

Unit One Study Guide (use pages 306-459)

1. Friction acts in a direction \_\_\_\_\_ to the direction of an object's motion.
2. Unless an object at rest is acted upon by a force, it stays at rest due to its:
3. A 10-kg ball is accelerated  $500 \text{ m/s}^2$  by a force of:
4. The momentum of a 1500-kg car traveling at a velocity of  $10 \text{ m/s}$  is:
5. A \_\_\_\_\_ force can cause an object's motion to change.
6. The amount of matter in an object is called its:
7. Newton's second law of motion states the relationship of mass, acceleration, and force. It says:
8. A \_\_\_\_\_ causes objects to move in a circle.
9. The unit of force, a newton, is equal to:
10. An object in free fall \_\_\_\_\_ until it reaches terminal velocity.
11. Air rushing against an airplane is an example of \_\_\_\_\_ friction.
12. Speed measurements are given in units of:
13. Measurements of acceleration are given in units of
14. An airplane that moves 50 meters in one second has a speed of how many meters per hour?
15. A car traveling at  $25 \text{ m/s}$  speeds up to  $40 \text{ m/s}$  over a period of 15 seconds. The average acceleration of the car is
16. A rider finishes a 120-km bicycle trip in 3 hours. The average speed of the rider is
17. An airplane flies 80 km in 10 minutes and then flies 100 km in 20 minutes. The average speed of the airplane is:
18. The unit of work is called a:
19. An ideal machine has an efficiency of
20. You do 1,200 J of work using a screwdriver. The screwdriver does 900 J of work on a screw. What is the efficiency of the screwdriver?
21. An ax, a zipper, and a front tooth are examples of a simple machine called a
22. You divide the radius of a wheel by the radius of an axle. What are you calculating?
23. A car's steering wheel is an example of a simple machine called a(n):
24. The fixed point that a lever rotates around is called a(n)
25. When you bend your arm at the elbow, the fulcrum is at your:

26. Define (include the formula, SI unit, and circle diagram for calculating")

a. Distance-

b. Speed-

c. Velocity-

d. Acceleration-

27. On a distance-time graph, what does the slope tell you?

28. On a speed-time graph, what does the slope tell you?

29. Describe (what does it say and what is it commonly called)

a. Newton's First law of Motion-

b. Newton's Second law of Motion-

c. Newton's Third law of Motion-

30. Give an example for each of Newton's laws

a. Newton's First law of Motion-

b. Newton's Second law of Motion-

c. Newton's Third law of Motion-

31. Define and give an example of each of the following terms.

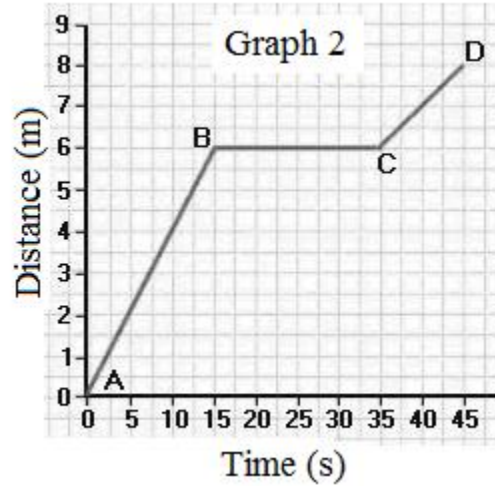
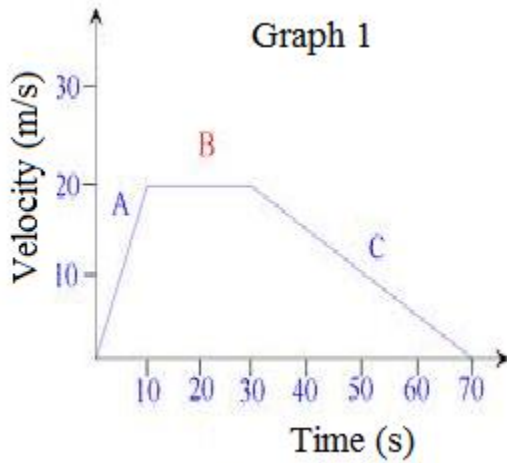
<b>Definition</b>	<b>Example</b>
a. Friction:	a. Friction:
b. Static Friction:	b. Static Friction:
c. Sliding Friction:	c. Sliding Friction:
d. Rolling Friction:	d. Rolling Friction:
e. Fluid Friction:	e. Fluid Friction:
f. Net force:	f. Net force:

32. Mixed Review Calculations [show your GIVEN, EQUATION, and SOLVE]

EX: A cat runs a total of 100 meters in 5 seconds. What was its average speed?

Given	Formula	Solve
D-100 meters T-5 seconds	$S=D/T$	20 m/s

33. What is the velocity of a missile that travels north 8000 meters in 10.12 seconds?
34. What distance does a rocket flying for 5 seconds at 100 m/s travel?
35. In 5 seconds, a car goes from 0 m/s to 60 m/s. What is the acceleration of the car?
36. A car's engine produces a force of 1500 N and it accelerates at  $2.5 \text{ m/s}^2$ . What is its mass?
37. You throw a 0.5 kg ball with a force of 15 N. What is the ball's acceleration?
38. A 15 kg ball accelerates at  $20 \text{ m/s}^2$  what force was exerted on the ball?
39. How much force is required to accelerate a 2 kg rock at  $3 \text{ m/s}^2$ ?
40. A horse ran 500 meters down the hill in 50 seconds. What is the velocity of the horse?
41. What is the acceleration of a 50 kg object pushed with a force of 500 newtons?
42. A horizontal line on a distance-time graph means the object is
43. An upward slope on a distance-time graph means the object is
44. A downward slope on a distance-time graph means the object is
45. A horizontal line on a speed-time graph shows that an object is
46. On a speed-time graph, a line with a negative slope indicates that the object is
47. On a speed-time graph, a line with a positive slope indicates that the object is



48. On Graph 1 calculate the following (**SHOW YOUR WORK with UNITS**)

- a. Acceleration from 0 to 10 seconds.
- b. Acceleration from 10 to 30 seconds
- c. Acceleration from 30 to 70 seconds

49. On Graph 2 calculate the following (**SHOW YOUR WORK with UNITS**)

- a. Find the average speed.
- b. Find the speed from 0 to 15 seconds
- c. Find the speed from 15 to 35 seconds.

Find the net force acting on the following items. Be sure to include direction.

<p>50. </p> <p>52. </p>	<p>51. </p> <p>53. </p>
-------------------------	-------------------------