

THIRD AND FOURTH CLASSES – PROPERTIES AND CHARACTERISTICS OF MATERIALS

Teacher Guidelines: pp 123-128

Linkage:

- Living Things
- Materials and change - p 123 – effects of heating and cooling
- Light – materials that allow light through
- Heat – materials that conduct heat
- Magnetism and electricity – materials that are magnetic; materials that conduct electricity

Integration:

- Geography: Natural Environments – Weather
- Oral Language Development – English and Gaeilge
- Visual Arts
- History
- Maths - sorting

THIRD AND FOURTH CLASSES – PROPERTIES AND CHARACTERISTICS OF MATERIALS

Content Objective:

- **IDENTIFY AND INVESTIGATE A RANGE OF COMMON MATERIALS IN THE IMMEDIATE ENVIRONMENT**

Water, air, rock, fabrics, paper, metal, wood, plastic, food

Some suggested activities:

- Distribute paper to each group with the words water, air, rock, fabric etc. written in the centre of page. Ask the children to discuss the material in groups and make a list of things made/manufactured using this material. Compile a class chart of these. Children could draw pictures to illustrate each chart.
- Describe each material above. What does it look like, feel like, smell like? Is it a natural material/synthetic? How do you know? How can we find out? If you pour water/liquid on it do you think it will absorb the liquid? Why? / Why not?

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Content Objective:

- **RECOGNISE THAT MATERIALS CAN BE SOLID, LIQUID OR GASEOUS**

Some suggested activities:

- Give each group a selection of items. Get them to describe each material and then to group them. (The grouping will lead to a discussion on the various materials and possible grouping into Solids, Liquids and Gases)
- Get the children to brainstorm liquids they can think of. Can you pour liquids? Do they spill? What shape are they? What about sand/salt. Did they take the shape of the container? Look at these with a lens. Draw what you see. Can you pour the liquids into a pile? Can you pour sand/salt into a pile? Do all liquids pour?
- Brainstorm what a solid is. How do they differ from liquids? Do all solids have the same shape? Are all solids hard to touch? Group these solids into soft to touch/hard to touch. Push/pull the soft materials. What happens? Are they still solids? Do solids change shape and pour like liquids? e.g. flour, powder, icing sugar. See **Exemplar 42** Teacher Guidelines.
- Compare solids and liquids. What happens when you turn each one upside down? Do any materials change shape or spread about e.g. oil treacle, honey.
- Brainstorm what a gas is. Do gases smell? Always? Can you see them? Why not? Are they always colourless/dangerous? What happens to gas when it is put into a container? Have we gases in this room? What do you think? How would we find out? (Note: Safety aspect in dealing with gases.)
- How do we breathe? Where does the air go when we breathe? See **Exemplar 36** Teacher Guidelines

Some suggested investigations:

- Do all liquids flow in the same way? How can we measure the speed or flow of a liquid.
- Investigate your breathing rate before and after exercise.

Some suggested designing and making:

- An instrument to measure the strength of the wind

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Content Objective:

- **DESCRIBE AND COMPARE MATERIALS, NOTING THE DIFFERENCES IN COLOUR, SHAPE AND TEXTURE**

Some suggested activities:

- Get the children to sort a selection of objects made from the following: wood, stone, rubber, oil, sheep’s wool, silk, raw cotton, leather, gold, gemstones, steel, nylon, PVC, aluminium, paint, glass, pottery, paper, brick, plastic. Get the children to note what they notice about the colour of each one? Can you group them by colour?
- What shape is each material? Is it two-dimensional or three-dimensional? What shape does it look like? (Square, rectangle etc) Can you tessellate any of the shapes to make another shape?
- Take each material in your hand. Feel it, rub it and scrape it.

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Content Objective:

- **DISTINGUISH BETWEEN RAW AND MANUFACTURED MATERIALS**

Some suggested activities:

- Get children to sort a selection of items into two groups – raw and manufactured. Are they solids? Liquids? Or gases? What is each material used for? Why do you think this is so? Are they used in their raw state? Why? Why not?
- Can we change these materials? How? (Wood – planed, stone – sanded, oil – refined, wool – treated, dyed, processed /woven, silk/painted, cotton/spun, leather/tanned, gold /mined/ melted, gemstones/cut /polished).
- Now look at the manufactured materials. Where did these come from originally? What are they made of? Made into?

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Content Objective:

- **GROUP MATERIALS ACCORDING TO THEIR PROPERTIES**

Flexibility, transparency, magnetism, conductivity or insulation properties, strength, shape, ability to muffle sounds, perishable and non-perishable, solubility

Some suggested activities:

- Get children to sort a selection of items. Identify ones that are flexible, transparent and magnetic. Using a Venn diagram and the materials place them in sets which ones are common to 2 sets /3 sets.
- Identify the materials that are conductors / insulators of electricity. How will you test this?
- Identify the materials that will not break easily? Are they raw materials or manufactured?
- Predict which of these materials will decompose and how long you think it will take for them to do so. Record your predictions.

Some suggested investigations:

- Whether raw or manufactured materials are better insulators of sound.
- The length of time it takes various materials to biodegrade

THIRD AND FOURTH CLASSES– FORCES

Content Objective:

- **INVESTIGATE HOW MATERIALS MAY BE USED IN CONSTRUCTION**

homes and other buildings, furniture, models, structures, everyday appliances

Some suggested activities:

- Brainstorm the materials used to build your home. Why were these particular ones chosen? (Durability, transparency, waterproof, insulators, tough, flexible, non corrosive, strong, light, safe, etc). Are all homes built from the same materials?
- Look at pictures of different types of homes. How are they alike and how are they different? What about homes of long ago? Were these built with the same materials as houses today?
- Visit a newly built house in your area. Make a list of all the materials used. If you decided to make a model of it would you use the same materials? Why not?
- Look at pictures of famous buildings/bridges/motorways. Were they designed by an architect/engineer? Find out what kind of work an architect/engineer does. Look at the materials used. Are they the same/different to the materials used to build your house? What is different about them?
- Choose two appliances used in your home every day. What are they made from? Is the material natural/manufactured? How many materials are used to make these appliances? What are they used for? Where do they get their energy? Why do you think these particular materials were chosen to make this appliance?

Some suggested designing and making:

- A small desk for a doll's house.