Name: _____

Physical Science Unit 1 Practice Sheet

Chapter 1:

Convert the following to scientific notation:

1. 0.005
2. 5050
3. 0.0008

Convert the following to standard notation:

4. 1.5×10^{3}
5. 3.35×10^{-1}
6. 3.75×10^{-2}

Make the following SI unit conversions.

7. 35 mL to dL
8. 25 cm to mm
9. 0.005 kg to dag
10. 950 g to kg
11. 275 mm to cm
12. 0.075 m to cm

Chapter 11:

13. What is the velocity of a car that traveled a total of 75 kilometers north in 1.5 hours?

14. What is the velocity of a plane that traveled 3,000 miles from New York to California in 5.0 hours?

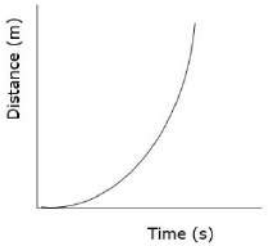
15. It took 3.5 hours for a train to travel the distance between two cities at a velocity of 120 miles/hr. How many miles lie between the two cities?

16. How long would it take for a car to travel a distance of 200 kilometers if it is traveling at a velocity of 55 km/hr?

17. A plane traveled for about 2.5 hours at a velocity of 1200 km/hr. What distance did it travel?

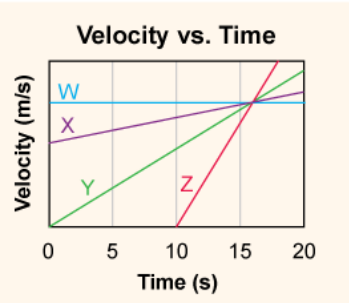
18. A car with an initial velocity of 12 meters per second east slows uniformly to 2 meters per second east in 4.0 seconds. What is the acceleration of the car during this 4.0 second interval?
    a. 6.0 m/s^2 east
    b. 2.5 m/s^2 west
    c. 2.5 m/s^2 east
    d. 6.0 m/s^2 west
19. A car is driven southward in a straight line with decreasing speed. Which of the following statements is necessarily true about the acceleration of the car?
    a. It is constant but not zero.
    b. It is directed southward.
    c. It is zero.
    d. It is directed northward.
20. What motion of an object is the graph representing?

    a. stationary
    b. acceleration
    c. deceleration
    d. constant speed



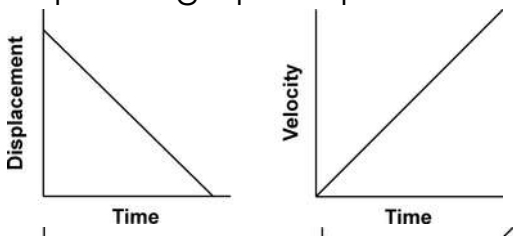
21. Which car has the GREATEST magnitude of acceleration during the time interval 10 seconds to 15 seconds?

    a. W
    b. X
    c. Y
    d. Z



22. Which pair of graphs represents the same motion of an object?

a.



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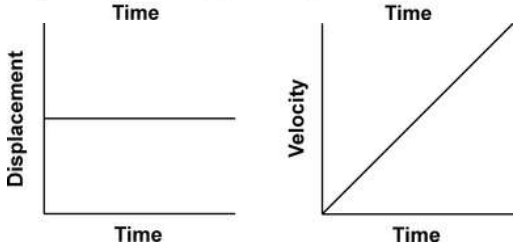

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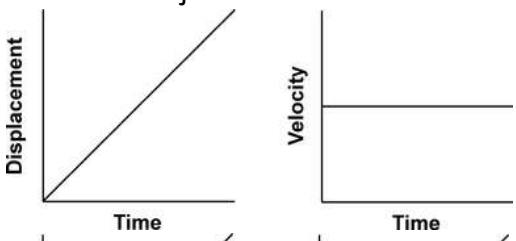

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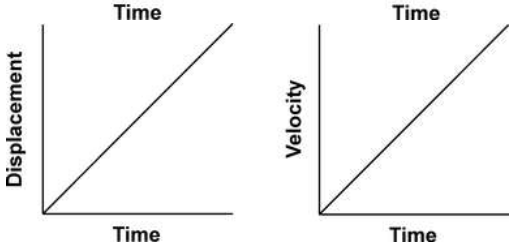
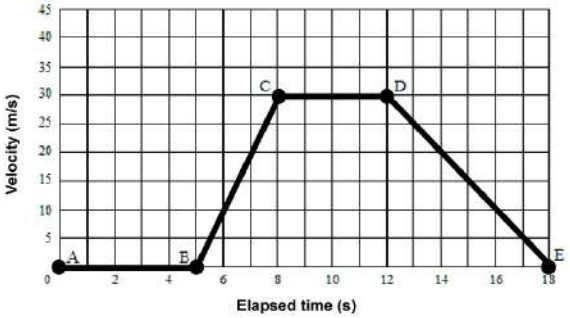


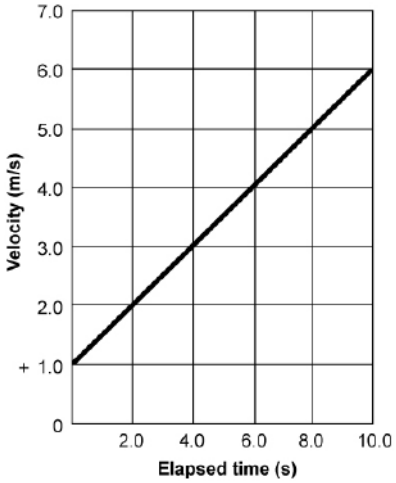
23. Kendra drove 300 km in 2 hours. Henry drove the same 300 km in 3 hours. If Kendra and Henry had the same average speed for their trips, what must be true?
    a. Kendra must have stopped for one hour during her trip.
    b. Henry must have stopped for one hour during his trip.
    c. Kendra must have had a lower velocity than Henry.
    d. Henry must have had a lower velocity than Kendra.

24. In which section of the graph is the magnitude of the acceleration the GREATEST?



a. AB
b. BC
c. CD
d. DE

25. How far did the vehicle travel from t = 0.0 x to t = 10.0 s?



a. 0 m
b. 15 m
c. 35 m
d. 40 m

Chapter 12:

26. With what force will a car hit a tree if the car has a mass of 30,000 kg and it is accelerating at a rate of 2 m/s^2?

27. A 10 kg bowling ball would require what force to accelerate it down an alleyway at a rate of 3 m/s^2?

28. What is the mass of a falling rock if it hits the ground with a force of 146 newtons?

29. What is the acceleration of a softball if it has a mass of 0.50 kg and hits the catcher's glove with a force of 25 newtons?

30. What is the mass of a truck if it is accelerating at a rate of 5 m/s^2 and hits a parked car with a force of 14,000 newtons?

31. A force of 6.0 N is applied horizontally to a 3.0 kg crate initially at rest on a horizontal frictionless surface. After the crate is pushed for 1.5 seconds, it has a velocity of 3.0 m/s. Does this support Newton's second law of motion, that force equals mass times acceleration? Explain.

a. Yes, because the acceleration of the crate is 2.0 m/s^2.
b. Yes, because the mass and the velocity of the crate are equal.
c. No, because the acceleration of the crate is 2.0 m/s^2.
d. No, because the mass and the velocity of the crate are equal.

32. Three carts with different masses are pushed along a track. The results of the experiment are shown below. Choose the pair of experiments that BEST support the claim that heavier objects require a greater force to accelerate.

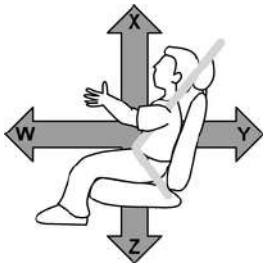
a. Experiments 1 and 2
b. Experiments 1 and 3
c. Experiments 2 and 4
d. Experiments 3 and 4

Experiment	Force (N)	Mass (kg)	Acceleration (m/s^2)
1	0.75	0.50	1.5
2	0.50	0.50	1.0
3	3.0	2.0	1.5
4	0.75	0.25	3.0

33. For two forces to be balanced, what must be true?
a. They must be opposite in direction and equal in magnitude.
b. They must be opposite in direction and different in magnitude.
c. They must be acting in the same direction and equal in magnitude.
d. They must be acting in the same direction and different in magnitude.

34. The diagram below shows a man fastened in a car seat while driving. Based on Newton's law of action-reaction, which arrow represents the force that the seat belt would exert on the man's body if he had to slam on the brakes?

a. W
b. X
c. Y
d. Z



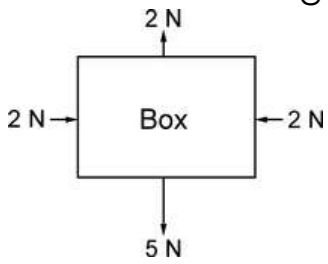
35. Scientists have sent an unmanned space vehicle to Mars to investigate the properties of the planet. Mars' gravitational field is 38% the strength of Earth's gravitational field. How will the weight and mass of the vehicle change on Mars?
a. The mass will increase, and the weight will increase.
b. The mass will decrease, and the weight will decrease.
c. The mass will remain the same, and the weight will decrease.
d. The mass will increase, and the weight will remain the same.

36. Compared to the inertia of a 0.10 kilogram steel ball, the inertia of a 0.20 kilogram Styrofoam ball is

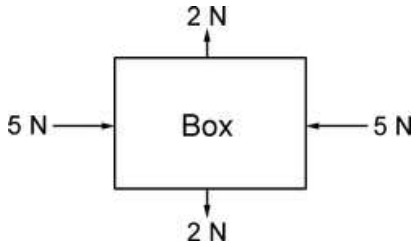
a. one-half as much.
b. twice as much.
c. the same.
d. four times as much.

37. Which of the following represents a box in equilibrium?

a.



b.



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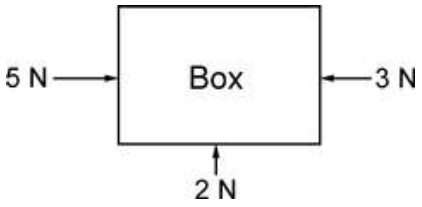

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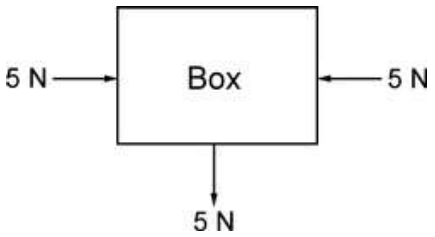

38. The picture below shows two forces being applied to a box on a frictionless surface. What is the mass of the box if it is accelerating at 2 m/s^2?

a. 2 kg
b. 6 kg
c. 8 kg
d. 14 kg

Chapter 14:

39. A book weighing 1.0 newton is lifted 2 m. How much work is done?

40. A force of 100 newtons was necessary to lift a rock. A total of 150 joules of work was done. How far was the rock lifted?

41. It took 50 joules to push a chair 5 meters across the floor. With what force was the chair pushed?

42. What is the mechanical advantage of a lever with an input distance of 9 m and an output distance of 3 m?

43. What is the mechanical advantage of a ramp with a height of 3 m? The length of the slanted side is 12 m.

44. How much work does Juanita do if she uses a force of 40 newtons to pull 2 friends on a wagon for 32 meters?

a. 1.25 J b. 640 N c. 1280 J d. 1280 N

45. A certain machine can output 50 Joules (L) of energy when 100 J of energy are input. If the amount of friction experienced by the machine is reduced, which of the following is most likely its output?

a. 0 J b. 25 J c. 50 J d. 75 J

46. A machine requires an input force of 35 N to lift 75 kg (735 N) of bricks. What is the mechanical advantage (MA) of the simple machine?

a. 0.048 b. 2.143 c. 35 d. 21

47. If William drove an axe into a tree for an effort distance of 5.0 cm and the mechanical advantage of the axe is 0.85, what is the resistance distance of the split tree?

a. 5.5 cm b. 5.9 cm c. 24 cm d. 42 cm

48. Which is the best way to increase the mechanical advantage of an inclined plane?

a. by increasing the length of the inclined plane
b. by decreasing the length of the inclined plane
c. by increasing the output force of the inclined plane
d. by decreasing the output force of the inclined plane

49. What happens to the energy now output by a machine?

a. It is absorbed by the machine.
b. It is destroyed by the machine.
c. It is transformed into heat and lost to the atmosphere.
d. It is transformed into light and lost to the atmosphere.

50. This lever has a mechanical advantage of 2. What does the lever multiply?

a. It multiplies the output work by 2.
b. It multiplies the output force by 2.
c. It multiplies the output energy by 2.
d. It multiplies the output distance by 2.