othe

METRE MEASURES

Can you find some objects that are about a metre long? How many hand-spans make a metre?

For this activity you need lots of old newspapers, and some sticky tape.

Make 1 metre length sticks using newspaper. Mark them to make measuring sticks.

Tightly roll 8 large sheets of newspaper, 4 and 4, place as in the photograph so that the length of the stick when the paper is rolled up will be 1 metre. Follow the instructions given below.

INDIVIDUAL OR GROUP ACTIVITIES

Find things that are longer than a metre. Find things that are shorter than a metre.
Can you find something that is exactly one metre in length?
How many hand-spans make a metre?   How many footsteps make a metre?
Stretch your arms out wide. Is it a metre from fingertip to fingertip or more or less than a metre?
Think of other body measurements you could explore.
Are the other people in your house shorter than, taller than or exactly one metre in height?
Who is the tallest person in your house? Who is the shortest person in your house?
What about your Mum; is she shorter than, taller than or exactly one metre in height?
Draw a picture of everyone in your house standing in a line in order of height making the heights in your drawing correspond to the heights of the people.

MEASURE THE BIGGEST ROOM IN YOUR HOUSE

Estimating activity

"How many metre sticks do you think you need, to get from one end of the room to the other?"

Keep this idea in your head.

Start measuring the room with your metre stick, one metre at a time until you reach about half-way.

Do you want to change your estimate? How many MORE sticks will be needed to reach the far wall? Then finish measuring.

Your room probably does not measure an EXACT numbers of metres. How would you measure the length of the 'extra bit'.

Is the length of the room the same along the other walls?

Measure all the walls of the room and draw a plan of the room.

What else can you measure in this way?

HOW TO MAKE NEWSPAPER STICKS

You need 8 large sheets of newspaper. Arrange the paper to make it very slightly over 1 metre wide by placing 4 sheets on the left and 4 on the right overlapping in the middle. You want to roll the paper as tightly as possible into a stick so that the length of the stick when the paper is rolled up will be 1 metre.

The best way to do this is to fold the newspaper in three before you start rolling so that the edges of the newspaper are inside the roll. That way the final roll will be neater.

Roll the paper tightly. You might find it helpful to work with a partner to do this.

Use sticky tape to secure the roll. Trim the end to make the stick exactly one metre long.

Mark the stick into 10 centimetre lengths using a short ruler or a tape measure.
Then mark **one section** into 1 centimetre lengths so that objects can be measured in centimetres.

HELP

It is difficult to make a newspaper metre measuring stick on your own. One person should roll the paper and hold the roll tight while the other person secures it with sticky tape.

It is also helpful to have 2 people to make marks for: 0 cm, 10cm, 20cm, … 80 cm, 90 cm, 1 m.

Whatever you measure, if two people do it independently, then they can check each other's measurements.

NEXT

Mark one 10 centimetre section of your stick into millimetres and measure some objects in centimetres and millimetres. Use the facts below and write millimetres and centimetres as decimal fractions of a metre.

10 millimetres = 1 centimetres

100 centimetres = 1 metre

1000 millimetres = 1 metres

In craft work, and building, millimetres are often used instead of centimetres.

GUIDE FOR PARENTS
Why do this activity?

This big advantage of making newspaper sticks so that learners can do their own measuring is that they will get practice in estimating, measuring, recording, comparing and ordering lengths. This will help them to judge lengths and give them a good conceptual understanding of the metre as a measure of length. These are crucially important life skills. It is important for learners to have this experience *before being introduced* more formally to centimetres and metres as standard units of measure. At this stage learners should have had some experience of measuring lengths in handspans and in paces and *discussing the need for* standard units of measurement because, for example, when an adult makes measures this way they get a different number of handspans or paces. This leads to the use of the newspaper sticks to measure lengths more accurately in centimetres and to introducing decimal notation for measurements in metres and centimetres.

Learning objectives

In doing this activity students will have an opportunity for:

- practice in estimating, measuring, recording, comparing and ordering lengths;
- development of the ability to estimate lengths and distances.

Generic competences

In doing this activity students will have an opportunity to:

- **develop visualization, spatial awareness** and the skill to interpret or create images to represent concepts and situations;
- develop of the ability to estimate lengths and distances in **apply this knowledge in everday life**;
- work in a team **to collaborate and work with a partner or group.**

SUGGESTIONS FOR HOMELEARNING

These tasks could engage learners of different ages and attainment levels giving everyone scope for success and offering challenges for the high flyers. Often learners who do not shine in other ways show more aptitude in practical activities of this sort. Learners can be motivated by the real life applications of this school work.

It's important that you make a metre stick with **the learners**. It is important **not** to show learners a finished product at the start so that they make discoveries for themselves and enjoy the surprise. If you are working with one child then make 2 sticks, if you have a group then they should have at least one stick between two.

Encourage them to measure objects around them. Find things that are longer than a metre. Find things that are shorter than a metre. Can they find something that is exactly one metre in length?

How many hand-spans make a metre?   How many footsteps make a metre? Tell everyone to stretch their arms out wide. Is it a metre from fingertip to fingertip or more or less than a metre? Measure each other's arm spans. Think of other body measurements you could explore.

Are the other people in your house shorter than, taller than or exactly one metre in height? Who is the tallest person in your house? Who is the shortest person in your house? Draw a picture of everyone in your house standing in a line in order of height making the heights in your drawing correspond to the heights of the people.

MEASURE THE BIGGEST ROOM IN YOUR HOUSE - Estimating activity

Ask the learners: *"How many metre sticks would do you need, to get from one end of the room to the other?"* Ask the learners to keep their idea in their head. Then they should start measuring the room, one metre stick at a time, helping each other until the sticks reach about half-way. Ask if they want to change their estimate. Ask how many MORE sticks will be needed to reach the far wall? Then finish measuring. Depending on the experience of the learners, discuss how to describe and measure the length of the "extra bit". The learners might measure the extra length in centimetres and, for example. say the room measures say 6 metres 70 centimetres or they might say it is a little less than 7 metres. Then ask; *'Is the length of the room the same in the other direction?'* The learners should measure all the wall of the room and draw a plan. *What else can we measure in this way?*
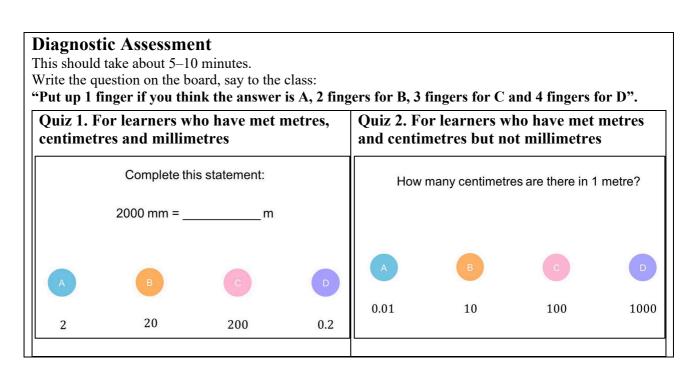
This sequence of tasks gives activities for several sessions. The learners should record their measurements in an age appropriate way. This could be done in the learners' workbooks and another possibility is to do this by making posters for the wall.

Then, after the learners have been introduced to standard measures of length in metres and centimetres, the learners could make scale drawings and talk about how scale drawings are used by architects in designing buildings and by builders in their work. Or they might measure everyone's height in metres and centimetres, then stand in line and arrange themselves in height order, and perhaps draw a graph of their heights, or learn about the median height.

Finish the work on this topic with the Diagnostic Quiz.

Key questions

- How can you find out if that thing is longer than that one? …
- Which of you is tallest?
- How many metres long is the school yard?
- How far away is that tree? Is it more than 100 metres or less? Can you find out?
- How long is that motor car? Will it fit into that parking space?

Diagnostic Assessment

This should take about 5–10 minutes.
Write the question on the board, say to the class:
"Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D".

Quiz 1. For learners who have met metres, centimetres and millimetres	**Quiz 2. For learners who have met metres and centimetres but not millimetres**
Complete this statement: 2000 mm = _____ m (A) (B) (C) (D) 2 20 200 0.2	How many centimetres are there in 1 metre? (A) (B) (C) (D) 0.01 10 100 1000

1. Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
2. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong. It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.
3. **Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.**

A. is the correct answer. **Common Misconceptions** **B.** These learners are confused about millimetres and centimetres and may think that there are 100 millimetres in a metre. **C.** These learners are confused about millimetres and may think that there are 10 millimetres in a metre. **D**. These learners are probably just guessing. They seem to have no idea about the relationship between millimetres and may metres.	**C.** is the correct answer. **Common Misconceptions** A. Confusion here perhaps because 1 cm = 0.01 m B. 10 may be a guess C. Confusion perhaps between centimetres and millimetres because 1000 mm = 1 m **https://diagnosticquestions.com**

Follow up

- Introduction of millimetres, centimetres and metres as standard units together with decimal notation.
- Drawing bar charts to represent class data, for example heights.
- Scale drawings of the classroom, school yard, football pitch etc.

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. New material will be added for Secondary 6.
For resources for teaching A level mathematics see https://nrich.maths.org/12339
Note: The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is beyond the school curriculum for Grade 12 SA.

	Lower Primary Age 5 to 9	Upper Primary Age 9 to 11	Lower Secondary Age 11 to 15	Upper Secondary Age 15+
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6