



Pre-field trip guide: Wastewater Treatment Plant Tour- Student Guide

- 1) Track your water usage for 1 day:
 - What activities required water?
 - Which activity(s) required the most water at the end of the day?
 - Estimate how many gallons of water you used:
 - What did you add to this water that made it 'dirty'?

- 2) Think about the water cycle. Is there a new water factory making new water for everyone to use?

- 3) You made 2 decisions every time you used water – they are important decisions - decisions that only you can make, no one else makes them for you. What are they?

- 4) All of the water you used was drinking water. Where did it come from?

- 5) Where will this water go when it leaves your house?

- 6) If this dirty water went directly to a lake or the Puget Sound, what impact would those items and contaminants have on the sewer system and the environment –specifically the health of humans and other species?

- 7) What is the difference between water that runs off a road, house or yard and into the storm drain (stormwater) vs. water that leaves a drain or toilet in your house (wastewater)?

- 8) Everything is recycled, nothing disappears. Imagine your bodies, drains and toilets are recycling bins and wastewater treatment plants are recycling centers. The water and organic solids that enter a treatment plant are separated, treated and safely recycled back into our environments as clean water or fertilizer. **What role do you play in keeping the treatment system working properly and protecting the soils and water of Washington State?** List three choices you can make to help the system run efficiently and



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keep the recycled fertilizer and water safe and clean (think about the water you use, what you throw away and the products you buy and use)

- 9) Predict what happens if too much water enters into 1) a pipeline and 2) a treatment plant:

- 10) As communities grow and more wastewater is generated, more water enters the treatment system. List four different ways to manage the problem of increased wastewater flows:

- 11) Think about all of the pipes and pump stations that help move dirty water away from your home or school. How old are they? How big are they? What are they made of? What happens when they get old?

- 12) Who pays for wastewater treatment? How?



Pre-field trip guide: Wastewater Treatment Plant Tour – Teacher Guide

13) Track your water usage for 1 day:

- What activities required water?
Brushing teeth, flushing toilets, taking showers, washing hands, washing dishes, washing clothes, watering plants/yards, washing pets/cars, cooking, drinking
- Which activity(s) required the most water at the end of the day?
Taking showers and flushing toilets, washing clothes/dishes
- Estimate how many gallons of water you used:
80-100 per person
- What did you add to this water that made it 'dirty'?
Dirt, germs, skin, hair (shower), trash (toilet paper), food, oils, grease (kitchen sink, garbage disposal, dishwasher), human waste, soaps/chemicals (all household cleaners, medicines taken, soaps, lotions, shampoos, cosmetics, etc), bacteria

14) Think about the water cycle. Is there a new water factory making new water for everyone to use?

No. The water we have today was the same water we had 1 year ago, 100 years ago, and the same water we will have 100 years from now. The water you drank today was already drank by someone else and will be drank by someone else in the future.

15) You made 2 decisions every time you used water – they are important decisions - decisions that only you can make, no one else makes them for you. What are they?

- *How much water to use*
- *What to put in the water (how dirty to make it, what to throw away, how much soap to use and what type of soap)*

16) All of the water you used was drinking water. Where did it come from?

Cedar River Watershed (for most King County residents) or groundwater



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- 17) Where will this water go when it leaves your house?
To a wastewater treatment plant, and eventually back to the environment
- 18) If this dirty water went directly to a lake or the Puget Sound, what impact would those items and contaminants have on the sewer system and the environment – specifically the health of humans and other species?
- *Chemicals: reproductive, sensory, response complications in aquatic organisms*
 - *Bacteria: disease, infection humans and aquatic organisms*
 - *Organic waste (food waste/human waste) affects the oxygen levels in the water, creates algae growth- too many nutrients can create 'dead zones'*
 - *Trash: contaminate Biosolids fertilizer that is recycled back into the soils of Washington State*
- 19) What is the difference between water that runs off a road, house or yard and into the storm drain (stormwater) vs. water that leaves a drain or toilet in your house (wastewater)?
- *Stormwater – goes directly into a water body (lake, river or Puget Sound) untreated – pollutants coming from streets, cars, lawns and gardens and pets*
 - *Wastewater – goes to a treatment plant for treatment before entering the Puget Sound – pollutants coming from inside homes, businesses from drains and toilets*
- 20) Everything is recycled, nothing disappears. Imagine your bodies, drains and toilets are recycling bins and wastewater treatment plants are recycling centers. The water and organic solids that enter a treatment plant are separated, treated and safely recycled back into our environments as clean water or fertilizer. **What role do you play in keeping the treatment system working properly and protecting the soils and water of Washington State?** List three choices you can make to help the system run efficiently and keep the recycled fertilizer and water safe and clean (think about the water you use, what you throw away and the products you buy and use)
- *Dispose of trash, grease and hair in the trash can – no broken pipes, overflows or clogged machinery – no contamination of Biosolids fertilizer*
 - *Conserve water – less water to be conveyed (piped), pumped, processed and sent to the Puget Sound*
 - *Use earth friendly, biodegradable simple household and personal products – fewer chemicals to be processed, fewer chemicals in recycled water, the Puget Sound and soils*



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- *Be healthy- take fewer medicines- fewer medicinal chemicals passing through your body to the treatment system and the Puget Sound*
- *Return extra or outdated medicines to your pharmacy, or throw in the trash can – fewer chemicals in the treatment system and the Puget Sound*

21) Predict what happens if too much water enters into 1) a pipeline and 2) a treatment plant:

- *1- pipeline overflows- this happens mostly in old parts of the system when too much storm water enters the pipelines- creates Combined Sewer Overflows (CSO's)*
- *2- Water is not treated to as high of a level, water bypasses the treatment plant and enters the Puget Sound – complete bypass is rare (twice in the last 50 years) during large storm events it is common for water to be treated to various level and the blended and disinfected prior to being sent to the Puget Sound*

22) As communities grow and more wastewater is generated, more water enters the treatment system. List four different ways to manage the problem of increased wastewater flows:

- *Build new facilities*
- *Expand existing facilities*
- *Increase the efficiency of existing facilities*
- *Water conservation measures- reduce the amount of water being sent the system – water efficiency and conservation at homes and businesses*

23) Think about all of the pipes and pump stations that help move dirty water away from your home or school. How old are they? How big are they? What are they made of? What happens when they get old?

- *1-100 years old*
- *4 in diameter to 14ft diameter*
- *Wood, brick, steel, concrete, plastic*
- *Break, crack, corrode –suck in extra water and dirt (think of vacuum suction) are not as efficient at moving only wastewater to treatment plants. Can break causing sink holes and sewer overflows.*

24) Who pays for wastewater treatment? How?

- *Residents pay for wastewater*
- *Water/sewer utility monthly bills- wastewater treatment is not tax based.*