

Balanced Forces

The activities are related to the work in the KS3 Science Scheme of Work Unit 7K: Forces and their effects.

Pupils will identify the origin of friction, air resistance, upthrust and weight and describe situations in which these forces act. Relate forces acting to changes of motion. Identify situations in which forces are balanced or unbalanced.



Organisation of the Materials

The SMART Notebook™ file is saved as “KS3 forces.notebook”. It consists of ten pages, the first of which is a title page. There are seven pages to support the activity. These can be used as

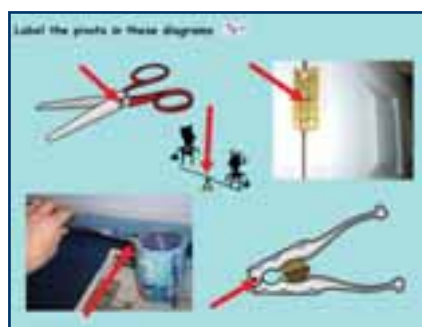
lesson starters, lesson plenaries or to support the main part of the lesson.

Page 9 contains links to some useful websites and page 10 contains teachers notes.

The materials can also be used for Year 9 SATS revision.

Activity 1

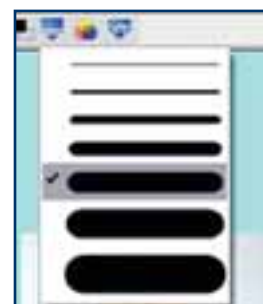
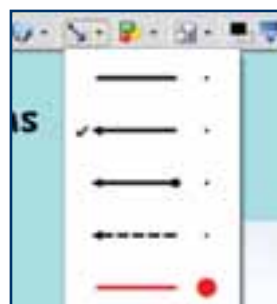
Present the pupils with this page and ask them to identify the pivots in each image. You might like to print this page to act as an accompanying worksheet.



You can add arrows to the page using the 'Straight Line' tool. Select 'Arrow' from the drop down menu and also select a thicker line to make them easier to see.

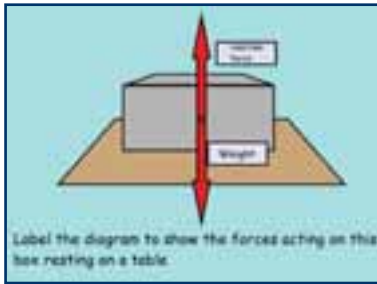
You might like to add other images of levers/pivots to this page, either using a digital camera or using the Internet to search for examples.

Arrows



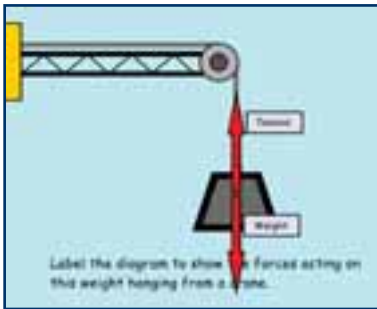
Activity 2

The next four pages all show different situations of stationary and moving objects.



Page 3

For each situation, ask the pupils to drag the arrows and the labels onto the diagram to show the forces acting on the object.

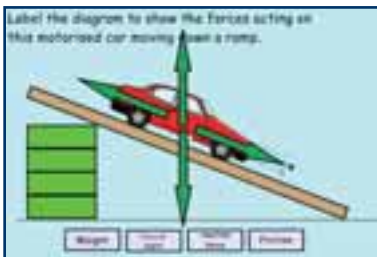


Page 4



Page 5

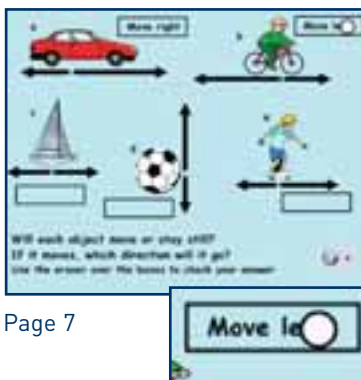
On page 6 you will need to rotate some of the arrows to show friction and the force of the engine.



Page 6

If you wanted the situation to show the forces acting on the car if it is moving down the slope, you will also need to change the size of one of the arrows.

Activity 3



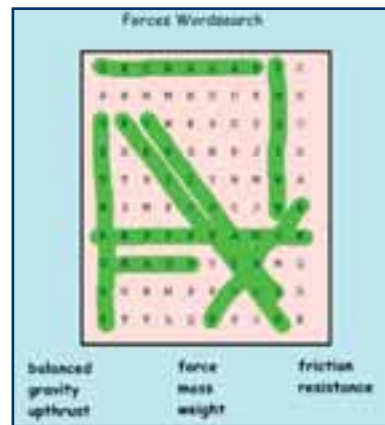
Page 7

Page 7 shows five different situations of either balanced or unbalanced force. Ask the pupils to look at each situation and consider if the forces are balanced or unbalanced. If they are unbalanced, then in which direction will the object move?

Give the pupils some time to think of the answers –

perhaps back this activity up by printing this page off to act as a worksheet. Once they have decided on their answers, you can reveal the answer by using the eraser on each box in turn.

Activity 4



Page 8

Wordsearch

This activity can be used as a quick lesson starter or as a lesson plenary to familiarise pupils with some of the key words that are used in this topic.

Present the wordsearch to the pupils and ask them how many force-related words they can see. The words are initially hidden on the

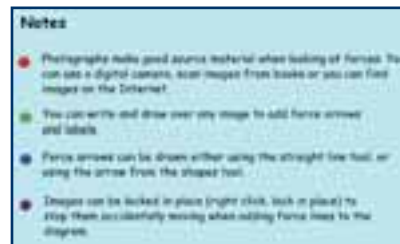
screen under a rectangle. You can remove this rectangle to check the words at the end or, for some lower ability groups, you may choose to have the words visible while they find them in the grid.

Make your own grid free at:

puzzlemaker.school.discovery.com/WordSearchSetupForm.html



Other Notes



Page 10

The SMART Notebook Gallery has an Education area, within which is a Science and Technology area. Within the Physics area there are some useful images and diagrams that you can drag into a

Notebook page, resize and manipulate.

You might also like to use a digital camera to build up a library of photographs of situations that involve balanced and unbalanced forces around the school and in the local environment – at the park, at a funfair/theme park, in the street. These images can easily be added into your notebook page using Insert/Picture/Template/from file or you can import them directly into your gallery for later use.

Google is a great source of images to use with your Notebook files. Use the camera tool to capture images and bring them into your Notebook.

Once added to a page, you can easily draw force arrows and text labels over the top of the images or ask the pupils to add them instead. When you add images to be used in this way, it makes life a lot easier if you lock them in place to stop them moving when pupils try and move the arrows instead. To do this simply click on the triangle in the corner and choose 'Lock in Place' (or select from a right click on the object).

You can modify the "KS3 Forces.notebook" Notebook file in any way you like – but it would be a good idea to save it with a different name in case you want to access the original again in the future.

www.smartboard.co.uk

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