Integrated Science Unit 6 Study Review Motion and Forces **Name** _____

1. Is it possible for the car below to be in motion?

A. Yes, because the forces are equal and opposite, the car must be changing directions.
B. Yes, it is possible for the car to be moving at a constant velocity.
C. Yes, there is 40,000N of force acting on the car, so the car is accelerating.
D. No, the forces are balanced, so the car must be at rest.

2. Write the SI (metric) unit.

a. Speed _____

b. Acceleration _____

c. Mass _____

d. Force _____

e. Time _____

f. Distance _____

Complete the following problems. Be sure to show your, work including units!

3. A 52-kg water-skier is being pulled by a speedboat. The force cause her to accelerate at $2m/s^2$. Calculate the net force that causes this acceleration.

4. What is the net force on a 1000 kg elevator accelerating a $2m/s^2$?

5. What net force is needed to accelerate a 55 kg cart at $15 m/s^2$?

6. Suppose you doubled the force acting on an object. In what way could you change its mass to keep its acceleration unchanged?

7. Describe the difference between an object's speed and an object's velocity?

8. Write out Newton's Laws and give an example of each.

   1st Law

   2nd Law

   3rd Law

9. In a tug of war, when one team is pulling with a force of 100 N and the other 80 N, what is the net force?

10. What is the sum of all forces acting on an object called?

11. Define friction and give an example.

12. Assuming there is no air resistance, how does mass affect acceleration due to gravity? (Hint: Think of the bowling ball and feather video.)

13. What is the difference between mass of an object and weight of an object?

14. The net force acting on a car rolling down a ramp is the addition of three forces. One of the forces is the ramp pushing up to support the car.

a. Name the two other forces acting on the car._____

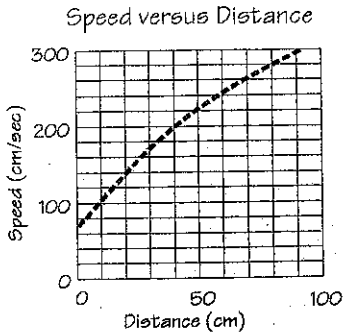
b. Which of these two forces helps the motion of the car?

c. Which of these two forces opposes the motion of the car?

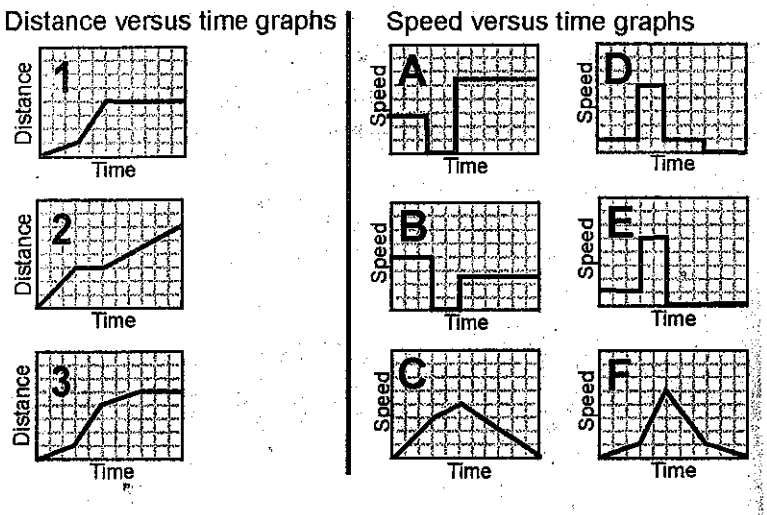
15. Define inertia.

16. What must be examined to know if an object is in motion?

17. Use the graph below to predict the speed of the car at the following distances: 20cm, 35cm, 60cm, 80cm.



18. Match each of the three distance vs. time graphs with the corresponding speed vs. time graph. All three distance vs. time graphs contain only straight line segments.



19. A woman goes to a store 3 blocks away from her home. She walks in a straight line and at a steady pace. Draw a position vs. time graph of her walk. Regard home as start.

20. The distance traveled by two crawling babies is shown below.

Time (s)	Baby Sarah Distance (m)	Baby Scott Distance (m)
0	0	0
1	0.5	0.4
2	1	0.8
3	1.5	1.2
4	2	1.6

A. Graph the information above. Be sure to include a title and correctly label both axes.

B. Calculate the slope of each line.

C. Calculate each baby's speed.