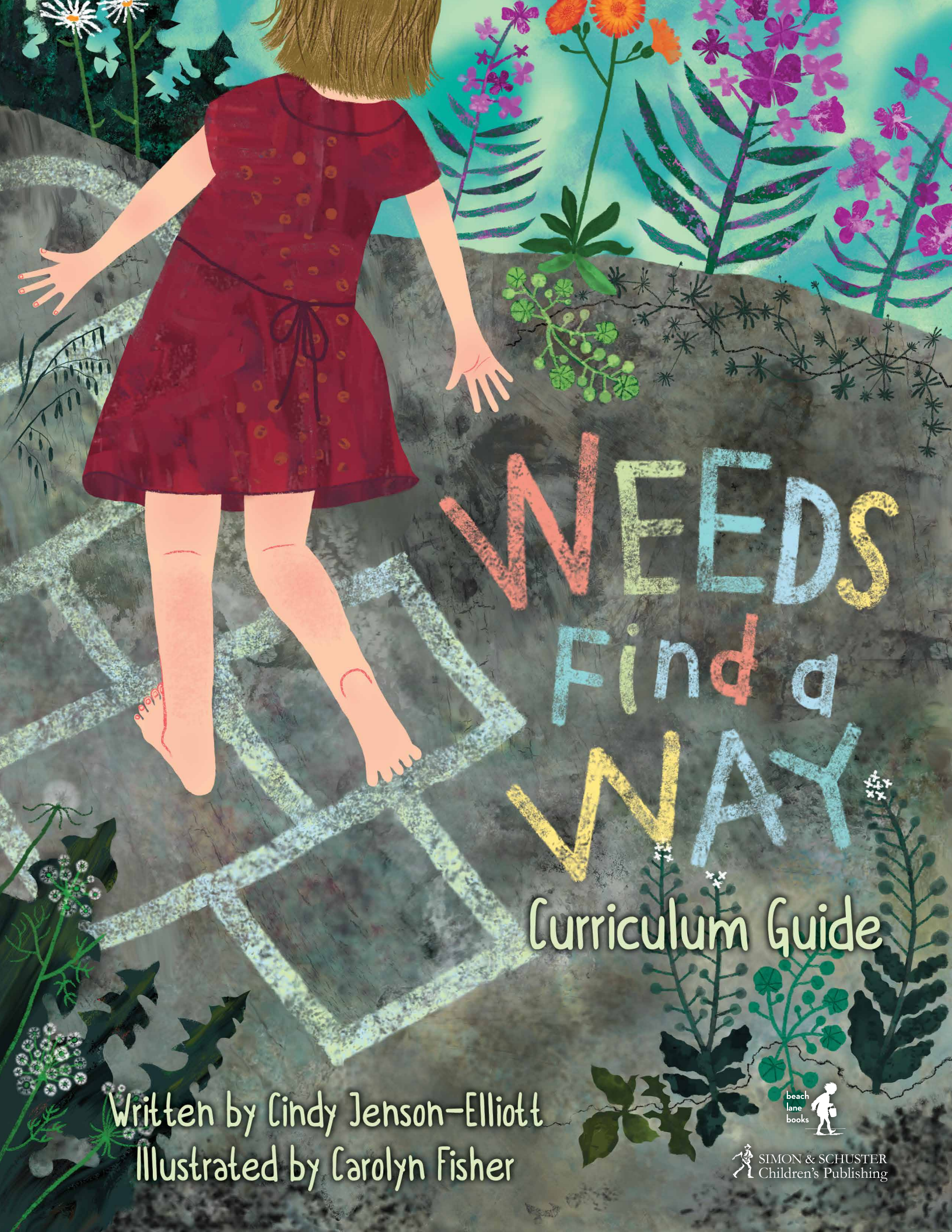
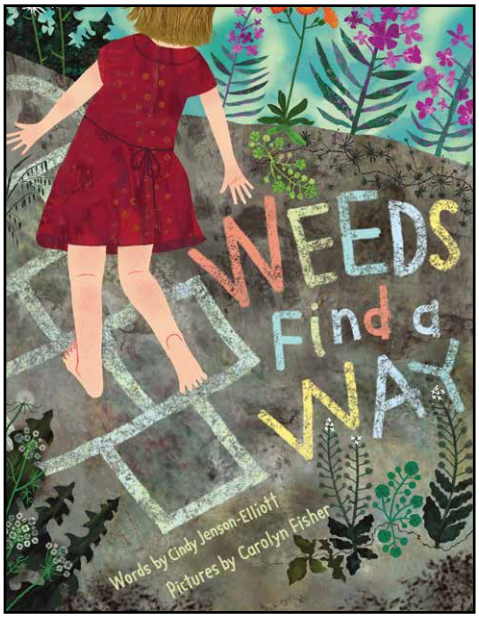


Curriculum Guide

Written by Cindy Jenson-Elliott
Illustrated by Carolyn Fisher

beach lane books
SIMON & SCHUSTER
Children's Publishing

Introduction: Weeds! Coming Soon to a Field Near You!



Weeds are everywhere. We find them in urban, suburban, and rural areas, on our schoolyards and streets, in our backyards and vacant lots, in wilderness areas far from people or as near as our own back door. Weeds pop up where we least expect them. And there lies their true talent: adapting to whatever situation they find themselves in.

Weeds can be used to teach just about any subject in just about any place. This guide will help you get started using weeds as one of nature's most accessible, free teaching resources, available to everyone everywhere, and coming soon to a field near you!

Weeds are also an excellent way to get children involved in the natural world. Even in urban areas with little access to nature, weeds find ways to thrive. What else lives in our urban environments? Where is nature finding a place? Use weeds as a jumping off point to explore these questions.

This Curriculum Guide contains activities that can be used, with modifications, for grades K–8. Some pages contain ideas that can be expanded to create a lesson, while others are complete lessons. Each lesson is geared to meet relevant Common Core (CC) and Next Generation Science Standards (NGSS), and is formatted in a Seven-E format—Engage, Explore, Explain, Elaborate, Express, Evaluate, and Exhibit.

Do you have some great ideas for using weeds to teach? Do you like what you have read, or want more information about how to use weeds in and out of the classroom? Visit my website at CindyJensonElliott.com and send me an email. Let's keep our ideas spreading like—you guessed it—weeds!

With warm, weedy wishes,
Cindy Jenson-Elliott

Preschool–Grade One

Art Ideas:

1. Go outside and draw some weeds. Bring different types of media—markers, crayons, colored pencils, pastels.

2. Gather a bouquet of flowering and leafy weeds and put them in a vase. Do a still-life drawing inside the classroom.

3. Create a giant dandelion weed using yellow crepe paper gathered into a funnel, and crimped and cut at the top. Use a green pipe cleaner for the stem and green crepe paper for leaves. Create a "gone to seed" dandelion using white pipe cleaners for the fluff and green pipe cleaners for the stem.

4. Experiment with the pigments in the plants themselves. Try smearing the leaves and flowers on watercolor paper. What kind of color do they leave behind?

Math and Science:

1. Find some weeds growing in a patch in the schoolyard or a nearby nature area. Count how many weeds there are of different varieties within a square meter. Are there any animals that live there, too? Use a magnifying glass or hand lens to find out. Count them, too.

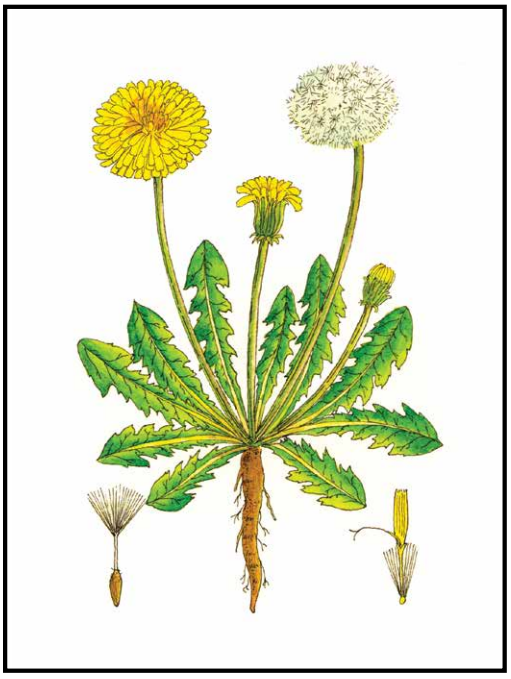
2. You're growing like a weed! How fast do weeds grow? Draw a picture of a weed in the schoolyard. Measure it. How tall is it or how big across? Measure the same plant every week. How much does it grow? Does it ever stop growing?

3. Weed Seed Sock Walk: Go outside in socks and walk around a weedy area. What weeds stick to the socks? Go inside, take the socks off and see what weed seeds your socks found. Make giant models of the seeds out of papier-mâché or clay.

Language Arts and Social-Emotional Learning

Read *Weeds Find a Way*. Ask students to tell you how they find a way to do things that are difficult to do (See the "I Find a Way" activity). Write down their words and have them draw a picture of something they have done that was hard to do.

Botanical Drawing



Botanical Drawing of a Dandelion
Artist: Mayumi Terao
Date: 6/30/08
Source: iStockPhoto.com

Subject Area: Science, Art
Grades 1–8
NGSS

Lesson Introduction

Long before the camera was invented, scientists such as John James Audubon and Charles Darwin drew pictures of the things they wanted to study. Drawing helped them **focus** closely on their subject and really **notice details**. Their drawings became data—records of what different kinds of animals and plants looked like at a particular time in history.

Materials

- Pencil
- Garden journal or paper and clipboard
- Worksheets
- Hand lens (magnifying glass)

Engage

Read *Weeds Find a Way*. Notice how artist Carolyn Fisher painted pictures of each different weed. Notice how Fisher painted the dandelion on the inside cover or on the "Meet the Weeds" section in the back.

Pick one or more dandelions or another weed and bring it into the classroom.

Put the plant on the document camera, or share with groups of two to four students. Have them look closely at the dandelion and notice details. Share the details.

Explore

1. Ask students to draw a picture of the dandelion on paper (five minutes).
2. When they are done, pass out the Botanical Drawing worksheet on page six.
3. Have students notice the differences between the two pictures—a botanical drawing and Fisher's painting of a dandelion. Ask them, what is the same and what is different about the two depictions of the dandelion? Use the Venn diagram on page five to record their ideas.

Botanical Drawing

Explain

The goal of botanical, zoological, and other scientific drawings is to create an accurate representation of something in great detail, and from all angles, often with measurements.

A botanical drawing is data, not art, but can still be beautiful. Picture book illustration, on the other hand, is art and is meant to be a beautiful way to illustrate a story or idea.

Elaborate

Ask students to look closely at the botanical drawing of the dandelion. What details did the artist include? (Possible answers: shape of leaves, shape and texture of flowers, shading, life stages—new blossom, full bloom, gone to seed.)

Express

Pass out Botanical Drawing Worksheet (or do this on back of flower worksheet) on page six.
Tell students they will be making a botanical drawing of a dandelion, with as much detail as possible (twenty minutes or more). If you choose, have students make two to three drafts of drawings, with critiques in between to refine the process.

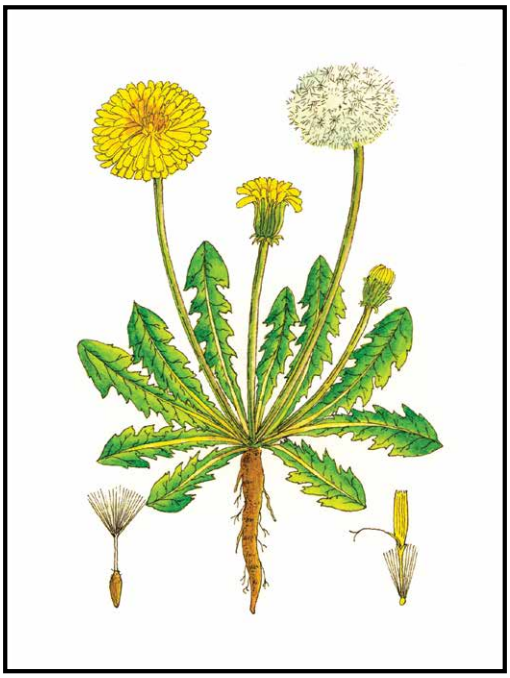
Evaluate

1. Walk around and check on students' progress and detail.
2. Museum Walk:
   Model how to critique a drawing in a way that is helpful. Notice things such as the shape of leaves, what details are left out, etc. Tape pictures up around the room and have students walk around to view each other's drawings. Using Post-it Notes, have students leave kind but helpful comments on each other's drawings. Or do the critiques as a group, and ask for a student volunteer to show their work.

Resources on critiquing scientific drawing:
Vimeo.com/38247060

Venn Diagram

Compare and contrast Carolyn Fisher's drawing of a dandelion from *Weeds Find a Way,* and the antique botanical drawing below.



Source: iStockPhoto.com

Weeds Botanical Drawing Worksheet

Draw your weed below in a Botanical Drawing style, using details to record the size, shape, texture, and color of the roots, stem, leaves, flower, seeds, and/or fruit.

Weed Adaptations: Parts of a Plant

Science: NGSS: LS1-A

Adaptations are adjustments in the structure, function, or behavior of an organism over time that help it survive in a particular environment. Explain that we will be looking at weeds to understand the adaptations that help them survive in a particular place.

Engage:

Bring in a weed from the schoolyard and examine it as a class. Ask: What does a weed need to be able to do to survive, and to ensure that its offspring survive? (Possible answers: spread seeds, avoid being eaten, avoid being pulled out, reach the sun, and get water.)

Ask students to look carefully at the weed. What helps this weed spread its seeds? What helps the weed avoid being pulled out? What helps the weed stand tall and reach the sun? What helps the weed avoid competition with other plants?

Read ***Weeds Find a Way***
Find lines that explain the ways weeds have adapted to survive and thrive in the following ways:

Spreading Seeds:

"Fluffing up like feathers and floating away on the wind,
Swirled into prickly burrs that stick to socks and fur;
Poking into pants and paws like tiny needles;
Shot out of tight, dry pods like confetti from a popped balloon."

Staying in the Ground:

"Weeds find a way to stay,
Reaching deep with a grip so strong
The stem always breaks first,
Or pinching into pieces
The minute you try to tug them out,
Spreading a spray of plant parts
That find new spots to take root."

Fighting for Their Lives:

"Hooking tender skin with horny thorns,
Stinging unsuspecting tongues with invisible prickles,
And surprising hungry insects
With sap so tart it could turn a tongue inside out."

Weed Adaptations: Parts of a Plant

Explore:
Go outside into the schoolyard, school garden, neighborhood, or nearby nature area. Find a patch of weeds. Have students each pull a weed. Have them notice their difficulty removing the weed. How has the weed adapted to avoid removal?

Bring the weeds back inside. Try to include roots, stems, leaves, flowers, and/or seeds.

Explain:
An adaptation is a physical quality or behavior (for animals) that helps a living thing survive in a particular place. Adaptations are specific to place because the qualities needed to live vary from place to place. For example, a polar bear blends in with Arctic snow, but would be very visible in a dark forest.

Elaborate:
Look over some examples of weed adaptations as a class. Have students come up in pairs to explain what happened when they tried to pull their weed. What adaptation does the weed have? Discuss as a class. Extension: Make a chart of weed adaptations.

Express:
In your garden notebook or on the worksheet on page nine, make a detailed botanical drawing of your weed. Draw and label the roots, stem, leaves, flower, fruit, and seeds of the plant if possible.

Evaluate:
Circulate around the room, making sure students have added details to their drawing and explained how each plant part played a role in helping the plant adapt.

Exhibit:
Post students' drawings for other students, parents, and the school to see, either on a bulletin board or online.

Weed Adaptation Drawing

Draw a weed below. Make sure to include all the parts of your plant:
roots, stem, leaves, flowers, fruit, and seeds. Include as much detail as possible to show how the parts of the plant are adapted for survival.

EncycloWeedia—an Encyclopedia of Weeds

Science—Life Science
NGSS Standard LS 3-1, 3-2
English Language Arts:
Common Core Writing
Nonfiction Text
Type

Materials:

- Weeds—one per child—from schoolyard, school garden, or nearby nature area
- Paper, pencils, rulers, or measuring tape
- Worksheets
- Hand lens (magnifying glasses)
- Research resources: iPads, computers, or plant identification books
- Digital camera (optional)

Engage

Read *Weeds Find a Way*. Show students that there is a section called "Meet the Weeds" at the back of the book, with information about each weed that was featured. Tell them that Meet the Weeds is a short description of weeds with only a few details.

Ask what the book tells us about where we might find weeds:
"In the smallest, strangest place,
They could possibly live—
By the side of a windy road;
In a crack in the cellar
Of a creaky old house;
In a tangle of tree roots
At the top of a spine of stone
On the tallest peak in a mountain range;
Wedged in the worn sole
Of a tourist's tattered sneaker.

Explain that we are going outside into the schoolyard to look for weeds, using a Weed Discovery worksheet. Go over what is on the worksheet.

Explore (Outside)

Take students out into the schoolyard, garden, or nearby nature area to observe the landscape. Which plants were purposefully planted by the maintenance staff? If you are in a nearby nature area, is it possible to identify which are native plants and which are invasive? In the garden, which plants are growing by themselves in unusual places, looking out of place? Those are the weeds.

Have students choose a weed to study. If possible, make sure students choose a wide variety of weeds to write about, and not all the same type.

Optional: Take a picture of their chosen weed. Use the Weed Discovery worksheet to help students write and draw observations of their weeds. When they are done, have students dig up their plants and come back to the classroom.

Explain (Inside)

Have students share their observations with the class. What did students notice about where the weeds lived? What was the strangest place they found a weed living in? What did students notice about weed shape and size?

Elaborate

Explain that students will be researching weeds using their EncycloWeedia worksheets. Then they will be writing an encyclopedia entry for their weed. When everyone is done, all the entries will be collected in a weed encyclopedia—an EncycloWeedia that the school will be able to use as a guide to the weeds that are growing in your schoolyard, garden, or nearby nature area.

Use the following resources to identify the weeds and find information about them.

- http://wssa.net/weed/
- https://www3.ag.purdue.edu/counties/marion/Pages/WeedIdentification.aspx
- http://www.bhg.com/gardening/pests/insects-diseases-weeds/types-of-weeds/
- http://www.resilience.org/stories/2012-11-05/the-vegetables-anyone-can-grow-edible-weeds
- http://www.ncwss.org/info/weedncwss.pdf
- http://wssa.net/weed/intriguing-world-of-weeds/

Express

After students have filled in the research on their weed on the EncycloWeedia worksheet, have them create a final draft EncycloWeedia entry for their weed, including all of the information on their worksheet, with a photograph and/or detailed drawing. Have one student create a cover with a picture and the words EncycloWeedia of _____ School.

Evaluate

Formative Assessment: Circulate around the room to assist students during the research, writing, and drawing processes to clear up misconceptions.

Exhibit

When the EncycloWeedia is completed and bound together as a book, give a copy to the school library, or make the book available to other teachers, families, and classes throughout your school.

Weed Discovery Worksheet

Draw your weed above.
Where is it growing? Draw what is around it. Include lots of details of both the weed and the setting.

My weed is located _____

Draw the stem:

Measure and describe the weed's stem: size/length, color, texture, woody or soft, stiff or floppy.

Weed Discovery Worksheet

Draw the leaves and roots:

Measure and describe the weed's leaves and roots: size/length, color, texture, waxy or soft, stiff or floppy, jagged or smooth edges, multiple leaves (like a feather) or singular.

Draw the flower, fruit, and/or seeds:

Measure and describe the weed's flower, fruit, and/or seeds: size/length, color, texture, number and shape of petals, and center of flower.

Other details: scent, "milk," or other qualities.

Weed Common Name: _____

Weed Scientific Name: _____

Weed Photo:

Weed Drawing:

Description of weed:

Where this weed grows—what habitat and what parts of the world:

Where did this weed come from originally?

Uses and precautions for the weed:

Interesting facts about this weed:

Weeds Poetry

Description
Detail
Figurative language
Sensory language

Grades 1–8
English Language Arts:
Common Core Writing
Narrative and Informative
Text Types

Materials

- Weeds in schoolyard, garden, or nearby nature area
- Paper
- Pencils
- Worksheets
- Hand lens (magnifying glasses)
- Research resources: iPads, computers, or plant identification books
- Art materials—paper, pastels, crayons, markers, paints, colored pencils, etc.

Like many picture books, ***Weeds Find a Way*** is a poem that is stretched out into a book, and illustrated.

Engage (Inside)

Read *Weeds Find a Way*, focusing on its qualities as a poem.

Explain

Poets use **figurative language** to create the imagery in their poems.
Figurative language is language that helps us visualize an image.

Explore

Explore *Weeds Find a Way* for Figurative Language:

Alliteration—using the same sound at the beginning of words close to each other.
Example: **W**eeds find a **W**ay

Find other examples of alliteration in *Weeds Find a Way*:

_____

_____

Assonance—Repetition of a vowel sound in words close together.
Example: Weeds find a way to live where other pl**ants can**'t grow.

Find other examples of assonance in *Weeds Find a Way*:

_____

_____

Weeds Poetry

Sensory language—words that describe how something looks, feels, smells, tastes, or sounds.
Example: " . . . sap so tart it could turn a tongue inside out."

Find other examples of sensory language in *Weeds Find a Way*:

Explore and Elaborate (Outside)

Go outside to observe weeds in the schoolyard or nearby. Using the Weed Words Worksheet, write down one thing you notice with your eyes, ears, nose, and sense of touch. Do not taste the weeds!

Brainstorm sensory words that describe the weeds and setting.

Express (Inside)

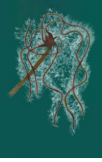
- Share what students noticed about weeds with their senses.
- Share sensory word brainstorm ideas.
- Brainstorm as a group words that display alliteration and assonance, and write them on the board for all to see and use.
- Write a poem about weeds in your schoolyard or neighborhood. Use alliteration, assonance, and sensory language to help readers visualize the plants and where they live.
- Use the Weed Poem template on page nineteen for younger students.
- Draw a colorful picture of each weed or of the environment in which they grow.

Evaluate

Outside, circulate among students as they observe weeds, and inside, circulate as they begin to write their poems.

Exhibit

Share weed poetry and pictures with your school on a bulletin board or online on a class blog.



Weed Words Worksheet

Observe weeds using all of your senses. Write down what you notice, using as many details as you can.

Touch:

What does the weed feel like?

What does the weed look like?

What does the weed smell like?

What does the weed sound like? (Is it silent, or does it rustle in the wind?)

Sensory Word Brainstorm:

Write down sensory words that help readers visualize your weed and its environment.

Write a poem about your weed below. Use sensory language, alliteration, and assonance.

Grades 1–8
Social-Emotional Learning
English Language Arts
Common Core Informational and Narrative Text Types
Poem/Personal Narrative/Autobiographical

Engage

Read *Weeds Find a Way*, looking for ways in which weeds display qualities that we admire or would like to emulate.

Brainstorm qualities of weeds and write them on the board, asking students to give examples from the book and from their own lives about what these qualities mean.

Perseverance
Beauty
Grit
Adaptability
Patience
Creativity
Generosity
Assertiveness
Cooperation

Using *Weeds Find a Way* as a mentor text, have students create their own "I Find a Way" book (younger students) or poem (older students), a group poem, or a personal essay (older classes) about their own weedlike qualities.

Optional: Go through the poem and template line by line, and let children fill in their own details and information.

When students have completed the template, have them write their final poem on another piece of paper.

I Find a Way Poem Template

Use this template to write the words you will use in your poem. When you are done, check in with your teacher, and write a final draft of your poem on another piece of paper.

Mentor text example:

Weeds find a way to live where other plants can't grow.

My example:

I find a way to _____ where/when other _____ can't _____.

Mentor text example:

Weeds send their seeds out into the world in wondrous ways.

My example:

I _____ into the world in _____ ways.

Mentor text example:

Fluffing up like feathers that float away on the wind.

My examples (three):

_____ _____ like _____ that _____.

_____ _____ like _____ that _____.

_____ _____ like _____ that _____.

Mentor text example:

Weed seeds wait until clouds billow and soft rain spills.

My example:

I wait until _____ _____, and _____ _____

_____.

I Find a Way Poem Template

Mentor text example:

Weeds find a way to stay...

I find a way to _____,

My examples (three ways that you persevere):

_____ _____ _____ _____ that _____ _____ _____ _____,

_____ _____ _____ _____ that _____ _____ _____ _____,

_____ _____ _____ _____ that _____ _____ _____ _____,

Mentor text example:

Weeds find a way to fight...

I find a way to _____

My examples (three ways that you are assertive and stick up for yourself):

_____ _____ _____ _____ that _____ _____ _____ _____,

_____ _____ _____ _____ that _____ _____ _____ _____,

_____ _____ _____ _____ that _____ _____ _____ _____,

Mentor text example

Weeds find a way to be loved...

My examples
I find a way to be loved...

My examples (three ways you are loved):

_____ _____ _____ _____ that _____ _____ _____ _____,

_____ _____ _____ _____ that _____ _____ _____ _____,

_____ _____ _____ _____ that _____ _____ _____ _____,

Guide provided by the author.