MR. NUSSBAUM
LEARNING + FUN

The Great Pacific Garbage Patch
Name _____

Faced with a broad horizon and wide blue seas, Captain Charles Moore set off in 1997 to cross the Pacific Ocean from Hawaii to California. This trip was expected to be unremarkable for the experienced seaman, a man of fifty with a grizzled beard and piercing blue eyes. But as Moore sailed through this remote area of the South Pacific, something unusual caught his eye.

> "As I gazed from the deck at the surface of what ought to have been a pristine ocean, I was confronted, as far as the eye could see, with the sight of plastic. […] No matter what time of day I looked, plastic debris was floating everywhere: bottles, bottle caps, wrappers, fragments".

Entirely on accident, Moore had run right into the undiscovered Great Pacific Garbage Patch. Just as a tornado sweeps trash and debris in a dizzying vortex, the ocean currents that meet in this spot of the Pacific swirl water and floating trash together in what is known as a gyre formation. The center of the gyre is full of calm, still ocean water that collects the trash that is spun into of the vortex.

In the swirling waters of the gyre, trash can sit for decades while it slowly gets broken down into smaller pieces by the sun and waves. The Great Pacific Garbage Patch, by some estimates, is at least occupies an area of more than one and a half times the size of the United States. Most of the trash is made of plastic - it is sturdy, widely used, and light enough to float on water. Plastic is so durable that it never truly disappears. It simply breaks into smaller and smaller chunks. Instead of being a solid island of trash, the Great Pacific Garbage Patch is actually made primarily of miniscule particles of plastic that sit on or just under the ocean surface.

It's the small size of the plastic that makes it so problematic. Sea birds such as gulls, terns, and albatrosses mistake the plastic for food and feed it to their chicks. From the waters underneath the Patch, fish, turtles, and other marine animals ingest plastic waste when they mistake it for small fish or plankton.

Since Moore's initial observations, solutions for the clean-up of the Great Pacific Garbage Patch have been at the forefront of scientific and technological innovation. Sometimes the best solutions can come from unexpected places. When he was just 17 years old, a Dutch teenager named Boyan Slat invented of a new method to clean up the plastic trash using a floating collection system. With a flurry of interest from across the world and funding for his cleanup project, Boyan gained the support he needed to put his plan into action. In the summer of 2018, Boyan launched the first test of his collection system in the waters of the Pacific. If the prototype is successful, a larger scale system will soon be launched. Even with the promising future of this collection system, the root cause of the Great Pacific Garbage Patch is still unresolved. It is the responsibility of everyone- from individuals to governments to companies and industries- to reduce the amount of plastic destined for waste piles like the Great Pacific Garbage Patch.

1. **Which of the options below is most likely to be the reason why no one had discovered the Great Pacific Garbage Patch before 1997?**
   a.) Captain Moore was an experienced sailor and noticed things no one else could
   b.) The Great Pacific Garbage Patch was too small to be discovered
   c.) The Garbage Patch was located in a remote part of the Pacific Ocean
   d.) Fish and other marine animals were eating all of the plastic

2. **Which "ingredient" is necessary to create a gyre?**
   a.) currents
   b.) a tornado
   c.) trash
   d.) boats

3. **Which of the following is <u>not</u> a reason why plastic is the most common material in the Great Pacific Garbage Patch?**
   a.) Plastic is durable
   b.) Plastic can float
   c.) Plastic is commonly used
   d.) Plastic never loses its shape

4. **The structure of the Great Pacific Garbage Patch is most similar to:**
   a.) A boat that floats on water
   b.) An island that rises up from the sea floor
   c.) A bowl of milk with floating pieces of cereal
   d.) A bowl of chocolate pudding

5. **Which would be the best title for the final paragraph?**
   a.) "Young Inventor Plans Patch Clean-Up"
   b.) "A Citizen's Responsibility"
   c.) "Floating Trash Poisons Sea Life"
   d.) "Cause of Garbage Patch Resolved"

6. **Why did Boyan Slat first launch a prototype before attempting full-scale collection system?**
   a.) To save money
   b.) To gain interest and funding from around the world
   c.) To test if the system would be successful
   d.) To acclimate marine animals to the device

7. **According to the reading, why can't Boyan Slat's invention completely fix the Great Pacific Garbage Patch?**
   a.) The device is incapable of cleaning up all of the trash in the Garbage Patch
   b.) Excessive waste continues to be produced
   c.) It is unclear whether or not the prototype will be successful
   d.) Boyan Slat needs more funding from individuals, companies, and governments to deploy his full-scale collection system