THE WATERPALOOZA TOOLKIT

Hands-On Activities for Grades 1 - 5

Water Environment Federation®
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The Water Palooza Toolkit is a collection of simple hands-on activities that water professionals can take into schools and other appropriate venues to educate children about water. Activity descriptions are modeled off the Water Environment Federation's (WEF) highly successful Water Palooza, a popular event held in conjunction with WEF's annual conference and exhibition, so the activities are well-tested with grade school students. Each description includes all the information you'll need to plan and execute a fun water-related activity, whether for your child's class, an Earth Day festival, a utility open house and more.

For more information about Water Palooza, visit:
https://www.wef.org/membership/students-and-young-professionals2/waterpalooza/

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What Not to Flush

Summary:

This demonstration will show items that can and cannot be flushed.

Materials:

- Toilet paper
- Items that can't be flushed
    - Dental floss
    - Wipes
    - Toothpaste
    - Q-tips
    - Plastic bag
    - Oil
    - Detergent

Volunteer Duties

- Ask students what they think can and cannot be flushed.
- Explain to students why the toilet paper is the only thing that is dissolving and why everything else doesn't dissolve.

Activity:

- As students come to the booth, mix the items up so that they are separated from the previous groups sorting.
- Ask the students which items they think can and cannot be flushed and separate them on the table.

Follow-Up

- Teach kids that only the 3Ps do down the toilet: poo, pee, and TP!

The Value of Water

Summary:

This demonstration shows how the cost of 1 cent of bottled water versus how much you get for 1 cent of tap water.

Materials:

- 1 case of bottled water
- Index cards
- Writing utensils
- Photo of a penny

Volunteer Duties

- Have the bottles of water displayed on the table and distribute index cards and writing utensils to the students. Ask them to write their names, class, and how many bottles of water can be filled for 1 cent (help younger students fill out cards). Explain where bottled water comes from and how it is nearly the same as what comes out of the tap.

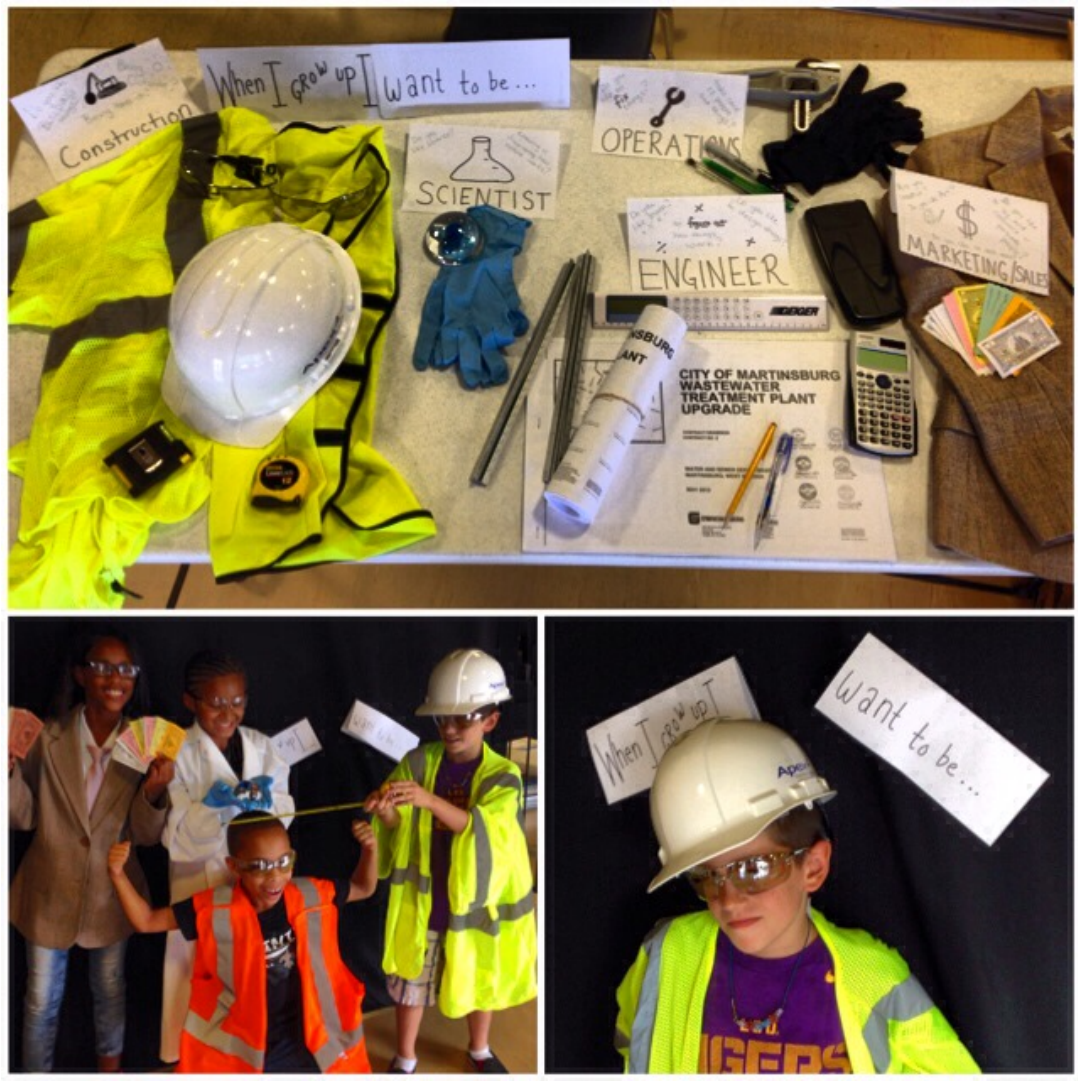
Activity:

- Students will get index cards to write their names and guesses how many bottles of water can be filled for 1 cent of tap water.
- Students who are the closest will be put in a drawing for a giveaway.

Follow-Up

- Ask students what ways they can bring water on the go with them or how to reuse water bottles.

Water Careers Photo Booth



Summary:

A fun, photo-booth-style activity to introduce and educate students to multiple careers in the water sector. Students receive an introduction to various job sectors followed by them picking their preferred career track after which they will get their photo taken in uniform.

Materials:

- Table/booth, Chair(s)
- Teacher/Chaperone Sign in Sheet
- Digital Camera with plenty of storage and charge
- "Frame" or Sign saying "When I grow up I want to be…" (or some variation)
- Back-drop (curtain, sheet etc)
- Career themed props (see attached table for suggestions, table may also be used for organizing who can bring various props)
- Career themed signs. Two for each selected career (see attached table for suggestions)

Volunteer Duties

- Host (1) – This person will greets student and give them an overview of the various job sectors. They can greet the next group while the previous group is getting their pictures taken.
- Photographer (1) – Takes pictures of the students in uniform.
- Recorder (1) – Take the name and photo number of the students as the pictures are taken.
- Assistants (1) – Help students get in and out of uniform in a timely manner.

"Before" Preparation:

- Explain idea to School or Organization prior to event and ask about photo policies to ensure there is no issue taking photos of participants. Clarify photos will only be shared with teacher/chaperone for their further use.
- Establish Careers to be included and collect associated career themed props (see attached table)
- Create two career themed signs for each selected career
    - Clearly and largely state the career as the main focus
    - Pictures and other related words/questions may also be shown on the sign
- Obtain a Backdrop for the photos
    - May use a sheet or curtain, be sure to check with venue prior to event – they may have available curtains near your booth that may be used
- Create a Frame or Sign to be placed on the backdrop that says "When I grow up I want to be.." (or some variation of the message)
    - For a frame, may use a large poster board, cutting out a large rectangle in the middle. Place text on the frame according to how you can mount the frame (if you can mount in front of the back drop so kids can stand between the frame and the backdrop, can write anywhere – if frame must be mounted on the backdrop – try to only write on the top of the frame as kids will be standing in front of it during the photo).
- Create a teacher sign in sheet include columns for:
    - Time at Booth
    - Teacher/ Chaperone Name
    - Teacher/ Chaperone Email Address (to send digital photos of students to)

Set up (Day of):

- Set up Backdrop, frame/sign, and chair as needed to set up photo area (take a few practice shots)
- Organize career props on table or booth, with one career sign displayed near/on top of props
- Tape the second career signs on a wall or on the floor to establish "waiting areas" for each career
- Make sure digital camera is charged and has plenty of storage. Bring charger.

- (Note a smart phone camera might serve as a good back up if camera runs out!)

Activity:

- When group arrives, explain the idea of the photo booth and ask teacher to sign in
- Give a general overview on the selected careers in the water sector.
- Ask students to decide which career seems most interesting to them and ask them to line up in straight lines behind the established waiting area signs for each career
  - If they seem uninterested, try asking their favorite activities or questions in attached table to encourage a career.
  - If there are a lot of kids, you may choose to ask the students to sit in the lines once they have lined up to help maintain order.
- In a rotating order, help the kids dress up in the available props for each profession
- To help with organization, take photo of the teachers name prior to starting taking pictures of kids
- Once dressed, take their picture
  - If multiple volunteers are available dedicate one to taking photos, one to dressing kids

Follow up:

- Email teachers photos of the students for use in the classroom and hopefully follow up conversations!
  - Drop box, the cloud, zip files or other mass storage applications might be useful to send photos

Career Suggestions Table:

Career:	Question:	Prop Ideas:	Who can bring:
Engineer	Do you like math? Do you like to design things? Do you like to figure out how things work? Do you take things apart and put them back together?	Roll of drawings Calculator Mechanical pencil Graph paper Engineer's scale	
Construction	Do you like building things? Being hands on? Do you like being outside? Do you like to get your hands dirty? Do you like to lift heavy things?	Hard hat Safety vest Safety glasses	

Scientist	Do you like science? Knowing how things work? Do you like how things work naturally?	Lab coat Beaker Microscope Gloves
Sales/Business	Do you like to trade baseball/Pokémon cards? Do you like to negotiate chores with your siblings/parents? Talk to people? Do you like to be on stage/talk in front of people?	Computer bag Sales brochures Blazer/Suit Jacket Bow tie/neck tie Monopoly money
Regulator	Do you like to tell people what to do? Do you like to be involved in developing the rules?	Clipboard? Gavel (Maybe even just a printed picture of one on the back of the clipboard)
Operations	Do you like to take care of people – provide basic needs to them? Do you like hands-on work? Do you like to be outside? Do you like to get your hands dirty? Do you like to lift heavy things?	Coveralls Toy tool (like a play wrench or hammer) Gloves
Communications/ Marketing	Are you creative? Do you like art? Do you like to draw? Have you ever convinced your friends to do something they didn't want to do?	Computer Other posters/marketing materials Colorful markers

What Does Water Mean to You?

Summary:

An interactive poster that allows students to display what water means to them.

Materials:

- Crayons
- Poster paper

Volunteer Duties

- Host – Person to introduce the subject of water and help students to draw or write what water means to them. Give an example of what water means to you before the students start. Instruct group leads to help students as well. Make sure that students are writing appropriate material as posters will be displayed in the school and at WEFTEC.

Activity:

- Students will be introduced to the subject of water through things they come in contact with often such as drinking water, showers, toilets, lakes, rivers, etc. Host can give an example of what water means to them to inspire students.
- Distribute writing utensils to students so they can write or draw what water means to them.
- Help students write or draw their ideas on the printed paper.

Follow-Up

- Distribute finished product to teachers for hanging up in the classroom.

How to Test Our Water Quality!

Summary:

Students learn about basic water quality parameters and the importance of water quality by testing a water sample from a local water body.

Materials:

- Local water sample
- Water Test Kit from the EarthEcho Water Challenge (www.worldwatermonitoringday.org)
- Paper & pen (recording test results)

Volunteer Duties

- The volunteer will introduce the different characteristics of water and how water quality can be measured and compared. Explain the four parameters (temperature, pH, turbidity, and dissolved oxygen) as they relate to the overall health of a waterbody for aquatic species.
    - Temperature – how warm or cold is the water
    - pH – acidity/basicity of water
    - Turbidity – "cloudiness" of water often from suspended solids
    - Dissolved oxygen – how much oxygen gas is in the water

Activity:

- Students are given a water sample and asked to work in groups to measure the pH, temperature, turbidity, and dissolved oxygen.
- Ask each student why they think each parameter is important to monitor.
- Encourage answers from multiple students for comparison.
- Record the test results on a piece of paper.

Follow-Up

- Discuss how human activity can impact the water quality parameters. Opportunity to donate test kits to the school to participate in the EarthEcho Water Quality Challenge. Water quality data collected from students will be added to the EarthEco Water Challenge database contributing to an international effort to increase public awareness of the quality of water in our waterbodies.

Identifying Invasive Plant Species

Summary:

This activity introduces students to the difference between native and invasive plant species and their impact on the local ecosystem.

Materials:

- 8-12 native and invasive plant species to your area OR pictures of plant species
- 4-6 native and invasive aqueous plant species OR pictures or plant species
- 2 tables

Volunteer Duties

- Identify common native and invasive plant species to your area. These can be found at www.audubon.org/native-plants and www.nwf.org/NativePlantFinder/Plants. Aqueous species can be found on your local DNR/DEQ website.
- Set out the plant species in random order on the tables.
- Explain the difference between native and invasive species and how this can change in different ecosystems.

Activity:

- Students arrange the plant species into a native group and an invasive group.
- Volunteer goes through each plant species, identifying the plant and whether it is native or invasive.
- Question and answer with students regarding why invasive species are bad for the local ecosystem.
- Additional visual aids of invasive species overgrowth and impacts to the ecosystem may also be incorporated.

Follow-Up

- Teachers bring their students on a walking field trip to identify native and invasive plant species on the school grounds or in the neighborhood.
- Remove invasive plant species that are identified.

Stormwater Filtration

Summary:

Our demonstration will be running water through sponges in a fish tank to show students how engineers employ infiltration for cleaning stormwater and protecting waterways.

Materials:

- 1 small fish tank
- 3 – 4 small sponges
- Locally sourced dirt and floatable bark or debris
- 2 two-liter soda bottles

Volunteer Duties

- Have both two-liter bottles, filled with tap water, on display with one also containing the mixed in "locally" sourced dirt and debris.
- Show students and then ask where stormwater comes from. Next, ask if stormwater starts out clean or like the "dirty", mixed two-liter bottle. Explain where stormwater comes from and how it becomes dirty after hitting the ground.
- Make sure to make the connection between stormwater, filtration and its impact on local waterways when it enters a drain.
- Have the small fish tank sitting out with enough sponges laying across the top to cover for activity.

Activity:

- One student will take the "dirty", mixed two-liter bottle and with volunteer help will pour some of the contents over the sponges.
- Students should then tell volunteers what they are observing (i.e. the sponges separating the water from the materials mixed in)

Follow-Up

- Ask students what ways they can help make stormwater cleaner and discuss keeping trash off the ground or picking up pet waste.
- For older groups, consider discussing sediment loading too.

Water Trivia

Summary:

A trivia game show where students are asked questions about water and the environment. Wrong answers provide an opportunity for discussion about the correct answers.

Materials:

- Quiz questions and answers
- Prizes/candy

Volunteer Duties

- Game Host (1) – Ask students quiz questions and distribute prizes to students who answer questions. Try to incorporate all students to answer questions.

Activity:

- Greet students and ask them how much they think they know about water.
- Inform students you will be asking them a series of questions. If they think they know the answer, they should raise their hand. Call on different students each time.
- Distribute prize/candy to those who answer a question.
- At the end of the quiz show, distribute prize/candy to those who did not receive anything yet.

Water Trivia Questions

1. True or false? Sound travels faster through water than air?	True
2. Water is made up of what two elements?	Hydrogen and Oxygen
3. What is another name for a tidal wave?	Tsunami
4. True or false? The Indian Ocean is the biggest ocean on Earth.	False – Pacific Ocean
5. The solid state of water is known as what?	Ice
6. Can the average human survive without water for a few days or a few weeks?	A few days
7. True or false? Pure water is tasteless.	True
8. Nimbus, cirrus, cumulus and stratus are types of what?	Clouds
9. True or false? Water is an example of a chemical element.	False
10. Does water cover more or less than 50% of the Earth's surface?	More – About 70%
11. True or false? Water boils at 100 degrees Celsius (212 degrees Fahrenheit).	True
12. When water is cooled, does it contract or expand?	Expand
13. Water freezes at what temperature?	0 °C (32 °F)
14. True or false? Water is easy to compress.	False
15. What is the chemical formula of water?	H_20
16. The deepest point in all of the world's oceans is named what?	Mariana Trench
17. True or false? The consumption of bottled water has risen significantly over the last few decades.	True
18. Pure water has a pH level of around what number?	7
19. What is the longest river on Earth?	The Nile River
20. True or false? Ice sinks in water.	False – It floats
21. What uses the most water in households?	Flushing the toilet.
22. How many times per day does the average family turn on a faucet?	70
23. About how much does one gallon of water weigh?	8 lbs.
24. About how much of the human body is water?	65% or 2/3
25. What is it called when water rises higher than the banks of a river or levee?	Flood
26. What is the name of the canal that connects the Pacific and Atlantic Oceans?	Panama
27. What is an artificial lake whose purpose is to collect and store water?	Reservoir

28. The gradual wearing away of soil by water, ice, and wind is called _____?	Erosion
29. What does the acronym EPA stand for?	Environmental Protection Agency
30. What has the greatest effect on tides?	Moon
31. What does water lubricate in our bodies to make us able to move more easily?	Joints
32. About how much water does our body need daily?	8 glasses or 2 liters
33. How do our bodies lose water each day?	Sweating, breathing, crying, and going to the bathroom
34. What is the term used to describe a person's body that has lost too much water?	Dehydrated
35. What chemical is added to water to kill harmful germs?	Chlorine
36. What does water help regulate in our bodies to keep at 98.6?	Temperature
37. What are 2 things that plants need in order to grow?	Water and sunlight
38. What is very good at removing dirt from river water as water sinks down through it?	Sand and gravel – nature's filters
39. How many gallons of water does the average American use daily?	100-150
40. What room of the house uses the most water each day?	Bathroom
41. What is a large hole that has been drilled into the ground so that groundwater can be pumped out of it called?	Well
42. About how many trees are needed to make one ton of paper?	17
43. How many gallons of water does the average American use for a 5 minute shower?	30
44. What is the name for an area of land that water flows across or under on its way to a larger body of water?	Watershed
45. What is the general name for a community's utility that purifies river and/or ground water to make it safe for drinking?	Water treatment plant
46. What is the process of plants giving off water vapor into the air as they grow called?	Transpiration
47. About how many gallons of water will run down the drain if you leave a faucet on for 1 minute?	5
48. What makes water sometimes look cloudy when it first comes out of a faucet?	Air bubbles
49. What is something water does for our bodies and is a reason it is so important for our good health?	Regulates body temperature; removes body waste; protects body organs; carries nutrients to body cells
50. Of all the water on Earth, what percentage is available to use for drinking water?	1%
51. What is a word often used to describe a hazardous material that is poisonous to our bodies?	Toxic

52. When rain soaks into the garbage at landfills, it picks up many harmful substances and is then called _____. Landfills are designed to protect groundwater from this substance.	Leachate
53. What is a piece of a glacier that has broken off into a body of water called?	Iceberg
54. What is the gas form of water called?	Vapor
55. Where is the rainiest spot on Earth?	Hawaii
56. Things that go down most storm sewers (or storm drains) end up in _____?	Rivers
57. What are the names of the 5 Great Lakes?	Huron, Michigan, Ontario, Superior, Erie
58. Has total water usage since 1940 doubled, tripled or quadrupled?	Quadrupled
59. What is the Spanish word for water	Agua
60. What is another name for the cottonmouth snake?	Water moccasin
61. Name the 5 oceans?	Atlantic, Pacific, Indian, Arctic, Antarctic
62. What is the name for the zone of water saturation below ground?	Water table
63. What are fabled women who live in the ocean known as?	Mermaids
64. What is the name of a game similar to soccer that is played in the water?	Water polo
65. What is material that will not let water soak into called?	Waterproof
66. What is the name for a docking area where a large number of boats can be kept?	Marina
67. Who is the mythological god of the sea?	Neptune or Poseidon
68. The world's largest freshwater lake was destroyed by over-irrigation by the former Soviet Union. What is the name of that lake?	Aral Sea
69. Name a plant that grows in water?	Cattail, water lily, arrowhead, etc.
70. How much snow is equal to one inch of water?	10 inches
71. What is the name of a whitish crunchy vegetable often used in Chinese cooking?	Water chestnut
72. What country has the longest coastline of any nation?	Canada
73. Name one purpose for building a dame on a river to create a reservoir?	Irrigation, flood control, recreation, drinking water source, hydropower
74. What percent of the Earth's fresh water is stored as groundwater?	50%
75. About how many gallons of water does the average person use to brush his/her teeth?	2 gallons
76. What percent of our skin is water?	70%
77. What percent of our blood is water?	82%

78. What percent of a watermelon is water?	92%
79. About how many gallons of water evaporate off of an acre of corn in one day?	4,000 gallons
80. Drinks containing this cause you to lose extra water from your body.	Caffeine
81. How many people in the world do not have access to clean water?	Over 1 billion