

out&about

School grounds focus:

- Where are we now?
- Where do we want to be?
- How can we get there?
- Making the changes
- Using your grounds

Curriculum focus:

- Science
- PSHE

Purpose of this activity:

- To explore the process and products of combustion
- To understand wood as a source of energy
- To understand how heat energy can be controlled and used as a tool
- To promote awareness of fire hazards and safety procedures

Equipment/materials needed:

- Sticks and twigs
- Stones
- Matches
- Nightlight
- Glass jars
- Tin can
- Aluminium foil pie dish
- Potatoes
- Sawdust
- Wood shavings
- Long-handled tongs
- A dozen eggs

Preparation:

- Talk about how the wood from a felled tree or fallen branch is also an energy store, the end result of the tree's many years of life and growth: energy from the sun locked up in the chemical constituents of the living tissue. Burning the wood releases the energy in the form of heat and light.
- Discuss various ways of starting a fire – for example, rubbing sticks together, stones, friction, sparks, matches. Talk about the need for heat, fuel and oxygen when starting a fire.
- Demonstrate the fact that if there is no air the fire cannot start – light a nightlight and then reduce the

air supply by covering it with an inverted jar. Cutting off the air supply effectively douses the fire.

- Discuss the products of combustion: heat, smoke/fumes/gas, ash and charcoal.

What to do:

- Prepare a sheltered fireplace by surrounding a small area with one or two layers of stones or bricks.
- Lay and light a small fire from wood materials and products only. Start with the most flammable materials. Light them with care.
- Once the fire is started adjust the air supply by the strategic opening of gaps between the stones or bricks. To see what happens when extra air is introduced, blow or use bellows.
- After burning well, let the flames die down. The embers will now be at their hottest. Using the long-handled tongs carefully place a can, half-filled with water, on stones or bricks in the embers and get the water to boil.
- When the embers start to fade, wrap some small potatoes in aluminium foil and put them in the ashes to cook.
- To put out the fire, cut off the air supply by covering with soil or sand.
- Using a thermocouple thermometer take and record (using the sheet overleaf) the temperature of the ashes at intervals during the next 24 hours. The effect of the changes in temperature can also be investigated by cooking an egg at varying intervals.

Extensions:

- Get the pupils to write a short account of this experiment, explaining the use of air to control fire.
- Examine the ashes when they are cold (air temperature). Try using any charcoal found to draw a picture.
- Research and discuss sources for cooking today, around the world.
- Invite a forester to talk about controlling forest fires.

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