**8.6 A & B Physics Review**

1. A wheeled cart is moving eastward at a speed of 1 meter per second when it is acted on by a 20-newton force to the north and a 20-newton force to the south. Explain why the cart’s speed and direction stays the same.

20-20=0N, which means the forces are balanced. Balanced forces do not cause a change in motion.

1. Two men are pulling on opposite ends of a rope. The man on the left is pulling with a force of 30 newtons. The man on the right is pulling with a force of 50 newtons. What will be the resulting motion?

50-30=20N to the right.

1. Sandy is pulling her pet pig on a leash. The pig exerts a force of 15 newtons to the left. Sandy exerts a force of 30 newtons to the right. What is the net force on the leash?

30-15=15N to the right.

1. What is required to change the direction of a moving object?

Unbalanced forces

1. A ball travels north at a rate of 9 meters per second. If a southward force starts acting on the ball, what will happen FIRST?

The ball when begin to slow down because the south force is opposite from moving north.

1. A southern force is the only force acting on a metal cube. If a westward force starts acting on it, illustrate how its path of motion changes.

Southern forces make objects go to the north. Westward is towards the west. The result is

1. A student pushes a wheeled cart eastward. Another student pushes the cart westward. What would have to be true for the cart’s position to change?

One student would have to apply a greater force than the other student.

1. A quarter falls out of a window. Why does the speed of its motion increases as it falls?

Gravity applies an unbalanced force on the quarter until it hits the ground.

1. In an elevator, the downward force of gravity is opposed by a greater upward force applied by elevator cables. What causes the elevator to rise?

The forces are unbalanced and the greater force is going up.

1. What happens to an object that has unbalanced forces acting on it?

The object will speed up, slow down, or change directions (all known as acceleration).

1. A car is traveling north at a speed of 75 kilometers per hour. What directional change in the force would cause an increase in the speed of the car?

The force must go in the same direction of the car to speed it up, so it most also go to the north.

1. A canoeis being rowed down a river with the current at 5 miles per hour. The girl stops rowing the boat with both oars and begins to paddle on only one side of the boat. What happens to the boat?

It will start to go in circles because the force on one side is now greater than the force on the other.

1. Calculate the speed of an airplane that travels 586 meters in 4 seconds.

s=d/t s=586m/4s s=146.5m/s

1. Calculate how far in meters will you travel in 5 minutes running at a rate of 3 m/s.

d=st d=5(3) d=15m

1. Calculate how long will your trip take (in hours) if you travel 450 km at an average speed of 50 km/hr.

t=d/s t=450/50 t=9hr

1. Calculate the speed of a person walking (in m/s) if the person travels 1000 m in 20 minutes.

20min\*60sec=1200sec

s=d/t s=1000m/1200sec s=0.8m/s

1. A hot air balloon is floating in the air. There are many forces acting on it, but the Net Force of the balloon when there is no wind equals zero. If a wind blowing from the west hits the balloon with a force of 40 Newtons, which direction will the balloon move?

The balloon will move to the east because the wind came from the west.

1. Draw a graph that best represents the following data.

|  |  |
| --- | --- |
| Time (seconds) | Distance  (meters) |
| 0 | 20 |
| 1 | 40 |
| 2 | 60 |
| 3 | 80 |
| 4 | 100 |
| 5 | 120 |

1. Describe the differences between the speed, velocity and acceleration.

Speed is how fast (distance over time).

Velocity is speed and the direction.

Acceleration is the change in velocity. (speed up, slow down, change direction)

1. Give an example of a unit for speed, for velocity, and for acceleration.

Speed = m/s Velocity = m/s east Acceleration = m/s2