

Learning with Lettuce



Tower Garden® Curriculum that Matches Academic Standards



2nd Grade Overview



This curriculum will help you take your 2nd graders through a 6-week, Tower Garden growing cycle. Although a wide variety of crops can be grown indoors and outdoors on a Tower Garden, the following lettuces grow well inside, provide different shapes and textures for kids, and should be ready to harvest in six weeks: arugula, red salad bowl, buttercrunch, black seeded simpson, and pak choi.

The lessons can be accomplished in about one hour per week.

Each week refers to the Tower Garden Journal, available for free download at <https://www.teacherspayteachers.com/Store/Tgardener>

If you need supplies and don't have a distributor you can order rockwool, mineral blend, and more from my website at skoontz.towergarden.com. If you need help, email me at steve@tgardener.com. I've been supporting teachers who use Tower Gardens since 2015.

Overview

Week 1

Build the Tower Garden and Plant Seeds

Week 2

Fill the tub with water, nutrients, and balance the pH.

Place seedlings into the Tower Garden

Week 3

Fill the tub, balance the pH, and add nutrients

Week 4

Fill the tub, balance the pH, and add nutrients

Week 5

Fill the tub, balance the pH, and add nutrients

Week 6

Salad Party

Week 1

Build the Tower Garden and plant seeds

Main Lesson Objective

- Use the Tower Garden parts to teach students about measurements.

The first week you'll lead students through putting the Tower Garden together and planting seeds. An overview video of setting up the Tower Garden can be found here: www.tgardener.com/setup. **Since the curriculum uses the building of the Tower Garden to teach several standards, the steps to building it are a little different than in the video.**

What you will need.

- 1 - 32 oz bottle - (Juice bottles work well)
- Construction paper
- Seeds - arugula, red salad bowl, buttercrunch, black seeded simpson, and pak choi grow well
- A few older students or adult helpers to help students plant seeds

Estimate and measure the length of an object by selecting and using appropriate tools, such as rulers, yardsticks, meter sticks, and measuring tapes to the nearest inch, foot, yard, centimeter and meter.

Understand that the length of an object does not change regardless of the units used. Measure the length of an object twice using length units of different lengths for the two measurements. Describe how the two measurements relate to the size of the unit chosen.

Show students the different parts of the Tower Garden and use different tools to measure each part.



Help students place the base of the Tower Garden on the tub. Then help them stack the parts of the Tower

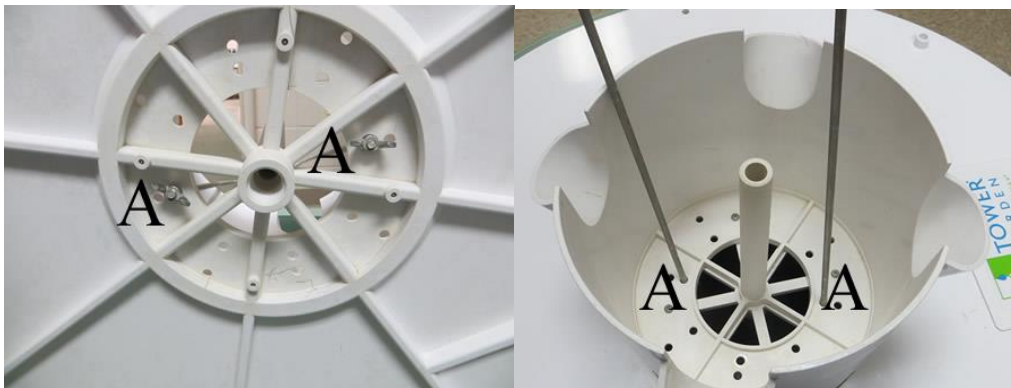
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Garden on top of the base. Measure the height as it's being built. Do not put water in the tub, or insert the netpots. (These will be done next week.)

Thread the tower sections onto the rods, alternating between the holes marked A and B.



Start the rods in hole 'A'



Continue adding sections alternating between hole 'A' and hole 'B'



Push the sections down firmly

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If you purchased the extension, screw the rods in like shown

Build the light cage with the students and place the lights on the light cage. Connect the lights to the timer and show students how the timer will go on and off when needed. (Skip this if you have the LED lights that attach to the top of the Tower Garden.) Set the timer for 12 hours on, 12 hours off. If the lights are too bright for students, they can be set to come on when students leave for the day and turn off 12 hours later.



Light clipped to support

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Plant Seeds

You will find the seed starting procedure available for a free download at

www.teacherspayteachers.com/store/tgardener

Tower Garden Journal Activity

Draw several Tower Garden parts and their measurements.

Week 2

Main Lesson Objective

Begin the engineering series in the science standards. The following 2 weeks will complete the series.

Fill the Tower Garden with water and place the seedlings into the ports.

Take off the lights and remove the light support. You should be able to take the light support off over the top of the Tower Garden without taking the light support apart. Pull the sections off the Tower Garden reminding students about how they measured them last week.

Fill the Tower Garden tub with non-softened water and build the Tower Garden

Estimate and measure volume (capacity) using cups and pints.

Place the pump in the bottom of the tub and thread the power cord through the hole. Screw the supply hose into the pump. When you're done with this lesson, plug the pump into the timer and set it for 15 minutes on, 45 minutes off for indoor growing.

Use different size containers to put the water into the Tower Garden. Talk about which size holds more water and how much each container weighs. Measure out 200 ml of Tower Tonic 'A' and 200 ml of Tower Tonic 'B' and pour into the Tower Garden base while pointing out to students the size of the container used to measure. Balance the pH of the water and talk about how much water was used and how many drops of pH tester was used. (See directions on the pH test kit.) If the pH is off, adjust it gradually by using 10 ml at a time of pH + or pH -, retesting each time.

Place the base on its side and push the long metal rods through hole 'A' in the base and secure with the wing nuts. Place one wing nut on the bottom of the base and one on the top of the base.

Screw the other end of the supply hose into the bottom of the base.

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Before Inserting the netpots into the Tower Garden ports, use them to teach the following standards.

Determine whether a group of objects (up to 20) has an odd or even number of members (e.g., by placing that number of objects in two groups of the same size and recognizing that for even numbers no object will be left over and for odd numbers one object will be left over, or by pairing objects or counting them by 2s).

Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal groups.

Ask students to place their seedlings in a netpot on the Tower Garden.

Pose questions, make observations, and obtain information about a situation people want to change. Use this data to define a simple problem that can be solved through the construction of a new or improved object or tool.

Talk with students about the problem of diminishing farmland and how the Tower Garden doesn't use soil.

Tower Garden Journal

Students draw a picture of the Tower Garden and how it pumps water and nutrients to the roots of the plants.

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Week 3

Main Lesson Objective

Develop a drawing to illustrate how the shape of an object helps it to function.

Estimate and measure volume (capacity) using cups and pints.

Ask students to fill up containers and pour water into the Tower Garden base to fill it to 3 inches from the top. (About 2 gallons will be required) Add 50 ml of Tower Tonic 'A' and 50 ml of Tower Tonic 'B' to the base. Balance the pH of the water and talk about how much water was used and how many drops of pH tester was used. (See directions on the pH test kit.) If the pH is off, adjust it gradually by using 10 ml at a time of pH + or pH -, retesting each time.

Draw a picture graph (with single-unit scale) and a bar graph (with single-unit scale) to represent a data set with up to four choices (What is your favorite vegetable? Lettuce, carrots, green beans, peas. Of the lettuces being grown, which one do you think you'll like the best?). Solve simple put-together, take-apart, and compare problems using information presented in the graphs.

Compare and contrast details of body plans and structures within the life cycles of plants and animals.

Talk about how plants take up nutrients through the roots and how the nutrients help the plant to grow. Talk about how the lights on the Tower Garden mimic the sun to provide the light needed for photosynthesis to take place.

Develop a simple sketch, drawing, or physical model to illustrate and investigate how the shape of an object helps it function as needed to solve an identified problem.

Talk with students about the problem of diminishing farmland and how alternative growing like the Tower Garden can offset that.

Tower Garden Journal - Have students draw a picture graph to represent their four choices.

Week 4

Main Lesson Objective

Analyze data from the investigation of two objects.

Ask students to fill up containers and pour water into the Tower Garden base to fill it to 3 inches from the top. (About 2 gallons will be required) Put 50 ml of Tower Tonic A and 50 ml of Tower Tonic B in the tub. Check the pH and adjust with the pH+ and pH- as needed

Analyze data from the investigation of two objects constructed to solve the same problem to compare the strengths and weaknesses of how each performs.

There are 3 types of soil-less growing systems

Aeroponics - The plants roots hang in the air while water washes the roots

Hydroponics - The plant roots are always in the water.

Aquaponics - The plant roots are always in the water, but fish are added to the water.

The Tower Garden is an aeroponic growing system. Have students investigate the strengths and weaknesses of each growing system.

Tower Garden Journal Activity

Write a logically connected paragraph or paragraphs, that introduce an opinion, with a concluding statement or section and multiple reasons to explain why a certain course of action should be followed.

Explain the 3 different types of soil-less growing systems. Ask students to form an opinion on which one they think is better, and write the steps they will take in order to do their research.

Week 5

Main Lesson Objective

Write a paragraph on a topic.

Ask students to fill up containers and pour water into the Tower Garden base to fill it to 3 inches from the top. (About 2 gallons will be required) Put 50 ml of Tower Tonic A and 50 ml of Tower Tonic B in the tub. Check the pH and adjust with the pH+ and pH- as needed

Tower Garden Journal Activity

Write a paragraph or paragraphs on a topic that introduce a topic, provide facts and details about the topic, and provide a concluding statement.

Record your growing system findings in the journal. Findings can also be presented in class if there's time.

Week 6

Plants should be large enough to harvest and eat. If not, wait another week. Have a salad party with students tasting the lettuce and deciding which varieties they like and which they don't like.

Tower Garden Journal Activity

Have students record what they liked and didn't like about the lettuce.

Need Help or Supplies?

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