Materials

Lesson plan and teacher's notes · Grade 2 Science · 1 period of 40 minutes

School	(write school name)	**Teacher**	(write name)
Date	(date)	**Class**	Grade 2
Subject	Science	**Enrolment**	Boys ___ Girls ___ Total ___
Time	40 minutes	**Topic**	Materials

Learners sort materials into solids, liquids and gases using real objects, then watch ice melt, water freeze and methylated spirit evaporate. One period of 40 minutes.

Specific outcomes

By the end of the lesson, learners should be able to:

1. Say that matter exists as solid, liquid and gas
2. Give examples of each form
3. Describe melting, freezing and evaporation from what they observe

Prior knowledge

- Learners can name common objects
- Learners know that water can be cold and hot
- Learners can walk in an orderly way around the classroom

Teaching and learning materials

- A stone, a bottle of water and an inflated balloon
- Ice cubes, a small pan, a brazier or sunlight
- A small container for the freezer
- Methylated spirit and a plate (teacher handles it)
- Chalk and board

References

Ministry of Education (CDC) Grade 2 Science syllabus and module; 25Schools learners' note: Materials.

Lesson development

Stage and time	Teacher activities	Learner activities
Hook: three objects 8 min	Show the stone, the water and the balloon with air. Ask: How can materials around us be grouped. How do they differ. Which is hard. Which can flow. Which cannot be seen but fills the balloon. Which keeps its shape. Introduce solid, liquid and gas.	Look, touch, answer and give reasons.
Examples and classroom walk 10 min	Let learners feel the stone and say what a solid does. Ask for other solids, liquids and gases. Then send groups on a short walk round the classroom to find one of each. Ask: In what state is the material. How can you tell.	Give examples, walk, find and report.
Changing state 16 min	Show an ice cube and ask for predictions. Write them on the board. Heat it gently in a pan on a brazier or put it in the sun and let learners watch it melt. Explain that a freezer turns water to ice. Pour a little methylated spirit on a plate yourself, keep learners back from fire, and ask them to check later what happened to the liquid. Say it has changed to a gas and gone into the air.	Predict, observe and say what changed.
Conclusion 6 min	Ask learners to name the three forms of matter and one change of state. Give the homework.	Summarise and copy the homework.

Teacher's content notes

Read these before the lesson. They are what you need to know, not what to copy onto the board.

Three forms of matter

Stone, water and air are examples of matter. A solid has a fixed shape and size. A liquid flows and takes the shape of its container. A gas cannot be seen easily and fills space.

Examples

Solids: book, pencil, spoon, toy. Liquids: milk, juice, cooking oil. Gases: cooking gas, steam.

Melting and freezing

A heated solid can melt and become a liquid. A liquid that becomes very cold freezes and becomes a solid.

Evaporation and safety

A liquid such as methylated spirit changes into a gas and goes into the air. Water changes to gas when heated. Take safety measures when learners do these experiments.

Questions to ask during the lesson

Question	Expected answer
The class has a stone, a glass of water and a balloon with air. The teacher asks which one cannot be seen easily but fills the balloon. (a) Which one is it. (b) What form of matter is it. (c) Name another gas.	(a) The air. (b) A gas. (c) Cooking gas or steam.
A boy puts water in a small container and places it in a freezer. The teacher asks the class to predict what will happen. (a) What will the water become. (b) What form of matter is that. (c) Why did it change.	(a) Ice. (b) A solid. (c) The water became very cold.
A girl pours milk into a cup, then into a bowl. The teacher asks the class what they notice. (a) What form of matter is milk. (b) What happens to its shape. (c) Name another liquid.	(a) A liquid. (b) It takes the shape of the container. (c) Juice or cooking oil.

Worked examples for the board

Sorting materials

Step 1: Hold up a book. Step 2: Ask if it keeps its shape. Step 3: Say yes, so it is a solid. Step 4: Do the same with water, which flows, and with air, which fills a balloon.

Melting ice

Step 1: Show the ice and say it is a solid. Step 2: Put it in the sun. Step 3: Watch it turn to water. Step 4: Say the solid melted and became a liquid.

Board plan

Write the title. Make three columns: solid, liquid, gas, with learners' examples under each. At the side write: ice melts to water; water freezes to ice; spirit evaporates to gas.

Form	Example	What it does
Solid	Stone, book	Keeps its shape
Liquid	Water, milk	Flows
Gas	Air in a balloon	Fills space

The finished board

Mistakes to expect

Learners often think	Put it right
Air is nothing because we cannot see it.	Show the balloon filled with air. Ask what fills it. Explain that a gas is hard to see but fills space.
When the spirit is gone, it has disappeared for good.	Ask what happened to the liquid. Explain that it changed into a gas and went into the air.

A liquid keeps one shape.	Pour water into two different containers. Let learners see that it takes the shape of each.

Differentiation

Learners who struggle

Use only three objects: stone, water, balloon. Ask learners to touch the stone and say hard. Let them point to the one that flows.

Learners who finish early

Ask learners to name a solid that can melt and a liquid that can freeze at home, and to say what they would see.

Hearing or visual impairment

For learners with a visual impairment, let them feel the stone, pour the water by hand and feel the air in the bag. For learners with a hearing impairment, face them, show the real objects and write solid, liquid, gas on the board.

No projector, no printing

If you have no freezer, use ice from a shop or let a cube melt in the sun. Use any small stone, a cup of water and a plastic bag filled with air in place of a balloon.

If time is short

Keep the three objects, the examples and the melting of ice. Move the classroom walk and the evaporation demonstration to the next lesson.

Evaluation

Question or task	A correct answer shows
A teacher shows a stone, a cup of juice and a balloon full of air to the class. She asks learners to group them. (a) Which one is a solid. (b) Which one is a liquid. (c) Which one is a gas.	(a) The stone. (b) The juice. (c) The air in the balloon.
Bwalya leaves an ice cube in a pan in the sun. After some time the pan holds only water. The teacher asks him to explain what happened. (a) What was the ice before. (b) What is it now. (c) What word describes this change.	(a) A solid. (b) A liquid. (c) Melting.

Homework

Thandiwe is helping her mother in the kitchen at home. She sees a plate, a cup of water and steam rising from a pot. Her mother asks her what she sees. (a) Which one is a solid. (b) Which one is a liquid. (c) Which one is a gas.

Extra practice with answers

Question	Answer

1. Mulenga sees a pencil, a bottle of cooking oil and steam rising from a pot at home. He tells his sister what he sees. (a) Which one is a solid. (b) Which one is a liquid. (c) Which one is a gas.	(a) The pencil. (b) The cooking oil. (c) The steam.
2. A teacher pours a little methylated spirit on a plate and the class waits a short time. The plate becomes dry. A learner asks where the spirit went. (a) What form was the spirit at first. (b) What form is it now. (c) What is this change called.	(a) A liquid. (b) A gas. (c) Evaporation.
3. Chileshe says that a stone, a spoon and a toy are all solids. His friend says the spoon is a liquid because it is smooth. The teacher asks the class to decide. (a) Who is right. (b) What does a solid keep. (c) Name one more solid.	(a) Chileshe. (b) Its shape and size. (c) A book or a pencil.
4. Natasha takes ice from a cooler and puts it in a bowl in the sun. The class watches for a while. She asks her teacher to explain the change. (a) What does the ice turn into. (b) Why does it change. (c) What word describes this change.	(a) Water. (b) It is heated by the sun. (c) Melting.

Answers to the learners' check-yourself questions

1. Name the three forms of matter.
   Solid, liquid and gas.
2. Which form of matter keeps its own shape.
   A solid.
3. What happens to ice when it is put in the sun.
   It melts and becomes water.
4. What do we call a liquid turning into a gas.
   Evaporation.
5. Chanda walks around the classroom and sees a desk, a bottle of water and a balloon filled with air. She tells her teacher what she found. (a) Which one is a solid. (b) Which one is a liquid. (c) Which one is a gas.
   (a) The desk. (b) The water. (c) The air in the balloon.
6. Mwila puts a little water in a container in a freezer. Later she takes it out and finds it hard. Her friend asks her what happened. (a) What did the water turn into. (b) What form of matter is it now. (c) What will happen if she puts it in the sun.
   (a) Ice. (b) A solid. (c) It will melt and become water.

Teacher's reflection

What went well:

What I will change next time:

Learners who need follow-up: