MOSA MACK SCIENCE

Food Webs Lesson 1: "The Solve"

Educator's Resource Guide

Objective:
In The Solve, students will:

1. Gather evidence to help solve Mosa Mack's mystery of why Frank the bullfrog can't find any of his usual food sources.
2. Engage in critical discussion to explore the interdependence of organisms in an ecosystem.
3. Complete vocabulary mind map.
4. Complete exit ticket to communicate understanding of food webs.

Time Required: 75 minutes

Materials Required	Safety Considerations	Science & Engineering Practices
• Student Guide (*includes student agenda and vocabulary handout)* • Food Webs Episode • Computer with speakers • Scissors • Glue or Tape • Index Cards	None	• Developing and Using Models • Constructing Explanations or Arguments From Evidence

Episode Description:
Frank is a bullfrog who lives near a large temperate forest. He loves to chomp on crickets and worms, but hasn't seen any around in days and he is hungry. Frank calls Mosa Mack to help him find some food before he croaks. Thankfully, a singing cricket and defiant earthworm help Mosa solve the mystery.

Inquiry Scale:
"The Solve" can be completed in various settings including presentation-style, small groups, individually or, in the case of a flipped or blended classroom, can be completed entirely at home.

Level 1: (*recommended for grades 4-5)*
View the animated mystery twice: once in full, and a second time along with the discussion questions, pausing the video as needed to answer the questions as a group. Project and complete the vocabulary handout as a class-wide activity. Have students informally quiz each other on the vocabulary until you feel they're familiar with the terms. Finally, have students complete the quiz online or on paper as an exit ticket.

Level 2: (*recommended for grades 5-6)*
View the animated mystery in full. Afterwards, have students work through the questions to the best of their ability in small groups. Play the mystery a second time, pausing the video for each question to discuss. Direct students to complete the vocabulary chart in small groups, coming back as a class to review correct answers as needed. Have students informally quiz each other on the vocabulary until you feel they're familiar with the terms. Finally, have students complete the quiz online or on paper as an exit ticket.

Level 3: (*recommended for grades 6-7)*
Provide students with their student URL and have students view the animated mystery in small groups. Have students play the animated mystery once in full and then answer questions in their table groups to the best of their ability. Then, as a class, project the mystery pausing as needed to discuss questions in a think-pair-share format. Have students complete the vocabulary chart in table groups and quiz each other until you feel they're familiar with the vocabulary. Finally, have students complete the quiz online or on paper as an exit ticket.

Level 4: *(recommended for grades 7-8)*
Provide students with their student URL and have students view the animated mystery and complete discussion questions in pairs. Have students review their answers with a neighboring table group. Have students complete the vocabulary chart in pairs and quiz each other until they feel they're familiar with the terms. Finally, have students complete the quiz online or on paper as an exit ticket.

Agenda

I. Solve the Food Webs Video Mystery (20 minutes)

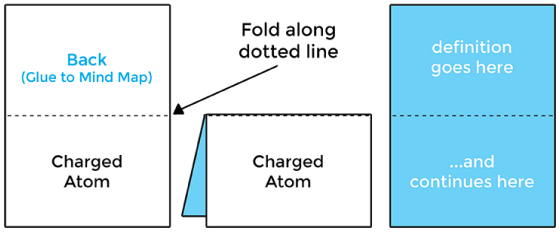
Differentiation Tip: The video mystery can be viewed as a class, in small groups, individually, or completed for homework. For additional support, students can view the episode twice: once before completing the questions, and once with teacher guidance, pausing the video to discuss each answer.

1. Play the animated Mosa Mack mystery on Food Webs.
2. Students fill out questions on student handout as they watch. Encourage students to cite the specific time codes in the episode to promote writing with supporting evidence. Answers can be found in the key below.

II. Vocabulary Mind Map Activity (15–45 minutes)

Differentiation Tip: The Mind Map can be done as a class, in small groups, individually, or completed for homework.

1. Students may complete the Mind Map **digitally**. Follow directions below. (15 minutes)
    a. Go to https://mosamack.com/home/food-webs
    b. Select **Lesson 1: *The Solve***.
    c. Select **Vocabulary** and complete **Part 1:** matching terms with definitions.
    d. Complete **Part 2:** matching terms and definitions with images on a diagram.
2. To complete the Mind Map **on paper**, follow the directions below (45 minutes).
    a. Print and pass out the Student Guide: Food Webs Lesson 1: *The Solve*.
    b. Introduce the warm up task: students will be making a Mind Map of the vocabulary for this Food Webs unit.
    c. Model the directions carefully, emphasizing the following. Students should:
        - **cut** out the vocabulary cards on the solid lines only
        - **fold** the cards at the dotted lines
        - write the definition of the term on the inside of the card using definitions provided



    d. Students use the clues from the Mind Map images, definitions, and terms to place the cards in the correct location in the Mind Map.
    e. Check that the students have matched their cards correctly before moving on.
    f. Students use glue or double-sided tape to connect the back of the vocabulary card to the correct place on the Mind Map.

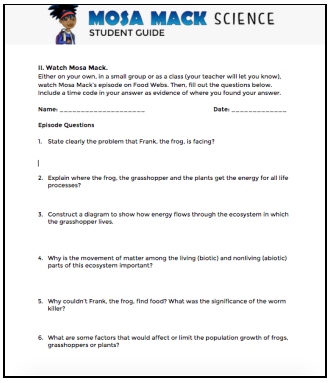
Teacher Tips:

- Since this is the first time many of the students will have seen these vocabulary terms, have students work together to use the images, definitions, and collaborative thinking to figure out where the terms go.
- Check in on student groups through this process. When you see a student or group who has placed a card in the correct place, ask a facilitating question such as, “Why do you think that term goes there?” or “What evidence leads you to believe that term goes there?” When students explain their thinking, this is a great opportunity to provide positive reinforcement. Then, encourage students to share their reasoning to the class or to other groups who may have trouble identifying the location of that specific term.
- If you do not have access to a color printer, provide students with black and white copies and project the colored version of the Mind Map at the front of the room so that students can reference both images.

III. Exit Ticket: Check for Understanding (10-15 minutes)

Differentiation Tip: This can be done in groups, pairs, individually or more formally as a quiz online.

1. Students complete the exit ticket to check for understanding. This can be done online by selecting this "Quiz" button or on paper in the student worksheet. Answers are in the key below.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II. Watch Mosa Mack.
Either on your own, in a small group or as a class (your teacher will let you know), watch Mosa Mack's episode on Food Webs. Then, fill out the questions below. Include a time code in your answer as evidence of where you found your answer.

Name: _____ Date: _____

Episode Questions

1. State clearly the problem that Frank, the frog, is facing?
2. Explain where the frog, the grasshopper and the plants get the energy for all life processes?
3. Construct a diagram to show how energy flows through the ecosystem in which the grasshopper lives.
4. Why is the movement of matter among the living (biotic) and nonliving (abiotic) parts of this ecosystem important?
5. Why couldn't Frank, the frog, find food? What was the significance of the worm killer?
6. What are some factors that would affect or limit the population growth of frogs, grasshoppers or plants?

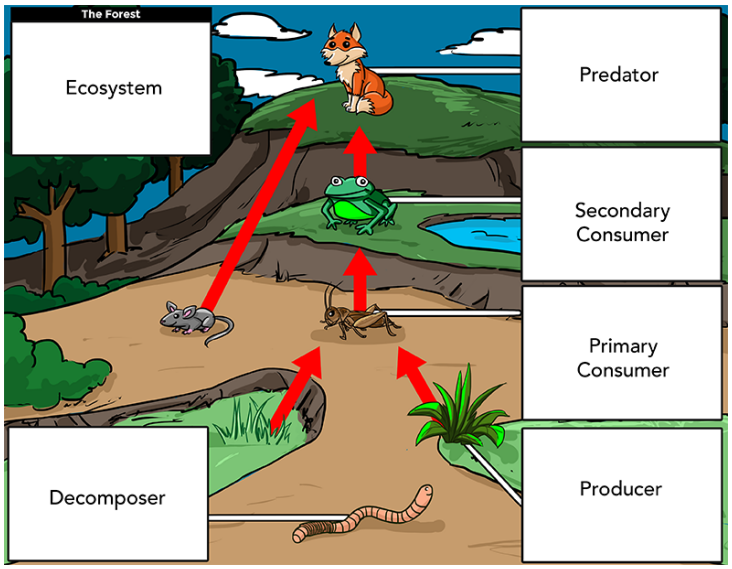
Answer Key

Episode Questions

1. State clearly the problem that Frank, the frog, is facing.
   Frank can't find food. (0:25)
2. Explain where the frog, the grasshopper and the plants get the energy for all life processes?
   The sun provides energy for the producers, the plants. (3:30)
3. Construct a diagram to show how energy flows through the ecosystem in which the grasshopper lives. (2:45)

   Be sure the students have placed the arrows in the correct direction.
4. Why is the movement of matter among the living (biotic) and nonliving (abiotic) parts of this ecosystem important?
   As one organism consumes another, energy is transferred through the ecosystem.
5. Why couldn't Frank, the frog, find food? What was the significance of the worm killer?
   The worm killer meant that the worms in the area near Frank, the frog, were dead. No worms mean sick plants; sick plants mean fewer grasshoppers.
6. What are some factors that would affect or limit the population growth of frogs, grasshoppers or plants?
   Possible answers include: a disease or pest affecting plants in the area, an increase in predators, a decrease in land availability.

Mind Map



Quiz: Check for Understanding

1. The frog is a carnivorous predator. What does a carnivore eat?
    a. Plants
    b. Plants and animals
    c. **Animals**
    d. Fungi

2. Which of the following is not characteristic of primary consumers?
    a. Primary consumers eat plants
    b. **Primary consumers eat animals**
    c. Primary consumers are low on the food web
    d. Primary consumers eat and get eaten

3. If the frog eats the grasshoppers, which direction would the arrow in a food web go?
    a. Frog → Grasshoppers
    b. Grasshoppers → Frog

4. What organism produces all the energy for the entire ecosystem by capturing energy from the sun?
    a. Primary consumer
    b. Secondary consumer
    c. Decomposer
    d. Producer

5. What organism produces all the nutrients that plants need?
    a. Primary consumer
    b. Secondary consumer
    c. Decomposer
    d. Producer

6. What organisms in a food web are essential for an ecosystem to thrive?
    a. Consumers
    b. Producers
    c. Decomposers
    d. All of the above