Overview: Food Waste

3 Topics, 12 Lessons

Note to teacher/site director:

1. Plan to reach out to Pete Stadig from Keep Nebraska Beautiful. He is a statewide partner who has resources to assist after school programming. | Stadig | Program Manager | Keep Nebraska Beautiful Materials Exchange Program | Food Waste Reduction Program
   pstadig@knb.org | 402.486.4622 | www.knb.org

2. Plan to call upon the local, state and community partners identified in iten 9 on page 2. We suggest that you contact potential partners early so that they can prepare to assist your activity.

3. There are additional resources here for use with this unit.
   a. Food Supply Game, a PowerPoint presentation
   b. Farmer's Market Packet
   c. Food Prdict dating .pdf
   d. Two soil texture .pdfs

Each lesson below is a 45-minute session that starts with a "setting the stage" question for whole group or small group input followed by a short (3-5 minute) video that further sets the stage. Then, students will work as a team or individually to complete an activity related to the topic at hand. Reflections follow activities. Those can be oral, written, or podcasty or some combination of all the above. Many activities have suggested enrichment components.

Unit Topics

1. **Topic 1 –What is Food?**
   - Lesson A – Food Energy
   - Lesson B – Food Waste Journal
   - Lesson C – Peter Piper Pickling
   - Lesson D – Fridge Friends

2. **Topic 2 –What is Farm to Fork?**
   - Lesson A – Where does food come from?
   - Lesson B – Sustainable vs. Industrial Farming
   - Lesson C – Farmers Market Magazine
   - Lesson D – Food Waste Policy

3. **Topic 3 –What is Food Waste?**
   - Lesson A – Healthy Food = Healthy Soil
   - Lesson B – Food Energy Pyramid
   - Lesson C – Trust Your Senses
   - Lesson D – Don't Waste Your Waste

Overview: Food Waste

3 Topics, 12 Lessons

4. Local, Community and State Partners:

- For Topic 1 –Local Nutritionists, Local Canning Groups, a grandparent,
- For Topic 2 – Local Farmers, Gardeners, Chef, School's Head Lunch Lady
- For Topic 3 – Local Recycling Facilities, Food Banks, Restaurants, Local Government Officials

5. State, local, and national standards are listed for each lesson:

In the footer of each lesson, you will find the standards that each lesson addresses at these levels.

- Nebraska Academic Standards
- College and Career Ready Standards
- National Standards Benchmarks for Science Literacy
- Next Generation Science Standards Grade Level Disciplinary Core Ideas

This unit addresses these standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 1 LA - Food as Energy

Big Question:

What do we really know about our food?

Set the Stage:

You know how cars need gas as fuel? We humans also need fuel so that we can be healthy and happy – and our fuel is food! This activity will look at how much energy is in food and how we can measure the energy present. ***ASK -*** How much energy is in **YOUR** food? https://www.youtube.com/watch?v=4ljg7GTMeRU, 2 minutes, 39 secs. Who do you think will win this race?

Resources:

Play the video one minute and 7 second video on creating a healthy trail mix. https://www.youtube.com/watch?time_continue=6&v=G53Fwi7t6MI&feature=emb_logo

Activity:

Procedure:

- Today, we are going to make a healthy trail mix!
- You can work in teams or on your own.
- Wash your hands
- Using the Trail mix items and amounts, make your own trail mix
- Sample the mix
- Give it a name!

Reflection

To communicate their observations: "I saw…"
To reflect on diversity of what they found: "I thought…but then…"
To demonstrate science community skills: "I liked…" or "loved…"

Materials:

- Computer
- Internet
- URLs noted to the left
- Trail Mix items suggested
    - Snack Ziplocs
    - ¼ Cup Almonds
    - 2 T.M & Ms
    - ¼ Cup Dried cranberries
    - 2 T. Raisins
    - ¼ Cup Cereal Squares or circles
    - Measuring cups
    - Measuring spoons

Standards:

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NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Food Waste Journal

Big Question:

What are we wasting and when? What can we do to waste less?

Civileats.com

Set the Stage:

About 40% of food in the United States goes unused and almost half of that is from individual people wasting food. In order to stop and prevent waste, it is important to know what we are wasting and why. In order to do that, lets create a food waste journal.

Resources:

https://net.pbslearningmedia.org/resource/930d15c4-5137-46f3-a9d8-39b8cd8d27f9/930d15c4-5137-46f3-a9d8-39b8cd8d27f9/ OR
https://net.pbslearningmedia.org/resource/ee18-sci-foodwst/kids-go-green-reducing-food-waste/

Activity:

Procedure:

- Watch one of the above videos (the first is for older students, the second for younger). Discuss food waste at home and school.
- Have students create a Food Waste Journal using existing notebooks, three-ring binders, or construction paper and string. Use crafting materials to personalize.
- Include templates of the "Food Waste Log" found below for students to monitor what food is wasted during snack time or even during meals outside of club. Have students share and compare with a neighbor.
- Also include templates or pages for notes from other activities.
- Each week ask groups of 3-4 students to review what was wasted most often, why they think that might be the case, and what happens to those things when they are wasted. Was something wasted with each snack? Did all snacks or meals have plastic packaging? Where does that packaging go?
- In groups of 2-3 and then as a class, have students brainstorm solutions. Consider potential solutions that may be part of other food waste lessons and activities.

Note to Facilitators: Incentives like first to get snacks, choosing snacks, or weekly completions that add up to prizes may help to encourage consistent participation.

Reflection

To communicate their observations: "I found out…"
To reflect on how they can change or have changed: "I used to…but now…"
To demonstrate science community skills: "I liked…" or "loved…"

Materials:

- Computer to watch video(s)
- Notebook, Three-ring binder, OR construction paper and string.
- Art supplies
    - Colored pencils
    - Markers
    - Stickers
    - Etc.
- Templates of "Food Waste Log"
- Extra pages for notes, observations, and predictions from other lessons and activities

Standards:

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NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Food Waste Journal

Landfill
Fruits: ________
Veggies: ________
Grains: ________
Protein: ________
Packaging: ________
____

Date: ______

Recycling & Compost
Fruits: ________
Veggies: ________
Grains: ________
Protein: ________
Packaging: ________
____

Landfill
Fruits: ________
Veggies: ________
Grains: ________
Protein: ________
Packaging: ________
____

Date: ______

Recycling & Compost
Fruits: ________
Veggies: ________
Grains: ________
Protein: ________
Packaging: ________
____

Landfill
Fruits: ________
Veggies: ________
Grains: ________
Protein: ________
Packaging: ________
____

Date: ______

Recycling & Compost
Fruits: ________
Veggies: ________
Grains: ________
Protein: ________
Packaging: ________
____

What items were wasted most?

Were recyclable and compostable items wasted?

Was there less waste than the previous week?

How can you improve next week?

Standards:
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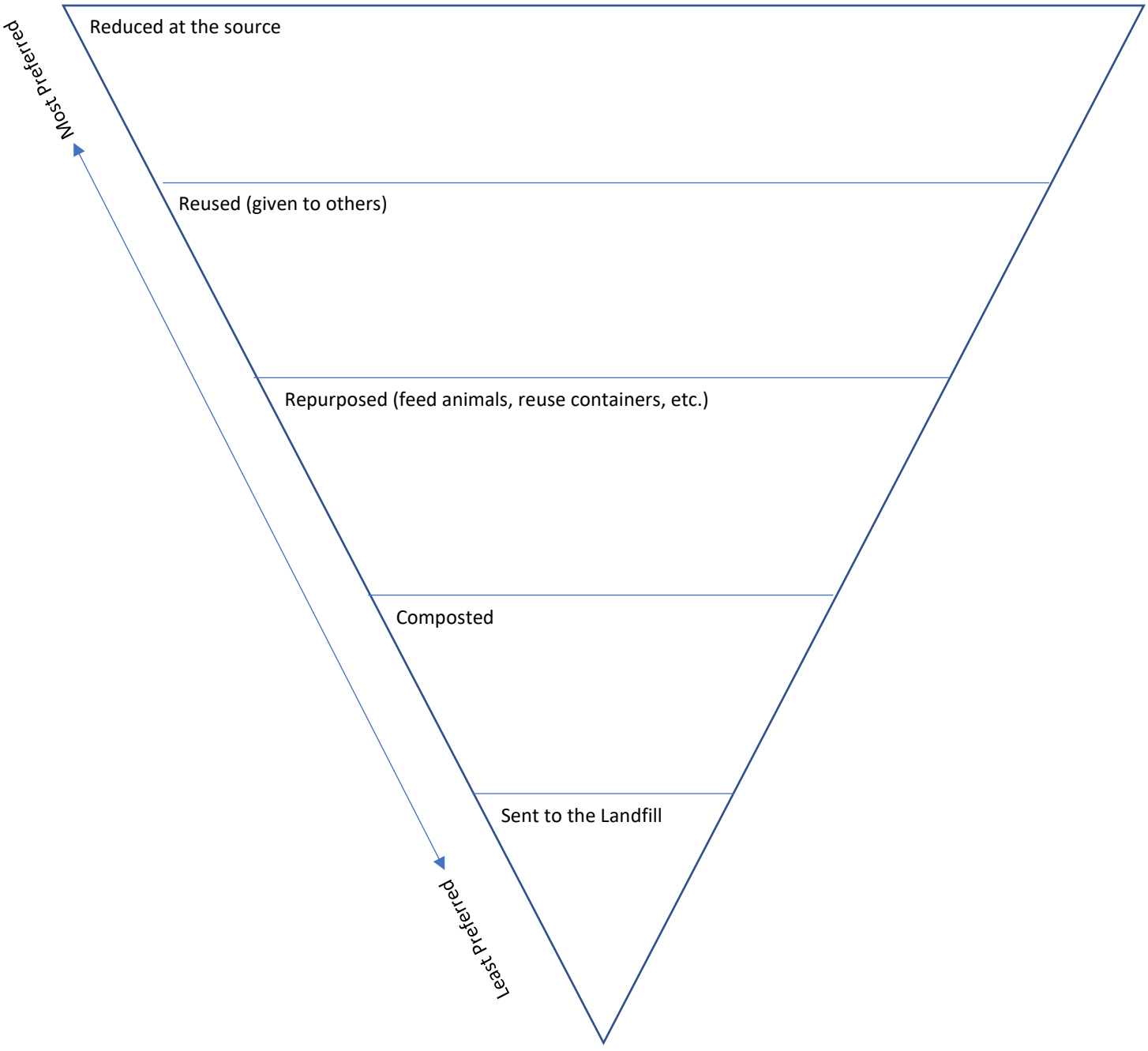
Food Waste Journal

Items that could have been…



Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Peter Piper Pickling

Big Question:

How can you store food and keep it fresh?

Set the Stage:

People have been pickling vegetables and other foods for other 4000 years! After looking into the "Use-By" lesson, let's take a lesson from our ancestors and learn how to store food we know is fresh with herbs and spices out of your own garden.

Resources:

This activity has students reduce food waste by make their own pickles and garden vegetables. https://net.pbslearningmedia.org/resource/he15-hpe-gardens/family-gardens-and-healthy-eating/ https://net.pbslearningmedia.org/resource/cyb12-ugly-food-video/ugly-food-and-food-waste-cyberchase/

en.wiktionary.org

Activity:

Procedure:

- After watching the videos, talk about some reasons people might waste food, even if it is perfectly healthy. Talk about some garden vegetables, herbs, and peppers the first video shows that might be healthier to eat and why.
- Have students wash hands (have instructors cut, chop, or slice different ingredients for younger students).
- Lay out different groups of vegetables, herbs, spices, and other foods you may want to pickle.
- In groups of 2-3 allow students to choose what ingredients they would like to include in their pickle jars. Have them note the quantities and predict different flavors that may result, record these in their food journals and add ingredients and name labels to their jars!
- Fill jars with pre-made brine leaving ½ - ¼ inch on top, seal and then place pickle jars into the fridge and be sure to label each jar with date and group names.
- In 1-2 weeks take jars out and enjoy! (if enough, let students try other recipes)

Note to Facilitators: Have some dish towels ready to clean up some spills just in case!

Reflection

To communicate their observations: "I think… will make the pickles taste…"
To reflect on the food they preserved: "Before the food was…but we changed it to…"
To demonstrate prediction skills: "I expect…" or "think…"

Enrichment – Try new pickling recipes or taste uniquely pickled items like eggs or peppers

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

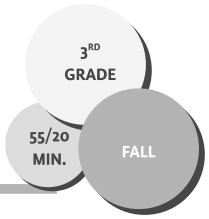
Materials:

- Computer to watch introduction videos
- Food Journals to take notes and write predictions
- Facilitator prepared vegetables, herbs, and brine (1:1 vinegar to water)
- Garden vegetables, herbs, and spices
- Jars with lids (recycled jars encouraged after cleaned!)
- Trays or plates to separate ingredients
- Fridge space to store pickles
- Hand towels to clean up

Peter Piper Pickling

Quick, Pickle That!

THEME: PREPARING HEALTHY FOOD



55 min. (Day One)
20 min. (Day Two)

ESSENTIAL QUESTION

How can we preserve fresh fruits and vegetables?

LEARNING OBJECTIVE

✓ Students will be able to collaborate to make quick pickles.

LESSON DESCRIPTION

In this lesson, students explore the role of preservation in preparing food. In teams, they make customized quick pickles.

MATERIALS

- ☐ Jar of store-bought sliced pickles
- ☐ Toothpicks
- ☐ 2–3 different ingredients from each column in the chart
- ☐ Pitcher of prepared brine
- ☐ Liquid measuring cup
- ☐ Wide-mouth funnel
- ☐ Masking or painter's tape
- ☐ Permanent marker
- ☐ Materials for cleanup
- ☐ Blank Recipe Cards for each student (p. 384)

Tray with the following for each group of 4–6 students:

- ☐ Half-pint jar with lid
- ☐ Several cutting mats
- ☐ Several knives
- ☐ Wide-mouthed funnel
- ☐ Bowl of produce you're pickling—from the chart (You may opt to have different groups prepare different vegetables, or keep it simple with one type of vegetable and allow for variety through the use of herbs and spices.)
- ☐ Small bowl for gathering herbs and spices
- ☐ Container for compost

PREPARATION

- Place sliced pickles on a plate, and skewer each with a toothpick.
- Before class, use the Quick Pickling Brine Ratio to make a brine for the class to use. Allow the brine to cool before handling it with students.
- Wash the produce.
- Prepare a small tray of samples of the herbs and spices students will have to choose from.
- Set up a station at the front of the room with measuring spoons and the various herbs and spices available to students.
- Photocopy and cut blank recipe cards for students.
- Check with school staff, and locate a refrigerator where you can store your pickle jars until you meet with your group the following week for Day Two of the lesson (tasting).

ACTION STEPS

1. Engage: Teach students the tongue twister, "Peter Piper picked a peck of pickled peppers." Ask students whether they've ever eaten a pickle. Ask, *When you imagine a typical green pickle, do you know what plant that comes from?* Discuss cucumbers, but also explain that so many other fruits and vegetables can make delicious pickles, like Peter Piper's pickled peppers. ***(5 min.)***

Standards:

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Peter Piper Pickling

Quick Pickling Brine Ratio*

- 1 cup vinegar
- 1 cup water
- 1 Tbsp salt

*Adjust the amounts assuming each half-pint jar will need approximately a ½ cup of brine. Combine ingredients in a saucepan over high heat and bring to a boil. Stir the liquid so the salt dissolves.

POSSIBLE PICKLE INGREDIENTS

Produce	Vinegar (1-to-1 ratio with water)	Herbs and Seasoning
• Cucumbers	• Apple cider vinegar	• Dill flower heads and seeds
• Zucchini	• White vinegar	• Rosemary
• Summer squash	• Rice vinegar	• Thyme
• Green beans		• Honey
• Sweet peppers		• Coriander seeds
• Carrots		• Turmeric
• Strawberries		• Paprika
• Rhubarb		• Garlic cloves
• Radishes		
• Turnips		

2. Pickle Tasting: Give each student a pickle slice on a toothpick, and have him or her taste it. Ask students to describe how pickles taste and if they know what ingredients give pickles their taste. Explain, *For as long as humans have been eating food, they've found ways to preserve. Preserving means to make something last longer. For example, berries only grow for a few months in the summer, so people make jam as a way to enjoy the flavor all year long. Pickles are the same. We add vinegar or salt to foods as a way to make them last longer. Pickling foods first began as another way to preserve the summer harvest.* Introduce the vegetable you'll be using in class. ***(5 min.)***

3. Explain the Activity: Tell students that today they're going to make pickles. Explain that they'll get to decide in groups what ingredients to use, and then they'll taste all the different pickles during the next class. Pass a sample of the various herbs and spices around the circle for students to smell, naming each one and having students repeat the name. Explain that in groups they'll decide on their flavors, chop their vegetables, and add all the ingredients to their jar. Explain that you'll then come around to help them fill their jar almost to the top with brine. Show them the brining liquid, explaining that it's equal parts water and vinegar with some dissolved salt. ***(5 min.)***

4. Wash Hands Break! Remind students about the importance of cleanliness while cooking and preserving food. ***(5 min.)***

5. Knife Skills Demonstration ***(5–10 min.)***

6. Deciding on Flavors: Split the class into groups of 4–6, and have them discuss and determine which seasoning they'd like to add to their pickles. ***(5 min.)***

7. Making Pickles: Pass out trays with supplies to each group. Supervise students while they're cutting vegetables. While teams are chopping, have one team member from each group come up and shop for the flavoring ingredients. Emphasize that they should take no more than 2 teaspoons of spices and no more than 1 tablespoon of fresh herbs. Once students have packed vegetables, herbs, and spices into their jar, move through the room, pouring the brine over the contents, leaving ¼ inch of room at the top of the jar. Have students seal the jars, and use a permanent marker to write their team name and the date on masking tape to label their jar. ***(10 min.)***

8. Writing the Recipe: Have students clean up. Pass out recipe cards. Have them write a list of the

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Peter Piper Pickling

ingredients they used. Next, as a class, review the directions for making quick pickles. Explain, *These are also called refrigerator pickles because they must be kept in the fridge, which is where I'll keep them until I see you next!* ***(10 min.)***

REFLECTION

Have students discuss the following questions in small groups, then share with the class: ***(5 min.)***

- *How do you pickle something?*
- *Why do people pickle foods?*
- *What makes pickles a healthy food?*
- *How did your group decide what to put in your pickle jar?*

ADAPTATIONS

Follow-Up: Next class, have each group share what type of pickles they made. Then have a smorgasbord of pickles to try. Students can use toothpicks to test pickles from each jar. You may want to bring plain crackers as a palate cleanser between pickle tastings. It should take about one week for the pickles to ferment. Remember to eat the pickles within two to three weeks after making them. Also, children who are at high risk for food-borne illnesses (those with compromised immune systems) should eat refrigerator pickles within the fresh food guideline time frame of three days.

Garden Setting: Have teams of students harvest the summer fruits and herbs from the garden to make your quick pickles.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.L.3.5

Demonstrate understanding of figurative language, word relationships and nuances in word meanings.

CCSS.ELA-LITERACY.L.3.5.B

Identify real-life connections between words and their use (e.g., describe people who are *friendly* or *helpful*).

Standards:

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Topic 1 LD - Fridge Friends

Big Question:

How can students reduce food waste at their own homes?

How can nature inspire students to help the environment?

Set the Stage:

According to the U.S. Environmental Protection Agency, 20% of what goes into City landfills is food. Meanwhile, in nature, wild animals are a great example of not letting any of their food go to waste.

Resources:

Kids go green, 1 minute 54 seconds, video click here

For older children, 1 minute 53 seconds, Reducing Food Waste

Procedure:

Students will first watch educational videos about scavengers and other examples of animals that are good consumers. Next students will be engaged in thinking about food waste in their own home.

Activity:

- Have students select an animal to draw
- Students can either draw or color in their picture of the animal
- Students create a speech bubble for a phrase the animal can say.
- Cut out the animal and speech bubble
- Use the glue to attach the pictures to the old magnet
- Ensure it dries and it is ready to hang on the fridge!

Enrichment:

This new fridge decoration now serves as a reminder every time the fridge is opened to consume all food taken, not let food go bad, etc.

Reflection: Ask students the following questions.

Am I helping reduce food waste like the animals I learned about?
What other things can I do to reduce food waste?

Materials:

- old magnets
- paper
- colors
- scissors
- glue

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Topic 1 LA - Food Supply Chain Game

Big Question:

How does the food supply chain look different depending on

the location of the farm?

Set the Stage:

Learn through an interactive simulation game about all the steps it takes to get the food

you eat from “farm to fork”.

Resources:

PowerPoint with the job descriptions

Activity

Procedure:

- Using kidney and pinto beans, this game simulates the cycle from farm to fork like a fruit or vegetable.
- Have a 4-5-minute conversation with students about what they know about where their food comes from.
- Reference this PowerPoint which gives detailed instructions for this activity. This lesson comes with cards that can be cut out and given to students with their job titles and descriptions.

Set up:

Each Farmer needs: Access to the bean bin and two cups.

Each Processor needs: A “waste” cup, pencil, and paper

Each Distributor needs: A “waste” cup, pencil, and paper

Each Shipper needs: Pencil and paper (to track how far they run)

Each Retailer needs: A TOTAL cup, a “waste” cup, pencil, and paper

Materials

- Pinto beans
- Kidney beans
- A bin/box
- 5 cups per farm
- Pencils
- Paper
- 4 cones

Standards:

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Topic 1 LA - Food Supply Chain Game

Food Supply Chain Game Instructions:

1. Assign each student to a certain farm and job. Hand them their job card.
2. Show them to their stations and quickly run them through their job titles.
3. Give students 15-20 minutes to collect at many pinto beans for their farm as possible
    a. Every 3-4 minutes announce an environmental factor or retail standard (slide 9 of the PowerPoint).
4. When time is up, have students clean up their stations and sit with their farm. The

    club leader will gather data from all the farms (see slide 10 for information about what to collect).

5. Go over reflection questions and ask students about their farm's experience.

Reflection

- What farm had the most beans reach the Retailer? Why?
- The number of cones the Shippers had to run represented the distance produce would have to travel to get to a store. Which farm is the best for the environment? Why?
- How many of your beans ended up being wasted? For what reasons is food waste bad? (examples: greenhouse gases, waste of resources/energy, fills up landfills, etc.)
- What other factors should be considered in a real food supply chain? (example: freshness, natural disasters, etc.)
- How did the environmental factors/retail standards affect your harvest or food waste?

Standards:
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NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 2 LB - Where Does My Food Come From?

Big Question:

What are the environmental/health consequences of industrial farming and why should we strive for sustainable farming practices?

Set the Stage:

With any quickly growing population comes the increased demand for large quantities of produce, meat, and dairy products. How does this demand hurt our environment, the quality of the products, and the health of the consumer?

Resources:

- Watch this video on industrial hog farming to introduce some of the issues with industrial farming.
- Watch this video on adopting sustainable food practices.
- Watch this video on a short overview of sustainable farming.

Materials

- Pencils
- Paper or journals
- Colored pencils/crayons/markers
- Poster board

Activity

Before talking to a farmer:

- Students will watch the videos provided and take notes on sustainable vs. Industrial farming practices.
- Students can work together to research both industrial and sustainable farming.
- Have students come up with questions to ask a farmer about sustainable farming practices.

Talking to a farmer:

- Students will tour a local small farm or a farmer will come into the classroom and talk to them about the farming process.
- Ask the farmer to present on some of these topics:

Standards:

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NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 2 LB - Where Does My Food Come From?

    - Sustainable vs. industrial farming practices
    - Monoculture vs. polyculture (number of crops planted in a field)
    - Using pesticides and fertilizers and the pros/cons
    - Free range and organic products
    - Environmental impacts of different types of farming
- Give students the opportunity to ask the questions they came up before talking with the farmer.
- During the presentation or tour, students should take notes about the differences between sustainable and industrial farming.

After the Talk:

- Students get into groups of 3-4 and create a poster with the information they learned during the farmer's presentation.
- Encourage students to make the poster colorful and engaging. Add drawing, quotes, or anything that will make an awesome poster.
- Display the posters somewhere other students and teachers can read about sustainable vs. industrial farming

Reflection

- Why do we see more industrial farming than smaller, sustainable farming?
- Why do animals tend to be healthier when they are free range rather than factory-farmed?
- What are some environmental impacts of poor farming practices? How can we limit these impacts?

Standards:

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NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 2 LC - Farmers' Market Magazine

Big Question:

What will you find when you explore a farmers market and how does it compare to a grocery store?

Set the Stage:

Learn more about locally grown products and explore a farmers' market.

Resources:

Watch this video from a Nebraska Farmer, 3 minutes and 38 seconds

Nebraska Food Cooperative- a year-round online

farmers' market

Baker's Grocery Store use for the "compare and contrast" page

Materials

- Farmers' Market Packet
- Pencil
- Crayons/colored pencils

Activity

**See the last page for variations to this lesson.

Procedure:

- Each student will be given a packet which they will turn into their own "Farmers' Market Magazine".
- Club leader can briefly go over each page. Students don't need to complete every page. A variety of activities have been provided to let students choose which ones they want to complete.

Standards:

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NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Topic 2 LC - Farmers' Market Magazine

Farmers' Market Packet Includes:

1. Cover page for the students to design their own magazine cover
2. A page where they can draw a picture and write about the cool things they saw at the farmers' market.
3. An "Interview with a Farmer" template where students can use sample questions and create their own questions to ask a farmer.
4. A "Scavenger Hunt" page which will encourage students to look around at the different produce/meats/products the farmers' market has to offer.
5. A "Farmers' Market vs. Grocery Store Compare and Contrast" activity where students will identify a number of details about some of their favorite produce from both the market and the store.
6. Blank pages for students to take notes, draw pictures, or whatever they want to do to make their magazines unique.
7. A "Resources" page that gives the URLs for different useful sites.

Back in the Classroom:

1. Students will take their magazines and place them on their desk/table in front of them.
2. Students will participate in a gallery walk and look through all of their magazines.

Reflection

- What did you see at the farmers' market that you don't see as often at a grocery store?
- What is something you learned from talking to a farmer?
- What differences did you see in the grocery store vs. farmers' market produce?
- Did you get more information about your food at the grocery store or the farmers' market?

Important Notes About Activity:

In an attempt to make this as inclusive as possible for all students, there are a few variations to this activity. This will also be factored into the Farmers' Market Packet and all components can be completed through visiting a farmers' market in person, or by visiting the online resources provided. Some adult assistance might be necessary for the younger students to access the right information if they complete this activity online.

- If possible, take a field trip to a farmers' market with the students.
- This can be a take-home after school club activity. Give the students the farmers' market packet 2-3 weeks before students participate in the gallery walk of the magazines. Students can attend a farmers' market and go to the grocery store with their family.

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Topic 2 LC - Farmers' Market Magazine

- Another option for students is exploring Nebraska Food Cooperative, an online

  farmers' market with information and pictures of different products. They can complete the comparison to a grocery store using Baker's Grocery Store and looking at the produce/meats/dairy items. Make sure students select "All" on the right side of the screen when browsing a category so they see all products.

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 2 LD - Food Waste Policy

Big Question:

How can thoughtful policies/rules help us to reduce food waste?

Set the Stage:

Students will transition into thinking about food waste through a 'solutions-oriented' lens. They will think about policies/rules they can implement in their home/classroom/school to reduce food waste. There are many opportunities to extend or scale up to think about policies on a state/national/global level as well.

Resources:

National-wide Food Waste Policy: https://www.refed.com/tools/food-waste-policy-finder/.

Activity:

Procedure:

- Day one: Interview Q&A with a community member impacted at some level (farmer, food bank employee, senator)
- Think about "policies" to adopt in their classroom to reduce food waste.
- Students split in groups of 2-3 to brainstorm "policies" their classroom could adopt
- They will explain their "policies" on a poster/pitch it to the class and articulate why it will reduce food waste.
- Class will vote on x number of policies to adopt.
  Students will journal about how they expect this policy to reduce food waste in their classroom and what rules they want to have for themselves to waste less (through guided questions)
- They will be asked to think about reducing food waste in their school. Where do they predict food is wasted and why?
- They will be asked to think about reducing food waste in their school. Where do they predict food is wasted and why?
- Observe! Students research to better understand if their predictions about food waste align with the reality of food waste in their school. This could mean interviewing school staff, or just observing where (why and when) they observe food being wasted in their community.
- They will come back and discuss as a group
- Working together students will decide on one "policy" they think would help reduce food waste in school (ex: banning use of plastic forks, creating a ''scraps' table)
- They will create a poster demonstrating the idea and 'pitch' it to school staff to (hopefully) implement.

Materials:

- Paper, Pencil, and clipboard to take notes and draw pictures
- Poster materials
- Optional: Policy Brief

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 2 LD - Food Waste Policy

Extension:

- Student draw and write about what they learned - articulating the need for better food waste legislation based on qualitative (interviews with community members) & quantitative research.
    - Administrators prepare policy "brief" see example below, to educate students on the different policies around a key policy issue (ex: food labeling).
- The letters are sent to state senators/presented to state senators/city council members.

Example: Food Labels Policy Brief

Reflection

To communicate their observations: "I saw…"
To reflect on diversity of what they found: "I thought…but then…"
To demonstrate science community skills: "I liked…" or "loved…"

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 3 LA - Healthy Soil = Healthy Food

Big Question:

What is Soil? What makes it healthy and how does it impact us?

Earth and Environmental Sciences Area

Set the Stage:

Healthy soil supports all life on earth, but how do we know what makes soil healthy? There are all kinds of soils and each kind has different qualities. Let's do a few experiments to see what kind of soil is in your backyard or park!

Resources:

Soil Texture: http://archive.fieldmuseum.org/undergroundadventure/kidzone/pdfs/Texture_by_Feel_Analysis.pdf
Soil Composition: https://www.soils4teachers.org/files/s4t/texture.pdf

Activity:

Procedure:

- Ask students why they think soil is important and what it does for the environment and for them. Fun facts: 1 tablespoon of healthy soil has more organisms than there are people on Earth. There are 138 soil series in NE alone.
- One factor that helps identify soil is its texture. Follow texture by feel activity (Enrichment: use soil from multiple locations in the field to see if they are different and talk about possible reasons why).
- Have students create "mud shakes" to understand soil composition (teachers may want to prepare one the day before to see settled particles). Measure layers to estimate percentages of soil particles (bottom to top: sand, silt, clay).
- Have students push sharpened pencils into soil in different locations measuring depth (do not use excessive pressure). Consider how plant roots grow and how animals burrow in different types of soil.
- Show students an example of healthy vs. unhealthy soil - have students feel the difference and compare with their own soil.
- Connect soil health to food source - ask students what they think leads to unhealthy soil. How would unhealthy soil impact food? Remind students of fact: 1 tablespoon of healthy soil has more organisms than there are people on Earth. Would unhealthy soil have less organisms? (yes!)
- Discuss, journal/draw their reflections from the activity.

Note to Facilitators: Have a washing station prepared as students may get dirty!

Materials:

- Mason jars with lids
- Sharpened pencils
- Rocks, sand, grass, and other natural materials from yard
- Paper, Pencil, and clipboard to take notes and draw pictures.
- Recommended: Print resource materials and guides beforehand, create 1 "mud shake" day before to show settled particles.

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 3 LA - Healthy Soil = Healthy Food

Reflection – Ask -

1. Why do you think soil is important?

2. What was the result of the soil texture test? Was yours the same as other students'?

3. About how much of the soil was sand? Silt? Clay? Draw a picture of your "mud shake" and point out each layer:

4. **How far down would the pencils go before it was too hard to push in? Do you think the soil there is easy or difficult for plants to grow in?**

5. **What was the soil temperature? Was it a lot different than the air temperature? Why do you think they were different or similar?**

6. **What new things did you learn about soil and why it is important? What do you think leads to unhealthy soil?**

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Topic 3 LB - Making an Energy Pyramid

Big Question:

How many trophic levels does an energy pyramid have with humans at the top?

Set the Stage:

As you move up the energy pyramid, energy is lost to the environment. How much energy actually makes it to the secondary and tertiary consumers?

Resources:

- A quick Energy Pyramid Video to show kids how energy is transferred from trophic level to trophic level.
- Enrichment video on the Ten Percent Rule

Materials

- Paper
- Pencil
- Crayons, colored pencils, or markers
- Access to computer to show videos

Activity

Procedure:

- Students will watch the quick "Trophic Level Pyramid" video to get an introduction to the activity.
- Lead a discussion with the students about the video and draw an outline of the pyramid with each trophic level represented for a reference for the kids (decomposers through tertiary consumer).
- Have students brainstorm what Nebraska's biggest crop and livestock productions are. Make sure students are aware a lot of these crops go into making animal feed.
- Each student will create their own energy pyramid with humans at the top of the food pyramid. They do not need to go all the way to the tertiary consumer, just go until humans are the top of the chain. Encourage them to include at least one Nebraska crop or livestock.
- Students will write the definition of each trophic level on their pyramid as well as draw a picture of that organism. Students can also include some sort of decomposer at the bottom of the pyramid.
- Have the students share with each other what they put on their energy pyramid.

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

Topic 3 LB - Making an Energy Pyramid

Reflection

- How many trophic levels did your energy pyramid have?
- What would happen to this energy pyramid if your producer was no longer available?
- Why are decomposers important to the energy pyramid?

Enrichment

- Students can watch this video (1 minute, 42 seconds) to learn about the 10 Percent Rule. Have the students figure out how much energy is available at each trophic level if at level two (primary consumer) there are 3,000 kcal available.

Standards:
BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Topic 3 LC - Trust Your Senses

Big Question:

When does food go bad?

Set the Stage:

Labels only tell us when food should be sold, but not when to eat it… that's what your senses are for! Using only your senses, consider what different food labels mean, what types of foods go bad quickly, and what foods stay good for a long time.

Resources:

Videos: https://net.pbslearningmedia.org/resource/he15-hpe-gardens/family-gardens-and-healthy-eating/ , 2 minutes, 55 seconds, "Healthy Eating."

https://net.pbslearningmedia.org/resource/cyb12-ugly-food-video/ugly-food-and-food-waste-cyberchase/, 2 minutes, 37 seconds, "Ugly Food and Food Waste

Tasteofhome.com/collection/how-to-tell-if-food-is-spoiled/ - website

Activity:

Procedure:

- Ask students how they know when food is fresh? What about when it is old? How can they tell when It's not good enough to eat anymore? Ask students about different labels explained in resource above.
- Test out some food that might be in your fridge and could have been there for longer than it was intended to be… see if you can tell if it is still good. Err on the safe side.
- Focus on texture and feel, color and sight, and smell. Are there any specific differences in how foods smell? What about if foods have been left out too long (don't deliberately leave out good food – use old food or examples already out). Pay attention to things like slimy textures, moldy surfaces, sour smells and faded and darker colors as indicators of food age.
- For foods that are similar in texture, smells, and look to fresh food, have students blindly taste test to see if they can tell the difference and what makes up that difference. (Could also include "ugly foods" taste test)
- Record observations in journal through notes, pictures, and drawings.

Reflection

To communicate their observations: "I saw…"
To reflect on differences of what they found: "I thought…but then…"
To demonstrate planning for future actions: "I used to… but I will try to… in the future"

Enrichment – Have students bring in old food instead of throwing it away (exclude meat and dairy) and create a compost pile to watch food deteriorate (cover over night to avoid pests)

Materials:

- Food Product Dating .pdf
- Food Journal with colored pencils, crayons, and markers
- Fresh food items
- Old food items to compare
  - Bread
  - Vegetables
  - Fruit
  - Eggs and water (floating test)
  - Greens
  - others
- Gloves to handle food
- Plates and workstations to compare food items
- Wash station (use before fresh foods, before old foods, and after old foods)

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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Topic 3 LD - Don’t Waste Your Waste!

Big Question:

Where do food scraps and other things go when you're done with them? What do they become?

Set the Stage:

Single-use culture is over-loading natural resource systems like paper production, mining for metals, and especially agricultures resources like water and soil. Sorting waste is key to the second and third most important Rs of Reduce Reuse and Recycle.

Resources:

https://net.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.recycleplant/visiting-a-recycling-plant/, 4 minutes, 3 seconds

Activity:

Procedure:

- Ask students about their recycling and composting habits in school and at home. What are their ideas of what happens when something is sent to an MRF?
- Separate students into teams of 3-4 and assign to workstations where they will have areas to sort through materials and design their own MRF.
- Give each group a comparable assortment of materials (do not let them see until the timer starts) to be sorted, as well as materials that can be used as tools. Students will have to create their own tools and transport materials to without touching them to the appropriate bins (reuse, recycle, compost, landfill)
- When each group has both sets of materials and is in their workspace, start a timer and each group will create their tools and sort their materials for 3 minutes. At the end of the time, groups will exchange their recycled and composted materials for new waste while any remaining materials go to the landfill. Reduce time by 1 minute for each round after, then 30 seconds for final round.
- The group that prevents their landfill from overflowing for the most rounds wins

Reflection

To communicate their observations: “I saw…”
To reflect on diversity of what they found: “I thought…but then…”
To demonstrate science community skills: “I liked…” or “loved…”

Enrichment – Can introduce different factors like the type of recycled or composted material, cleanliness of items, or remove tools to separate waste items. Consider visiting a local recycling plant or MRF when possible.

Materials:

- Computer to watch video
- Assorted Waste, Compost, and Recyclable Materials
    - Plastics
    - Paper
    - Cans
    - Jars
    - Food Scraps
    - Etc.
- Note: materials should be mixed up
- Bins or designated material areas (labeled areas)
- Household / classroom items
    - Magnets
    - Straws
    - Rulers
    - Pencils
    - Etc.

Standards:

BSB: The Do Place: Nebraska – SC2.4.2.b, National – 8C/P2>,
NGSS – K-ESS3.C.1, 4-ESS3.A.1, K-ESS3.A.1, and 5-ESS3.C.1

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