CLASS 6 SCIENCE NCERT SOLUTIONS

Class 6 Science Chapter 5 Measurement of Length and Motion NCERT Solutions

NCERT Solutions for Class 6 Science Chapter 5, "Measurement of Length and Motion" from the Curiosity textbook (2026-27 edition). This chapter explains why standard units are needed, how to measure length correctly, and the different types of motion around us.

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How Do We Measure?

Historically, people measured length using body parts — a **handspan**, **arm length**, **foot length**, or **stride**. Ancient Indian units included the *angula* (finger-width), *dhanusa* (bow-length), and *yojana* (a larger distance unit). The problem with body-part units is that they vary from person to person, giving different measurements for the same object.

Standard Units

To avoid this inconsistency, the world adopted **standard units** — fixed, universally agreed-upon units of measurement. The **SI unit of length is the metre (m)**, established through the French metric system. Common conversions:

1 kilometre (km) = 1000 metres (m)

1 metre (m) = 100 centimetres (cm)

1 centimetre (cm) = 10 millimetres (mm)

Therefore, 1 km = 1,00,000 cm

Very large distances (like the distance between two cities) are measured in kilometres, while very small lengths (like the thickness of a page) are measured in millimetres — using the metre for both would be inconvenient.

Correct Way of Measuring Length

Place the measuring scale in direct contact with the object, along its full length.

If the scale's zero mark or edge is broken or worn out, start measuring from any other clear full mark (such as the 1.0 cm mark) and **subtract** the starting reading from the ending reading to get the correct length.

Avoiding parallax error: position your eye **directly above (perpendicular to)** the point on the scale being read. Viewing the scale from an angle (to one side) gives an incorrect reading.

Measuring the Length of a Curved Line

A rigid scale cannot directly measure a curved or irregular path. Instead, lay a flexible **thread** along the curve (holding it taut and following the curve exactly), mark the endpoint on the thread, then straighten the

thread out and measure its length against a rigid metre scale.

Describing Position and Motion

To describe an object's position, we need a **reference point** — a fixed point used to judge whether the object's position is changing over time. For example, kilometre stones along a highway act as reference points showing the remaining distance to a destination; as the numbers decrease, it shows the traveller is getting closer, meaning their position is changing.

An object is said to be in **motion** if its position changes with time relative to a reference point; otherwise, it is at **rest**. Note: if you are inside a closed cabin (like a ship's cabin with no windows) with no external reference point visible, you cannot tell whether you are moving or at rest.

Types of Motion

This chapter classifies motion into three types:

> **Linear (rectilinear) motion:** movement along a straight-line path. Examples: a car moving on a straight road, an athlete running a 100 m race, an object falling straight down.
>
> **Circular motion:** movement along a circular path. Examples: a merry-go-round, a stone whirled on the end of a string, a spinning top, fan blades, clock hands.
>
> **Oscillatory (periodic) motion:** to-and-fro movement about a fixed position. Examples: a swing, a simple pendulum, a plucked or pressed metal strip.

Note: this chapter does not introduce "rotational motion" as a separate named category — objects that spin in place (like fan blades or a spinning top) are grouped under circular motion at this level. Earth's motion (both its daily spin and its yearly path around the Sun) also falls under this chapter's "circular motion" label, even though advanced physics later distinguishes spinning-in-place (rotation) from moving-around-something-else (revolution/orbit).

Solved Textbook Questions (Let Us Enhance Our Learning)

Q1. Match the following to the most suitable unit: distance between Delhi and Lucknow; thickness of a coin; length of an eraser; length of a school ground.
Answer: Delhi-Lucknow distance → **kilometre**. Coin thickness → **millimetre**. Eraser length → **centimetre**. School ground length → **metre**.

Q2. State whether True or False: (i) A car moving on a straight road shows linear motion. (ii) Motion is defined based on a change in position relative to a reference point. (iii) 1 km = 100 cm.
Answer: (i) **True**. (ii) **True**. (iii) **False** — 1 km = 1,00,000 cm, not 100 cm.

Q3. Which of the measuring units mentioned is a non-standard unit that varies from person to person?
Answer: The **handspan** — since hand sizes differ between people, it gives inconsistent measurements.

Q4. Convert 1.5 km into metres.

Answer: 1.5 × 1000 = **1500 m**.

Q5. How would you measure the length of a curved boundary, such as the edge of a leaf?
Answer: Lay a flexible thread carefully along the curved edge, mark where it ends, then straighten the thread and measure its length using a rigid metre scale or ruler.

Q6. Give one example each of linear, circular, and oscillatory motion from daily life.
Answer: Linear: a car moving on a straight road. **Circular:** a merry-go-round. **Oscillatory:** a swing moving back and forth.

Q7. A rollercoaster track goes straight from A to B, loops in a circular path from B through C and D to E, then goes straight again from E to F. Classify the motion in each segment.
Answer: A→B: **linear motion**. B→C→D→E (the loop): **circular motion**. E→F: **linear motion**.

Q8. Tasneem wants to make a one-metre measuring scale at home. Should she use a stretchable rubber strip? Explain.
Answer: No. A stretchable material like rubber changes length when pulled, so it would give inconsistent, inaccurate readings. A measuring scale should be made from a rigid, non-stretchable material (like wood, metal, or plastic).

Q9. While sitting in a cabin of a ship on a calm sea with no windows, can you tell whether the ship is moving or at rest? Explain.
Answer: No. Without an external reference point visible from inside the closed cabin, there is no way to judge whether your position (and the ship's) is changing over time.

Q10. Why can't the same unit (like the metre) be conveniently used to measure both the length of a railway track between two cities and the thickness of a page?
Answer: The metre is too small a unit to conveniently express very large distances (like railway tracks between cities, which would involve huge numbers), and too large to precisely express very small thicknesses (like a page, which would involve tiny fractions). Kilometres are used for the former and millimetres for the latter, for convenience and precision.

See also: Extra Questions | Revision Notes for this chapter.