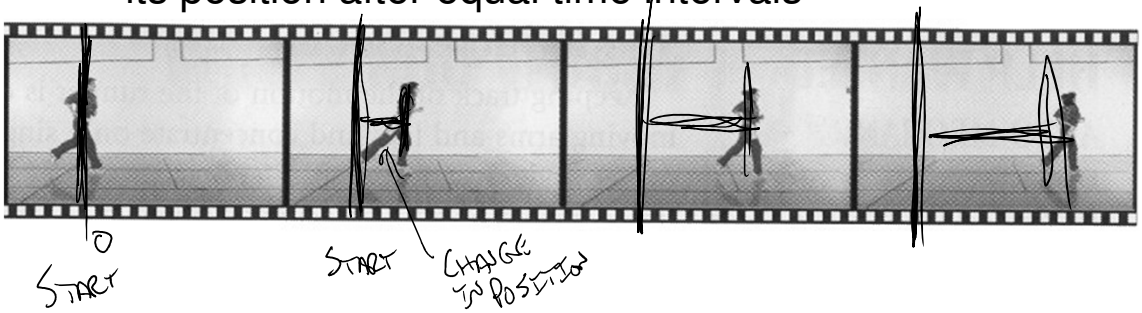
Picturing and Describing Motion

1

Motion Diagrams

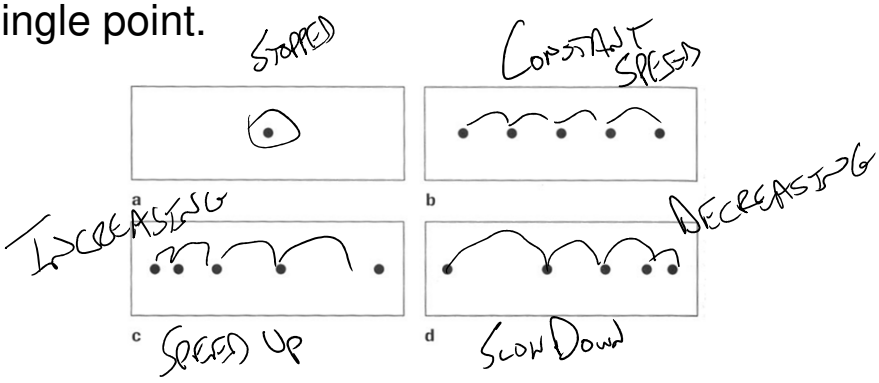
- A series of images of a moving object that records its position after equal time intervals



2

Particle Model

- Replacing the object in a motion diagram with a single point.



3

Defining a Coordinate System

- Each time you take a measurement, you define the zero point, or origin of the variable you are studying.
- You also establish the positive and negative direction of the variable.

4

Types of Measurements

- Scalar quantity
  - measure of quantity only
- Vector quantity
  - measure of quantity and direction

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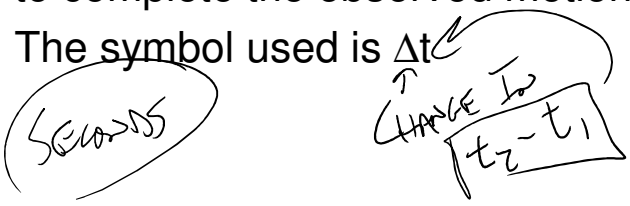
Time interval

- Scalar Quantity
- The change in time, or the amount of time needed to complete the observed motion.
- The symbol used is Δt



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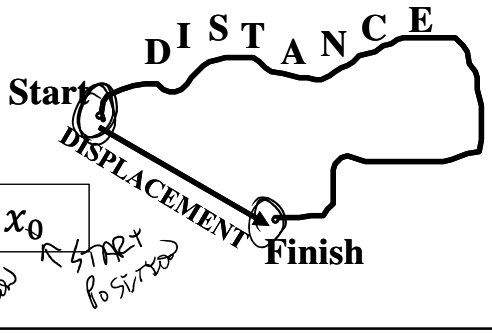
Distance

- Scalar Quantity
- The change in position of an object along a path.

7

Displacement

- Vector Quantity
- The change in position in a particular direction when comparing starting and ending positions. (path independent)



$$\Delta x = x - x_0$$

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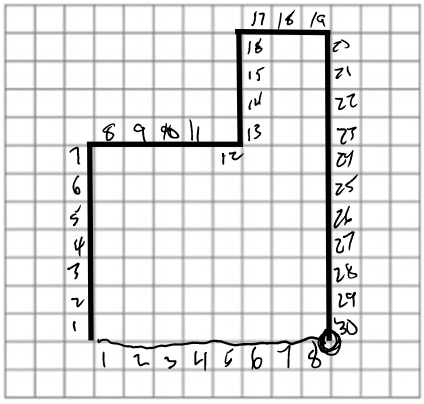
Example 1

- What is the distance and traveled and displacement of a of a bug that crawled from A to B if each box represents 1 cm?
- Distance = 30 cm
- Displacement = 8 cm



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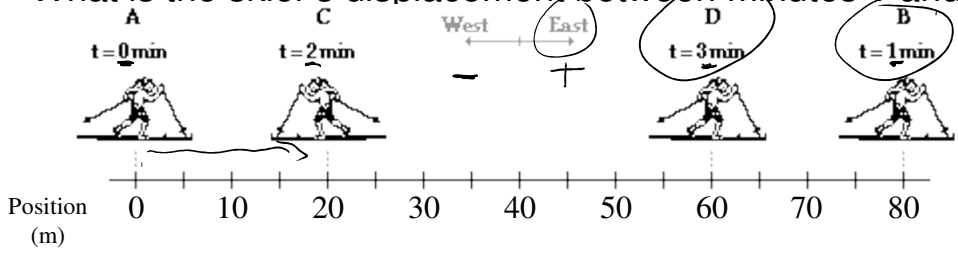
Example 2

- The skier moves as shown below.
  - What distance did the skier move during the first 2 minutes? 140m
  - What is the skier's displacement during the first 2 minutes? 20m EAST
  - What distance did the skier move during the full 3minutes? 180m
  - What is the skier's displacement after the 3 minutes? 60m EAST
  - What is the skier's displacement between minutes 1 and 3? 20m WEST



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