

# Dollar Street Water and Sanitation Lesson (Secondary)

TEACHER	DATE
GRADE LEVEL Secondary	SUBJECT Science, health, and/or social studies

- LESSON OBJECTIVE(S)**
- SWBAT discuss different methods of sanitation across the world and its importance.

- MATERIALS**
- Access to the TED Ed video “When Is Water Safe to Drink?”: <https://ed.ted.com/lessons/when-is-water-safe-to-drink-mia-nacamulli>
  - Access to the Dollar Street website: <https://www.gapminder.org/dollar-street/matrix>
  - Associated worksheet
  - Optional: Access to Gates Foundation Reinvent the Toilet video <https://youtu.be/fdwvuTrycYU>

- ENGAGEMENT**
- Describe how the teacher will capture students’ interest.
  - What kind of questions should the students ask themselves after the engagement?

Without access to clean water and toilets, people (especially children) fall prey to a wide range of preventable diseases, some of which can lead to death. Water and sanitation are important for every region in the world, even in places where it’s taken for granted. Open a conversation with the class about water-related crises in the U.S. What water crises have occurred recently, and what do they know about them? Bringing the discussion to Flint, Michigan, share with the class the TED Ed video, “When Is Water Safe to Drink?” (available at <https://ed.ted.com/lessons/when-is-water-safe-to-drink-mia-nacamulli>). What did they already know and what surprised them? Spell out a few diseases that come from polluted water sources. What pollutes water in the U.S. and in other countries? And what is necessary to achieve clean drinking water, here and around the world?

Segue into sanitation systems by asking students if they know what happens after they flush. How do toilets work? Describe the system that toilets are connected to, that we depend upon for human waste processing. Then transition into the next activity by asking students if they have first-hand experience with toilets in other countries.

- EXPLORATION**
- Describe what hands-on/minds-on activities students will be doing.
  - List “big idea” conceptual questions the teacher will use to encourage and/or focus students’ exploration

Student will need access to the Dollar Street website (available at <https://www.gapminder.org/dollar-street/matrix>). You may choose to have them work in pairs. Begin the lesson by having them explore the website on their own for a few minutes. Then pass out the worksheet which guides them through learning about different toilets across the world. If students finish early, have them explore other aspects of homes across the world such as food, lighting, or cooking tools. It also may be interesting to direct students to investigate the aspirations of different individuals across the world using the “Things I Dream of Having” filter.

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**EXPLANATION**

- Student explanations should precede introduction of terms or explanations by the teacher. What questions or techniques will the teacher use to help students connect their exploration to the concept under examination?
- List higher order thinking questions which teachers will use to solicit student explanations and help them to justify their explanations.

Ask student to reflect on what they learned about sanitation across the world. Ask them to draw conclusions about what types of toilets are safe vs unsafe. Have them deliberate over how the choice of a good toilet is not entirely up to individuals, given the larger sanitation system of the country or region. You may also want to walk them through the cycle that disadvantages poorer regions of the world: when people have to spend more of their own time to purify water or treat waste in order to prevent disease and death, less of their time is available for other kinds of work, which contributes to keeping them in poverty — and ultimately impoverishes the country as well.

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**ELABORATION**

- Describe how students will develop a more sophisticated understanding of the concept.
- What vocabulary will be introduced and how will it connect to students' observations?
- How is this knowledge applied in our daily lives?

You may choose to formalize a few definitions with students using your favorite vocabulary strategy. The following words are closely related to the lesson.

**Social determinants of health** — conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes (definition from the Centers for Disease Control)

**Sanitation** — the promotion of health and prevention of disease through maintenance of healthy conditions (as by the removal of sewage and waste)

**Human microbiome** — the collective genomes of the microbes (composed of bacteria, bacteriophage, fungi, protozoa and viruses) that live inside and on the human body. Humans have about 10 times as many microbial cells as human cells (from NIH National Human Genome Research Initiative)

**Open defecation** — the practice of using field, bushes, forests, open bodies of water rather than toilets to defecate. This is the practice (generally by necessity) of about 12% of people worldwide.

**Diarrheal diseases** — disease causing diarrhea which can result dehydration, infection, and malnutrition. These kill around 525,000 children under five every year.

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**EXTENSION**

You may wish to use the following resources to extend the discussion of toilets and sanitation.

- A Brief History of Toilets (TIME):  
<http://content.time.com/time/health/article/0,8599,1940525,00.html>
- Types of Toilets: <http://www.bfplumbingbayarea.com/blog/toilets-around-the-world/>
- World statistics, infographics and videos: <https://www.gapminder.org/>

**GOING DEEPER**

*Option One:* Have your students test water from a variety of locally-available sources: school toilets, bathroom sinks, and water fountains; local rivers or streams; and water filtered by a few methods. You might even have your students go through the process of purifying water, so they experience firsthand the amount of time it takes to get access to clean water when you live in a region with poor sanitation. Classroom test kits such as Ward's Lab Activity kit provide strips, vials, and chemical testing agents.

*Option Two:* Students can also research and present on innovations that are being introduced around the world to improve sanitation where waste treatment systems are not an option. Watch the “Reinvent the Toilet” challenge video from the Gates Foundation (<https://youtu.be/fdwvuTrycYU>). Then create a poster presentation on how scientists are reinventing the toilet to transform human waste into valuable resources that save time while also improving the health of whole communities.

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**POSSIBLE STANDARDS**

- WA State Social Studies Standards 9-10th grade: 2.4.1 Analyzes and evaluates how people across the world have addressed issues involved with the distribution of resources and sustainability in the past or present.
- WA State Social Studies Standards 9-10th grade: 3.2.1 Analyzes and evaluates human interaction with the environment across the world in the past or present.

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**DIFFERENTIATION  
STRATEGIES TO MEET  
DIVERSE LEARNER NEEDS**