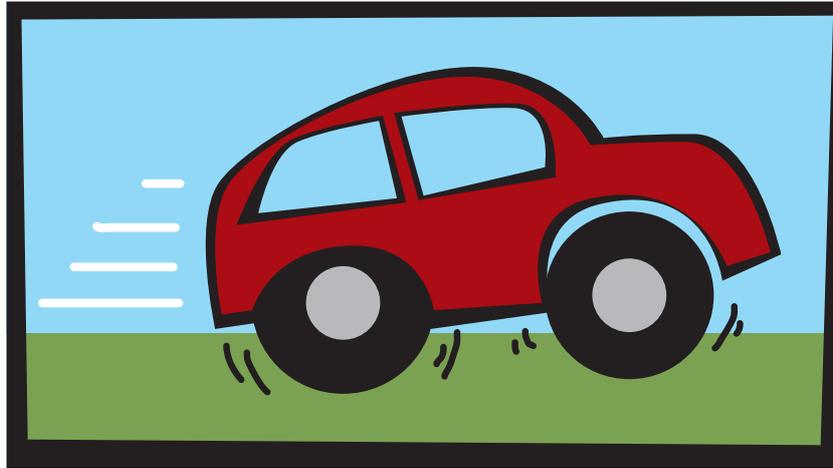


Task theme Wheels in Motion



Task title How do wheels reduce friction?

Learning outcomes

- To understand how the wheel and axle system simplifies the transportation of materials.
- To investigate and compare different sized wheels.

EHoM link



PROBLEM FINDING

Ask questions based on observations.



SYSTEMS THINKING

Identify how an object or tool breaks down into parts.

EDP link



Key Stage/Year Group KS1 – Year 2

Resources required

- Cardboard boxes
- Heavy objects to put inside the boxes
- A selection of toy vehicles with different sized wheels

How to run the task

1. Engage the children by asking them to put heavy objects inside the cardboard boxes and then try to move them along the ground by pushing or pulling the box. Discuss the problems. If appropriate, introduce the terms 'friction' and 'gravity' as forces which are impeding the progress.
2. Elicit their understanding by encouraging them to discuss the problems they have found and explain why the problem may exist. When appropriate, explain the terms 'friction' and 'gravity' forces which are slowing down the movement of the box.
DEFINITION: Friction is a force between two surfaces that are sliding, or trying to slide, across each other. For example, when you try to push a box along the floor, friction makes this difficult.
Gravity is a force which tries to pull two objects toward each other. The Earth's gravity is what keeps you on the ground and causes objects to fall.
3. Provide the children with a series of different toy vehicles to explore – if they can take them apart all the better. What helps these toys to move easily? Ask the children how they could adapt their cardboard box to make it move more easily?
4. Explain the different system components (wheel and axle) and discuss with the children what jobs they do.
DEFINITION: Wheels are simple machines that reduce the force of friction. A wheel allows an object to roll along the ground.
Axles – an axle is a rod which passes through the centre of a wheel to enable the wheels to rotate.
5. Focus the children's attention on the key features of the toys and their wheels. Does the size of the wheels make a difference to the performance of the vehicle? Using these ideas encourage the children to draw and label a sketch of their ideas. Make sure the wheels in the drawings are mounted on axles.
6. Ask the children to evaluate each other's designs. Can they make any improvements following their investigation?

Top Tips

- For homework, ask the children to research the history of the wheel and how it has evolved since it was first invented.
- In a separate session, challenge the children to build and try out their vehicle designs.

Evaluate learning

- How did people move heavy objects before wheels were invented?
- Why do we need an axle to make our wheels turn?
- Are smaller wheels or larger wheels better for moving heavy loads? Why?

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As a practising teacher, Julie has written these 12 tasks to encourage more children to engage in engineering in primary schools. They have been stimulated by real-world engineering and inspirational ideas shared by others. They are linked to the Tinkering for Learning research and development project run by SEERIH.



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