

Name _____ date _____ period _____

Physical Science

Unit 2

Motion

Chapter 11

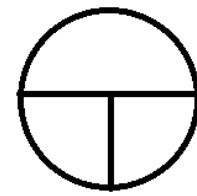
1. Motion – when something changes _____
2. Distance – How far an object _____
3. _____ - the distance an object has been moved from one position to another.
4. Example: one car travels from one town to another that is _____ to the east.
5. Another car travels around a track for _____ and ends up at the starting point.
6. Both cars traveled a distance of _____ but the first car's displacement is _____ east while the second car's displacement is _____ because it ended up where it started from.
7. To describe motion accurately and completely, a **frame of reference** is necessary.
8. _____ is a system of objects that are not moving with respect to one another.
 - a. If you are standing beside the tree on the left, what is moving?
 - b. If you are on the train, what is moving?
 - c. If you are riding down the road on a bus is your friend moving beside you?
 - d. Are the road signs moving?
 - e. If you are on the plane what is moving from your frame of reference?
 - f. If you are beside the tree what is moving from your frame of reference?
9. _____ is the total length traveled.
10. _____ is the distance measured directly from starting to stopping point.
 - a. What is the distance traveled on the path?
 - b. What is the displacement?
 - c. A runner leaves his house and runs two blocks east, then three blocks south and finally 1 block west. How far has the runner traveled?
 - d. What is his displacement?
 - e. What is the distance traveled of a race car driver in the Indy 500?
 - f. What is the displacement of a race car driver in the Indy 500?
11. Speed – How much _____ it takes for a change in position to occur or how _____ something moves.
12. Any change over time is called a _____. Speed is the _____ of changed in position or the rate of _____.
13. Kinds of Speed - _____ speed – the rate of motion at any given instant (speedometer)
14. Constant Speed – a speed that does not _____ (cruise control).
15. Average Speed – is the total distance traveled by total _____ of travel (miles per hour)
16. Formula for speed: $s =$ _____
17. Velocity – is both speed and _____. Like speed, velocity may _____. Unlike speed, the velocity can change while the speed stays _____. (because velocity includes both speed and direction, if either value changes, velocity will change)
18. Formula for velocity - $v =$ _____

19. Terminal velocity – the highest velocity that will be reached by a _____

20. Magic Circle with units ----->

21. Both are calculated by dividing distance by time.

- a. Velocity = distance/time speed= distance/time
- b. Velocity has a direction, speed does not.
- c. UNITS of speed and velocity is meters/second or kilometers/hour



22. Examples

1. A runner ran 400 meters for 40 seconds. At what speed did he run?

Given	Equation 	Solve
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3. A runner traveling at 4.25 m/s will travel how far in 23 s?

Given	Equation 	Solve
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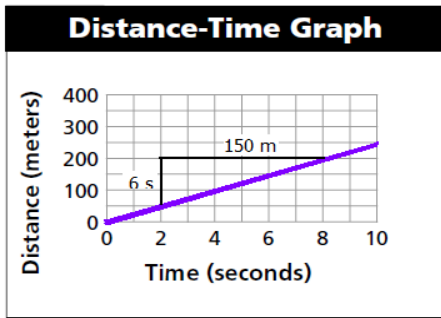
4. How long will it take a runner going 4.25 m/s to travel 50.0 meters?

Given	Equation 	Solve
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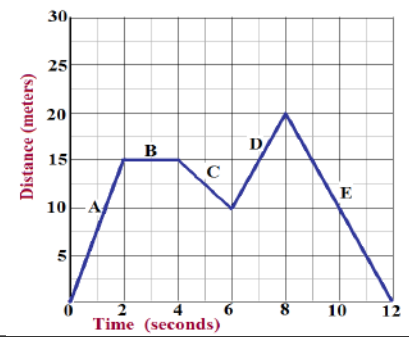
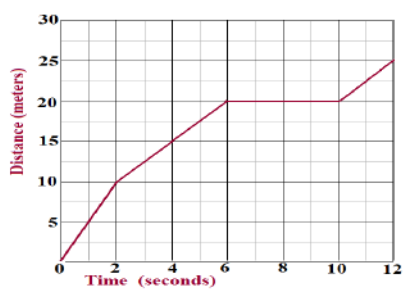
Graphing Speed

23. A _____ -- _____ graph is a good way to describe motion.

24. The _____ of a line on a distance-time graph is _____



$s = d/t = 150m \div 6s = 25m/s$



- | | |
|---|--|
| <ul style="list-style-type: none"> a. What is the object's average speed? b. What is its speed between 6s and 10 s? c. When is it traveling the fastest? | <ul style="list-style-type: none"> e. Where is the object standing still? f. Where is the object traveling backwards? g. Where is the object traveling at 5m/s? |
|---|--|

d. When is it NOT moving?	h. What is the speed at line E?
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25. Acceleration – the rate of change of _____.
26. Acceleration is both the rate of change in velocity and the _____ of that change.
27. So, even if an objects’ speed remains constant, _____ occurs if the direction changes.
28. IF: an object travels in a straight line, acceleration is just the rate of change of _____. The acceleration is in the same direction as the velocity (change in direction) then the object _____. The acceleration is in the opposite direction from the velocity then the object _____.
29. To calculate average acceleration, divide the change in velocity by the time interval

$A = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{T}$

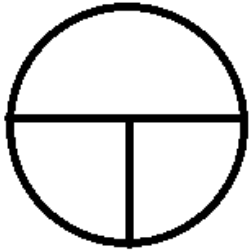
Where: a =

$v_f =$

$v_i =$

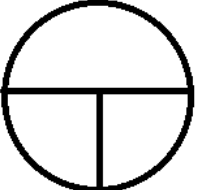
T =

$\Delta =$

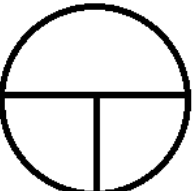


30. Acceleration - The change in velocity over _____
31. **Or** the change in _____ or _____
32. Acceleration cont. - If acceleration is small – speed change is _____. If acceleration is large – speed change is _____.
33. Acceleration cont. - _____ acceleration = object is speeding up.
34. Negative acceleration = object is _____.
35. Examples

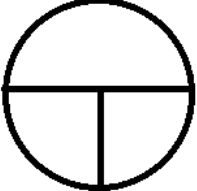
1. A roller coaster starts down a hill at 10 m/s. Three seconds later, its speed is 32 m/s. What is the roller coaster’s acceleration?

Given	Equation	Solve
		

2. How long will it take a car traveling 30 m/s to come to a stop if its acceleration is -3 m/s²?

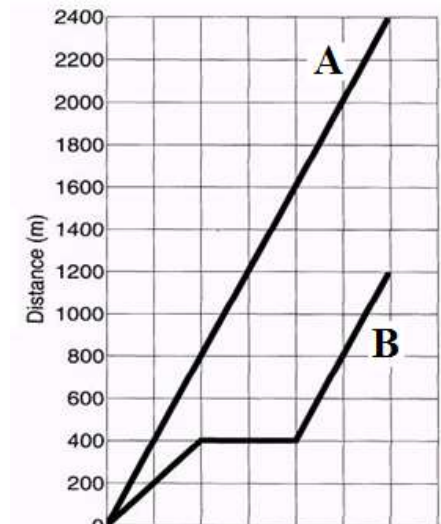
Given	Equation	Solve
		

3. What is the change in velocity if a truck acceleration is 25 m/s^2 over 4 seconds?

Given	Equation	Solve
		

36. Graphing Motion Speed

- slope =
- steeper slope =
- straight line =
- flat line =
- Who started out faster?
- Who had a constant speed?
- Describe B from 10-20 min.
- Find their average speeds.



37. Graphing Motion Acceleration

38. Acceleration is indicated by a curve on a Distance-Time graph.

39. Changing slope = changing velocity

- Slope = _____
 - Positive slope = _____
 - Negative slope = _____
- Straight line = _____
- Flat line = _____
- Specify the time period when the object was...
 - slowing down
 - speeding up
 - moving at a constant speed
 - not moving

