

## FIFTH AND SIXTH - HEAT

### Teacher Guidelines:

- Exemplar 43 pp.128-129

### Linkage:

- Living Things: Myself - using senses; Plants and animals
- Materials and change - p 123 – effects of heating and cooling
- Properties and characteristics of materials – materials that keep us warm

### Integration:

- Geography: Natural Environments – Weather
- Oral Language Development – English and Gaeilge
- Visual Arts
- SPHE – safety
- Maths – measurement

### Content Objective:

**EXPERIMENT WITH A RANGE OF MATERIALS TO ESTABLISH THAT HEAT MAY BE TRANSFERRED IN DIFFERENT WAYS**

*Through water, metals or air*

### Some suggested activities:

See below

### Some suggested investigations:

- Which spoon should I use for stirring? (blobs of butter on a wooden ruler, a metal ruler and a plastic ruler all submerged in warm water – heat is transferred better through metals than through other materials – teacher demonstration)

### Content Objective:

**RECOGNISE A VARIETY OF SOURCES OF HEAT**

*Renewable sources (eg solar energy, heat from burning of bio mass) Non renewable sources (eg heat from burning of fossil fuels)*

*Friction in mechanical movement*

**Some suggested activities:**

- Solar Heat: White paper, black paper, tin foil: Which piece feels warmest after an hour exposed to the sun's rays? (Caring for the environment)
- Friction as a source of heat – Poem “Grandma’s hands”
- Rub hands together 10 seconds, what happens? Repeat the experiment but this time for 20 seconds. What difference is observed by the children
- Rub your hand on the table for 10 then 20 seconds. Explain results this time
- What happens to the brake pads on a bike when the brakes are pulled for a while?

**Some suggested investigations:**

- Which heats water the best for the paddling pool- 5 plastic bottles/10 plastic bottles or 15 plastic bottles around the hose? 500ml bottles/ 2 litre bottles or 5 litre bottles – bottles acting as mini greenhouses

**Some suggested design and make:**

- A solar panel to heat water on a sunny day. (Paint the inside of a baking tray black, fill with cold water, take the temperature, cover in clear plastic, leave in the sun for an hour. Take temperature again at this stage)

**Content Objective:****KNOW THAT HEAT ENERGY CAN BE TRANSFERRED**

*In solids (conduction), In water and air (convection), From the sun (radiation)*

**Some suggested activities:**

- Heat energy can be transferred by radiation: Use a magnifier to melt a blob of butter. Feel heat from lamp on your hand.
- Conduction – blob of butter on a spoon in hot water. What causes the butter to melt and drop off?
- Heat energy can be transferred in water – 2 jars. One filled with coloured hot water, one with coloured cold water. Will they mix?
- Heat transferred in air – Plastic bottle in hot water. Put a balloon over the neck of the bottle

**Some suggested investigations:**

- Does the temperature of the water affect how much the balloon inflates?
- Which melts fastest on a metal spoon – butter, margarine or lard? (Materials and change)

- Radiation from the sun – How hot is it in parked cars?

**Some suggested designing and making:**

- Blinds to keep a car cool in hot weather

**Content Objective:**

**MEASURE AND RECORD TEMPERATURE USING THERMOMETER**

**Some suggested activities:**

- See below

**Some suggested investigations:**

- Does the wind make any difference to temperatures recorded in an area?
- What happens to the temperature when ice melts?
- Which materials are the best insulators; artificial or natural materials?
- Set up investigation with four cups each wrapped in a different material, two artificial e.g. Lycra and nylon and two natural materials e.g. wool and cotton. Take the temperature when hot water is poured in. Continue to take the temperature at 5 min intervals for 30 minutes

**Some suggested design and make:**

- A thermometer