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7/8 STEM
April 18, 2017

Astronomy Week 1 Homework

1. Read "An Ocean of Plastic" (p. 8) in the April 17 edition of *Science World*. If you need the digital version of the magazine, go to http://scienceworld.scholastic.com/issues/04_17_17/book Sign in as a student.
Your display name: 7/8 STEM Your classroom password: ravens8mylunch
Complete the attached skills sheets.

2. Read Chapter 1 of the new text, *Astronomy* (pp. 4-13) and answer the following questions. You can type or handwrite your answers.
 - a. What are the two major motions of Earth as it travels through space?

 - b. Which motion causes day and night?

 - c. What causes the seasons?

 - d. What are solstices and equinoxes? How are they related to the seasons?

 - e. How would the seasons be different if Earth were not tilted on its axis?

 - f. Go to our class blog at <https://parade78stem.edublogs.org>. Read any unreviewed student blog posts and add your sincere, positive comment. Keep it short.

Questions? Always check the class blog assignment page first. Go to our blog at <http://parade78stem.edublogs.org/> and click on "2ND SEMESTER 7/8 STEM ASSIGNMENTS" at top of page. If you still can't find the answer to your question, feel free to email me at culverwelll@rsd407.org.

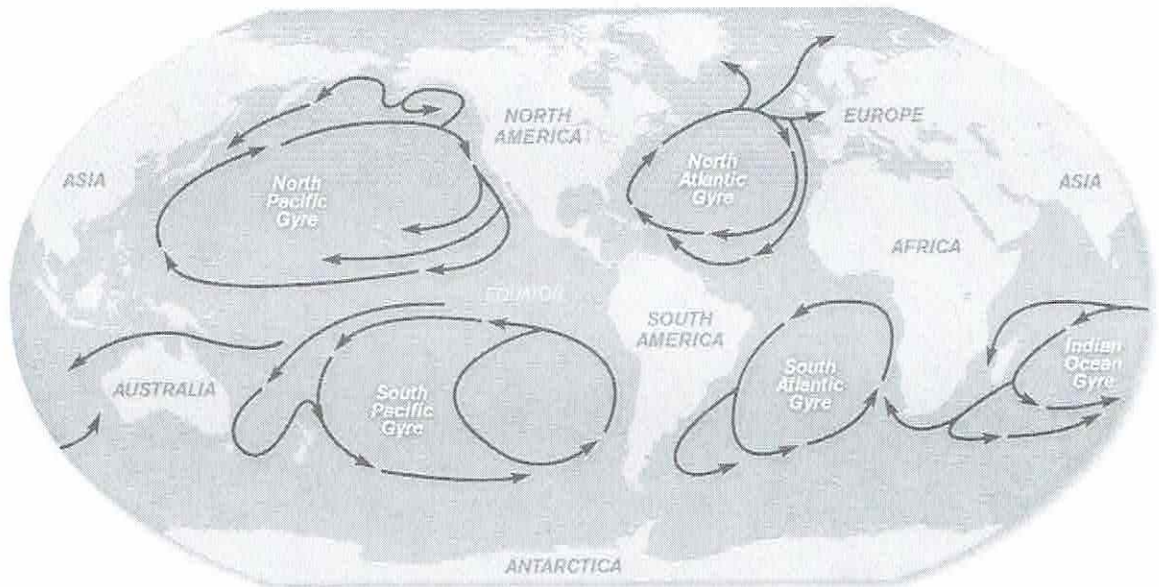
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OCEAN WHIRLPOOLS

In "An Ocean of Plastic" (p. 8), you learned that floating patches of discarded plastic are formed by *gyres*—circular ocean currents created by the motion of winds around the planet. Use what you learned in the article and the information below to answer the questions that follow.

SWIRLING WATERS

Temperature differences on Earth cause winds to travel away from the equator toward the poles and back again. But since Earth rotates on its axis, these wind patterns curve in what's known as the *Coriolis effect*. In the Northern Hemisphere, winds blow in a clockwise direction. In the Southern Hemisphere, winds blow counterclockwise. As these winds sweep across Earth's oceans, they drag water along with them.



QUESTIONS

- Which gyres are in the Northern Hemisphere?
- Which gyres border Africa?
- Explain why the North Pacific Gyre rotates in a different direction than the South Pacific Gyre.
- In the article "An Ocean of Plastic," you read that 80 percent of plastic pollution originates on land. Use the information in the map to explain why this pollution doesn't just remain near the coasts.
- Scientists are developing technologies that could help remove plastic that collects in the ocean garbage patches. Do you think any one country should cover the costs of ocean cleanups, or should they be shared? What factors do you think should be used to determine who pays? Support your answer using the information above and in "An Ocean of Plastic."

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PLASTIC HOME

In "An Ocean of Plastic" (p. 8), you learned that plastic pollution in the ocean harms wildlife. But some organisms actually thrive on the floating debris. Read the passage below to learn more, and then use complete sentences to answer the questions that follow.

THRIVING ON OCEAN DEBRIS

An estimated 8 million tons of plastic ends up in the ocean every year. Eating or becoming entangled in this trash presents a serious threat to most sea life—but not all. When scientists examined some of the floating plastic debris with microscopes, they found that the garbage had become home to a thriving community of microorganisms.

The researchers called the newly discovered *ecosystem*—a community of organisms interacting with each other and their physical surroundings—the "plastisphere." That term was derived from the word *biosphere*, which describes Earth's environment and all the organisms living on it. The plastisphere includes many different species of

microbes—many of which had never been seen before. Some of the bacteria use *photosynthesis*, a process that harnesses the sun's energy to produce food. The ecosystem also contains microbes that prey on other bacteria.

The scientists made another discovery as well. They found bacteria living in tiny pits in the surface of plastic trash. The pits may have formed as the bacteria consumed the plastic. If that's true, there might be a way to use the microbes to reduce the amount of pollution in the ocean. But there's bad news too: Some of the microbes found in the plastisphere are disease-causing *pathogens*. They could cause other problems for marine organisms that ingest plastic pollution.

QUESTIONS

1. Do you think "plastisphere" is a fitting name for the community of microbes found living on ocean debris? Why?
2. Use at least two details from the text to explain what makes the plastisphere an ecosystem.
3. Use context clues in the text to define the word *pathogen*.
4. How might studying the plastisphere help scientists develop solutions to the problem of plastic pollution in the ocean?
5. Scientists think humans' introduction of plastic into the environment has led some organisms to adapt to be able to live in the plastisphere. Use evidence from the passage and "An Ocean of Plastic" to describe other ways human activity might alter how marine organisms behave.

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RECYCLING MADE EASY

In "An Ocean of Plastic" (p. 8), you learned how people have polluted the oceans with plastic trash. One way to reduce this pollution is to get people to recycle. In the following passage, you'll learn about technology that is used to make recycling easier. Read the passage, and then answer the questions that follow.

SO LONG TO SORTING

When recycling programs first began in the 1970s, they required people to sort their discarded aluminum, paper, and plastic into separate recycling bins. Today, however, *single-stream recycling* allows people in many communities to dump all of their recyclables into a single container.

In a single-stream system, all of your mixed recyclables are dumped into a recycling truck and taken to a recovery facility. There, machines and workers do the sorting for you. First, the materials are dumped onto a conveyor belt, where workers remove

nonrecyclable trash that could jam the machines. Then, powerful *electromagnets*, magnets powered by an electric current, lift steel objects off the belts. Finally, a scanner shoots a beam of *infrared light* (invisible heat energy) onto the material to identify different types of plastic and sort them accordingly.

Switching to a single-stream system can make it more likely that a community will recycle. In its first year of operation, a single-stream facility in Denver, Colorado, for example, recycled 30 percent more goods than the older system did in the prior year.

QUESTIONS

1. How is single-stream recycling different from other recycling programs?

- (A) It works only with a single type of recyclable.
- (B) It allows people to mix their recyclables in with their regular trash.
- (C) It requires people to drop off their recyclables directly at a recycling facility.
- (D) It allows people to use one container for all recyclables.

2. Which of the following statements about infrared light is NOT supported by the passage?

- (A) It is used in single-stream recycling facilities.
- (B) It is invisible heat energy.
- (C) It can be used to sort metals.
- (D) It can be used to identify different types of plastic.

3. What evidence does the author use to show that single-stream recycling can affect the amount of material that is recycled?

- (A) Single-stream recycling is less expensive than traditional recycling.
- (B) Single-stream recycling sorts materials more quickly than past programs.
- (C) Single-stream recycling programs are spreading across the U.S.
- (D) A single-stream program recycled 30 percent more than the system used the previous year.

4. Do you think single-stream recycling could help reduce the plastic pollution in the ocean? Use evidence from the passage and "An Ocean of Plastic" to support your answer.

5. Recycling more is one way people can reduce their plastic waste. What are some other ways that individuals can decrease the amount of plastic they throw away?