Teacher's Guide for Odyssey

November 2014, Volume 23, Number 9

Wasted

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Teacher's Note:
This guide contains project ideas, short answer, extended response, fill-in, and true/false with correction. The variation is designed to have the students think critically, as well as to test their comprehension. An answer key to the short answer sections can be found at the end of the guide.

Extended Response: Comprehension & Critical Thinking
The questions below can be used as written, simply answered in complete sentences or easily transformed into longer essay (ELA) style questions, or even research topics. In any case, have the students support their answers with details from the text or use critical thinking skills to create a thorough and interesting answer. The questions, essays and projects have been aligned with the **Common Core Standards**. Consider the level of your students when deciding how to use the questions.

"Throwing It All Away" p. 8-10

1. What are some of the changes that have occurred due to the growth of cities and changes in government regulations since the 1980s?
2. Explain SENSEable's Trash Track program and its goal for sending out over 2,000 pieces of "smart trash".
3. What was the disturbing conclusion that Trash Track scientists reached from tracking the high-tech waste?
4. What were some of the strategies used by Metro High School to try to improve the waste management in their school district?
5. How could a "waste audit" improve your diet?

"Waste Not, Want Not" p. 11-13

1. How is it possible that forty percent of the food that's produced in this country never makes it into the mouth of a human being?
2. What did farm manager, Nick Papadopoulous, do to try to solve the problem of his wasted produce? Was he successful?
3. What is CropMobster?
4. How much money do we spend per year to dispose of excess food? How does the food get disposed?
5. How is uneaten food a waste of several important resources?
6. What is the difference between Food Cowboy and Food Shift?
7. *Opinion:* Do you think that solving food distribution issues could totally eliminate world hunger? Why or Why not?

Activity: *Construct a Venn Diagram comparing/contrasting two of the following: CropMobster, Food Cowboy, Food Shift*

Essay: *Write a short essay describing how technology/social media can be a huge asset in preventing waste. Use the examples from this article, as well as at least one other real-world example to support this positive trend. Be sure to use specific details and to include an appropriate introduction and conclusion.*

"Seek And You Shall Find" p. 14-15

1. What is 'dumpster diving'?
2. What types of things is Professor Saier finding in the dumpsters outside the supermarkets?
3. How can we use dumpster diving to reform the current food system?
4. *Opinion:* How do you feel about the practice of dumpster diving? Support your answer.

"Bum Wrap" p. 16-18
Read the article in its entirety and then fill in the blanks. Refer back to the text if necessary.

1. When the world was plastic free, people made objects with materials extracted from the _____, like stone, clay, metal and glass.
2. Options were expanded when we started using special materials gathered from _____ _____, like wood, fibers, cotton, rubber, resin, wool, silk and leather.
3. Wohler proved that organic substances could be made with ordinary lab equipment by manipulating compounds that contain the versatile element _____.
4. The first human-made plastic was _____.
5. Strategies for dealing with unwanted plastic include reducing, reusing, recycling and _____.

"What's the Buzz" p. 21-23

1. How do birds, hermit crabs and even insects utilize human trash?
2. What is meant by the statement, "Of the 4,000 or so species of bees in North America most are solitary"?
3. Explain how the Alfalfa leafcutter bee builds a line of brood cells.
4. What is included on the list of essential things that city bees, like their country cousins, need?
5. Why do you think that the Alfalfa leafcutter began using plastic to construct the cell walls? How can we tell that it was an "accident"?
6. How is the Megachile campanulae using plastic?
7. How can the use of plastic by insects and birds be evolution in action?

"Mount Everest: What a Mess!" p. 24-27
Mark the following statements TRUE or FALSE. Provide the correct answer if false.

1. _____ On May 29, 1953 with the first successful expedition to the top of the world's tallest mountain, the trash problem of Mount Everest began.
2. _____ Approximately 5 tons of garbage litters the slopes of Mount Everest.
3. _____ In most cases, climbers dump their garbage and supplies simply to lighten the load.
4. _____ None of the garbage/supplies decompose due to the icy conditions.
5. _____ The area above 16,000 feet on the mountain is known as the 'death zone'.

6. _____ The government of Nepal's new law requires that each expedition pay a deposit of $4,000 to be returned only if it is proven that they brought down all their own garbage plus an additional 18 pounds of waste.
7. _____ Artists are turning Everest's trash into art. By using the trash creatively, the artists hope to earn space in modern museums.

"Waste + Water" p. 26-27

Define the following terms: *microorganism, effluent, potable, aquifer*

1. What happened when the Clean Water Act was passed in 1972?
2. Explain the three steps for turning wastewater into clean, usable water.
3. Why is it that even after treatment, effluent is not clean enough to drink?
4. What can effluent safely be used for?

"What To Do With Poo" p. 28-29

1. How can we recycle nutrients from human waste products?
2. How do composting toilets work?
3. Why is the shape of the toilet tank significant?
4. Why are composting toilets a smart alternative?
5. Do you think we will see a massive turnover from our current toilet to composting toilets? Why or why not? Support your answer.

"Nowhere To Go" p. 36-39

Define the following terms: *radioactive, nucleus, radioactive decay*

1. How much electricity is produced in the United States by nuclear power plants?
2. What fuels the US 100 commercial nuclear reactors?
3. Explain what happens when a neutron strikes a U-235 atom just right.
4. What do workers do with used fuel assemblies and why?
5. How much used fuel does the industry generate per year?
6. How long does it take for the spent fuel to be cooled down?
7. What is dry storage?
8. What do the NRC and the UCS disagree on?
9. What barriers lie in the way of resuming the studies on fuel waste?
10. What are the main dangers of spent waste disposal?

Activity: *Study the nuclear energy chart on page 38. Interpret the data and write it into paragraph form.*

ANSWER KEY

"Bum Wrap"

1. *Earth*
2. *living things*
3. *carbon*
4. *celluloid*
5. *reinventing*

"Mount Everest"

1. *True*
2. *False, 50 tons*
3. *True*
4. *True*
5. *False, 26,000 feet*
6. *True*
7. *False, hope to raise funds and awareness*