

8th UNIT 2 TEST REVIEW

Name _____

Date _____

1. Using yourself as a reference point, how can you tell if another object is in motion? (Hint – use the definition of motion!).
2. Using yourself as a reference point, where would you need to be in order for the Earth to be in motion?
3. To your point of view, is an object on your lap, while you are sitting in a moving car, in motion? Explain!

For all problems you must show the formula with units, your work and correct units. Circle your final answer.

$$\text{Speed} = \text{distance} / \text{time}$$

$$\text{Distance} = \text{speed} \times \text{time}$$

$$\text{Time} = \text{distance} / \text{speed}$$

4. You arrive in my class 45 seconds after leaving math, which is a distance of 20 m east. What is your **velocity**?
5. You need to get to class, 90 meters away, and you can only walk in the hallways at about 1.5 m/s. How much **time** will it take to get to your class?
6. How far can you ride your bike in 20 minutes at a speed of 12.5 mi/minute?
7. Assuming that distance is the same, which has a stronger gravitational pull on an object, the sun or the earth, and why?

8. You are pushing, with a force of 20 N, and another student is pulling, with a force of 25 N, a big box of science supplies down the hall (towards Mr. Glass' classroom). The floor exerts a frictional force of 10 N on the box. Draw a force diagram (in the box) for this scenario that includes the net force and in what direction is the box moving?

10. Why is an object's mass the same, but the object's weight different on Earth verses on the Moon?

12. If all forces are balanced that are being exerted on an object, what can you predict about the object's motion?

9. Draw a free-body diagram of an object, weighing 312 N in a state of free-fall.

11. What is the weight (in newtons), of a 4500 kg meteorite when it is near the earth's surface?

13. When air resistance is a force acting on an object, at what point does a falling object fall at a constant velocity?

Use the information and diagram below to answer questions 14-16 (use the $F = m \times a$ from Newton's 2nd law).

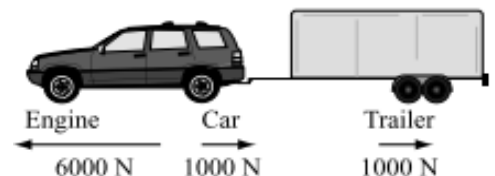
A car is pulling a trailer. The car's engine exerts a 6000 N force pulling the car to the left. In addition, the car and the trailer each experience a 1000 N frictional force as they are being pulled, as shown. Assume no other forces act on the car and trailer.

14. What is the magnitude of the net force on the car and trailer?

- A. 2000 N
- B. 4000 N
- C. 5000 N
- D. 8000 N

15. Which statement best describes the car and trailer's motion?

- A. They will move to the left at a constant velocity.
- B. They will move to the left and their speed will decrease.
- C. They will move to the left and their speed will increase.
- D. They will remain at rest.



16. Together, the car and trailer have a mass of 2000 kg. If the net force acting on the car and trailer stays the same as above, at what rate will the car and trailer accelerate? Show your work below!

A. 2 m/s^2

B. 2000 m/s^2

C. 0.5 m/s^2

D. 3 m/s^2

17. Explain how Newton's first law makes it a good idea to wear a seatbelt while in a moving car.

18. Will an object accelerate if the net force acted upon it is Zero N? Why or why not?

19. A man with a mass of 80 kg falls off the top of a building and accelerates toward the ground. What is the force of gravity acting on the man?

20. A man doing push-ups presses down on the ground with his hands with a force of 100 N. With what force does the ground push up on the man?

21. 9. A 0.14-kilogram baseball is thrown in a straight line at a velocity of 30 m/s. What is the momentum of the baseball?

22. What is the mass (in kg) of a truck if it produces a force of 14,000 N while accelerating at a rate of 5 m/s^2 ?

23. On the moon, which will hit the ground first when dropped at the same time from the same height, a boulder or a feather and why?

24. Action force: a dog pulls rightward on a leash? _____

25. Action force: _____; reaction force: the road pushes on the car's tires

26. Study your glossary words – you will need to know the definitions for the test.