7th Grade Practice Test, 11-14-17

- Equations, for reference:
  - $s = d/t$
  - $a = (v_f - v_i)/t$
  - $d = at^2/2$
  - $t = \sqrt{2d/a}$
  - $v_f = at$
  - $p = mv$
  - work = force x distance
  - power = work/time
  - $KE = mv^2/2$
  - GPE = weight*height

1. What is motion?

2. If you're riding on a bus, seated next to a parent, what is your motion relative to that parent?

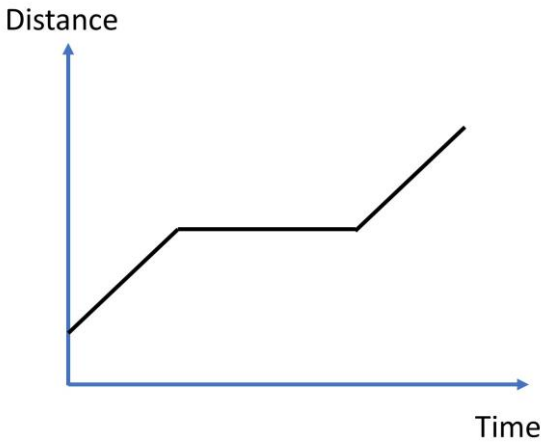
3. If you're riding in an elevator going up at a steady speed, are the forces acting on you balanced? How can you tell?

4. Describe the forces acting on a box of cereal sitting on a table.

5. How is velocity different from speed?

6. How is acceleration different from speed?

7. Briefly describe the motion of the object represented in this graph.



8. Describe Newton's Laws of Motion here:

1st:

2nd:

3rd:

9. What's the difference between weight and mass?

10. If you went to Mars, which has ⅓ the mass of the earth, what would happen to your weight? Explain your answer in terms of the universal law of gravitation.

11. What's the difference between force and momentum?

12. If a kid on a bike rides 60 miles in four hours, how fast is he going?

13. What is the rate of acceleration of an elephant that starts from a standstill, and then is running at 10 m/s 2 seconds later?

14. If you kick a box with a force of 50 N, and the box has a mass of 5 kg, what will its rate of acceleration be?

15. Assuming that there is no air resistance, how far will a cow have fallen 10 seconds after it has jumped out of a helicopter?

16. If you jump off of a cliff onto a huge pile of fluffy pillows 50 m beneath you, how long will it take you to fall?

17. What will your final velocity be if you start from a stop and keep accelerating at a rate of 3 m/s/s for 14 seconds?

18. If you're in a rocket-powered car that is traveling over the steep canyon pictured below, how fast do you have to be traveling (in m/s) to make it over the chasm? Assume that both sides of the canyon are exactly the same height.