KNOW, SOW, GROW

Edible Education at Home

At the Edible Schoolyard Project, we believe that students' experiences outside of school are just as meaningful as their experiences at school. We seek to bring students' lived experiences into our classrooms to connect their lives to their learning. Now, widespread distance learning has created a moment in which learning primarily occurs outside of formal learning environments. Co-designed by Raquel Vigil and Nick Lee, Edible Education at Home aims to support students, teachers, and families through a suite of lessons and activities designed for the home classroom.

ABOUT THIS LESSON SET

Overview:

This set of six garden-based activities and lessons is geared towards teaching the basics of plant parts and processes, emphasizing garden vocabulary and observation. The lessons include leading students through hands-on activities practicing basic gardening skills. The lessons emphasize and actively teach vocabulary because gardening has a deep lexicon that can be intimidating for new gardeners without proper scaffolding. All lessons are designed so that they can be taught in person or remotely, even asynchronously.

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Standards:

These garden-based lessons were designed with an emphasis on the learning process, in alignment with NGSS and Common Core standards for Middle School. These lessons can be mapped to many other standards as well, including but not limited to environment and sustainability standards. We recommend you review the curriculum and find natural alignment with standards relevant to your classroom. We've included the following standards as examples of the types of standards that are fulfilled by these lessons. For more information on standards that neatly match with garden content check out LifeLab's resource: https://lifelab.org/content-standards/.

Next Generation Science Standards:

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Common Core State Standards:

CCSS.ELA-LITERACY.SL.8.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher- led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Assessments: This lesson set includes a number of formative assessments within the lesson plans. Suggestions for summative assessments are included below.

Formative assessments allow you to get a sense of what students are learning and experiencing. Each lesson asks students to complete a worksheet or answer a set of questions. These worksheets and answers can serve as your formative assessments and evidence of student work.

Summative assessments. As this is a short lesson set, we have not included a summative assessment. If you wish to include a summative assessment, here are some suggestions for ways you could create one:

- Students can label a plant of their choosing from seed to root. Assign specific plants or give students an option to label a plant of their choosing. Direct them to draw the plant parts from seed to root, labeling each part and describing its function.
- Summative assessments for vocabulary learning:
    - Instruct students to use the Know, Sow, Grow Vocabulary worksheet as a study guide for vocabulary-based games. There are a number of great online platforms like Kahoot or Jeopardy Labs that offer fun ways to create games.
- Create garden-based, problem-based learning activities.
    - Problem-based learning (PBL) activities is a student-centered approach to learning in which students are presented a problem to solve for. Consider framing a summative assessment using a PBL. Check out our reference section for references to PBL resources.

HOW TO USE THIS LESSON SET

The Know, Sow, Grow lesson set consists of six lessons. All lessons are designed so that they can be taught in person or remotely, even asynchronously. We recommend teaching Know, Sow, Grow in the sequence described below as later lessons build on concepts and vocabulary taught in earlier lessons. We also recognize that every teacher is their own best lesson planner and encourage users to adapt, excerpt, and expand on these lessons to fit the needs of their students.

Lesson 1: Seed Parts and Sprouting Starts
Student Outcomes: Students will...

- Understand the difference between dicots and monocots.
- Identify four seed parts; the seed coat, endosperm, and embryo.
- Begin to understand the function of the various seed parts.
- Successfully germinate seeds.

Lesson 2: Root Investigations
Student Outcomes: Students will...

- Understand the difference between primary roots and secondary roots
- Identify key functions of roots

Lesson 3: Discovering Flowers

Student Outcomes: Students will...

- Identify four flower parts; the peduncle, receptacle, sepal, and petal.
- Use their senses to make observations.
- Begin understanding how function informs structure in flowers.

Lesson 4: Create Your Own: Planter Box

Student Outcomes: Students will...

- Understand why both drainage and irrigation are important for plant health
- Identify various sources of organic plant fertilizers
- Build their self-efficacy in gardening
- Practice following a multistep procedure

Lesson 5: How to: Read a Seed Packet

Student Outcomes: Students will...

- Practice reading and analyzing visual and information-dense text.
- Identify the life cycles differences between annual, biennial, and perennial plants
- Learn key vocabulary related to starting plants

Lesson 6: How to: Direct Seed

Student Outcomes: Students will....

- Practice following a multistep procedure
- Build their self-efficacy in gardening

Teacher Notes:

- All of the lessons in Know, Grow, Sow introduce students to basic plant anatomy. If more science-rich lessons are needed, we encourage you to teach these lessons as introductions or openers to lab-based science lessons.
- For sections that instruct students to READ, you can record yourself reading aloud and send it to students. Direct them to read along with the recording. This is a helpful strategy for differentiating learning that supports all students, especially English Language Learners. The READ sections can also serve as talking points for teachers if the lesson is being taught in person.
- We have prepared a number of worksheets and suggest a couple of resources to support students with vocabulary learning. Throughout the lesson set we offer a number of strategies adapted from Marzano (2004) six steps for vocabulary learning: explain, restate, show, discuss, refine and reflect, and apply.

Lesson Extensions: We have a number of lessons that would be wonderful extensions to the learning in Know, Sow, Grow lesson set.

- Exploring Nature in your Home. This lesson is a great ice-breaker for a distance learning classroom and introduces students to using their observation skills and noticing their surroundings.
- Making Seed Balls: This is a great family friendly lesson that engages students in a different form of direct seeding. In this lesson, students will learn how to make seed balls to spread the beauty of flowers any place plants will grow.
- Create Your Own: Any Organic Green Pesto: This lesson offers a great way to connect garden-based learning into the kitchen. As a flexible recipe, any greens pesto utilizes whatever greens are available. You can encourage students to plant greens in their planter boxes and ask them to make this recipe once their plants reach maturity.
- Growing from Food Scraps: This lessons explores growing food from food scraps and offers another way to learn how to garden with very little tools and supplies.

Technology Support Documents: These "How to" guides walk you through commonly used distance learning platforms, sharing features that can be used to host synchronous and asynchronous classes.

- How to: Use QR Codes. QR codes can be a useful tool for facilitating creative and exploratory activities, both in person and remotely.
- How to: Use Zoom. Zoom is a video meeting software that allows large groups to come together at a distance. It is a useful tool to hold synchronous discussions, present information, or conduct group activities.
- How to: Use Padlet. Students and instructors can use Padlet to post images, links, and text to a shared page, allowing participants to add something unique to a collective learning experience.