

# Bowwow Barker Training 007: Persistent Pollution

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## Biblical Integration

“Therefore, we do not lose heart. Though outwardly we are wasting away, yet inwardly we are being renewed day by day. For our light and momentary troubles are achieving for us an eternal glory that far outweighs them all.” 2 Corinthians 4:16-17

## Objective

Using the super sleuth skills of observation, measurement, and analysis, determine the effects of water pollution on vegetation.

## Vocabulary

- **Pollution:** the introduction of harmful materials into the environment. Some types of pollution can be seen while other types cannot.
- **Pollutant:** a substance that, when concentrated, causes land, air, and water to become impure or unhealthy.
- **Natural resource:** anything that is found in nature that can be used by living things to grow and thrive.
- **Chemical pollution:** when gasses, smoke, and chemicals come into the environment in large enough amounts to harm humans, animals, and plants.

## Materials

- 2 clear cups (can be glass or plastic)
- Red food coloring
- 2 celery stalks
- Measuring cup
- Knife (adult help required)
- Pencil
- Data sheet

## Lesson: Persistent Pollution

Take a look outside the window. Look for a plant or tree. Is it thriving? Or barely surviving?

Observe the location of the plant or tree. Does it receive sunlight and water? Does it have enough soil? The three main ingredients a plant needs to survive are sunlight, water, and nutrients in the soil. If a plant does not have one or more of these resources, it doesn't have a good chance of surviving.

God created all the **natural resources** plants and vegetation need to survive. However, sometimes plants don't receive these resources and therefore can't thrive in the way God intended.

Every decision and choice has a consequence, be it good or bad. Sometimes, mankind makes choices that have bad consequences. These consequences negatively affect plants and vegetation, often in the form of **pollution**.

There are six main types of pollution:

- ❖ Air
- ❖ Noise
- ❖ Land
- ❖ Water
- ❖ Thermal
- ❖ Radioactive

Today, we will focus on water pollution. Water pollution falls into six categories:

- ❖ Chemical pollution
- ❖ Ground water pollution
- ❖ Microbial pollution
- ❖ Nutrient pollution
- ❖ Oxygen-depletion pollution
- ❖ Surface water pollution

The most common type is **chemical pollution**. This occurs when chemicals enter both underground water and water sitting on the Earth's surface. Water pollution can be complex, but in its simplest form, it occurs when a **pollutant** gets into water that feeds vegetation and makes it difficult for the plant to survive.

As Christians, we face different kinds of "pollution" too. We encounter people, words, emotions, or physical injuries which hinder our faith and might keep us from loving God and serving Him.

We can have peace knowing that each day, God gives us all we need to renew our hearts and minds. He is Jehovah-Jireh (which means "Provider"). 2 Corinthians 4:16-17 is a reminder that God renews us day by day.

Today, you will reflect on the topic of renewal and use the materials list to see the effects of water pollution on stalks of celery.

## Procedure

- #1. Using the measuring cup, measure 1-2 cups of water into each of the clear cups. (The amount of water you use will depend on the size of the cups.)
- #2. Add 3 drops of food coloring to Cup A. Swirl or stir to disperse the coloring evenly.
- #3. With the help of an adult, cut about half an inch off the bottom of both celery stalks.
- #4. Place one stalk into each cup.
- #5. Answer questions 1-2 on the data sheet.
- #6. Wait a minimum of two hours. Check the stalks and answer questions 3-4.
- #7. Leave the cups of water with the stalks in place, undisturbed, until the following day. Observe the stalks again. Answer questions 5-7.
- #8. Place the stalk from Cup A (red water) into Cup B (clear water). Wait 24 more hours. Observe what the stalk that used to be in Cup A looks like now that it has spent a day in Cup B. Answer question 8.
- #9. Even though water pollution can negatively affect a plant, when it is placed in a good environment with the right kind of resources, the plant can still thrive. Though pollution can be persistent, it does not have to take over completely. Answer question 9.

## Data Sheet

- 1) **Observe** both celery stalks. Describe what each one looks like.

The celery in the clear water:

The celery in the red water:

- 2) **Hypothesis:** What do you think each stalk will look like after a few hours?

The celery in the clear water:

The celery in the red water:

- 3) After a few hours, observe both stalks. Has anything changed? If so, what?
- 4) What types of emotional or mental “pollution” might be keeping you from loving God and serving Him?
- 5) After waiting 24 hours, how does each stalk look?
- 6) **Analysis:** Was your hypothesis from Question #2 correct? Why or why not?
- 7) Which cup of water represents water pollution?

- 8) After removing the celery stalk from Cup A (red water), placing it in Cup B (clear water), and waiting 24 hours, observe the celery stalk originally from Cup A. What does it look like now?

Has its condition improved?

- 9) Read 2 Corinthians 4:16-17 together. God promises to renew us each day, even though we face circumstances that try to pull us away from Him. What can you do to let God renew your heart and mind each day?

## Conclusion

Now that you've seen firsthand the negative effects of water pollution on vegetation, brainstorm ways you can help conserve water and provide the three natural resources plants need to survive.

Can you help a plant thrive with a compost pile?

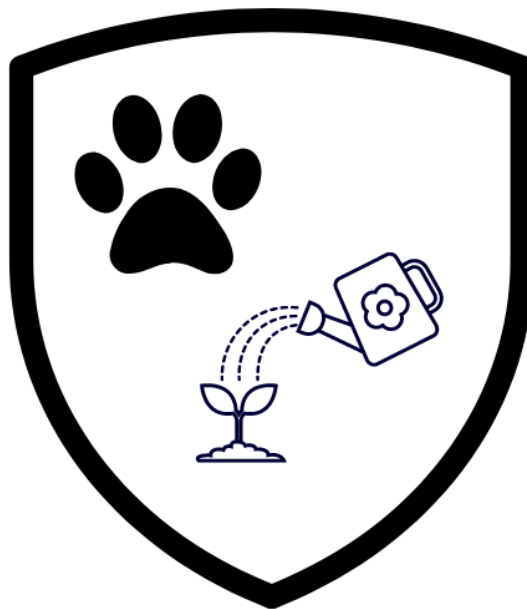
Are you able to conserve water in your daily routine?

While we cannot always influence major water pollution, we can still be good stewards with the resources and natural spaces in our immediate surroundings.

Likewise, as we face circumstances that try to pull us away from God, when we choose to seek and spend time with Him, we receive the "nutrients" we need to combat the "pollution" in our lives.

Today, spend time in God's word and work on memorizing a Bible verse with your family that can help you to grow closer to Him.

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