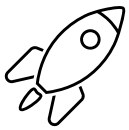
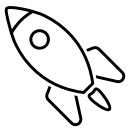


Brain Twister

Pre – Class Activity



Introduction: You will soon be participating in an engineering project at Driftwood Education Center. In this lesson, you will be working in teams to create a prototype for a new device to be used by NASA. In the following activity, you will learn more about the physics of making a prototype.

Directions: Work together in groups to match the term with the correct definition using the following cards. As a class go over the answer and discuss how each force impacted an object such as a flying vs. a flying paper airplane.

IMPACT	**GRAVITY**	**DRAG**	**KINETIC ENERGY**
POTENTIAL ENERGY			**SCIENTIFIC METHOD**

The energy that is stored in an object due to its position relative to some zero position.

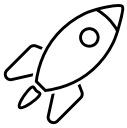
The force generated at the start of contact or collision - can be minimized if the duration of the collision is increased.

The force of attraction between all masses in the universe; especially the attraction of the earth's mass for bodies near its surface.

The force that is always opposite to the object's motion, and unlike friction between solid surfaces, this force increases as the object moves faster.

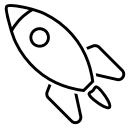
The process of observing, asking questions, and seeking answers through tests, experiments, and troubleshooting.

The energy of motion; an expression of the fact that a moving object can do work on anything it hits.



Brain Twister

Post – Class Activity



Introduction: During the Brain Twister activity at Driftwood, your group designed a water transport landing device. In these following questions, you will revisit the scientific method and explore the inspiration/application of this device. Remember to use the vocabularies from the Pre–Class activity.

1. Describe how your device protected the water balloon from exploding. What material protected your balloon the most? The least?

2. Knowing your results, how would you improve upon your design to make it work better on the next try? Draw a picture to help you!

3. What material would you like to use in a future design that you did not use during the class, and why do you want to use it? It can be a material that was not offered.

4. The water landers simulate parachutes and similar features seen in nature (ex. helicopter seeds dropping from maple trees). What else do we see in nature that we can relate to this device? (Hint: think about animals as well!)

5. Parachutes have been used throughout history and continue to be important for science. Currently, parachutes are frequently used for emergency aid and transportation of goods to inaccessible areas. What other items used by humans can be related to this experiment and parachutes? How do these things work?

6. When else might an engineer need to think about what materials they use in their products? For example, engineers who design submarines need to use material that can withstand high water pressure.