

What's the Issue? – Sample Activity

Purpose

You studied environmental problems earlier in this lesson. When does an environmental problem become an issue?

Scientists attempt to solve environmental problems based on factual research and data. A fact is a measurement or observation proven correct. Your height and the city of your birth are facts. A problem is a situation that has a solution. Your car breaking down is a problem. When there are many solutions to the same problem, disagreements and disputes about the solution occur. These disagreements make a problem an issue. An issue is a matter in dispute or about which people disagree. Cell phones in the classroom are an issue because people disagree on what rules are appropriate.

Figure 1 shows a flowchart with simple questions to determine whether a statement is a fact, a problem, or an issue.

What are the facts, problems, and issues found in environmental science?

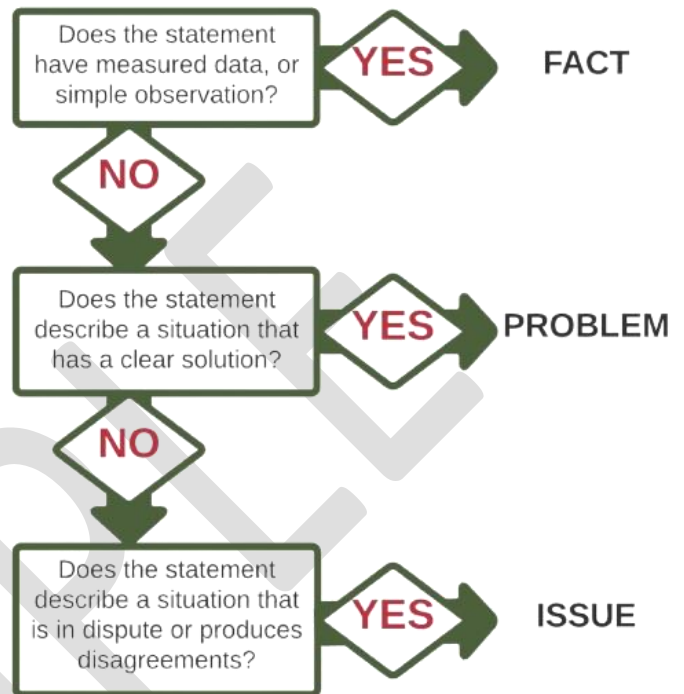


Figure 1. Fact-Problem-Issue Flowchart

Materials

Per group of four students:

- (6) Sticky notes
- Device with internet access

Per class:

- (3) Posterboards
- Assorted markers

Per student:

- Pen
- *ESI Notebook*
- *Laboratory Notebook*

Procedure

Categorize statements as facts, problems, or issues. Then research a topic in environmental science and find a fact, problem, and issue within that topic.

Part One – Define Issues, Problems, and Facts

1. Use the flowchart in Figure 1 to identify the following statements as a fact, problem, or issue. Record the statements in your *Laboratory Notebook* and label them as a fact, problem, or issue.
 - The stream temperature is 76°F.
 - The stream banks do not have enough shade trees to cool the water.
 - To preserve water quality, logging should not be allowed in the watershed.

2. Review your answers with your teacher.
3. In your *Laboratory Notebook*, make a table with three columns titled *Facts*, *Problems*, and *Issues*.
4. Practice identifying statements using the following list. Use the flowchart in Figure 1 to identify the statements as facts, problems, or issues, then record them in the correct column in your table.
 - There are 1,000 chickens in this barn.
 - It is acceptable to raise chickens in the smallest space possible.
 - The water level in my groundwater well has been dropping for years.
 - State leaders should divert groundwater from agricultural use to industrial use.
 - The water level in my groundwater well is at 202 ft.
 - Producers have found the avian influenza virus in the barn.
 - Cleaning polluted water is not worth the cost.
 - The sewage plant leaks.
 - The D.O. concentration is 8mg/l.
5. Once you have finished, review your results with your partner.

Part Two – Identify Environmental Facts, Problems, and Issues

1. With your partner, select an environmental topic from below or another topic approved by your teacher.
 - Biodiversity
 - Carbon footprint
 - Climate change
 - Food safety
 - Fracking
 - Genetic engineering
 - Habitat destruction
 - Logging
 - Mining
 - Overpopulation
 - Renewable energy
 - Soil degradation
 - Water pollution
 - Wildlife depletion
2. Use the internet to research your topic. Identify two facts, two problems, and two issues for your topic.
3. Write each fact, problem, and issue on a separate sticky note. You should have six notes. Do not label the statements as facts, problems, or issues.
4. Shuffle your notes and exchange them with another pair of students.
5. Sort the other students' notes into the categories of facts, problems, and issues.
6. Discuss your groupings with the other pair of students. Verify and compare your groupings.
7. Repeat Steps 4–6 with a different pair of students, then retrieve your original set of statements.
8. Label each of your statements as facts, problems, or issues based upon your discussions.

Part Three – Class Environmental Issues

1. Locate the *Facts*, *Problems*, and *Issues* posters. Place your six notes on the appropriate posters.
2. Your teacher will review the notes on the *Issues* poster.

Sample Teacher Notes

Students use a flowchart to identify facts, problems, and issues. Then, students apply those labels to topics related to environmental science.

Teacher Preparation

Become familiar with the flowchart in the activity. Prepare three posters by labeling one poster *Facts*, the second *Problems*, and the third *Issues*. Place the posters in a visible spot in the room.

Student Performance

Students analyze nine statements and categorize them as facts, problems, or issues. Then students select an environmental topic to research. They identify two facts, problems, and issues associated with the topic. Encourage students to search using their topic, followed by the term facts, problems, or issues. For example: "logging facts" or "biodiversity issues." Discussions may arise concerning whether a statement is a fact, a problem, or an issue. Refer students back to the flowchart in Part One. Remind students that issues are associated with disagreements.

Next, students examine and categorize the results of two other student pairs. Student pairs place their six notes on one of the three posters labeled *Facts*, *Problems*, or *Issues*. Each poster should have two notes from each pair of students. Review the notes on the *Issues* poster. Direct students to record the issues on a page in their *Laboratory Notebook*. You may have a student transcribe the issues onto a piece of paper on a document camera to improve visibility and record the issues. Use this list in the next activity.

Results and Evaluations

Students should understand how to identify a statement as a fact, problem, or issue. Table 1 provides properly categorized statements.

Table 1. Part One Responses

Facts	Problems	Issues
<i>There are 1000 chickens in this henhouse.</i>	<i>Producers have found the avian influenza virus in the barn.</i>	<i>It is acceptable to raise chickens in the smallest space possible.</i>
<i>The water level in my groundwater well is at 202 feet.</i>	<i>The water level in my groundwater well has been dropping for years.</i>	<i>State leaders should divert groundwater from agriculture to industrial use.</i>
<i>The D.O. concentration is 8 mg/l.</i>	<i>The sewage plant leaks.</i>	<i>Cleaning polluted water is not worth the cost.</i>

Sample Activity

This sample is a modified version of *Activity 1.1.4 What's the Issue?* from the CASE 4 Learning *Environmental Science Issues* (ESI) curriculum. For more information about the course visit www.case4learning.org. The sample has been modified for time and material simplification to fit a workshop format and is not for resale or profit. Teachers are permitted to use this sample in their classroom without certification.

Contact **CASE 4 Learning** to receive permission to use this sample at a teacher professional development.



ENVIRONMENTAL SCIENCE ISSUES

Course Description

Environmental Science Issues (ESI) focuses on ecosystem management, sustainable agriculture, energy choices, and pollution.

Students maintain a research-level laboratory notebook throughout the course documenting their experiences observing and collecting data from the environment. Research and experimental studies are highlighted as students develop and conduct an issue analysis.



Equipping teachers

- Specialization Level
- Full year course
- Inquiry and project based instructional practices
- CASE Institute professional development

Engaging students

- ✓ Investigate and research a local environmental issue
- ✓ Record research and labs in a scientific notebook
- ✓ Practice environmental science lab techniques
- ✓ Use science, technology, engineering, and math to solve industry-based problems
- ✓ Demonstrate relevant personal and lab safety practices.

Instructional Units

- Issue Analysis
- Biodiversity
- Energy, Technology, and Society
- Feeding the World
- Pollution
- ESI Research

Flexibility & Adaptability

CASE provides a comprehensive professional development experience, in addition to a work-life balance so teachers can best educate their students. Course work is adaptable and customizable based on teacher preference to fit all geographies and communities.

“CASE ESI has significantly enhanced my students' learning experiences by providing practical, real-world applications of concepts taught in the classroom, fostering deeper understanding and enthusiasm for STEM education.”

- Joshua Krieg, Washington



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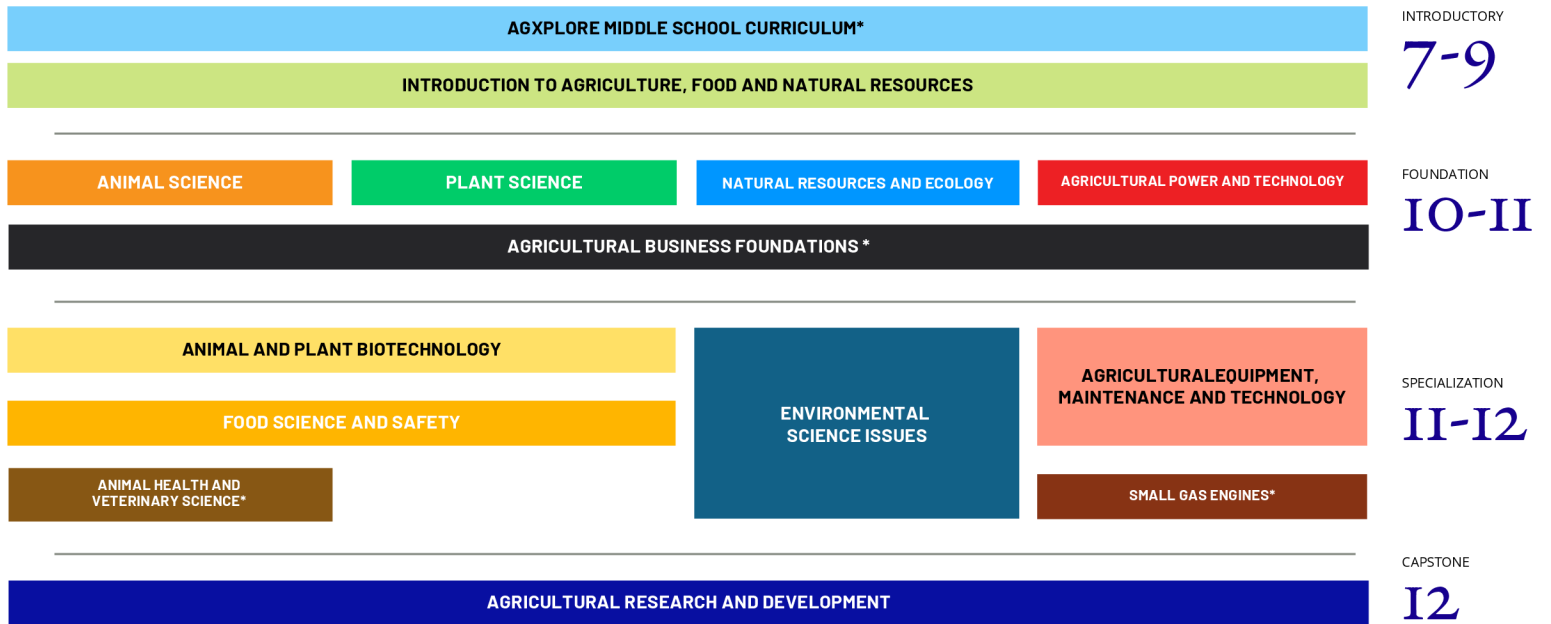
Equipping Teachers Engaging Students



Purposeful Curriculum

CASE has sequenced courses at four levels that enhance the delivery of agricultural education through inquiry-based learning and technical skills.

Courses and Instruction Levels



Mission

To design industry-leading, inquiry-based curriculum and teacher education to create lifelong learners and prepare students for the future of agriculture.

Standards Aligned

CASE develops curriculum with industry feedback and aligns courses to National Agriculture, Food, & Natural Resources and Career & Technical Education standards.

Professional Development and Lifetime Certification

CASE 4 Learning enhances agricultural education with inquiry and project-based learning to prepare the next generation of the agricultural workforce through teacher certification and professional development.

CASE Institutes

Professional development events preparing teachers to implement full-year CASE courses. Institutes provide teachers the content and skills needed to use CASE curricula in their classroom. CASE Institutes range from five to eight days in a hybrid, in-person, or virtual format.

BriefCASEs *

Professional development for shortened CASE courses or modules. BriefCASEs range from one to three days.

Grants & Scholarships

Corporate sponsors and donors throughout the agriculture industry support CASE teachers through funding material implementation grants and professional development scholarships. Teachers are eligible to apply in the fall to fund their programs in the following year.

Certification

Once the teacher is certified by attending a CASE Institute or BriefCASE, they have lifetime access. There are no subscriptions or renewal fees!



In-Person

Teachers attend the entire training at the host site.



Virtual

Teachers attend the entire training online. Teachers will receive materials via mail, and are responsible for their lab space.



Hybrid

Teachers receive training both virtually and in-person based on the course.