

Old measures

Activity 1

Focus of activity: Measuring lengths in centimetres and finding the difference between two lengths by counting up.

Working together: conceptual understanding

- Explain that in ancient Egyptian times (and for centuries afterwards), people didn't measure distances using metres and centimetres but used units such as cubits and feet. Show how a cubit is the distance from the base of the elbow to the tip of the middle finger.
- Show a centimetre cube and say that each cube is one centimetre long. Ask children to make a stick of cubes to measure the distance from your middle finger tip to the base of your elbow.
- Record this distance, reminding children how to use cm to stand for centimetres.
- Repeat for one of the children. Record the distance.
- Lay the two sticks side by side, so that the first cube in each stick is aligned. *Which cubit is longer? How much longer?* Ask children to count the extra number of cubes. *The difference between the two cubits is ... cm.* Mark these two numbers on a large 0 to 100 beaded line. *To find a difference between two numbers we can count up from the smaller number to the larger number.* Help children to do this, looking to see how much is needed to make the next 10 and then the larger number.
- *If you were an Egyptian and wanted to buy some cloth 7 cubits long, but I measured it using my cubit, you would get more than you wanted!* Explain that to solve this problem, they had a royal cubit, literally a stick, and all cubits had to be based on that standard measure, just like a centimetre is the same length all over the world.
- Say that another old unit of measurement is the foot, and people still measured in feet and inches until very recently. Some children may have heard parents or grandparents say their height in feet and inches for example. Take your shoe off (you can keep your socks on!) and ask another child to do the same. Ask children to use the cubes to make a stick the same length as your foot from heel to the tip of your longest toe. Repeat for the child's foot.
- Ask a child to lay the two sticks side by side so that they can be compared. Have they aligned them correctly? Ask children to count the number of extra cubes to find the difference between the two lengths. Mark the two numbers on the beaded line and count up to find the difference between the two numbers.
- Explain that measuring heights/lengths using different size feet was no good either, so there was a standard foot, which was 12 inches, about 30 centimetres – the length of our rulers. Show a 30cm ruler. *Is the ruler about the same length as your foot?*

Up for a challenge?

Ask children to look around the room for something which they estimate to be about 30cm long/tall. Use the ruler to check.

Now it's the children's turn:

- Children work in pairs to measure each other's cubits and feet using sticks of centimetre cubes. They both find the difference between each child's foot and cubit. They then look around the room to see if they can find objects with lengths/heights between their pair of measurements. They use centimetre cubes to check.
- Go round the group and mark their measurements and differences, e.g. initially after the first pair of measurements.

S-t-r-e-t-c-h:

If children cope well, ask them to estimate the distance from their wrists to elbows, and their hand spans. Do they think these two distances are longer or shorter than a foot?

Things to remember

Remember that it is really useful to have a standard measure, like centimetres and metres which are the same all over the world. We can find a difference between two lengths by counting up from the shorter length to the longer length. Discuss the difference between children's cubits and feet. Were the differences roughly the same as other children's? Explain that in Roman times a cubit was $1\frac{1}{2}$ feet. Take one of the children's foot length stick, find half and add on this number of cubes. Is this new stick the same length as the child's cubit?

You may want to add something that has emerged from the activity. This may refer to misconceptions or mistakes made.

Resources	Outcomes
<ul style="list-style-type: none">• Centimetre cubes• Large 0 to 100 beaded line• 30cm ruler	<ol style="list-style-type: none">1. Children can measure lengths in centimetres.2. Children can count up to find a difference between two lengths.3. Children begin to estimate distances in centimetres.

