Measuring the height of a building. Teacher's sheet

Subject: Maths
Level: KS2

No linked sheet for pupils as this is not necessary.
These three methods can be used at the Museum or in your own environment.

Equipment required:
A clinometer or a 45° measure
10m or 20m measuring tape
Stick or pencil

Method 1:

Walk away from the building (between 15m & 20m), but leave a friend standing right under the tallest part of the roof.

Hold up your pencil at arm's length and close one eye. Move your thumb nail down the pencil until the top of the pencil is in line with the top of your friend's head and your thumb is in line with the feet.

Use that as a measure to see how many times the height of your friend is equivalent to the height of the building. Now multiply this number by the height of the friend.

Method 2:

Hold up your pencil vertical and walk away from the building until the pencil is the same size as the building when the pencil is held at arm's length and you look through one eye.

Line up the base of your pencil up with feet of a friend, who is standing next to the building. Rotate the pencil 90° so that it is now horizontal. Ask your friend to turn and "walk" along the pencil to the end.

Measure the distance that your friend has travelled. This will be the height of the building.

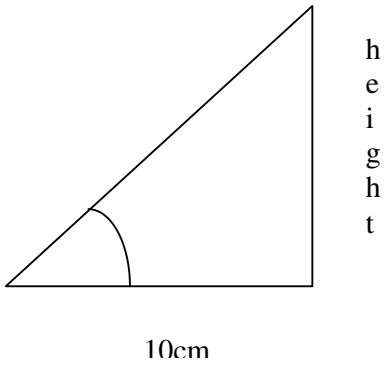
Method 3:

You are going to make a scale drawing of a triangle, to represent the height of the building and where you are standing, with a clinometer.

Stand 10m away from the building. Use a clinometer to measure the angle between you and the top of the building. Use 1m – 1cm scale (100:1).

Draw a right-angled triangle: the base will represent the 10m you are away from the building; the angle will be the one measured on the clinometer.

The height of the triangle will be the scale height of the building. When you have finished, make sure you add your height to the result.



OR
You can use a 45° measure. From your eye point the 45° measure at the top of the building and walk away from the building.

When you can see the top of the building through the 45° measure, then use the tape to see how far you are away from the building. That will be the height of the building.

Follow-up:

Compare the results of all three methods.
Suggest repeating each method three times and taking a mean (average).
Use the sheet 'Observing and recording a building'.

If you are planning to visit to do this activity at the Museum, please contact our school services team to book your visit on 01243 811459 or email schoolbookings@wealddown.co.uk