How Things Fly: Internet Lab

Worksheet by www.middleschoolscience.com for http://www.aero.hq.nasa.gov/edu/index.html

Read all directions on the screen and this handout carefully. You will see this tool bar:

Click on "**Air is Stuff**"

1. How is air similar to water? _____

   _____

2. How is air different than water? _____

   _____

Click on "**4 forces**"

1. Name the 4 forces :

   a. _____ b. _____

   c. _____ d. _____

Click on the word "**Lift**" in blue

1. What is **lift**? _____

   _____ Click on "**4 forces**"

2. What does **weight** do? _____

3. What force "pulls' objects to the ground? ($9.8 m/s^2$) _____

   _____ Click on "**4 forces**"

4. What is **thrust**? _____

   _____ Click on "**4 forces**"

5. What is **drag**? _____

   _____

6. What force is drag similar to? _____

   _____

Click on the words "**Wind Tunnel**" in blue. You will see various wing shapes. Test each wing shape in the wind tunnel.

1. **Cylinder** : Does this design work? Why/Why not? _____

   _____

2. **Teardrop** : Does this design work? Why/Why not? _____

   _____

3. **Cambered** : Does this design work? Why/Why not? _____

   _____

4. **Tilted cambered** : Does this design work? Why/Why not? _____

   _____

5. **Steeply tilted** : Does this design work? Why/Why not? _____

   _____

6. What type wing design worked the best?: Explain using the terms **lift** and **drag** :

   _____
   _____
   _____

Click on "**How it Works**" - Balloon Test, Wind Tunnel & Simulation

Click on **Balloon Test** and read the directions carefully!

1. Which of the three caused the balloon to **sink**? Why? (use the term density in your answer)_____
   _____
   _____

2. Which of the three caused the balloon to **float**? Why? (use the term density in your answer) _____

   _____
   _____

Simulation

1. What does the pitch do? _____
2. What does the yaw do? _____
3. What is the roll? _____
4. If you were a pilot, why would it be important to control these 3 factors?

   _____
   _____
   _____