

Math 9
2.1 SI Measurement (part 1)

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Personal Referents

Estimating lengths or distances is easier if you can approximate common measurements using your bodies or surroundings.

referent: something familiar or convenient that is used to refer to something else





Explore and Analyze

- Hold a metre stick at your side with one end of the stick touching the floor. How high up your body does the other end reach? You can use this location on your body as a personal **referent** for 1 metre. The referent does not need to match the measurement exactly, but it needs to be pretty close.

- Complete the table as you collect personal referents for common SI (metric) lengths.

| SI Measure | Personal Referent |
|------------|--|
| 1 m | height to my hip / length of one big step. |
| 10 cm | width of spread fingers |
| 1 cm | width of pinky finger |
| 1 mm | thickness of fingernail / tip of pen |

- Use your body to create other personal referents for SI (metric) lengths. Complete the table.

| Personal Referent | | SI Measure |
|-------------------------|--|------------|
| Your outstretched hand |  | 20cm |
| The length of your foot |  | 26cm |
| The length of your arm |  | 75cm |
| Your height |  | 178cm |

The length, width or height of some things is often standard. In most homes, all of the doors measure the same height. Again, you can use a referent to estimate, even if the measurement is not exact. For example, you can use the width of a standard piece of paper as a reference for 20 cm even though it is a little wider than 20 cm.

4. Complete the table.

| Referent | SI Measure | Referent for Approximate SI Measure |
|--------------------------------|-----------------|-------------------------------------|
| Width of a piece of paper | 21.5 cm | 20 cm |
| Height of a door | 206 cm | about 200cm or 2m |
| Height of a desk | 75.4 cm | about 75cm |
| Height of an electrical outlet | 24 cm to centre | about 25cm |
| Length of a piece of paper | 27.8cm | about 30cm . |

5. You can use a collection of measurement referents to estimate different heights. For example, a student may be 5.5 paper lengths tall. Use one of your referents from #4 to estimate the height of the classroom.

$$4 \text{ desks tall} \\ 4 \times 75 \longrightarrow 300 \text{ cm}$$

$$1\frac{1}{2} \text{ doors} \\ 1.5 \times 2\text{m} \longrightarrow 3\text{m}$$

EXACT
HEIGHT
304 cm

$$10 \text{ pieces of paper} \\ 29^{\text{cm}} \times 10 \longrightarrow 290 \text{ cm}$$

$$2\frac{1}{2} \times \text{Josh} \\ 173 \times 2\frac{1}{2} \longrightarrow 513 \text{ cm}$$

$$2 \text{ Izzy's} \\ 157 \times 2 \longrightarrow 314 \text{ cm}$$