SCIENCE 8 – BALANCED & UNBALANCED FORCES WORKSHEET

NAME: _____

1) A driver and a passenger get out of their car that has run out of gas on a city street. They cannot agree on which gas station is closer, so they begin pushing with equal force on opposite ends of the car.

   (a) Make a sketch of this car-pushing situation using arrows to represent the forces on the car.

   (b) Use your sketch to explain whether the forces on the car are balanced or unbalanced.

   _____

   _____

   _____

   (c) Re-draw the sketch with force arrows illustrating a more effective way for the driver and passenger to get the car to the gas station.

   (d) Does this new sketch illustrate balanced or unbalanced forces? Explain.

   _____

   _____

   _____

2) A floatplane lands on a harbour. When the floats touch the water, the plane slows down.

   (a) Are the forces on the plane balanced or unbalanced? Explain.

   _____

   _____

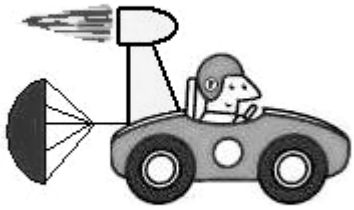
   (b) What type of force does the water exert on the plane's floats, which causes the motion of the plane to slow?

   (c) Sketch the floatplane at the moment of landing on the water using arrows to represent the forces on the plane.

3)

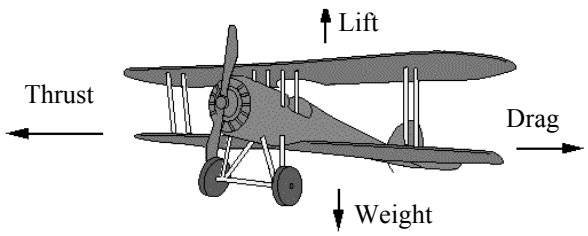
Assume that the wheels of the car apply 10 N of force forward. Add a force arrow to the picture showing this situation. What is the combined force (net force) if friction and drag are negligible?

Now assume that a parachute opens that applies 7 N of force in the other direction opposite to the 10 N of force still being applied by the wheels. Add force arrows to the picture showing this situation. What is the new combined force (net force) and direction?



A rocket applies an additional force of 10 Newtons to the 10 Newtons that are applied by the wheels. Add force arrows to the picture assuming that the parachute continues to apply 7 N of force in the opposite direction. What is the new combined force (net force) and direction?

4)



Flight condition	Effect
Lift > Weight	Plane Rises
Weight > Lift	Plane Falls
Drag > Thrust	Plane Slows
Thrust > Drag	Plane Accelerates

An airplane has a weight of 100,000 N and a lift force of 75,000N.

(a) What is the combined force (net force) on the airplane? _____

(b) Are the forces balanced or unbalanced? _____

(c) What will happen to the plane? _____

An airplane has a thrusting force of 200,000 N and a drag force of 23,000 N.

(d) What is the combined force (net force) on the airplane? _____

(e) Are the forces balanced or unbalanced? _____

(f) What will happen to the plane? _____