SCIENCE

Lesson 11

Year 4

Topic: Elaborating on forces

Investigating force and motion of everyday objects

Today you will:

► understand the effect of an applied force on an object's motion.

Resources

Digital

Slideshow — Forces in action: Australian Defence Force

Find and prepare

Sheet 8 — Design a forces poster

Sheet 9 — Everyday forces poster

A4 piece of card (optional)

Exercise book

Key terms

force, motion

For definitions and explanations of terms, please see the Glossary.

Lesson

Discuss forces involved in everyday activities

1. What are some activities you do in your everyday life that involve forces? Write them down or discuss with another person.

During this lesson, you will examine everyday objects and activities. You will understand how force and motion in these objects and activities relate to each other.



2. View the **Slideshow — Forces in action: Australian Defence Force**.





There is a relationship between the force applied to an object and the effect it has on the object's motion.

Can you think how the force applied to the object in the pushing gun picture in the slideshow affects its motion?

When viewing gunners from 8/12 Medium Regiment 'pushing a gun' think about:

- when a pushing force is applied to the gun, it moves forward when friction is overcome
- an upwards force is also applied to lift the gun off its stabiliser arm
- the arm of the gun assists with the pushing force that is applied from one end
- the amount of force required to push the gun depends on a number of factors, such as the surface over which it is being pushed.

Just because it is a large gun, it might not necessarily need a large amount of force to move it, due to its design.

Factors that may affect the motion of the gun include the size of the gun, the surface it is on, the strength of the person pushing it and the position of its wheels.

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C2C Independent Learning Materials

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Examine everyday objects

3. View examples of everyday objects: a skateboard, bike, toy cars and shoes.

i. 

 ii.

iii. 

 iv.

4. Choose one of the objects in the images.
5. Create a poster on **Sheet 8 —** Design a forces poster. You will:
   - identify what forces are required to make the chosen object work or move
   - draw a force diagram for the chosen object
   - write a short explanation of how the chosen object is used
   - explain the relationship between the forces and the motion of the chosen object (as per the example of pushing the gun).

Describe relationships between forces and motion

6. Read **Sheet 9 —** Everyday forces poster, which describes the relationship between the forces required to move the golf ball and the effect on the golf ball's motion.



The force required to make the golf ball move is called **push**.

A golf ball is used in the game 'golf'. Players use a golf club to hit the ball with the goal of getting it into a hole. The player who can get the golf ball around the course with the least amount of strikes with the golf club is the winner.

When a pushing force from the club is applied to the ball, it moves forward when friction is overcome. The amount of push force required to move the ball depends on how far the ball needs to go. If the hole is close, the player needs to apply only a small amount of push force to the ball to overcome the friction and move the ball a short distance.

Another factor that may affect the motion of the golf ball is the condition of the green. The green may be long grass, freshly mowed grass, covered in water or dew. If the ball is in longer grass, the player will need to apply more force to the ball to overcome the friction from the grass and move the ball the required distance. If the ball is on a smoother surface, like freshly mowed grass, it will require less push force to overcome the friction and move the ball.

i. http://www.morguefile.com/archive/display/602811 ii. http://www.morguefile.com/archive/display/839565
iii. http://www.morguefile.com/archive/display/214404 iv. http://www.morguefile.com/archive/display/166135

7. How does hitting a golf ball with a golf club affect the golf ball's motion?