SURFACES, LINES ON THREE-DIMENSIONAL OBJECTS.

INVESTIGATIONS OVERVIEW PAGE
THIS PAGE IS A SUMMARY OF THE INVESTIGATIONS THAT STUDENTS MAY ENGAGE IN TO DEEPEN THEIR RELATIONAL UNDERSTANDING.
NVESTIGATIONS WITH INSTRUCTIONS TO STUDENTS FOLLOW ON SUBSEQUENT PAGES.

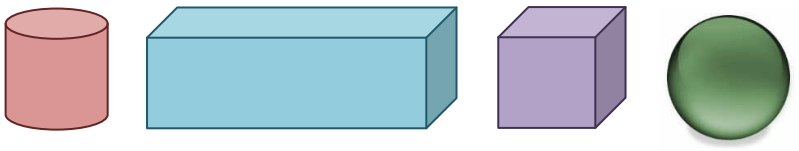
- In pairs or small groups, children have a selection of three-dimensional objects including cones, cylinders, spheres, cubes and prisms. They group them by their flat or curved surfaces. They record their groups. They group them by their straight or curved lines. They record their groups. They explain objects with flat surfaces and straight lines have faces and edges and are prisms. They explain objects with curved surfaces and curved lines are not prisms and are just curved surfaces and curved lines. Reflection: How can we describe the surfaces and lines on objects?
- In pairs or small groups, children have a selection of prisms. They describe the flat surfaces with straight lines as faces and edges. Reflection: How can we describe the surfaces and lines on objects?
- In pairs or small groups, children have a selection of non-prisms (cone, cylinder, sphere). They describe the flat surfaces and curved lines as flat surfaces. They describe the curved surface as curved surfaces. They describe the curved lines as curved lines. Reflection: How can we describe the surfaces and lines on objects?
- In pairs or small groups, children have a selection of objects. They select an object and describe its surfaces and lines. They describe the flat surfaces with straight lines as faces and edges. Theydescribe the flat surfaces and curved lines as flat surfaces. They describe the curved surface as curved surfaces. They describe the curved lines as curved lines. They record their object. Reflection: How can we describe the surfaces and lines on objects?
- In pairs or small groups, children have a bag in which an object has been placed, for example a rectangular prism, cylinder, sphere or cube. A child places their hand into the bag and describes the object, including its surfaces. The other child / children suggest what object it could be using everyday language. Reflection: How can we describe the surfaces and lines on objects?
- In pairs or small groups, children have a group of rectangular prisms, cylinders, spheres or cubes. One child describes the surfaces of one of the objects and the other child / children select it from the group. Reflection: How can we describe the surfaces and lines on objects?
- In pairs or small groups, children make models of three-dimensional objects out of modelling clay, play dough or plasticine. They draw the models and describe the surfaces and lines. Reflection: How can we describe the surfaces and lines on objects?
- Children use objects including rectangular prisms, cubes, spheres and cylinders to construct a model. They comment on which objects stack and why. In pairs, children choose 6 blocks to build a model that is taller than the models of other pairs of children. Reflection: How do the surfaces of objects help them to stack?
- Children select an object that they think will move best by rolling. Which object rolls best. Reflection: How do the surfaces of objects help them to roll?

- In pairs, children are each given straight sticks. They arrange the sticks to be parallel, horizontal and vertical. Reflection: How can we describe lines?
- Children go on a line hunt, looking for parallel, horizontal and vertical lines (and surfaces) in the room or outside. Reflection: How can we describe lines on objects?
- Children investigate lower case and upper case letters, classifying them as having straight / curved lines, parallel, horizontal and vertical lines. They could investigate just the letters in their name. Reflection: How can we describe lines on objects?

Surfaces, Lines on Three-dimensional Objects.

Sit in pairs or small groups.

Select some objects, for example,



Describe the dimensions on the three-dimensional objects as up and down, left to right, and front to back.

Describe the surfaces of the objects as flat or curved.

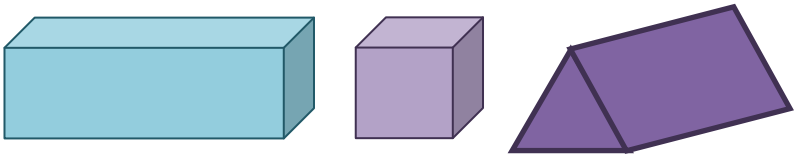
Group the objects by their surfaces and attributes, for example,

- can it stack?
- can it roll?

Reflection: How can we describe the surfaces of objects?

Surfaces, Lines on Three-dimensional Objects.

Have a selection of objects with straight lines and flat surfaces, for example,



Select an object and describe its surfaces and lines.

Is a flat surface with straight lines, a face?

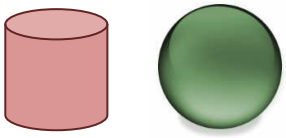
Are straight lines, edges?

Record your object.

Reflection: How can we describe the surfaces and lines of objects?

Surfaces, Lines on Three-dimensional Objects..

Have a selection of objects with curved lines and flat and curved surfaces, for example,



Select an object and describe its surfaces and lines.

Is a flat surface with curved lines, a flat surface?

Is a curved surface, a curved surface?

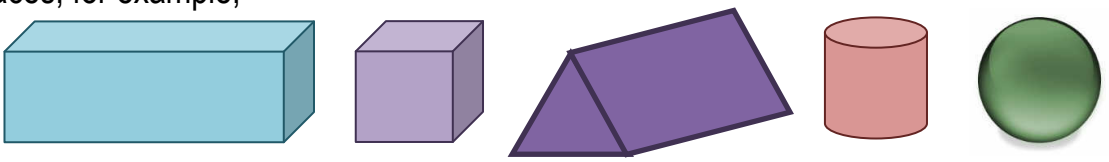
Are curved lines, curved lines?

Record your object.

Reflection: How can we describe the surfaces and lines of objects?

Surfaces, Lines on Three-dimensional Objects.

Have a selection of objects with straight lines and flat surfaces and with curved lines and flat and curved surfaces, for example,



Select an object and describe its surfaces and lines.

Is a flat surface with straight lines, a face?

Are straight lines, edges?

Is a flat surface with curved lines, a flat surface?

Is a curved surface, a curved surface?

Are curved lines, curved lines?

Which lines are vertical?

Which lines are horizontal?

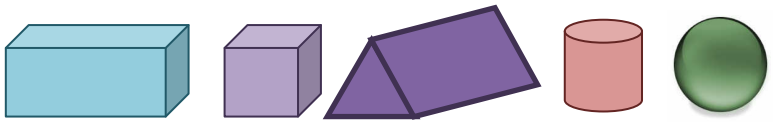
Which lines are parallel?

Reflection: How can we describe the surfaces and lines of objects?

Surfaces, Lines on Three-dimensional Objects.

Sit with some friends.

Have some objects, for example,



Have a bag.

Take turns to place an object into the bag without the friends seeing.

One of the friends places their hand into the bag and describes the object, including its surfaces and lines.

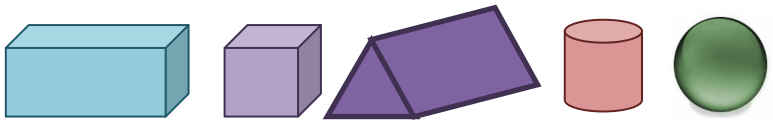
The friends suggest what object it could be.

Reflection: How can we describe the surfaces and lines on objects?

Surfaces, Lines on Three-dimensional Objects.

Sit with some friends.

Have some objects, for example,



Take turns to describe the surfaces and lines on an object, without touching the object.

The friends suggest what object it could be.

Reflection: How can we describe the surfaces and lines on objects?

Surfaces, Lines on Three-dimensional Objects.

Make models of three-dimensional objects out of modelling clay, play dough or plasticine.

Draw the model.

Describe the surfaces and lines.

Reflection: How can we describe the surfaces and lines on objects?

Surfaces, Lines on Three-dimensional Objects.

Use objects to construct a model.

Which objects did you use? Why?

Did those objects stack? Why?

Sit with a friend.

Choose 6 blocks to build a model

Make a model that is taller than other children's models.

Make a model that is shorter than other children's models.

Reflection: How do the surfaces of objects help them to stack?

Surfaces, Lines on Three-dimensional Objects.

Select an object that you think will move best by rolling.

Which object rolls best? Why?

Reflection: How do the surfaces of objects help them to roll?

Surfaces, Lines on Three-dimensional Objects.

Have some straight sticks.

Arrange the sticks to be parallel, horizontal and vertical.

Draw and label the sticks as lines.

Reflection: How can we describe lines?

Surfaces, Lines on Three-dimensional Objects.

Go on a line hunt, looking for parallel, horizontal and vertical lines) in the room or outside.

Reflection: How can we describe lines on objects?

Surfaces, Lines on Three-dimensional Objects.

Investigate lower case and upper case letters, looking for

- straight lines,
- curved lines,
- parallel lines,
- horizontal lines,
- vertical lines.

You could investigate the letters in your name.

Reflection: How can we describe lines on objects?