

Name: _____ Date: _____

Motion Study Guide



Definitions – write the definitions for the following vocabulary words.

1. SPEED – the distance an object travels per unit of time

2. What is the formula for speed?

speed = distance ÷ time

3. Reference Point – an object or place used for comparison to determine if something is in motion

4. What makes a good reference point?

it should be stationary (attached to the earth/not moving)

5. Motion – an object is in motion if the distance between the object and a reference point is changing (distance is increasing or decreasing) **j**

Units - Identify the following as measuring distance (D), time (T), speed (S), or velocity (V).

Distance 6. 25 centimeters

Distance 10. 102,000 m

Velocity 14. 67 mi/hr north

Time 7. 5.5 hours

Time 11. 1 hour 5 minutes

Time 15. 9,999 seconds

Speed 8. 89 mi/hr

Velocity 12. 35 km/hr west

Velocity 16. 25 inches/second right

Speed 9. 9 m/s

Distance 13. 2.9 miles

TRICK! 17. 500 eyeballs

Units - Based on the given units, write the correct unit of speed.

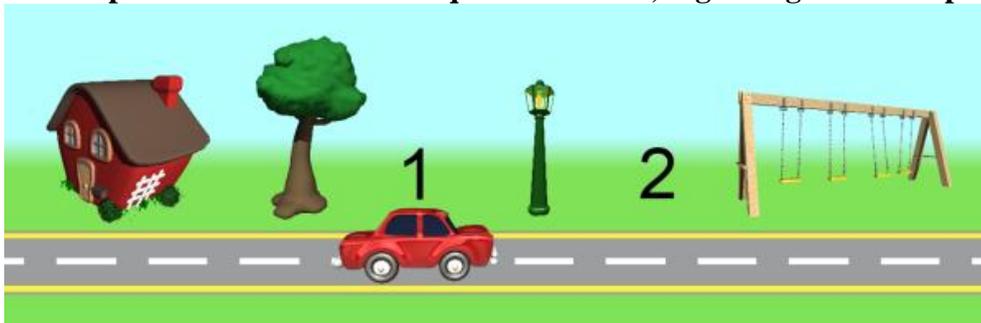
km/hr 18. Time = hours, Distance = kilometers

m/s 20. Distance = meters, Time = seconds

cm/min 19. Time = minutes, Distance = centimeters

ft/s 21. Distance = feet, Time = seconds

Use the picture below to answer questions 22-25, regarding reference points:



Describe the car's motion as it moves from Point 1 to Point 2, using the following reference points:

22. tree – **the car is getting farther away from the tree**

23. lamppost – **the car is getting closer and then farther from the lamppost**

24. swings – **the car is getting closer to the swings**

25. What does this tell you about reference points?

your choice of reference point can change the motion of the object

26. As you drive to school, compared to which reference point are you moving the fastest?

Circle your answer: **your car seat, the school, your home, the sun**

Because we are on the earth and the earth is rotating on its axis and revolving around the sun at extremely fast speeds

27. A car is driving 45 mi/hr from Graham to Raleigh. If the car travels at a faster speed, how will that affect the amount of time it takes to get to Raleigh?

faster speed means the car will get to its destination in less time

Calculate speeds for each of the following Distances and Times. Circle the slowest speed.

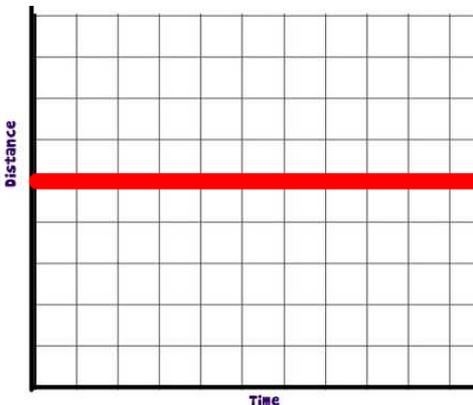
<u>Speed</u>	<u>Distance</u>	<u>Time</u>
28. 5 km/hr	15 km	3 hr.
29. 9 km/hr	18 km	2 hr.
30. 5 km/hr	10 km	2 hr.
31. 1 km/hr	1 km	1 hr.
32. 0.5 kh/hr	5 km	10 hr.

Calculate the speed for each object at 2 seconds and circle which object is going fastest.

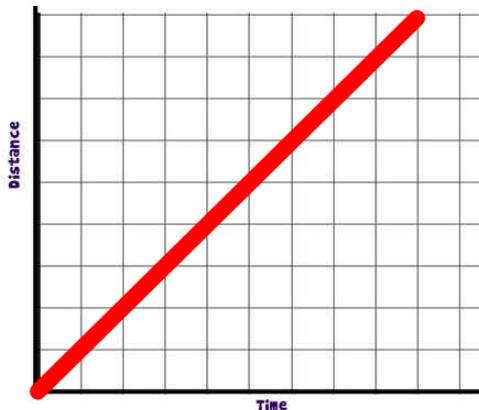
Object A		Object B		Object C	
Time (seconds)	Position (meters)	Time (seconds)	Position (meters)	Time (seconds)	Position (meters)
0	0	0	0	0	0
1	6	1	4	1	4
2	12	2	10	2	20
3	18	3	21	3	21
4	24	4	24	4	24
33. Speed: 6 m/s		34. Speed: 5 m/s		35. Speed: 10 m/s	

Use the following labels to identify the graphs below: **FASTER, SLOWER, NO MOTION**

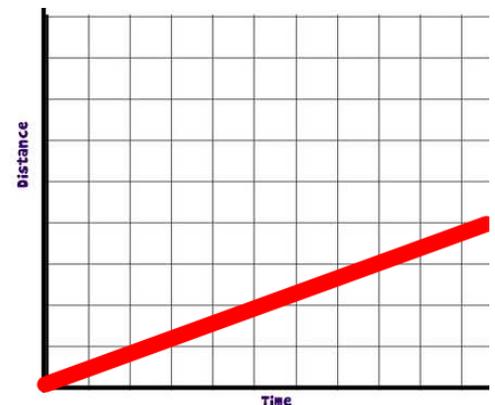
36. **no motion**



37. **faster**

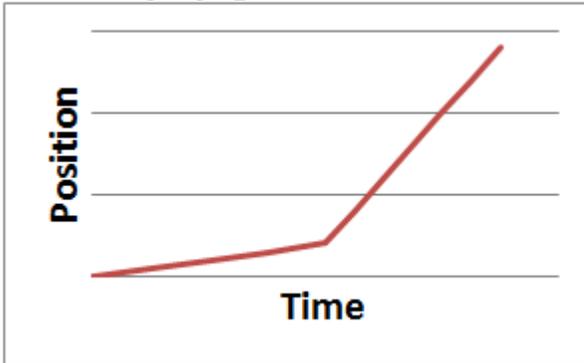


38. **slower**

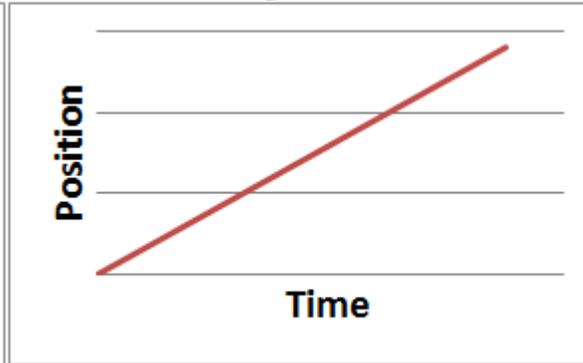


Use the following labels to identify the graphs below: **CONSTANT SPEED**, **CHANGING SPEED**.

39. **changing speed**

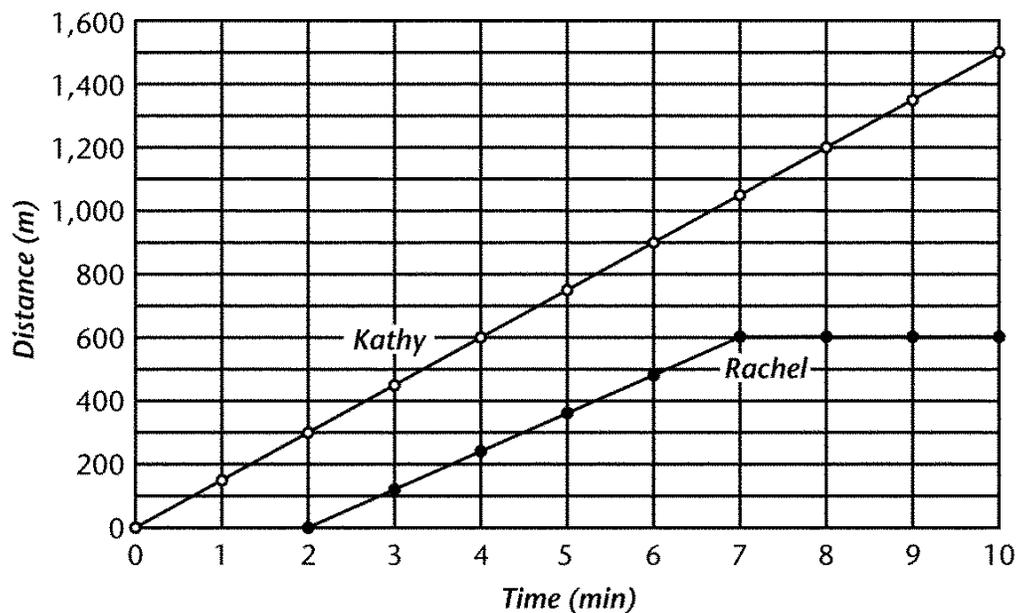


40. **constant speed**



Use the graph below to answer the questions 41-45 regarding interpreting a graph.

Motion of Two Joggers



41. What is Kathy's speed when she has jogged 300 meters?

$300 \text{ m} \div 2 \text{ min} = 150 \text{ m/min}$

Describe Kathy's speed throughout her jog. Describe Rachel's speed throughout her jog.

42. Kathy – **constant speed**

43. Rachel – **constant speed, but stopped between 7-10 minutes**

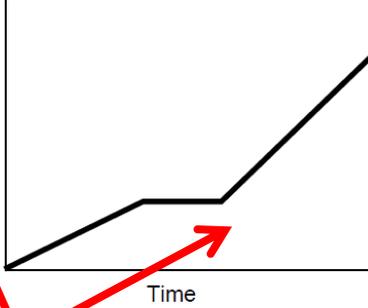
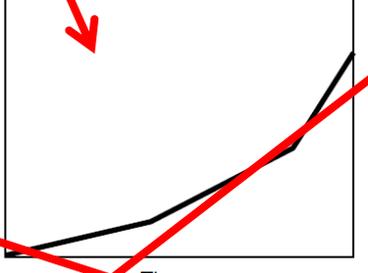
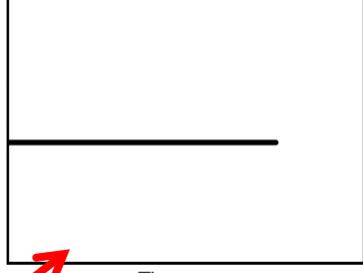
44. At the end of their jog, who ran a farther distance?

Kathy

45. What was her distance?

1500 m

Match the graphs below with the descriptions/data that were used to generate them.

Description/Data	Graph															
<p>46. Kailey was walking to school. It was Monday and she was not excited so she started walking slowly. When she looked at her watch, she realized she was going to be late so she started jogging a little faster. When the school bus passed her, she realized she had better run if she didn't want to be tardy.</p>																
<p>47. Jeff went for a hike. He started slowly and was looking around as he walked. Then he spotted an orange frog on the trail that he had never seen before so he stopped to look at it. After the frog hopped away, Jeff realized he was going to be late for dinner so he ran home.</p>																
<p>48. Jenna was training for the track team and recorded the following information during her practice:</p> <table border="1" data-bbox="82 743 727 932"> <thead> <tr> <th>Lap #</th> <th>Total Distance</th> <th>Total Time</th> </tr> </thead> <tbody> <tr> <td>Lap 1</td> <td>400 meters</td> <td>2 minutes</td> </tr> <tr> <td>Lap 2</td> <td>800 meters</td> <td>4 minutes</td> </tr> <tr> <td>Lap 3</td> <td>1200 meters</td> <td>6 minutes</td> </tr> <tr> <td>Lap 4</td> <td>1600 meters</td> <td>8 minutes</td> </tr> </tbody> </table>	Lap #	Total Distance	Total Time	Lap 1	400 meters	2 minutes	Lap 2	800 meters	4 minutes	Lap 3	1200 meters	6 minutes	Lap 4	1600 meters	8 minutes	
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<p>49. Kevin was supposed to meet his friend at the movies. Kevin sat down on his couch and watched an episode of Spongebob. When the show was over, he looked at his watch and figured he had enough time to watch another episode, so he did. While watching Spongebob, Kevin used his iPad to get on Facebook. The next thing he knew, he had missed the movie.</p>	