

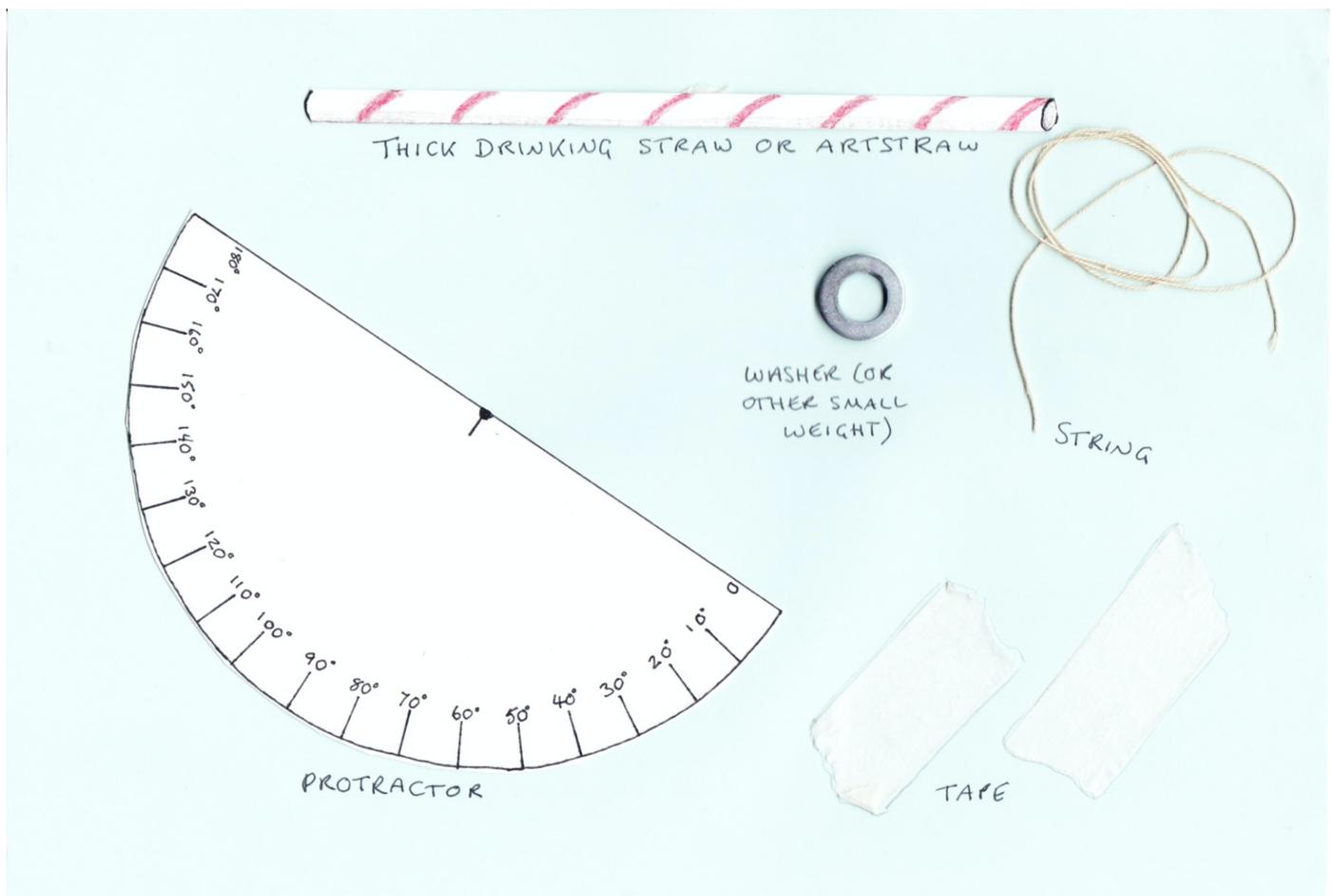
MAKING A SIMPLE ASTROLABE

An astrolabe is a complex instrument with many different uses. The central function is as an **INCLINOMETER**. This is an instrument for measuring angles of slopes and the height of objects. In navigation it could be used to measure the height of the moon and stars. Perhaps you could investigate why this might be useful.

A simple inclinometer consists of a sight to look through and line things up, a scale, which is basically a protractor, and a weighted string which hangs down across the scale and always remains vertical.

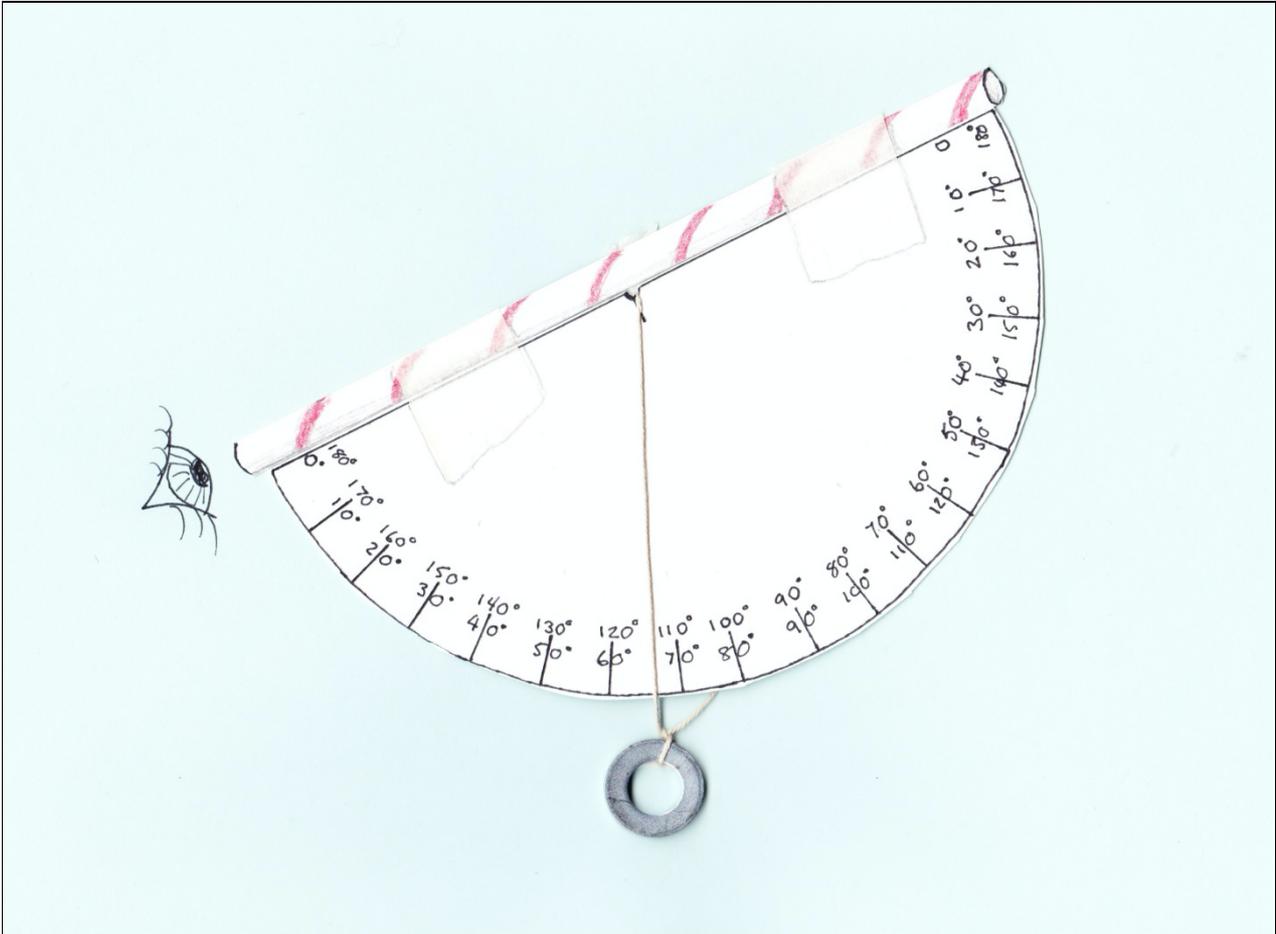
To make one you need:

- A protractor that you can make from card
- A drinking straw or Artstraw – needs to be wide enough to look through
- Tape
- String
- A small weight such as a washer or a lump of plasticine



INSTRUCTIONS

1. Make a slot or small hole at the centre point on the card protractor.
2. Feed the string through the hole and tape down on the back of the card.
3. Tie the weight to the other end of the string, at 10 – 15cms length.
4. Tape the straw along the flat axis of the protractor.



5. Now you can decorate your instrument inspired by the pattern investigations and practices you have done.

USING AN INCLINOMETER TO MEASURE THE HEIGHT OF A TREE

You will find this easier with a partner.

1. Stand back from your tree, facing it.
2. Look at the top of the tree through the sight (straw) on the top of the instrument.
3. Walk backwards or forwards, keeping sight of the top of the tree until the string crosses the scale at 45° .
4. Measure the distance to the base of the tree.
5. Now for the maths:

You now know 2 angles and one side of a triangle, because the angle from the foot to the top of the trees is a right-angle (90°). This means we can work out the third angle. We know that the sum of the angles inside a triangle is 180° therefore the third angle is also 45° .

This means we have a right angled triangle with 2 equal angles of 45° .

What does this tell us about the length of the two sides adjacent to the right-angle?

It means they will both be the same length. Therefore, the height of the tree will be the same as our distance from the tree.

(To be absolutely accurate you need to add in your height up to your eye, because you are measuring from a little way above the ground).

