# Class Activity Lesson Plan Template

**Name of Activity** – Tower Garden: Learning About Parts of Plants

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**Purpose** – Crop plants have a long history of domestication, with scientific research continuing now and in the future. In this lesson, each student will do extensive internet research on one crop plant and prepare a report and presentation for the class. Each student will become an expert on his or her crop plant. At the end of the presentation sequence, whereby students are exposed to detailed information on crop plants from their peers' reports, they will decide, as a class, which seeds would be best to plant in the Tower Garden® and why

**Background Agricultural Connections** – Learners will discover the origin of many different plants that can be grown in the garden towers and how they used to be grown compared to how they will be grown in a garden tower.

**Grade Levels** – 7th Grade and above

**Lesson Length** – The lesson will be ongoing due to the growth on the garden tower, but the research project should take about a week of 45 minute lessons.

**Learning Objectives** – Learners will be able to explain the botanical and geographical origin of the plants they choose to grow in the Tower Garden®, their medical and nutritional values, and current challenges to crop plants being researched in a written report citing reliable sources of information.

**Standards** – LS1.B: Growth and Development of Organisms Genetic factors as well as local conditions affect the growth of the adult plant. (MS-LS1-5) Middle School LS4.B: Natural Selection In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring. (MS-LS4-5) LS4.C: Adaptation Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverges under different conditions, and the decline–and sometimes the extinction–of some species. (HS-LS4-6)

**Materials and Equipment Needed** – Garden Tower, seeds, materials to assist with growing plants, computers, access to presentation applications

**Teacher Preparation** – Teacher will need to assemble the garden tower and acquire all of the seeds/plant materials prior to starting the lesson.

**Activities & Procedures** –

**Engage** = Ask the class: What did you eat today? Students make a bulleted list of individual foods. Then ask: "Where did each of these foods come from?" Ask students to write the answer next to the list of the foods they wrote down. If they list a meat product, ask them to write what that animal ate.
Example: • Hamburger: cow that ate grass • Bun: wheat Key question: Where does our food come from? (plants)

**Explore** = Have students share foods on their list and guide them as they come to the conclusion that plants provide all animals with food. They can trace their food from the market (to the factory) and back to the farm, with all the transport in between, and then jump back through history to the scene of crop domestication, to its wild ancestor, which may still be growing in the wild. The food has taken a journey of thousands of miles and thousands of years to arrive on our plates today.

**Explain** = This story is different for every crop. Wild ancestors of tomatoes and potatoes grew in South America. Corn's ancestor grew as a grain in Mexico, wheat came from the Middle East, apples from Central Asia, coffee originated in Ethiopia, oregano around the Mediterranean Sea, and squash in Central America. These foods are a gift of our ancestors, who, over generations, selected the best varieties each year as the seeds for the next year. Scientific research to improve crops continues at present and into the future. New varieties are bred to be resistant to diseases, produce tastier fruit, or be better adapted to grow in hot or dry conditions. The Tower Garden® is a new way to grow plants. In this lesson, students carry out research about one of the plants they can grow in the Tower Garden and present their findings to the class in an informative presentation.

Tower Garden Plants can include tomato, cucumber, strawberry, cilantro, basil, mint, lettuce, oregano, thyme, peas, green beans, kale, arugula, mustard greens, swiss chard, tatsoi, pakchoi, spinach, parsley.

Research Guide for Crop Plant Report & Presentation
1. Find the scientific (Latin) name for the plant and the meaning of this Latin name
2. Where was this crop plant first domesticated?
3. Find general information about the eating of this plant:

    a. Which part(s) of the plant are eaten?
    b. Are any plant parts poisonous?
    c. What is the nutritional value of this plant? Is it more nutritional raw or cooked?
    d. Find and include two healthy recipes that you'd like to try using this plant.

4. What agricultural challenges are driving the research on your plant?
5. What are some of the important varieties of this crop, and how do they differ?
6. What nutritional benefits or medical value does this plant provide?
7. Find out how your plant is typically grown agriculturally — its needs for water, sunlight, optimum temperatures, soil type, nutrients, season of growth and harvest, and other

interesting growing tips.
8. Find out what diseases or pests threaten the growth of your plant.
9. What are the benefits for growing your plant in a soil-free system? What are the challenges that you should prepare for?

**Expand** = Students will listen to the research findings of their classmates and think about the history and current challenges of each of the plants presented. They will list a minimum of four essential facts about each plant in their notebooks as their peers present. They must include in their notes: 1) country of origin, 2) major nutrients, 3) important challenges, and 4) other facts of interest. At the end of all the plant presentations, the class will decide what plants they would like to grow in the Tower Garden with rationales. Twenty (twenty-eight with an extension kit) plants can be grown, but only six to seven different seed packets will be purchased. Students must consider information learned in prior lessons about wavelengths and quantity of light for each plant; size of adult plants; if there are heavy fruits, vines, or large leaves that might block light from other plants; and time from seed to harvest. These are important characteristics to consider when grouping different plants to grow together in a vertical tower.

**Evaluate** = Students write the answers to these questions at the conclusion of the research presentations: 1. Where in the world is the origin of most of the plants your class researched? 2. What are the most important challenges facing agriculture today? Which challenge would you be interested in researching if you were a botanist? 3. What are the major nutrients in green leafy vegetables? 4. What are the best plants for our Tower Garden® and why?

**References/Resources** –

General information on crop plants: http://plants.usda.gov/java/
New World Encyclopedia: http://www.newworldencyclopedia.org/entry/Info:Main_Page
Encyclopedia Britannica online: http://www.britannica.com/
Wikipedia—The Free Encyclopedia: https://en.wikipedia.org/wiki/Main_Page

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**Grading of Lesson Plan Activity**

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| Appropriate Purpose, Background Agricultural Connections and Learning Objectives | 10 points |
| Description of Materials and Equipment Needed and Teacher Preparation | 5 points |
| Description of Activities and Procedures | 20 points |