

Materials

Properties of materials; magnets; floating and sinking

God is Truth

God is Faithful

Spiritual awareness

God's truth doesn't change. In the world of man made and natural materials we see that materials have consistent properties. Glass is always glass. Wood is always wood. Diamonds are always diamonds. Sometimes there are attempts to make substitutes, to make an object look as if it's made of a particular material, but in fact it's not.

In the Christian life we need to be able to discern what is real and what is not; what is truth and what is not. In this unit of study students can test properties of materials to find out whether objects are real or substitute. In the same way we can use the Bible to test ideas to be true or not true.

Supporting devotional resource

Themes for Christian Studies 1, (Truth): God wants us to obey the truth

Themes for Christian Studies 3, (Truth): God's truth doesn't change

Biblical references

Bible stories and passages

Ephesians ch 6 – the armour of God includes the belt of truth

Daniel ch 3 Shadrach, Meshach and Abednego were faithful to the true God.

Daniel ch 6 Daniel was faithful to the true God.

Exodus ch 32 The golden calf is an example of God's people serving a false God.

1 Kings 18:1-40 Which is the true God? The God of Israel or Baal?

Memory verses

Ephesians 6:14 Stand ready, with truth as a belt tight around your waist, with righteousness as your breastplate.

Proverbs 20:23 The Lord hates dishonest scales and weights.

Malachi 3:6 "I am the Lord and I do not change."

Psalms 33:4 The words of the Lord are true, and all His works are dependable.

Outcomes

Students will

Knowledge

- Understand that materials can be from the natural world, (made by God), or man-made, (made by man from something that God made first.)
- Understand that materials have various properties that make them suitable for different uses.
- Classify materials into man-made and natural categories.

- Identify material common objects are made out of (wood, plastic, metal, glass, fabric, paper).
- Find out which materials float and which materials sink.
- Find out which materials are attracted by a magnet.
- Identify properties of wood, metal, rocks, plastics, pottery, glass, fabrics.
- Identify materials and objects that are 'pretending' to be something they are not, (substitute).

Skills

- Draw objects made of wood, plastic, metal and glass.
- Observe reactions of magnets in free play.
- Predict results of experiments with floating and sinking.
- Predict which materials will stick to a magnet.
- Make inferences about the properties of materials and magnets.
- Use their senses to classify materials.

Values

- Show curiosity
- Be keen to investigate properties of materials.
- Recognize that materials belong to categories according to their properties, and that some materials *look* like the genuine article but are not.
- Recognize the importance of standing by your word, do what you say you will do, and be faithful to the truth. (WWJD?)

Activities and Assessment

a) Classification of materials

Activities

- Collect a range of materials made from wood, metal, rocks, plastics, pottery, glass, fabrics and identify their properties using observation, prior knowledge and experimentation
- Classify materials according to natural or man-made.
- Make a chart and list the properties

WOOD: Comes from trees; Strong and flexible; Used to make paper; can float

METAL: found in the ground; sometimes mixed with rocks; strong, hard shiny

ROCKS: found in the earth; found on the beach; some are hard e.g. granite, some are soft e.g. chalk

PLASTICS: made from oil; can be coloured; strong; can be made into any shape; waterproof

POTTERY: made from clay which is shaped then heated to make it hard; strong but can shatter

GLASS: man made; can be made into different shapes; hard and can shatter; waterproof

FABRICS: made from fibres woven together; some are natural e.g. silk and cotton; some are man made e.g. nylon; they are used to make clothes

- Discuss how different properties make materials suitable for different uses
- Discuss where you might use each material and where the materials are found
- Play the 'animal, vegetable, mineral' game where someone is chosen to think of an object. Children take turns to ask this person a question with the goal of guessing the object. The questions asked must be questions that can be answered with 'yes' or 'no', e.g. "Is it animal?" "Is it vegetable?" "Is it mineral?" "Is it made of plastic?" "Is it made of metal?" etc.
- Conduct floating and sinking experiments and ask children to predict whether a material will float or sink.
- Conduct experiments to see if a material is porous or waterproof.
- Draw a picture of something made of your favourite material, and write a sentence about its properties.
- Make a model of a river using the natural things (For example, leaves for the river, seeds or twigs for trees)
- Make a model of a building using man made things. (For example, plastic blocks, cardboard boxes.)

Assessment

- Classify a selection of materials

b) Classification of objects according to materials they are made of Activities

- Make a collection of objects made from the materials covered in the first section, e.g. wooden spoon, wooden ruler, plastic unifix cube, plastic pot, metal spoon, drinks can, glass jar, glass bottle, cotton T-shirt, wool scarf, newspaper, pottery container
- As a whole class children identify what material objects are made out of. Show them different forms of the same material e.g. plastic pot and plastic bag.
- Discuss how you can't always tell by sight what an object is made of e.g. glass and plastic, and have to use other senses such as touch and sound.
- Discuss where each material comes from. Ask children to think of any other objects they can be made out of wood/plastic/metal/ glass - look round classroom for ideas.
- Show children a pair of scissors made of metal with plastic handles. Get them to identify both materials and discuss how many things are made from more than one material.
- Children can list what objects in the classroom are made from and why this is a good material to use – e.g. windows are made from glass so we can see through them.

Assessment

- Identify what material objects are made from (wood, plastic, metal, glass, fabric and paper)?
- Draw at least 3 objects made of each of these 4 different materials: wood, plastic, metal and glass

c) Magnets

Activities

- Supply a selection of different sizes and types of magnets (e.g. horseshoe, bar, ring), and a selection of objects (both magnetic and non-magnetic, made from wood, plastic and metals)
- discuss what students already know about magnets and pose questions about them. From the discussion give the children several questions to answer e.g. Does everything made of metal stick to a magnet?
- Free play - children explore a variety of different magnets and objects (both magnetic and non-magnetic) including paperclips in jars/bowls of water. Can they get the paperclip out of the water without getting their hands wet? Experiment with different kinds of metal – aluminium, copper, steel
- Ask children to draw up a table to record their predictions and findings, e.g. Will a plastic cube stick to a magnet or not?
- Use magnets to separate impurities, e.g. pencil shavings from a tin of pins; sawdust from iron filings
- Fishing game - the children use magnetic fishing rods (ring magnets tied to string) to fish for points (points written on cardboard fish with a paperclip on them) from a bowl.
- Maps - children hold a magnet under a piece of card and move the paperclip on top along the line.
- Trains - children play with a magnetic train set (magnets used to hold carriages together). See if they can move a second carriage by pushing and by pulling it with an engine, without touching the carriage themselves.
- Strength - using paperclips children find out if all magnets can hold the same number of paperclips. Are big magnets always stronger than small magnets?
- Make a magnet by stroking and magnetic induction

Assessment

Assessment cues for a rubric:

- able to use their first hand experience to answer questions
- able to sort objects into magnetic and non-magnetic
- able to predict correctly what will stick to a magnet
- able to record results in table form

d) Classification of materials according to whether they are 'real' or 'substitute'

Activities

- Collect a variety of objects that may be real or substitute such as:
 - objects made from different metals
 - real fruit and plastic imitation fruit
 - a drinking glass and a clear plastic cup
 - pieces of natural and synthetic fabrics
 - pictures of, or pieces of substitute building materials such as 'mock' bricks, 'modwood'
 - real and fake jewellery
- Use the senses as well as all the testing methods used so far to discover what the objects are really made from.

Assessment

Collect some objects that could be real or substitute, e.g. glass or plastic cup; wool or synthetic fabric; fruit or plastic fruit; rock or lump of concrete; flower or plastic flower; insect or plastic insect.

Ask the children to draw up a table to record their guess. They can write the objects down one side of the table.

Hold up a plastic cup. Ask, "Is this a glass?" They record 'yes/no'. Ask 'How do you know?'

When everyone has recorded their answer, ask a child to come and test it.

Ask the children:

What have we learned from the study of materials...

- about God?
- about doing what God wants me to do?
- about the Bible?

Link with Australian Curriculum

Science Foundation Year: Chemical Sciences – Objects are made of materials that have observable properties

Learning Connections

English: identify fiction and non-fiction

Mathematics: Which bottle holds more – the tall narrow bottle or the short wide one? Test to find out.

Social Studies: Materials in the environment and our community

ICT: Children could use a program such as *Pages* to drag scanned in items into boxes labeled wood, plastic, metal and glass

Thinking Skills: See *Creative Thinking Skills* on this web site – "Magnets" (Middle/Upper Primary).