

Estimating Lengths in Metric Units

Overview

This activity introduces the idea of using our own parts of the body, such as hand spans and arm lengths, as personal references or 'benchmarks' for estimating lengths in metric units. In this enjoyable activity students work in pairs and gain practice at both estimating and measuring with rulers and tape measures.

It also introduces the 'guess, estimate and measure' activity mode that can be adapted for many other types of measurement. This encourages students to 'think metric', rather than always trying to convert from other systems of measurement they may be more familiar with.

Skills and Knowledge

- Metric units of length - m, cm, mm
- Estimating lengths
- Measuring with tapes and rulers
- Counting in 10s and 20s

Preparation and Materials

- Tape measures (1 per pair of students)
- Photocopy Activity Sheets 1 & 2 (1 per student)
- Photocopy Practice Sheet 1 (2 per student)

Suggested Procedure

Step 1: The Challenge

Ask:

- *Take a piece of paper and try drawing a line that you think is approximately 10 centimetres long.*
- *Don't look at any ruler or tape measures.*
- *Just draw what you think it might be.*

Distribute tape measures and ask students to measure their lines.

Ask:

- *How did you make your estimate?*
- *How close were you?*
- *Did anyone guess much too long?*
- *Did anyone estimate much too short?*



The **vertical metre** is from the floor to the waist, of the hip, or the trouser pocket, depending on one's height.

This is useful for estimating vertical heights such as when buying furniture, since the shoulder-arm measure is not much used in this situation.

Step 3: Using the body measures to measure each other

Arrange students in pairs.

Give each pair a copy of Activity Sheet 2.

Explain:

- *You will be measuring each other in this activity*
- *You will do this in 3 stages:*

Stage 1 – **Guess** with your eyes

- then fill in the guess on the table in the 'guess' column.

Stage 2 – **Estimate** a measurement using your hands and arms

- then fill in the estimate in the 'estimate' column.

Stage 3 – **Measure accurately** with the tape measure

- then fill in the exact measurement in the last column.

The items on the Activity Sheet are designed to create maximum interaction between students and usually lead to much laughter as well.

They also introduce language of measurements such as, 'circumference', 'height', 'distance'.

As students are doing the activity circulate and encourage them to use the appropriate measures and give hints where necessary. For example:

- For measuring heights it is easier to stand against the board or a wall and make a mark.
- When using a tape measure make sure you start at the zero mark, rather than the end of the tape.



Debriefing the activity

When students have completed the activity explain the final task:

- *Let's see who has improved at estimating.*
- *I want you to use your new estimation skills to draw a 15 cm line.*
- *Do it without looking at a ruler or tape.*
- *But you can use your body and hand measures.*

When students have done this ask:

- *Who thinks they are now better at estimating?*

Extension

Explain:

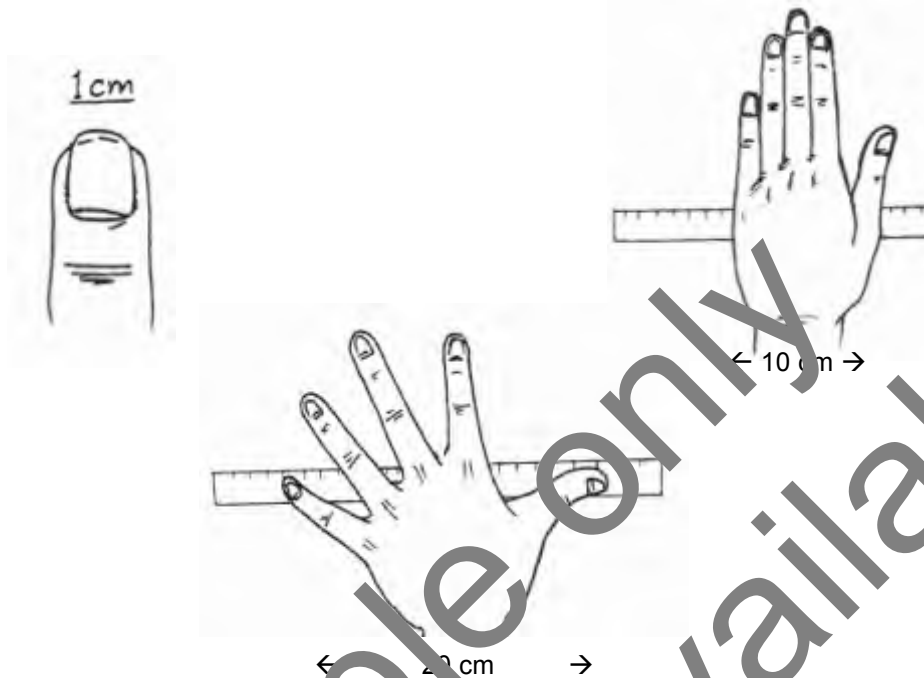
- *Practising these techniques at home will help you to remember them.*
- *It is also really useful to teach them to someone else.*

Distribute copies of **Practice Sheet 1** (2 copies) and explain the task to the students. Encourage them to do the task at home with a friend or family member and to report back in a following session.

Sample Only
Print not available



These hand measures are useful references for estimating small lengths



Longer lengths can be estimated using these two different body metre measures



Body references for measuring length

Work in pairs to make these measurements and fill the answers in the spaces of the table

	Guess Using eyes only	Estimate Use hands and body measures	Accurate Measurement Use tape measure
Your partner's height			
The circumference of your partner's head			
Your partner's foot length			
The distance between your partner's eyes			



Estimating metric lengths at home

Teach the hands and body references for metric length to a friend or family member. Give them a copy of Activity Sheet 1 to record their own body measures.

Choose 5 - 8 different things that you will both to measure. These could include:

- Sizes of furniture – e.g. length of dining table, height of chair, width of kitchen bench.
- Lengths in the house – e.g. height of doors, width of hallway, length of room.
- Other parts of the body – e.g. neck circumference, arm length, back length.

Each take a copy of the table below and write in the things you have chosen.

Remember the procedure:

- First **Guess** – using eyes only.
- Then **Estimate** – using hand and body references.
- Then **Measure** – using a tape measure.

Object or distance	Guess	Estimate	Measure

Make notes about how you both went with your estimations:

- Did you get better?
- Were you a good teacher?
- Which estimations were most difficult?

