

## Investigating Ramps – Roll, Slide, Stay Put

*Topic: I Can Move - Ramps*

*Time: 20 min*

*Age group: 4 - 7*

### What you need

- A clear space for building ramps
- A step or stack of books for ramp height
- A flat piece of wood or plastic to act as a ramp
- A variety of objects from the classroom to test on the ramp, for example:
  - Balls
  - Pencils
  - Cardboard tubes
  - Cubes
  - Glue sticks
  - Different shaped blocks
  - Small boxes
  - Lids/bottle tops
  - Index cards
  - Erasers

### What to do

#### Set up

- Build a ramp, the ideal for this is to have one very large wide ramp or several ramps that are exactly the same height and angle.
- The ramp is made with a flat piece of wood, cardboard or plastic on top of a container/step or stack of books, the ramp should not be too steep but the steepness should be consistent across the ramps that you use.

#### Activity

- This activity involves investigating different objects and how they move down the ramps.
- Do an example demonstration of how to test different objects on the ramp and introduce the words you will be using: roll, slide, stay put.
- Introduce the different shapes of objects and the different words to describe them.
- Get the children to test different objects on one large ramp or on multiple ramps around the classroom. Ideally hand out the same objects to all children or small groups of children so that they can all discuss the same results at the end.
- Ask the children to put objects into three groups – objects that roll, objects that slide and objects that do not move. Record the results that the children/class has found using a table where objects are categorised according to whether they slide, roll or stay put when put on the ramp.
- If different group are using different objects get them to swap and try all the objects on their ramp.
- Discuss the results as a group. Which objects slide? Which objects roll? Which don't move? Note some objects will roll if put on the ramp one way and slide if another, for example pencil will roll if placed sideways but slide if placed pointing downwards.
- Pass around the objects that roll and ask the children to describe their shape and texture. Ask what is similar about all the rolling things? What about those objects that do not roll? Record their observations in the 'roll, slide, stay put' results table.



- Use this information to get the children to start developing predictions as to what will happen when they try a new object on the ramp. It doesn't matter if they predict incorrectly, what matters is that they are starting to build hypotheses based on previous information – this is the scientific method!

## The science

**Gravity** – when you drop things they fall, when you have a ramp things will move down the ramp due to the force of gravity. Gravity is a force by which a planet draws objects towards its centre, so all objects are drawn to the centre of Earth.

**Friction** – the texture of the ramp and object affects the friction of the object, friction is a type of force that opposes movement that has to be overcome in order for something to move.

**Shapes** – the shape of an object affects the kind of friction that has to be overcome, rolling friction is easier to overcome than sliding friction (which means round objects move easier!).

**Angles** – the angle we place the ramp at means it is steeper or not and therefore things will move down it easier or not.

## Science talk

### Description words

Roll, Slide, Ramp, Steep, Slope, Flat, Slanted, Round, Square, Texture, Rough, Smooth.

### Science process words

Observe, notice, compare, same, different, change, predict, test and record.

### Open ended questions

- What makes things that roll different to things that do not roll?
- What do you think will happen when we put this object on the ramp?
- What do you think will happen if we make the ramp steeper?

## Skills

Observing, predicting, recording, learning about the concepts of gravity and friction.

## Stay Safe

- Be careful if using heavy wood for ramp
- Be careful with children standing on ramps or knocking over objects

## Ways to document

Use a table as suggested above to document objects that roll, slide or stay put and observations about how these objects look/feel.

## Extending the activity

Take the activity outside and use natural ramps found outdoors, ask the children to identify these for you. Vary the steepness of the ramp and see if the results differ for the different objects.

## Other science and cross curricular links

Shapes, Textures, Building. Literacy.