

AFTER SCHOOL PROGRAM

JUNIOR FARMER CLUB CURRICULUM



GREEN MOUNTAIN FARM-TO-SCHOOL

Green Mountain Farm-to-School (GMFTS) is a non-profit organization in Newport, VT that strengthens local food systems by promoting positive economic and educational relationships between schools, farms, and communities. GMFTS supplies fresh, local food to schools and institutions and gives students of all ages the knowledge and skills they need to make healthy food choice through school gardens, farm-to-school programs, a regional food hub, and mobile learning kitchen. For more information, visit www.GreenMountainFarmtoSchool.org.

Writer: Green Mountain Farm-to-School staff and AmeriCorp service members

Graphic Design: Kathryn Hansis

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JUNIOR FARMER CLUB

The following “BIG Ideas” provide a framework for the curriculum and our teaching. The questions are meant to lead our discussions and encourage student thinking. Each lesson also has its own guiding questions and objectives.

ESSENTIAL IDEA

How do I participate in Vermont’s agricultural history?

K-2 ESSENTIAL QUESTIONS:

What do we eat as food and where does it come from?

What happens to food between the farm and your plate?

3-6 ESSENTIAL QUESTIONS:

How has farming changed over time in our community and beyond?

What people, tasks, steps, and resources are required to produce food and bring it to the table?

Curriculum Designed for Sprouts After-School Program

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JUNIOR FARMER FLOW

Each lesson is divided into different sections. Use the lesson as a template to follow when teaching a class, but feel free to add your own personality and ideas.

GOAL

The goal of the Junior Farmer curriculum is to provide a time and space to:

1. Teach students about Vermont's agricultural history.
2. Instruct students about where everyday products originate from.

LESSONS

- Each lesson has several components. The filler activities and books are there if you have extra space in a lesson. Some weeks, the journal sheets are fillers. Other weeks the journals are meant to be used as a component in the lesson. Be prepared to have copies of these each week.
- Fun Fillers is a great section to use when you need a quick run around or circle game to fill a few minutes.
- Remember to take pictures of the students doing the activities.



When you see the camera symbol there is a photo opportunity in the activity.

SAFETY TIPS FOR COOKING WITH KIDS

ELIMINATE INTERFERENCES

Tie back long hair, pull up long sleeves, and secure other articles of clothing that could pose safety or hygiene risks.

HAND HYGIENE

Wash hands with soap and warm water before touching any food or utensils. Gloves are not required if the food you are preparing will ultimately be cooked, but they are recommended if the food will be served raw. Encourage arm sneezing, and stress the importance of not touching your face, hair, etc. once hands are clean.

CLEAN COOKING AREA

Start with a clean workspace. Clean all counter tops and surfaces before preparing food on them.

SET-UP

Prepare work stations ahead of time with ingredients and proper tools.

WORK IN SMALL GROUPS

Cooking with children is most successful when they can work in small groups of no more than 4-5, ideally with an adult per group. Younger children benefit from even smaller groups. Increase the adult-child ratio by involving parent volunteers in classroom cooking activities.

A JOB FOR EVERYONE

Include every student in the cooking process by assigning everyone a job. This may mean giving each student a small task or even making up additional jobs. Tasks can include reading the recipe aloud, checking to be sure you have included all the ingredients, washing produce or dishes, drying dishes, measuring, stirring or helping another student. Every job is important and it is easy for children to get excited about the task at hand.

KNIFE SAFETY

Be careful with knives and other sharp tools such as graters and peelers. Emphasize the responsibility that comes with handling knives and kitchen equipment. Teach children the proper ways to hold, wash, carry, and store these tools. Most children take this responsibility very seriously.

USE THE RIGHT TOOL FOR THE JOB

Kids can cut too, as long as you give them a safe and appropriate knife for the task. As an introduction to knife use you can use plastic disposable knives, plastic knives from a kids' set, or a butter or dinner knife with a less-than sharp serrated edge and a rounded point. Herbs, peeled fruit, and soft vegetables like zucchini, cucumbers, and tomatoes will yield to these kid-friendly knives. Sometimes a sharper or larger knife is a more appropriate tool for a cutting job and, with proper use, can be a safer option than trying to cut something with an inadequate tool. Use your discretion in gauging the readiness of your students for using more professional cutting tools and always monitor use closely.

CUTTING TECHNIQUES

- Place a wet paper towel under your cutting board to prevent it from slipping around on the table.
- Use a claw-like grip (with fingers curled slightly under) to hold the food steady on the cutting board - the knuckles act as a bumper and finger tips are kept away from the knife blade.
- Before cutting rounded objects, such as potatoes, carrots, or zucchini, give the food a flat edge so that it does not roll around on the cutting board. Do this by cutting a small slice from one side of the food so that it can lie flat on your work surface.
- Tools stay with the cutting board.

DEMONSTRATE

Always demonstrate the correct cut, size, technique, etc. before handing the task over to the kids.

READ THE RECIPE

Ask a child to read each instruction aloud as you prepare the food. Kids will get a sense of turn-taking and sequencing from following directions in order. This also helps to pace the process so that you can focus on one job at a time and avoid multiple distractions.

MAKE CLEAN-UP A PART OF THE ROUTINE

Cleaning up is an important part of the cooking process and kids may love using a mop or dustpan as much as they love the food preparation. But save cleaning until the cake is in the oven!

TASTE!

Have the students taste the food they are preparing. Encourage the practice of trying new things, but never force anyone to eat something against their will. Try offering the option of a "No, thank you" bite if someone is really hesitant to taste the food. Also keep cleanliness in mind when tasting the food – use clean tasting utensils to prevent contamination.

BEFORE GETTING STARTED

Explain that the after-school program is a place for fun learning. In after-school program, the same rules they follow during the day at school are the rules they will follow with you. Similar to a classroom, we have some basic rules to ensure that all students have fun and are safe.

1. Explain that we have four basic expectations. We want all students to be:
 - i. Safe – with tools, bodies, and materials.
 - Have a student show you an example of what being safe looks like.
 - ii. Respectful – use kind language, be good listeners, be careful while cooking
 - Have several students show you an example of what being respectful looks like: using respectful words, being a respectful listener and speaker, being respectful with cooking tools, being respectful to the room.
 - iii. Responsible – participate in activities, take care of belongings, stay on task in the garden or classroom.
 - Have a student give an example of what being responsible is.
 - iv. Have Fun
 - How can you tell if someone is having fun in a safe, respectful way? We expect that everyone will want to participate in the activities and have fun. If, for some reason, someone is being unsafe, disrespectful, or irresponsible, there will be consequences like there are during the school day. Students are still in school, even though it is after school, and the same school rules apply. Inform them of any consequences you have discussed with the principal.
2. Signal for attention: Explain to the students that there will be a signal for when you want to get everyone's attention and have them listen for new directions. Everyone is to respond to the signal by having quiet mouths and eyes on the teacher. Until this happens, you should wait quietly until they respond appropriately, try the method again, or use a different method. Do not move on to the next direction/activity until they are all listening to you.
3. Every day we will do similar activities:
 - Welcome Circle with a thinking question
 - A lesson or activity
 - Some active games and partner games
 - A book
 - Journal time
 - A snack

TOP 10 EDUCATOR TIPS

1. Set your expectations for the students at the beginning.
 - a. Ask principal for school expectations and procedures. Most discipline structures look like this:
 - 1st offense: warning – “It is not okay to You need to The next time you do that, you will have to sit out.”
 - 2nd offense: sit out/take a break/time out – “It is not okay to You were warned before. I need you to take a break.” Student will sit out for an activity or a few minutes. You will need to talk with the child before they reenter the group. Explain why what they did was not okay and what they should be doing. Remind the student of the consequence for a 3rd offense.
 - 3rd offense: This will be based on the school and your conversation with the principal or site coordinator. They will either need to call home, be removed from the program, or talk to the principal the next day.
 - b. Ask students for their suggestions.
 - c. Have a short but specific list of expectations.
 - i. Be safe, Be Respectful, Listen to Directions, Have Fun
 - d. Take time to talk about what each expectation looks like, act it out.
2. Use a signal to get students attention and use it every time. Wait for everyone to stop, look, and listen before you give directions. If it isn't working, try another one.
 - a. Use a visual sign: peace, quiet coyote, hand in the air
 - b. Use a verbal sign: “When I say ‘Sprouts!’ you say ‘What?’” clap a pattern
3. Be prepared and organized. Have everything ready to go before students arrive.
4. Be flexible. You might need to change an activity if it isn't working or a game may not last as long as you thought. It's okay to change your plan. Also look for teachable moments that aren't connected to the lesson but are important and interesting for students.
5. Have a few games or activities in mind that don't involve any materials that you can do at a moment's notice.
6. Watch the group's body language. Circles are best for discussions and giving directions. Tables are good for doing group activities.
7. Be as enthusiastic and involved as you want the kids to be. They will pick up on your attitude and behavior.
8. Have a sense of humor!
9. Let students find the answers. Instead of giving them all the information, ask questions to allow them to come up with the answers themselves.
10. Give an overview so they know what to expect for the day and individual activity.

LESSONS

WHO MADE MY COOKIES

SUMMARY

Students discover where everyday food items come from, particularly cookie ingredients.

MATERIALS:

Book:

Honey Cookies
by Meredith Hooper

Journal Sheets:

Journal Covers
Introduction Surveys
Cookie Recipes

Ingredients for Cookies

Mixing Bowls (+ a small bowl for
sugar and cinnamon)

Wax paper

Mixing Spoons

Measuring cups

Measuring Spoons

Napkins

Starting from Scratch materials:
find a variety of images or real
items to use

4 tubs labeled: Store, Factory,
Natural World, Farms

Create 4 boxes with labels or
make colorful signs with imag-
es for each box (i.e. woods for
Natural World)

GUIDING QUESTIONS:

1. Where do the ingredients for Honey Cookies come from? (K-2)
2. How does climate affect which of those ingredients we can get in Vermont? (4-6)

GOALS:

1. Students will understand how we come by ingredients for baking cookies.
2. Students will learn where our everyday products originate from.

OUTLINE:

- Welcome Circle and Attendance
- Name Game
- Ground Rules
- Introduction Surveys
- Honey Cookies by Meredith Hooper
- Cooking Intro
- Make Honey Cookies
- Clean Up
- Starting from Scratch
- Eat Cookies
- Wrap-Up

WELCOME CIRCLE AND ATTENDANCE - 5 MINUTES

Welcome: Today you will discover where everyday food products come from, the different ways in which they reach your plates, and how it affects your bodies, the planet and the community.

Today's Question: What is something that you ate today and where do you think it came from?

Name Game: Have the students introduce themselves and share one item found on a farm (tractor, cat, seeds, tools, etc.). Ask the students if they can repeat each other's name and word!

INTRODUCTION SURVEYS – 15 MINUTES

Surveys are used to calculate and record student knowledge and progress. We use them to help guide us in lesson planning.

1. Explain that before we begin today you need to learn a little bit more about them as students; what they know, what they would like to learn about. Tell them not to worry if they don't know some of the answers, it is not a test; we just want to know what they already know. All of the topics will be covered in the program.
2. Let students know that these surveys are very important for us because they help us gauge the success of the program. We like to know when students have a memorable time and what they learn. This helps us get funding for the program and to stay at the school.
3. Pass out the surveys and pencils. Consider reading the questions one by one as a group. "If you would like to go ahead and read the questions to yourself, please start. If you would like me to read the questions to you, sit by me and I will read them one by one."
4. When students are done and waiting, they can draw on the back or work on a journal page. Gather the surveys when they are complete and store safely to use at the end of the session.

BOOK - 5 MINUTES

Honey Cookies by Meredith Hooper

Through making cookies with his grandma, this young boy learns not only how to bake cookies, but also the source of the ingredients. Allow the students to guess what ingredient Ben and Grandma will need next.

Listening Question: What are the similarities between the places where Ben and his grandma get their ingredients for their cookies?

Reflect: What are some of the similarities and differences between how Ben made his cookies and how you might? What ingredients are available here in Vermont? Where do the other ingredients come from?

COOKING 101 – 3 MINUTES

Students get a crash course in cooking!

1. Explain to students that today we are making cookies! Ask students to think about other cooking experiences they have had. How did they know how to prepare the food correctly?
2. Explain that often when cooking, we start with a recipe. What does a recipe tell us?
 - a. A recipe is a set of instructions about how to prepare a meal.
 - b. Most recipes cover the same key elements:
 - i. The dish name
 - ii. The serving size
 - iii. The ingredients with measurements
 - iv. The directions about how to use the ingredients
 - c. Review with students the layout for Sprouts Program recipes.
3. Explain that we will be using various kitchen tools in the program.

Review with the students:

- a. Bowls
- b. Spoons
- c. Measuring spoons and cups
- d. Sheet pans
- e. Oven mitts

Explain to students the various measuring units and demonstrate how to use the measuring spoons and measuring cups.

4. Explain that cooking in the kitchen is a fun experience and in order to be safe and respectful we will follow a similar outline of activities each time we cook.
 - a. Review the kitchen sequence:
 - i. Wash hands
 - ii. Divide students into groups (if needed)
 - iii. Review the recipe together as a group
 - iv. Pass out all the necessary equipment
 - v. Follow recipe directions and work step-by-step as a group
 - vi. Clean up the kitchen (It is not ours and we need to leave it cleaner than we found it so we can continue to have the privilege of using the space.)
 - b. Things to remember when cooking:
 - i. Have your group partners double check measurements

HONEY COOKIES – 30-40 MINUTES

Students make the honey cookies they just read about.

1. Preheat oven to 350 (if needed).
2. Pass out recipe and review the ingredient list.
3. If needed, divide the students up into groups, dispersing ages well.
4. Review recipe aloud.
5. Begin cooking prep by having one student come up to you to retrieve supplies and ingredients one at a time. Review the quantity needed with each student as they retrieve their ingredients.
6. Place cookies on a cookie sheet with wax or parchment paper.
7. Bake cookies.
8. As they bake, clean dishes and the table. Each group is responsible for cleaning their own stations. As they finish, assign other cleanup duties to students (sweeping, dishes, etc.)



Reflect: What words would you use to describe the taste? How do these cookies compare to others that you have had?

STARTING FROM SCRATCH – 15 MINUTES

Students will learn about the origins of everyday items and food.

1. Ask the student what kinds of things they just used to make cookies. Ask them what other things they do and use every day. List the items and foods they mention.
2. Explain that you will trace these items and some others back to their source. Show the students the four bins labeled “Store,” “Factory,” “Natural World,” and “Farms.” Tell them they will sort the pictures based on their source and place them in the appropriate bins.
3. Divide the students into two groups and have them form two lines. Set the bins opposite these lines. Place the pictures a few feet in front of their lines. Explain they will participate in a relay race to sort the pictures. One student from each team selects a picture, runs and places it in the appropriate bin, then returns to the end of his or her line. The next person in each line will repeat the process. This will continue until everyone has had a turn or all of the pictures are sorted.
4. Review the items in each bin. The students can show their approval or disapproval for each item with a show of thumbs up or down. Begin with the bin labeled “Store.” Review one or two times, asking if they can be traced back even further. Does anything actually originate in the store? (No, that is where most of us purchase the things we need and use daily.) Encourage the students to offer suggestions as to where items would be placed. Continue onto the “Factory” bin. Where do the raw materials come from to make these items? Can these items be traced even further back to their source? (Yes, to the natural world or farms.)

5. Review the items in the bin labeled “Natural World.” (It will include a wide array of items including wooden objects from trees, metal mined from minerals in the earth and plastics and synthetic materials made from petroleum products.) What categories do these objects fall into? (Clothing, health, shelter, transportation, education or recreation.) Point out that some of the objects are made with renewable resources and others with non-renewable resources. Ask the students for a definition of these terms. (Renewable resources are those which can be replenished over time, such as plants, trees, solar and wind energy, non-renewable resources are those which one used cannot be replaced in this geological age such as petroleum based products like plastic.) Which of the items pictured are made from renewable resources? Non-renewable? Point out that some non renewable resources are also recyclable. What are examples of these? (certain plastics, tin, aluminum.)
6. Last review the items in the “Farm” bin. What categories do they fall into? (Mostly food, both fresh and processed with some examples of natural fibers, such as wool, cotton and silk.) Could we live without these things? (No, because food is essential to life and therefore so are farms!) Discuss the idea of farming as a renewable resource with food being produced year after year.
7. Complete the discussion by talking about the wise care or stewardship of our natural resources and farmlands. Stress that the stewardship of farmland goes hand in hand with that of the natural world to provide a high quality of life. Care needs to be given to the soil, water and air to ensure adequate and continued food production. Discuss farming practices that reflect this caring attitude towards the earth and environment.

Reflect: Ask the students if they notice any similarities between the products that they looked at. A lot of the products need similar inputs. There is a story behind everything we eat. Look closer at some of the different stories.



EAT COOKIES – 5 MINUTES

JUNIOR FARMER JOURNAL – 15 MINUTES

Students will put together a journal to be filled out as the session goes along.

1. Pass out journal cover and ask students to put their names on them. Allow students time to decorate their journals.

Reflect: When this session is over you will have a journal full of fun information and recipes to take home and cook with!

WRAP-UP – 5 MINUTES

Reflect: Where does most of our food come from? Why is it important to eat local food when possible?

Take Home: Extra cookies, recipe

HONEY COOKIES RECIPE

It is fun to make cookies from scratch! Using just a few ingredients, you can make delicious, healthy, home-made cookies. As you make them, see if you can figure out where each ingredient came from. This recipe will make about 30 small cookies.

INGREDIENTS & MATERIALS

½ C (cup) butter
1/3 C (cup) sugar
3 Tbsp (tablespoons) honey
1 egg
1 tsp (teaspoon) cinnamon
1 C (cup) white flour
¾ C (cup) wheat flour
2 tsp (teaspoons) baking powder
½ tsp (teaspoons) salt
A little more sugar and cinnamon
to roll dough in

DIRECTIONS

1. Preheat the oven to 350° F.
2. Beat the butter and sugar together in a bowl until they are creamy.
3. Next, beat in the honey, then the egg.
4. In a separate bowl, mix the cinnamon, flour, baking powder, and salt together.
5. Add the flour mixture (dry ingredients) a little at a time to the butter mixture (wet ingredients) and mix into a soft dough. If the dough is sticky, add a little more flour.
6. Shape about a teaspoon of dough into a ball, roll it in a little extra sugar and cinnamon, and put it on a greased cookie sheet. The mixture should make about 30 cookies.
7. Put the cookies into the oven for 10-12 minutes.
8. The cookies are ready when they are golden brown. Take the cookies out of the oven, let them settle for a few minutes and transfer to a rack or plate to cool.



SPROUTS JUNIOR FARMER

COOKBOOK



JUNIOR FARMER CLUB SURVEY

Name: _____ Grade: _____ School: _____

1. What are you looking forward to in Junior Farmer Club?

2. What is left over when making butter?

Cheese Yogurt Ice cream Buttermilk

3. What is one way to save or prepare apples to enjoy them all year?

4. What does felting mean?

5. Circle all of the items that can come from sheep.

wool milk meat eggs cheese cotton

6. Which food is made with corn?

Candy Soda Macaroni and Cheese Tortilla Chips

7. Draw lines to connect the different parts of a chicken:

Beak
Wings
Wattles
Feet
Comb



8. How many gallons of sap are needed to make 1 gallon of Maple Syrup?

5 10 40 10

JUNIOR FARMER CLUB SURVEY

ANSWER KEY

1. What are you looking forward to in Junior Farmer Club?

2. What is left over when making butter?

Cheese

Yogurt

Ice cream

Buttermilk

3. What is one way to save or prepare apples to enjoy them all year?

make applesauce; make cider

4. What does felting mean?

the process of rolling and pressing wool accompanied by the application of moisture or heat, which causes the constituent fibers to mat together to create a smooth surface.

5. Circle all of the items that can come from sheep.

wool

milk

meat

eggs

cheese

6. Which food is made with corn?

Candy

Soda

Macaroni and Cheese

Tortilla Chips

7. Draw lines to connect the different parts of a chicken:

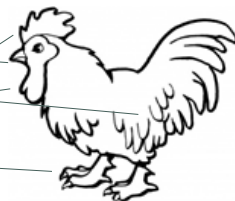
Beak

Wings

Wattles

Feet

Comb



8. How many gallons of sap are needed to make 1 gallon of Maple Syrup?

5

10

40

10

LESSON TWO

FROM MOO TO YOU

SUMMARY

Students will learn about dairy cows, dairy farming, and how to make butter.

MATERIALS:

Journal Sheets:

Recipe for making butter
Dairy Riddles
Super Cow picture

Book:

Clarabelle: Making Milk and So Much More by Cris Peterson and David Lundquist

Dress up As a Cow supplies
(see list in activity)

Rocks to Butter sequence items
(see list in activity)

Two quart size mason jars
with lids

1 pint heavy cream

Colander

Bowl

Container for buttermilk

Spoon

Butter knife

Crackers

Napkins

Copies of "Shake It"

Cups for students to try
buttermilk

Containers for the students
to take home extra butter

Crayons and colored pencils

Fabric or bandana as cow tail
in game

GUIDING QUESTIONS:

1. What are some of the products that we get from dairy cows? (K-2)
2. How does cow milk turn into milk, cheese, and butter? (3-6)

GOALS:

1. Students will learn the process of making butter.
2. Students will learn the identifying characteristics of a cow and their proper names.

OUTLINE:

- Welcome Circle and Attendance
- Clarabelle: Making Milk and So Much More by Cris Peterson and David Lundquist
- Dress Up As a Cow
- Rock to Cheese (Butter)
- Butter Making
- Snack – Home-made butter on crackers
- Filler, Activity: Dairy Riddles
- Filler, Game: Cow Chases Tail
- Wrap-Up

WELCOME CIRCLE AND ATTENDANCE - 5 MINUTES

Greeting: Today you will learn about cows and dairy farming in Vermont. Dairy cows have specific needs to produce quality milk. You will also learn how to make butter!

Today's Questions: Have you ever visited a farm before? What kind of farm was it? What kinds of animals would you find on a farm?

BOOK - 5 MINUTES

Clarabelle: Making Milk and So Much More by Cris Peterson and David Lundquist

(**Note to Educators: Choose selected pages for reading, tab or paper clip)

A day in the life of a dairy cow in Wisconsin. Real photographs document how she makes milk and electricity! Use the book as a background for guided discussion, ask a lot of questions and keep students engaged by relating the farm activities to their lives.

Listening Question: How does a cow make milk?

Reflect: Are there any connections between you and the farmers in the story? Have you met a cow like Clarabelle?

DRESS UP AS A COW – 10 MINUTES

Students learn about the different parts of a dairy cow.

1. Ask the students to imagine what the animals look like. What makes them unique?
2. Pick a volunteer from the class and have the student stand by you, so everyone can see him/her. (Whisper in your volunteer's ear to ask permission to dress them up.) Explain to the class that they are going to help you turn their classmate into a cow. This is a fun activity that students will be excited about. Maintain a no touching/ harassing the cow volunteer rule to respect privacy.
3. Ask the students for suggestions on how to make your volunteer look more like a cow.
4. As they come up with ideas, dress up the student volunteer with the props that you have in your large bag.
 - a. Spots – (black felt spots) Holstein cows are a breed of dairy cow that have black spots on their hides. Loose skin helps to protect the cow from insect bites.
 - b. Stomachs – (pink felt on string) cows have one stomach with four compartments to help with the digestion of food.
 - c. Tongue – (Sandpaper cut to size of cow's tongue with string or binder clip) helps to pull in the grass and hay they eat.
 - d. Hooves – (4 socks with paper hoof prints glued to the bottom) Hooves help to loosen up the soil so new grass can grow more easily. Each hoof is technically a covering of horn, protecting two toes – very similar to a nail or claw found on other animals.

- e. Ears/Horns – (Headband with cardboard ears and horns) ears help to transfer heat. Some cows with larger ears can fan themselves in warm weather.
- f. Tail – (Fly Swatter with string) used to swat flies away
- g. Udder - (Baby bottle nipples & plastic jug) a large bag-shaped organ belonging to female cows that produce milk after she has had her first calf.
- h. Eyes – (felt eyes with string) Cows large eyes are on the side, to help them be aware of what is going on all around them including predators or danger.



Take a group picture with the cow at the end!

5. After the volunteer has dressed up with all the props, ask the students what they could add to make the student look even more like a dairy cow (covering, placement of features, lack of features, posture, habitat...)

FROM ROCKS TO BUTTER - 10 MINUTES

Students organize items to discover what is needed in nature to produce butter.

1. Show students the picture of the rock and the picture of the butter. Ask them, “Can we can get butter from this rock?” Tell them they are going to try!
2. Pass out an item to each student (there are 12 items, so pair students up or give a few students a couple of items).

** Try to obtain real items for props.

- a. Large Rock
- b. Small Rock
- c. Nature debris (leaves, etc.)
- d. Soil
- e. Sun
- f. Water
- g. Grass
- h. Calf
- i. Heifer
- j. Cow with calf and full udder
- k. Milk
- l. Butter

3. Instruct the students to discuss first with their group about what their item represents and then have them walk around and converse with other groups and compare items, the goal being to put the items into their correct sequence.
*Educator note: there are a number of ways to go from rocks that break down into soil to grass to feeding cows to milk then butter. Let the group work together to determine their own sequence.
4. Once a line has been formed and all groups are in the place where they think their item belongs, have each group describe their item beginning with the first group in the sequence and so on.

Reflect: Did you think that rocks were necessary to making butter?

BUTTER MAKING & EATING – 10 MINUTES

Students learn how to make butter the old fashioned way with local, organic cream!

****Educator Note:** Cream should be at room temperature before attempting to make butter. Continue to shake beyond the point where contents look like cream, yellow butter and white buttermilk will form after several more minutes of shaking.

1. Ask the students how they think butter is made. What ingredients are needed?
2. Divide the class into two groups.
3. Give each group a half-pint of cream and a mason jar.
4. Direct them to add the cream to the jar and fasten the lid securely. (A marble added to the cream can make the process speed up and makes a sound as it hits the jar. However we recommend using a plastic container with a tight fitting lid, as marbles can break the glass jar if shaken too hard. When you can't hear the marble anymore, you know the butter is done!)
5. Ask the students to predict how long it will take to make butter.
6. Teach students the Shake It! (The Butter Song). Sing while shaking, change milkshake to _____ and have the students fill in the blank and act it out!
7. Have each group note their starting time and then have each student shake the jar ten times.
8. The butter is ready when all of the fat has clumped together tightly and is floating in the middle of liquid buttermilk.
9. Direct the students to place a bowl beneath a colander and carefully pour the liquid (buttermilk) off into another container for tasting.
10. Ask whether they know the name of the liquid that is formed when making butter? (Buttermilk!)
11. Pour buttermilk into cups and pass out for tasting.
12. With the colander over the bowl, have the students wash the butter by pouring cold water over it to rinse off any traces of buttermilk.
13. Direct them to gently press the butter against the side of the colander with a wooden spoon to make sure all the water is out.
14. Spread the butter onto crackers for the students to sample.
15. Pack leftover butter into the cups used for tasting buttermilk for students to take home.



Reflect: Was it easier than you thought it would be to make butter? Could you notice any differences in this fresh made butter and butter that you eat at home?

FILLER ACTIVITY: DAIRY RIDDLES - 10 MINUTES

Students solve riddles about different dairy products.

1. Explain that you will be passing out a journal sheet of riddles and ask a volunteer to read the riddles out loud.
2. Have the students record their answers in their journals and draw a picture of each item. If time permits have students share their favorite flavor of ice cream and/or yogurt.
 - A Cold and creamy,
Frozen treat,
In a cone or shake,
It can't be beat! (Ice cream)
 - A thick, tart, custard,
Fruit flavored or plain,
Curdled and cultured,
With a funny name. (Yogurt)
 - Rich, creamy, yellow,
Salted or sweet,
On toast or corn,
It's good to eat. (Butter)

FILLER GAME: COW CHASES TAIL – 10 MINUTES

This is a fun, high-energy group challenge in which lines of people chase one another. It provides a good hidden message about leaders and followers.

1. Participants form a line, facing the same direction. Each player then puts his or her arms on the shoulders of the person in front. The last person in line tucks a handkerchief into the back of his or her belt, belt loop or pocket.
2. The first person in line is the “head” of the cow and his or her arms are the cow’s mouth. The last person in line is the cow’s tail.
3. If the cow successfully captures its own tail (by snatching the dangling handkerchief), the head goes to the end of the line and puts the handkerchief tail in his or her own belt or pocket. The second person in line becomes the new head.

Reflect: What did it feel like to be the head, the tail or the middle of the cow? How did the group members communicate while playing the game? Who had the most power to decide the group’s direction? Did you see yourself as following the head or the tail or neither? How did you decide which way to go? Or did you simply follow along?

WRAP-UP

Reflection: What kinds of things does a dairy farmer have to do? What kinds of products are produced on a dairy farm? How does the butter you made taste different than that of the grocery store? You can make this butter anytime at home!

Take Home: Extra butter in buttermilk cups

DAIRY RIDDLES

Draw a picture or write the name of the answer on the line across from the riddle!

A cold and creamy,
Frozen treat,
In a cone or shake,
It can't be beat!

A thick, tart, custard,
Fruit flavored or plain,
Curdled and cultured,
With a funny name.

Rich, creamy, yellow,
Salted or sweet,
On toast or corn,
It's good to eat.

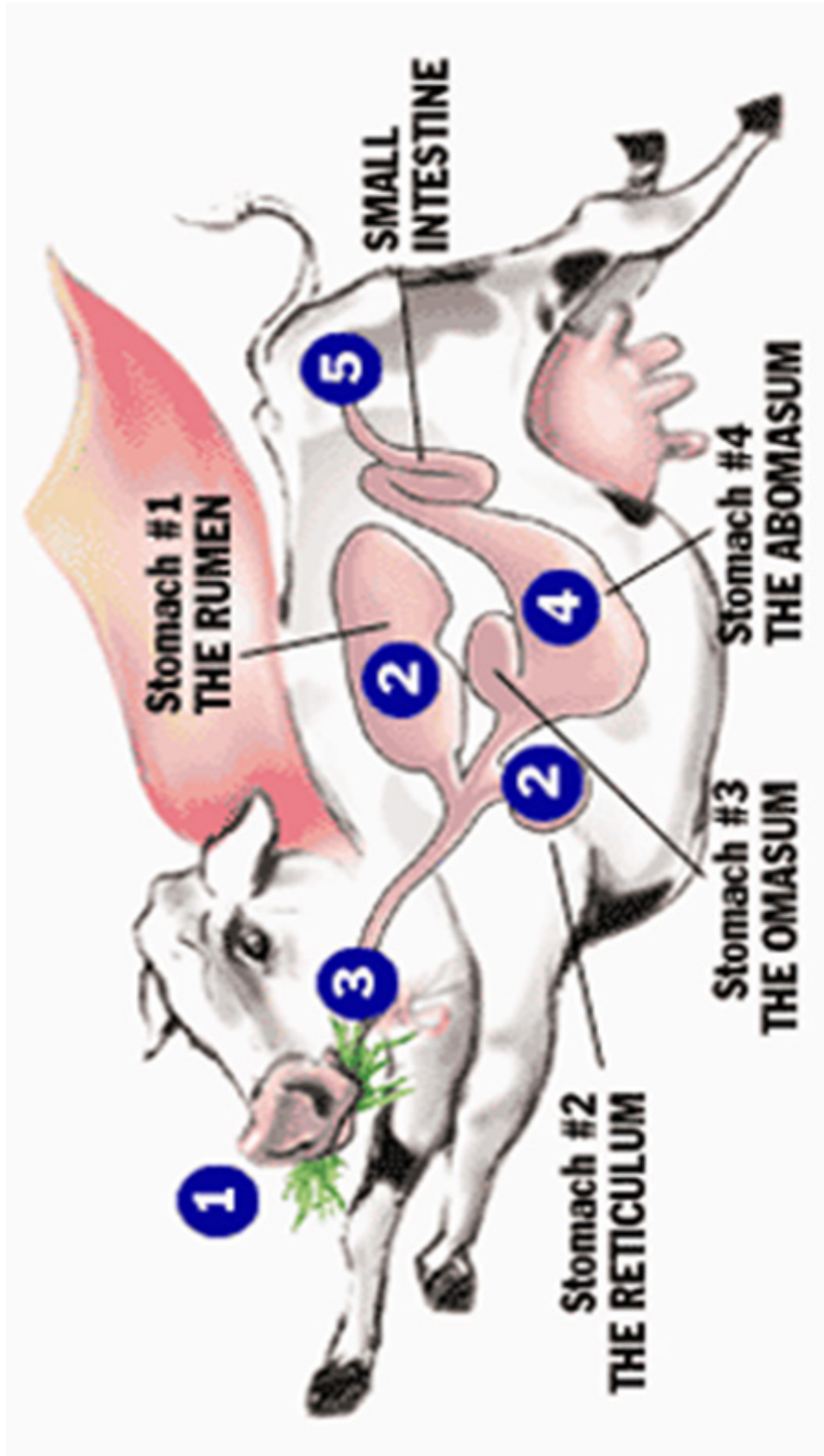
HOW TO MAKE BUTTER AT HOME!

INGREDIENTS & MATERIALS

1 Pint of heavy cream
1 Quart Mason jar with lid
Colander
Bowl

DIRECTIONS

1. Pour the cream into the Mason jar and close the lid tightly
2. Shake the Mason jar briskly for approximately 5-10 minutes.
3. When the liquid begins to thicken, keep shaking! The fats will separate leaving a lump of butter and liquid buttermilk. Pour the mixture through a colander to strain off the buttermilk.
4. Rinse any excess buttermilk out of the butter by running cool water over the butter,
5. Press the butter against the edge of the colander with wooden spoon to remove all of the buttermilk and/or water.
6. Spread butter onto your favorite crackers or bread!
7. Store in refrigerator.



SHAKE IT!

(Sung to the tune of the "I Have Something in My Pocket" or the "Brownie Smile Song". Post the verses on the wall for the class to follow.)

We're going to make some butter,
Rich and creamy too,
With milk from a cow's udder
Before you can say "moo."

Chorus:

So shake it, shake it, shake it,
Shake it if you can
Shake it like a milkshake, (or other adjective)
And shake it once again / And pass it to a friend.

Put some cream into a jar,
You can add a marble or two,
Make sure the lid is on tightly,
That's all you have to do.

Chorus

We're learning while we're churning,
Hey this is lots of fun!
It's easy to make butter,
Let's eat it when it's done.

Chorus

Oh, Listen very carefully,
It's sounding different now,
Hooray it's finally butter!
Be sure to thank the cow.

Chorus

LESSON THREE

SEASONS OF THE APPLE ORCHARD

SUMMARY

Students will learn about the seasons of an apple tree and how activities on an apple orchard change throughout the seasons. They will make applesauce to learn how to preserve apples so they can enjoy them year-round.

MATERIALS:

Journals Sheets:
Applesauce Recipe
Seasons of My Apple Orchard

Book:
Our Apple Tree
by Görel Kristina Näslund

Stock pot for cooking apples

Apples, 2 per student

2 apple slicers

Apple peelers (if desired)

2 stainless steel bowls

1 food mill

2 wooden spoons for stirring

Small ladle for serving
applesauce

Cinnamon (and measuring
spoon if you want to measure it)

Plastic spoons

Serving cups

Dish soap

Scour pad

Containers for students to take
home extra applesauce

Crayons/colored pencils

Apple Tree Life Cycle images

Apple to Plate sequence cards
(in image tub)

GUIDING QUESTIONS:

1. In what seasons are apples harvested and how can we save the harvested apples to last longer? (K-3)
2. What people, tasks, and steps are required to put apples on your plate? (4-6)

GOALS:

1. Students will learn what apple trees look like throughout all the seasons.
2. Students will prepare applesauce and learn about preserving foods.

OUTLINE:

- Welcome Circle and Attendance
- Making Applesauce
- Our Apple Tree by Görel Kristina Näslund
- Apple Tree Seasons Diagram and journal sheet
- Filler, Activity: Apple Tree to Plate Sequence Cards
- Wrap-Up

WELCOME CIRCLE AND ATTENDANCE – 5 MINUTES

Greetings: You will explore an apple tree and an orchard throughout the seasons and then learn how to preserve apples.

Today's Questions: What kinds of jobs need to be done in an orchard? How can we preserve apples for the winter?

MAKING APPLESAUCE – 30 MINUTES

Students get to preserve apples by making applesauce. Start immediately with this activity to have time to cook apples and have them cool before the end of class.

1. In preparation, have a pan with ½ inch to 1 inch of water heating up on the stove; use as little water as possible without burning the apples. More water will make the applesauce too runny.
2. Have a brief discussion with students about preserving food. Ask them about different ways of preserving food.
3. Have students line up.
4. Each student will pick up two apples.
5. Discuss the quality of the apples; applesauce is a great use for lower quality apples. If there are extra apples have students taste a slice.
6. After the apples are clean, have students stay in line. Use the apple knives to cut the apples and explain knife etiquette.
7. Have students place the cut-up apples into a bowl and clean up their space.
8. Once every student is finished cutting their apples and putting them into the bowl, show them the hot water pan, and then you pour the apples into it. Be careful not to splash the hot water onto anyone!
9. Have students line up and take turns stirring the apples.
10. While it is cooking, ask the students to transition to the next activity.



BOOK – 10 MINUTES

Our Apple Tree by Görel Kristina Näslund

Two impish children introduce the changes each season brings to their apple tree, beginning with bare, snow-covered boughs in winter. When spring arrives, the tree's riot of glorious blooms begins the cycle of flower, fruit, and harvest, until winter arrives again. In spare, elegant language, just two or three sentences per page, Näslund presents very basic facts about the growing cycle: "Pink buds and white blossoms show that it is [the tree] is ready to make apples again." Children may want fuller explanations for some concepts, such as the roles that bees and pollen play in the process.

Listening Question: How does an apple tree change from season to season?

Reflect: What has to happen to the tree in order for it to produce apples?

APPLE TREE LIFE CYCLE DIAGRAM – 10 MINUTES

Students will explore the changes of an apple tree through the seasons by placing seasonal items on apple tree diagrams.



1. Show students laminated sheets of bare apple trees (Spring-Winter).
2. Ask students to think about what an apple tree looks like during each season.
3. Use laminated props (leaves, grass, apples, apple blossoms, etc) to add to the bare trees to make each tree reflect the season.

*Keep the correct diagrams displayed so students have a reference point when drawing their pictures in the activity below.

SEASONS OF MY APPLE TREE JOURNAL SHEET – 15 MINUTES

Students will document the changes of an apple tree through the seasons by drawing detailed pictures of the tree in different seasons. *Educator Note: Some students can mill the apples while the others are doing their journal entry.

1. Pass out the journal sheet provided in the lesson and colored pencils.
2. Ask students to recall the colors from the book and pictures of the apple tree from the previous activity. With those in mind have students take turns adding items on to the tree and drawing detailed pictures of the apple tree in the different seasons.
3. Take note of the tree's look and colors in the bottom section and describe or draw what is unique about the apple tree in each season in the top part. Example: Spring – little blossoms and buds appear, Summer – the green leaves flutter in the wind, Fall – the apples are ready to pick, Winter – snow collects on the branches.
4. Point out the four seasons and boxes. Let the students begin.

Reflect: There are a lot of tasks that need to be done in an apple orchard. What are some of the jobs that are done in fall? What are some examples of other things that change during the seasons?

FINISH APPLESAUCE & EAT!

Students will use the food mill to turn the cooked apples into applesauce. When it is done, they can taste their hard work!

1. Show the students how the mill works and when the apples are soft pour them into the food mills.
2. Have the students take turns operating the food mill while others are completing their journal entry.
3. Do a taste test with the students. Have students try the applesauce plain, with cinnamon, and with maple syrup.

WRAP -UP

Reflect: Review the seasons of the apple tree. Great work, a lot was accomplished!

Take Home: Extra applesauce

YUMMY VERMONT APPLESAUCE

Apples are a local food that can be made into many things. Take a few apples or many to make delicious applesauce at home!

INGREDIENTS & MATERIALS

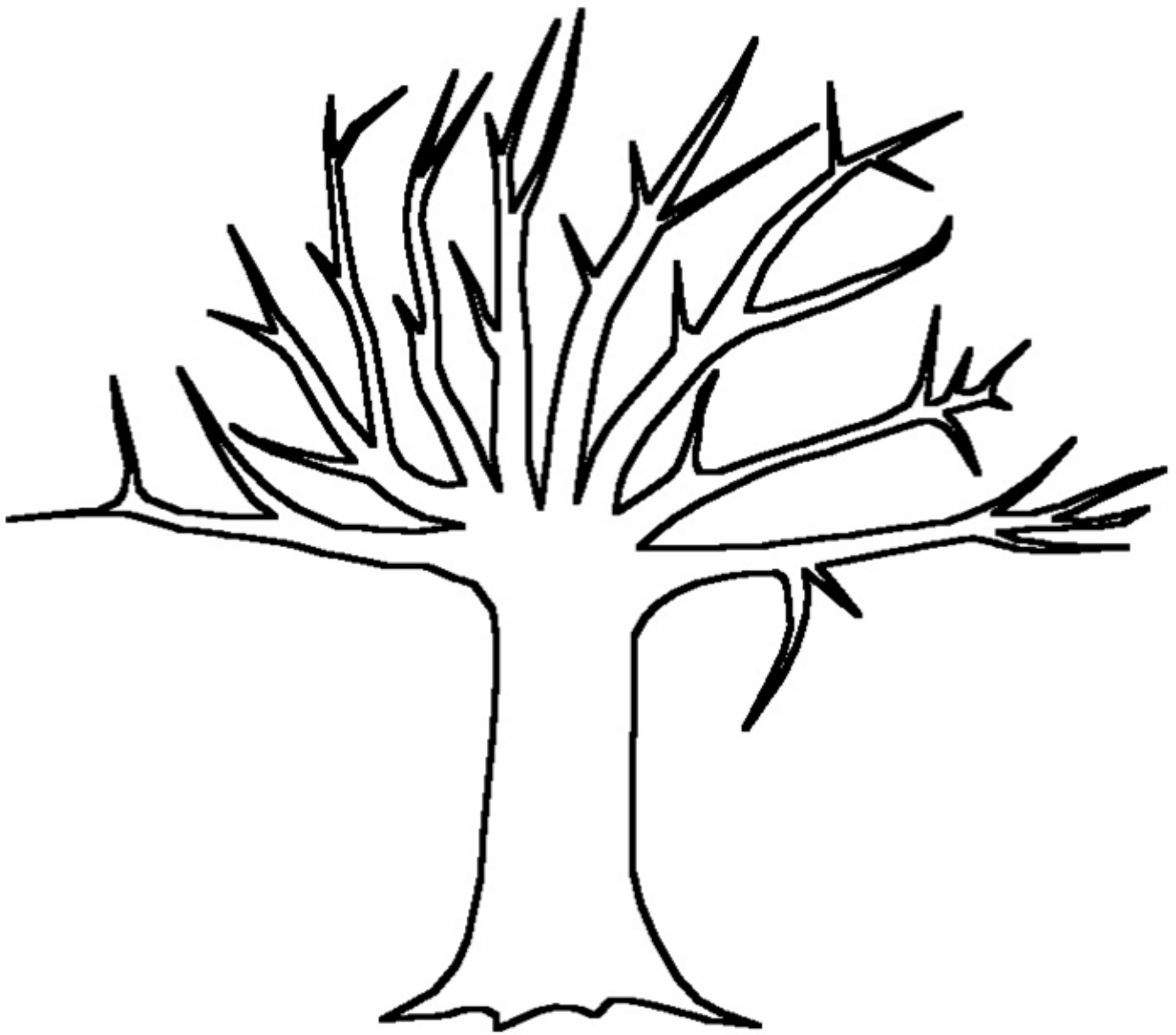
Apples
Cinnamon
Maple Syrup
Apple corer or knife
Large pot for the stove
Food mill
Large bowl

DIRECTIONS

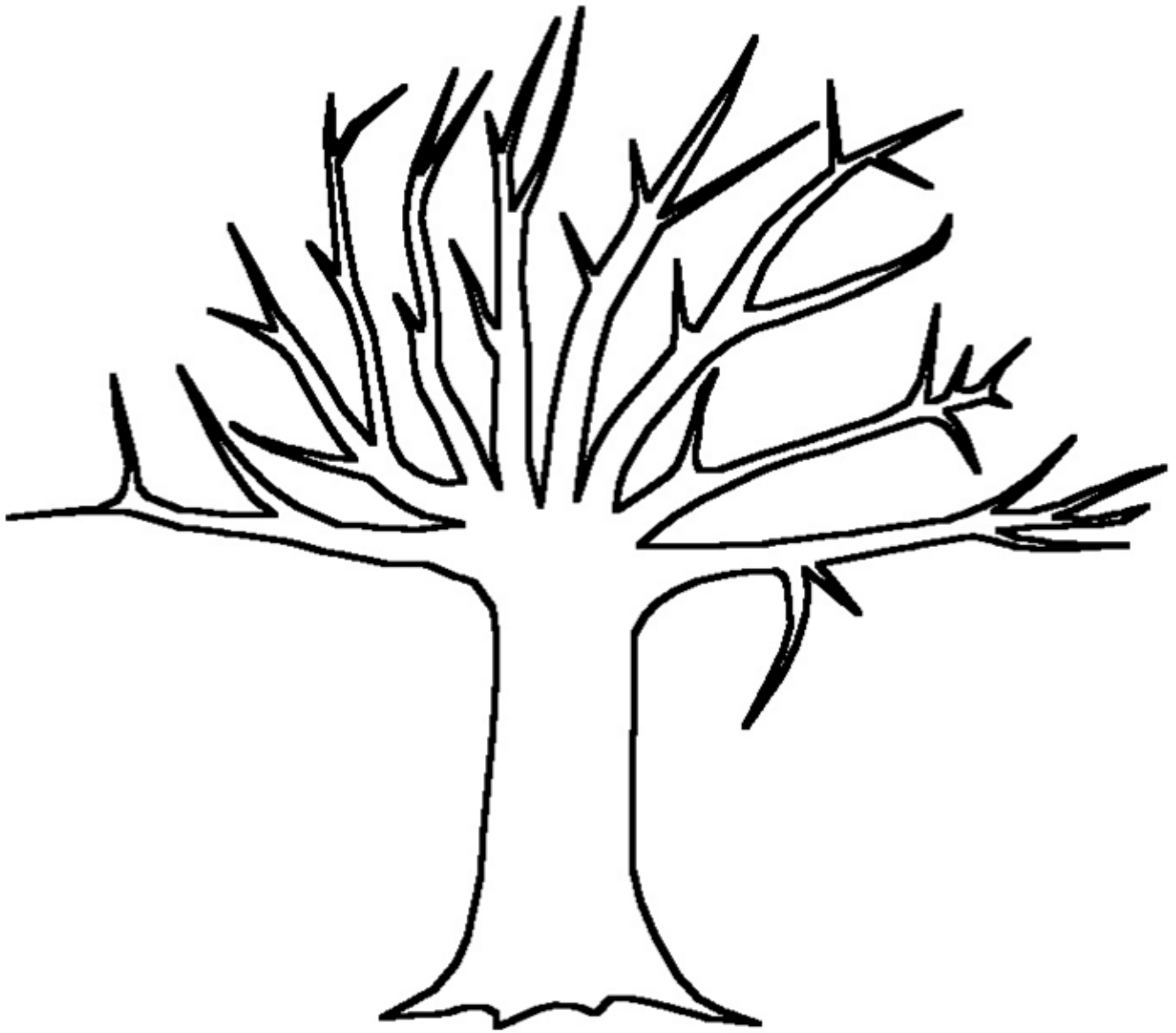
1. Core each apple. If you do not have a corer, you can cut the apple into quarters.
2. Fill the bottom of the large pot with 1 inch of water and the apples.
3. Cook over low heat until the apples are soft.
4. Cool apples for a few minutes.
5. Place food mill in a large bowl. Spoon apples into the food mill to mash. (You can also mash with a spoon if you cut the seeds out.)
6. Eat as is or flavor with cinnamon or sweeten with maple syrup.



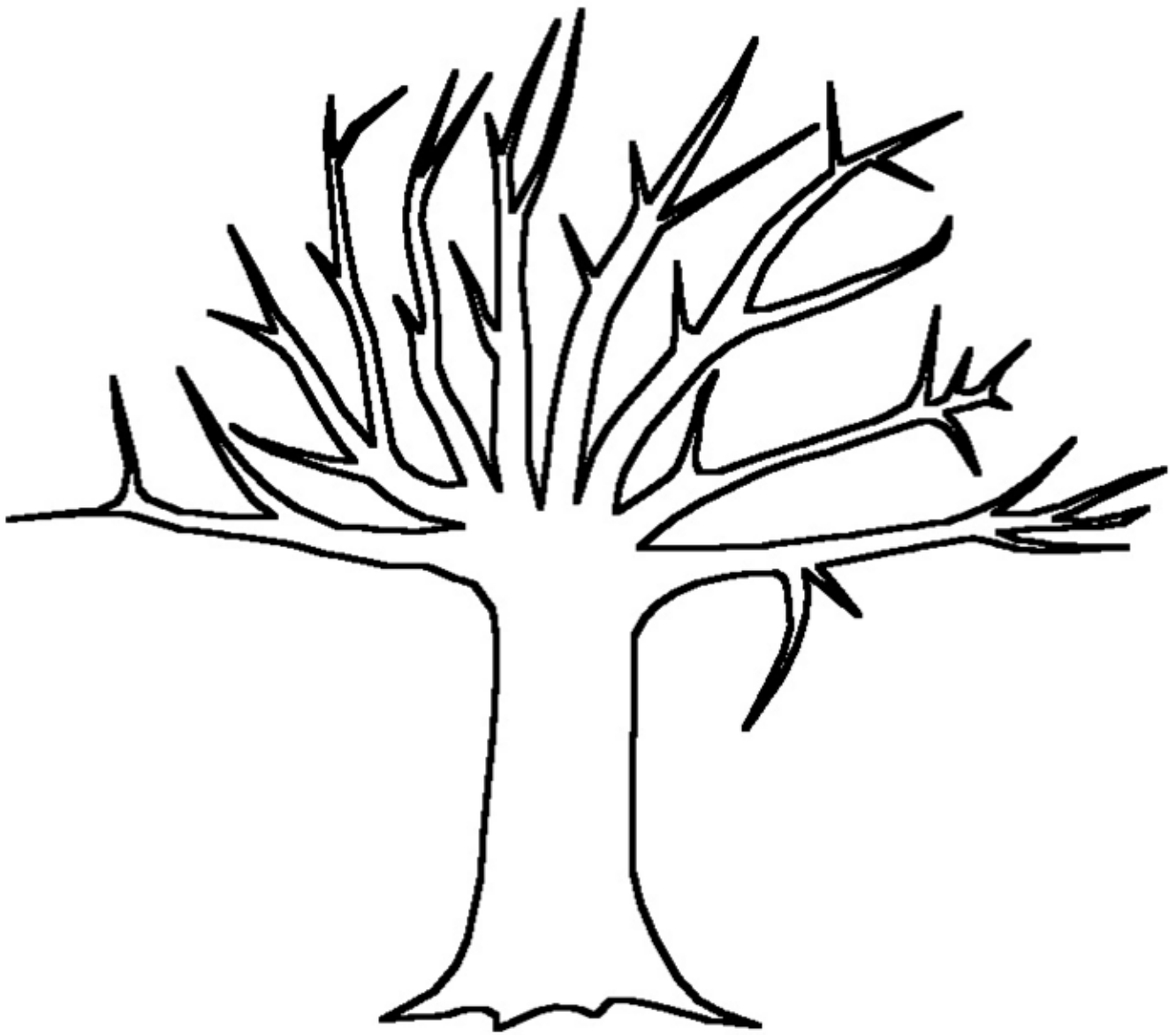
FALL



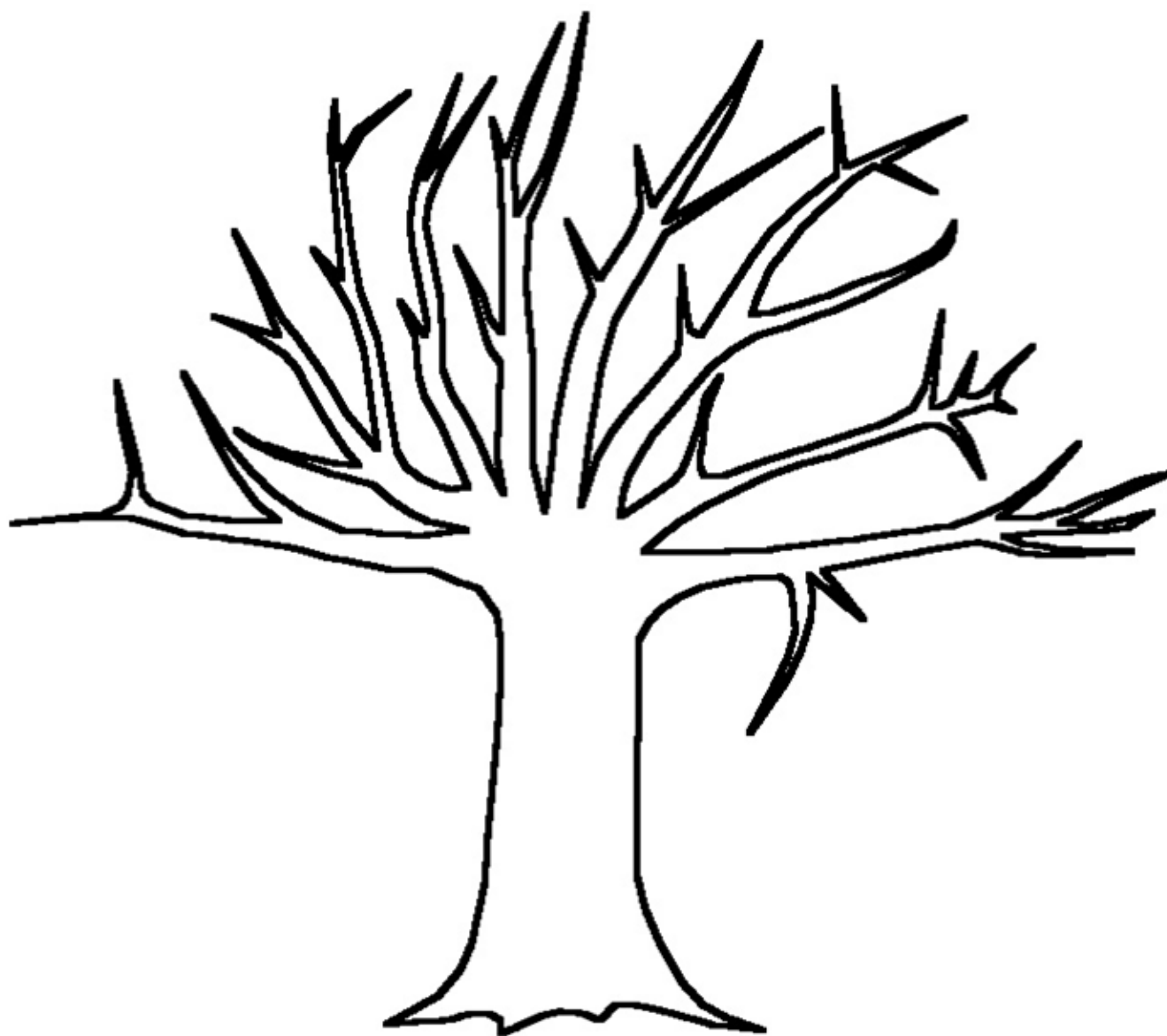
WINTER



SPRING

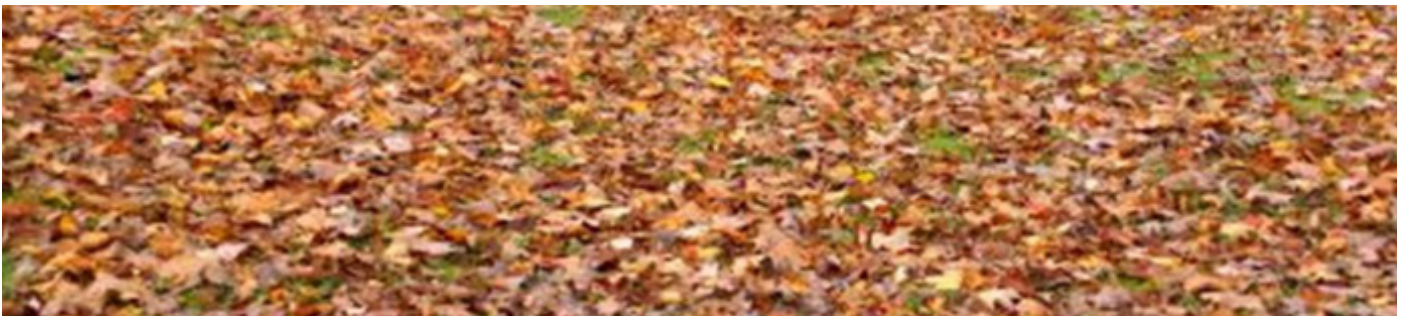


SUMMER















SEASONS OF MY APPLE TREE

 SPRING	 SUMMER	 FALL	 WINTER

LESSON FOUR

FROM SHEEP TO SWEATER

SUMMARY

Students will learn about sheep farming and sheep products. They will learn about the felting process and use what they learned to make a wool beads and then a necklace.

MATERIALS:

Journal Sheets:

Sheep Production sheet

Book:

Charlie Needs a Cloak by

Tomie dePaola

Dress Up As A Sheep props

(see activity for materials needed)

Wool sequence cards and props

Sheep cheese/yogurt & crackers for snack

Knife

Napkins or plates

Wool of different colors for felting

Knitting needles

Carding brushes

Yarn

Knitted mittens

Water basin

Tarp

Towels to clean up if needed

Hot water

Dawn dish soap

Crayons and colored pencils

GUIDING QUESTIONS:

1. What does a sheep provide that we can use or eat? (K-3)
2. What does a sheep need in order to survive? What people, tasks and steps are required to produce wool, sheep cheese, etc.? (4-6)

GOALS:

1. Students will recognize wool as a sheep by-product. Students will create products from wool.

OUTLINE:

- Welcome Circle and Attendance
- Charlie Needs a Cloak by Tomie dePaola
- Dress Up As A Sheep
- Sheep snack
- Wool production sequence cards
- Finding Sheep products
- Felted Wool Jewelry
- Wrap-Up

WELCOME CIRCLE AND ATTENDANCE - 5 MINUTES

Greeting: Today you will learn about sheep and sheep farming. We will learn about the things we get from sheep

Today's Question: Have you ever visited a sheep farm?

BOOK - 5 MINUTES

Charlie Needs a Cloak by Tomie dePaola

This book illustrates the process of wool production through the actions of a shepherd who needs a new wool cloak. There is a sneaky mouse and a silly sheep that students should keep their eyes on every page!

Listening Question: What is Charlie doing in each step? Why? What time period do you think this is happening in? What are your clues?

Reflect: Can you recall all of the sequence of steps in the creation of Charlie's new cloak?

DRESS UP AS A SHEEP - 10 MINUTES

Students learn about the different parts of a sheep. Be sure to compare the cow and sheep as you go along!

1. Ask the students to imagine what sheep look like. What makes them unique?
2. Pick a volunteer from the class and have them stand where everyone can see them. (Whisper in your volunteer's ear to ask permission to dress them up.) Explain to the class that they are going to help you turn their classmate into a sheep.
3. Ask the students for suggestions on how to make your volunteer look more like a sheep.
4. As they come up with ideas, dress up the student volunteer with the props that you have in your large bag. *Educator's Note: you will need to create the items needed for this activity
 - a. Stomachs (Laminated sign of stomachs) – One stomach with four compartments. Grass is chewed and later regurgitated as CUD. This is an adaptation that allows grazing animals to eat more quickly in the morning and fully chew and digest their food later on in the day. When grazers are eating, their heads are lowered; leaving them vulnerable to predators where as chewing cud does not leave them vulnerable.
 - b. Hooves (4 socks with paper hoof prints glued to the bottom) – Hooves are similar to horns. They protect the toes and help to break up the soil to help grass grow more easily.
 - c. Ears/Horns (Headband with cardboard ears and horns) – Sheep have excellent hearing and use their ears to help transfer heat. In some breeds both males and females have horns. In other breeds, just the males or just the females.



d. Tail and wool (piece of wool or fleece safely pinned on back of shirt) – Domesticated sheep often have their tails DOCKED, shortly after birth. This is done to keep the wool cleaner. The wool is clipped, or SHEARED, 1-2 times per year, depending on the breed. The wool is then processed and spun to create fibers for textiles and clothing.

e. Udder (2 baby bottle nipples & plastic jug) – an organ shaped like a bag that produces milk. Female sheep (ewes) can feed up to 2-3 babies with milk produced.

Take a group picture!

5. After the volunteer has dressed up with all the props, ask the students what they could add to make the student look even more like a sheep (covering, placement of features, lack of features, posture, habitat...)

Reflect: How are you different from a sheep? What does a sheep need for all of its parts to work properly? And, if all of its parts work properly, what does it produce?!

WOOL PRODUCTION SEQUENCE CARDS - 5 MINUTES

Students will take a closer look at wool production. There are cards for each step in addition to physical props for a few of them. If you'd like to use the physical props in place of the cards, remove the pictures before you start activity. Steps 2-6 can be moved about since there is no correct sequence. For example, you can card the wool and then wash it, dye it and then spin it.

1. Explain to the students that, like in the book, wool must first be processed into a form that we can use for creating wool products. What is that process?
2. Pair the students up and give each group an illustrative card or prop from list of items below. Ask them to work together and talk with the other groups and share their cards to agree on the correct order. Ask each group to describe what is happening in their pictures on their cards and then position the cards in the correct sequence.
 - a. Shear the sheep: Farmers will shear the sheep to take the wool off. This does not hurt the sheep. It actually helps them stay cool in the summer.
 - b. Wash the wool: Sheep wool gets to be very dirty, so it has to be washed before you can do anything with it.
 - i. Prop: Bag of just sheared wool.
 - c. Card the wool: In order to use the wool, all of the fibers need to face the same direction. Using the carding brushes, you can “bush” all of the fibers to get them ready for spinning.
 - i. Prop: Two carding brushes...demonstrate or have the kids try to card using a tiny bit of dirty wool. You could also leave this out for a filler towards the end of class.
 - d. Spin the wool: Now that the wool is clean and the fibers are going the right way, you can spin the wool into one continuous piece.
 - e. Dye the wool: Using colored dye, the white wool becomes a new color!
 - f. Put dyed, threaded wool in a ball: The wool can take up a lot of space and it will be difficult to work with if it isn't made into a nice, neat ball.
 - i. Prop: Skein of yarn. (Which also can be used for the wool bead necklace activity.)
 - g. Knitting needles: You can't wear the ball of yarn, so you must knit it, crochet it, or weave it into something else.

i. Prop: Knitting needles (caution NOT TOYS)

h. Mittens (or a sweater): All of that work makes a great item that will keep us warm all winter long.

i. Prop: Knitted mittens.

Reflect: Are there any surprises in this sequence? Would the tools be the same for a large amount of wool as they would be for a small amount?

FELTED WOOL NECKLACE - 30 MINUTES

Students make a necklace using roving wool. You will need to set up a basin of hot/warm water and a basin of cold water. Pre thread the needles and separate wool before class starts to save time later.

1. Fill the water basin with warm water and soap, and place it on a tarp in the middle of the students sitting in a circle on the floor.
2. Show the students the wool they will be using for the project. Ask the students if they have ever felted wool before? Explain to the students that felting is when small microscopic hooks on the wool fibers become entangled together.
3. Pass out a small portion of the wool to each student. Explain that everyone will make their first ball together, following the instructions:
 - a. Form the wool into a bead in your hands and put a bit of soap on each bead.
 - b. Place the bead into the warm water and then take it out quickly. Start felting it by gently squeezing, patting and smoothing the ball.
 - c. Keep dipping it in the water and adding soap as needed.
 - d. As the fibers begin to stick together rub and roll the bead in your palms. Dip it in the cold water and alternate between hot and cold while rolling the bead in your palms.
 - e. You will know when it is felted because the bead will feel stiff and compacted. Run under cold water to get extra soap out.
4. Set it to the side to dry.
5. Pass out additional wool for more beads as needed. Most students will only have time to make two.
6. When all beads are made, thread yarn through the felted beads with a needle to make a necklace. Use your judgment if students can use the needle or not.
7. Place a bead at one end of the necklace and a loop the other end so that it can slip over the bead as a fastener.



Reflect: What are some examples of some other felted items?

WRAP-UP

Reflect: Sheep are interesting animals that produce a lot of things, wool being one of them, and there are many steps in the process of producing wool.

Take Home: Felted jewelry

BACKGROUND INFORMATION

FELTING:

Felting is matting, condensing and pressing woolen fibers.

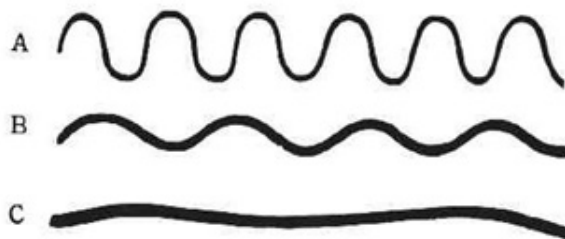
CARDING:

Carding is a mechanical process that breaks up locks and unorganized clumps of fiber and then aligns the individual fibers so that they are more or less parallel with each other.

WHAT HAPPENS TO WOOL WHEN YOU FELT?

Wool fibers have tiny microscopic scales along their surface. Some types of wool have larger scales than others. The types of wools that are coarser and smoother and have the highest sheen to them (such as Lincoln, Leicester, Wensleydale) have larger scales and reflect more light off their surface leading to the sheen. Finer wools (of which Merino is the main example) have much, much smaller scales and do not reflect light and have a more "matt" look to the surface of the yarn or finished knitting.

When wool fibers are shocked by temperature and rubbing the little scales lift up and as the fibers rub against each other they lock down on nearby fibers and form a tighter and tighter mass and form felt. Felt can be made from "just the fibers" unspun, or as many knitters are discovering, from knit pieces that are felted after knitting.



SHEEP FARMING IN VERMONT

Sheep farming in Vermont dates back to the 18th century when the state's earliest settlers brought sheep with them as part of their family agricultural operations. The early sheep were of no particular breed, and they were raised for the dual purpose of mutton and wool for the family. Beginning in the 1810s sheep farming began to develop from a largely subsistence operation into an industry that gave Vermont national prominence, first for the production of wool, and later for its superior sheep breeding. In 1840 there were enough sheep in Vermont for every person to have three! During the second half of the 19th century, sheep farming began to decline and was gradually eclipsed by the dairy industry.

In 1840, there were 1,681,819 sheep and 300,000 people in VT.
That is a 6:1 ratio.

In 2000, there were around 14,500 sheep and about 621,000 people.
That is a 1:42 ratio.

COTTON

Cotton is a soft, fluffy staple fiber that grows in a boll, or protective capsule, around the seeds of cotton plants. The plant is a shrub native to tropical and subtropical regions around the world, including the Americas, Africa, India, and Pakistan. This fiber is most often spun into yarn or thread and used to make a soft, breathable textile, which is the most widely used natural-fiber cloth in clothing today.

SILK

Silk is a natural protein fiber, some forms of which can be woven into textiles. The best-known type of silk is obtained from the cocoons of the larvae of the mulberry silkworm *Bombyx mori* reared in captivity. Silks are produced by several other insects, but only the silk of moth caterpillars has been used for textile manufacturing .

SHEEP PRODUCTS FIND MANY USES

While providing a continued supply of red meat to the tables of American consumers, sheep and lambs also provide significant by-products used by a number of American industries. These by-products are used in the manufacturing of many consumer items which are enjoyed by and contribute to the health and convenience of people from all walks of life.

FROM HIDE AND WOOL

Lanolin
Clothing
Drum Heads
Yams
Artists' Brushes
Sports Equipment
Fabrics
Pelt Products
Rouge Base
Insulation
Rug Pads
Asphalt Binder
Textiles
Ointment Base
Tennis Balls
Worsted Fabric
Felt
Carpet
Footware
Woolen Goods
Baseballs
Upholstery
Hide Glue
Paint and Plaster

FROM INTESTINES

Sausage Casings
Instrument Strings
Surgical Sutures
Tennis Racquet Strings

FROM MANURE

Nitrogen Fertilizer
Potash
Phosphorus
Minor Minerals

FROM FATS AND FATTY ACIDS

Explosives
Solvents
Chewing Gum
Paints
Makeup
Rennet for Cheese
Industrial Oils
Industrial Lubricants
Stearic Acid
Cosmetics
Dog Food
Protein Dog Food
Mink Oil
Oleo Margarine
Ceramics
Medicines
Shoe Creme
Dish Soap

FROM BONES, HORNS AND HOOVES

Syringes
Gelatin Desserts
Rose Food
Piano Keys
Marshmallow
Potted Meats
Pet Foot Ingredients
Bandage Strips
Bone Charcoal Pencils
Gelatin Capsules
Adhesive Tape
Phonograph Records
Combs and Toothbrushes
Buttons
Abrasives
Bon Jewelry
Bone Meal

Tires
Paraffin
Chicken Feed
Biodegradable Detergents
Antifreeze
Crayons
Floor Wax
Tallow for Tanning
Chemicals
Rubber Product
Oleo Shortening
Insecticides
Candles
Herbicides
Shaving Cream
Protein Hair Conditioner
Protein Hair Shampoo
Creams and Lotions

RETAIL MEATS

Leg of Lamb
Pot Roasts
Lamb Chops
Round Steaks
Rack of Lamb
Ground Lamb
Lambecue
BBQ Ribs

Grade Steel
Plywood and Paneling
Shampoo and Conditioner
Dice
Collagen Cold Cream
Crochet Needles
Cellophane Wrap and Tape
Glycerine
Photographic Film



GRINDING CORN

SUMMARY

Students learn about grain farming and production.

MATERIALS:

Journal Sheets:

Cornbread recipe

Book:

The Popcorn Book
by Tomie dePaola

Corn stalk

Corn diagram

Examples of food products
that contain corn

Corn kernels for cornbread

Grain mill

Bowl to grind corn into

Spoon

Ingredients for cornbread

Measuring cups and spoons

2- 8" pans

Knife

Butter to eat with the bread

Napkins or plates

Baggies for extra cornbread

Dish soap & scrubby pad

Corn on cob, different kinds
of corn examples

Crayons and colored pencils

GUIDING QUESTIONS:

1. What happens to corn between the farm and your plate? (K-3)
2. In what ways can corn be found in the foods we eat? (4-6)

GOALS:

1. Students will learn how cornmeal is made and where it comes from.
2. Students will learn the parts of the corn plant.

OUTLINE:

- Welcome Circle
- The Popcorn Book by Tomie dePaola
- Grinding Cornmeal
- Prepare Cornbread
- Explore corn and the different varieties
- Filler, Game: Corn, Corn, Squash
- Wrap-Up

WELCOME CIRCLE AND ATTENDANCE - 5 MINUTES

Greeting: Today students will look at grain farming, corn in particular. They will learn how it is produced, and processed to make corn meal, and then they will make cornbread.

Today's Questions: What are some every day food items that you eat that are made with corn? What are different kinds of corn? What are the differences among them, and their different uses?

GRINDING CORNMEAL - 15 MINUTES

Students will review parts of the corn stalk and find the kernels.

1. Hold up one of the corn stalks from the garden.
2. Ask the students if they know what some of the parts are.
3. Show them the diagram, and then ask for the students to point out the parts on the actual stalk.
4. Then ask them how to get to the kernel, and how they think we get the kernels off in order to grind them.
5. Pass out a couple of stalks and let some of the students try.
6. Show them a picture of, or describe to them, an implement that strips the corn off of the corn cob. Let each student take off 10 kernels.
7. Then get out your kernels to be ground, pour them into the grinder.
8. Have the students line up and let them one by one grind corn for 10 cranks.
9. Save the ground corn to be added into your cornbread.



Reflect: Now that we have ground/processed our corn, let's use it in a recipe.

CORNBREAD - 40 MINUTES

Students get to make corn bread.

1. Split the students up into same number of groups as number of steps in recipe.
2. Give each group a recipe sheet.
3. Assign each group a step.
4. Have the student line up at a table assembly line style, step 1 first and so on.
5. Read and go over the recipe together.
6. Allow the groups go up to the supply table and get the supplies that they think they will need for their step.
7. Then have group one begin with the first step.
8. Once group one is finished group two can continue and so on.
9. When all steps are complete, then you place pans in oven to bake.
10. While cornbread is baking, students can work together to clean up the space.
11. Each group must clean up their own stations, tools, and ingredients.
12. No one can taste cornbread until spaces and dishes are cleaned.

Reflect: How do you like your cornbread! What kind of corn did we use to make it?

BOOK - 5 MINUTES

The Popcorn Book by Tomie dePaola

Two brothers want to make popcorn as a snack. Their curiosity about popcorn leads us into the history of corn and gives scientific and historical facts along the way!

Listening question: How is popcorn made? How have people used corn throughout history?

Reflect: What mistake did the brothers make? What kind of corn were they using?

EXPLORING CORN - 15 MINUTES

Students will try and match up corn varieties with their names, purpose, and then corn products.

1. Have students gather around table where you have the 5 different types of corn displayed in bowls.
2. Place the 5 name cards on the table and ask students to come to an agreement as to which names go with which bowls of corn.
3. Next, display the 5 different description cards, and have the students again, come to an agreement on where the descriptions go.
4. Finally, pull out corn product cards (or boxes/packages), and have the students decide again. Looking at the corn product packages could also be a separate activity, to discover which products actually have corn as an ingredient.
5. Ask the students now if they can name some other things they eat that have corn in them:
 - a. Cereal
 - b. Grits
 - c. Bread
 - d. Candy/soda
 - e. Tortilla chips
 - f. Corn Tortillas
 - g. Taco Shells

Reflect: Is anyone surprised by the results? Did you know that there were this many different kinds of corn?

EAT CORNBREAD - 5 MINUTES

Have students wash hands and get settled at a table.

1. Once cornbread is done, let it cool for a few minutes while the students wash their hands.
2. Only the teacher can touch it because it will be very warm.
3. Demonstrate how to cut the butter and put it on a slice of bread. You can also butter yourself.
4. Give a slice to each student to eat then or to take home on paper plate.

FILLER GAME: CORN, CORN, SQUASH

Corn, Corn, Squash is a game played just like duck, duck goose.

WRAP-UP

Reflect: A lot of foods that we eat have corn in them! Go home and try to find where corn is hiding in your kitchen. You may be surprised! (How will you know if something has corn in it?)

Take Home: Extra cornbread and cornbread recipe

BACKGROUND INFORMATION

FLINT CORN

Flint corn is very hard and gets its name from flint, a hard type of stone. The colors of flint corn range from white to red. (Flint corn is also known as Indian corn.) Flint corn is commonly used for industrial purposes and livestock feed. Today, flint corn is widely grown in Asia, Europe, and Central and South America and used mostly as corn meal, flour, or hominy. Considered more of an heirloom variety. It is similar to Dent corn, only dent corn tends to have higher production rates. Open pollinated, harder corn meal. Products: hominy.

POPCORN

Popcorn is a special type of flint corn with hard, small kernels. The natural moisture inside the kernels turns to steam when heated, but the outer coat of the kernel is so hard that the moisture is trapped. This causes the steam to build up pressure until the kernel explodes. The wild ancestor of modern corn is believed to have been a type of popcorn. Today, the United States is responsible for producing almost all of the world's popcorn. Products: popping corn

DENT CORN

Dent corn is softer than flint corn. It has a dent in each kernel. Most kernels are yellow or white. It is commonly grown in North America and often used as livestock feed. It is also used to make many processed foods. Used for similar purposes as flint corn, however it tends to have higher production rates, because it is more hybridized. Products: High fructose syrup, cow feed.

FLOUR CORN

Flour corn has a very soft starchy kernel. It is easily ground and is used in baked goods. Flour and Flint corn were the chief types of corn raised by Native Americans. Today, it is used mostly for food by the people who grow it. It is one of the oldest kinds of corn.

SWEET CORN

Sweet corn has more natural sugars than other types of corn. Today, it is eaten on the cob or it is stored frozen or canned. Most Native American tribes didn't grow sweet corn because they didn't like the sweet taste.

POD CORN

Pod corn is thought to have been the first type of corn grown for food. Each kernel grows in its own husk, so it is difficult to use without incorporating a lot of labor. It is raised today for scientific research.

DID YOU KNOW? FUN CORN FACTS!

- Scientists think that the ancestry of corn in the Americas dates back to 10,000 years ago, and that it is closely related to a wild grass called teosinte.
- Corn was introduced to Spain by Columbus, who brought it back from the Americas. The Spanish called it Panizo, which means grain in Spanish.
- Corn provides nearly 20% of the world's food calories.
- Corn is grown in Africa more widely than any other crop.
- The United States grows 45% of the world's corn, much of which is processed into animal feed.
- A bushel of corn yields 2.5 gallons of ethanol: a renewable fuel used to improve gasoline.
- More than 2000 supermarket products are sweetened with corn syrup, more than are sweetened with refined sugars.
- Corn farming was probably introduced to Africa to supply cheap food for slave ships. Ironically, while Africa was losing people to slavery, the addition of corn to the African diet helped to fuel a population increase.
- Corn, which was easy to cultivate and grew rapidly, became a staple crop in many parts of Africa. Today, in east Africa for example, corn is eaten at nearly every meal.

CORNBREAD RECIPE

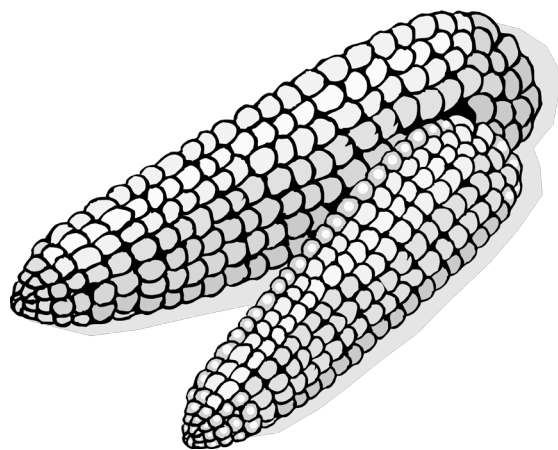
INGREDIENTS & MATERIALS

- 1 cup yellow corn meal
- ½ cup whole wheat flour
- ½ cup unbleached white flour
- 4 tsp. melted butter
- 2 tsp. baking powder
- ½ tsp. baking soda
- ½ tsp. salt
- ¼ cup honey
- ½ cup milk
- ½ cup yogurt
- 2 eggs

DIRECTIONS

Makes 10-12 servings

1. Preheat oven 400°
2. In one bowl beat eggs together.
3. Add milk and honey to eggs, beat together.
3. In another bowl, mix white and wheat flour together.
4. Add baking powder, baking soda and salt together with flours.
5. Mix wet ingredients with dry.
6. Butter and flour two 8-inch pans.
7. Pour even amount of batter into each pan, getting it all out of the bowl.
8. Bake for 20 minutes at 400°.



FLINT CORN

DENT CORN

POP CORN

FLOUR CORN

SWEET CORN

- It has a dent in each kernel.
- Most kernels are yellow or white.
- Used to make high fructose corn syrup, processed foods, & to feed livestock feed.
- Tends to have higher production rates, because it is a hybrid.

- Very soft starchy kernel.
- It is easily ground and is used in baked goods.
- It is used mostly for food by the people who grow it.
- It is one of the oldest kinds of corn.

- Has more natural sugar than other types of corn.
- Today, it is eaten on the cob or it is stored frozen or canned.
- Most Native American tribes didn't grow this corn because they didn't like the sweet taste.

- Is very hard and gets its name from a hard type of stone.
- This corn is also known as Indian corn.
- Used mostly as corn meal, flour, or hominy.
- Considered more of an heirloom variety.

- A special type of flint corn with hard, small kernels.
- When heated, natural moisture inside the kernels turns to steam and pressure builds up until the kernel explodes.
- Today, the U.S. produces almost all of the world's supply of this type of corn.
- A favorite snack for movie-goers.

LESSON SIX

POULTRY POWER

SUMMARY

Students will be introduced to chickens and poultry farming by dressing up as a chicken, reviewing poultry products, comparing chicken breeds and then finally creating their own chicken!

MATERIALS:

Journal Sheets:
Egg Salad recipe
Chickens aren't the Only Ones
Poultry products grab bag
Dress Up As A Chicken
Supplies
Hard boiled eggs
Bowls
Egg slicer
Spoon
Mayonnaise
Salt & Pepper
Crackers
Chicken breed catalogues
Crayons/Colored Pencils
Containers for extra egg salad

GUIDING QUESTIONS:

1. What kinds of food do chickens provide? (K-3)
2. What are the different kinds of chickens and the products they make? (4-6)

GOALS:

1. Students will be able to identify at least 3 different types of chickens.
2. Students will be able to identify parts of a chicken and their proper names.

OUTLINE:

- Welcome Circle and Attendance
- Chickens aren't the Only Ones by Ruth Heller
- Poultry Products Grab Bag
- From Rock to Egg- Sequence Cards
- Dress Up As A Chicken
- Contrast and Compare Chicken Breeds
- Create your Own Chicken
- Egg Salad Snack

WELCOME CIRCLE AND ATTENDANCE - 5 MINUTES

Greeting: Today you will learn about chickens by participating in many different hands-on activities.

Today's Question: What is your favorite farm animal?

BOOK - 5 MINUTES

Chicken's Aren't the Only Ones by Ruth Heller

The book points out one of the chicken's most common farm products: eggs; and illustrates that chickens aren't the only ones that lay eggs!

Listening Question: Can anyone remember what an animal is called if it lays eggs?

Reflect: What are some other kinds of poultry that lay eggs? What about other kinds of animals? Do we use any other animal's eggs for anything?

POULTRY PRODUCTS GRAB BAG - 15 MINUTES

Students will discover a plethora of products that come from chickens.

1. While sitting in a circle, ask the students if they know what a product is (something that is made or created by a person, machine, or natural process, especially something that is offered for sale, or the goods or services produced by a company, animal, person).
2. Explain to them that you have a grab bag of products, with each product connecting to a chicken in some way. Ask them to pull an item out of the bag and describe how it is connected to a chicken.
3. Grab bag items are as follows:
 - a. Chicken noodle soup
 - b. Chicken stock
 - c. Egg carton
 - d. Egg Noodles
 - e. Fried Chicken breading
 - f. Fertilizer
 - g. Feathers for down items
 - h. Loose corn in jars to feed chickens
 - i. Little picture of chicken coop housing
 - j. Little jar of water
 - k. Etc.

Reflect: Can you think of any items connected to chicken farming that we did not have in the bag? Which one of these items do people use most?

DRESS UP AS A CHICKEN - 15 MINUTES

Students will be introduced to the distinguishing characteristics of a chicken.

1. Explain to the students that you will need a brave volunteer to help teach her fellow students about chicken anatomy.
2. Pick a volunteer from the class and have them stand where everyone can see them. (Whisper in your volunteer's ear to ask permission to dress them up.) Explain to the class that they are going to help you turn their classmate into a chicken.
3. Ask the students to imagine what chickens look like. What makes them unique? What are some suggestions for how to make your volunteer look more like a chicken.?
4. As they come up with ideas, dress up the student volunteer with the props that you have in your large bag. Once all props are on the volunteer add more distinguishing characteristics that have to do with eating, moving, sounds etc.
5. Props:
 - a. Feathers – protects from weather and injury
 - b. Beak (Paper cone with string) – used primarily for eating and grooming
 - c. Comb (hair comb glued to head band) – a fleshy growth on the top of the chicken head. Both males and females have them; the male's is typically larger. Combs are different shapes, sizes and colors for different breeds, but all serve the same purpose: cooling. The way this works is that blood circulates between the comb and the wattle.
 - d. Wattles (deflated balloons on a string) – a fleshy growth located under the chin. Both males and females have them; each chicken has 2. They serve the same purpose as the comb, assisting with cooling during hot weather.
 - e. Wings (cardboard) – chickens are not good flyers and can only fly short distances.
 - f. Feet (2 hand cultivators held so that the handle becomes the fourth toe) – chickens have 16 bones in their feet making up 4 toes. The third toe is the longest, while the fourth toe is claw-like. Many birds have webbed toes, however, the chicken does not.
 - g. Gizzard: a felt stomach with three chambers and stones glued to one of the chambers to simulate the stones grinding



Reflect: Was it fun to dress up as a chicken? Would it be fun to be a chicken?! What are some parts that a chicken has that we don't and what are some parts that we have in common?

COMPARE AND CONTRAST CHICKEN BREEDS - 15 MINUTES

Students will briefly review the various breeds of chicken and compare and contrast breed characteristics.

1. Ask the students if they know the names for chickens at different ages (Human: Baby, Child, Teenage, and Adult). Chick, Pullet (females <1 year), Cockerel (males <1 year), Hens (females >1 year), and Rooster (males >1 year). Explain to the students that there are many different breeds of chickens, just like there are dogs or cats.
2. Pass out chicken catalogues to the students so that they can look along with you as you describe some of the breeds to them.
3. Hold up the poster of chicken breeds with large photos and describe the differences in the breeds, what they are good for, what kind of climate they live best in, etc.
4. Ask the students if there is one breed that they see in the catalogue that stands out to them and why. Tell them a little about the breed if you can.

Reflect: Which breeds have you seen before? Which breeds do you think would be best suited for Vermont? Which breeds do you think are the most interesting looking?

CREATE YOUR OWN CHICKEN - 15 MINUTES

Students will employ creativity to come up with a chicken breed of their own based on the basic structure of a chicken's body.



1. Using crayons and paper, students will create their own chickens. Remind them to include all of the parts of the chicken: feathers, beak, comb, wattles, wings, and feet.
2. Encourage the students to be creative and ask for volunteers to share when finished.

Reflect: Museum walk: Students walk around tables where their creations are. Ask students to take a look at others artwork as if they were in a Museum gallery.

EGG SALAD SNACK - 20 MINUTES

Students will help to prepare egg salad to eat with crackers.

1. Demonstrate peeling and slicing hard boiled eggs
2. Have each student peel and slice 1 egg.
3. Measure and add mayonnaise and salt and pepper.
4. Pass out crackers and have students spread egg salad.

FILLER GAME: CHICKENS AND COYOTES

Chickens and Coyotes is a tag game. The runners are chickens and the taggers are

coyotes.

FILLER GAME: HENS AND ROOSTERS

Hens and Roosters is just another name for Sharks and Minnows! The Rooster stands in the middle of the designated running space. The chickens are at one end and when the Rooster calls them, they must make it to the other end without getting tagged. If they are tagged, they become Roosters too.

FILLER GAME: EGG, CHICK, HEN

Played like Rock, Paper, Scissors and goes through the life cycle of a hen. Everyone starts out as an egg, walking crouched low to the ground. Eggs play other eggs, and whoever wins the rock, paper, scissors challenge moves onto being a chick, walking around on their knees. Chicks play other chicks, with the winner progressing to a hen, full standing and flapping their wings. Hens play other hens, and whoever wins goes back to being an egg.

WRAP-UP

Reflect: We looked at chicken products, chicken eggs, and chicken breeds and how they all differ. We covered a lot of information!

Take Home: Extra Egg Salad

EGG SALAD RECIPE

INGREDIENTS & MATERIALS

10 Eggs
1 Tbs. Mayonnaise
½ to 1 tsp. dried dill weed
½ to 1 tsp. paprika
salt
pepper
Diced celery (optional)
Diced carrots (optional)

DIRECTIONS

1. Hard-boil eggs
2. Peel and slice eggs
3. Combine egg, mayonnaise, dill and paprika, salt and pepper, and optional vegetables
4. Mash with wooden spoon
5. Serve on crackers

7 TYPES OF CHICKEN & COCKERAL COMBS



Strawberry

ROSE – is a solid, broad and nearly flat comb on top. It is a low, fleshy comb that concludes in a well-developed tapering spike at the back.

STRAWBERRY – is a low comb that is set well-forward. The shape and surface resemble the outer part of half a strawberry with a large end nearest the beak of the chicken.



Buttercup

BUTTERCUP – consists of a single leader from base of beak to a cup-shaped crown set firmly on the centre of the skull and completely surmounted by a circle of regular points.

PEA – is a medium length, low comb, the top of which is marked with three low lengthwise ridges, the centre one is slightly higher than the outer ones. The outer ones are either undulated or marked with small rounded serrations.

SINGLE – comb is a moderately thin, fleshy formation of smooth soft surface texture, firmly attached from the beak along the top of the skull with a strong base. The top portion shows five or six rather deep serrations or distinct points, the middle points being higher than the back or front, forming a semi-oval shape when viewed from the side. The comb is always upright and much larger and thicker in males than in females. It may be lopped or upright in the female. This depends on the breed. The comb is divided into three sections: the front, the middle and the posterior or blade which extends past the rear base of the skull.



Pea

V-SHAPED – comb is formed of two well defined horn like sections that are joined at their base, as in breeds such as Houdans, Polish, Crevecœurs, Le-Fleche and Sultans.

CUSHION – is a solid low, moderately small comb; smooth on top, the front, rear and sides are nearly straight with rounded corners. It has no spikes.



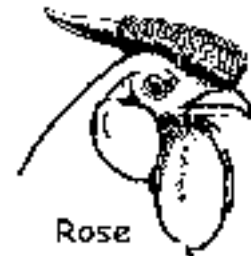
Single



V Shaped



Cushion



Rose

MAPLE SUGARING

SUMMARY

MATERIALS:

Journal Sheets:

Layers of a Maple Tree
Circumference Chart
New Grading System

Book:

At Grandpa's Sugar Bush
by Margaret Carney & Janet
Wilson

Cross section of tree

Be a Tree/Tree layer action cards

Maple syrup history
sequence cards

Sap to Syrup Chart

Maple sugaring process props:

Buckets
Hand drill
Measure tape/string
Sugar Maple branches

Ladle or density measurer

2 clear gallon jugs

4 sap buckets or 5 gallon
buckets

Graded syrup samples

Tape measure

String labeled with
measurements

Syrup for taste test

Spoons for syrup

40 "1 Gallon" Sap cards

Cardboard Snowshoes

2 Sap Buckets

Students will learn about the history and process of turning maple sap into syrup.

GUIDING QUESTIONS:

1. How does sap turn into maple syrup? (K-3)
2. How has farming changed over time in our community? (4-6)

GOALS:

1. Students will learn about the process of making maple syrup.
2. Students will learn about the different methods used over time to make maple syrup.

OUTLINE:

- Welcome Circle and Attendance
- At Grandpa's Sugar House by Margaret Carney & Janet Wilson
- Layers of a Maple Tree
- Be a Tree
- 40:1 Sap Search
- Grading Maple Syrup
- Maple vs. Faple- Taste Test
- Filler Activity: From Sap to Syrup
- Wrap-up

WELCOME CIRCLE AND ATTENDANCE – 5 MINUTES

Greeting: Today you will learn about the maple sugaring process.

Today's Question: What is your favorite way to eat maple sugar/syrup?

BOOK – 5 MINUTES

At Grandpa's Sugar Bush by Margaret Carney & Janet Wilson

A young boy and his grandpa share the work of tapping maple trees, and collecting and boiling the sap into syrup.

Listening question: What season is sap gathered in to make syrup?

Reflect: Who can describe the process of making maple syrup?

LAYERS OF A TREE – 5 MINUTES

Students will learn about the layers of a maple tree and why the tree produces sap.

1. Provide a cross-sectional slice of a tree (or photo of one). Ask students to share observations about the different layers and discuss the role of each.
2. Explain to the students that they will be forming the layers of a maple tree trunk.
3. Ask for a volunteer(s) to be the heart wood and have him or her stand in the center of the room or space. Explain that the heart wood is very strong and helps hold up the tree similar to the way bones and muscles hold up our bodies. Ask the heart wood student(s) if they think they are strong enough for the job, have them flex their muscles!
4. Point out the lighter wood that is closest to the bark and surrounds the heart wood. Explain that this is the wood that is alive and full of sap! Ask if they can guess its name. (Sap wood) Pick out 6 students to be sap wood and instruct them to join hands in a circle around the heart wood. Ask what they think the function of the sap wood is. (To carry water and minerals throughout the tree). Have the sap wood students demonstrate this by moving their wiggling fingers from the floor to the ceiling and back.
5. Point out the outer edge of the tree. Ask students what they think it is. (Bark). Explain that the bark is made up of 2 parts with 2 functions:
 - a. The inner bark serves as the tree's food conductor, carrying food from the leaves to the rest of the tree to help it grow. Choose a number of students for this role and have them encircle the sap wood students.
 - b. The outer bark- protects the tree from weather, animals, insects, and disease. Compare the outer bark to skin. Choose a number of students for this job and ask them to encircle the inner bark layer. Have all bark volunteers bark and growl to demonstrate how they will be good protectors of the tree.



6. Ask now, is our tree complete? NO! We are missing an important microscopic layer that cannot be seen on the cross section view, the cambium layer. This layer helps the tree to grow by adding new rings of sap wood and a new layer of inner bark. Have the remaining students join the tree in between the sap layer and inner bark. Have them join hands and walk in a circle to demonstrate the creation of new rings.

7. Pass out the maple tree layer riddles and have students complete, then review the answers as a group.

Reflect: Which layer does the sap run in? How do we get the sap from maple trees?

40:1 SAP SEARCH – 15 MINUTES

This game can be played as a relay-race or as a scavenger hunt, or a combination of both. If it's a scavenger hunt, you will need to hide the gallons of sap before the lesson starts. If it's a relay race, students can scatter the gallons of sap in a designated area.

Supplies Needed:

40 "Gallons of Sap" cards

2 pairs of snowshoes (made out of cardboard and string)

2 sap buckets

1. Split students into 2 groups. Each group will send one person at a time out into "The Maple Forest" to retrieve one card and return it to their bucket. If you are using the cardboard snowshoes, students must stay on them at all times. Students who are waiting their turn must guard their bucket. If they stray from their bucket, the Sap Monster (you) can steal gallons of sap.



2. The game ends when all 40 gallons of sap have been collected. Each team will count up their gallons of sap to see who collected the most.

3. This activity takes some time. At the end you can discuss the amount of time and energy it takes to collect sap and make maple syrup. Each bucket can weigh up to 20 pounds, imagine carrying more than 1 gallon of sap at a time!

GRADING SYRUP – 5 MINUTES

Students get to see the difference in various grades of syrup. The grades changed in 2013 and are taking affect throughout the US and Canada. See Background Information: New Grading System for more information.

1. Explain to the students that after syrup is bottled, it is graded. Show them the graded syrup containers and ask them if they can think of what some of the differences in the various grades might be, and then explain the differences. The names underlined represent the old system naming system, the new names are designated in bold.
 - a. The grades roughly correspond to various times within the season when syrups are produced. Grade A Light Amber or **Amber, Rich Taste**, is made in early-season, while Grade B or **Very Dark, Strong Taste**, is made in late-season. (See more information at end of lesson)
 - b. Typically Grade A (especially Grade A Light Amber), **Amber, Rich Taste**, has a milder, more delicate flavor than Grade B, **Very Dark, Strong Taste**, which is very dark with a robust flavor.
 - c. The dark grades of syrup are primarily used for cooking and baking.

Reflect: Do you think the different grades of syrup taste different? Which grade of syrup might you like the best?

MAPLE VS. FAPLE SYRUP TASTE TEST – 15 MINUTES

Students will get to taste different grades and types of syrup, including imitation maple syrup.

1. Prepare tray ahead of time – 1 spoon or small tasting cup per student per sample.
2. Pass out a sample of syrup to each student. Have them lick the sample off their spoon or drink the syrup in their cup and compare the taste of each grade and type of syrup.

Reflect: How does each grade of syrup taste? Which one is your favorite?

FILLER ACTIVITY: FROM SAP TO SYRUP ROLE-PLAY – 20 MINUTES

Students reinforce what they have learned about the maple sugaring process by acting out the process using props.

1. Ask for volunteers to act out the following items:
 - a. Maple tree: holds sugar maple branches and bucket that collects sap.
 - b. Tree tappers: measure circumference of tree and tap it.
 - c. Sap collectors: carry buckets of sap to collection tank.
 - d. Fire loader: Loads the fire with wood.
 - e. Density checker: checks the density of the sap to tell when it is finished turning into syrup by dipping ladle into sap and slowly pouring it out.
2. Ask the students what they think the first thing is that should be done if someone wants to start sugaring? (identify the sugar maple trees) Point out some distinctive qualities of the sugar maple and then have the student tree volunteers spread out throughout the room.
3. Now that the students know which trees are sugar maples, ask them what step 2 is. (tapping the trees) How does the sugar maker know which trees to tap or how many taps a tree can have?
4. Explain that a tree must be a certain size before it can be tapped. Sugar makers measure trees by how big around they are (circumference). Show students the circumference chart.
 - a. <30 inches then the tree should not be tapped
 - b. <54 inches 1 tap
 - c. <72 inches 2 taps
 - d. >72 inches 3 taps
5. Have tree tappers measure and tap their trees using a string that is labeled with a specific length. After measurements are made students should pretend to use a hand drill to drill the correct number of holes for the taps.
6. Now that the taps are in, ask the sap collectors to pass out the sap buckets to the trees. Wait a moment for them to fill up and then take the buckets to the holding tank/ evaporator. Discuss how long it would take for a bucket to fill with sap.
7. Ask the students if they know how many gallons the sap buckets hold. Ask them if they know how many gallons of sap it takes to make a gallon of syrup (40 gallons of sap=1 gallon of syrup). Have the students gather enough sap to make a gallon of syrup.
8. Ask the students how they will turn sap into syrup. Have the fire loaders load fire wood to keep the fires going.
9. Ask how do you know when it is done? (Density checkers should keep checking density with their ladle)
10. Once sap collectors have collected enough sap to make one gallon of syrup, and the density checkers say the syrup has reached a good consistency then bottle the syrup.

Reflect: What time of year does sugaring happen in? Why? What surprised you about the sugar making process?

FILLER ACTIVITY: MAPLE SUGARING SORT AND SEQUENCE – 15 MINUTES

Students learn about the maple sugaring process by sorting through illustrations, categorizing them and then placing them in proper sequence.

1. Explain to the students that you have 4 sets of sequence cards that illustrate the maple sugaring process during 4 different time periods: Pre-Colonial, Colonial, and two types of present day sugar makers.
2. First ask the students to look at all of the cards together; next divide the students up into the 4 categories, with 3 cards in each group.
3. Next have the students put the 3 cards in each group into sequence. If some of the cards do not seem to fit into sequence, suggest to the students that they might need to be moved to another group.
4. Sequences are as follows:
 - a. Pre-Colonial:
 - i. Hewn wooden trough
 - ii. Birch bark basket
 - iii. Fire pit
 - b. Colonial:
 - i. Wooden Spout
 - ii. Wooden Bucket
 - iii. Kettle on wood frames over fire
 - c. Present day sugar makers(type 1):
 - i. Metal Spouts
 - ii. Metal sap collecting bucket
 - iii. Wood burning evaporator
 - d. Present day sugar makers (type 2):
 - i. Plastic spout
 - ii. Tubing
 - iii. Propane evaporator
5. Once all sequences are laid out correctly, discuss by contrasting and comparing the process.
6. Ask a volunteer to outline the process of present day sugaring for reinforcement.

Reflect: How does the process change over time? Does the present day process seem easier or harder? How do you think the final product differs from past to present?

WRAP-UP

Reflect: Today we learned a lot about the maple sugaring process; why the maple tree makes sap, how to make that sap into syrup, and how to grade the syrup!



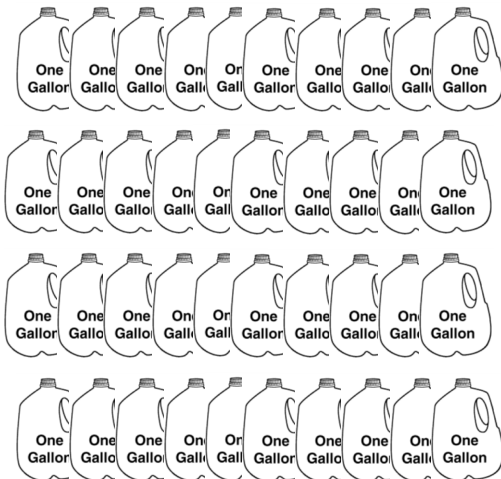


CIRCUMFERENCE CHART

Circumference of Maple tree must be equal to or greater than...
Circumference = inches around tree

INCHES	# OF TAPS
30	1
54	2
72	3

FROM SAP TO SYRUP



40 GALLONS OF SAP

=

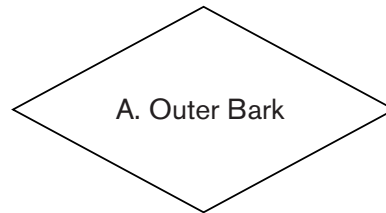


1 GALLON OF SYRUP

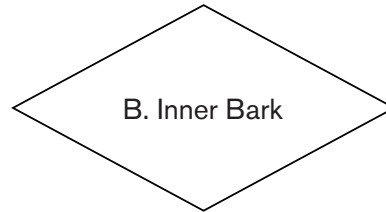
THE LAYERS OF A MAPLE TREE

Guess the answers to the riddles by drawing lines!

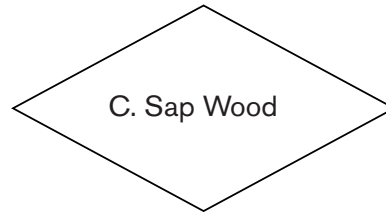
1. Full of water and minerals
Going up and down
At sugaring time
I am where the sap is found
Do you know my name?



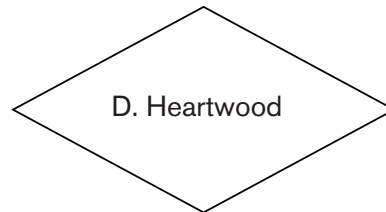
2. I cover the tree
Just like your skin
Providing protection
To the layers within
Who am I?



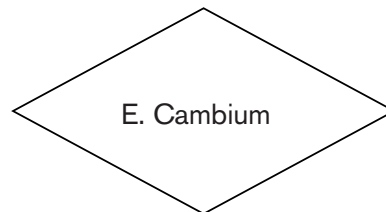
3. I carry sugar from the leaves
Throughout the tree
When you scratch the tree
You're hurting me
Can you guess my name?



4. To find me you must dig
Through 2 layers of skin
I'm not very big;
The naked eye can't see me
But, I provide the tree
With age defining jewelry!
What am I called?



5. I am right in the middle
I am not very brittle
But very strong wood
I am not alive
Should I begin to rot
I can become a bee hive-
Who am I ?



CROSS SECTION OF A MAPLE TREE TRUNK



SUGAR MAPLE BARK, FRUIT, LEAF, AND TWIG



NEW GRADING SYSTEM

New Grading Standards		GRADE A	Current Grading Standards	
75.00%	Golden, Delicate taste		U.S. Grade A Light Amber "Vermont Fancy" (Canada No. 1 Extra Light (AA))	75.00%
50.00%	Amber, Rich taste		U.S. Grade A Medium Amber (Canada No. 1 Light)	60.50%
25.00%	Dark, Robust taste		U.S. Grade A Dark Amber (Canada No. 1 Medium (B))	44.00%
0.00%	Very Dark, Strong taste "for cooking"		U.S. Grade B for Reprocessing (Canada No. 2 Amber (B)) (ME: Grade A Extra Dark Amber)	27.00%
	Processing Grade (any light transmittance, contains off- flavors)		U.S. Grade B for Reprocessing (commercial grade in VT, OH, ME) (Canada No. 3 Dark (C))	0.00%
		Substandard		

BACKGROUND INFORMATION

The International Maple Syrup Institute (IMSI) has targeted adoption of a new maple grading system for the 2013 maple production season, subject to obtaining regulatory approvals. The IMSI represents most U.S. state and Canadian provincial maple producer associations, as well as maple packers and maple research institutions. The decision to revamp the grading system came about based on a comprehensive review of existing maple grades, nomenclature, current regulations in the U.S. and Canada, as well as consumer research findings on maple flavour. The goal is to provide a single reference for the entire maple industry and its consumers and to end bias against the darker syrups, which because of its "Grade B" or "No. 2" labeling has been equated with an inferior product. While these revisions are coming, not all maple syrup producers know or understand them yet.

The new standards are, in large part, meant to reduce confusion. It is less important to those who sell locally to their neighbours than it is to those that cater to out of province (mail order, web order, and retail crossing provincial or international jurisdictions). The number of syrup classes has been reduced which also helps reduce confusion and the light transmittance breakpoints are very easy to remember compared to the old system. Altogether, it is a simpler system that has more information to help consumers pick what they want. This is NOT a government driven change. It was proposed and developed entirely within the maple industry. There is flexibility to allow producers and packers to put other things on the labels as long as the required descriptors are also on there.

The IMSI standards are not mandatory, but the organization is recommending them for all maple regulatory agencies in the U.S. and Canada. Once the new standard is adopted by the regulatory agency in a particular state or province, maple producers and packers will have to comply with the new standard. It will be up to state and provincial maple regulatory authorities to decide if the new standard will be mandatory or voluntary. Enforcement and compliance will be entirely up to the government agency responsible.

The changes encompass the following:

- All current grading systems used will be eliminated and replaced by a single, international, standardized grading system.
- Only two grades will exist: Grade A (for retail sale) and a Processing Grade.
- Grade A will have four colour classes, each having its own quality descriptors, which will eliminate the current discrimination against darker syrup.
- Grade A can be any colour, but no off-flavours are permitted to be sold.
- Any syrup that does not qualify for Grade A (including off-flavoured syrup) must be labeled as "Processing Grade." This syrup may not be sold in retail markets and must be packed in 5-gallon or larger containers.
- Pure maple syrup can only be produced from the concentration of maple sap or from the solution or dilution of another pure maple product in potable water (reconstituting maple sugar into syrup)
- Syrup must fall between 66.0 and 68.9 on the Brix scale. Recommended in the 66.5-67.5 range for best flavour.
- Must comply with federal and provincial regulations for contaminants.
- Must comply with federal and provincial regulations such as labeling, standard containers, etc.
- Must have proper determination of grade and colour class
- Must be traceable to batch (have a recordable code on container)

LESSON EIGHT

CRAFTS

SUMMARY

Students will create a farm craft.

GUIDING QUESTIONS:

1. What are ways people celebrate Spring?

GOALS:

1. Students will celebrate the end of one season and the beginning of another as a group.

OUTLINE:

- Welcome Circle and Attendance
- Junior Farmer Trivia Game
- Final Survey
- Memory Journal
- Craft
- Wrap-Up

MATERIALS:

Journal sheet
My Favorite Thing
Graduation Certificate
Post Survey
Pencils
Colored pencils/markers
Post Test
Craft materials

WELCOME CIRCLE AND ATTENDANCE - 5 MINUTES

Greeting: Today you will celebrate the end of the garden program by making winter crafts.

Today's Question: What was your favorite thing about Junior Farmer?

JUNIOR FARMER TRIVIA GAME - 15 MINUTES

Students will play game show style trivia game to review Jr Farmer lessons.

1. Split into two teams, have the students create a team name.
2. Ask questions related to garden program.
3. Assign silly points to keep the game less competitive (ex. Bucket of worms).
4. End game by asking for their favorite memory of the Jr. Farmer Club.

FINAL SURVEY - 15 MINUTES

Post Survey will test the student's knowledge and help gauge the program's success. The data gained will be used in future reports, grants, etc. After, they will complete a memory journal and they should draw and write their favorite experiences (you can brainstorm a list if you'd like).

1. Pass out surveys with pencil. Advise the students to complete the surveys on their own, it's okay if they don't know an answer.
2. Read the questions one at a time. Older students can go ahead if they want. Help fill out written answers for students who need help.
3. When they are finished, collect them. The students can then fill out their memory journal.

MEMORY JOURNAL SHEET - 10 MINUTES

Students will record one of their favorite memories from the past session. It is helpful to talk about the things you've done in the past weeks.

1. Hand students the Memory Journal Sheet.
2. Ask the students to help review the Junior Farmer lessons and take a moment to recall some of the different activities from the session.
3. Ask students recall one of their favorite memories from the session.
4. Encourage the students to draw their memory, capturing the image in color and in detail.
5. Students should also write a sentence or two or more about their drawing using descriptive words.
6. Collect.

GRADUATION CERTIFICATE - 5 MINUTES

Explain that everyone in our program has worked hard. We are going to take a moment to say thank you for all your efforts.

1. Call each student up one at a time
2. Share a memory about that students from the session
3. Present them with their graduation certificate and journals.
4. Shake hands and thank them "Farmer ____" for all their work.

WRAP-UP

Reflect: I hope you had as much fun in Jr. Farmer as I did!

JUNIOR FARMER TRIVIA GAME

1. What part of a plant does cinnamon come from? Bark of a tree
2. How many teaspoons are in a Tablespoon? 3
3. What is the first thing we do when we go into the kitchen to cook?
Wash our hands
4. When we put cream in a jar and shake it a bunch, what 2 things are made?
Butter and buttermilk
5. How many stomachs does a cow have? 4
6. What are 3 (or 4, or 5) products that can be made from a cow's milk? Butter, ice cream, yogurt, cream cheese, cottage cheese, whipped cream, etc.
7. What does a cow's tongue feel like? Rough, like sandpaper
8. What does a cow use its tail for? To swat flies
9. During what season do we harvest apples? Fall
10. What are 3 products we can get from sheep? Meat, wool, milk
11. Where does cotton come from? A plant
12. What is another name for Flint corn? Indian corn, Painted corn
13. What do you call it when you peel the outer layers off an ear of corn to see the corn kernels? Husking
14. What do you do to corn before you use it to make cornbread? Grind it
15. What is the name for an animal that lays eggs? Oviparous
16. Name 3 animals BESIDES BIRDS that lay eggs. Insects, fish, reptiles, amphibians, dinosaurs
17. What are 3 products we get from chickens? Eggs, meat, feathers
18. Where is a chicken's wattle? Under neck Its comb? Top of head
19. How many gallons of sap does it take to make one gallon of syrup? 40
20. What month do people usually tap trees to make maple syrup? February
21. What do we call the spout that we pound into trees to get the sap out? Spile
22. What do we do with the sap after we get it from trees? Boil it
23. Name 2 different kinds of syrup. Golden, Delicate Taste; Amber, Rich Taste; Dark, Robust Taste; Very Dark, Strong Taste; Processing Grade
24. What was your favorite Jr. Farmer activity?
25. What is one thing you learned from Jr. Farmer?

MY FAVORITE THING ABOUT JR FARMER WAS...

Name: _____

School: _____

Grade: _____

My favorite thing about Healthy Junior Chef Club was:

CONGRATULATIONS

JUNIOR FARMER GRADUATE!

Has Successfully completed the Sprouts Junior Farmer Program
& Learned about farming in Vermont!

Sprouts Teacher



FUN FILLERS

RUN AROUND/MOVING GAMES

VEGETABLE FREEZE TAG

In this game, the tagger tries to “freeze” other players. But, like in TV tag, if the player sits down and names a fruit or vegetable, they are safe.

CORN, CORN, SQUASH

Like Duck, Duck, Goose...play with cups of water if it's hot!

ROOTS AND LEAVES

In this activity, students will play a physically active game using vegetables as a theme.

1. Divide the group into two vegetables--e.g., carrots and spinach. Have the "root" group stand together and the "leaves" group stand together.
2. Have each group line up facing each other on opposite sides of a field or a large room. Create a goal line behind each group.
3. The object of the game is to have one group catch every member of the other team. The instructor will call out a group name and all the leaves will try to run past the roots without being tagged. If they are tagged, they become a member of the team that caught them (a spinach who is tagged by a carrot becomes a carrot).
4. Finish the activity with a short discussion of favorite roots and leaves to eat.

COWS & PIGS

In this activity, students will play a tag game using farm animals as a theme.

1. Set up a space, a large rectangle, to play the game and use markers (cones, jackets, tubs, rocks, etc) to show the space.
2. One person will be the cow and the rest of the people will be pigs. The cow will stand in the middle of the rectangle and the pigs will line up on one side in a line.
3. The Cow says, "Pigs, cross my field," and the pigs run across the space without going out of bounds to the other side. Once they cross the line they are safe and stay there until the Cow tells them to cross again. If the Cow tags a pig, the pig turns into a cow and helps the original cow tag the other players.
4. Continue step 3 until there is only 1 player left. That player becomes the "Pig" in the middle and the cows line up and wait to cross the field.

GO ON A WORM OR BUG HUNT

ALPHABET SCAVENGER HUNT

Assign a student or groups of students with a letter of the alphabet. Set a time limit and challenge students to find as many items as possible that begin with the assigned letter.

CIRCLE GAMES

GUESS WHAT I'M THINKING

I'm thinking of something _____. Guess what it is!
[Students ask yes or no questions to find answer.]

FARM CHARADES

In this activity, students will act out different things on the farm and have others guess what they are.

1. Ideas are attached on separate sheet. Cut them out and let the children pick or quietly tell each student or group of students the garden event they will act out when it is their turn.
2. Finish the activity with a short discussion of their favorite things on a farm.

FARMER SAYS

Like "Simon Says," but the speaker is the farmer and s/he is asking the crowd to do farming related actions (pulling up carrots, planting garlic, saving sunflower seeds).

GARDEN CHARADES

In this activity, students will act out different events in the garden and have others guess what they are.

1. Have the students write down on a strip of paper a gardening activity. Put all of the strips of paper in a bowl. Let the children pick one and then act it out to the group. OR Have the students think of a word they can act out and remember that word and think of an action.
2. Pick a student based on a random criteria—they won a previous game, their birthday is next, they are the oldest, etc.
3. The student will stand in front of the group and act out their word without talking.
4. The student that guesses correctly gets to go next.

CATCH MY CLAP

This is a good transition activity. There is no talking in this game. One player is the leader. All players rub their hands together. They watch the leader and when she claps, they try to clap in unison.

DUCKS 'N HENS

Circle up in groups of 8-10. Hand one person two random objects. One of these random objects represents a duck, the other represents a hen. The person is a “vendor”. His goal is to sell the fowl. To his right, he passes the first item, and says, “Do you want to buy a duck?” The “buyer” says, “Does it quack?” The vendor says, “Yes it quacks.” The duck continues to be passed to the right with the question and answer session going all the way back to the original vendor and back to the current transaction. (B asks A, A answers B, B sells to C, C asks B, B must turn around and ask A, A answers B, B answers C, C sells to D, D asks C, C asks B, B asks A, A answers B, B answers C, C answers D, and so on.) In the meantime, immediately after the duck is sold, the original vendor turns to his left with the hen, and says, “Do you want to buy a hen?” The buyer asks, “Does it cackle?” “Yes it cackles.” Same deal with the hen... the question and answer session goes all the way back to the original vendor. The fun comes when the messages start to cross. It's hilarious!

NAME & VEGETABLE

Sit in a circle. The first person tells their name and their favorite fruit or veggie. The second person has to say the name and veggie of player 1 then their own name and veggie. The third person says player 1's name and veggie, player 2's name and veggie, and then their own. This continues until everyone has said their name and favorite vegetable. Challenge the kids at the end to see who can do everyone's! Who can do it with their eyes closed? Backwards?

MIRRORS

One person plays the role of a mirror and copies the movements that the other person looking into the mirror makes. After a short period, ask the partners to switch roles.

GESTURE NAME GAME

Stand in a circle. The first person in the group says their name and does a movement with their body. It has to be simple, quick, and one foot must remain on the ground. Everyone in the group will repeat the name and movement. The next person in the circle will say their name and do a movement and the class will repeat it. Continue until everyone has had a turn.

SING “OLD MACDONALD HAD A FARM...”

OLD MACDONALD SAYS

Like “Simon Says”, but doing farm-related actions (hoe your field, feed the chickens, etc)

WHO'S MISSING?

The children sit in a circle. One child is selected to be in the middle with their eyes closed. The leader points to one of the children to leave the circle and hide close by. The rest of the children switch places and remake the circle. The child in the center is instructed to open their eyes and guess who is missing. The missing child then becomes the new center child.

THE WIND BLOWS FOR...

Big Wind Blows is a good icebreaker that helps people get to know each other better. Players sit in a circle, with one person in the center as "the big wind." This person identifies a characteristic that is true about themselves and then all players who share the same characteristic must find a new seat.

BIG BULL

Have all players sit in a circle and then chose a person to be "it". The "it" is to leave so that "it" cannot see or hear. Choose one person to be the Bull and s/he will act out short movements. Examples are clapping hands three times, stomping feet 4 times, etc. All other players must do what the Bull does. Have "it" return to the group to figure out who is the Big Bull, you can give him up to three guesses if there's a large group.

LOOK UP

Players stand in a circle, all with their heads looking down. The facilitator yells "look up". All players look up at someone else (they cannot change who they are looking at after they look up). If two people happen to be looking at each other (i.e. make eye contact), they both have to scream. Whoever screams last is eliminated from the circle. If someone screams when they are not making eye contact with anyone, they are also eliminated. The facilitator then says "look down" and everyone looks down. The facilitator then says "look up" and the process continues. The game continues until there are only two players left.

FARM CHARADES ACTIVITY CARDS

TRACTOR

SEED

DUCK

CAT

SHEEP

SLUG

RAKE

SPIDER

SOIL

HONEYBEE

SNAKE

SNOW

COW

APPLE TREE

GRASS

RAIN

FARMER

FLOWER

SUN

HORSE

GOAT

WORM

SHOVEL

DOG

BUTTERFLY

CARROT

ANT

TREE

CHICKEN

JOKES

Why did the chicken cross the road?
(Fill in your own answer here)

What do you call a cow after it has given birth?
De-calf-enated!

Why do cows make excellent employees?
Because they're all out standing in their fields!

Why does a milking stool have only 3 legs?
Because the cow has the udder!

A lady from the city and her traveling companion were riding the train through Vermont when she noticed some cows.
"What a cute bunch of cows!" she remarked.
"Not a bunch, herd", her friend replied.
"Heard of what?"
"Herd of cows."
"Of course I've heard of cows."
"No, a cow herd."
"What do I care what a cow heard. I have no secrets to keep from a cow!"

Where do cows go when they want a night out?
To the moo-vies!

How does a farmer count a herd of cows?
With a Cow-culator

What do you call a crate of ducks?
A box of quackers!

SUGGESTED BOOK LIST

Richards, Jean. *A Fruit Is A Suitcase For Seeds.* Millbrook Press.
PreSchool-Grade 2

Richards's carefully worded information provides an excellent introduction to seeds, their purpose, and growth that should be easy for young children to grasp. On each page, one or two short lines of text appear beneath a large painting. Hariton's use of bright watercolors adds sensual appeal to her illustrations of various fruits, vegetables, animals, and habitats. This cleverly presented book can be used as a read-aloud discussion starter, as a prelude to planting seeds and observing their growth, or in preparation for dissecting fruits and vegetables in order to find the seeds inside.

Balian, Lorna. *A Garden For A Groundhog.* Star Bright Books.
Kindergarten-Grade 3.

During the winter, the O'Learys feast on the bounty from their summer garden, and Groundhog hibernates in his burrow home beneath the apple tree. The O'Learys know that the groundhog does not come forth on February 2 to forecast the weather but rather to check if the O'Leary garden is planted. Mr. O'Leary's plan to keep the groundhog out of their vegetables has one flaw, though, which is humorously revealed on the final page.

Henderson, Kathy. *And The Good Brown Earth.* Candlewick Press.

Throughout the seasons, Gram and little Joe work independently but side-by-side on their gardens, planning, planting, watering, weeding, and waiting. At harvest time, both have grown beautiful vegetables—Gram's in neat rows; Joe's "higgledy-piggledy, tangly, FANTASTIC!" Henderson writes in simple, musical poetry that evokes the delicious, "squashy," "squelching" physicality of garden work, and the mixed-media illustrations of a garden teeming with plants and creatures have a waxy texture that, while sometimes indistinct, nicely extends the awe and mystery in the refrain: "The good brown earth got on with doing what the good brown earth does best." Best, though, is Joe's freedom to discover, follow his instincts, and create something wonderful on his own.

Creasy, Rosalind. *Blue Potatoes, Orange Tomatoes.* Sierra Club.

An introduction to organic gardening which explains how to grow a cornucopia of fruits and vegetables in unexpected colors, outlining simple guidelines for planning, planting, caring for, and troubleshooting a rainbow garden. Also includes some special recipes.

McCloskey, Robert. *Blueberries For Sal.* Penguin Group.

This simple story of a mother and daughter picking blueberries, and a mother bear and baby bear eating blueberries, does a perfect job depicting the sweetness of the mother/child relationship. It shows the protective nature of loving mothers and the security a child feels when with his/her mother. And it's a great example of two little families preparing for winter by picking (or eating, as the case may be) blueberries.

Siddals, Mary McKenns. *Compost Stew.* Crown Publishing Group.

From eggshells to wiggly worms, this delightful recipe in bouncy verse features items—some familiar and some not so—that are fit for the home compost bin and will nourish Mother Earth. Vibrant collage illustrations use recycled and found materials to further a timely message. And to keep young environmental chefs fully informed about composting do's and don'ts, there's a note in the back about what's not fit for the bin.

Koontz, Robin. *Composting Nature's Recyclers.* Picture Window Books Publication.

Dead leaves, food scraps, and grass clippings for lunch? Small animals, fungi, and bacteria called decomposers turn trash into a tasty compost treat. Learn more about compost and how you can use it in your garden or yard.

Gibbons, Gail. *Farming.*
Holiday House Inc.

Gibbons depicts aspects of that life with her characteristic bright colors and stylized forms in a conceptual space that is intended to portray not one particular farm but a universal one. Every season brings its own specific chores, indoors and out, its own crops and its own food. There are the forces of nature, and the ways the farmer harnesses or copes with the elements using mechanical devices. Despite an overuse of the passive voice ("The vegetable garden is planted . . . water is lugged . . . fields are fertilized") this is a good addition to the author's energetic how-to books. Ages 4-8.

Gibbons, Gail. *From Seed to Plant.*
Holiday House, Inc.

The cover of this book has the title written in large, green font and it's not too wordy for kids. The illustration on the front cover is very colorful and would be appealing to young children. The content of this book is excellent. Gail Gibbons provides accurate information about plants in this book in a manner that is suitable for children. She researched the topic and worked with Bob Welch of Shearer's Greenhouses in Bradford, Vermont. At the end of the book she presents an exciting project for kids called A "From Seed to Plant" Project that ties in directly with the book. Additionally, she lists fun facts about seeds and plants. For example, did you know that some plants eat insects? Kids will love the end sections. The illustrations in this book are outstanding.

Rockwell, Lizzy. *Good Enough To Eat.*
Harper Collins Publishers.

Kindergarten-Grade 3 – This picture book about healthy eating begins at the beginning: food is necessary for one's well-being and it tastes good, too. Six categories of nutrients are introduced: carbohydrates, protein, fat, water, vitamins, and minerals. Digestion is described, as is the Food Guide Pyramid. Five recipes are given at the end. Every bit of information is illustrated with a large or small picture, sometimes accompanied by labels or dialogue balloons.

Ehlert, Lois. *Growing Vegetable Soup.* Reed Business Information, Inc.
Pre-School-Grade 1

This is the boldest, brassiest garden book to hit the market, and what a delight. Intensely colored graphics capture the complete growing process from seed to cooking pot, with the focus on the plants. The unseen narrator describes the process of growing vegetable soup, from preparing the tools and digging holes for the seeds to weeding plants; picking vegetables; washing, chopping, and cooking them and finally enjoying the homemade soup while planning to grow more next year. It's a fresh presentation of the gardening cycle with a joyful conclusion, and the added attraction of an easy and tasty recipe for vegetable soup on the flyleaf. A book to help nourish healthy readers.

Hooper, Meredith. *Honey Cookies.*
Frances Lincoln Children's Books.

For young Ben, nothing is better than his grandmother's honey biscuits. But what exactly goes into making this special treat? Grandma decides it's a good time for Ben to find out. When he learns how to make honey biscuits, he doesn't just find out how to bake biscuits, he also discovers where all the ingredients in the recipe come from and whose help he really needs. Alison Bartlett's warm, vibrant illustrations accentuate Meredith Hooper's simple, lively text. Including an easy recipe for honey biscuits, this is a perfect introduction to food and cooking for very young readers.

Priceman, Marjorie. *How to Make an Apple Pie and See The World.*
Dragonfly Books.

An apple pie is easy to make... if the market is open. But if the market is closed, the world becomes your grocery store. This deliciously silly recipe for apple pie takes readers around the globe to gather ingredients. First hop a steamboat to Italy for the finest semolina wheat. Then hitch a ride to England and hijack a cow for the freshest possible milk. And, oh yes! Don't forget to go apple picking in Vermont! A simple recipe for apple pie is included.

Tomecek, Steve. *"The Dirtmeister".*
Jump Into Science – Dirt.
National Geographic Society.

What is soil? Who lives in dirt? How does earth help things grow? The answers are within this fun – and fact-filled picture book. Just follow the gardening star-nosed mole in the colorful outfits... and dig in!

French, Vivian. *Oliver's Vegetables.* Hodder Children's Books.

On a visit to his grandparents' house, Oliver wants to eat only French fries. Grandpa tells him that he may look in the garden for potatoes, but that he must eat what he finds, whatever it may be. On the first evening, Oliver pulls up carrots and discovers that he likes them. On successive days he discovers spinach, rhubarb, cabbage, beets, and peas all of which he eats with unexpected enjoyment. On the last evening, he finds the potatoes at last and as he is sitting down to supper his mother arrives. Oh dear! Too bad! She thinks Oliver is still eating only fried potatoes. Oliver and his grandparents laugh delightedly at the irony, and so will small listeners.

Naslund, Gorel Kristina. *Our Apple Tree.* Roaring Brook Press.

Here's a whimsical and very useful look at the life cycle of the apple tree. With two helpful tree sprites as guides, readers travel from spring, when the apple tree blossoms, through summer, when the fruit grows, to fall and the harvest. Along the way, you'll learn about the life of the tree and the animals that visit – from insects that pollinate the flowers to deer that eat the fallen fruit.

Carle, Eric. *Pancakes, Pancakes.* Aladdin Paperbacks.

Here's a whimsical and very useful look at the life cycle of the apple tree. With two helpful tree sprites as guides, readers travel from spring, when the apple tree blossoms, through summer, when the fruit grows, to fall and the harvest. Along the way, you'll learn about the life of the tree and the animals that visit – from insects that pollinate the flowers to deer that eat the fallen fruit.

Titherington, Jeanne. *Pumpkin Pumpkin.* Greenwillow Books.

Jamie plants a pumpkin seed in the spring and, after watching it grow all summer, carves a face in it for Halloween! But best of all, he saves some seeds that he will plant again next spring.

McKy, Katie. *Pumpkin Town.* Houghton Mifflin Harcourt Publishing Company.

What happens when a town has an accidental abundance of pumpkins? What do José and his well-intentioned brothers do with a mountain of pumpkins? An EXPLOSION of pumpkins? Step into Pumpkin Town and see!

Bunting, Eve. *Sunflower House.* Harcourt Books.

A young boy plants the seeds in a large circle. He waters them and waits patiently until they grow taller than with huge nodding blossoms that form a perfect "sunflower house." He and two friends play in the "house" all summer, even sleeping in it one night, until the leaves turn brown and the stems fall down. Then they fill their pockets with the seeds, the birds eat some, and the rest are left on the ground to grow again next summer.

De Paola, Tomie. *The Popcorn Book.* Holiday House Inc.

Tomie dePaola seldom fails to delight and this offering is no exception. Kids get together to pop up some pop corn and the little story of their "adventure" is quite funny. Along with the story though, we get a great mini-lesson in the history of popcorn along with some wonderful scientific facts, i.e. why does popcorn pop, how do you store popcorn, etc. It tells us how the early Native Americans cooked and used popcorn as well as those in Central America. There are dozens of lessons that can be created from this little book, great handouts and projects can be made with just a touch of creativity on the teachers part. I use this one in the class room, but it would be great for the home school folks also.

Gibbons, Gail. *The Seasons of Arnold's Apple Tree.* Harcourt Books.

This book is a must-have for any elementary teacher. I used this book in my Kindergarten class to teach the seasons and the growth of apples. My students loved the pictures and really learned the material from the story and reviewing after. I kept coming back to this book day after day to reinforce the content and my students were excited each time. One activity I did to teach the seasons was make a "The Seasons of (students name) Apple Tree" book. There were four pages with a bare tree. At the top the students would write It is summer, It is fall, etc. Then we would look at our story and describe the picture. Then the students would add orange and red leaves for fall, etc. I love this book and would recommend it to all.

Hall, Zoe. *The Surprise Garden.* The Blue Sky Press.

We're planting the seeds for a surprise garden. Can you guess what we will grow?" Trace the progress of three small children (and various and sundry dogs, ladybugs, spiders, worms, and butterflies) as they loosen the soil, poke seeds in one by one, water the garden, and watch the small green shoots grow. Surprise! The gardeners find carrots and radishes, broccoli and cauliflower, peas, beans, squash, and even a sunflower. When it's harvest time, the children have a garden party to eat all their delicious produce.

Carle, Eric. *The Tiny Seed.* Children's Publishing Division.

This picture book admirably conveys the miracle of a seed. Flower pods burst and dispatch their seeds on the wind; the air-borne seeds are subject to myriad disasters; and the ones that make it through the perils of the seasons to become mature flowering plants are still susceptible to being picked, trod upon and otherwise damaged. But nature allows for survivors, and so the tiny seed grows into a giant flower, releasing its seeds and continuing the cycle. As he has demonstrated with *The Very Hungry Caterpillar* and other books, Carle has an extraordinary kinship with nature. Here we have not just the explanation of the life of a flower, but drama, lessons of life and a lovely spirituality.

Lin, Grace. *The Ugly Vegetables.* Charlesbridge Publishing.

The neighbor's gardens look so much prettier and so much more inviting to the young gardener than the garden of black-purple-green vines, fuzzy wrinkled leaves, prickly stems, and a few little yellow flowers that she and her mother grow. Nevertheless, mother assures her that these are better than flowers. Come harvest time, everyone agrees as those ugly Chinese vegetables become the tastiest, most aromatic soup they have ever known. As the neighborhood comes together to share flowers and ugly vegetable soup, the young gardener learns that regardless of appearances, everything has its own beauty and purpose.

Stevens, Janet. *Tops & Bottoms.* Harcourt Books.

Hare solves his family's problems by tricking rich and lazy Bear in this funny, energetic version of an old slave story. With roots in American slave tales, *Tops & Bottoms* celebrates the trickster tradition of using one's wits to overcome hardship. "As usual, Stevens' animal characters, bold and colorful, are delightful. . . . It's all wonderful fun, and the book opens, fittingly, from top to bottom instead of from side to side, making it perfect for story-time sharing."

Hoberman, Mary Ann. *Whose Garden Is It.* Houghton Mifflin Harcourt.

The gardener says the garden belongs to him. But the woodchuck insists that it's his. And so do the rabbit, the butterfly, the squash bug, and the bumblebee. Even the tiny seeds and whistling weeds think the garden just couldn't grow without them. As they stroll through the exquisite plants and flowers, Mrs. McGee and her child listen and wonder: Whose garden is it?