

Title of activity: It's Not Easy Being Green! Evaluating the water needs for your schoolyard.

Concept covered in activity: This lesson plan will cover the concept of how much water we need, and how much we get. By conducting research, and through the completion of this activity, students should have a better understanding of how much water we receive and whether or not it's enough to keep our school-yard grass nice and green.

Grade level or other prerequisites for activity: Grades 6-8, and familiarity with the CoCoRaHS rain gauge and measurements.

Standards:

- **Next Generation Science Standards (Committee on Conceptual Framework):**
 - The Roles of Water in Earth's Surface Processes (ESS2.C)
 - Weather and Climate: What regulates weather and climate? (ESS2.D)
 - Global Climate Change: How do people model and predict the effects of human activities on Earth's climate? (ESS3.D)
- **State (from Colorado Academic Standards – Colorado Department of Education):**
 - Science Standard 8.3.1 (Weather can be predicted and described)
 - Science Standard 6.3.2 (Water on Earth is distributed and circulated)
 - Science Standard 6.3.3 (Earth's natural resources provide foundation for human society's needs)

Learning objectives: Students will be able to (SWBAT)

- Observe differences in dry and wet weather conditions, and infer what the consequences are for wet and dry weather conditions in certain areas.
- Compare and contrast characteristics of wet and dry weather conditions.
- Infer what will happen if the lawns and parks around them don't get enough water.
- Solve solutions to situations when lawns do not get enough water, and discuss the consequences that could be associated with their particular solutions.
- Participate in month long data entry and analyze data collected from the rain gauge.

Materials

- Computer (for data entry to CoCoRaHS)
- Overhead projector (for projecting notes during class discussion on research questions)
- CoCoRaHS Rain Gauge
- Graph paper
- Class data table for rain measurements over the duration of one month (optional)

Instructional planning:

This lesson plan will require students to use graph paper in order to make their graphs. This lesson also requires data collection over the duration of one month, so start this lesson accordingly. Because this lesson involves lawns, it is best done in the spring or early fall.

Procedure/activity:

	Student Activity	Teacher Activity
Engage	<ul style="list-style-type: none">• Students will watch slideshow and record on a piece of paper what their reactions are when they see each picture.• This can be treated as question of the day or warm-up activity.• Questions that students could potentially answer include reactions/experiences they've had with dormant and live grass, and what conditions exist for live and dormant grass.• Before moving on to the next section, students will write down how much water they think grass require in order to stay nice and green.	<ul style="list-style-type: none">• Prepare slideshow of images that depict the difference between green and dormant grass.• Slide show could also have images of before and after pictures of areas that were dormant and then live, or live and then dormant.• See slideshow for reference, or feel free to use the slide show included in this lesson plan.• Manage class and instruct them to write down their reactions to share with the rest of the class later.
Explore	<ul style="list-style-type: none">• Students will be given research questions to discuss and consider (see below).• Students will collaborate with other members in their groups and discuss possible solutions to the scenarios that they are given.	<ul style="list-style-type: none">• Divide students into groups of 2-4 students.• Discuss the research questions as a class, getting input on other ideas the students may have to extend the research.• This may be a good time to invite the person who does the school ground care to speak to the class about what they do to keep the lawn in good shape.

Explain	<ul style="list-style-type: none"> • Students will present their research question to the class and share the answers that they came up with as a group. • Listen to other group's presentations and contribute further ideas. 	<ul style="list-style-type: none"> • Redirect students and ask for groups to volunteer to share their research question and answers with the class. • Lead group discussion and ask students outside the group to contribute ideas that they feel would be a good addition to the group's solution. • After every group has shared their scenarios and solutions, make sure to contribute any information that may have not been covered. This could include information that is required to know how much water is needed to keep grass alive.
Elaborate	<ul style="list-style-type: none"> • During the month of data collection, students will be assigned to create a weekly advisory report to the school grounds keeper in order to keep their school fields nice and green. 	<ul style="list-style-type: none"> • Have the students create a precipitation chart for the month - using graph paper.
Evaluate	<ul style="list-style-type: none"> • Students will create a final report summarizing the month, complete with the classroom data table, graph, and report for how much additional water should be used to keep the grass alive. They can also recommend ideas to conserve water and reduce costs to the school. • Students will also include an essay summarizing their thoughts on their research question. 	<ul style="list-style-type: none"> • Evaluate students based on their report summaries. • They should report the necessary amount of additional water needed, and understand the need for accurate precipitation measurements.

Assessment

Formative (informal and/or formal)

- Class discussion related to solutions to each group scenario.
- Participation in group activity.

Summative (usually formal)

- Rain advisor report to school's ground keeper on amount of water that needs to be used to water the grass.

Anticipated misconceptions/alternative conceptions:

- Students may think that no matter how little it rains, it's still enough to sustain our needs.
- Student may believe that water is available regardless of how much it rains; that it's a plentiful resource.

Accommodations/modifications of activity for any special needs students (special education, ELL, and gifted/talented):

Special Education

- Be sure their research question is a "knowledge level" fact-type question that will support the group's larger research question.

ELL

- Be sure their research question includes a visual and/or hands-on component. For example, "Where does our water come from, and where does it go?" could be answered by drawing on a map. Gathering pictures of the different species of grass and writing numbers for how much water each requires does not involve a lot of English language skills.

G/T

- Challenge these students to do cost analysis, conservation plans, or take action on the research.