

# 15<sup>th</sup> Annual Water Poster Contest

## Toilet Leak Detection Challenge

---

### OVERVIEW OF CHALLENGE

Student Worksheets and child-safe dye tablets are provided to each participating classroom. In the classroom, students will learn how a gravity-flush toilet works, and students will conduct the toilet leak check with an adult at home. The student then completes the Worksheet with an adult, has a parent/guardian sign, and submits the worksheet to the teacher. Teacher will submit completed student worksheets with poster contest entries. **Classrooms the top three number of participating students will receive a \$50 gift card.**

### GRADE LEVEL: K-5

**Key Concepts:** Leak detection, water efficiency, water conservation

**Goal:** Students will learn how much water leaks can waste in homes across the country; determine whether their toilet(s) leak; and calculate water savings achieved by fixing leaks.

### TEACHERS, HERE IS HOW TO PARTICIPATE:

#### 1. Teachers Review the Experiment in the Tank information with Students

After reviewing the Experiment in the Tank information with students, assign the Home Challenge as homework. **Ask students to leave the dye tablets stapled to the worksheet until ready to conduct the test with an adult.**

#### 2. Students Conduct Test at Home & Return Completed Worksheet

Students should conduct the test and complete the questions on the Student Worksheet. The student should return the worksheet to the teacher.

#### 3. Teachers Compile, Review Results with Students, Complete Toilet Leak Detection Challenge Cover Sheet and Return Completed Cover Sheet and Student Worksheets with Poster Entries.



*The 15<sup>th</sup> Annual Water Poster Contest is co-sponsored by Florida Governmental Utilities Authority and Pasco County Utilities to encourage interest in conserving our water resources.*

# 15<sup>th</sup> Annual Water Poster Contest

## Toilet Leak Detection Challenge

---

### BACKGROUND INFORMATION

#### *Why save water?*

- The toilet is the largest indoor use of water.
- Toilet leaks are the largest source of indoor leaks.
- Toilet leaks can waste up to 200 gallons a day.
- Taking simple steps, like finding and fixing leaks, can make a big difference.

### LESSON: EXPERIMENT IN THE TANK

**Goal(s):** To understand how a toilet works  
To learn how to check toilets for leaks

**Estimated Class Time:** 25 minutes

**Materials Needed:** Student worksheet, dye tablets, & instructions

#### **Curriculum Focus:**

- Science: Students will gain greater understanding of science and experience conducting an at-home experiment.

#### **Vocabulary:**

**Gravity:** An invisible force that pulls objects toward each other. Earth's gravity is what keeps you on the ground and what makes things fall. It's why you land on the ground when you jump up instead of floating off into space?

**Mass:** A gallon water bottle filled with sand is denser than a gallon water bottle filled with water. Mass commonly is measured by how much something weighs. But weight is caused by gravity, so your weight on the Moon is less than here on Earth, but the **mass** stays the same.

### **Toilet Basics:**

The basic gravity-flush toilet uses the same basic principles used since the flush toilet was invented by Sir John Harington in 1596. Let's take a look at what happens when the toilet is flushed.

The handle is connected to a chain inside the tank, so that when you pull it, it pulls up on the flapper valve cover at the bottom of the tank. The valve then releases the water from the tank into the bowl. The water flows into the bowl due to gravity, and as it falls it creates a siphon effect in the trap way near the base of the toilet. The circular motion and gravitational force move the waste through the S-shaped pipes below and into the sewer system or septic tank.

### **The Home Challenge:**

For this experiment, students will need one dye tablet per toilet. (Two tablets are included in each dye packet.) Parents should remove the lid from the toilet tank, as lids are often heavy and awkward to move. Then, students can drop a dye tablet into the tank. Then, wait 15 minutes before checking the bowl. If there is color in the bowl, the toilet has a leak.



**Note: Remind students to flush the toilet several times after 15 minutes have elapsed to avoid staining.** Have an adult help replace the tank lid, and record findings. Teachers can review the results of the classroom leak challenge with students as group discussion.

1. How many leaks were found?
2. Why is repairing leaks important?
3. Can you think of other places at home where leaks might happen?

**15<sup>th</sup> Annual Water Poster Contest**  
**Toilet Leak Detection Challenge**  
**Cover Sheet**

---

**School:** \_\_\_\_\_

**Teacher:** \_\_\_\_\_

**Grade:** \_\_\_\_\_

**Number of Students Participating in Poster Contest:** \_\_\_\_\_

**Number of Students Participating in Toilet Leak Detection Challenge:** \_\_\_\_\_

**Would you Like Similar Challenges**

**in Future Water Poster Contest Years:**  Yes  No

**Comments (optional)** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# 15<sup>th</sup> Annual Water Poster Contest

## Toilet Leak Detection Challenge

### Student Worksheet

---

Thank you for taking a few moments to participate with your student in a home toilet leak detection challenge that is being completed as part of our classroom learning about our water resources and ways we can protect them.

Completing this challenge will take about 20 minutes total, with only about 5 minutes of student/adult activity. During the challenge your student, with your help, will test up to two toilets in your home for leaks, record their findings and return this worksheet to the classroom. Participating classrooms with the most worksheets completed have the opportunity to receive gift cards to help offset classroom materials costs.

Here's how to participate:

Remove the attached packet from this worksheet. Open the packet. It contains two child-safe dye tablets. Remove the lid from the toilet tank. Have your student drop a dye tablet into the tank. Then, wait 15 minutes before checking the bowl. If there is color in the bowl, the toilet has a leak.



**After the leak detection test is complete, flush the toilet several times to avoid staining.** Complete the information below.

How many toilets were tested:    1            2

Were leaks detected?            Yes            No

***If a leak was detected, check the flapper in the tank as a 1<sup>st</sup> course of action. Information about replacing toilet flappers is available online at [toiletflapper.org](http://toiletflapper.org).***

Student Name: \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_