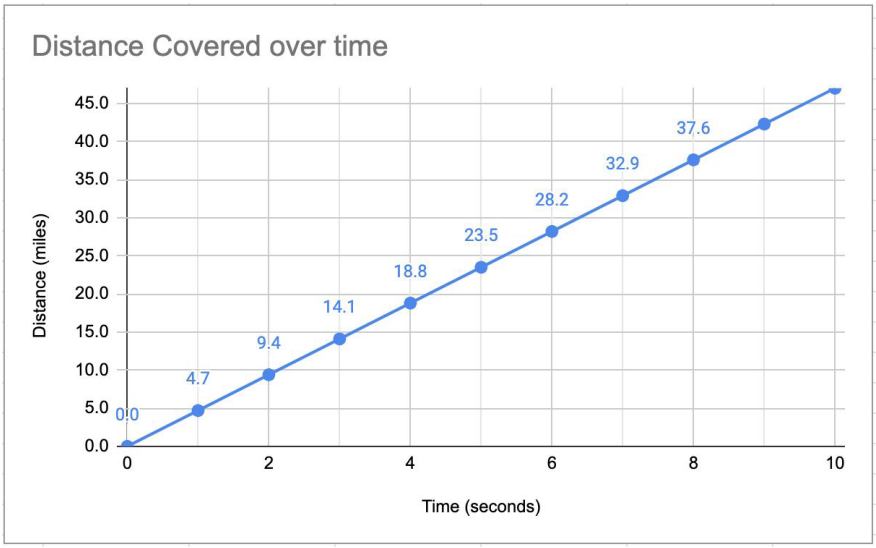
Name: _____

UASpace Algebra 1 Worksheet

1) A CubeSat in orbit traveling at 4 miles per second can cover a distance of 252 miles in 63 seconds. How far could it go in the same amount of time if it got a boost from a rocket and increased its speed to 5 miles per second?



2) Above is a chart of how many miles our CubeSat Traveled over a given number of seconds. We need to find what the speed of our CubeSat was. Luckily this should just be the slope of this line. Can you figure out what the speed of our CubeSat was, in miles per second, from this graph? Hint: Slope = change in Y / change in X

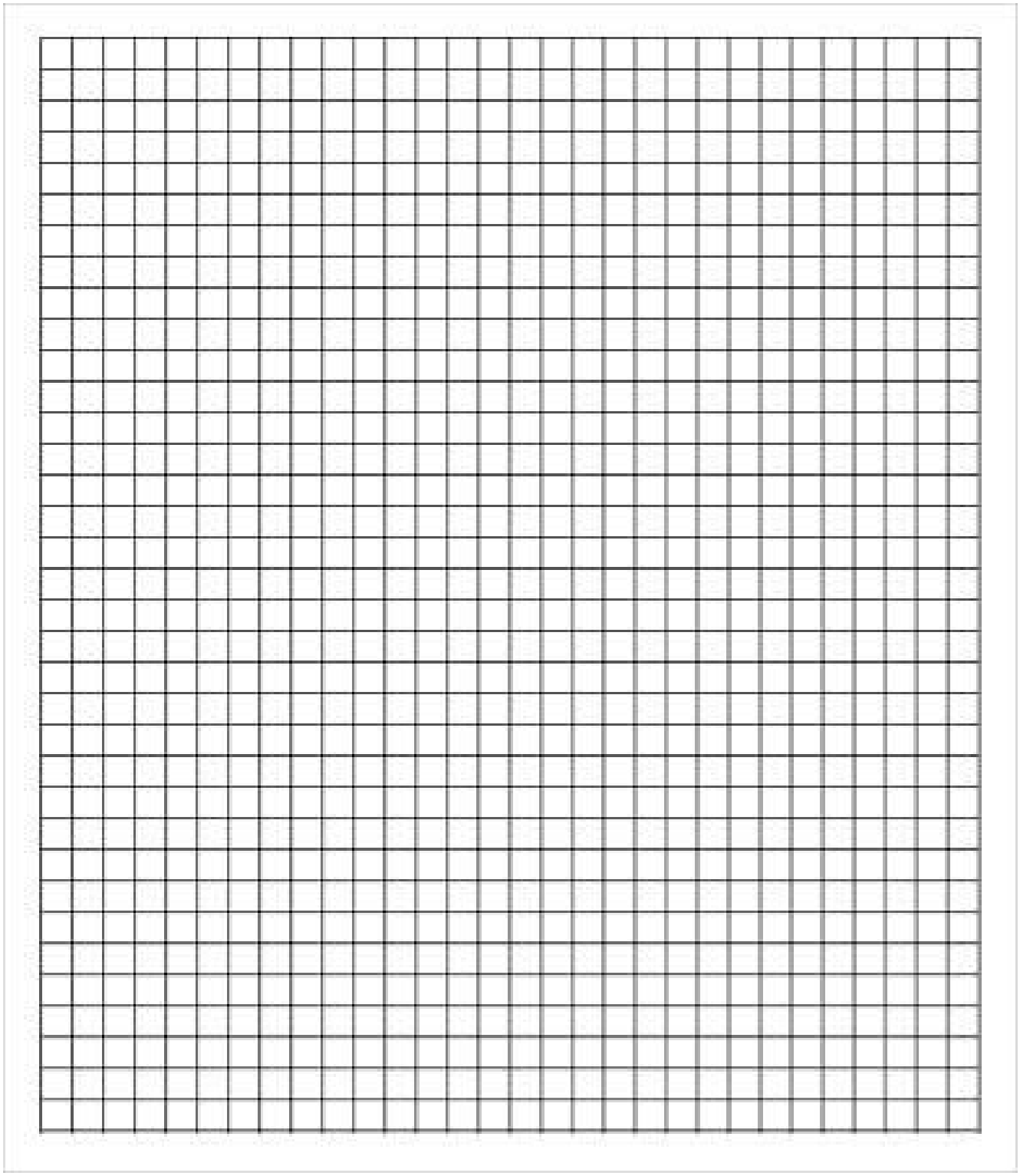
Name: _____

time (seconds)	distance (miles)
0	0
1	1
2	2
3	5
4	8
5	13
6	18
7	25

3) Our CubeSat just sent us down this new data for how far it has traveled over the last 7 seconds. Can you graph this new data on the attached sheet for us?

4) On the chart you graphed in question 3, can you see anything interesting about the speed of the satellite (the slope of the line)? Is it increasing, staying the same, or decreasing?

Name: _____



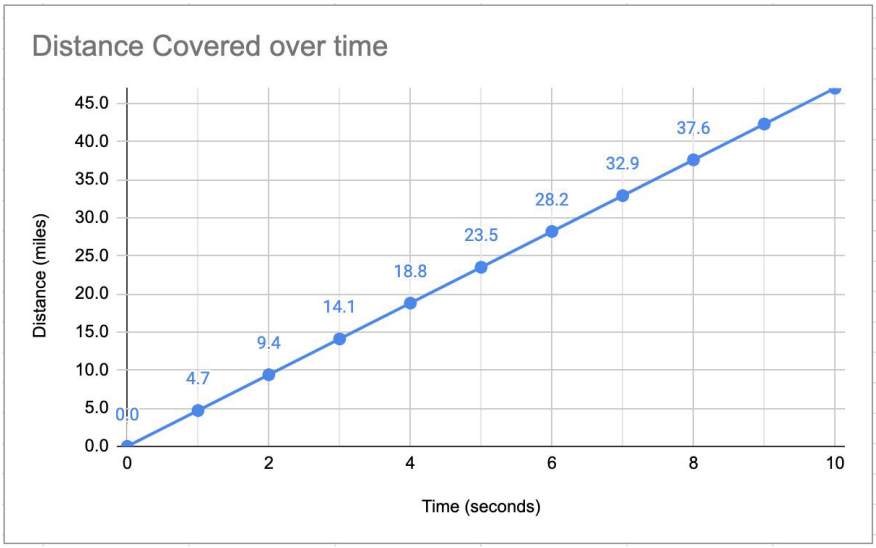
UASPACE

Name: _____

UASPACE Algebra 1 Worksheet

1) A CubeSat in orbit traveling at 4 miles per second can cover a distance of 252 miles in 63 seconds. How far could it go in the same amount of time if it got a boost from a rocket and increased its speed to 5 miles per second?

D = R * T
D = 5 * 63
D = 315 miles



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From x = 1 to x = 2, y went from 4.7 to 9.4
Y1 - Y2 = 4.7
Change in Y = 4.7
The change in X was 1
Slope = 4.7 / 1
The slope is 4.7
Thus the Speed is 4.7 miles per second

Name: _____

time (seconds)	distance (miles)
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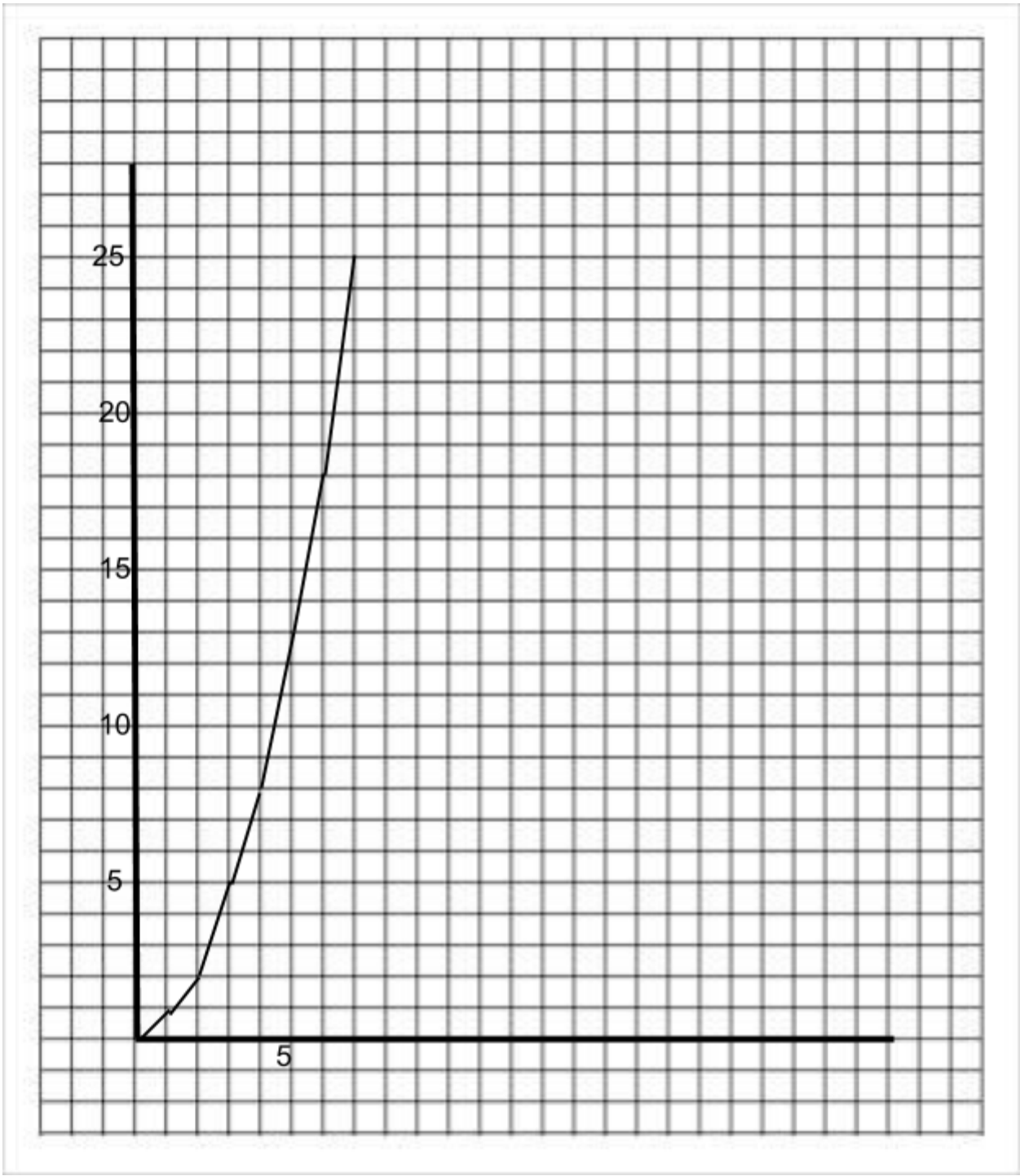
   The slope is increasing. This means that the speed of the satellite is increasing over time

Name: _____



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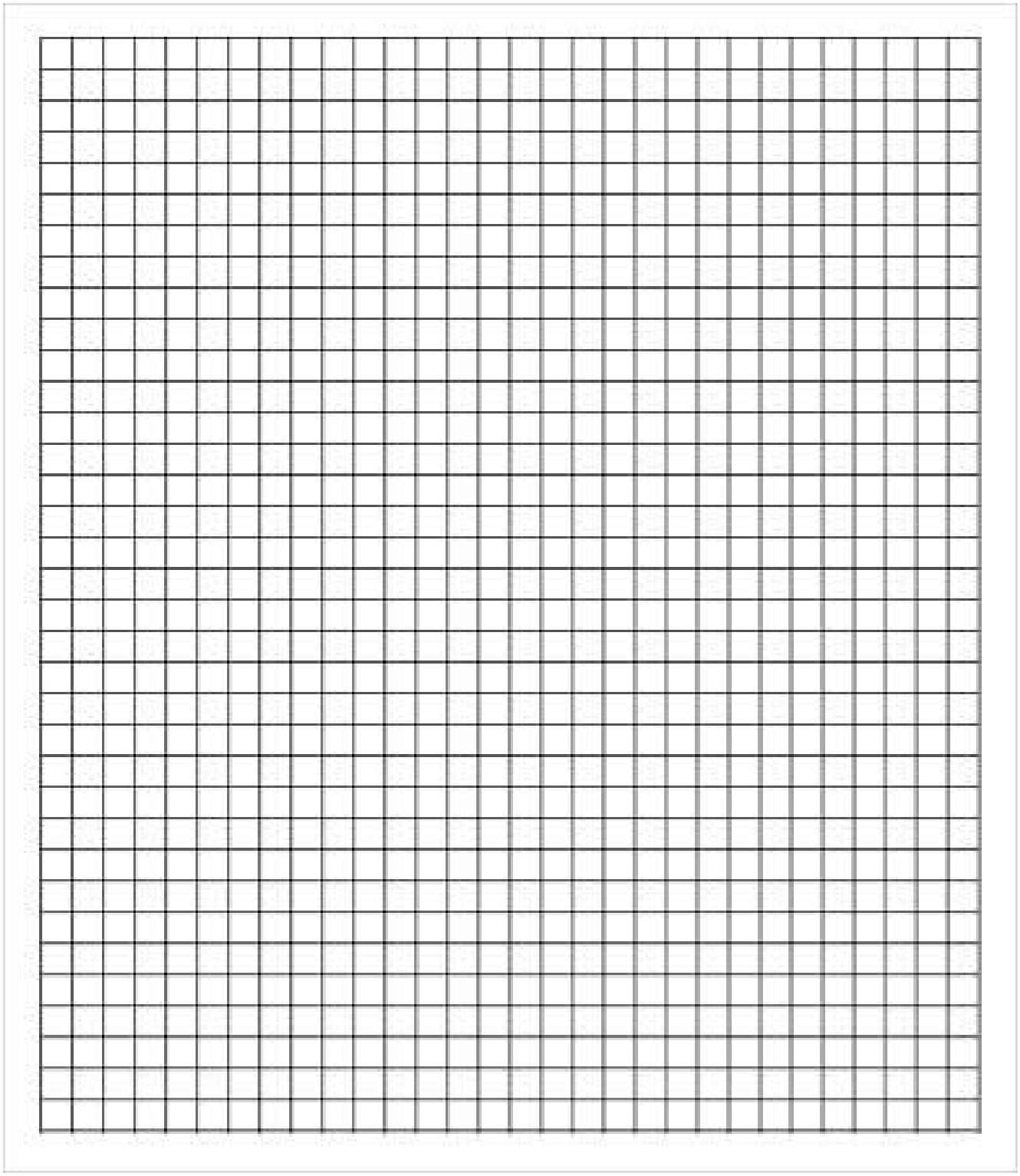


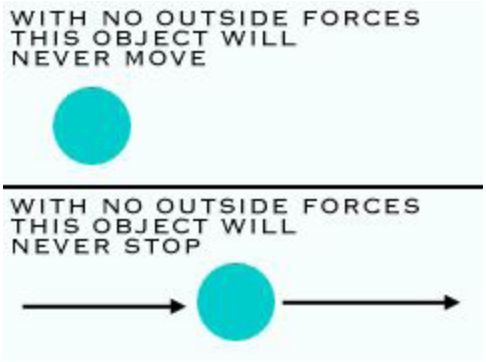
UASPACE

Name: _____

UASpace Physical Science Worksheet

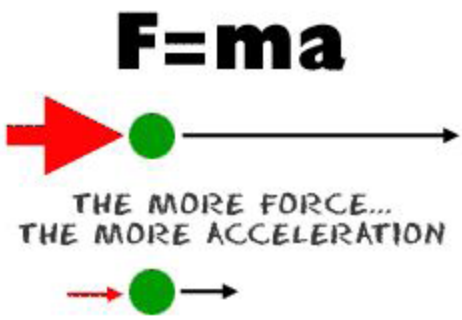
Newtons Laws of Motion

First Law



With no outside forces, objects stay in one place or continue moving at the same speed and direction. The first law says that an object at rest tends to stay at rest, and an object in motion tends to stay in motion, with the same direction and speed. Motion (or lack of motion) cannot change without an unbalanced force acting. If nothing is happening to you, and nothing does happen, you will never go anywhere. If you're going in a specific direction, unless something happens to you, you will always go in that direction. Forever.

Second Law



The second law says that the acceleration of an object produced by a net (total) applied force is directly related to the magnitude of the force, the same direction as the force, and inversely related to the mass of the object (the inverse is a value that is one over another number... the inverse of 2 is 1/2). The second law shows that if you exert the same force on two objects of different mass, you will get different accelerations (changes in motion). The effect (acceleration) on the smaller mass will be greater (more noticeable). The effect of a 10 newton force on a baseball would be much greater than that same force acting on a truck. The difference in effect (acceleration) is entirely due to the difference in their masses.

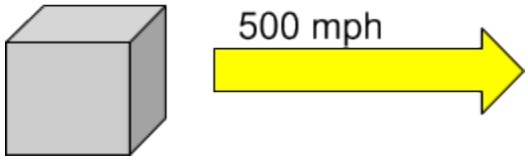
Third Law

The third law says that for every action (force) there is an equal and opposite reaction (force). Forces are found in pairs. Think about the time you sit in a chair. Your body exerts a force downward and that chair needs to exert an equal force upward or the chair will collapse. It's an issue of symmetry. Acting forces encounter other forces in the opposite direction. There's also the example of shooting a cannonball. When the cannonball is fired through the air (by the explosion), the cannon is pushed backward. The force pushing the ball out was equal to the force pushing the cannon back, but the effect on the cannon is less noticeable because it has a much larger mass.

Name: _____

Newtons laws

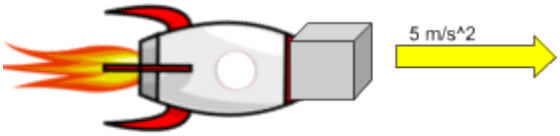
1) An object at rest will stay at rest and an object in motion will stay in motion unless it is acted upon by an outside force.
2) Force is equal to the mass of the object times its acceleration, or F = m * a.
3) For every force, there is an equal and opposite reaction.



1) If the CubeSat Shown above is flying through space at 500 miles per hour, and no other forces are acting on it, will it

a) Slow down
b) Speed up
c) Not change speed

2) Because of which of Newton's laws does #1 happen? _____



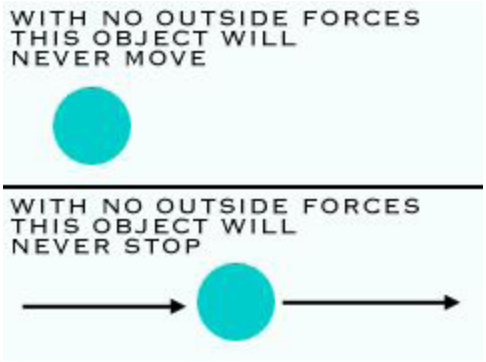
3) If the rocket above pushes our 2 kilogram CubeSat and is accelerating it by 5 meters per second per second, what is the force exerted on the CubeSat by the rocket? Hint: Newton's second law

Name: _____

UASPACE Physical Science Worksheet

Newtons Laws of Motion

First Law



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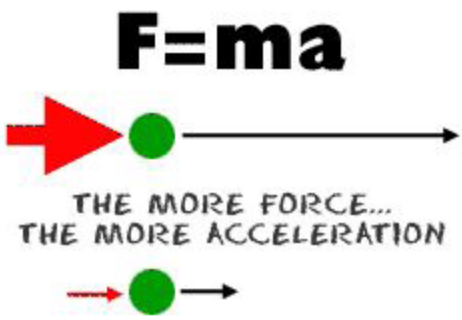

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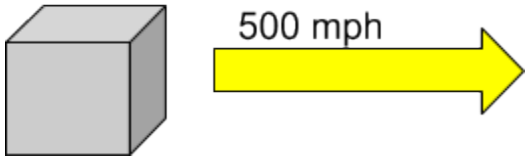

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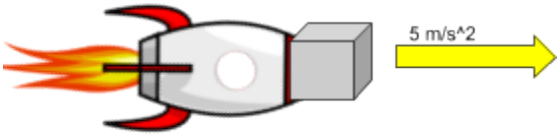

3) If the rocket above pushes our 2 kilogram CubeSat and is accelerating it by 5 meters per second per second, what is the force exerted on the CubeSat by the rocket? Hint: Newton's second law

Force = Mass * Acceleration
Force = 2kg * 5m/s^2
Force = 10 kg*m/s^2
Or
Force = 10 Newtons