



February Theme: Water for Life

Due Date: February 29, 2024

Challenge #18: Seed & Water Experiment

Your challenge is to create your own experiment with seeds and water as your variables. This experimentation will help you be better plant parents by understanding which inputs best suit your plants' needs.

Challenge #19: Local Water Quality Assessment

Water is the key ingredient to the success of life on our planet. Without access to healthy water our forests, wildlife and human activity would diminish drastically. Your challenge is to observe, record and evaluate local water sources. Plan to analyze three different water sources: one treated and two untreated.

Challenge #20: Rainwater Harvesting

Your challenge is to build a rainwater harvesting system, such as rain barrels and rain gardens. Each rainwater harvesting system should include a list of supplies and procedures and a short description of why this system is effective.

Challenge #21: Deadly Water Bottles Public Service Announcement

The presence of clean water in the Cincinnati region is an invaluable resource for agriculture and transportation. Your challenge is to tackle an environmental tragedy: the single use water bottle. You will create a public service announcement (PSA) in the form of a poster or flier that can be shared with the public.

“Water is life’s matter and matrix, mother and medium. There is no life without water.”

~ Albert Szent-Gyorgyi



This page intentionally left blank.



Challenge #18:

Seed & Water Experiment

February

Description

Your challenge is to create your own experiment with seeds and water as your variables. One idea might be to see whether carrot seeds from 2018 or 2023 germinate better. Another idea could be to use the same broccoli seed but using water from a rain barrel vs. from the water fountain. This experimentation will help you be better plant parents by understanding which inputs best suit your plants' needs.



Resources

For inspiration and ideas, see <https://civicgardencenter.org/green-teens-challenge>. For further support, email us at greenteens@civicgardencenter.org.

Steps to Success

- Step 1:** Read the description (above) and rubric (next page) for Challenge #18.
- Step 2:** Create an experimental design. Remember, you should only change 1 variable (either seeds or water), while keeping everything else the same.
- Step 3:** Clearly define the experimental variable and the control variable. Determine what you are measuring and record your hypothesis.
- Step 4:** Create your materials list.
- Step 5:** Set up your experiment.
- Step 6:** Collect data as your experiment continues. Collect data points as often as you can. Organize your data into a graph, chart, or table.
- Step 7:** Write your reflection.
- Step 8:** Make sure your name and email are written clearly and that you have submitted all pieces of your submission.
- Step 9:** Review the rubric to make sure you have met all the “Full Points” column.
- Step 10:** Submit and celebrate!

Don't forget the rubric on the next page!

Challenge #18: Seed & Water Experiment Rubric

	Full Points	Half Points	No Points
Plan	Submission includes a clear and legible experimental design and materials list; experimental and control variables are defined; experiment is centered around seeds and water	Submission is missing one component from the Full Points column	Submission is missing one component from the Full Points column
Data	At least ten data points were collected and are represented in a chart, table or graph with a caption explaining result trends; submission includes at least two pictures of experiment set-up and/or results	At least five data points were collected and are represented in a chart with a caption explaining trend results and/or submission includes only one photo	Submission is missing one component from the Full Points column
Reflection	Submission includes a three- to five-sentence reflection that accurately summarizes results, and the implications of possible sources of error	Submission is missing one component from the Full Points column	Submission is missing a reflection
Student Information	Student names and email addresses are clearly written		Student names and email addresses are missing
Due Date	Challenge was submitted by the due date of February 29		Challenge was not submitted by due date

Did you...

- Complete the Steps to Success checklist on the previous page?
- Make note of the submission due date?
- Email us for support (greenteens@civicgardencenter.org)?

Standards Alignment

- **Meets these ELA standards:** RST.11-12.8, WHST.9-12.9, W.9-10.7, W.11-12.7, W.9-10.8, W.11-12.8, RH.11-12.9, WHST.9-10.2, WHST.11-12.2, WHST.9-10.9, WHST.11-12.9
- **Meets these Math standards:** MP.2, MP.4, HSN-Q.A.2, F.IF.4
- **Meets these Science standards:** HS-LS4-5

Challenge #19:

Local Water Quality Assessment

February

Description

Water is the key ingredient to the success of life on our planet. Without access to healthy water our forests, wildlife and human activity would diminish drastically. Your challenge is to observe, record and evaluate local water sources. Plan to analyze three different water sources: one treated and two untreated.



Resources

For a sample worksheet, see <https://civiggardencenter.org/green-teens-challenge>. To check out a Water Quality Test Kit or for further support, email us at greenteens@civiggardencenter.org.

Steps to Success

- Step 1:** Read the description (above) and rubric (next page) for Challenge #19.
- Step 2:** Visit <https://civiggardencenter.org/green-teens-challenge> for a sample worksheet.
- Step 3:** Determine where you will get the samples from. Water should be from treated and untreated sources.
- Step 4:** Obtain materials necessary to perform water quality tests. Kits are available to borrow; please email the Green Teens team at greenteens@civiggardencenter.org for information.
- Step 5:** Set water testing date.
- Step 6:** Test water and collect data.
- Step 7:** Write a description about the data that explains any trends or significant findings in your water assessment.
- Step 8:** Make sure your name and email are written clearly and that you have submitted all pieces of your submission.
- Step 9:** Review the rubric to make sure you have met all the “Full Points” column.
- Step 10:** Submit and celebrate!

Don't forget the rubric on the next page!

Challenge #19: Local Water Quality Assessment Rubric

	Full Points	Half Points	No Points
Sampling	Three samples were taken: one from a treated source and two from untreated sources	Three samples were taken, but two are treated and one is untreated	Fewer than three samples were taken
Data Collection	Ten data points were collected for each water sample (see sample worksheet for details) using proper units	Eight data points were collected for each water sample using proper units	Fewer than eight data points were collected for each water sample
Data Analysis	Data is accurately represented in a graph, table or chart and accompanied by a three sentence description explaining significant findings and conclusions	Data is accurately represented in a graph, table or chart but description is lacking clear conclusions	Data is not accurately represented in a graph, table or chart and/or description is missing
Student Information	Student names and email addresses are clearly written		Student names and email addresses are missing
Due Date	Challenge was submitted by the due date of February 29		Challenge was not submitted by due date

Did you...

- Complete the Steps to Success checklist on the previous page?
- Make note of the submission due date?
- Email us for support (greenteens@civicgardencenter.org)?

Standards Alignment

- **Meets these ELA standards:** RH.9-10.3, RH.9-10.7, WHST.9-10.9, WHST.11-12.9
- **Meets these Math standards:** HSN-Q.A.3, N.Q.2
- **Meets these Science standards:** HS-ESS2-5

Challenge #20: Rainwater Harvesting

February

Description

Your challenge is to build a rainwater harvesting system, such as rain barrels and rain gardens. You should take time to research rainwater catchment systems and develop one that is safe and effective. Each rainwater harvesting system should include a list of supplies and procedures and a short description of why this system is effective (see the rubric on the next page for details).



Resources

For a resource to help plan your project, see <https://civicgardencenter.org/green-teens-challenge>. For further support, email us at greenteens@civicgardencenter.org.

Steps to Success

- Step 1:** Read the description (above) and rubric (next page) for Challenge #20.
- Step 2:** Check out the resource for this challenge at <https://civicgardencenter.org/green-teens-challenge> for inspiration and help planning your project.
- Step 3:** Locate where you are going to place the water catchment system. Provide evidence as to why this is a good location.
- Step 4:** Sketch or draft a build plan for your system. Gather your materials.
- Step 5:** Build and test the system to ensure it works as intended. Calculate how much water your system is capable of holding.
- Step 6:** Create a plan for winterization.
- Step 7:** Submit pictures of the whole system and its location.
- Step 8:** Make sure your name and email are written clearly and that you have submitted all pieces of your submission.
- Step 9:** Review the rubric to make sure you have met all the "Full Points" column.
- Step 10:** Submit and celebrate!

Don't forget the rubric on the next page!

Challenge #20: Rainwater Harvesting Rubric

	Full Points	Half Points	No Points
System Specifications	System is built to harvest rainwater and utilizes sustainable materials	System is built to harvest rainwater but doesn't use sustainable materials	System doesn't harvest rainwater or use sustainable materials
System Components	System includes elements to collect, store and use rainwater	System includes elements to collect and use rainwater	System is missing vital elements and/or doesn't collect rainwater
System Effectiveness	System is built to withstand heavy rain events and includes a plan for winterization; submission includes a calculation of how much rainwater the system can hold	System is able to withstand heavy rain events but doesn't include a plan for winterization or a calculation of how much rainwater the system can hold	System is unable to withstand heavy rain events and doesn't include a winterization plan or a calculation of how much rainwater the system can hold
Student Information	Student names and email addresses are clearly written		Student names and email addresses are missing
Due Date	Challenge was submitted by the due date of February 29		Challenge was not submitted by due date

Did you...

- Complete the Steps to Success checklist on the previous page?
- Make note of the submission due date?
- Email us for support (greenteens@civicgardencenter.org)?

Standards Alignment

- **Meets these ELA standards:** RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.1, WHST.9-10.9, WHST.11-12.9
- **Meets these Math standards:** MP.2, MP.4, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3, G.GMD.3, G.MG.1
- **Meets these Science standards:** HS-ETSI-2, HS-ETS1-3, HS-ESS3-4

Challenge #21: Deadly Water Bottles

Public Service Announcement

February

Description

The presence of clean water in the Cincinnati region is an invaluable resource for agriculture and transportation. Your challenge is to tackle an environmental tragedy: the single use water bottle. You should create a public service announcement (PSA) in the form of a poster or flier that can be shared with the public. Each PSA should be engaging and appropriate for an audience of all ages while providing basic information about the dangers associated with single use water bottles.



Resources

For more information on the catastrophe of bottled water and alternatives to plastic bottles, see <https://civicgardencenter.org/green-teens-challenge>. For further support, email us at greenteens@civicgardencenter.org.

Steps to Success

- Step 1:** Read the description (above) and rubric (next page) for Challenge #21.
- Step 2:** Begin research on water bottles by checking out the links above.
- Step 3:** Conduct additional research.
- Step 4:** Create an outline with all your information and references.
- Step 5:** Design a poster that includes the information from your outline.
- Step 6:** Find a public space (somewhere other than your school hallway) where you would like to display your poster or distribute your flier.
- Step 7:** Receive necessary permission to display your poster. Take photos of your poster displayed in a public venue. Write a caption detailing where your poster is located.
- Step 8:** Make sure your name and email are written clearly and that you have submitted all pieces of your submission. Include your outline from step 3, photos of your poster, and your photos from step 6.
- Step 9:** Review the rubric to make sure you have met all the “Full Points” column.
- Step 10:** Submit and celebrate!

Don't forget the rubric on the next page!

Challenge #21: Deadly Water Bottles Public Service Announcement Rubric

	Full Points	Half Points	No Points
PSA Parameters	PSA focuses on the topic of single-use water bottles	PSA mentions single-use water bottles but doesn't focus on the topic	PSA doesn't focus on single-use water bottles
PSA Elements	PSA outlines at least five drawbacks of single-use water bottles and lists at least three potential alternatives	PSA outlines at least three drawbacks of single-use water bottles and lists at least two potential alternatives	PSA is lacking basic information and/or has fewer than two alternatives listed
PSA Distribution	PSA is clearly displayed and/or distributed in public spaces and documented with a photo or video submission	PSA is displayed and/or distributed with limited public access and documented with a photo or video submission	PSA is not displayed and/or distributed OR is not documented with a photo or video submission
Student Information	Student names and email addresses are clearly written		Student names and email addresses are missing
Due Date	Challenge was submitted by the due date of February 29		Challenge was not submitted by due date

Did you...

- Complete the Steps to Success checklist on the previous page?
- Make note of the submission due date?
- Email us for support (greenteens@civicgardencenter.org)?

Standards Alignment

- **Meets these ELA standards:** W.9-10.2, W.11-12.2, W.9-10.6, W.11-12.6, W.9-10.8, W.11-12.8, SL.9-10.5, SL.11-12.5, L.9-10.3, L.11-12.3, WHST.9-10.5, WHST.11-12.5, WHST.9-10.6, WHST.11-12.6, WHST.9-10.9, WHST.11-12.9