

Into the Air

Lesson at a glance:

Students will observe how gravity and air resistance affect different objects.

Skills:

Investigating, Observing, Predicting, Communicating

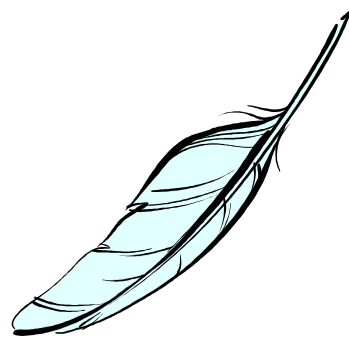
Grades:

3-5

Materials:

For each team of students:

- A feather
- A sheet of paper
- A pencil
- A leaf
- A book
- Two pieces of tissue paper
- A pencil
- "Into the Air Data Sheet"



Background:

Objects push air out of the way as the force of gravity causes them to fall. The force that the air exerts on the object as it moves through it is air resistance. Air resistance is a type of friction.

Air resistance acts to slow down moving objects. For example, as your car moves down the road it has to push the air it encounters aside and around it. This causes friction. A vehicle with a boxy front end will have to push more air aside and will, therefore, experience more air resistance than a sports car with a streamlined shape. Since it has to overcome less air resistance, the sports car will be more fuel efficient since it will have to do less work (use less horsepower) to travel at the same speed as the car with the boxy front end.

An object with a large surface area, such as a sheet of paper, will encounter more air resistance. If an object has a large surface area and a small weight, like a feather, it will gently float downward. If it has a large weight, like a book, it will fall quickly.

Activity:

1. Divide the students into groups of two. One will drop the object, the other will record their results. (They can take turns if you would like)
2. Give each group a feather, a leaf, a book, a pencil, a regular piece of paper and two pieces of tissue paper.



AMERICA'S CAR MUSEUM®

3. Have each group drop one object at a time (except for the tissue paper) and record their results.
4. Now have each group scrunch up one of the two sheets of tissue paper.
5. Have them stand on a chair and drop both sheets of tissue paper at the same time. Which one hits the ground first?

Discussion:

1. Which object traveled the fastest?
2. Which object traveled the slowest?
3. What happened to the tissue paper when you crumpled it up? Did it fall faster or slower? Why?
4. Take your students out to the parking lot. Ask them how they think the design of a car helps it move through air. How might less air resistance benefit the driver? (Better gas mileage).
5. Point out different designs and relate them to the shapes that they dropped. How would a school bus move compared to a sports car?

Assessment:

1. Have your students fold a piece of paper in half.
2. On one half of the paper, have them draw a car that would have more air resistance.
3. On the other half of the paper have them draw a car that would have less air resistance.



AMERICA'S CAR MUSEUM®

Into the Air Data Sheet

Record your observations below.
Rank the objects in order of which one fell the fastest.

Object	Feather	Paper	Pencil	Book	Leaf
Observations					
Ranking					

Object	Sheet of Tissue Paper	Ball of Tissue Paper
Observations		
Ranking		

