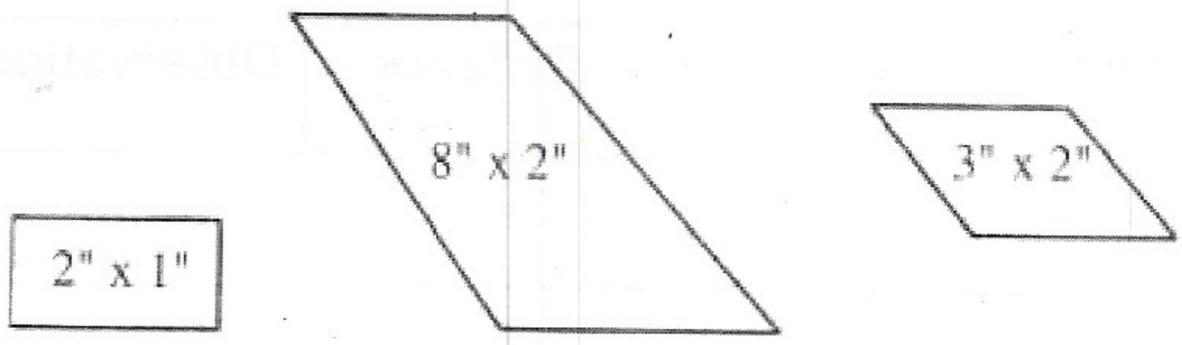
Rudder Away

Name: _____

We are going to make a Wright Brothers Front Rudder airplane. They experimented with many different designs and you will too!

In your groups, each student will:

1. Measure and cut the wings. Using the file folder, measure and cut: one wing 8” long and 2” wide wing. The Front Rudder wing should be measured and cut: 3” long and 2” wide. The wing that is vertical (up and down on the tail) should be measured and cut: 2” long and 1” wide.
2. Cut the drinking straw on one end to make a 1” slip. Slip the vertical wing into the cut.
3. Tape the longest wing that measures 8” long and 2” wide just behind the vertical wing. Tape the other, shorter wing that measures 3” long and 2” wide on the opposite end of the straw.
4. Test fly your Front Rudder Plane to have a Control Flight



Record your Data Here

Control	Average Distance	Observations:
Team member 1:		
Team member 2:		
Team member 3:		

Ground to Ground (Share)

- How did you build your Wright Brothers Front Rudder airplane?
- Why was this activity fun to do with your family?

Climb Out (Process)

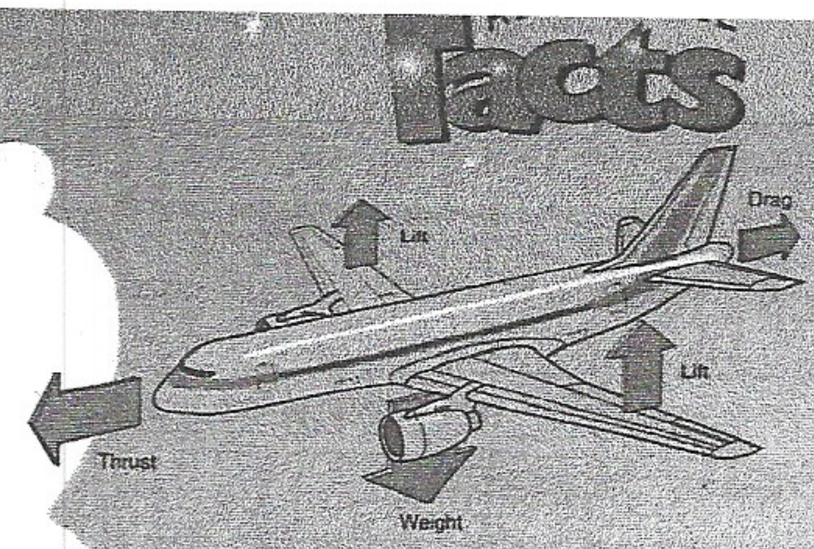
- Which airplane design flew the longest? Fastest? Highest? Why?
- When did a family member change a design to make it fly better? Why?

Level Off (Generalize)

- When are other times you have been a member of a team?
- What do you do when members of a team do not agree?

Cross Country (Apply)

- How could you be a better team member in the future?



Forces of Flight

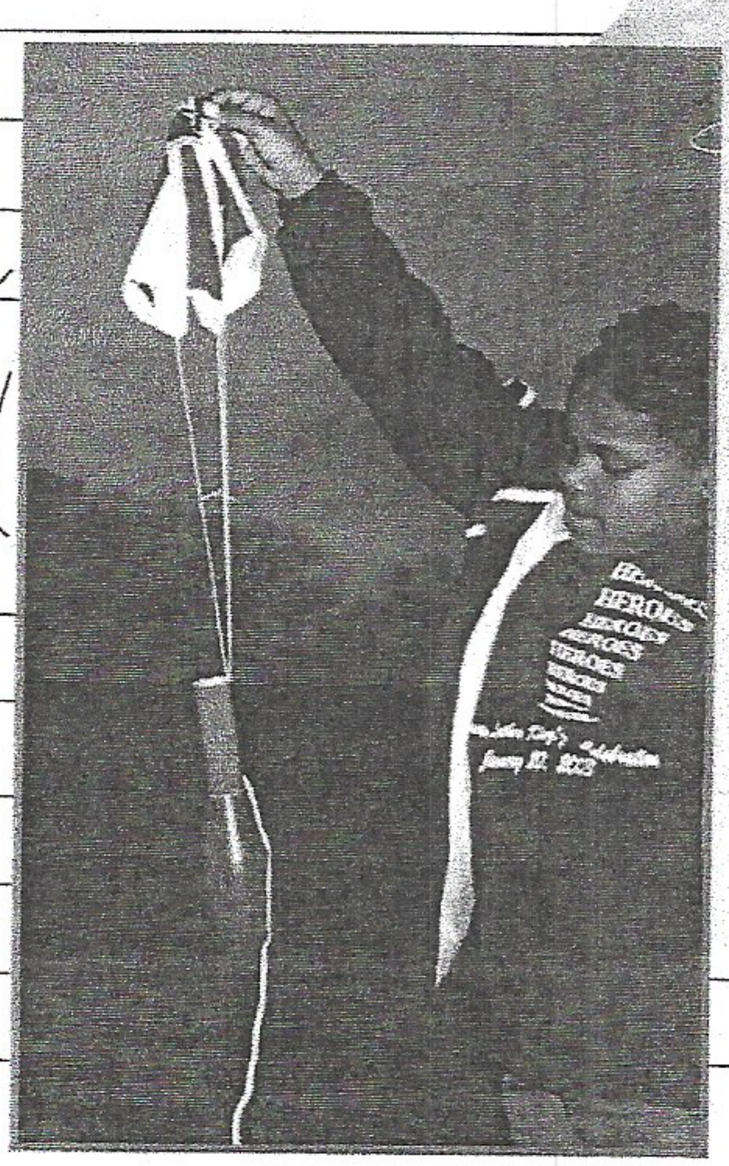
Forces acting on an object during flight:

Lift - The force opposite of weight; upward force created by airflow as it passes over and under a wing.

Weight or Gravity - The force that is opposite of lift; causes an object to be pulled downward.

Thrust - Opposite of drag; force which moves an object through the air.

Drag - Opposite of thrust; limits the speed of an object.



1. Use four feathers to make a **horizontal stabilizer** and **vertical stabilizer** for a feather flyer. Strip all but one thin tip of one feather. This will be your fuselage and horizontal stabilizer. Trim two quills shorter than the quill already made. Make small pin holes with a scissors at the end of the fuselage with the remaining feathers. Stick both feathers into the holes. Glue after several test flights.