Winging It

The wings on modern commercial aircraft are attached to the plane at a slight angle known as a dihedral. This angle allows the plane to achieve the lift it needs to fly, and at the proper angles, keeps the plane stable. This activity provides you an opportunity to experiment with how different dihedral angles and wing shapes affect plane flight.

Procedure

1. Use your "Airplane Template" handout to create a set of four models. When folding the front edge of your airplane, run your ruler over each fold to flatten the fold as much as possible.
2. You can use the gum eraser as a guide for the angles of the dihedral in models 2, 3, and 4. Once you fold the wings upward on those models, the airplane should sit level on a tabletop between the two erasers. Use your "Wing Angles" handout to help you create your four models.
3. You will test your planes at four different angles (0°, 10°, 20°, and 40°). On a separate sheet of paper, write down the four angles and note which one you think will work best and why.
4. Your goal is to find out which of the models has the most stable flight. Conduct 10 trials with your models. Describe the behavior of your models on a separate sheet of paper.
5. After completing your trials, compare the behavior of your models to the behavior of models tested by other teams, then answer the questions to the right.

Questions

Write your answers on a separate sheet of paper.

1. Describe the behavior of your team's models at each angle you tested.
2. What are some variables that affect the flight behavior of the plane?
3. Compare the flight stability of the different angles you chose to test. At which wing angle(s) was the flight most stable? At which angle(s) does the plane fail to fly well? What may be the reason?
4. What may be causing any wind currents in the room? What effect may these currents have on the models?
5. How can the effect of wind currents be determined in the launching area?