

THIRD AND FOURTH CLASSES – HEAT

Teacher Guidelines: p 129

Linkage:

- Living Things: Myself - using senses; Plants and animals
- Materials and change – 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 – construction, design and make
- History: Local studies - Changes in the ways in which homes are heated
- SPHE
- Maths – Representation and interpretation of data (temperature)
- Digital Technology – Adobe Spark/Seesaw for oral and written explanation and showcasing

THIRD AND FOURTH CLASSES – HEAT

Content Objective:

LEARN THAT HEAT CAN BE TRANSFERRED

Some suggested activities:

1. Transfer of heat through a solid:
 - Put a metal spoon into a jar of hot tap water.
 - How does the handle feel?
 - How does it feel after 5 minutes
2. Transfer of heat through a gas (air):
 - Hang/hold strips of tissue paper above a radiator
 - Observe movement of tissue paper?
 - Why is the tissue paper moving?
 - How is it moving?
 - What can your hand feel?
 - How can it sense heat if it is not touching the radiator?

Some suggested investigations:

1. Which blob of butter will melt first?
 - Place three blobs of butter at different heights along a metal ruler
 - One end submerged in boiling water – teacher demonstration
 - Use three spoons made from three different materials e.g. plastic, wood, metal. Stick a bead to the handle of each spoon with a blob of butter/margarine. Then place the spoons in a bowl of warm water. Time how long it takes for the bead to fall off each spoon.

Some suggested designing and making:

- Hot air balloon.
- Make paper snakes. Hang half of them over a cold radiator and the other half over a warm radiator. The children should observe the difference. Snakes over the hot radiator will “dance” because of the rising warm air.
- Explore different materials and structures. Design and make structures which move in different ways.

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Content Objective:

RECOGNISE THAT TEMPERATURE IS A MEASURE OF HOW HOT SOMETHING IS

Some suggested activities:

- Use three basins of cold, lukewarm and warm water.
- Can the children predict temperature using sense of touch?
- Measure using a thermometer
- Record, discuss results.

Some suggested investigations:

- Which is the coolest part of the school?

Some suggested designing and making:

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Content Objective:

MEASURE CHANGES IN TEMPERATURE USING A THERMOMETER

Some activities:

See below:

Some suggested investigations:

- Which material is the best insulator?
- Which cup (polystyrene, ceramic, plastic) will keep my drink the hottest?
- Investigate how temperature affects plant growth.

Some suggested designing and making:

- A container for keeping drinks hot/cold

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Content Objective:

MEASURE AND COMPARE TEMPERATURES IN DIFFERENT PLACES IN THE CLASSROOM, SCHOOL AND ENVIRONMENT AND EXPLORE REASONS FOR VARIATIONS

Some suggested activities: See below

Some suggested investigations:

1. What causes changes in temperature?
 - Choose 4 different places within the school/classroom in which to measure the temperature at the same time each day for a week;
 - a sunny window,
 - a shaded window, on a radiator,
 - near a door rarely opened
 - What factors affect the results? (*fair testing*)
2. Choose 4 different places outdoors in which to measure the temperature at the same time each day for a week:
 - an area in full sun,
 - an area in the shade,
 - an exposed place
 - a sheltered place.
3. Repeat these investigations at different times of the year. Record, discuss and compare results.

Some suggested designing and making:

- A draft excluder (door snake)

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Content Objective:

UNDERSTAND THAT THE SUN IS THE EARTH'S MOST IMPORTANT HEAT SOURCE

Some suggested activities:

1. Solar Heat: White paper, black paper:
 - Leave each piece of paper in the sun's rays for an hour.
 - Using their sense of touch what do children notice about each sheet now?
 - Discuss with children the effect of having the sun as the earth's most important heat source in relation to living things all around them, e.g. plants in winter, animals hibernating and birds migrating.
2. Record and compare outdoor temperature during winter and summer.
 - At the same time observe and record growth/behaviour changes in plants and animals.
 - How does the heat of the sun affect plants and animals?
3. Observation of potted plants reaction to sunlight
 - Place maturing sunflower or other potted plant in direct sunlight
 - Observe plant as it bends toward light
 - Turn plant after first half of the day
 - Observe how plant turns again to face the sun
 - Why is this happening?

Some suggested investigations:

- Design a simple investigation to demonstrate how solar energy can be used as an energy source

Some suggested designing and making:

- A mini greenhouse for growing seeds/plants in a glass bottle/jar
- Compare seed growth to control outside the mini greenhouse
- Model solar panel

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Content Objective:

IDENTIFY WAYS IN WHICH HOMES, BUILDINGS AND MATERIALS ARE HEATED

cookers, kettles, electric radiators

Some suggested activities:

1. Discuss with children which items in their homes help to keep things/themselves warm?
 - Identify materials used for insulation.
 - Where in school and at home do we see evidence of insulation? (lagging jacket, tea cosy, double glazed windows etc)
 - If possible could children visit the boiler house
 - What temperature is the water as it leaves the boiler?
 - Will it return as the same temperature?
 - Can you follow the line of the pipes as they leave the boiler house?
 - Find the first radiator on the line.
 - Using a thermometer can you find its temperature?
 - Find the last radiator. What temperature is it?

Some suggested investigations:

- Where is the warmest place within the school building?
- How does temperature effect different materials? (the world of sport, hot/cold tennis balls)
- What materials make good insulators? (drinks containers/lunch boxes)

Some suggested designing and making:

- A tea cosy
- Tea/Coffee cup/Lunch box warmers