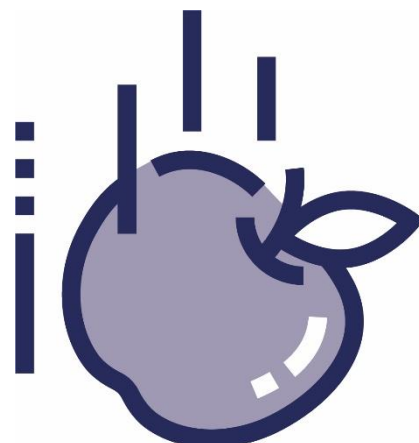


Acceleration

Why does a space rocket need so much force to lift off? Can humans keep getting faster at the 100 m sprint? What would happen if you jumped through a hole through the centre of the Earth?

The ways in which objects move depends on the forces acting on them. If the forces acting on an object are unbalanced, the object will change its speed, direction or shape. The behaviour of objects in motion follow mathematical laws that can be used to make predictions about speed, distance travelled, the time taken and acceleration.



This is the **third** unit we are studying as part of the big idea: **Forces Predict Motion**

In this unit we will learn the effect of forces on the motion of objects, learning about Isaac Newton's First Law. We will also review the effects of balanced and unbalanced forces. We will also look at Newton's Third Law and learn how to describe forces in terms of action-reaction pairs. We will learn about the differences between scalar and vector quantities and examples of each, comparing speed and velocity; distance and displacement. By the end of this unit we will be able to describe the forces acting on an object based on its motion.

We will develop our mathematical skills in this unit by learning how to do some complex calculations to find the resultant force of an object using a graph. We will also learn how to calculate acceleration. By the end of this unit we will be able to describe motion using velocity-time graphs and interpret these qualitatively and quantitatively.

We will develop our practical enquiry skills in this unit by doing an investigation into acceleration, measuring for ourselves the acceleration of a small object.

TASKS:

What subject will this unit focus on? BIOLOGY CHEMISTRY PHYSICS
(circle the correct subject)

There are lots of keywords underlined above. List these into the two columns:

Words I know	Words I haven't seen before



To answer before the unit:

1. What are you most excited to learn about in this topic?

2. What do you already know about this topic?

3. Why do you think it's important to learn about how forces predict motion?

4. What knowledge from previous science lessons might help us?

5. What questions do you have about this topic?

To answer at the end of the unit:

1. Tick off any words in the 'words I haven't seen before' column that you are now confident with. Circle any you still need more practice to use.
2. What have you most enjoyed about this unit?

3. What more would you like to learn about forces as part of the big idea: 'forces predict motion'?



Teacher guidance:

The purpose of this resource is to provide students with an overview at the beginning and end of each unit. It is designed to create a discussion about the unit prior to the sequence of lessons.

The unit scope should be read as a guided reading activity. Tier 3 vocabulary has been highlighted. It may need to be adapted further for LPAs or pupils with different reading ages.

There are a range of ways to use this resource.

1. Display on a slide for students to read as a class. Direct students to complete the activities in their book.
2. Print off for students to stick into their book at the beginning of the unit along with their knowledge organiser. Complete as a guided reading task together. Direct students to complete the activities.
3. Have students complete as part of a booklet.
4. Set as a homework prior to a unit.

If you have any feedback about how this resource could be used/improved, please contact the science mastery team: sciencemastery@arkonline.org

