



Science planning with Sustainable Travel Links for Year 3 and 4
Forces and magnets: comparing how objects move on different surfaces
Links to maths (data handling) and DT

Objectives:	<ul style="list-style-type: none"> • compare how things move on different surfaces • 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
Success Criteria:	<ul style="list-style-type: none"> • Discussion about how vehicles move on different surfaces. • Accurate illustrations to show understanding of the poles. • Recognition of materials that do/do not attract magnets
Teacher Input with key questions:	
<p>Explain that today's lesson is about exploring different surfaces. It builds on many of the elements from the lesson on wheels and axles. It is in two very distinct parts and it is suggested that the class is split with a rotation of activities.</p>	
<p>Intro: Draw on the plenary from the lesson about wheels and axles. What would the children need to do to improve their enquiry? Did they manage to make a fair test, create a relevant "big question", a conclusion, useful data and a conclusion?</p>	
<p>Explain that today we are going to look how vehicles travel on different surfaces. Thinking about the weather which kind of surfaces might we encounter when cycling, scooting? Dry, wet, slippery, oily, soggy. Go over the clip: http://pbskids.org/sid/funwithfriction.html</p>	
<p>Why does the block travel faster on some surfaces? What force acts against it? Work through the power point: http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0CEIQFjAE&url=http%3A%2F%2Fwww.primaryresources.co.uk%2Fscience%2Fpowerpoint%2Ffriction.ppt&ei=pTPaU4aDOcmi0QW544GwBA&usq=AFQjCNHN9OLPKDwg8x2RNRBNESPGT5sBwq&bvm=bv.72185853,d.ZGU</p>	
<p>TASK 1 – Forces and surfaces investigation Explain that one task will be an enquiry based on comparing how vehicles move on different surfaces that representing roads in different weather. Explain that the incline of the road will also be a consideration. Show the children the materials available for their road surfaces and that they will have to explain which material is representing which road type. SEND group(s) off to task while 2nd activity is explained.</p>	
<p>Investigation: In groups the children decide their "Big Question" and record it. Chn make and record their prediction and record Time given for enquiry, and results to be recorded. Conclusions from the results. Reflection on what went well, what could be improved for another time.</p>	
<p>TASK 2 – Magnet Activities Work through the information given in the clips. What does it tell us?</p>	
<ul style="list-style-type: none"> • http://www.bbc.co.uk/bitesize/ks2/science/physical_processes/magnets/read/4/ • http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CCYQFjAB&url=http%3A%2F%2Fwww.primaryresources.co.uk%2Fscience%2Fpowerpoint%2Fmagnetism.ppt&ei=5DjaU4fzMoGs0QX65IDgAw&usq=AFQjCNGUYQYGLHHUvWwIWiiqLTMgzW3CZLA 	
<p>Magnet Activity 1: Investigate which materials from those available are attracted to magnets and which are not. Record on the sheet</p> <p>Magnet Activity 2: Experiment with the magnets to find out how they can make them move. Record in books showing poles</p> <p>Midway plenary to swap groups over and pick up misconceptions. Set off new groups.</p>	
<p>Resources</p> <ul style="list-style-type: none"> • http://pbskids.org/sid/funwithfriction.html • http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0CEIQFjAE&url=http%3A%2F%2Fwww.primaryresources.co.uk%2Fscience%2Fpowerpoint%2Ffriction.ppt&ei=pTPaU4aDOcmi0QW544GwBA&usq=AFQjCNHN9OLPKDwg8x2RNRBNESPGT5sBwq&bvm=bv.72185853,d.ZGU • cars, card, books for ramps, silver foil, sand paper, leaf mould, lino, plastic • everyday objects • magnets of different types and sizes • recording sheets for surface enquiry and object sorting (provided) 	
<p>Plenary</p> <ul style="list-style-type: none"> • CT to check that the questions are relevant and able to be investigated. • What is the prediction based on? • What is the fair test element? • Was your prediction correct? • Was your prediction correct? • What conclusions can we make from the poles of the magnets? • What did we find out? Each group to share their most exciting discovery. <p>http://www.bbc.co.uk/learningzone/clips/usin-g-magnets-to-sort-scrap-metal/2186.html</p>	
<p>Homework – find out where and how magnets are used in cars.</p> <p>Assessment</p> <ul style="list-style-type: none"> • Can discuss about how vehicles move on different surfaces. • Can draw accurate illustrations to show understanding of the poles of a magnet and how they repel and attract. • Can recognise materials that do/do not attract magnets. 	

My name:
Other people in my group:

Our big question:

My prediction – what I think will happen:

Description of activity:

Equipment we used:

How we made it a fair test:

Results

Type of surface and the weather it represents.	Time taken – seconds and minutes	Distance travelled – cm and m

What we found out – our conclusion:

Was my prediction correct?

How we could improve our enquiry for next time?

What have I learnt today?

Science



Science: Enquiry about magnets

Some materials are attracted to magnets, others are not. You will know if they are attracted because they will 'stick'. Fill in the table below. You will need to predict if the material is magnetic first then test it. Work in your groups, but record your answers on your own. When we have finished we will share our answers with the rest of the class.

Object	Material	My prediction – will it be magnetic or not magnetic?	Result	Was your answer correct?

Am I surprised by any of the results? If so, why?

What have I learnt about magnets today?