Forces Progression map Year 5

Previous Year: Year 3	Current Year: Year 5	Next Year: KS3
Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • • Predict whether two magnets will attract or repel each other, depending on which poles are facing.	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	• Magnetic fields by plotting with compass, representation by field lines. • Earth's magnetism, compass and navigation. • Forces as pushes or pulls, arising from the interaction between two objects. • Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. • Moment as the turning effect of a force. • Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. • Forces measured in Newtons, measurements of stretch or compression as force is changed.

Learning Values:

-respect

-responsible

-resourceful

-resilient

-risk taker

Possible stimulus to teach:

How can the learning be applied?

• Investigate the effect of friction in a range of contexts e.g. trainers, bathmats, mats for a helter-skelter.

• Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water and pulling shapes, such as boats, along the surface of water.

•Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats.

• Explore how levers, pulleys and gears work.

• Make a product that involves a lever, pulley or gear.

• Create a timer that uses gravity to move a ball.

• Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.

Key learning for the topic:

A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object. A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.