



LESSON 3 AERODYNAMICS

START YOUR ENGINES!

ASK: How many different kinds of man-made objects can you name that move quickly through the air? (e.g., balls, jets, helicopters, drones, kites, rockets, etc.)

SAY: One thing these objects all have in common is they are designed to move through the air efficiently. The study of how objects move through air is called “aerodynamics.” Engineers think about aerodynamics when designing objects that move quickly through air—including race cars!

GO!

Give your child the “Aerodynamics” Worksheet

SAY: Today we are going to practice “close reading” for the section “What a Drag” because scientific reading requires paying close attention to the words and sentences in order to understand the meaning.

SAY: Read the Section “What is Drag” three times following this pattern:

1. First read: Read to “get the gist.”
2. Second read: Circle new words; underline interesting parts or make notes in the margin.
3. Third read: Read smoothly and fluently and think about the meaning.

Read the “Cause” phrases on the “T-Chart” below. Complete the “Effect” side after the third read.

CAUSE	EFFECT
Moving air ...	
Very strong moving air ...	
A race car uses gasoline ...	
A car with less drag ...	

ANSWERS: Moving air ... can slow you down.
 Very strong moving air ... can stop you.
 A race car uses gasoline ... to speed up.
 A car with less drag ... moves faster.

OBJECTIVES

Your child will:

- Understand the basic concept of aerodynamics and Greek origin of the word
- Practice “close reading”
- Compare similarities and differences in race car designs
- Build content vocabulary (aerodynamics, drag, wind resistance)
- Complete simple cause and effect statements

You will need:

- Aerodynamics Kid Scoop News Worksheet
- Engineer’s Journal (see Lesson 1)



LESSON 3
AERODYNAMICS

Golf on the Moon:

SAY: *The air on the moon is very, very thin. What do you PREDICT would happen if you hit a golf ball on the moon? (Record answers on a sheet of paper). Read the next section of the worksheet to find out.*

Science at Sonoma Raceway:

SAY: *Look at the two different shaped cars for NASCAR and NHRA Drag Racing. Complete the chart comparing similarities and differences among the designs:*

SIMILARITIES	DIFFERENCES

VICTORY LANE!

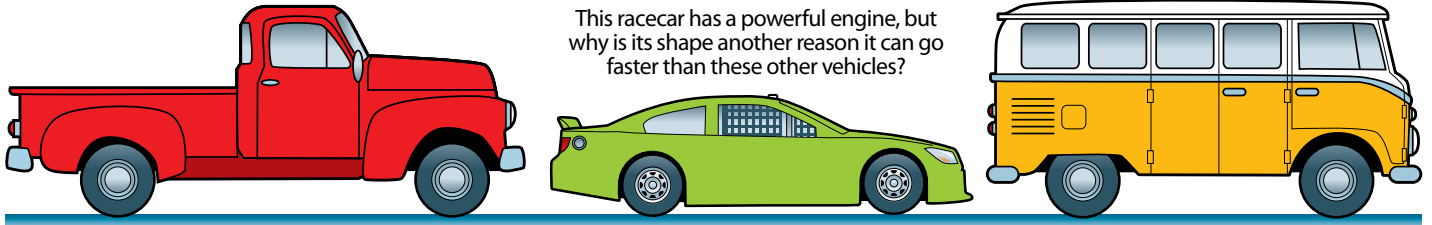
- 1. Chat it UP!** Take a field trip to a parking lot. Observe the different shapes and designs of cars. Discuss which cars you claim are more aerodynamic. Defend your claim with evidence. Use these words to describe your observations: aerodynamics, drag, wind resistance.
- 2. Imagin-eer!** Use the computer and a search engine to research "aerodynamics for kids." Find and conduct a simple experiment. Write up your findings in your Engineer's Journal using the scientific format: hypothesis, materials, process, findings, and conclusion.
- 3. Write On!** How many words can you make from the letters in A-E-R-O-D-Y-N-A-M-I-C-S? Record your list in your Engineer's Journal.

STUDENT NAME: _____

AERODYNAMICS

THE POWER OF AIR

The word **aerodynamics** comes from two Greek words:
aeros: of the air
dynamis: power, strength, force



This racecar has a powerful engine, but why is its shape another reason it can go faster than these other vehicles?

What is aerodynamics?

Aerodynamics is about the power of air and the way it moves around an object. Understanding the power of air is how engineers have learned to make airplanes fly and racecars go faster!

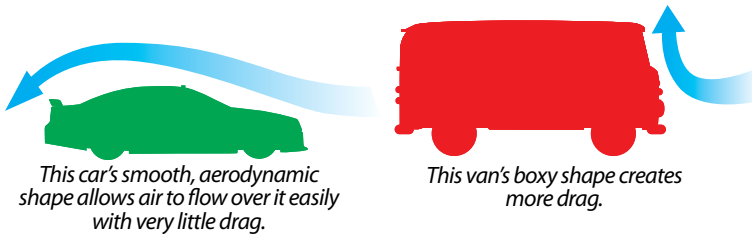


What a drag!

Have you ever felt the wind on your face when running or riding a bike? That is the power of air moving against you. Moving air slows you down. It can even stop you in your tracks, if it is strong enough. This is called **wind resistance** or **drag**.

A racecar uses the energy of gasoline in its engine to speed up. But moving through the air slows it down. This is the force called drag. In order to go faster, a car should have less drag.

Look at the car shapes at the top of the page again. Which ones do you think will have the least drag?



This car's smooth, aerodynamic shape allows air to flow over it easily with very little drag.

This van's boxy shape creates more drag.

Golf on the Moon

Air slows down moving objects. So what would happen if you hit a golf ball on the moon where the air is much thinner than on earth?



Astronaut Alan Shepard got the chance to find out when he walked on the moon on Feb. 6, 1971. Even wearing a bulky space suit, he hit a ball that traveled 400 yards (366 meters). On earth the average golfer can hit a ball about 200 yards (183 meters).

SCIENCE AT SONOMA RACEWAY: Which cars are more aerodynamic?

There are two big car race events at Sonoma Raceway. They are NASCAR and NHRA Drag Racing. For each one, the cars have different shapes.

Look at the two cars. Which one is more aerodynamic?

