

SUBJECT: Science
GRADE: 5
DATE:
DURATION: 60 minutes
TOPIC: Food production methods
<p>ATTAINMENT TARGET:</p> <ul style="list-style-type: none"> • Gain an understanding of some life processes in plants and animals, and how lifestyle choices impact health and well-being in humans • Begin to appreciate the influence and limitations of science with consideration for ethical issues
<p>BENCHMARKS:</p> <ul style="list-style-type: none"> • Know that foods are produced in different ways (organic, non-organic and genetically modified) • Begin to understand the interdependence of living things in the environment • Display curiosity, objectivity and perseverance in their approach to activities
<p>LEARNING OBJECTIVES:</p> <ul style="list-style-type: none"> • Investigate different methods of growing food • Compare traditional and modern food production methods • Draw conclusions from results of investigations on different food production methods • Value individual and team work through ‘hands-on’ activities • Construct a design by following a given rubric
KEY SKILLS: Gather data, collaborate, communicate, manipulate, observe, investigate, infer, create
KEY VOCABULARY: organic, non-organic food, traditional and non-traditional farming, chemical, manure, food production
<p>MATERIALS/RESOURCES: Video, pictures, vegetable seeds, water, soil, manure, plastic bottles, bamboo sticks/fudge sticks, wire, string, newspaper, water hyacinth/moss,</p>
CONTENT OUTLINE: Foods from animals and plants can be grown using both organic and non-organic methods. Organic methods do not involve the use of chemicals while non-organic methods use fertilizers and pesticides. Vertical farms, hydroponics, aquaponics and green houses are some of the methods used.
PRIOR LEARNING: Check that students can: Identify examples of animals and plants used for food
<p>LEARNING OUTCOME: Students who demonstrate understanding can: Identify different food production methods Cite differences between traditional and modern food production methods Suggest solutions to identified food problems</p>

ASSESSMENT CRITERIA:

- Presentation contains accurate information
- Designs are innovative and make use of everyday materials

PROCEDURES/ACTIVITIES

Engage - *How can I get students interested in this?* Use of an interesting picture. (5 min)

- Students will be shown a video or a series of pictures of flooded and drought areas and asked to suggest what is happening and the problems that may arise. Food shortage will be identified as a possible problem that may arise. Students will discuss solutions to the world food problem. The need for different food production methods will be stressed.



- *Teacher instructs students to form their own groups and provides instructions for the next activity.*

Explore - *What tasks/questions can I offer to help students puzzle through this?* Use of a simple investigation. (10 min)

- The traditional methods used by farmers to produce food from plants and animals will be listed. Students will research ways of growing food that differ from traditional methods of farming (using pictures or video clips).
- In groups, students will provide answers to the following questions:
 1. How were the foods grown in the video or pictures?
 2. Give examples of the foods grown.
 3. What are the names of the different methods explored?
 4. What are the advantages and disadvantages of these non-traditional methods?
 5. Can the methods be grouped as organic or inorganic?
- *Teacher provides Colour-coded task cards with different activities to each group and monitors groups, offering suggestions and direction.*

Explain - *How can I help students make sense of their observations?* Class presentation and discussions. (10 min)

- Students will report on one or more of the identified methods (vertical farms, hydroponics, aquaponics, green houses etc.) based on colour-coded task cards.
- *Yellow group* – take or draw pictures of the varied food production methods and write a few sentences explaining the method.

- *Green group* – write lyrics to a tune of your choice about the different food production methods.
- *Pink group* – Present arguments supporting the use of traditional or other non-traditional methods over the other.
- Each group will answer questions posed by the class showing how the method works. Students will complete a table to show the information gathered for each method under the headings: name of method, crops grown, materials used, comparison with traditional method.
- *Teacher notes information presented by students on the board and offers clarifications of any misconceptions held and provides additional information to students.*

Elaborate - How can my students apply their new knowledge to other situations? Application of what they learned. (20 min)

- Students will be given a scenario in which farmers in flood prone regions of Malaysia or Philippines are unable to grow crops using their traditional methods due to excessive flooding (from pictures). Students will discuss possible solutions to this problem with the floating garden identified as one solution.



In groups, students will design a model of a Floating Garden or a Green House to increase food production. Instructions for making a floating garden will be provided. Students will choose from the materials provided and record a description of their design. Students will use Science content on buoyancy (floating materials), Mathematics content on measurements (area and perimeter) and content on designing materials according to specifications (Engineering and technology) to design their floating gardens. Students will be guided to use a rectangular design with an area less than 225 cm².

Teacher instructs students to use the following questions to guide the design process:

- From the materials given, which ones can float in water?
- How will the area be determined? What measurements of length and width are needed?
- How much weight can the materials take before it sinks?
- How will my soil be able to remain on the float/ raft?
- What will be used to provide nutrients for the seeds/ plants?

- What will determine a successful design?
- The designs presented from each group will be discussed. Students will suggest how their method is expected to work. Improvements for each design will be provided by the class. The designs will be tested using a teacher-prepared rubric.
- *Teacher offers guidance to the groups and directs them to follow the rubric given.*



Student Worksheet

NAME: _____ CLASS: _____

Please draw your design in the box below – DESIGN 1

Evaluate - *How can I help my students self-evaluate and reflect on the teaching and learning, and how can I evaluate the students learning of concepts and skills.* Assessment (15 min)

- Students will present their designs to the rest of the class for peer-evaluation using the Engineering Design Rubric (to assess design, presentation, collaboration and project completion time).
- Students will self-assess their design and how well it worked by answering questions attached on the Student worksheet. Students will reflect by answering the following questions:

Tell us which design you chose to make, and why...

Tell us more about your final design...

Do you think it worked well?

How much weight did your model garden support?

What would you like to change in your final model?

What will you do differently next time you do a challenge like this?

EXTENDED LEARNING:

Research the growing of animals such as poultry and fish on a large scale.

LINKS TO OTHER SUBJECTS:

- Resource and Technology, Social Studies, Mathematics

POST-LESSON REFLECTION:
