

ST HELEN'S AND ST MARY'S PARTNERSHIP DRAFT TERMLY OVERVIEW

Termly Overview of knowledge and skills			
Context	Knowledge	Skills	Vocabulary
<p>Science</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p><i>MISCONCEPTIONS:</i></p> <ul style="list-style-type: none"> • <i>the heavier the object the faster it falls, because it has more gravity acting on it</i> • <i>forces always act in pairs which are equal and opposite</i> • <i>smooth surfaces have no friction</i> • <i>objects always travel better on smooth surfaces</i> 	<p>Suggested investigation to cover key skills: <i>How do parachutes work?</i> Children are to create parachutes changing a variable to try and isolate what is needed for an effective parachute (e.g. changing parachute material, size, shape etc.)</p> <p>Working scientifically skills:</p> <ul style="list-style-type: none"> • Plan – Identify variables, predict based on scientific knowledge. • Do - take repeat measurements when appropriate. • Record - • Review - Offer scientific explanations for their conclusions using scientific evidence to support or refute ideas 	<p>Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p>

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<ul style="list-style-type: none"> • <i>a moving object has a force which is pushing it forwards and it stops when the pushing force wears out</i> • <i>a non-moving object has no forces acting on it</i> • <i>heavy objects sink and light objects float</i> 		
Prior Learning	Future Learning	Sticky Vocabulary
<ul style="list-style-type: none"> • Compare how things move on different surfaces. (Y3 - Forces and magnets) • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets) • Observe how magnets attract or repel each other and attract some materials and not others. (Y3 - Forces and magnets) • 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. (Y3 - Forces and magnets) • Describe magnets as having two poles. (Y3 - Forces and magnets) • Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 - Forces and magnets) 	<ul style="list-style-type: none"> • Forces as pushes or pulls, arising from the interaction between two objects. (KS3) • Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. (KS3) • Moment as the turning effect of a force. (KS3) • 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. (KS3) • Forces measured in Newtons, measurements of stretch or compression as force is changed. (KS3) 	

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Activities:

- 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.