



## St Winefride's Catholic Voluntary Academy

### Curriculum Plan for Science

Year Group: 5

Does everything that goes up always come down?

#### **National Curriculum Requirement:**

##### ***Science Year 5: Pupils should be taught to ...***

- *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*

#### **Key Knowledge and Skills:**

- Know what gravity is and its impact on our lives
- Identify and know the effect of air resistance
- Identify and know the effect of water resistance
- Identify and know the effect of friction
- Explain how levers, pulleys and gears allow a smaller force to have a greater effect





# Year 5: Forces Knowledge Mat

Subject Specific Vocabulary		Interesting Book	Sticky Knowledge about Forces
<b>friction</b>	Friction is a force between two surfaces that are sliding, or trying to slide, across each other.		<ul style="list-style-type: none"> <li>• Frictional force is any force that is caused due to friction. An example of this might be when you put the brakes of your bike.</li> <li>• Gravity is the pulling force acting between the Earth and a falling object, for example when you drop something. Gravity pulls objects to the ground.</li> <li>• Surface resistance is the force on an object moving across a surface, such as an ice-skater skating on ice.</li> </ul>
<b>gravity</b>	Gravity is a force which tries to pull two objects towards each other.		
<b>air resistance</b>	Air resistance is a type of friction between air and another material. For example, when an aeroplane flies through the air.		
<b>water resistance</b>	If you go swimming, there is friction between your skin and the water particles. This is water resistance.		
<b>levers</b>	A lever can be described as a long rigid body with a fulcrum along its length.		
<b>pulleys</b>	A pulley is a simple machine and comprises of a wheel on a fixed axle, with a groove along the edges, to guide a rope or cable.		
<b>gears</b>	Gears are wheels with teeth that slot together. When one gear is turned the other one turns as well.	<p><b>Important facts to know by the end of the forces topic:</b></p> <ul style="list-style-type: none"> <li>• Know what gravity is and its impact on our lives.</li> <li>• Identify and know the effect of air resistance.</li> <li>• Identify and know the effect of water resistance.</li> <li>• Identify and know the effect of friction.</li> <li>• Explain how levers, pulleys and gears allow a smaller force to have a greater effect.</li> <li>• Know who Isaac Newton and Galileo were.</li> </ul>	
<b>parachute</b>	A parachute is a device used to slow down an object that is falling towards the ground. As the parachute opens, the air resistance increases.		
<b>Galileo</b>	Galileo developed the telescope to enable close observation of the night sky.		
<b>Newton</b>	During his lifetime, Newton developed the theory of gravity and made breakthroughs in the area of optics, such as the reflecting telescope.		
			<ul style="list-style-type: none"> <li>• Any kind of force is really just a push or a pull.</li> <li>• Air resistance is the force on an object moving through air, such as a plane moving through the sky. Air resistance affects how fast or slowly objects move through the air</li> <li>• Water resistance is the force on objects floating on or moving in water.</li> <li>• Magnetic force is an invisible force created by electrons. Magnetic force controls magnetism and electricity.</li> </ul>



## Science unit: Year 5 Forces

### Does everything that goes up always come down?

#### Issues related to long-term memory and metacognition

Focus on children's learning links	Think of the important learning
<ul style="list-style-type: none"><li>• Children should consider the learning links they have to forces, thinking of gravity, pulleys and air resistance. They should consider what happens when they throw anything up in the air. Pupils may own bicycles and should be able to talk about gears.</li><li>• They should think of any learning link to specific texts, such as 'The Man who Walked Between the Towers'.</li></ul>	<ul style="list-style-type: none"><li>• Link to the key knowledge and skills statements about forces, pulleys, gears, air and water resistance. At the end of the learning, we want pupils to know why things will always fall down rather than up.</li><li>• We also want them to know about the famous scientists such as Newton who helped us understand more.</li></ul>
What inferences can pupils make?	Help pupils to make sensory links
<ul style="list-style-type: none"><li>• Throughout the unit, pupils will be encouraged to come up with their own questions, especially in relation to how objects fall to the ground.</li><li>• Activities will be deliberately set that require pupils to ask their own questions based on the learning they have received.</li><li>• Pupils should begin to understand about the forces that are around us.</li></ul>	<ul style="list-style-type: none"><li>• For this unit the sense of sight is very important. Pupils should have opportunities to talk about resisting objects from falling to the ground, that is, parachutes, etc.</li><li>• They need to understand that balloons that seem to go upwards eventually fall to the ground.</li></ul>
Reflect on the learning that has taken place	Fixing misunderstandings
<ul style="list-style-type: none"><li>• At the end of the unit of learning, an activity needs to be organised that helps pupils to recall the learning.</li><li>• This can be in different forms. It could be a power point presentation, a short video clip or even a display.</li><li>• The main focus is to present their learning to the class as a whole. This could include staff creating a presentation of the learning using photographs, etc.</li></ul>	<ul style="list-style-type: none"><li>• It is important that pupils' misconceptions are picked up as quickly as possible, especially in relation to what happens to objects as they fall to the ground.</li><li>• It is important that pupils know why their investigations have to be fair.</li><li>• Pupils must develop their understanding about what being a scientist means.</li></ul>