

Carnation Water Quality

ACTIVITY OVERVIEW

STEM Focus Area: Water Quality

Learning Goal: To understand how the quality of water can affect plants

Youth Learning Targets

- “I understand that dirty water can be bad for plants and other living things.”
- “I understand that whatever is in the water is what makes it healthy or unhealthy.”

LEARNING ENVIRONMENT

Activity Duration: 3 days

Class Size: Large – Minimum of 5

Type of Space: Indoor

Age of Youth: Grades K-2

Guiding Question: What is the question to explore OR the problem or challenge to solve?

Does the health or quality of water affect plants?

Through this activity, youth will:

- Explore how water quality can affect the health of a plant.
- Make observations and record data

Facilitator Prep

- Provide a designated space for flowers to sit undisturbed for up to 5 days.
- Laminate or have photos available of things that should be in out and things that shouldn't be in our water

Literacy Connection: Great books to get youth support learning about water quality (*available on Amazon*).

- *One Well: The Story of Water on Earth* by Rochelle Strauss (Author), Rosemary Woods (Illustrator)
- *The Water Princess* by Susan Verde (Author), Georgie Badiel (Author)

DoS: Authentic Stem Practices

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| <ul style="list-style-type: none">○ Predict and hypothesize✓ Develop and use models○ Measure materials✓ Observe○ Investigate✓ Record observations○ Analyze and infer | <ul style="list-style-type: none">○ Share and communicate data○ Interpret data○ Test and revise✓ Draw conclusions and relationships○ Have voice and agency, make decisions and guide their own learning |
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PREPARATION

Materials

- 3 white carnations
- 3 containers/vases
- 2 colors of food coloring
- Various images of items that may be found in water: healthy & unhealthy/appropriate and not appropriate
- Markers & labels

Room

An informal setup would be best suited for this activity, ensuring there's a space for the vases to be set aside and left alone for a few days. They'll need sunlight, so an area near windows would be best.

Content

- The quality of water will affect the health of plants and animals that rely on it.

Inquiry

- What are some things that are found in water that doesn't harm us, or are healthy for the water?
- What are some things that are in our water that shouldn't be there or can harm animals and plants?
- What is it that makes these things helpful or healthy for our water?
- What is it about these things that is harmful?
- What may happen to plants or animals if these harmful things increase?

DoS:

- ✓ Organization: I practiced the activity/technology, prepared materials/extras/place to record youth ideas, and completed an activity (including timings).
- ✓ Materials: Materials are appropriate for teaching the learning goals; youth will be able to use them and will think they are appealing.
- ✓ Space Utilization: The space is set up appropriately for the activity and there will be no safety issues or distractions.
- ✓ Relevance: I have researched why the content matters to youth's everyday lives.
- ✓ Content Learning: I have become familiar with the content.
- ✓ Inquiry: I have become familiar with how authentic, age-appropriate inquiry practices look in this activity.

INTRODUCTION TO ACTIVITY (10 MINUTES)

- Start with a conversation about things that we sometimes find in our water. Write them out as they're named and have the pictures prepared as well. If they're struggling to come up with things to add to the list, you can add your own. Have the youth sort the list into two categories: (1) things are healthy to have in lakes, rivers, streams, etc (2) things that are unhealthy to have in water.
 - Animals: fish turtles frogs people dogs gators
 - Lily pads, cattail, algae
 - Trash/Pollution: bags, sewage, dead animals, chemicals
- Discuss how every living thing relies on water, whether it lives in water or drinks water. If the water has unhealthy things it, what could happen to the living things that live in it? Ask if plants are living things. Carnations are a type of plant, and they also need water to survive.

- Explain the activity:
 - Over the next few days, we'll be giving these three different carnations water.
 - One carnation will get regular tap water that doesn't have anything in it. That carnation will be our "control" and will give us something to compare the other plants to.
 - The other carnations will be given water that has water colors in it. Those colors will represent healthy and unhealthy water. Allow them to select which color will represent healthy and which will represent unhealthy.
 - Add a few drops of food coloring to each of the other two vases and mix them.
 - Add the pictures from the healthy and unhealthy categories to the vases.
 - Label which plant will receive which kind of water. Label them "control" "healthy water" and "unhealthy water."
- Schedule a time to record observations every couple of hours over the next 3 days. You can have them draw and color or take photos to document changes they observe. As you see changes, continue to discuss how plants have to use the water that is near them, so if the water is unhealthy, the plant will be as well.

DoS:

- ✓ Space Utilization: I will use the space informally avoiding the lecture hall format.
- ✓ Purposeful Activities: This intro section gets youth on track for the learning goal.
- ✓ Content Learning: If age appropriate, I will accurately present content.
- ✓ Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- ✓ Relationships: I will make each youth feel welcome.
- ✓ Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- ✓ Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.

ACTIVITY ENGAGEMENT (10 MINUTES)

Have youth record observations of the color of the flower immediately after the water is given to the flower each time you meet, including the first time you give them water.

DoS:

- ✓ Space Utilization: I will use the space informally avoiding the lecture hall format.
- ✓ Participation: All youth will have access to the activity.
- ✓ Purposeful Activities: This core section helps youth to move toward the learning goal.
- ✓ Engagement: This activity has youth physically engaged with their hands and their minds.
- ✓ Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- ✓ Reflection: If appropriate, I will ask youth questions during the core activity that will help them make sense of what they are learning.
- ✓ Relationships: I will take steps to share my enthusiasm and create a nurturing, safe learning environment.
- ✓ Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- ✓ Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.

FINAL REFLECTION AND RELEVANCE (5 MINUTES)

- Why are the plants changing color? Remind me, what do the colors mean? What does this mean for the plants? What does this mean for us? What would happen if we drink unhealthy water? Where does it go?
 - Discuss ways the youth can help to keep the water clean:
 - o Pick up trash
 - o Use trash cans
 - o Make sure chemical don't get into water ways
 - o Recycle
 - Come up with a plan that the group can use to keep a nearby water resource clean.
 - Consider having a guest speaker come and discuss ways their city/town helps keep local water sources clean.
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DoS:

- ✓ Space Utilization: Again, I will use the space informally.
- ✓ Participation: I will prompt youth who do not have access to the activity to participate.
- ✓ Purposeful Activities: The closing section helps youth to reach the learning goal.
- ✓ Content Learning: I will help youth make connections between different ideas. I will create opportunities for youth to ask questions/provide ideas that show a deeper level of understanding.
- ✓ Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- ✓ Reflection. I will provide youth with a sustained opportunity to make sense of their learning.
- ✓ Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- ✓ Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.