



**aerodynamic:**

having qualities that make something move easily through the air using less fuel

## Mars Rover Model Celebration – Lesson Plan

### Introduction:

One of the new vocabulary words for this unit is **aerodynamic**. When something is aerodynamic, it “has qualities that make it move easily through the air using less fuel”. Engineers design cars, planes, trains and spaceships to be aerodynamic so that they go faster using less fuel. An aerodynamic design is especially important for spaceships because most of the weight of a rocket is the fuel it burns in order to reach orbit.

Let’s look at some pictures to will help us understand the word aerodynamic. The first picture shows an aerodynamic train. It is actually called a “bullet train” because of its shape and because it moves very fast. A bullet train can travel nearly 200 miles per hour. That is about 3 times faster than a car on a highway. The second picture shows a rocket. Its aerodynamic design allows it to move through the air easily in order to reach outer space. The final picture shows a man with a paper airplane. A sheet of paper is not aerodynamic, but once it is folded into an airplane, it becomes aerodynamic and easily moves a long distance through the air.

### Example:

Here is another example of the word aerodynamic. Engineers at NASA design spaceships to be aerodynamic. They want the spaceship to move through the air using as little fuel as possible in order to escape the Earth’s atmosphere. Fuel has so much weight that if a spaceship design is not aerodynamic, it may be too heavy and might be pulled back to Earth by the force of gravity.

### Reflection:

Things that are aerodynamic will have features like a sleek or narrow design, wings, light-weight materials, and/or a pointed (or round) tip to help them move through the air. I am going to name some objects. Think about which features make these objects aerodynamic. Raise your hands to share your ideas.

- An arrow (pointed tip, sleek design)
- A paper airplane (light-weight materials, wings, pointed tip)
- A bird (pointed tip, wings, light-weight materials)
- A racing car (pointed tip, narrow design)
- A soccer ball (round tip, light-weight material)
- OPTIONAL: A badminton birdie (light-weight materials, rounded tip)

### Make it personal:

Reflect for a moment about why it’s important for the scientists at NASA to design spaceships that are aerodynamic. Share your thinking with a neighbor. Start your sentence as follows: “It is important for spaceships to be aerodynamic because...” I will then ask some of you to share your ideas with the class.