Cancer Treatment Garden

a lesson plan from CancerEd

Grades K-2

Subject: Science

Crossovers: ELA

Topic: Cancer Treatment Options

Links to Other Lessons: Chemotherapy & Blood

Description: Students will use the analogy of a garden to learn about cancer. Just as weeds grow and can spread throughout a garden and make the garden unhealthy, cancer cells can grow and spread throughout a human body and make the body unhealthy. Just as weeds need to be removed from a garden, cancer cells need to be removed from the body. Just as there are better treatment options depending on the type and amount of weeds in a garden, there are different treatment options for various cancers.

Time Required: 30 minutes

Background Information (for Teacher): Review the *Treatment Options* backgrounder for teachers.

Prerequisite Knowledge (for Students): Students must be familiar with the basic needs of a garden before this lesson. Students should also have a basic understanding of cancer: they should understand DNA, mutations, and how cancer cells can begin to form. It would also be helpful for students to understand that cancer cells divide rapidly (the *Cells & Cell Division* lesson plan should be taught prior to this one).

Learning Objectives:

Students will…

- Explain how cancer in the body is similar to weeds growing in a garden.
- Explain various cancer treatment options.

Realize the importance of detecting cancer before it has spread to other parts of the body.

Standards Addressed: see end of document

Supplementary Materials:

- *Garden 1* handout
- *Garden 2* handout
- *Garden 3* handout
- *Garden 4* (to be filled in) handout
- *Garden 4* (complete) handout

Classroom Materials:

- Crayons/colored pencils

Preparation & Setup: Print enough copies of each garden for each student.

Lesson Opener:

This lesson is intended to introduce students to cancer treatment options using the analogy of weeds in a garden.

Ask students if they (or someone they know) have a garden. Discuss the work that goes into tending a garden: watering, weeding, fertilizing, etc. Ask students to share what things make a garden healthy (sunlight, healthy plants, water, soil, etc.). Ask students what make gardens unhealthy (weeds, animals, etc.)

Development:

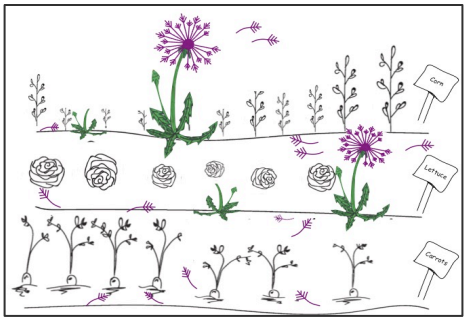
Activity Description:

Part 1: Unhealthy Gardens

Show students a picture of the healthy garden (*Garden 1*) and a picture of *Garden 2*. Ask students to think about what's different in *Garden 2*. Instruct students to share their ideas.

> *One has a weed in it and one does not.*
>
> *The garden with weeds has smaller plants. (This is because the weeds steal the nutrients from the healthy plants)*

Then, show students a picture of *Garden 3* with a mature dandelion. Explain that as dandelions mature, their flowers turn into seeds, and these seeds can fly in the wind and spread all over the garden, causing new dandelions to grow. This is very unhealthy for the garden.



Invite students to think about what the garden might look like after awhile if nobody took care of it. Pass out copy of *Garden 4* (to be filled in) to students and have them complete the garden with weeds and plants. Their gardens should have multiple weeds and seeds throughout the garden and should look similar to the picture on the right:

Part 2: Cancer and Weeds

Next, explain to students that gardens are a lot like our bodies. Show students the picture of the healthy garden (*Garden 1*) and explain to them that the healthy garden represents our healthy bodies. Then, show students the picture of *Garden 2*. Explain to them that the weed in the garden represents a tumor in a person who has cancer. Tumors can steal nutrients from other tissues, just like weeds can steal the nutrients from the surrounding plants.

Next, show students the picture of the *Garden 3*. The weed represents the tumor and the seeds represent the cancer cells. Just like the seeds can spread all over the garden, cancer cells can spread all over the body, and just like those seeds can form weeds of their own, cancer cells can divide and form tumors in other parts of the body too. The *Garden 4* that the students drew represents cancer that has spread and formed tumors all over the body. Cancer must be treated *before* it gets to this point.

Part 3: Cancer Treatment

Go back to *Garden 2*. Ask students how they could treat the garden (i.e. what could you do to get rid of the weed?) *You could pull it!* Pulling weeds is very similar to cancer patients having surgery to get rid of their tumors.

Now look at *Garden 3*. Again, ask students how they could treat the garden. Could you still pull the weed? *(Yes)* Is that enough? Why or why not? *No, because the seeds have spread all over the garden, and they're too small to see and pull out.* What could we use instead to make sure we kill all weeds and seeds in the garden? *We could spray the garden with weed killer.* This chemical is like chemotherapy in a cancer patient.

In our gardens, weed killer will destroy plants that are dividing and growing very quickly (like weeds). Because of this, you might accidentally kill some healthy plants in your garden when you spray weed killer. This is similar to chemotherapy. Chemotherapy is medicine that kills *cells* that divide quickly, (like cancer cells). Cancer cells aren't the only cells that divide quickly, though. There are other cells in the body that divide quickly.

Ask students if they can think of cells that divide/grow quickly. (Tongue cells, hair cells, stomach cells, blood cells etc.). Draw in these areas on the body outline. Explain to students that chemotherapy can kill those healthy cells too. Draw X's on the cells that are killed by chemotherapy. Ask students to think about what might happen when these cells are killed.

> *Their hair might fall out.*
> *Food might taste funny.*
> *They might have a tummy ache.*
> *They might feel really tired.*

Closure:

Ask students some questions for review:

How are weeds like tumors?
What are the two treatment options for cancer that we talked about? (Chemotherapy and Surgery)
Why did we have to use weed killer when the weed had spread seeds all over the garden?

Why isn't chemotherapy always the best treatment option? Why isn't surgery always the best treatment option?

Assessment:

Assess student understanding based on participation and responses during the closure part of the lesson.

You could also assess student understanding by having them draw a picture of someone receiving one of the types of treatment and how that person would feel after receiving treatment.

Further Exploration:

You could invite students to think of what would make a treatment option better for cancer patients: what kinds of qualities would it have? *(It kills only cancer cells, it doesn't affect healthy cells, it's very specific, has no side effects, etc.)*

Additional Resources:

AmerraMedical: Colorectal Cancer Surgery 3D Medical Animation https://www.youtube.com/watch?v=CtJtOe_UABc
A video for teachers to learn more about what the process of removing a tumor via surgery is like.

St. Louis Children's Hospital: Kids Talk to Kids About Cancer: Getting Chemotherapy, Losing Hair and the Central Line https://www.youtube.com/watch?v=N1BwKHZjbc0
Kids with cancer talk about their treatment experience with chemotherapy.

FoundationMedicine: Cancer Explained https://www.youtube.com/watch?v=UwbuW7oK8rk
A video explaining cancer and how it can be treated.

Immunotherapy is another treatment type of cancer treatment, but the lesson does not go into detail describing that specific treatment. For more information, the American Cancer Society explains immunotherapy in greater detail: http://www.cancer.org/treatment/treatmentsandsideeffects/treatmenttypes/immunotherapy/immunotherapy-what-is-immunotherapy

Questions or Comments?

Please contact us at: info@CancerEd.org

Standards Addressed:

Next Generation Science Standards K-2	
Practices	*Practice 1: Asking Questions and Defining Problems* • Ask questions based on observations to find more information about the natural and/or the designed world(s). *Practice 2: Developing and Using Models* • Distinguish between a model and the actual object, process, and/or events the model represents. • Develop an/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s). *Practice 3: Planning and Carrying Out Investigations* • Make predictions based on prior experiences. *Practice 4: Analyzing and Interpreting Data* • Use and share pictures, drawings, and/or writings of observations. *Practice 6: Constructing Explanations and Designing Solutions* • Generate and/or compare multiple solutions to a problem. *Practice 8: Obtaining, Evaluating, and Communicating Information* • Communicate information or design ideas and/or solutions with others in oral and/or written forms using models, drawings, writing, or numbers that provide detail about scientific ideas, practices, and/or design ideas.
Core Ideas	*ETS1.B: Developing Possible Solutions* • Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.
Cross Cutting Concepts	*Scale, Proportion, and Quantity* • Relative scales allow objects and events to be compared and described (e.g., bigger and smaller; hotter and colder; faster and slower). *Energy and Matter: Flows, Cycles, and Conservation* • Objects may break into smaller pieces, be put together into larger pieces or change shapes *Structure and Function* • The shape and stability of structures of natural and designed objects are related to their function(s).
Common Core State Standards	
ELA/Literacy	• *SL.K.1* Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups • *SL.1.1* Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups • *SL.2.1* Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups