



Activity Theme: Wastewater

Activity Type: Relay Race 

Grade 2-5

# Wastewater Adventure Race

**Activity Overview:** In this activity, students will re-enact the process of wastewater treatment by travelling through a competitive, relay obstacle course.

**Learning Objectives:**

- To describe the treatment stages that wastewater goes through before it reaches Lake Ontario
- To identify the importance of treating wastewater

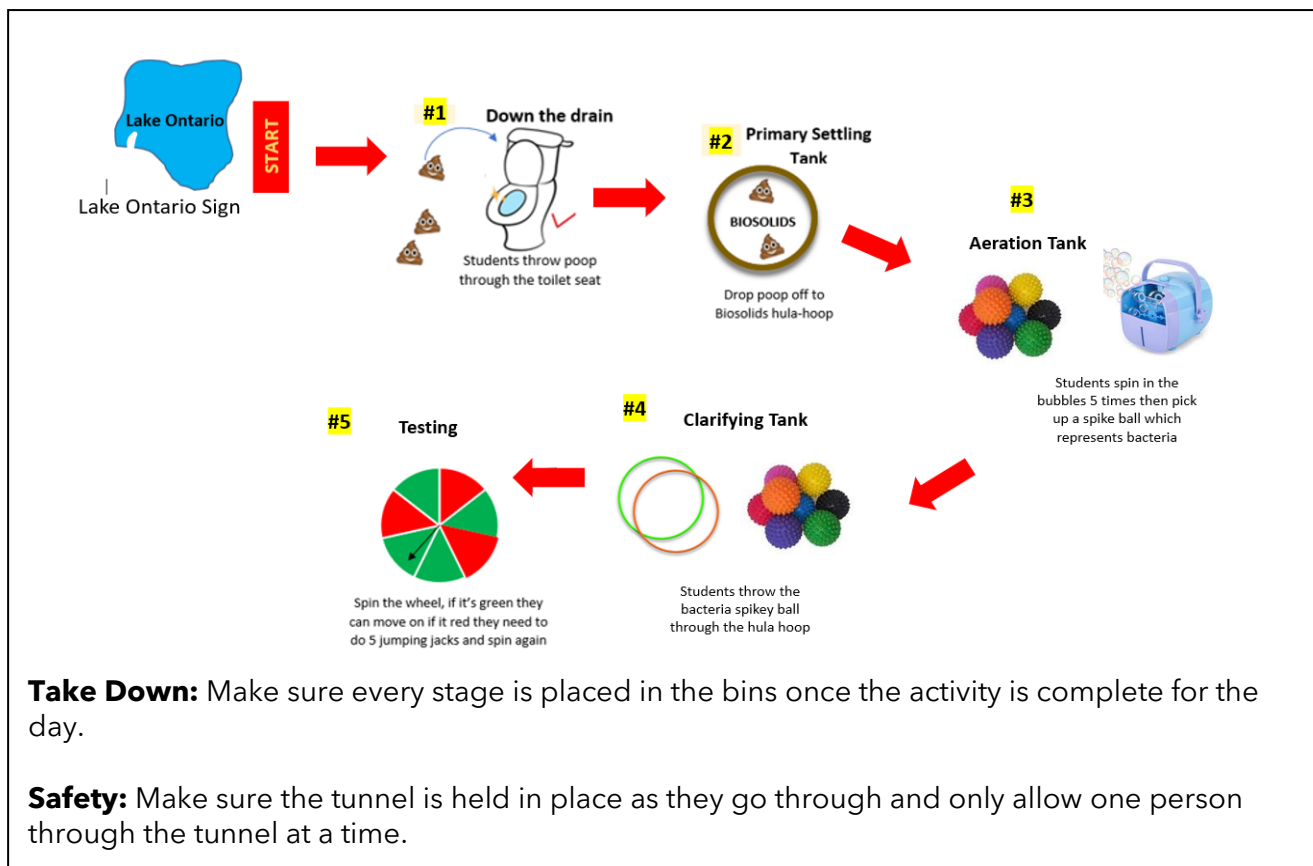
**Materials:**

- 25 poop emojis
- A children's basketball net designed to be model toilet
- Bucket labelled biosolids with a laminated piece of paper
- Bubble maker and bubble solution
- 25 spiked balls to represent bacteria
- Hula hoop labelled clarifying with a laminated piece of paper
- Wheel to spin for water testing

**Setup:**

Set up both obstacle courses beside each other following the picture shown below;

1. Have the toilet basketball net set up a metre from the starting line
2. Have the poop emojis ready at the starting line in a bucket
3. Have the hula-hoop labelled biosolids set up after the toilet
4. Have the bubble maker ready beside the biosolids hula-hoop
5. Have a bin with the bacteria balls ready beside the bubble maker
6. Set up spinning wheel for testing the water
7. Place another hula hoop beside the spinning wheel



### What will I be doing? (Procedure)

Before you start your presentation check with the teacher or chaperone that the entire group is present and ready to start.

Remember that **doing** an activity is more powerful than watching and listening to someone, so try to involve as many children as possible.

**Say:** "Welcome to the **Wastewater Adventure Race!** This obstacle course will help us understand what wastewater is and how it is cleaned."

**Ask:** "Do you know where your water goes after it goes down your drain?"

- Answer: "To a water resource recovery facility" *Students may be more familiar with the term wastewater treatment plant, but Peel's are called water resource recovery facilities.*

**Ask:** "What is wastewater?"

- Answer: "Wastewater comes from all the water that we use at home and school that goes down the drain. This includes water from showering, using the toilet, washing the dishes, doing laundry and many other activities"

**Ask:** "Why do we need to treat water before it goes to Lake Ontario?"

- Answer: "Once we use water, it is contaminated: meaning that it contains our germs, dirt, and bacteria. Water is a limited resource, so we need to reuse it and ensure that clean water is returned to the environment."

**Say:** "In this obstacle course we are going to be learning about wastewater and how it gets treated."

**\*\*Before allowing the students to do the obstacle course, one high school volunteer should explain each stage while the second volunteer demonstrates it for the students to understand\*\***

**\*\*Make sure that students understand each stage as they pass through it. You may need some extra time discussing and reviewing this for them\*\***

### **STAGE 1 - Down the Drain**

**Say:** "In the first stage, our wastewater is collected in the pipes leaving our home. Grab a poop emoji and throw it into the basketball net to re-enact waste going down the toilet."

### **STAGE 2 - Primary Settling Tank**

**Say:** "The second stage is a primary settling tank where heavy things sink to the bottom and lighter things float to the top. Once the materials have settled, this large screen scrapes the heavy material from the bottom and skims the lighter materials from the top so that it can be removed. What's left is the water in the middle, which moves onto the next step."

**Say:** "In the second stage, grab the poop emoji out from under the toilet basketball seat from the previous step and throw it into a bin labelled biosolids."

### **STAGE 3 - Aeration Tank**

**Say:** "In the third stage, oxygen is pumped into the aeration tank which allows good bacteria to live and grow and they eat any of the gross germs that didn't get removed in the last step. This turns the water from brown to clear."

**Say:** "The good bacteria need oxygen to survive and do their job in cleaning the water. Spin around in the bubbles 5 times and then pick up a colorful bacteria ball"

### **STAGE 4 - Clarifying Tank**

**Say:** "In the fourth stage, the bacteria from the last step sinks to the bottom of the clarifying tank because they are so full after eating all the gross material in the water. The bacteria are then removed from the water after they have done their job of making it clean"

**Say:** "Your job is to throw the ball which represents bacteria into the hula-hoop to show how the bacteria sinks down and is removed from the water"

### **STAGE 5 - Testing**

**Say:** "Before the water is put back into the lake, we need to test it to make sure it's clean"

**Say:** "In this last stage you will spin a wheel; if it lands on green then you are safe to go into Lake Ontario. If it lands on red, then you have to do 5 jumping jacks and spin again until you get green."

\*Check that the students understand what they will be doing and then start the activity:

Split the students into 2 groups. The teams will race on separate courses beside each other to try and get their whole team to Lake Ontario. The teams will make a line and go one at a time through the course. The next student can start once the student in front of them makes it to stage 2. The members that have already completed the course can help cheer on their teammates.\*

**Specifically remind students that:**

- In Peel, wastewater is clean and safe to return to Lake Ontario because it goes through a very important process to keep the environment pollution-free.

**Background Information for Volunteer**

**Stage 1 - Wastewater Down the Drain**

After you've used the water and sent it down the sink, toilet, or other drains, we do not send it directly back to Lake Ontario. The water needs to be cleaned before it can be put back into Lake Ontario so we don't harm the fish and plant life that live there. After the dirty water leaves your house, it flows through pipes until it reaches the water resource recovery facility. Before the water enters the facility it passes through a screen to prevent large items from entering the facility.

**Stage 2 - Primary Settling Tank**

Next the wastewater travels to the primary settling tanks. It gets this name because the water is given time to settle. Here, heavy things sink to the bottom, and lighter things float on the top. Once the materials have settled, this large screen scrapes the heavy material from the bottom and skims the lighter materials from the top so that it can be removed. What's left is the water in the middle, which moves onto the next step.

**Stage 3 - Aeration Tanks**

From the settling tank, the water travels to the aeration tanks. Here oxygen is pumped into the tank which allows good bacteria to live and grow. The bacteria eat any of the gross materials that didn't get removed in the last step. This is where the water turns from brown back to clear.

**Stage 4 - Clarifying Tanks**

The good bacteria start to sink towards the bottom of these clarifying tanks. Once the bacteria sink to the bottom they are removed, and some are added back into the aeration tanks. Now, the water is almost ready to be put back into Lake Ontario.

**Stage 5 - Testing**

Before the water is put back into Lake Ontario it is tested to make sure it's safe for the fish and plants.

**Stage 6 - Lake Ontario**

At the bottom of Lake Ontario there is a large pipe, similar to the pipe that is attached to the Water Treatment Plant, except this pipe has many small holes along it which allows the water to be slowly put back into the Lake.