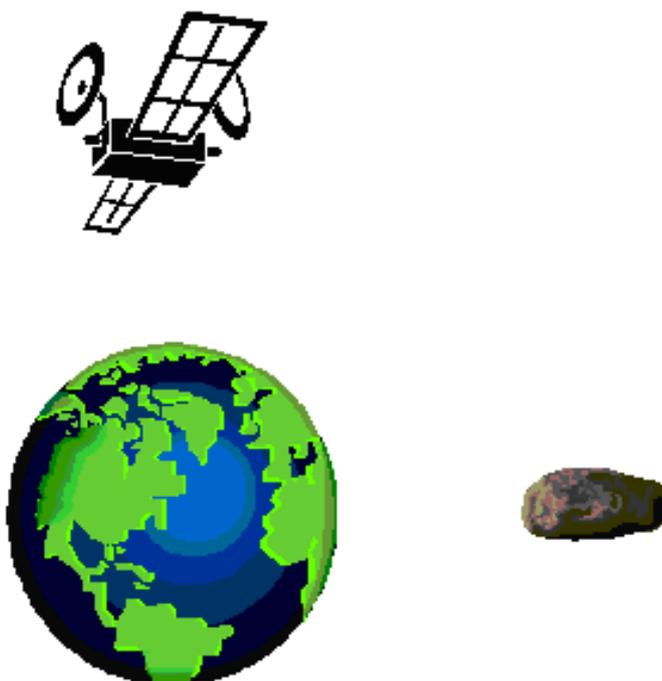
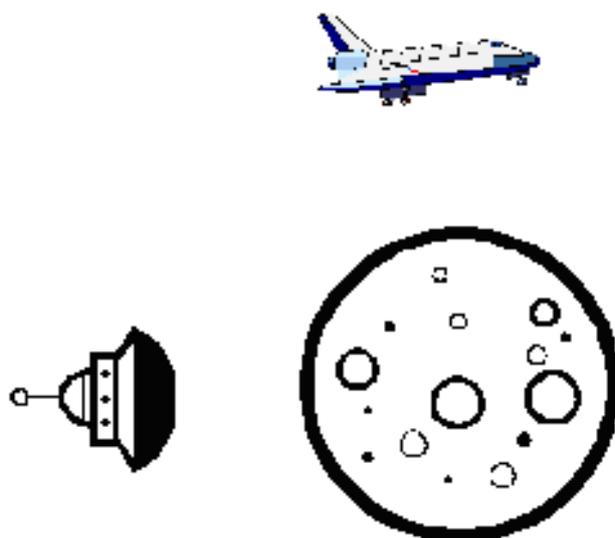


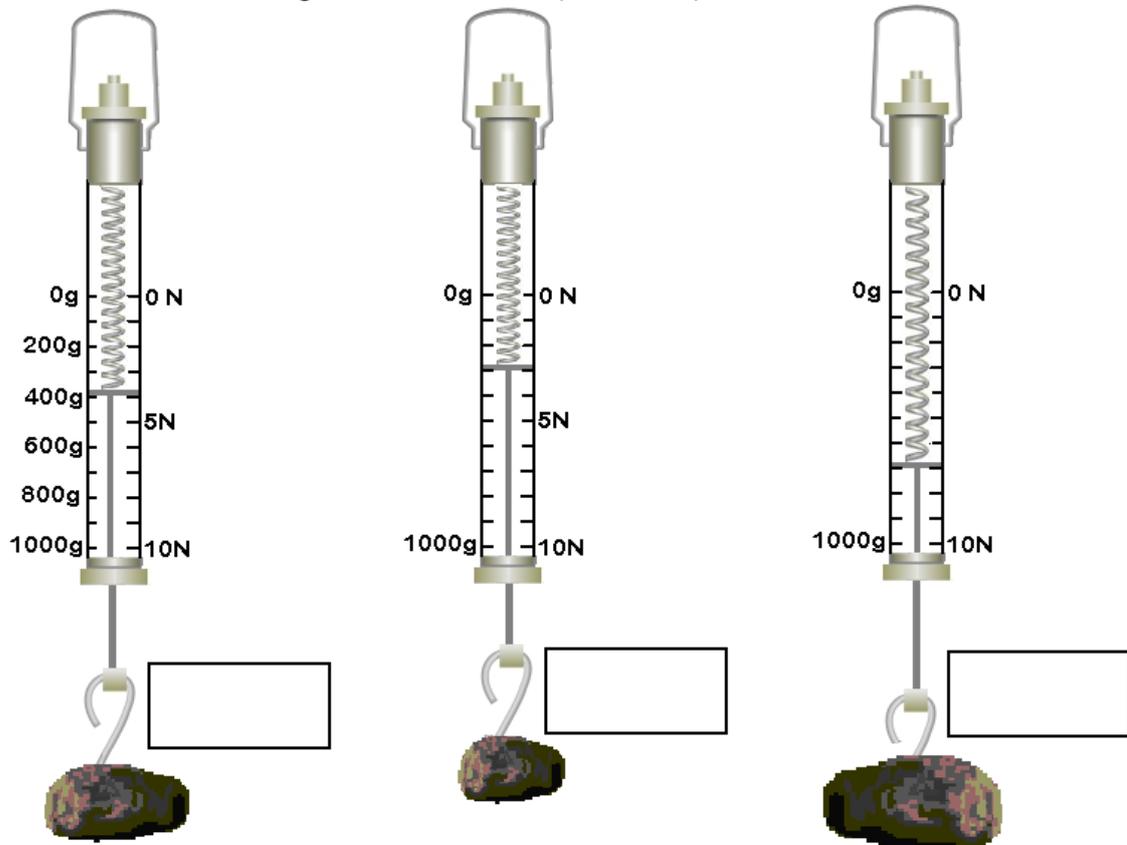
1) Here is a picture of the Earth orbited by a satellite and with an approaching meteor heading straight for it!. Label the direction the Earth's gravity is acting in on both of them.



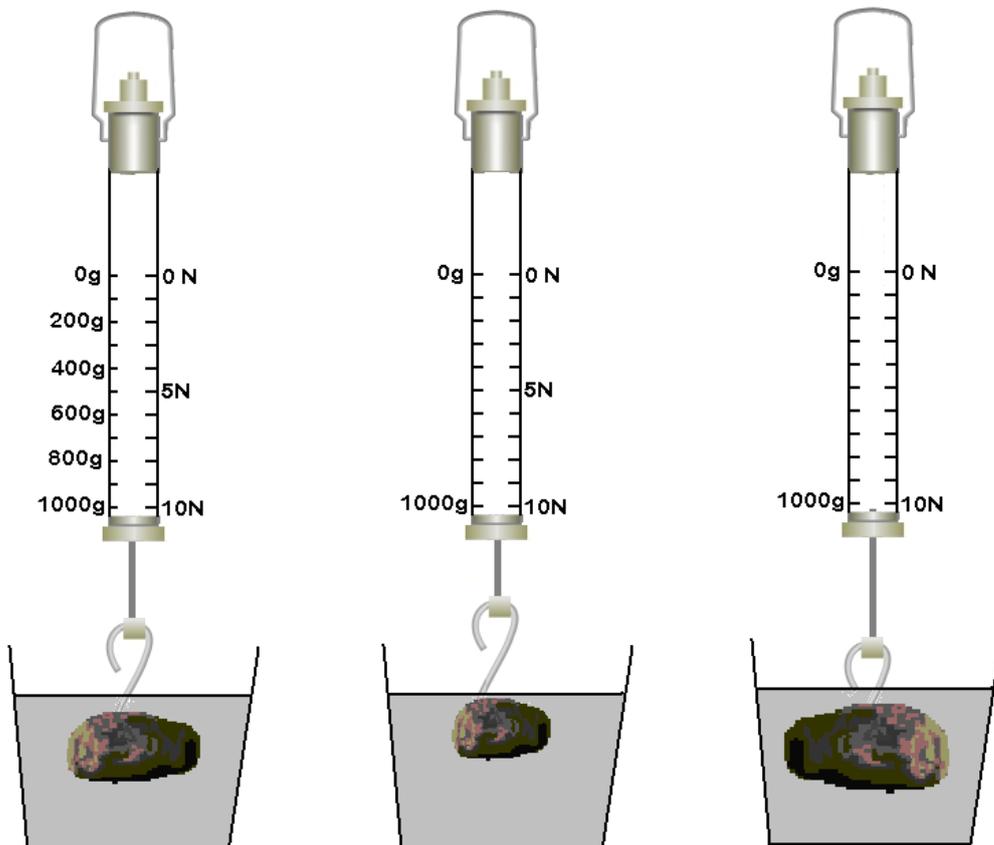
2) Here is a picture of the Moon being orbited by the shuttle and an alien spaceship coming to land. Label the direction the moon's gravity is acting in on both of them.



2) Write down the weights of these lumps of clay as shown on these forcemeters.



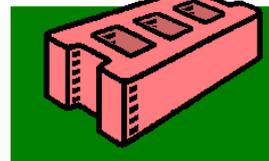
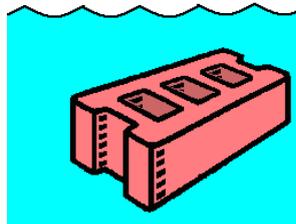
3) John now placed the same three lumps of clay in water. Mark with a line on the forcemeter the readings you think they would show now.



4) Gravity on Earth gives **1kg of mass, a weight of about 10 Newtons**. On the Moon, gravity gives **1kg of mass only 2 Newtons** of weight. Finish this table to show the mass and weight on the moon and Earth.

Object	 on Earth		 on Moon	
	Mass	Weight	Mass	Weight
rock 	1 kg	10 N		2 N
man 	60 kg			120 N
flag 		20 N	2 kg	
lunch 	500 g			1 N
alien 			100 kg	

5) John picked up this **brick** in the swimming pool but he found it harder to pick up when it was out of the water. Why was this? TICK ONE



Objects in water weigh less because gravity doesn't pull things down so hard

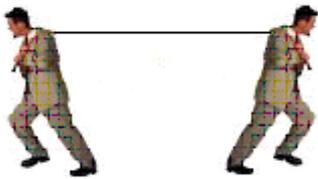
John was pretending the brick was heavy

The brick floats in the water

Objects in water weigh less because of upthrust

6) Label arrows to represent the forces acting in each of these pictures.

No one is going to win this tug-of-war!



This sub is not moving in any direction!

This car is driving steadily across a rough field



This man is falling steadily through the air...

6 Dan stretched some elastic bands using different masses. Here are his results. He forgot to fill in some information.

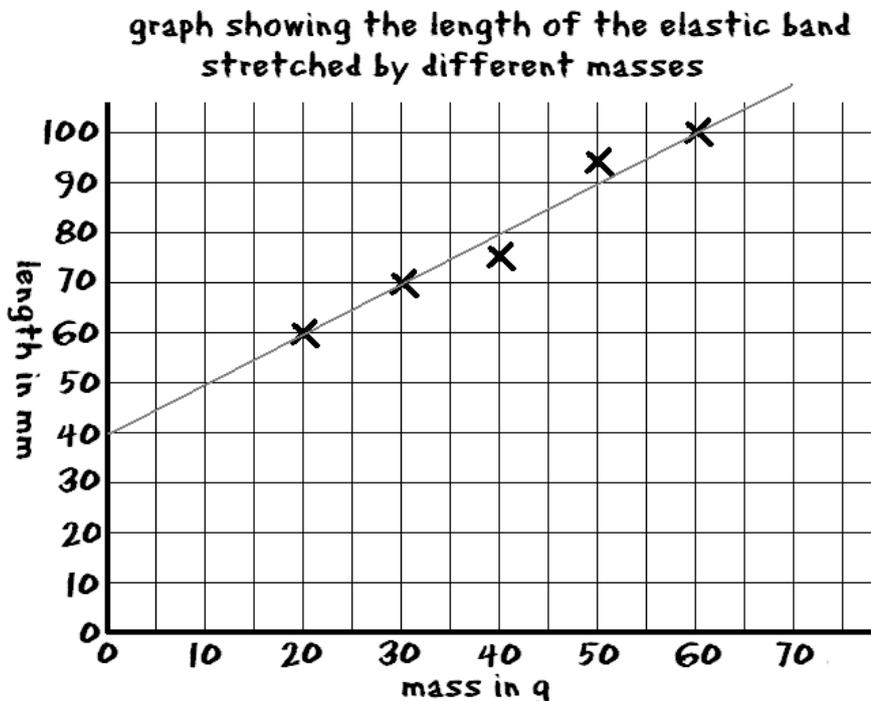
a) Fill in the missing figures.

mass in g	length in mm
10	
20	80
30	90
40	100
50	
60	
70	130

b) What would the length of the unstretched elastic band be?

mm

7) a) Jim did the same experiment with a different elastic band. He drew a graph of his results. Here is the graph.



b) What length was the band when Jim used 30g to stretch it?

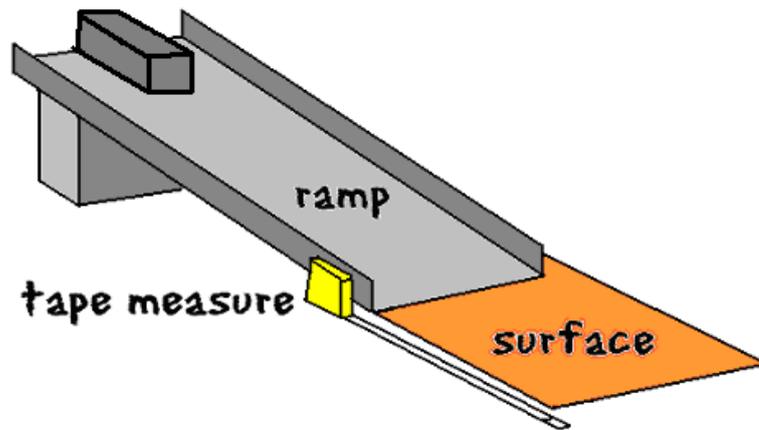
mm

c) What was the length of the unstretched elastic band?

mm

c) Two of Jim's results don't fit exactly on his line. Why might this be?

8) Jan rolled a wooden block down a slope onto different surfaces.



She measured how far the block traveled each time. The three surfaces she used were:

Rough sandpaper carpet Smooth tiles Wooden floor

Here is her table. Two of the surfaces are missing. Write them into the correct places.

surface	distance travelled
	80cm
carpet	24cm
	11 cm
wood floor	35cm

Tick which of these forces (be careful - there is more than one!) are acting on the block as it rolls down the slope?

- | | | | |
|------------------|--------------------------|----------------|--------------------------|
| Gravity | <input type="checkbox"/> | Air resistance | <input type="checkbox"/> |
| Water resistance | <input type="checkbox"/> | Upthrust | <input type="checkbox"/> |
| Friction | <input type="checkbox"/> | magnetism | <input type="checkbox"/> |

9) John dropped a heavy 1 kg mass and a lighter tennis ball from the atrium balcony. In which order did they hit the floor?

The 1kg mass first the ball first same time

10) Jan did the same thing with the tennis ball and a **flat** piece of paper. In which order did they hit the floor?

The paper first the tennis ball first At the same time

11) a) How could Jan change the paper so that both the tennis ball and the paper hit the floor at the same time?

b) Explain why would this would make both hit the floor at the same time
