**NATURAL SCIENCES**

**Gr. 7 -** **MATTER & MATERIALS - LESSON PLAN 1**

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| **TOPIC:** PROPERTIES OF MATERIALS | | | |
| **Sub-topic**: Physical properties of materials | | **Duration**: 60 minutes | |
| CONTENT & CONCEPTS (CAPS p22)  KEY CONCEPT:   1. **Physical properties**: the way in which a substance or material behaves (Colour, texture, cost, particles) 2. **Particles**: small pieces of something 3. **Strength**: how difficult the material is to break. 4. **Flexibility**: how much the material bends without breaking. 5. Boiling point: the temperature at which material changes from liquid to a gas. 6. **Melting point**: the temperature at which the material changes from solid to liquid. 7. **Electrical conductivity**: how easy the material let electricity to flow through it. 8. **Heat conductivity**: how easily the material lets heat move through it. 9. **Magnetism**: when a material is attracted to a magnet. | | | |
| **Specific Aims:** | Specific Aim 1: ‘Doing Science’ | | **X** |
| Specific Aim 2: ‘Knowing the subject content and making connections’ | | **X** |
| Specific Aim 3: ‘Understanding the uses of Science’ | | **x** |
| **LESSON OBJECTIVES:**   1. Learners will be able to demonstrate an understanding on using a material in suitable situation. 2. Learners will able to measure the temperature of water to the boiling point, draw accurate line graph. 3. Learners will be able to demonstrate an understanding how heat is conducted. 4. Learners will know negative impact of different materials in the environment. | | | |
| **Materials to use testing the strength and flexibility**   * Eight paperclips bent into hooks * Eight lengths of strings or elastic bands * A 1 litre plastic bottle * One litre of water * A measuring jars * Materials to test: A4 Photocopier paper, newspaper, thin cardboard, plastic shopping bag, plastic book wrap, aluminium foil, wax paper and fabric | Material required to test boiling and melting points   * Bunsen burner, retort stand, stand clamp * Iron rod * Nails * Wax * Thermometer * Beaker * Water * Kettle, spoon, mug   **Video links**:  <https://www.youtube.com/watch?v=w_IbPRNZ6ho> | | |
| TEACHING & LEARNING ACTIVITY 1   * Tape a piece of each material to a table. * Attach a paperclip hook to each piece * Fill the plastic with 100 ml of water. Tie the elastic band around the bottle and hang the bottle from the hook. Test each this way * Test again with 250ml ,500ml and 750ml of water. | **TEACHING & LEARNING ACTIVITY 2**   1. Here learners will observe how long will it take water to reach a boiling by recording temperature in every 3 minutes using a thermometer. 2. Secondly learners will observe the melting point of candle wax which is in a test tube container in glass beaker of water that will be put over the flame and record the temperature at which candle melts in hot water. 3. Lesson starts with a brief review of the previous lesson on Electrical Conductivity. 4. Teachers asks student to explain what they understand by the term heat transfer. Thereafter the video is viewed <https://www.youtube.com/watch?v=w_IbPRNZ6ho> 5. Teacher concludes by reinforcing the term Heat Conductivity. | | |
| **Results: will let the learners conclude about materials that have more strength than others.**   |  |  |  | | --- | --- | --- | | **Material** | **Amount of water it could hold before tearing** | **Strength** | | **Newspaper** |  |  | | **Thin cardboard** |  |  | | **Plastic shopping bag** |  |  | | **Aluminium foil** |  |  | | **Wax paper** |  |  | | **Fabric** |  |  | | **A4 photocopier paper** |  |  | | **Plastic book wrap** |  |  | |  |  |  |   **Teaching and learning activity 3**  Learners will be asked to use a magnet over the different materials where they will identify things that are attracted by magnetic while others will not be attracted   |  |  |  | | --- | --- | --- | | **Material** | **Attracted by magnet** | **Not attracted by magnet** | | Paper |  |  | | Money clips |  |  | | Plastic |  |  | | Candle wax |  |  | |  |  |  |   **Teaching and learning activity 4**  Learners will be asked to identify material that conduct heat and electricity as it was done in **Activity 2**  **SAFETY NOTE:** Some procedures utilize hot water and hot and/or sharp objects. Remind students to use caution when handling hot or sharp objects. | | | |
| **TEXTBOOK REFERENCES**: (Oxford Successful Natural Sciences Grade 7, page 58-63)  (Solutions for all-Natural Sciences Grade 7,99 - 123) | | | |
| **ASSESSMENT**: Learners will be asked to complete their findings in a worksheet. | | | |