

Exemplar 3B

A unit of work based on forces

sixth class

Strand unit from the curriculum	Development of the unit	Working scientifically
<p>The children should be enabled to</p> <ul style="list-style-type: none"> identify and explore how objects and materials may be moved <i>by pouring and pumping using trapped air pressure (pneumatics)</i> <i>using trapped liquid under pressure (hydraulics)</i> come to appreciate that gravity is a force become aware that objects have weight because of the pull of gravity design and make a spring balance explore the effects of friction on movement and how it may be used to slow or stop moving objects <i>a falling object by a parachute</i> <i>air resistance, streamlining.</i> 	<p>Children should learn that</p> <ul style="list-style-type: none"> air can be squashed into a small space, for example pumping air into a tyre. Compressed air gives the force to a machine to break up concrete air can be used to lift heavy objects such as books a heavy weight can be lifted using (a little) water. Excavators often use hydraulics the weight of something is a measure of how hard the Earth is pulling on it the greater the pull of gravity on something the more it weighs things are pulled towards the centre of the Earth. Objects fall because they are pulled towards the centre of the Earth. This pull is the force of gravity forces can be measured with a spring balance (also called a forcemeter): the more the spring is pulled the more it stretches. The greater the pull the more an object weighs the pull is measured in newtons any falling object must push through the air on its way to the Earth air resists being pushed away; it pushes back, creating air resistance a streamlined shape cuts through the air more easily than a flat, square shape a streamlined shape can overcome air resistance more easily than something that is not streamlined. This is important for speed and flight. 	<p>observe</p> <ul style="list-style-type: none"> dropping objects of different shapes dropping weights of different weight dropping objects of different shapes but of equal weight parachutes falling the effect of tying objects of different weights onto rubber bands <p>predict</p> <ul style="list-style-type: none"> if we drop two toys, which one will hit the ground first? which material will make the best parachute? which rubber band will stretch the most? <p>question</p> <ul style="list-style-type: none"> can you describe what happens when the feather and conker fall <p>investigate</p> <ul style="list-style-type: none"> the effects of different weights on the same parachute <p>estimate and measure</p> <ul style="list-style-type: none"> use a spring balance to measure the force of gravity i.e. weight <p>analyse</p> <ul style="list-style-type: none"> examine the relationship between the size of the parachute and the speed at which something that is attached to it falls
<p>Methodologies</p>	<p>Assessment</p>	
<p>Among the methods and teaching approaches that may be used are:</p> <ul style="list-style-type: none"> free exploration with materials used to design and make parachutes, models using gears and levers discovery learning teacher-guided learning. 	<p>Among the techniques that may be used are:</p> <ul style="list-style-type: none"> teacher observation <i>outcomes of pupil-teacher discussions</i> teacher-designed tasks <i>pictures or diagrams of ideas about forces and levers</i> portfolio assessment <i>samples of recording and communication completed by pupils</i> curriculum profile. 	