Grandpa Pencil

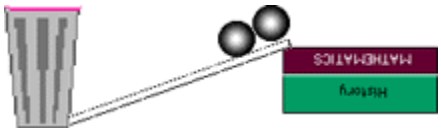
learns about

Newton's Laws of Motion

Newton's 2nd law of motion:

Answers the question about how much force is required to accelerate an object.

Before we get into looking at Newton's second law we are going to build a load bearing ramp from a piece of paper.
Take an A4 sheet of typing or copy paper and fold it down the centre along the longest side.
Fold the paper, in the same direction, as the cross section A, above.
Run some adhesive tape across the two loose 'legs' to stop the ramp flattening out with the load.



In a container (a foam coffee or milk shake container or similar) cut a doorway near the bottom capable of allowing a marble to come off the end of the ramp and enter the container.
Run the ramp from the top of a book/s about 5cm (2") high down to the little door on your container.
Roll one marble down the ramp into the container and note the distance it moves.
Now roll two marbles down the ramp and note the distance the container moves.
Since it takes twice the force to move the two marbles at the same acceleration as one marble it takes twice as much force to decelerate them until they have stopped.
The cup was pushing on the two marbles with exactly the same force as the one marble so with the two the cup had to push longer.
The ultimate stopping force here, by the way, was the friction of the bottom of the container on the surface it stood upon.