

NEWEA School-age Presentation Toolkit
How We Use Water and How Wastewater is Treated (4-8)

Objective: Students will have an understanding of the role that humans play in the global water cycle, what wastewater is, and that it has to be “cleaned” before being returned to the environment. They will also be introduced to the typical processes included in a wastewater treatment (water resource recovery) facility.

Materials Needed:

Laminated NEWEA Letter Sheets (optional)

Fifteen pages of pictures with presentation materials on the back

Toy Toilet

Time: 40-50 minutes

NOTE: We recommend that handouts should be held until the end to maximize student attention and participation.

Procedure:

1. Introduce yourself. Mention you are in the water or wastewater field, or whatever field you are in. If you are an active NEWEA member or would like to start the presentation in this fashion, begin with the “What is NEWEA?” activity using the NEWEA letter package and tips.
2. Introduce Water Cycle picture. Water is the ultimate in recycling. The water you used this morning to brush your teeth could have been a dinosaur’s bath water - that is how long our water has been around. Someday your great grandchildren will be drinking the same water you used today. Explain the water cycle, including the terms evaporation, condensation, and precipitation, and explain that humans are a part of the water cycle when we use water then return it to the environment.
3. Ask the students: “Who used water today?” Almost every hand will go up. Ask what they used water to do. (We suggest you go around the room and let every student answer.)
4. Hold up the picture of the cutout house. Discuss the kids’ ideas on how they use water in the house. As they answer, go room by room and repeat the ways the students use water. Start with the kitchen; we use water to wash dishes, either in the sink or a dish washer, we use the garbage disposal, we rinse off fruits and vegetables, we dump out liquids and ice cubes still in a cup, etc. Make the point that it’s not just water going down the drain, it is water plus...bits of food, soap, etc. Next, talk about doing laundry; point to the washing machine, ask students if they have ever had anything in their pockets when it went into the washing machine, but it was gone when it came out. **Save the bathroom for last...**talk about brushing teeth, taking baths and showers, and finally the toilet.
5. Pull out the toy toilet and give it a flush! Ask students to raise their hands if they flushed a toilet already today. Remind students that we all flush toilets every day; we have to because, as humans, we have to go the bathroom, we have to brush our teeth, we have to take baths and showers - these things keep us healthy. Explain that when we use water this way and it goes down the drain, we call that **wastewater**.
6. Have the students give some ideas of what might be in wastewater besides just water (e.g., bits of food, dead skin, toys that were flushed by mistake, etc.) Take this opportunity to also discuss what should not be flushed down the toilet (e.g., baby wipes, diapers, paper towels, cooking grease, and anything else that could clog a plumbing fixture or sewer pipe or pump).

7. Ask the students where the wastewater goes? Answers may vary. Some students may begin by saying the “ocean” or “rivers.” Tell them they are right and hold up the picture of the receiving water. Say, it doesn’t go straight from the house to the ocean. Ask how the wastewater gets from the house to the ocean or rivers...through a **sewer**. (Note: some treatment plants discharge to groundwater, this concept may be appropriate to mention to older students, especially if it is applicable to your town.)
8. Not all buildings are connected to a sewer; others are connected to a **septic system**. Hold up the picture of a septic system. Ask students who has a septic system in their yard. Explain that a septic system is a tank that collects wastewater, and where solids settle to the bottom and need to be pumped out by a truck, and liquids leach into the ground from a leaching field. Point out the picture of the system vent (the ‘candy cane’) – many kids will recognize that they have one of those in their yard.
9. Hold up the picture of the sewer. Explain that a sewer is a pipe underground that wastewater or sewage travels through. Students may start by saying sewers are where wastewater goes. Tell them they are right but explain that wastewater doesn’t stay in the sewers, it travels through the sewers. Then ask where it goes from there...to the ocean or rivers.
10. Explain that wastewater doesn’t travel directly from homes to the ocean or rivers; something happens to it in between...it gets cleaned at a wastewater treatment plant (or “water resource recovery facility”). Hold up a picture of the **Wastewater Treatment Plant**.
11. While you are holding the Wastewater Treatment Plant picture, explain to students that wastewater treatment plant is different from a water treatment plant. A water treatment plant cleans the water before we use it, and a wastewater treatment plant cleans the water after we use it.
12. Go through the treatment process steps in order, using the text on the slides as a guide, explaining how each works. Place emphasis on which processes are **physical** versus **chemical** versus **biological** treatment, as shown on the backs of the slides.
13. Hold up the picture of the **influent/effluent**. Reiterate that when the water comes into the treatment plant it’s dirty (remind them it’s our dishwater, shower water, toilet water), but the job of the treatment plant is to clean the water before putting back in the environment. Ask the students: why do you think it is important that water be cleaned before going into the environment? What are some uses of oceans and river waters?
Hold up the Oceans and Rivers picture again.
14. If time permits, ask the students questions and when they answer the questions correctly let them flush the toilet. Or, you can have the students flush the toilet each time they provide a correct answer throughout the body of the presentation, after the point at which you’ve first shown them the toilet. Helpful hint: tell students that there will only be one flush per person. Tell them that even if they know the answers to every question after that, please don’t raise your hand because it’s hard to remember who flushed and who didn’t, and you wouldn’t want to give one person two flushes when others have even flushed once.
15. CLOSING: Use the water cycle picture and explain that it is important to protect water and keep it clean because it is continuously recycled and reused.

Sample Questions:

- What does the “N” in NEWEA stand for?
- What might be in wastewater other than water?
- What is grit?
- What is sludge and what can it be used for?
- What is something you do not want to flush down the toilet?
- Why is it important that water is clean before it is returned to the environment?