

Title:

Study Guide Theme: Consumption

Featured Photos (minimum 3):

- (Indonesia) Trash Wave: Indonesia surfer... Surfing trash island: photographer captures startling images of garbage-strewn waves in Indonesia. Indonesian surf champion Dede Suryana rides a wave filled with trash on Untung Jawa Island. 2013. [credit: Zak Noyle]



- Seal in Net: Hawaiian monk seal caught in fishing tackle Hawaiian monk seal caught in fishing tackle off Kure Atoll, Pacific Ocean. The seal was subsequently freed and released by the photographer. Photo date - May2001 [credit: Michael Pitt]



- (India) Man Bathing: A larger percentage of the global population... A man bathes from a broken water pipe line in a Noida slum, located in the northern Indian state of Uttar Pradesh June 10, 2011. [credit: Parivartan Sharma]



Overview: Students will calculate percent increase of plastic consumption/waste over time and the percent of plastic being produced in Asia in 2015. They will do this after looking at 3 photos from the *OVERbook*, recording observations, and reading a National Geographic article about plastic consumption.

Grade level(s): 6-8

Subject(s): Mathematics

Corresponding National Standards:

National Council for Teaching Mathematics Standards:

6-8.NO.1.1 Work Flexibly with fractions, decimals, and percents to solve problems.

Common Core Mathematics Standards:

6.RP.A.3.C Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving find the whole, given a part and the percent.

7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

National Curriculum Standards for Social Studies Theme:

People, Places, and Environments

Common Core English/Language Arts Standards:

CCSS.ELA-LITERACY.WHST.6-8.1.A Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.

CCSS.ELA-LITERACY.WHST.6-8.1.B. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate the understanding of the topic or text, using credible sources.

Corresponding Global Competency Skills:

Investigate the World: Students investigate the world beyond their immediate environment.

Essential Question(s):

In what ways does plastic use impact the environment?

Day 1 of 45-60 minute period: Photo Analysis

In this activity, students will look at photos about plastic consumption. The teacher will pass out sticky notes for students to write their thoughts down on and the students will write down their thoughts about what they see in the photos. The photos are meant to engage students in the environment and tap into their emotions.

- Step 1: Display each photo one at a time. Either project the photo using a computer and projector or have the photos pre-printed.
- Step 2: Have students write on sticky note any observations they see and/or any questions they have. Note: they might need additional sticky notes per student.
 - Note: an ELL student might have trouble with this activity depending on their level of the language. You could have them just write down any words they know of objects in the photo.
- Step 3: Either have the students bring up the sticky notes one at a time to paste on a the photo, collect them, or have an open discussion. See possible discussion questions to help guide a discussion.
- Step 4: Repeat steps 1-3 until each photo is complete.
- Step 5: Discuss what each photo has in common.

Possible Discussion Questions:

- What caught your attention in the photo?
- What feelings do you have about this photo?
- What questions do you have about this photo? What do you wonder?

- What/How do you think the person/animal in the photo is thinking or feeling?
- What is missing from this photo that was not captured?
- What do you think is the story behind this photo?
- Why do you think these photos were chosen?
- What do you think is in common between each of these 3 photos?

Day 2 of 45-60 minute period: Reading the Article/ Looking at statistics

- Step 1: Read the [National Geographic Article “We Made Plastic. We Depend on It. Now We’re Drowning in it?”](#). While students are reading the text, instruct them to underline any statistics that demonstrate how plastic impacts the environment.
 - Differentiation: If students have trouble with stamina in reading long passages, consider cutting parts of the article. Give the parts of each article to groups of students (about 2-3). Have students read the article in their group, highlight statistics, and write a short summary to share with the class. Then, have each group share that summary with the class.
- Step 2: Ask students to share what they found interesting. Give about 5-10 minutes of share time.
- Optional: Ask students to share what statistics they found. Review what numbers like 9.2 billion looks like as a number.
- Step 3: Read through the [Scary Statistics infographic](#) statistics to the students. I would strongly suggest having a paper copy for students to reference individually or in groups.
- Optional: Allow the students to speak up and ask what they can do about plastic waste.
- Exit Ticket: According to the article or infographic, what are the ways in which plastic impacts the environment? Cite three pieces of evidence from the text in your answer.

Day 3 of 45-60 minute period: Calculating Percents

- Teacher Preparation: Using a colored printer, print each graph from the data visualization website. You can use the snipping tool on your computer to copy and paste the visualizations to word documents to print. Giving students the graphs allows for them to grapple with reading the graphs.
- Step 1: Have the students work in groups of 3-4. Give each group a different visualization to focus on, but each group should receive all of the visualizations. Have them write down anything they notice or have a question about in the graph. Have them discuss what the labels mean and what they think the graph is trying to tell them. This will probably take about 5 minutes. Call them back together as a group.
- Step 2: Project the bar graph from the [data visualization website](#). Call on the students that had the bar graph. Possible guiding questions: What did they notice? What do the labels mean? What is the graph trying to tell them? What questions do they have? Why does the bar graph start at 1950? What units is the graph going up by?
- Step 3: Show the [visualization](#) about what the plastic is being used for. Call on the students that had that visualization. Possible guiding questions: What did they notice? What questions do they have? What are common items that contain plastic? What part of the graph is the highest? What types of plastic? Why do you think that takes a lot of plastic? What can each student do to try to reduce their plastic consumption?
- Step 3: Show the [visualization](#) about plastic use across industrialized nations. Call on the students that had that visualization. Possible guiding questions: What do they notice? What are the labels on the graph? What is the graph trying to tell them? What questions do they have? What nations are using plastic the most? Why do you think those nations are using more plastic?
- Step 4: Show the [visualization](#) about how long the plastic stays in the ocean. Call on the students that had that visualization to share. Some possible guiding questions: What do you notice? What questions do you have? What do you think could be done to keep trash out of the ocean?
- Step 5: Pass out the [Plastic Consumption Percents](#) Worksheet.
- Step 6: Complete this worksheet as a class. Start by showing students how to do complete one or two of each type of problem, and then have them work in groups of 2-3 to complete the sheet.

- Students that might have trouble with percents might need more reinforcement. Consider working with those students in a small group while the others are completing the worksheet in their groups. The plastic consumption percents sheet will be collected as an assessment.

Optional Extensions:

- Arrange a field trip to your local recycling or landfill to discuss how much space is being used for waste, what can be recycled, etc.
- Students can write a letter to a local city leader, congressman, grocery store, etc. expressing concern for the use of plastic materials and educating the public on recycling options.

Materials:

- 3 featured OVERBook photos either projected on screen or hung up around the room
- Computer
- Projector
- Sticky notes (3 per student)
- Pencils/Writing utensils for students
- Copies of the [National Geographic Article](#) for each student or to share
- Highlighters for each student
- Color copies of the [Scary Statistics infographic](#) for each group of 3-4 students
- Copies of [Plastic Consumption Percents Worksheet](#) for all students

Bibliography:

Gaille, B. (2017, May 27). 21 Scarey Plastic Consumption Statistics. Retrieved from <https://brandongaille.com/20-scary-plastic-consumption-statistics/>.

Grun, G.-C. (2016, December 30). Six data visualizations that explain the plastic problem. Retrieved from <https://www.dw.com/en/six-data-visualizations-that-explain-the-plastic-problem/a-36861883>.

Noyle, Z. (Photographer). (2013). *Indonesia surfer... Surfing trash island: photographer captures startling images of garbage-strewn waves in Indonesia. Indonesian surf champion Dede Suryana rides a wave filled with trash on Untung Jawa Island* [photograph]. New York, NY: Goff Books.

Parker, L. (2016, August). WE MADE PLASTIC. WE DEPEND ON IT. NOW WE'RE DROWNING IN IT. Retrieved from <https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/>.

Pitt, M. (Photographer). (2001, May). *Seal in Net: Hawaiian monk seal caught in fishing tackle Hawaiian monk seal caught in fishing tackle off Kure Atoll, Pacific Ocean. The seal was subsequently freed and released by the photographer* [photograph]. New York, NY: Goff Books.

Sharma, P. (Photographer). (2011, June). *Man Bathing: A larger percentage of the global population... A man bathes from a broken water pipe line in a Noida slum, located in the northern Indian state of Uttar Pradesh* [photograph]. New York, NY: Goff Books.