or when we do not have electricity. Some people use candles for lighting, especially in sleep-outs or caravans not connected to a power source. We use candles for celebrating, either in rooms or on birthday cakes, and we use aromatherapy candles to produce pleasant smells in room.

Young people especially enjoy having lighted candles or aromatherapy candles in their rooms, but do not consider the fire dangers.

Some people use candlelight to read by in bed, although this is very dangerous because it is easy to set the bedding alight or forget the candle as you get sleepy.

Lighted candles cause fires by:

- being left too close to curtains or bedclothes
- setting fire to peoples' hair or clothing as they light or put them out
- burning down and setting fire to the surface on which they are sitting
- falling over and setting fire to nearby materials.

Lighted candles must always be:

- in a safe place away from:
  - paper, curtains, bedclothes or anything else that will burn easily
  - open windows with curtains and draughts that could blow them over
- in a container with a wide base so that if the candle falls over it will fall in the container and not onto something that will burn
- safe from pets or small children who could knock them over.

## **Fireworks fact sheet**

*For use on and around 5 November.*

### 20 tips for a FireWise Fireworks Night

1. Light fireworks in a wide, open area away from anything which could catch fire.
2. Stand fireworks in dirt or sand, or on a firm, flat surface.
3. Only one person should be in the area where the fireworks are being lit and should light only one firework at a time.
4. Keep your supply of fireworks well away from the area where you are lighting them, and away from heat or flames.
5. Be careful when lighting fireworks. Always have responsible adults present and don't let small children light fireworks.
6. Follow the instructions printed on each firework. Have a torch so you can read the instructions.
7. Light fireworks at arms length. Keep your body back and reach out to light a fuse. Never light fireworks in your hand.
8. Keep clear of fireworks that have been lit but have not gone off. Don't try to re-light a dud firework.
9. Keep family and friends at least 15 metres away from where a firework is being lit.
10. Never point or throw fireworks at people, pets, cars or buildings.
11. Never ignite fireworks inside.
12. Never carry fireworks in your pocket.
13. Never experiment or try to make your own fireworks.
14. Clean up after your fireworks display and make sure that all fireworks are out, and that nothing can start a fire.
15. Keep all your pets indoors and make sure that they are not frightened by the fireworks.
16. Make sure that anyone who has been drinking alcohol, or who is behaving irresponsibly does not light fireworks.
17. Have a bucket of water or a hose handy just in case something or someone gets burnt.
18. Remember that a burn is a serious injury and needs to be put under water for 10 minutes while someone dials 111 for help.
19. Do not give a sparkler to any child under 5 years old, and make sure that sparklers are not waved in people's faces. Sparklers burn at a temperature exceeding 700°C.
20. As soon as a sparkler goes out, put it in a bucket of water.

### **Identifying common causes of fire in the home**

1. Divide your class into groups of three.
2. Give each group a blank copy of the sheet (see page 9).
3. Watch the media clip *Stop the home fires burning*.
4. Run a competition to see how many of the hazard preventions the students can remember from watching the media clip.

| <b>Common causes of fires in the home</b>              | <b>What can I do to prevent this being a fire hazard?</b>  |
|--|--|
| Clothes drying too close to heater or fire             | Move clothes well away from heater or fire – use the 'metre from the heater' rule                                    |
| Curtains too close to oven or source of heat           | No curtains near oven or other source of heat  |
| Dressing gown sleeves near flames or sources of heat   | Wear close fitting clothing when cooking   |
| Electric blanket left on with heavy objects on the bed | Only have electric blankets on when warming the bed. Turn them off before you get in. Don't put heavy objects on bed |
| Lint (fluff) build-up in clothes dryer                 | Clean the lint catcher in clothes dryer regularly  |
| Overloaded power points                                | Use a multi-box. Only have a small number of plugs from any socket   |
| Faulty electric appliances                             | Get it fixed or throw it out   |
| Candles burning unattended                             | Don't leave candles burning if there is no one in the room   |
| Candles burning near curtains                          | Place candles in a safe place  |
| No screen in front of open fire                        | Use a fire screen – use the 'metre from the heater' rule   |

### **Identifying common causes of fire in the classroom**

1. Discuss the following common causes of fires in school classrooms. Ask each group to record on the blank copy of this sheet (see page 9) what they would do to prevent these causes from becoming hazards.

| <b>Common causes of fires in the classroom</b>                  | <b>What can I do to prevent this being a fire hazard?</b>                                   |
|---|---|
| Artwork too close to heaters                                    | Move artwork well away from heater or fire – use the 'metre from the heater' rule           |
| Computers left on   | Turn off computers  |
| Overloaded power points   | Use a multi-box. Only have a small number of plugs from any socket                          |
| Shoes and clothes drying in front of the heater                 | Move shoes and clothes well away from heater or fire – use the 'metre from the heater' rule |
| Students playing too close to pot-belly stoves and open heaters | Don't play within one metre of the stove or heater– use the 'metre from the heater' rule    |
| Firewood for pot-belly stoves stored too close to the stoves    | Move firewood well away from heater or fire – use the 'metre from the heater' rule          |
| Students putting firewood into stoves                           | Let only teachers or students supervised by teachers put wood into stoves                   |



**Common causes of fire in the home and classroom**

| <b>Common causes of fires in the home</b>              | <b>What can I do to prevent this being a fire hazard?</b> |
|--|---|
| Clothes drying too close to heater or fire             |   |
| Curtains too close to oven or source of heat           |   |
| Dressing gown sleeves near flames or sources of heat   |   |
| Electric blanket left on with heavy objects on the bed |   |
| Lint (fluff) build-up in clothes dryer                 |   |
| Overloaded power points                                |   |
| Faulty electric appliances                             |   |
| Candles burning unattended                             |   |
| Candles burning near curtains                          |   |
| No screen in front of open fire                        |   |

| <b>Common causes of fires in the classroom</b>                  | <b>What can I do to prevent this being a fire hazard?</b> |
|---|---|
| Artwork too close to heaters                                    |   |
| Computers left on   |   |
| Overloaded power points   |   |
| Shoes and clothes drying in front of the heater                 |   |
| Students playing too close to pot-belly stoves and open heaters |   |
| Firewood for pot-belly stoves stored too close to the stoves    |   |
| Students putting firewood into stoves                           |   |

### **Fires in specialist classrooms**

- Work with the teachers who teach in specialist classrooms such as science labs, cooking rooms and art and technical rooms.
- Ask these teachers to work with students to focus on responsible FireWise behaviour in these rooms.
- The students could identify potential fire hazards in these rooms, and the actions the teacher and the class take to eliminate or minimise them.
- Draw up some rules for FireWise behaviour in these rooms and display them, or refocus on the existing rules, identifying the reason for each rule and the possible consequences if someone is irresponsible and ignores them.

### **Spot the potential fire hazard**

This activity is available on the student CD-ROM.

Ask the students to identify as many potential fire hazards they can see in each picture and describe how to eliminate them.

### **Reducing the risk of fires at home**

Conduct an anonymous post box exercise where students check the safety of the rooms in their homes.

- Have students review the student CD-ROM for information on the most common causes of fires in key areas of the house.
- Ask each student to go home and assess their lounge, kitchen, bedroom and outside their house for fire hazards. Writing each room's assessment down on a separate sheet of paper, have students write down the potential fire hazards they found for each room, what the hazards were and what they did/could do to eliminate them.
- In the classroom, have the students post their answers in boxes or envelopes marked LOUNGE, BEDROOM, KITCHEN, OUTSIDE THE HOUSE
- Collate all the results into graphs or charts.
- Draw some conclusions from your results.

## **Belinda's story**

This section is focused around a short film clip. *Belinda's Story* is about a 13-year-old who was badly burnt in a fire caused by the candle she had lit to read by in bed.

It is a graphic account of the personal consequences of fire, and is included with Belinda's permission because she wants others to be aware of the consequences of being irresponsible around fire.

The film clip can also be used to discuss young people's acceptance of people who look different.

### ***Belinda's Story: an introduction***

Before showing the video clip, please introduce it to your class by making these points:

1. *Belinda's Story* is about a young person who every day faces the consequences of not acting responsibly around fire. Belinda fell asleep in bed reading with a candle that caused a fire in which she was severely burned.
2. She has decided to tell her story so that other young people might realise how being casual or careless around fire could change their lives forever.
3. Belinda was disfigured from the burns she received, and faces many more painful operations. She says that many of the friends she had at school before the fire don't want to be with her now.
4. Belinda did not believe this could happen to her, she knew not to use a candle in bed, but she liked to read by candlelight. She can never go back to the life she enjoyed before the fire.
5. She would like you all to think before you are irresponsible with fire, or take risks with candles, lighters or matches.

Post-viewing discussion starter questions:

1. Ask your students to imagine what it is like to be Belinda.
2. Discuss why some of her friends find it hard to be with her.
3. What challenges do you think Belinda will face as a result of the fire?