

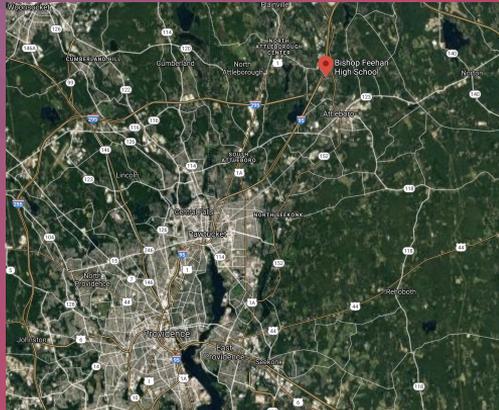
The background is a vibrant, abstract space-themed illustration. It features a gradient of colors from deep red and purple on the left to bright blue on the right. Scattered throughout are various celestial bodies: a large, textured red planet in the top right; a yellow and orange striped planet below it; a green and blue planet in the bottom left; and several smaller, dark purple and blue planets. The space is filled with numerous small white stars and larger, multi-pointed starburst shapes.

# Lesson Implementation

Astronomy and Space Science  
Spring 2021  
Eileen Correia

# Background

- Bishop Feehan High School
  - Catholic School
  - Grades 9-12
  - 1000 Students
  - Southeastern Massachusetts
- 11th and 12th graders
  - AP Environmental Science
  - Unit 8: Aquatic and Terrestrial Pollution
- Hybrid learning
  - Students in 2 cohorts
  - 1 cohort physically in school
  - 1 cohort at home on Zoom
  - Small number of permanent 'Home Cohort' students



# My NASA Data Story Map

## Ocean Circulation Patterns: Garbage Patches

### Ocean Circulation Patterns: Garbage Patches

[Introduction](#)[Engage](#)[Explore](#)[Explain](#)[Elaborate](#)[Evaluate](#)[NASA Connection](#)[Teacher Resources](#)

Ocean Circulation Patterns: Garbage Patches



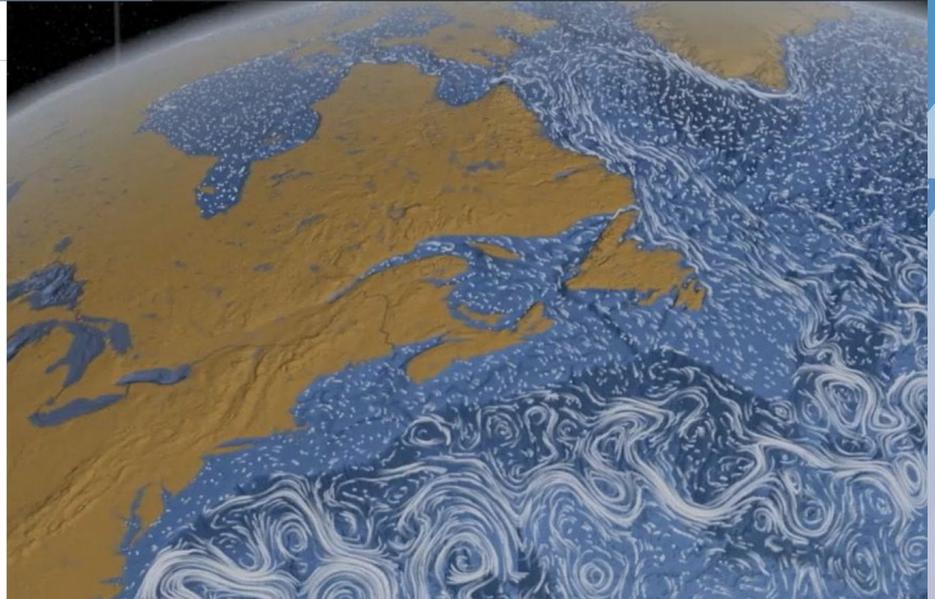
### Ocean Circulation Patterns: Garbage Patches

#### Purpose:

This story map allows students to explore **ocean circulation patterns** as they relate to the world's ocean garbage patches using NASA ocean currents data. Students will investigate the forces that contribute to ocean circulation patterns, and how debris, especially plastics, travel from land to the garbage patches. Students will also analyze regional plastic production and waste management data to describe the human influence involved in ocean plastic pollution.

**Grade Level:** 7-12

**Essential Questions:**





Name:

Date:

Class:

Ocean Circulation Patterns Student Sheet

Link to Story Map: <https://arcg.is/1P0b1C>

### Part A: Engage

A.1. Play I-Spy: What types of items do humans throw away?

A.2. What types of materials are these items made of?

A.3. Identify several examples of items in the photos that you use in your household.

A.4. What differences do you observe between the two images?

### Garbage and Waste

#### What Do We Throw Away?

Did you know human beings are the only living organisms on the planet that create unnatural waste? Shown in the image is some of the waste generated by humans that end up in landfills. Additionally, click the hyperlink below to view another image of the types of garbage disposed of by humans:

[View Another Image](#)

Closely analyze the two images and then answer the following questions.

A.1. Play I-Spy: What types of items do humans throw away?

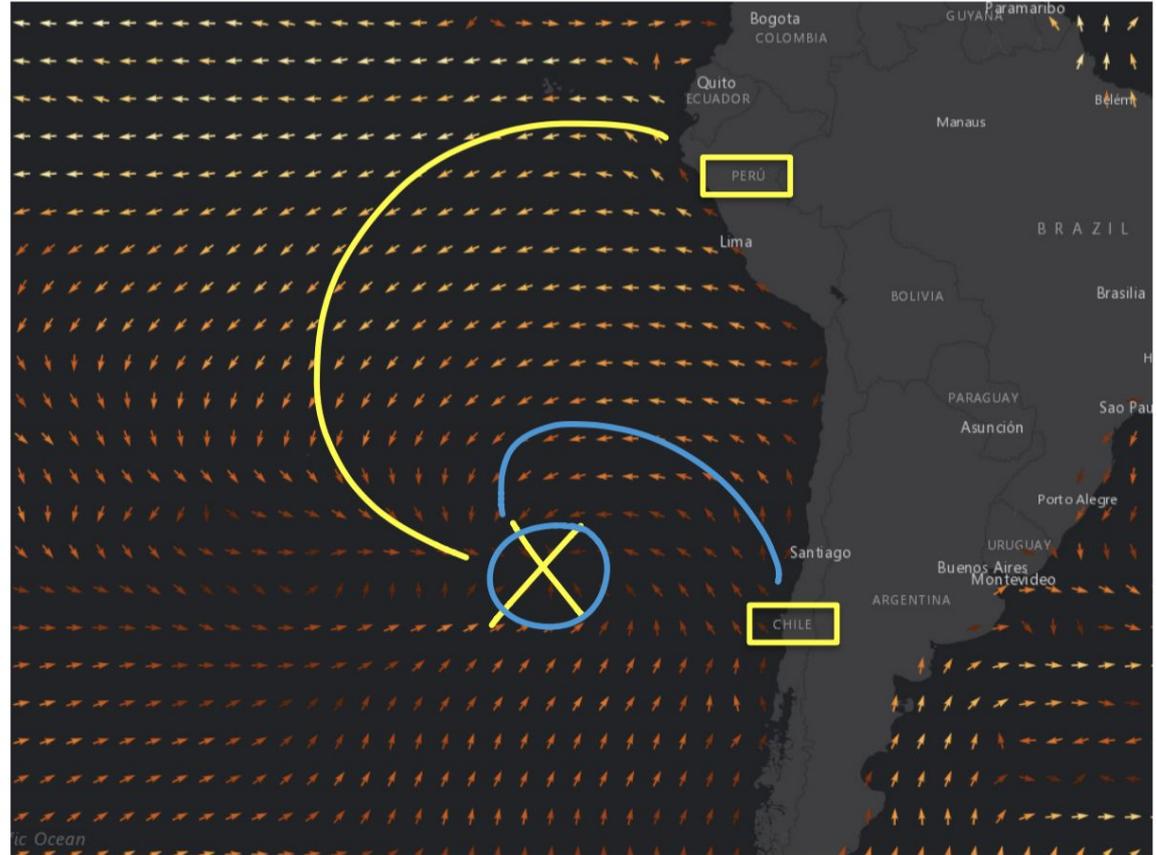
A.2. What types of materials are these items made of?

A.3. Identify several examples of items in the photos that you use in your household.



- Student work 1
- Allows visualization of why garbage ends up gathering in patches

B.8. On the map on your student sheet find the country Peru. Imagine that garbage was released somewhere on the coast of Peru. Draw the path the garbage would take, and mark its final destination with an X.



- Student work 2
- Evaluate Section of the lesson allows students to model the path of plastic waste from an area of their choice to a garbage patch
- Allows them to synthesize information about a variety of topics into one coherent story

E.1. Pick a location on the world map that is within a region with a high concentration of mismanaged waste. This is where your plastic will start its journey. (NOTE: Assume the plastic will enter the river nearest to this location. The world map displays rivers that become more detailed the farther you zoom in, so make sure you zoom in on the location you pick.)

Si Basin, China

E.2. Describe the processes that contribute to your plastic entering a river.

→ river dumping  
→ littering

E.3. How do Earth systems (atmosphere, biosphere, hydrosphere, geosphere) contribute plastic to rivers and creeks?

Those systems carry or move along plastic into rivers and creeks.

E.4. Describe any relevant information about the region your plastic is located in that may contribute to how plastic ends up in a river.

The high population density will attribute to the waste produce!

E.5. Describe how population density, the locations of cities and rivers, and attitude towards waste management lead to plastic river pollution. You may want to refer to the data presented in the Elaborate tab.

- high pop density
- rivers downstream of cities
- Not a good waste management system

# Pros and Cons

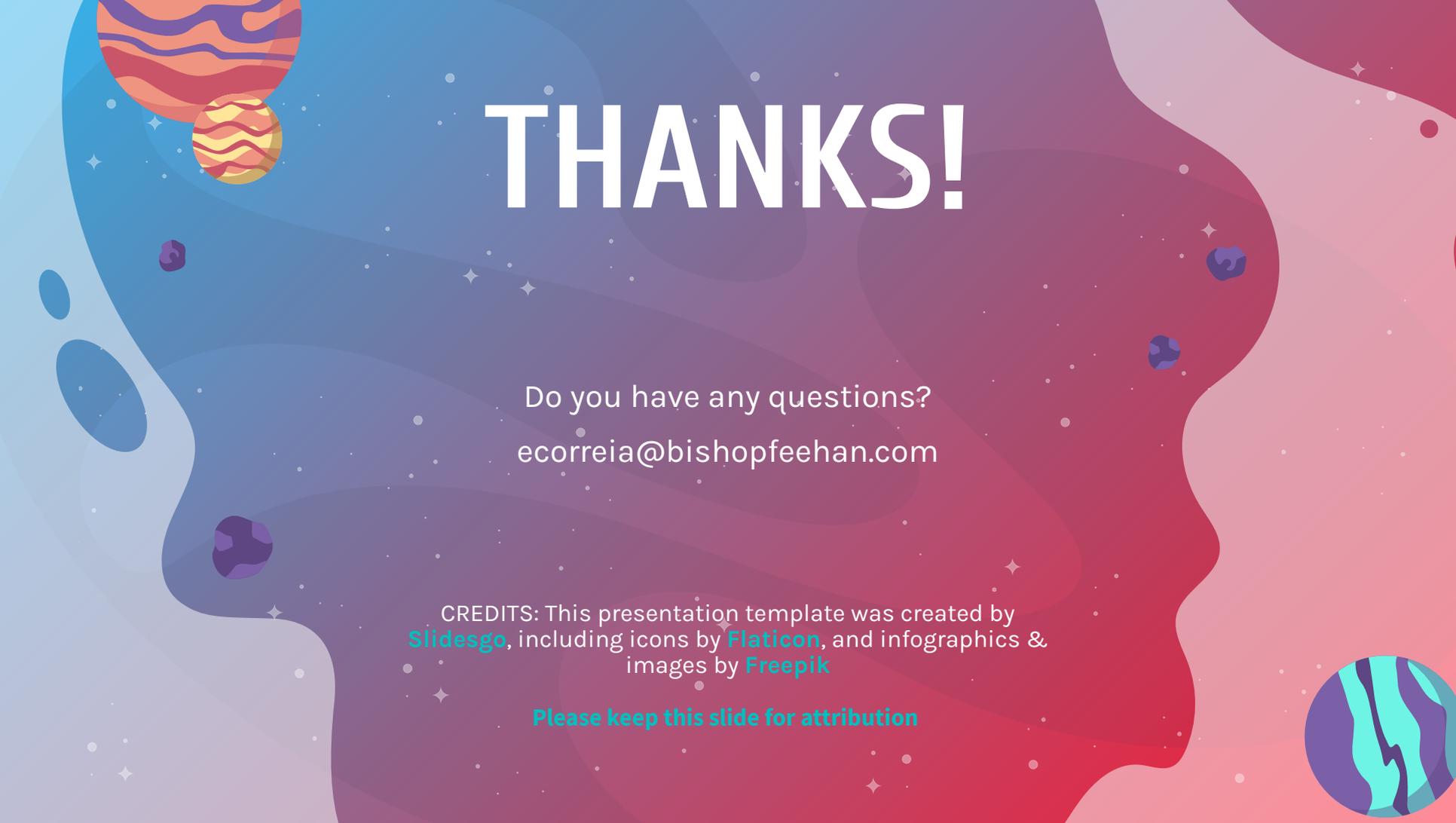
## Pros

- 5 E Model
- Variety of prompts
  - Images
  - Data
  - Videos
- Ease of use
- iPad compatibility

## Cons

- Student packet is long
  - 15 pages
- Some questions were too easy for my AP students

- Combine/ skip some questions to make packet shorter
  - More Claim/ Evidence/ Reasoning
- Ask students to investigate with the connected data sets
  - For Example: Use the Ocean Surface currents data set to determine the path of plastic instead of giving students the picture.
- Use the data sets to write a Free Response Question
  - Students always need FRQ practice.
  - Hard to find questions they have not seen before.

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# THANKS!

Do you have any questions?  
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