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Working- Assistant Professor  
Chandigarh University  
Mohali, Punjab(India)

Teaching – Computer Science, Physics,  
Mentoring & counselling

Experience :3+ years for University  
2+ for school



# Lecture conducting

1. Topic-Introduction
2. Real World Demonstration of Topic
3. Concept behind Demonstration- Theory
4. Examples with Doubt Discussion
5. Numerical Questions
6. Assignments/Practice Question-Discussion

# Prerequisites

- Algebra Basics
- Trigonometry with right angles
- The Pythagorean theorem
- Others- Graphs/Derivation

# Study Vs. Learning

Focus on memorization and recall

Copy and read everything

Scattered information

Random Trial Error

Time Consuming and hard work

Teacher centered

Need high focus

Routine

Focus on things, Understanding,  
and making information meaningful

Concentrate on key concept

Connected and organized information

Plan(method or Process)

Effective and efficient work

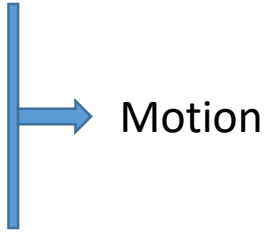
Student centered

Not boring- fun/exciting

Engaging and inspiring

# **Demo – Lecture Motion**

- 1. An Object
- 2. Change position
- 3. W.R.T. time



Object(Ball)



08:10AM



08:20AM

# Motion in a straight line



Objects in some kind of motion

## Definition:

### Motion

**Motion** is change in position of an object with time. Motion of object along a straight line is called **rectilinear motion**. Examples include flying kite, moving train, earth's rotation etc.

Q&A:-Write Down 5 real world examples of motion in straight line.



# Frame of Reference



Object(Boll)

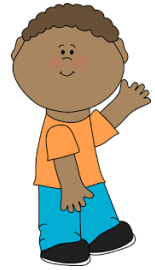


# Frame of Reference



Object(Boll)

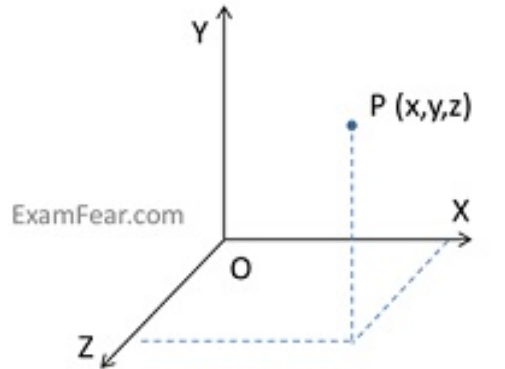
- To Know the change of position –  
We need a reference point
- Coordinate System



# Frame of Reference

# Frame of Reference

- Objects changing positions with time with respect to the frame of reference are in motion while those which do not change position are at rest.
- For a moving car, for the frame of reference outside the car, it appears moving. While for the frame of reference inside the car, the car appears stationary.



O is the Origin or start point of the object.

P is the position of object after a time t.

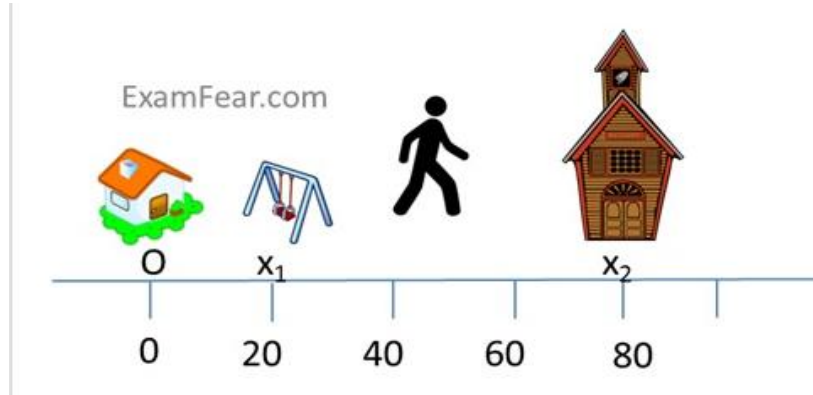
3-dimesional coordinate system

## Frame of Reference

In order to know the change in position of an object, a reference point is required. Point O in the figure is the **reference point or Origin** and together with three axes, this system is called the **coordinate system**. A coordinate system with time frame is called **frame of reference**.

Q&A: Can a moving body have relative velocity zero with respect to another body? Give an example.

# Distance and displacement



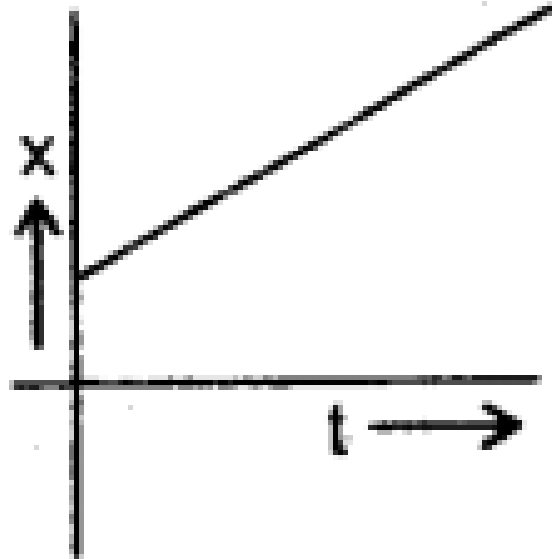
## Path Length (Distance) Vs. Displacement

Path Length: It is the distance between two points along a straight line. It is **scalar** quantity.

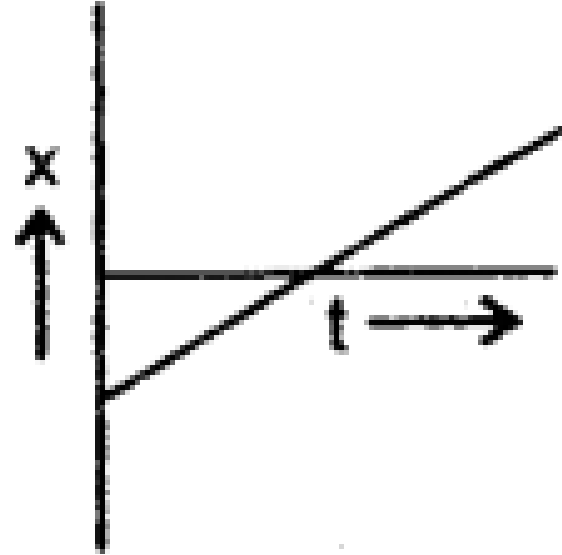
Displacement: It is the change in position in a particular time interval. It is **vector** quantity. Change in position is usually denoted by  $\Delta x$  ( $x_2 - x_1$ ) and change in time is denoted by  $\Delta t$  ( $t_2 - t_1$ ).

Q&A: The displacement of a body is zero. Is the distance covered by it necessarily zero?

Q&A: What is common between the two graphs shown in figs, (a) and (b)?



(a)



(b)



Units	Topics
<b>I</b>	<b>Electrostatics</b>
Chapter 1	Electric Charges and Fields
Chapter 2	Electrostatic Potential and Capacitance
<b>II</b>	<b>Current Electricity</b>
Chapter 3	Current Electricity
<b>III</b>	<b>Magnetic Effect of Current &amp; Magnetism</b>
Chapter 4	Moving Charges and Magnetism
Chapter 5	Magnetism and Matter
<b>IV</b>	<b>Electromagnetic Induction &amp; Alternating Current</b>
Chapter 6	Electromagnetic Induction
Chapter 7	Alternating Current
<b>V</b>	<b>Electromagnetic Waves</b>
Chapter 8	Electromagnetic Waves
<b>VI</b>	<b>Optics</b>
Chapter 9	Ray Optics and Optical Instruments
Chapter 10	Wave Optics
<b>VII</b>	<b>Dual Nature of Matter</b>
Chapter 11	Dual Nature of Radiation and Matter
<b>VIII</b>	<b>Atoms &amp; Nuclei</b>
Chapter 12	Atoms
Chapter 13	Nuclei
<b>IX</b>	<b>Electronic Devices</b>
Chapter 14	Semiconductor Electronics
<b>X</b>	<b>Communication Systems</b>
Chapter 15	Communication Systems

