# Y5 - Forces and Magnets

# Lesson 2

| Lesson | 2 of 6 |
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| Key Unit Question: | Are there different types of forces? |
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| Key Lesson Question: | What is friction? |
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## Learning Objective

I can identify the effect of friction between moving surfaces.

## NC Links

Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.

## Resources

- Presentation
- Differentiated activity sheet (easy/medium)
- Challenge activity sheet (and answer sheet)
- Next step
- Group activity sheet
- Partner activity sheet
- Pre-assessment task sheet
- Jelly cubes and oil

## Teaching Input

- Introduce the learning objective using the title page.
- Thinking time – what is a force? Children answer this question using the pre-assessment task sheet. Encourage them to explain as fully as they can using scientific vocabulary (a list of key vocabulary can be found in the assessment pack).
- Review the children's answers and establish that a force is a push or a pull (PPT slide 3/PDF p2).
- Partner activity – display the pictures on the partner activity sheet. Ask the children to identify the forces in action by annotating the photos. Can they name any forces? (e.g. friction, gravity, air resistance). Encourage them to think about the previous lesson on gravity. Use PPT slide 5-7/ PDF p4–6 to discuss the children's initial ideas on forces in action.
- Tell the children that today they will be learning about friction as a force. Read the information on PPT slide 8/PDF p7. Ask the children to place their palms together and rub their hands – why do their hands feel hot? Ask the children if they can think of any other examples of friction (you may want to refer back to the photos on the partner activity sheet).
- Ask the children to think of an example where friction is useful (e.g. training shoes). Can they think of an example where it would be useful to have less friction? (PPT slide 9/PDF p8)
- Group activity – ask the children to predict which jelly cube will be easy to pick up. Encourage them to explain their predictions in relation to the amount of friction on each cube. Perform the experiment; which cube was hardest to pick up and why? Were their predictions correct? How does this activity link to friction?
- Introduce the independent activity.
- Plenary – review the independent activity, did they find any scenarios difficult to sort? Ask the children to turn to their partner and describe friction without using the word 'friction'. Swap roles and ask partner two to describe force without using the word 'force'. Review as a class and share definitions. Finish the lesson by asking - what is friction? Can you give examples of scenarios where lots of friction would be useful and some examples where having little friction would be useful?

**BACKGROUND INFORMATION FOR TEACHERS**

Friction either acts between surfaces or between an object and a medium: it happens when things rub together, or when something moves through/over something else. Friction is a force that always resists movement. Sometimes this causes problems and sometimes it actually helps by assisting movement on a different level. The SI unit for the measurement of force is the newton (N). It is defined as the force required to accelerate a 1kg mass by 1m per second per second.

## Differentiated Activities

### ⭐ (working below)

Children are given pictures to sort into two scenarios; those that use lots of friction and those that don't. They then need to explain which scenario is a useful source of friction and which isn't a useful source of friction.

### ⭐⭐ (working at)

Children are given pictures to sort into two scenarios; those that use lots of friction and those that don't. They need to think of 4 more scenarios to add to the table. They then need to answer the question: is friction useful?

## Challenge Activity

Children are given statements to read about friction. They must decide if the statement is true or false.

## Next Step Activity

Children are asked to consider the question - what if there was no friction on Earth? What would the world be like? They think of 2 positives and 2 negatives of a world without friction.

## Assessment Questions

What is force?
What is friction?
Are all moving objects subject to friction?
When is friction a useful force?
Can you think of a scenario where having less friction is useful?

## Self-assessment

I can explain what frictional force is.
I can give examples of friction in everyday life.
I know that friction is a force that slows moving objects.
I can give examples of friction being a useful force.
I can give examples of friction being an unhelpful force.

## Key Vocabulary

push
pull
friction
slowing
heat