

11. Fatberg, Right Ahead!

Overview and Purpose

To introduce students to the growing environmental problem of fatbergs, how they are caused, and what can be done about them.

Lesson Summary

Students will become familiar with fatbergs, how they form, move, and affect the sewer systems of municipalities.

Students will learn about fatbergs through a video from Great Lakes Now, conduct an experiment to see how exactly different materials breakdown over time, and then use the results from their experiment and knowledge of fatbergs to create a public service announcement informing their school of the fatberg problem.

The experiment in this lesson requires students to collect observations and data over the course of several days, up to a week, and then compare the results. The lesson itself will take more time at the beginning and end of the multi-day learning progression, but requires only that students take data on the days in between. Thus, this lesson can be taught concurrently [with other lessons](#) happening during the days where students only need to collect observations from their lab.

The background context needed for this lesson is to be able to create a public service announcement (e.g., infographic poster, video, etc.) and conduct an experiment that is carried out over multiple days.

ESSENTIAL THEMES	<ul style="list-style-type: none">● Fatbergs● How our household habits affect our sewer systems● Public Service Announcements
NEXT GENERATION SCIENCE STANDARDS	<ul style="list-style-type: none">→ SEP2: Develop and/or use a model to predict and/or describe phenomena.→ SEP8: Integrate qualitative and/or quantitative scientific and/or technical information in written text with that contained in media and visual displays to clarify claims and findings.

	<p>→ MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.</p> <p>→ HS-ESS3.1: Construct an explanation based on evidence for how availability of natural resources, occurrence of natural hazards and changes in climate have influenced human activity.</p>
OBJECTIVES	<ul style="list-style-type: none"> <input type="checkbox"/> Know what fatbergs are <input type="checkbox"/> Understand how fatbergs are formed, affect sewer systems, and can be remedied <input type="checkbox"/> Create a public service announcement to educate the school community about fatbergs and how they can help be part of the solution to them
ESTIMATED TIME	❖ 10 class periods

Materials Needed

- Video projection monitor or screen/speakers
- Internet access
- Notebooks and pencils
- Beakers
- Masking tape and markers
- Scissors
- 2L plastic soda bottles, labels removed
- Toilet Paper
- Facial Tissue
- Paper Towel
- Flushable Wipes
- Cotton (swabs or balls)

Facilitation Steps

WARM UP: Begin by asking students what they already know about the essential themes of the lesson and what they wonder about it. Have them turn and talk with a shoulder partner. Then, after a minute of conversation, elicit responses from a couple of volunteers and jot down 2-3 ideas on the board under the categories KNOW and WONDER. The teacher should help students clarify their ideas as they are shared by checking for understanding using a talk move such as “so you are saying...” or help students think together by asking for a show of hands of agreement from the class in response to what individual students share.

LAUNCH: Once the warm up has concluded, give a brief overview of the background context to students, making connections to their KNOW and WONDER responses as well as any other relevant prior knowledge they would have from other lessons they have learned. Describe the activities planned for this lesson to students.

ACTIVITY 1: What Is a Fatberg, Exactly?

First, explain to students that they are going to be viewing an introductory video about fatbergs—a problem facing communities worldwide—from Great Lakes Now. Inform them that after the video, they will be using their new knowledge to create an informative public service announcement (PSA) about fatbergs. This video will provide some basic information to them that will help in the creation of their PSAs, and address some of their WONDERS from the warm up. Introduce students to the 4 Notes Summary protocol that they will use after the video is complete, where they write one of each of the following:

- Oooh! (something that was interesting)
- Aaah! (something that was an ah-ha moment)
- Hmm... (something that left them thinking afterward)
- Huh? (a question they have afterward)

Ask students to give an example of each type of note that they will be making to check for understanding.

Next, have a volunteer read the introductory overview from [the article on Fatbergs](#) from Great Lakes Now.

Then, show the video [segment on Fatbergs](#) from Great Lakes Now to the whole class and, afterward, have students record in their notebooks a 4 Notes Summary about it.

Last, have students form a group of four to discuss their takeaways from the video using the Conversation Roundtable protocol. In this protocol, students take turns sharing what they wrote

for their individual responses to the 4 Notes Summary with their group while each student writes down what they heard the speaker say. Then, each student writes their own “sum it up” statement of their group members’ responses. After the Conversation Roundtable, have a whole-class share out. Choose a few students to each share their summaries from their group discussion aloud with the whole class. After each, ask students to raise hands if what was just shared matches something that came up in their group discussion as well.

ACTIVITY 2: Should It Flush?

First, inform students that they are going to work with their groups from the Conversation Roundtable in the last activity to conduct an experiment with was referenced in the video. Ask for a show of hands about how many students noticed the containers with flushable wipes—including one that was sitting there for a year—in the video. After the show of hands, explain that they will be doing a variation of that experiment to let different types of materials sit in water over time and compare the results to see for themselves what should or should not be flushed down the toilet.

Next, ask for suggestions of common materials that get flushed down the toilet and write them on the board as students give them. Discuss with students the relevance to fatbergs of each one on the list, and try to parse the large list down to a list that focuses on the following materials to investigate:

- Toilet Paper
- Facial Tissue
- Paper Towel
- Flushable Wipes
- Cotton (swabs or balls)

Inform them that they will put these materials in containers (2L plastic bottles) filled with the same amount of water and take observations of each over time. The times at which groups should take observations of each material sitting in water, in order to include in their data table, should be:

1. 5min
2. 1 day
3. 2 days
4. 3 days
5. 1 week

Then, have each group set up an experimental bottle with the same amount of water (they can determine how much) and place a similar-sized sample (they can determine how big) of each

material in each corresponding bottle and label the bottle with what is in it. The bottles should get capped to model the relatively closed system of underground sewer pipes.

Last, have students collect data and observations for each bottle at the designated time intervals and keep all data organized in their notebooks. After the final data is collected in the bottles, have students pour out the water from each bottle and get the material out (e.g., cut open the bottles) to examine them by touch, and take observations about how much each has broken down. Once all observations are complete, have students summarize their findings in a data table and make some analysis about what happened with each material. Remind students that they should conclude how flushable each material is and which material would be safest to flush.

ACTIVITY 3: Fatberg Public Service Announcement

First, explain to students that they are going to apply their learning from the fatberg video and lab in the previous activities to create a public service announcement informing people about fatbergs and explaining which materials should or should not be flushed down the toilet. They can create a video, image (e.g., meme or GIF), radio announcement, or an infographic (using an infographic tool such as [Canva](https://www.canva.com/)) about fatbergs.

Ask them what they think should be included in the PSAs and discuss with them what additional features you think should be included in a good PSA. At the least, each PSA should include a:

- Description of what a fatberg is and why they are a problem
- Explanation of how fatbergs are formed
- Summary of the findings from their fatberg experiments
- Call to action for what the public should do, or not do, as a result of this knowledge

Next, give students time to work with their group on creating their PSAs.

Then, after the PSAs are finished, allow students to present them to the class and get feedback from one classmate and the teacher.

Last, have the class vote on which PSA they think would be most impactful to their school. Give students a chance to discuss how they think that PSA should be distributed to the school community (e.g., read on the daily announcements, posted online, etc.) and work with them to get that to happen in a manner consistent with the requirements and practices of the school.

**Share what students create with Great Lakes Now by emailing students' experimental results (from Activity 2) or their PSAs (from Activity 3) to gln@dptv.org or by posting photos of them on Facebook or Twitter with @GreatLakesNow!*

SYNTHESIS: Give students individual thinking and writing time in their notebooks to synthesize their learning by jotting down their own reflections using a Word, Phrase, Sentence protocol, with:

- A **word** that they thought was most important from the lesson
- A **phrase** that they would like to remember
- A **sentence** that sums up what they learned in the lesson

After the individual synthesis is complete, students should share their synthesis with a shoulder partner.

COOL DOWN: Have students complete a 3, 2, 1 Review protocol for the lesson with a partner, recording in their notebooks or, optionally, on exit ticket slips to submit, the following:

- **3** things that they liked or learned
- **2** things that make more sense now
- **1** question that they were left with

CLOSURE: Have one student share a response from each of the categories of the 3, 2, 1 Review. Depending on the available time, the teacher can make connections between the ideas students share and the learning objectives of the lesson, and respond to the question that is shared.

EXIT TICKET: Students write an “I used to think... Now I think...” statement about what they flush down the toilet.

About the Author

Gary is an educational consultant, award-winning science educator and the author of [Science With Scarlett](#). He is also a double cornea transplant recipient who, since having his sight restored, was moved to use his teaching gifts to make science fun for kids. He lives with his family near Detroit and designs learning experiences to inspire children, like his own daughter, to love science. Gary is the 2014 recipient of the Michigan Teacher of the Year honor. Contact him via his consulting firm, [Saga Educators](#), or connect with him on [Twitter](#).

About Great Lakes Now

With a [monthly magazine-style television program](#) and daily online reports at [GreatLakesNow.org](#), the **Great Lakes Now** initiative offers in-depth coverage of news, issues, events and developments affecting the lakes and the communities that depend on them, while capturing the character and culture of the region.