

NCERT SOLUTIONS CLASS-VI SCIENCE CHAPTER-10

MOTION AND MEASUREMENT OF DISTANCE

NCERT Solutions Class 6 Science Motion and Measurement of Distances

Q1. Give 2 examples of water, land and air modes of transport

Answer:

Water – Boats and ships

Land – Cars, Bikes and trucks

Air – Helicopters and airplanes

Q2. Fill in the blanks

(a) One meter is ____ cm.

(b) 5 kilometres is _____ m.

(c) Motion of wheel in bicycle is _____

(d) Motion of a kid in a swing is _____

(e) Motion of needle in a sewing machine is _____

Answer:

(a) 100

(b) 5000

(c) Circular

(d) Periodic Oscillatory

(e) Periodic Oscillatory

Q3. Why can't a pace or footstep be used as a standard unit of length?

Answer:

Because a footstep or pace differs from person to person, the stride is not equal for everyone

Q4. Arrange the following lengths in their increasing magnitude:

1 centimetre, 1 metre, 1 millimetre, 1 kilometre.

Answer:

Ascending order of length:

1 millimetre < 1 centimetre < 1 metre < 1 kilometre

Q5. The height of a person is 1.72 m. Express it in cm and mm.

Answer:

For cm, WKT, 1m = 100cm

Therefore, $1.72 \times 100 = 172\text{cm}$

For mm, WKT, 1m = 100cm $\times 10 = 1000\text{mm}$

Therefore, $1.72 \times 1000 = 1720\text{mm}$.

Q6. The distance between Vibu's home and his school is 2250m. Express this distance in km.

Answer:

WKT, 1 km = 1000 m

So, $2250 \text{ m} = 2250/1000 = 2.25 \text{ km}$

Thus, distance between Vibu's home and his school is 2.25 km.

Q7. While measuring the length of a knitting needle, the reading of the scale at one end is 2.0 cm and at the other end is 43.1 cm. What is the length of the needle?

Answer:

Length of the needle = $43.1 \text{ cm} - 2.0 \text{ cm} = 41.1 \text{ cm}$.

Q8. Write the similarities and differences between the motion of a bicycle and a ceiling fan that has been switched on.

Answer:

Similarity: Both the wheel and ceiling fan produces rotational motion on fixed axis.

Dissimilarity: Bicycle moves forward in rectilinear motion but ceiling fan does not show any such motion

Q9. Why can't you use elastic measuring tape to measure distance? What will be the problems you'll face when measuring using an elastic measuring tape?

Answer:

An elastic measuring tape won't give a correct reading of length between two points.

Reasons:

- (i) The elastic tape will stretch with respect to the force with which it is pulled, which eventually gives incorrect readings.
- (ii) Over 2-3 readings, it won't give the same measurement even when measured by the same person and same tape.
- (iii) Measurement would also vary for different persons measure the same distance because the force with which they pull the tape would be different.

Q10. Mention any two examples depicting periodic motion.

Answer:

- (a) Vibrating tuning fork
- (b) Earth in its orbit around the sun.

Very Short Answer Type Questions

Q1. Can we rely on our senses for accurate measurements?

Answer: No, We can't rely on our senses for accurate measurements.

Q2. Why can't we use hand span and arm length as standard units of length?

Answer: Because hand span and arm length differ from person to person.

Q3. How many centimetres are there in 2.5m?

Answer: 250cm.

Q4. Name the measuring tape which can be used to measure a tree's girth.

Answer: Measuring tape

Q5. Give an example of linear motion.

Answer: Motion of apple falling from tree

Q6. Give an example of circular motion.

Answer: Motion of earth going around the sun.

Q7. Name the type of motion in which an object moves along a straight path.

Answer: Rectilinear or Linear motion.

Q8. Give the unit for measuring the following:

(a) Length of your eraser

(b) Distance between Delhi and Jaipur.

(c) Length of your shoe lace

(d) Thickness of a coin.

Answer: (a) Centimetre (b) Kilometre (c) Centimetre (d) Millimetre

Q9. Name the device used to measure the following:

(a) Size of your wrist.

(b) Size of your shoulder.

(c) Your weight.

(d) Circumference of a round table.

(e) Your height.

(f) Cloth required for a curtain.

Answer:

(a) Measuring tape

(b) Measuring tape

(c) Weighing balance

(d) A long thread or measuring tape.

(e) Measuring tape

(f) Metre scale or measuring tape.

Short answer type questions

Q1. State any two precautions to be observed while measuring the length with the help of a metre scale.

Answer:

Two precautions are:

(a) The starting point of distance should coincide with the zero reading of metre scale.

(b) The eye should be exactly perpendicular and in-line with the point of measurement.

Q2. Define rest and motion.

Answer: The bodies, which don't change their positions over time, are said to be at rest. The objects, which change their positions over time, are said to be in motion.

Q3. Define the term standard unit.

Answer: The unit which can be used anywhere around the world as a common unit of measurement is called a standard unit.

Q4. How can a measured length be expressed?

Answer: Each measurement has:

- (a) A number representing the numerical value of the length.
- (b) Followed by the unit in which the quantity is measured.

Q5. Give one example in each of the following types of motion:

- (a) *Linear*
- (b) *Translation*
- (c) *Circular.*
- (d) *Periodic.*

Answer:

- (a) Motion of an apple falling from tree
- (b) Cars
- (c) Ceiling fan
- (d) Pendulum of a clock

Long answer type questions

Q1. Why do we need a standard unit for measurement?

Answer: We need a standard unit for measurement to make our measurement more common, reliable and accurate. While taking a measurement, the value should be same for everyone. In order to do that, we have a common unit of measurement called a standard unit. SI units are used everywhere in the world for the sake of uniformity.

Q2. What type of motion do the following objects have?

- (a) *Falling of apple from a tree*
- (b) *The swinging of pendulum of a clock*
- (c) *The movements of a bee*
- (d) *The blades of a propeller.*
- (e) *The smoke from a chimney*
- (f) *Wheels of moving car.*

Answer:

- (a) Falling of apple from tree: Linear motion.
- (b) The swinging of pendulum of clock: Periodic motion.
- (c) Movement of a bee: Random motion.
- (d) Blade of a propeller: Circular motion.
- (e) The smoke from a chimney: Random motion.

(f) Wheels of moving car: Linear motion and Rotational motion.

Q3. Give two examples for each of the following motions:

(i) Linear motion

(ii) Spinning motion

(iii) Oscillatory motion

(iv) Periodic motion

(v) Vibrational motion

(vi) Circular motion

(vii) Random motion

Answer:

(i) Linear motion:

(a) Falling of an apple from a tree,

(b) Rolling of ball on ground,

(ii) Spinning motion:

(a) Propeller of a ship,

(b) Rotating fan.

(iii) Oscillatory motion:

(a) Motion of a child on a swing

(b) Pendulum of a clock

(iv) Periodic motion:

(a) Pendulum of a clock,

(b) Motion of a swing, heartbeat.

(v) Vibrational motion:

(a) Vibration of tuning fork,

(b) String of a guitar.

(vi) Circular motion:

(a) Bicycle wheel,

(b). Hands on watch

(vii) Random motion:

(a) Motion of smoke from the chimney,

(b) Movement of bees.

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