Aquaculture

*Lesson Plan for Grade K, Science*

*Prepared by NAITC*

*Modified by Mississippi State University, School of Human Science*

*for Mississippi Farm Bureau Federation - AITC*

# OVERVIEW & PURPOSE

Students identify the basic needs of plants and fish and engineer, assemble, maintain, and observe a small-scale aquaponics system that meets plant and fish needs.

# EDUCATIONAL STANDARDS

**Mississippi College-and-Career Readiness Standards:**

L.K.3A.2 Construct explanations using observations to describe and report what animals need to live and grow (food, water, shelter, and space).

ELA-W.K.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

**NALOs:**

T2.K-2.c Identify examples of feed/food products eaten by animals and people

T2.K-2.e Identify the importance of natural resources (e.g., sun, soil, water, minerals) in farming

# OBJECTIVES

* Students will investigate aquaponics
* Students understand why it is beneficial to raise fish and plants together
* Students understand the needs of plants

# MATERIALS NEEDED

* [Aquaponics-Pass the Plate video](https://video.disney.com/watch/aquaponics-pass-the-plate-4ece977e6d34cbb50e43bf04)
* [Needs of the Plant Powerpoint slides](https://docs.google.com/presentation/d/1AVN8R_FwFuwY43J-kQ-SjYL-t4LneKSB/edit?usp=share_link&ouid=109918902593538910659&rtpof=true&sd=true)
* [Plant Observation Sheet](https://drive.google.com/file/d/1zITW5BRY6woOzz0s_z8VkcDV21shc59I/view?usp=share_link)
* [Ocean Live Cam](https://explore.org/livecams/oceans/cayman-reef-cam)
* [Fish Needs Card](https://drive.google.com/file/d/1Y4vaD9VdGduvdtg1dXi4e337EJHIg3H9/view?usp=share_link)

# Lesson Set Up:

1. Ask the students, "Where is the food you eat grown?" After discussing the student responses, ask them if they think food can be grown in the middle of a big city.
2. View the video [Aquaponics – Pass the Plate.](https://video.disney.com/watch/aquaponics-pass-the-plate-4ece977e6d34cbb50e43bf04)

# LEARNING PROCEDURES

Activity 1: Needs of a Plant

1. Ask the students if they have ever taken care of a plant. If they have, ask them to describe what they did to care for their plant.
2. Ask the students, "What are the basic needs of plants?" (*nutrients, water, air, and light)* Use the [Needs of a Plant](https://docs.google.com/presentation/d/1AVN8R_FwFuwY43J-kQ-SjYL-t4LneKSB/edit?usp=share_link&ouid=109918902593538910659&rtpof=true&sd=true)PowerPoint Slides to introduce the four basic needs of a plant.
3. Divide the class into four groups. Assign each group one of the needs of a plant.
4. Provide each group with a potted plant. The fifth plant is the "control" plant. Show the students the control plant and explain that this plant will receive everything it needs to live and grow—nutrients, water, air, and light.
5. Each group will design an investigation to find out if their plant can survive without their assigned need. For example, if a group was assigned "light," they will design an investigation to determine if their plant can survive without light.
6. Allow each group time to brainstorm ideas about how to design their investigation. Tell students to keep in mind that they are limited to easily available materials that can be found either in the classroom or at home. Be sure to visit with each group during the brainstorming process to give guidance and feedback.
7. After the necessary materials are gathered, have each group set up their investigation. Provide each student with a [Plant Observation Sheet](https://drive.google.com/file/d/1zITW5BRY6woOzz0s_z8VkcDV21shc59I/view?usp=share_link)and give students time to record their observations each day for two weeks.
8. After the two-week observation period, have each group meet together to summarize their observations and interpret their findings. Provide time for each group to share their findings with the class.

**Activity 2: Needs of a Fish**

1. Ask the students, "What do you need to survive?" (*food, water, air, and shelter*) Ask the students if they think fish have the same or different needs. Discuss their responses and guide them to the understanding that fish have the same basic needs as humans.
2. View an [Ocean Live Cam](https://explore.org/livecams/oceans/cayman-reef-cam). Using the information from the *Background – Agricultural Connections* to discuss how the needs of the fish seen in the live cam are being met.
3. Choose a large outdoor area or gymnasium to represent the ocean. Tell the students that they are going to play "Fish Tag" and they are all fish. Assign 5-10 students to be predators. Use sports pinnies or headbands to identify the predators. Spread all of the [Fish Needs Cards](https://drive.google.com/file/d/1Y4vaD9VdGduvdtg1dXi4e337EJHIg3H9/view?usp=share_link)and the four hula hoops around the ocean. Explain to the class that the fish will have two minutes to "swim" around the ocean collecting cards while trying to avoid being caught by the predators. If a predator tags a fish, the fish has been caught and is out of the game. Eaten fish will move to the edge of the ocean and participate in an activity such as jump rope, hula hoop, jog around the ocean, etc. Each fish is trying to collect one food card, one water card, and one air card before time is up. The hula hoops represent shelter. When a fish is standing inside a hula hoop, they are safe from predators and cannot be caught. Only three fish can stand in a hula hoop at a time, and they may only stay there for ten seconds.
4. After one round is complete, choose new predators and play again. Repeat the game until every child has had an opportunity to be a predator.
5. Review with the students the importance of food, water, air, and shelter to the survival of a fish.

Additional Learning Procedures

To help students review and elaborate more about aquaculture, try using the [“Think Pair Share”](https://drive.google.com/file/d/1fA6UDmvJ81KNgL2WR1It4Gv7rY6zSSx5/view?usp=drive_link) method to allow students to think deeper and make new connections.



*For more information and additional lessons visit*

*https://msfb.org/ag-in-the-classroom/lesson-plans/.*