



VERMONT FARM TO SCHOOL

A Guide for Connecting Farms to Schools and Communities

INSIDE:

- How to market your food for use in schools
- How to use your farm for education with kids
- Hands-on, farm-based educational activities
- How to connect your farm to the community



Vermont FEED: Food Education Every Day

a partnership of Food Works, Northeast Organic Farming Association of Vermont (NOFA-VT), and Shelburne Farms

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Table of Contents



Introduction

Purpose of the Guide	1
Contact Information	2
Thank You	3
FEED Goals, Mission, Beliefs	4
The Three C's Approach to Food in Vermont Schools	5
Why Vermont FEED?	6



Getting Started 7



How do I insure a safe environment for visitors on my farm?	9
How do I protect my farm and my visitors?	10
What are my insurance liability considerations for farm visitors?	11
Do I charge groups to visit my farm?	12
How will visitors know where to go on my farm?	13
Will all visitors have adequate accessibility to my farm?	13
What about visitor transportation and parking?	14
What bathroom and washing facilities do I have?	14
What should I do if the weather turns bad?	15
What about trash?	15



Connecting to the Classroom. 17

Advertising and finding schools	19
Preparing your farm for the visit.	20
Working with students of all ages	22
Teaching Tips	25
Templates	27
Field Trip Information	29
Farm Visit Chaperone Letter.	30
Confirmation Letter to School - Sample	31
Confirmation Letter to School - Blank	32

continued

	Connecting to the Cafeteria	33
	Understanding the School Food Environment	35
	Where does school food come from?	35
	Who prepares the school food?	35
	How are decisions made about what is served?	36
	Are any Vermont schools buying local products?	36
	How many farms does it take to feed a school district?	36
	Local Purchasing Options.	37
	Wholesale Distributors	37
	Direct Purchasing.	37
	CSA (Community Supported Agriculture) Arrangement.	38
	Contract Growing	38
	Grow A Row	38
	Marketing Cooperative	39
	District Purchasing Cooperative.	39
	Why schools purchase local products.	39
	Action steps to build purchasing relationships with a School Food Service	40
	Connecting to the Community	43
	Ways to reach out to your community.	45
	Sample press release - Reporting on an Event	47
	Sample press release - Announcing an Event	47
	Activities	49
	Bibliography.	109



Purpose of the Guide

This guide is intended to help farmers utilize their farms as learning environments for local schools and communities, market their products to schools, and increase their exposure within their community. There are many details to consider before hosting the public. The contents of this book will help you identify those considerations, overcome many of the challenges, and provide farm-based activities and resources. By hosting school groups, opening your farms for public events, and selling farm products to the school cafeteria, you are not only reconnecting your neighbors to Vermont's agrarian history, but creating a more educated and agriculturally-literate consumer. You are helping to rebuild and redefine a local food system.

The Vermont FEED partners are thrilled to be offering this guide to you. We have spent many years working to link Vermont schools with Vermont farms. Joining a national trend of reconnecting people to where their food comes from, the VT FEED project has worked with communities throughout the state to bring school groups and the greater community to farms, and to help farmers establish viable markets with the school cafeterias.

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Thank you for being a steward of the land, growing food, and sharing your experiences with others.

Enjoy!



Contact Information

Vermont FEED is a partnership of Food Works, The Northeast Organic Farming Association of Vermont (NOFA-VT) and Shelburne Farms.

Food Works



64 Main Street
Montpelier, VT
(802) 223-1515
www.tworiverscenter.org

Food Works was founded in 1988 to address the crisis of childhood hunger in Vermont. The initial aim was to provide teachers and students with prevention-based skills and knowledge of food through school gardening and nutrition education. Over the years, we have found students hungry for real connection to nature and their local community and have since developed ecological literacy and cultural literacy programs.

NOFA-VT

Northeast Organic Farming
Association of Vermont



PO Box 697
Richmond, VT 05477
(802) 434-4122
www.nofavt.org

NOFA-VT is a nonprofit organization of farmers, gardeners, and consumers working to promote an economically viable and ecologically sound Vermont food system for the benefit of current and future generations.

Shelburne Farms



1611 Harbor Road
Shelburne, VT 05482
(802) 985-8686
www.shelburnefarms.org

Shelburne Farms is a membership-supported, nonprofit environmental education center, 1,400-acre working farm, and National Historic Landmark in Shelburne, Vermont. The farm serves as an educational resource by practicing a rural land use that is environmentally, economically and culturally sustainable. Its mission is to cultivate a conservation ethic.



Thank You

Vermont FEED would like to thank the many educators and farmers that made this guide possible. In particular:



Scott Greene & Suzanne Young are raising two sixth generation Vermonters on their diversified farm. They are committed to traditional agricultural and farmstead vocations by providing their family and community with choice farm products.



Anne & Jack Lazor have been dairy farmers at Butterworks Farm for 30 years, growing all the feed for their cows, as well as grains and beans for people in their farm crop rotation system. They process all their milk into yogurt, grind wheat into flour, and corn into cornmeal. They feel that education is important in order to share farming insights with the public and to inspire and nourish coming generations to eat healthy food and grow their own.



Suzanne Long has been a diversified organic farmer with her husband, Tim Sanford for 18 years, as well as a cello and fiddle teacher. She has raised two children on the farm, apprenticed young farmers for 15 years, and worked with students for 13 years. She finds the teaching rewarding when the kids are excited to be on a farm and ask many questions. Their awe is a refreshing reminder to Suzanne of all the amazing things on a farm. "When kids and adults come to a farm, they're inspired by the natural world and how food is produced: things they take for granted when they purchase food at a store."



Scout Proft and her husband Matt have been diversified farmers for more than 20 years in the hills of East Dorset, and are raising five children on the farm. "I have students on my farm," explains Scout, "because I want them to know and appreciate where their food comes from. With this knowledge they will be better able to make wise and healthy food choices and support local farmers."



Amy Richardson, with her forestry degree, joined her husband on his multi-generation dairy farm in the Hartland hills to raise a family and run the diversified farm. Amy states that she "feels strongly that many children, even in Vermont, have lost a basic connection to land, seasons, and cycles of life. Bringing children to farms can be a successful event with organization, and rewarding for the farmer as well!"

Thanks also to Beth Holtzman, Jen Cairns, Dana Hudson, Erica Curry, Abbie Nelson, Joseph Kiefer, John Hayden, Julie Wolcott and Holly Brough.



FEED Goals, Mission, Beliefs

Mission

To raise school and community awareness about healthy food, Vermont farms and farmers, and good nutrition. We act as a catalyst to rebuild healthy local food systems by cultivating links between classrooms, cafeterias, local farms, and communities.

Goals

- To increase student and teacher knowledge of food, farms, and nutrition by developing and testing replicable curriculum that meets the Vermont Framework for Standards and Learning.
- To increase direct marketing opportunities for locally produced foods and improve the eating patterns of school-aged children by developing local purchasing contracts with schools and offering professional development to school food personnel.
- To engage communities in active support of their local school and community food system.

Beliefs

- All children and members of their community should have access to safe, affordable, healthy, nutritious foods.
- Children will make healthier food choices, gain confidence, and develop critical thinking skills through growing, harvesting, and preparing foods as part of their school curriculum.
- Healthy diets positively and directly impact students' academic performance.
- Local agriculture is important historically, and for the future.
- School food policy must change to make local, healthy, and nutritious foods available to students.
- Food-literate children will impact and change family purchasing, cooking, and eating patterns.



The Three C's Approach to Food in Vermont Schools

VT FEED was designed to help school-age children make informed food choices, improve their diets, and recognize the role local farms play in communities. VT FEED achieves this by focusing on the three C's: Classroom, Cafeteria, and Community.



Classroom – providing standards-based farm, food, and nutrition curriculum and professional development for teachers.



Cafeteria – incorporating local and seasonal produce as well as professional development for school food personnel.



Community – developing community forums and committees of farmers, partners, and other community members.

Together the three C's support healthy children, healthy agriculture, and healthy communities.





Why VT FEED?

- Twenty six percent of Vermont children are at risk of being or are now overweight.
- Every day an average of 48,000 Vermont school children line up for breakfast and lunch. For some this equates to 10 meals a week and half of their daily nutritional intake.
- Only 2% of children and youth in our nation meet Food Guide Pyramid recommendations for all five major food groups in a day.
- Despite the abundance of food nationwide, children and youth are still undernourished. Homemade meals have been replaced by highly processed, convenient foods.
- School food service is challenged to feed a well-balanced meal to students who have an appetite for high fat, salt and sugar foods.
- The farmer share of the food dollar has dropped drastically from 40% in 1950 to 10% of every food dollar today.
- Although fresh, local foods are being grown next door to schools and are readily available statewide, they are not being widely used in schools.
- Youth are increasingly disconnected from how food is grown and how it gets from the farm to their plates.



Getting Started



Initial Considerations

Before you open your farm to schools and the public

Connecting a community or school to a farm can help define and deepen peoples' sense of place. The public needs to understand the local reality of our Vermont agricultural communities and what better way than to have them on the farms to experience those connections? Before you begin, however, you will need to consider some of the issues surrounding visits to your farm.

Everyone anticipates having a safe and fun visit to the farm, but you need to prepare for potential accidents.

It is important to ask the teacher of the visiting group about their first aid policy. Encourage teachers to bring their own first aid kit and know their students' medical information. This information should clarify policies regarding administering medicine (including pain relievers like aspirin) to students. Be clear about these policies with each visiting group.

Make sure that you have an emergency plan that at least one other adult is familiar with for emergency situations. There is no need to unnecessarily alarm students with a long emergency plan lecture, but a few words about potential hazards will alert them to things on your farm that they may not think about as hazards. If your visitors will be around farm animals, you should alert them to the dangers of sharp teeth (pigs), etc., either verbally or with signage around pens, stables, or gates.

How do I ensure a safe environment for visitors on my farm?

A basic First Aid Kit should have:

- adhesive bandages (like band-aids)
- antibiotic ointment
- gauze pads
- antiseptic prep pads
- butterfly bandages
- medical adhesive tape
- aspirin and non-aspirin pain relievers
- tweezers
- eye drops
- ace bandages
- moleskin
- sunscreen
- instant cold pack
- Benadryl
- disposable gloves

QUESTIONS TO CONSIDER:

- Do you have a first aid kit? Where? Is it accessible?
- Do you have an emergency plan and a meeting spot for all on-farm people?
- Where is the nearest phone in case of an emergency?
- Who on the farm knows the answers to these questions besides you?
- Do you have current First Aid Training from the American Red Cross?

How do I protect my farm and my visitors?

The truth is that veterinarians, neighboring farmers, and the milk tester who visits many different farms (including yours) pose more of a threat to your farm than students and community members who are not exposed to farm-based contagions regularly. But precautions are necessary to ward off potential biological threats arriving on the shoes and tires of your visitors. A combination of several safety measures can help protect your farm and make you feel comfortable welcoming visitors.

First, don't hesitate to ask the group leader about where visitors have been, especially if any have been out of the country in the past couple of weeks. Also, a number of companies are now making disposable plastic booties that visitors can slip over their street shoes, or you might place a simple foot bath at the door of your barn and ask each visitor to walk through it before they enter. These procedures protect the farm from diseases transferred from other farms.

You may want to develop a policy to deal with potential hazards that visitors may bring to your farm. The following is an example of a policy on foot-and-mouth disease that is used at a farm that allows visitors.

For more information on foot-and-mouth disease, call the U.S. Department of Agriculture at (800) 601-9327, or the Vermont Agency of Agriculture at 802-828-3829

Facts about the disease are also available at: www.state.vt.us/agric under links or at www.aphis.usda.gov/

We take every reasonable precaution to prevent the devastation resulting from foot and mouth disease that is occurring in many rural communities around the world from spreading to this country and Vermont.

Foot-and-mouth is a highly contagious viral disease of cattle and swine. It also affects sheep, goats, deer, and other cloven-hoofed ruminants. It is not considered a human health risk but can be spread accidentally by humans carrying the virus on their clothing, shoes, body (particularly the throat and nasal passages), and personal items.

Before your field trip here, please contact us if any student or anyone in his or her household has been outside of the United States or Canada within 7 days of coming to this farm and we can discuss possible measures that can be taken to reduce the risk of spreading the disease. Depending on particular family travel circumstances we may request that a student not attend the field trip.

Thank you so much for your consideration and cooperation.

QUESTIONS TO CONSIDER:

- How will you protect your farm from outside contaminants?
- Do you have a written policy to share with the teacher or group leader?
- Are there areas on the farm that need to be “off-limits” because of disease concerns?

It is important to research if your farm insurance covers visitors to the farm. Consult with your insurance agent to find out if you are covered for accidents. Coverage often requires, at minimum, an endorsement or rider added onto the current general liability policy. Check if one-day coverage is an option, as some carriers offer this as a separate choice. Also, find out the specific range and limits of the school’s insurance coverage. In some districts, students are covered while on field trips.

What are my insurance liability considerations for farm visitors?

If older students are doing a service project or having a more extensive on-farm experience, a more specific insurance rider may be appropriate. You should also check out OSHA guidelines for the use of power tools by students and Workers Compensation laws. There are no guidelines for hand tools, except those dictated by common sense.

There is some debate over the usefulness of release forms or waivers. In many instances, these documents, in which parents agree not to hold the farm liable for injury, don’t hold up in court. Liability is based on fault and can’t be sidestepped by a signature. Nevertheless, a release form that students take home and have their parents sign performs an important communication role about the issues and expectations on a farm visit.



Do I charge groups to visit my farm?

Your time is valuable and it is important to be compensated for a group's visit. Plan to spend as much time preparing for the visit as you do hosting it (for a two-hour workshop, plan for a total of four hours of your time). Make sure all your costs are covered. For some groups, their visit to your farm may be their first exposure to agriculture and a powerful experience. Consider this impact and be mindful that you and your farm are ambassadors for agriculture.

You may want to consider a sliding scale of charges, depending on the audience. A school may be fundraising to cover the costs to visit your farm, while the leaf-peeping tourists traveling by bus are accustomed to per person fees. Whatever your rate, it is important for the visitors to value the time and effort you have put into their visit.

QUESTIONS TO CONSIDER:

- Will you charge per visitor or a flat group rate?
- What extra costs do you need to cover?
- Are you providing a snack, sample, or something for the visitor to take home?
- Did you photocopy materials for a teacher?
- Do you have a brochure, activity sheets or other handout to give visitors?
- Will the sale of your product to the group cover the visit's cost, rather than charging a flat rate?
- Will the visit be publicized?



Take the extra time to put signs up that help visitors know where on the farm they should not go and where they should go. Many visitors may not be able to identify farm hazards, so properly marking areas can prevent confusion and save you time in the long run. Signs are important to prevent situations such as visitors getting their cars stuck in the mud, or driving/parking in undesirable areas. You may want to invest in durable signs that will withstand weather conditions and can easily be moved. Consider a map that shows areas on your farm open for visitors.

How will visitors know where to go on my farm?

QUESTIONS TO CONSIDER:

- Is your farm visible from the road and clearly marked?
- Will cars/buses know where to turn in and park?
- Are electric fences labeled?
- Have you roped off and labeled dangerous areas, like the manure pit or machine area?

Be sure to ask your visiting group if any guests might have challenges getting around the farm. If so, discuss in detail your farm buildings and farmyard to find opportunities where you can be fully inclusive of the group. Your farm is not required to meet public handicap accessibility laws, but you will want to consider this issue when opening it to the public.

Will all visitors have adequate accessibility to my farm?

With minor adjustments, some areas can easily be made more accessible for the elderly and physically disabled. Perhaps you can fill a pothole in a path, move a piece of machinery to provide closer parking, or remove obstacles in doorways and aisles to make for easier mobility.

QUESTIONS TO CONSIDER:

- Will everyone be able to get around the farm?
- Do you know of any visitors that may have mobility limitations and have you planned accordingly?



What about visitor transportation & parking?

Students and public visitors will most likely arrive at your farm in a bus or in cars. You can estimate that one car will hold 3-5 students. There needs to be a place to turn around and park the bus, or a large space to park the cars. For safe boarding and de-boarding, please make sure the parking area is not too close to heavy traffic. Also, consider the parking area's soil condition. Vehicles will compact the soil, and parking cars in a muddy field may necessitate pulling visitors out with a tractor.

QUESTIONS TO CONSIDER:

- Will the visiting group arrive by bus or cars?
- Do you have a place for the bus to turn around?
- Where will the cars park?

What bathroom and washing facilities do I have?

Whatever the facilities are, share your expectations with the teacher or group leader before they arrive so that there are no surprises. If you plan on hosting groups on a regular basis, you will want to consider renting port-o-lets. There are daily, weekly, and seasonal rental options. Make sure you have enough for the number of guests.

Hand washing is another important consideration, not only after using the restroom, but after activities, before lunch/snack, and before/after touching animals. If sinks are not available, have a hose with running water and antiseptic wipes available, or warm soapy water in a bucket and hand-sanitizing lotion. It is also helpful to post signs that remind visitors to wash their hands after touching animals.

QUESTIONS TO CONSIDER:

- Will the group have access to a bathroom?
- Do you want people in your house unattended?
- Can your restroom facilities handle all your visitors?
- Will you rent a port-o-let?
- Will visitors be expected to use the woods?
- Is there anywhere to wash hands besides the bathroom?

Create a plan for what you will do if the weather is not cooperating and discuss it with the group leader before the visit. Visitors should expect to be outside even if the weather is not perfect, and wear appropriate clothing for both warm and cold conditions (snowgear, raingear, warm layers, sunscreen, mud boots, etc.). A hot drink may boost group morale when it is cold, and providing cold water refills or a run through the sprinkler will help in the heat. If the weather is too extreme, discuss alternatives with the teacher or group leader before the visit. If you have indoor space to continue with the visit, discuss with the group ahead of time. If not, you may want to reschedule.

What should I do if the weather turns bad?

QUESTIONS TO CONSIDER:

- Will you cancel or postpone and reschedule?
- Do you have enough sheltered space to go ahead with the visit?
- Do you schedule a rain date ahead of time?

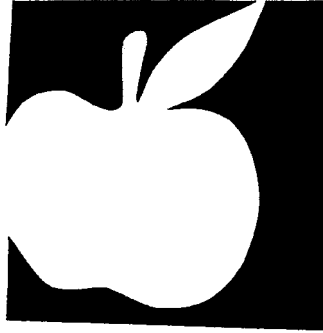
If you are supplying a snack, you will need a way for the visitors to dispose of the waste. If you are not supplying food and are worried about the cost of trash disposal, don't hesitate to ask the group to take their own trash with them. Be sure to discuss this ahead of time so they know to "pack out" any trash that they "pack in." You may want to have some extra trash bags on hand in case the group forgets theirs.

What about trash?

QUESTIONS TO CONSIDER:

- Where will visitors put their trash during the visit?
- Will you supply garbage cans?
- Did you factor the cost of disposing of garbage in your group fee calculations?
- Do you want a "pack it in, pack it out" policy?





Connecting to the CLASSROOM



Connecting to the Classroom

There are many ways to open your farm to visitors. Hosting classroom students is a powerful way to reach young people and build a strong connection with the next generation. But don't feel like you have to do everything at once. Consider starting with just 10 school visits a year or work with two classes for multiple visits. The one-time visit is a perfectly good starting point, as well, but people learn best when they are given multiple experiences.

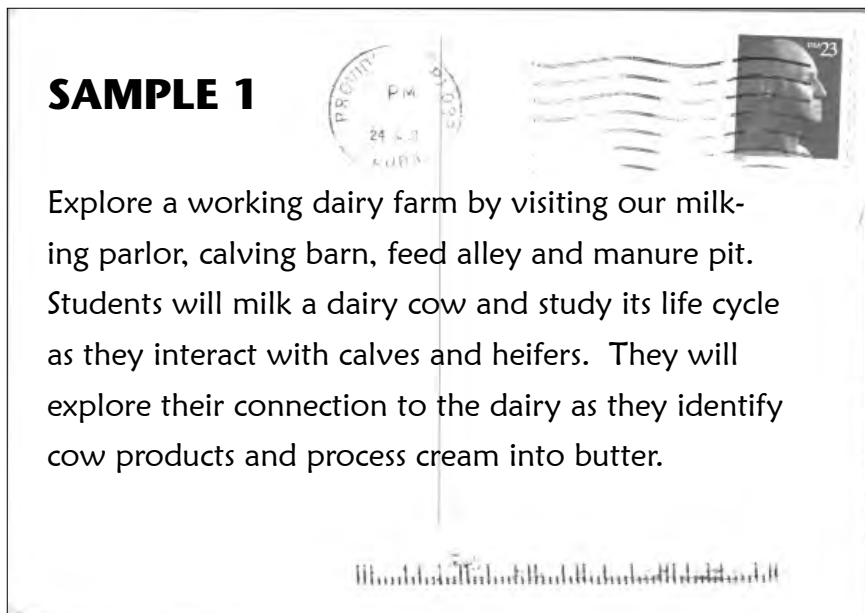
Now that you've assessed your readiness to host a school group, how do you find one? Start with the phone book or the internet. Start with just one or two schools. (Farmers often start with their children's schools.) After you have identified schools in your community (including preschools), send out a letter, flyer, or postcard. Try to identify a lead contact at each school who can be a spokesperson for you as you start to make connections. You might even ask for five minutes to speak at a faculty meeting. The following are two samples of what a postcard could include:

Advertising and finding schools

FINDING SCHOOLS ON THE WEB:

A list of Vermont K-12 school websites can be found at:
<http://www.k12.vt.us/>

You can also search for private schools in your county at: http://www.privateschoolreview.com/state_high_schools/stateid/VT



**SAMPLE 2**

A visit to our farm offers school children an opportunity to discover the important role farms play in their lives. Children will be able to interact with cows, sheep, goats, chickens, and other farmyard animals and venture in to the garden of 'pickable' food to tend the plants and possibly taste the fresh fruits and vegetables.

Preparing your farm for the visit

You may find it helpful to record the information outlined here using the "Field Trip Information" template and the "Farm Visit Chaperone Letter" template on pp. 29 & 30.

Like you, teachers are busy people and are sometimes hard to get a hold of. Usually, the best time to reach them is at the beginning or end of the school day. If you leave a message, remember to leave your contact information and a time that's best to reach you. When organizing a visit with a teacher, discuss and record the following:

INITIAL CONVERSATION:

- Date and time of the visit
- Grade/age range of the students
- Number of students
- Number of adults/chaperones
- Group goals- what are their goals and what do you have to offer to meet those goals

ONE WEEK BEFORE VISIT:

- How will the group be transported?
- Are there any allergies or special needs to consider?
- Will the group bring a snack to eat during the visit? When will that work best?
- What is your rain plan? Will they visit rain or shine? Will you cancel and reschedule?
- What is your backup contact plan? Does the teacher have a cell/home number to be available at? Are you



willing to give out your home phone number or cell phone number to the teacher?

- What are the teacher's goals and objectives of the visit? What are yours?
- How does the visit fit into their curriculum? Are they working on a farming unit? Is there anything they'd like to focus on during their visit?
- What related activities will students complete before or after their visit? What are your ideas?

After all the details have been ironed out over the phone or in emails, you may want to send a confirmation letter or email to the teacher (sample on p.31). If you discussed any activity ideas or would like to share a few for the students to complete at school or at home, send those too!

DAY OF VISIT CHECKLIST:

- Is the boot wash station ready?
- Are signs and map ready?
- Animals: Put dogs in the house; put bull in back pasture; lock up grumpy rooster
- Is the first aid kit out and ready?
- Do the bathrooms have toilet paper?
- Is parking area clear of equipment & well marked?
- Are emergency numbers posted by the phone?
- What is the weather for the day? Do you have cover ready if it rains?
- Put out extra trash bags
- Are all materials for your activity stations ready?
- Put hand sanitizer at hand washing stations
- Are the snack and/or take-home activities ready?
- Rope off areas where you do not want foot or car traffic (pond, equipment, infirmary, etc.)
- Take keys out of tractor
- Turn off the electric fence
- Are all fertilizers, pest-control products and medicines out of reach?
- Name tags or masking tape and pens



Working with students of all ages

How do you know if the activities you've planned are appropriate for the students who are visiting on a particular day?

Will the activity that was a hit with the preschoolers yesterday be a hit with 5th graders tomorrow? It depends on the activity. Milking a cow or harvesting vegetables from the garden are activities for all ages. An activity about trait selection in animal breeding, on the other hand, would be most appropriate for high school-age students or older.



The following is a partial set of characteristics and tips for working with youth in four general age groups: 3-7 years, 7-11 years, 11-13 years, and 13-18 years. It should be noted that to communicate effectively with youth, the whole context of a child's background and special needs, as well as the particular circumstances of any given situation, must be taken into account. This includes various social, ethnic, and cultural traditions or communication styles or patterns not within the scope of this listing.

AGES 3 - 7

CHARACTERISTICS	TEACHING TIPS
Thinking is in the here and now ("concrete" thinkers)	<i>Youth need real experiences to learn.</i>
Attention span is about 20-30 minutes; need hands-on experiences	<i>Vary the length of activities. Try rotating small groups through stations.</i>
Begin to develop friendships, usually with youth of the same sex	<i>Plan activities that youth can do in groups rather than individually.</i>
Want to be liked and to please adults	<i>Let youth know when they have done a good job.</i>
Learn best when physically active	<i>Allow youth to participate in activities where they can use physical energy.</i>
Have a special attachment to older youth	<i>Allow youth to choose an older youth to be their helper and role model.</i>
Are easily motivated	<i>Use encouragement to keep them motivated.</i>
Competitive activities are less appropriate	<i>Plan some cooperative activities.</i>
Differentiation between fantasy and reality can be difficult	<i>Build in transitions and discussions to help distinguish the imaginary from the real.</i>

AGES 7 - 11	
CHARACTERISTICS	TEACHING TIPS
Learn best when physically active	<i>Allow youth to participate in activities where they can use physical energy.</i>
Have a special attachment to older youth	<i>Allow youth to choose an older youth to be their helper and role model.</i>
Are easily motivated	<i>Use encouragement to keep them motivated.</i>
Reading becomes an individual experience	<i>Allow time for youth to read on their own and think of activities before working with others.</i>
Attention span is about 45 minutes	<i>Use varied activities to keep them interested.</i>
Acceptance by peer group is important	<i>Use the peer group to recognize good works, e.g., applaud completed activities and avoid put-downs.</i>
Interests expand from home, to neighborhood, to community	<i>Talk to youth about friends and neighbors, and what goes on in their community. Involve them in community service.</i>
Enjoy both cooperation and competition	<i>Plan activities so that sometimes youth work together, sometimes compete with each other.</i>
Show independence by seeking individual attention and sometimes disrupting the group	<i>Involve youth in selecting activities from a "short-list." Give individual attention, like assigning tasks to "special helpers."</i>
Feelings of competence enhance self-concept	<i>Provide activities that will let youth feel good about themselves and succeed. Recognize them for their accomplishments.</i>

continued

**AGES 11 - 13**

CHARACTERISTICS	TEACHING TIPS
Can take responsibility in planning and evaluating own work	<i>Give youth responsibility for group activities, including planning, implementing, & evaluating.</i>
Can discuss current events, international affairs, and contemporary issues with some help	<i>Use discussion activities and games that encourage awareness of current events and issues.</i>
Want to make decisions but still depend on adult guidelines	<i>Establish guidelines that give parameters for youth to follow.</i>
Peer pressure mounts, first from same sex, then from opposite sex	<i>Use peer pressure to influence positive behavior. Have group give encouragement to individuals. Provide opportunities to work in groups.</i>
Can be quite self-conscious	<i>Avoid asking youth to share their work individually until they feel more comfortable with the group.</i>
Strong emotional attachment to older youth and adults	<i>Encourage youth to participate in activities with older youth and adults.</i>
Choices are often unrealistic	<i>Assist youth in making realistic choices. Review their plans, discuss alternatives and help them weigh options before making decisions.</i>

AGES 13-18

CHARACTERISTICS	TEACHING TIPS
Personal philosophy begins to emerge	<i>Use activities where youth search for experiences that will allow them to identify their own philosophies.</i>
Enjoy discussing global situations as well as personal activities	<i>Encourage discussion of events and feelings.</i>
Abstract thinking and problem-solving reach a higher level	<i>Put youth into real-life, problem-solving situations.</i>
Strong desire for status in peer group	<i>Develop a climate in which youth are encouraged and supported by peers.</i>
High interest in social activity	<i>Encourage youth to plan and carry out own activities.</i>
Need freedom from adult control to make decisions	<i>Help youth realize their decisions have consequences.</i>
Widespread feelings of inferiority and inadequacy	<i>Encourage and help youth see their positive worth.</i>

Adapted from 4-H Cooperative Curriculum Systems 1997 – Theater Arts Adventures. Used with permission.

Teaching Tips

- 1. Set the tone at the beginning of the trip.** Establish guidelines and rules with the students—what can they do to help themselves have a safe and fun day? See what they come up with and then add other things that they may have left out.
- 2. Use a positive tone.** Use phrases like “Please walk” and “Keep your hands to yourself” instead of “Don’t run” or “Don’t touch.”
- 3. Give the group a brief overview of the day.** “We’ll be spending the whole day outside. We’ll have time to see the animals, do some chores, and we may even be tasting something today!”
- 4. Refer to the students by name as often as you can.** Name tags are very helpful, so ask the teacher to use them. Small pieces of masking tape and a pen will do if nametags are forgotten.
- 5. Eye contact is important.** Make sure to situate yourself so that the group can look at you and not have to look into the sun.
- 6. Instead of giving all of the information, ask students to come up with it themselves.** Asking questions will encourage your students to think and discover on their own and will help you understand their level of knowledge. Let them think for a few seconds, then give a hint or two if there is no response. Leading them to discover the answer themselves builds their confidence.
- 7. When possible, let the group make decisions about their trip.** “Would you like to spend a few more minutes harvesting carrots, or are you ready to head over to the compost pile?”
- 8. Remember the “teachable moment.”** If the students’ attention is diverted to the manure spreader in the field, go ahead and stop what you’re doing and talk about





natural fertilizers and the benefits of manure! Take advantage of their interests.

9. Be aware that students have multiple learning styles. It will be helpful to use a range of methods to convey the ideas you would like the students to learn about. Try to be creative, allow the students to smell, hear, see, and touch while learning.

10. Stay one step ahead of your group. Try to foresee safety issues before they happen and identify students who may need special attention. For example, if one student has an especially high energy level, delegate a special task for them or give them an extra responsibility, such as carrying an item or opening gates.

11. Keep the group actively participating instead of mostly watching and listening. You can vary the pace by letting them run in some areas and tip toe in other areas.

12. Gear the duration of your activity to the energy and interests of the group. Sometimes an activity will last for 10 minutes, some groups can do it for 20.

13. You are not responsible for behavior management and discipline. If you are having a problem with a child or group of children, ask a teacher or chaperone to deal with the situation separate from your activity.

14. Be flexible and HAVE FUN! If the group senses that you're enjoying yourself, they will too!



Templates

Field Trip Information

Date of Visit: _____ Topic: _____

Students: _____ Grade(s): _____

Transportation: Bus Cars Length of visit: _____

Students with special needs or allergies: _____

TEACHER CONTACT INFORMATION:

Name: _____

Best way to contact: ___phone ___email E-mail Address: _____

School Tel: _____ Teacher Tel: _____ When to Call: _____

GOALS OF VISIT & ACTIVITIES PLANNED: _____

CONFIRMATION PHONE CALL:

Date _____ Time Confirmation _____ # Students _____

Snack: Yes No _____

Pre/Post Activities _____

CONFIRMATION LETTER: Date Mailed _____

PAYMENT:

Students: _____ Amount Paid: _____ Chk # _____ School Billed: _____

NOTES AND THINGS TO REMEMBER:

Farm Visit Chaperone Letter

Dear Chaperones,

Thank you for volunteering to assist with the field trip to _____ Farm.

We encourage chaperone participation throughout the field trip. Your main responsibilities include:

- Keeping a total count of the students in your group
- Keeping an eye on groups of students during exploration
- Allowing students to make discoveries on their own
- Help facilitate proper behavior of students
- Being alert to potential hazards on the farm
- Having fun!

Some areas to be aware of for potential safety concerns on the farm are:

However, we have taken necessary precautions to ensure safety as a priority during student group visits.

Please notify me if any first aid issues should arise, your support is much appreciated! Also, please keep your conversations with other chaperones to a minimum as they may be distracting to the students as well as the teachers.

We are grateful that you have made special arrangements to be with us on the day of the field trip. Thank you for helping to make this a memorable experience for the students.

Sincerely,

Confirmation Letter to School

Dear _____,

Thank you for your interest in visiting my farm. This letter is to confirm the plans for your upcoming visit and to help integrate the field trip into your classroom studies. Please review the following information and contact me as soon as possible with any changes. Please check the reverse side of this page for directions and parking information.

Date of trip: _____ **Time & length of trip:** _____
of Students: _____

What to Wear: You can expect to be outdoors for at least two hours. Vermont weather is anything but predictable, so please have students and chaperones come ready for anything — waterproof boots, long pants, warm jacket, and dress in layers!

Group Sizes: For the majority of the field trip we will be in small groups of 8-12 students. Prior to arriving, please divide your students into ____ groups. At least one chaperone is recommended per small group. Please have all the children wear visible name tags on their outdoor clothes.

Chaperone Role: We greatly value chaperone participation in order to make this a memorable experience for the students. Enclosed is a letter to chaperones outlining their responsibilities during the field trip. Please make sure they receive this letter prior to arrival.

Cost: The field trip price is \$_____ per student. Please pay *by check* on the day of the field trip. There is no charge for teachers and adult chaperones.

Program Cancellation: In case of inclement weather, your field trip may have to be cancelled, although we often hold the field trip rain or shine! I will call you at school at 8:00 AM if the weather is questionable. If you must cancel your field trip, please notify me as soon as possible so we can schedule another group.

Enclosed Activities: To make the most of your field trip, classroom work before and after your visit is highly recommended. Enclosed you will find activities suited to the classroom and related to this field trip theme. Please feel free to call me for further information or if you have any questions.

Sincerely,

Confirmation Letter to School

Dear _____ ,

Thank you for your interest in visiting my farm. This letter is to confirm the plans for your upcoming visit and to help integrate the field trip into your classroom studies. Please review the following information and contact me as soon as possible with any changes. Please check the reverse side of this page for directions and parking information.

Date of trip: _____

Time & length of trip: _____

of Students: _____

What to Wear:

Group Sizes:

Chaperone Role:

Cost:

Program Cancellation:

Enclosed Activities:

Sincerely,



Connecting to the CAFETERIA



Understanding the School Food Environment

Every day schools in Vermont serve breakfast and/or lunch to more than 50,000 Vermont students, an annual business of \$30 million. The average amount that can be spent on the food for a lunch (includes milk, vegetable, fruit, protein, and carbohydrate) is about \$1.00. It is also common today for a school district to serve after-school snacks, and meals for summer programs, making them a year-round program.

School food service directors are responsible for providing healthy, nutritious meals, budgeting and controlling costs, establishing menus, managing USDA commodity food, and meeting federal nutrition guidelines. With all of these responsibilities and constraints, they need high-quality products, in the quantity specified, at a price that works, with a consistent delivery system. Meeting these needs and establishing a successful working relationship takes time and good communication. When each party is familiar with the challenges and opportunities that the other party faces, a working relationship is more likely to flourish.

Currently schools in Vermont order about 86% of all their food through distributors. This often entails on-line ordering or just a few phone calls to salespeople. To save on time and labor, the food service industry sells schools inexpensive fresh produce that is already washed, cut, and ready to serve. Schools also receive low cost USDA commodity foods; this makes up about 14% of their total food inventory. These include: meats, cheeses, a few types of fresh storage vegetables and fruits, canned and frozen vegetables and fruits, and some dry goods (such as flour and pasta).

Where does school food come from?

Fifty percent of Vermont schools run their own independent food programs. The rest either receive prepared food from another school in the district or have a catering company run the program. The food service manager OF any given school may not have authority to make purchasing decisions.

Who prepares the school food?

How are decisions made about what is served?

Depending on ages, nutrition requirements, and food preferences, different foods might be offered at different schools even within the same district. Of course, the supply that the school receives from its catering company or distributor affects its meal offerings.

Are any Vermont schools buying local products?

Some schools are requesting Vermont products from their distributors, and a few are buying directly from local farmers. Local products can be challenging for school food service because of the time and labor it takes to wash and process them—even carrot sticks. Vermont is just beginning to supply some Vermont products (starting with apples in Fall 2005) into the USDA stream. Some directors are mixing less expensive commodity products with local product (such as chili made with USDA commodity beef and local vegetables). Others are having local lunches once a month.

How many farms does it take to feed a school district?

The number of farms needed to feed a school district depends on the school district's needs and the farms in any local region. A single farm might meet many of a small school's needs. Where there are several in the area, the school or district might obtain berries from one grower, spring vegetables from some other farm, and fall produce from still another farm.



Local Purchasing Options

School Food Service programs in Vermont are expanding their local purchasing through a variety of arrangements outlined below.

Whichever option is selected, know that every school food service must comply with a strict food safety program based on the Hazard Analysis and Critical Control Point (HACCP) principles. Temperature control of fresh and cooked products is very important. Therefore, arrange for proper refrigeration of merchandise during storage and distribution.

Wholesale Distributors

Distributors are the link to virtually every institutional food service operation in Vermont and a true resource for farms that do not have transportation or storage infrastructure. Vermont is fortunate to have a number of distributors who look for, and showcase, Vermont products. If you are a larger producer, your product will get to many more schools without you worrying about distribution. If you want to bring your products to one place, be aware distributors often require a minimum amount of product. The upside to this arrangement is that there is often no contract or long-term commitment. The downside is that your farm may be anonymous — schools will likely only know that the product they receive is from Vermont, but not know which farm it comes from.

Direct Purchasing

In direct purchasing, food service staff call you directly, or you may contact food services about your products. Food service directors and managers expect to work with dependable farmers with whom they can establish a long-term purchasing relationship. Things will go wrong occasionally. Food service directors need to be able to contact someone quickly if there is a problem. They will also want to be notified ahead of time if a delivery will be late or missed completely so they can make substitutions and adjustments. Here are some direct purchasing options that a farmer could offer:



DELIVERY ARRANGEMENTS

are often a unique collaboration between farms and schools. Some options to consider are:

- Farmers may choose to work with a school district that utilizes a central food service facility in order to deliver to one site rather than to multiple schools.
- Growers may add destinations to an established delivery route. For example, a farmer may be able to deliver to schools on the same day she goes to the farmers' market or delivers to restaurants.
- If several farms are delivering to a school district, they could collaborate by bringing their products to one farm and have that farmer do the deliveries for all of them.



CSA ARRANGEMENT (Community Supported Agriculture)

Also referred to as subscription farming, CSAs typically have subscribers who receive weekly shares of a farm's summer and fall harvests. Schools are trying similar arrangements

with winter shares of fall and winter storage crops. The school pays in advance and receives a set amount of a large winter share on a weekly or monthly basis. A school could also pay in advance and buy down from that amount, requesting items on the winter share list along with any extras your farm might have. CSA shares aren't always appropriate for large schools, but they can be perfect to supplement produce for harvest dinners and regular classroom taste testing. They can also work well for smaller schools that can more easily adapt to a rotating array of farm products. This arrangement often has a direct farmer-to-teacher component.

CONTRACT GROWING

In some school districts several farmers and school food service staff meet together each spring to identify foods the food service can use for the coming school year. Both sides agree upon a price for a given amount of product. When farmers plan for what the schools need, they can often offer the school a discount. Contract growing can create a secure market for your products ahead of time. Once you have made an initial agreement to supply food to schools, it may be helpful to draw up an agreement (see the checklist in this section).

GROW A ROW

Innovative teachers and food service staff have experimented with "grow a row for the school kitchen." Students plant a particular crop at a farm they visit in the spring. The following fall, the class harvests the crop and brings it to the school to be stored or processed and frozen for later use. To date, carrot, potato and pumpkin crops have been tried, but why not corn, onions, and rutabaga? This strategy takes more planning but it is often worthy of publicity, and of course, more educational for all involved.

MARKETING COOPERATIVE

Some farmers work together to share in the distribution, marketing, processing, selling, or billing of their products. The benefit of a cooperative like this is that it's easier for farmers to get their products to the school and easier for the food service director to call one number. In Vermont, Deep Root Organic is an example of a regional marketing cooperative. In Central Vermont, Food Works operates "Farm to Table," a cooperative program for schools, senior centers, and daycares. And in Randolph, Randolph Area Family Farms (RAFF) has coordinated the ordering, purchasing, and delivery of local produce for four area schools for monthly local lunches.

DISTRICT PURCHASING COOPERATIVE

School districts that hire or find a part-time purchasing director/coordinator (such as a motivated parent with business experience) are able to find significant savings by arranging local purchasing agreements on behalf of an entire school district. This idea is being explored in Vermont and has worked in communities throughout the U.S. Several districts can share the cost of hiring a purchasing director who can then be a central broker and schedule orders, deliveries, or trainings for food service professionals who are shifting to more fresh and local food.

Why schools purchase local products

Talking Points for farmers in discussion with a school food program

- ✓ Local produce is fresher which means there will be less waste and a longer shelf life.
- ✓ Cost of product is often comparable to what other vendors charge.
- ✓ Students can gain environmental and nutritional education through local sourcing.
- ✓ Small market farmers often raise varieties of produce that taste better than conventional varieties, and can cater to a local market.
- ✓ Buying locally supports the local community.
- ✓ Schools can protect the environment by reducing the distance products travel.
- ✓ Schools develop rewarding relationships with the farmers in their school community.
- ✓ Keeping money cycling locally helps the community.



Action Steps to build purchasing relationships with a School Food Service

- 1. Start small.** To develop a reputation as a reliable vendor, commit to a realistic sales volume and develop a realistic delivery schedule that suits you and the school food service.
- 2. Identify and set up business appointments with the directors of school food service** (rather than school cafeteria managers), since they are typically responsible for making final procurement decisions.
- 3. Invite the food service director and employees to visit your farm.** Your best selling point is your farm and your products. When food service staff visit, they will see how you care for your farm and the work it takes to produce the food they want. Food service directors need to develop menus that accommodate what grows seasonally in your region, and visiting your farm will help make this point.
- 4. Offer free samples.** Think about offering potential school food service customers samples that they can test in their school food programs.



- 5. Make sure you are considering the labor costs and product costs** to ensure your program is sustainable in the long run.
- 6. Develop a sales strategy that offers a variety of ways the food service can incorporate local products.** You might suggest recipes for some of your more uncommon foods such as hubbard squash.
- 7. Be aware of how your farm liability insurance interfaces with the school food service's food safety program.** Every school food service has a strict food safety program that is based on the Hazard Analysis and



Critical Control Point (HACCP) principals. Temperature control of fresh and cooked products is very important. Therefore, arrange for proper refrigeration of merchandise during storage and distribution. Also, incorporate strict quality standards when assembling and packaging products.

8. Supply products that are difficult to obtain from long-distance shippers, such as highly perishable fruits or small-quantity products.

9. Consider growing a different variety of crops to serve more of the daily needs of the school food service. Cherry tomatoes, for example, only require washing; they store well, and are easy to serve. Talk to schools as early as possible to plant vegetables accordingly.

10. Consider washing and even cutting and bagging your product.

A “value-added” product could make you more money and save the food service time.

11. Work with the school food service on meeting their nutrition guidelines, which dictate what can be on menus. Because menus are developed a month ahead of time, substituting products can be difficult. Devise a system with the food service director for supply replacements, such as putting “local fresh seasonal vegetable” on the menu to accommodate the ebb and flow of your vegetables.

12. Develop fact sheets for food service and the school community throughout the season. A weekly fact sheet could include information about: product availability, size of food items, quality descriptions, estimated quantity and price per unit, other timely news that would provide food service directors with factors necessary to make good purchasing decisions. It could also contain a farm profile to further connect the farm to the school community.

A Purchasing Agreement with the School Food Service should include:

- The total estimated volume of each item to be delivered.
- Amount and price of standing order items.
- Delivery schedule: time of day, frequency, and location.
- Packing requirements: standard box, grade, loose pack, bulk, etc.
- Post-harvest handling practices; is the product pre-cooled? How clean should the product be?
- Cost per unit, payment terms, payment process.
- Names and phone numbers of the contact people for ordering and billing.



13. Clearly establish a payment schedule plan. School districts often have a payment cycle of 30-90 days or longer. As a farmer, however, you may be used to presenting an invoice and receiving payment upon delivery. This difference in operation needs to be worked out between a school district and the farmer before purchasing begins.

14. Stay in touch to inform the school what crops will be harvested.

If you can let them know what products to expect one to two weeks ahead, they can plan. Try to get a standing order by offering a discount. When each party is familiar with the challenges and opportunities that the other party faces, a working relationship is more likely to flourish.





Connecting to the COMMUNITY



Connecting to the Community

The idea of improving children’s nutrition and supporting local farms is easy to “sell” as a local media story. The more positive media coverage a project receives, the more support it will generate from the school administration, school board, parents, teachers, food service staff, and the local community. By collaborating with teachers, administrators, and community members, you can find the appropriate individual and organization to support and develop different aspects of your farm-to-school initiatives and farm education program.

As a farmer, you can do many things within your community to get the word out about your interest in selling food to local schools and having community education on your farm.

Ways to reach out to your community:

- Create a flyer with your farm’s information on it.
- Develop a logo for your farm, if you haven’t already, and put it on all information that you distribute.
- Develop advertisements for local television and radio announcing how your farm can be a part of local community members lives and interests.
- Consider hosting open-house/open-farm days.
- Develop various seasonal festivals on your farm. Each festival can reflect what is being harvested or grown at that time and can include activities such as:
 - making salve, wreaths, or bouquets
 - hosting Solstice/ May Day festivities
 - holding a community harvest celebration.
- Contact a local band or musician to have an outdoor concert on the farm.
- Create a web site for your farm posting events and general farm information.

continued



- ✓ Consider creating a “farm tour” with other local farmers, representing a variety of farms in the area. You could even have a “tour scavenger hunt” to draw people to each farm.
- ✓ Take an ad out in the local paper describing your events and goals.
- ✓ Local papers often welcome photos with captions about community events. Be sure to submit a photo announcing your event and follow-up results.
- ✓ Write a once-a-month, on-the-farm column for your local paper. (If you’re not a writer, have a customer or group of students write the piece.) Writing the columns during the winter months makes it doable.

Your interaction with the public will be important in developing your farm’s relationship to the community. Try to identify one “spokesperson” for the farm. This means insuring that the person who is communicating with the public is comfortable with this role. It is also important to identify one person who fields questions about activities on the farm. Conveying consistent information is vital in developing a solid reputation. For instance, if you are charging a certain amount for group visits to the farm, be sure this information is consistently conveyed.

Points to remember:

- ✓ Be sure to follow up with phone calls. Don’t drop the ball — always follow up!
- ✓ Keep all newspaper clippings and articles relating to your farm; you can access them later to show that your farm is relevant in the community.
- ✓ Have events annually. This will help ensure your farm as a place identified with the community.

The following are sample press releases to use as a reference when advertising a community event.

Name of Your Farm Here

N E W S R E L E A S E

FOR IMMEDIATE RELEASE

Contact: Your Name Here

Insert Date Here

Your Phone Number

NAME OF EVENT HERE

Your Town, VT – Saturday, June 5 _____ Farm hosted five classes of fifth and sixth graders from _____ elementary school. The school group has been studying soil cycles and farming this spring and finished the unit with a trip to the farm. Teachers were eager to take a trip to _____ farm because of the variety of opportunities to see first hand the topics that the students had been so interested in during the school year. Students helped farmer _____ mix potting soil in the green house and planted some seeds which will turn into large beautiful pumpkins months from now. While visiting the pigs students learned about the benefits of having animals on a farm to maintain healthy soil. _____, a teacher from the school raved about the ability for the students to learn experientially on the farm, and gain a deeper understanding about where their food comes from. Students were impressed with the farm, and some even asked if they could return to help with the harvest in the fall.

_____ farm schedules field trips throughout the school year for students of all ages. Field trips vary depending on the season, what is happening on the farm, and the visiting groups' interests. For more information on scheduling a field trip, please call _____.

_____ Farm is a 7 acre mixed vegetable farm that provides agriculture education to the local community while supplying fresh local food. Its mission is to support local agriculture and promote environmental stewardship by educating about the value of small farms in Vermont.

YOUR FARMS ADDRESS HERE

Name of Your Farm Here

N E W S R E L E A S E

FOR IMMEDIATE RELEASE

Insert Date Here

Contact: Your Name Here

Your Phone Number

NAME OF EVENT HERE

Your Town, VT – Saturday, November 26 _____ Farm will be hosting its annual Harvest Festival. The farm will be bustling with exciting annual events and friendly community faces. The day-long event features music, storytelling, traditional crafts, and foods from the bounty of the harvest. Visitors can participate from 11:00 am to 5:00 in a variety of harvest activities including wreath making, salve making, and learning how to make dried flower wreaths. Hay rides are free, weather permitting, and are offered on a first-come, first-served basis.

The _____ band will be providing entertainment for the whole family to enjoy. Other family friendly activities include pumpkin picking and carving, pressing apple cider and visits with farm animals. Enjoy your neighbors cooking skills and fresh baked pies from the annual apple pie contest at the festival.

Admission to the Harvest Festival is \$6/adults; \$4/children. Children under three years of age are free. THE EVENT IS HELD RAIN OR SHINE. For information, please call _____.

_____ Farm is a 7 acre mixed vegetable farm that provides agriculture education to the local community while supplying fresh local food. Its mission is to support local agriculture and promote environmental stewardship by educating about the value of small farms in Vermont.

YOUR FARM'S ADDRESS HERE



ACTIVITIES

GENERAL FARM Activities

Food Chain Game	51
Sound Map/Fistful of Sounds	52
Five Basic Needs on the Farm Scavenger Hunt	53
Animal Feed Scavenger Hunt	55
Dress up a _____	57
Product Relay	59
Farm Detective Bingo	61
Help with the Chores	63

SOILS, COMPOST & LAND Activities

Compost Critter Charades	64
Compost Concoctions	65
Soil and Worm Search	66
Learning about Soil	67

GARDEN & GREENHOUSE Activities

A Fruit by Any Other Name	69
Brown Bag Botany	70
Simply Salads	72
Recipe Scavenger Hunt	73
Smelly Plant Scents Match	75
Blindfold Walk in the Garden	76
Count the Seeds	77
Three Sisters Improvisation	78
Three Sisters Tag Game	79
Plant Needs Inventory	80
Stages of Growth Scavenger Hunt	81
Working in the Greenhouse: Greenhouse Stations	82
Greenhouse Pests	83
Learning about Seeds	84

continued

DAIRY Activities

What Does it Take to Make Milk?	85
If I Were a Cow, What Would I Eat?	86
Dairy Food Tasting	87
Ice Cream in a Bag	88
There's No Such Thing as a Free Lunch	89

POULTRY Activities

Flocks of a Feather	90
How Does Your Food Behave?	91
Farm Animal Travels	93
Feathers, Feathers, Feathers	94
Chicken Choices	96
Grinding Grain	97

MAPLE SUGARING & TREE Activities

Signs of Sugaring	98
Maple Stations	99
Every Tree is Different	101
Food from Trees	102
Tree Life Cycle Sort	103
Those Tappable Trees	104
Tapping Sugar Maples	105
The Boiling Process	106

BEE & INSECT Activities

Insect Safari	107
Bees A-Buzzin'	108

A NOTE ON SOURCES:

The activities that follow were submitted by farmers; many of them were hand written. Any ideas, images, and text in this book that are similar to those in any copyrighted materials were used unintentionally and without awareness. To the best of our abilities, we have credited all the sources for activities. These sources include: PROJECT SEASONS, UK Soil Association, DIGGING DEEPER, the NOFA FARM-TO-SCHOOL DIRECTORY, and the FARM FIELD TRIP MANUAL from Massachusetts Ag in the Classroom. See the bibliography for a complete listing of sources.

Food Chain Game

Summary

Using pictures of ten different “players” in a food chain, students see that all living things are part of a complex food web. When one organism is destroyed, the rest of the web is affected.

Procedure

1. Give one picture to each child.
2. Ask them to put themselves in order of the food chain, i.e., “who eats who.”
3. Once in order, have the students form a circle. This is the cycle of life and energy flow.
4. Talk about the importance of each member in the cycle. What would happen if we removed one of the organisms from the circle (maybe a farm is using pesticides to kill off their aphids). If the bees die due to disease, how will flowers produce fruits? What will people eat?

Farms are often home to a wide variety of wildlife because they encourage diversity and mutual reliance. These practices help the rest of the food chain by attracting the next level of predator, and so on.



For Grades K-5

Materials

Pictures cut out of magazines, or drawn of:

- water
- sun
- soil
- seed
- plant
- flower
- honeybee
- farmer
- farmstand
- people

You can also use puppets and/or real samples.

Extension:

Have students identify the producers, primary consumers, secondary consumers, and decomposers in their circle of life.

Sound Map/ Fistful of Sounds

**For
Grades K-8**

Materials

(all optional)

- paper
- pencil
- clipboard or hard surface

Extensions:

- Have students tape record sounds of the farm.
- Farmers can use taped sounds as background for narrative about the farm.

Summary

Use this activity to introduce the group to your farm using senses other than sight—you'll be amazed at what they'll notice!

Procedure

Before everyone starts walking around and exploring the farm with their senses of sight and touch, explain that they will begin by listening to the sounds of the farm. Have each child find a private spot so that he or she is not touching anyone else. Ask them to close their eyes and hold up one fist. For each sound they hear, have them hold out one finger. After a few minutes, gather the group back together and share the sounds. To heighten the sounds, you can ask the students to cup their hands behind their ears (like satellite dishes or deer ears).

For an older group, you may want to expand this activity. Give each child a piece of paper and pencil before they find their private spot. Ask them to draw a dot in the middle of the paper to represent themselves. Have them sit and draw or write down all the sounds they hear in relationship to themselves (e.g., bird chirping behind me, airplane overhead, chicken clucking to my right, etc.). Come together after 5-10 minutes and share maps!

Now you can explore the farm looking for the sources of all of those sounds!

Encourage students to try this same activity back at school or at home.

Five Basic Needs on the Farm Scavenger Hunt

Summary

Using a scavenger hunt as a discovery tool, introduce students to the basic needs that all living things share and the concept of the farm as a whole system.

Procedure

1. Following introductions, discuss the five basic elements all organisms need for survival — food, water, shelter, air, and space to grow. Explain that in many ways, a farm is a kind of living organism. It needs all the same things other living things need. Humans, animals, plants, and machines help the farm organism to thrive.
2. Ask the students, individually, in pairs or small groups, to find the various things listed on the scavenger hunt sheet and draw a sketch of each thing they find in the square.
3. As part of the hunt, have students lay the hunt sheet on the ground. How many plants are growing under it? How many insects travel over or under it in three minutes? See if you can get three or more people to stand on the paper at the same time.
4. How might students help to keep the farm viable? How about professionals (veterinarian, scientist, seed distributor)?

**For
Grades 2-8**

Materials

- scavenger hunt sheets (enough for each person or small group)
- pencils or pens
- clipboards (optional)
- gathering baskets (optional)

Five Basic Needs on the Farm

PLANTS	ANIMALS	PEOPLE
Find a source of water for plants in the garden	Find a source of water for animals	Find a source of water for people
Find a source of food (or nutrients) for plants	Find a source of food for animals	Find a source of food for people
Find a place plants find shelter	Find a place animals find shelter	Find a place people find shelter
Find a source of air (carbon dioxide) for plants	Find a source of air (oxygen) for animals	Find a source of air (oxygen) for people
Lay this paper on the ground. Count how many plants are growing under this space.	Lay this paper on the ground. Count how many insects travel over or under this space in 3 minutes	See if you can get 3 or more people to stand on this paper at the same time

Animal Feed Scavenger Hunt

Summary

Introduce students to the various farm animals and the different foods they eat.

Procedure

1. Introduce yourself and tell students about your farm.
2. Ask some introductory questions.
 - a. What animals are on the farm?
 - b. Where would you find them?
3. Explain the scavenger hunt. The class will be broken into several groups. Each group will discover the kind of food each farm animal eats. Students will record their findings on the scavenger hunt sheet. Depending on students' age, an adult with the group may record the findings for the group.
4. Discuss ways students can tell what animals eat.
5. Have students look inside and outside the barns and animal pens to find the food each eats.
6. If possible, collect samples of foods (in ziplock bags) for students to sort and explore back at school.



For Grades K-8

Materials

- access to a barn, animal pens, and fields
- pencils
- photocopies of scavenger hunt chart
- paper

Extensions:

- Categorize animals by what they eat — grass, grain, etc.
- Do farm animals eat just one kind of food? Do different farm animals eat different kinds of foods? What farm animal foods might people eat too? What foods wouldn't people eat? If there is interest, explain the differences between different animals' digestive systems.

Animal Feed Scavenger Hunt

ANIMAL	FEED	HOW DO YOU KNOW?

Date: _____ **Group Members:** _____

Dress up a _____

Summary

Students will be introduced to the distinguishing characteristics of a certain animal or plant.

**For Grades
Pre-K - 6**

Materials

COW:

- glue 4 baby bottle nipples to a Cool Whip container for udder
- fly swatter for the tail
- headband with cardboard ears and horns attached
- 4 socks with paper hoof prints glued to the bottom for legs/hooves
- sandpaper cut to size of cow's tongue
- four deflated balloons tied together for stomachs

SHEEP:

- sheep skin if available or handful of fleece for covering
- 4 socks with paper hoof prints glued to the bottom for legs/hooves
- headband with cardboard ears attached
- plastic margarine tub for udder with 2 baby bottle nipples glued on (or inserted through holes and glued) for teats
- four deflated balloons tied together for stomachs

CHICKEN:

- feathers to represent covering
- paper cone with string for beak
- hair comb glued on headband for comb
- deflated balloons on a string for wattles
- cardboard wings with string/rubber band/tape for handle
- 2 cultivators (claw-like hand tool) for feet (handle for 4th toe)

BEE/INSECT:

- large piece of cardboard shaped and decorated as a smaller black thorax on top and a larger yellow and black striped abdomen below. Attach ribbon or yarn to hang the body around a student's neck. Cut 3 holes on each side of the thorax to attach the legs—use old stockings or socks stuffed with batting or newspaper.
- cardboard wings with string/rubber band/tape for handles.
- headband with pipe cleaners attached for antennae

continued

<input checked="" type="checkbox"/> old sunglasses divided into facets with marker or paint pen for compound eyes	SEED/SPROUT:
<input checked="" type="checkbox"/> 3 sticky paper dots for simple eyes	<input checked="" type="checkbox"/> large raincoat/poncho for seed coat
<input checked="" type="checkbox"/> specialized mouth parts: <ul style="list-style-type: none"> • new kitchen sponge: housefly • drinking straw: butterfly/moth • turkey baster: mosquito • clothes pin: chewing beetles 	<input checked="" type="checkbox"/> backpack as cotyledon containing: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> gorp/energy bar for food <input checked="" type="checkbox"/> water bottle with attached straw (roots) <input checked="" type="checkbox"/> hat for first green leaves
<input checked="" type="checkbox"/> spray bottle labeled “Eau de Insect #5” to represent pheromones	

Procedure

Extension:

Copy this activity and give it to the teacher to do as a follow-up activity in her classroom.

1. Ask the students to imagine what the plant/animal looks like. What makes it unique?
2. Pick a volunteer from the class and have them stand by you, so everyone can see him or 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 plant/animal.
3. Ask the students for suggestions on how to make your volunteer look more like a plant/animal. As they come up with ideas, dress up the student volunteer with the props that you have in your large bag.
4. After you have dressed up the volunteer with all the props you have, ask the students what they could add to make the student look even more like the plant/animal (covering, placement of features, lack of features, posture, habitat, etc.) Discuss how we are different from plants/animals and how we are similar.

Product Relay

Summary

**For
Grades 2-6**

Give your group an opportunity to release some energy and learn what products come from your chosen producer.

Materials

- 3 large bins: one labeled “from a COW ” (or sheep, bee, plant), one labeled “NOT from a COW” (or other). For nonreaders, it is helpful to have a picture of the producer on the “from a” bin. The third large bin will hold assorted products to be sorted.

Product ideas:

COW:

- milk products (empty milk, butter, ice cream, yogurt, cheese containers)
- leather products (shoes, belts, purses)
- meat products (plastic meat replicas, beef dog food, raw hides, ox tail, soup cans)
- manure (dried in a bag or empty “moo-doo” compost bag)

CHICKEN:

- feather products (feather duster, single feathers, feather pillow)
- meat products (plastic meat replicas, chicken soup, chicken bouillon, chicken flavored pet food/treats)
- egg products (empty egg cartons, plastic/wooden eggs)
- manure (dried in a bag or empty compost bag)
- fly fishing tie

SHEEP:

- wool products (hats, mittens, felted items)
- lanolin (lotion bottle)
- milk products (cheese packages, milk containers, soap containers)
- meat (plastic replicas, empty sheep jerky packages, lamb/sheep flavored pet foods/treats)
- leather products
- manure

TREE:

- wood products (paper, cardboard, pencil, twig, etc.)
- fruits & nuts (be sensitive to possible nut allergies)
- sap products (syrup, rubber)
- crushed leaves, shredded bark mulch

continued

BEE:

- wax, honey, queen jelly, and other products that have honey as an ingredient like Honey Nut Cherrios, honey graham crackers

PLANT:

- fruits
- vegetables
- fibers (cotton/hemp clothing)
- baskets

* DON'T FORGET TO INCLUDE PRODUCTS THAT ARE NOT FROM THAT PRODUCER! These could be plastic things; wood things; synthetic fabric, etc.

Procedure

1. Set up the two labeled bins on a flat open space about 5 feet apart from each other. (Check to make sure area is free of holes and debris that could cause injury.)
2. The third bin (containing the products to be sorted) is located about 20 feet from the other bins—facing both.
3. Have your group split into two smaller groups and line up on either side of the product bin, facing the two labeled bins.
4. On your signal, the first person in each line will grab an item out of the product bin and run to the labeled bins, where they will place their item in the appropriate bin (have them guess if they don't know). Then they will run back and tag the next person in their line so that that person can take their turn.
5. Depending on the number of people playing, you may want to have each person take two turns and sit down after their second turn.
6. After the products have been sorted and everyone has had their turn(s), gather around the labeled bins and review and discuss the contents of each—were there any tricky items?

Extension:

Try having multiple baskets or bins that represent the full range of products that come from your farm (from a chicken, from a cow, from the garden, etc.). Have the students sort them all out based on the animal or plant they come from. Remember to include a bin for the products that don't come from your farm.

Farm Detective Bingo

Summary

Students explore the farm using a “bingo” card as a discovery guide.

Procedure

1. Photocopy and laminate the “Farm Detective Bingo” card on the following page, or create your own to guide students around your farm.
2. Divide the students into several smaller groups. Depending on the age, it may be appropriate to have an adult chaperone with each group. Give each group a card and grease pencil to carry with them around the farm as they hunt for the pieces to make a straight line for “Bingo.”
3. Establish boundaries for the hunt, and the time frame for returning.
4. Send the students out to collect as many items as they need to complete a straight line.

**For
Grades K-4**

Materials

- bingo cards
- grease pencils
- bags to gather items

Extension:
Have groups try to fill in the entire board.



Farm Detective Bingo

As you explore the farm, look for the items below. Mark the box with an X once you've found the item. Call out "BINGO" when you've found and marked 5 items in a row — horizontally, vertically, or diagonally.

Find an insect	Find something that has been nibbled	Find food for a plant	Find food for an animal	Find something red
Find a sprouting seed	Find something made by the sun	Find food for a worm	Find part of an evergreen tree	Find something yellow
Find a worm	Find something that needs water	Find something green	Find another insect	Find something prickly
Find a whole leaf	Find something that smells sweet	Find a flower	Find something brown	Find something white
Find a rock	Find something dry	Find something mushy	Find a twig	Find a seed

Help with the Chores

Summary

Introduce students to the many jobs on the farm that bring food from field to table.

Procedure

Asking students to help with some farm chores and jobs can be a powerful learning experience and may even help you get some jobs done. Most schools are encouraging teachers to provide *service-learning** opportunities. Discuss with your teacher before the field trip the type of task you were considering having the students do. Some samples of tasks include: Mulching, weeding, thinning, mixing potting soil, stacking firewood for the sugarhouse, broadcasting cover crop, filling seed trays, or picking rocks.

Considerations for Success

- **Be clear on steps to accomplish the task** with the end result obtainable in given time frame.
- **Be conscious of the number of students that fit comfortably and safely in the work space**, such as around an evaporator, down a row of potatoes, in the milkhouse or greenhouse.
- **Have the hand tools necessary for the task(s)** collected ahead of time and close at hand.
- **Be specific about the hazards and forbidden actions** such as jumping over garden beds, touching switches, or playing with scales.
- **Discuss, after the task is completed, how efficiency is important in farming.** How could this task be accomplished using different tools? Are there systems in place, or that could be in place to improve the task?

For All Ages

Materials

Dependent on farm job

* Service learning is a method of teaching that engages students in addressing issues in their community as part of their academic education. If this is the intent of the field trip, work with the teacher to tie the farm chores to the curriculum.

Compost Critter Charades

**For
Grades K-5**

Materials

- clear containers (tennis ball containers work great)
- live compost critters:
 - worms
 - pillbugs (or millipedes or centipedes)
 - flies
 - whatever you can find!
- or take group to the compost pile with a shovel to find the critters together.

Summary

Introduce students to the important critters that help to make compost.

Procedure

1. Discuss with students what kinds of things live in the soil or compost. What kinds of critters help turn the soil into compost? Worms, bugs, flies, etc., are great answers.
2. After discussion, show the students some of these critters that you brought along or use the shovel to dig some out of the compost to show them.
3. After everyone has had a chance to look at the critters briefly, explain that the kids are going to play a compost charades game.
4. Divide the students into three groups. Once they are divided, tell them you will show each group one of the critters they have just seen. Instruct each group not to say the name of the critter.
5. Take a couple of minutes for each group to practice moving like their critter in small groups.
6. Once everyone is ready, each group will take a turn acting like their critter. The job of the other group is to guess which critter is being demonstrated.
7. Keep playing until all groups have gone. If time and interest allow, let all groups act out each critter.
8. Show all live critters again at the end.

Compost Concoctions

Summary

Introduce students to the process of composting.

Procedure

1. Discuss with the students what kinds of things turn into soil. What kinds of things make up soil in the woods? In the garden? What kinds of things don't turn into soil?
2. Give each student their own container and stirring stick.
3. Tell the students that they are going to make a compost concoction! Their job is to collect in their containers different ingredients that will make soil.
4. Demonstrate how they can take a little of this and a little of that and mix them all up in their cups. Tell them that they are making their own mini-compost.
5. As they mix their own compost, ask them to think of a name to go along with it to describe it.
6. Allow the students to mix and mush their compost for 5-10 minutes, assisting them with ideas as they go.
7. Bring kids back together to see if their compost have turned to soil yet. Suggest they may need a missing ingredient, water. Let students drip water into their mixes.
8. After a minute or two of dripping water ask again if they have soil. Explain that soil takes time and describe the process of breaking down vegetative matter to turn into soil. Ask each student to tell about their compost and how it came by its name. Why is soil so important to every living thing?

Save cups of mixed up compost to use later in the garden for planting.

For Grades K-5

Materials

- a collecting container for each student (paper cup, yogurt cup, small bucket)
- stirring stick
- pile of leaves, compost, soil, grass, hay, water or access to these things in the natural environment

Extensions:

- Give the students some partially decomposed unfinished compost to investigate. Is it ready? What needs to happen to decompose further?
- Create a decomposition timeline to demonstrate how one thing in the compost changes over time. Show students a whole fresh leaf, a slightly dried out leaf with a few holes, a skeleton of a leaf and a fully decomposed leaf. Have students put them in decomposition order and then describe what has happened to the leaf over time.

Soil and Worm Search

**For
Grades K-8**

Summary

Introduce students to the biology and natural history of earthworms by digging into soil, examining worms, soil, and other creatures they find.

Materials

- metal spoons
- 3-ft. lengths of string
- 2-3 trowels
- pieces of 2x3-ft. white cloth or large pieces of white paper
- hand lenses or magnifiers

Procedure

1. Following introductions, talk with the students about soil as an ecosystem with living and dead components, and how it is home to earthworms and many other critters. Tell students that they will be investigating earthworms. An earthworm has five hearts, which are actually pairs of enlarged blood vessels that pump blood throughout the worm. Worms eat their weight in soil each day. Soil enters the mouth, travels into a bag-like crop, and then to the gizzard, where strong muscles and bits of soil act like teeth to grind up food hidden in the soil. The remaining soil is expelled from the worm as waste, called worm *castings*.
2. Discuss earthworms' role in soil quality (and, therefore, animal and plant health). Worm castings are five times richer in nitrogen, seven times richer in potassium and eleven times richer in phosphorus than the soil ingested. These nutrients are important for plant growth.
3. With her or his string, have each student mark a patch of ground that she or he will dig in.
4. Have students dig small holes with their spoons. Encourage them to look carefully for worms, insects and evidence of plant roots or decomposing leaves.
5. Lay the white clothes on the ground. Place specimens on the cloths to get a better look at the soil and worms. Have the students observe the worms carefully and describe what they notice. What parts of the worms can they see? What parts can they see through the magnifier? Put a worm on a clear plastic plate and shine a flashlight under it to show some of its internal and external parts.
6. After everyone has finished looking at their worms and sharing their observations, place the worms gently in the holes and cover them lightly with soil and leaves.

Learning about Soil

Summary

This series of experiments involves students in soil investigation and comparison.

Procedure

Experiment #1:

1. Have groups or pairs of students collect soil samples. Each group should be assigned a different place on the farm so that each sample will be unique.
2. Each pair of students will study their soil sample and record their findings on the "Soil Properties Record Sheet."
3. Discuss with the entire group how the soil samples are different.
4. Have each group fill their lidded jar 2/3 full of water. Add 1/3 soil, add a lid, and shake the contents vigorously.
5. Leave the samples alone for at least 15 minutes while performing another experiment or exploring the farm. Let the contents settle out and observe the differences. Which soil is heaviest? Which soil has the most sand? Sand will settle at the very bottom because it is the heaviest; clay will be on top since it is the lightest and has the smallest particle size.
6. Discuss how different plants need different kinds of soil, how Vermont has more than 25 different soil types, and how soil types are derived.

Experiment #2:

1. Have students poke three holes in the bottom of their paper cups and fill the cups 1/2 full with soil.
2. Hold the soil cup over the mason jar and then pour a measured amount of water through the soil. Time how long it takes for 1/2 of the water to pass through the soil.
3. Compare results. How does soil "hold" the water? Which part of this experiment illustrates a part of the water cycle? How does this experiment relate to water pollution? How do farmers and gardeners use this information to farm better?

For Grades 6-12

Materials

Each pair/group of students will need:

- copy of the "Soil Properties Record Sheet" on p. 68.
- clear jar with lid
- trowel
- paper cup
- one mason jar (quart size)
- paper & pencil
- pie plate

Extension:

Set up 3 containers: One with sand, one with clay, one with silt. Do Experiments 1 and 2 with these pure samples. Explain to students that their soil samples from the farm have a mixture of these soil particle sizes. Let students compare their own soil samples to the sand, clay, and silt. Ask students which soil particle sample their soil is most like.

Soil Properties Record Sheet

Soil is made of 4 main components:

solid rock and minerals (45%), organic matter (5%), air (25%), and water (25%).

**What organic (living or once-living) components can you see in your soil sample?
(worms, leaves, seeds, etc.)**

How big are the inorganic (rocks & minerals) components?

**How does your sample feel if you rub it between your fingers?
(Textures: rough, sandy, soft, silky).**

**How does your sample hold together if you try to form it into a ball?
(Consistency: loose, friable/crumby, firm, sticky)**

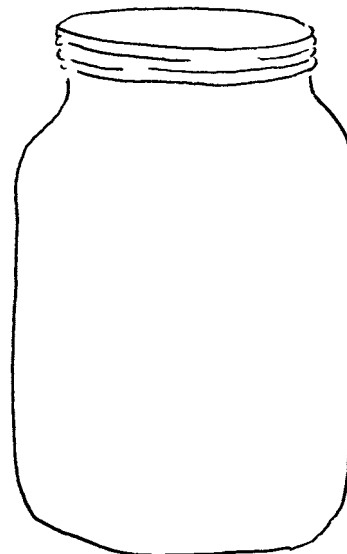
Smear a bit of your sample below. What color is it?

EXPERIMENT #1:

**Draw the layers of your sample in the jar after
its particles have settled out of the water
(wait about 24 hours).**

EXPERIMENT #2:

**How long did your sample
"hold" $\frac{1}{2}$ the water?**



A Fruit by Any Other Name

Summary

Introduce students to the variety of plants that produce edible fruit through discussion, observation, and comparison.

Procedure

1. Discuss the different fruits we eat.
2. Explain the difference between fruits and vegetables. A *fruit* is any edible part of a plant that has seeds inside it. A *vegetable* is a plant part that is consumed and does not have seeds inside it.
3. Have students classify fruits according to what they grow on: bushes, vines, trees.
4. Have children differentiate between small fruit (grown on bushes or vines) and other fruits.
5. Ask children to classify fruits according to which grow in Vermont and which do not.
6. Discover which foods are grown on the farm during the farm tour. As each food is discovered, write its name on an index card for students to bring back home or to the classroom for further investigation.
7. After exploring the farm, have the students map the buildings and land. Focus on where the food for animals and the food for people are grown. Make a large map on a white bed sheet to hang up for future guests or for the students to take back to the classroom.



For Grades K-6

Materials

- fresh fruit
- access to gardens or orchards
- photographs of fruit and fruit plants

Extensions:

- Ask students to draw the fruit and plants that they are from when they get back in the classroom. Ask them to research more about these fruits and turn their artwork and research into a "Vermont Fruit Field Guide."
- Collect a variety of fruits (fresh and preserved) for the group to investigate. Have students describe how these fruits are similar and different. Let students sample and compare the different kinds of fruits: fresh, dried, jammed, and leathered.

Brown Bag Botany

For All Ages

Materials

- ☑ large brown paper bag
- ☑ labels identifying each of the plant parts listed
- ☑ an assortment of foods, including a variety of plant part products such as:
 - **ROOTS:** carrots, beets, tapioca
 - **STEMS:** celery, potatoes, sugar, asparagus, rhubarb
 - **LEAVES:** tea, lettuce, spinach, onion
 - **FLOWERS:** chamomile, nasturtiums
 - **BUDS:** broccoli, brussel sprouts, cauliflower, artichoke
 - **FRUIT:** cucumber, pepper, pizza sauce, tomatoes, zucchini
 - **SEEDS:** alfalfa sprouts, bread, spaghetti, cereal, oatmeal, rice, chocolate, peas or beans out of the shell

Summary

Students are introduced to edible parts of plants and identify the nutritional qualities of different plant parts.

Procedure

1. Set up areas with a label or sign for each plant part.
2. Fill the paper bag with an assortment of edible foods from each of the plant-part categories (see materials list). Be sure to include animal and people food from your farm!
3. In teams of two, have students pull a food out of the bag and try to match it with the corresponding plant part. Lettuce, for example, would be placed in the station marked “leaves.”
4. When everyone has had a turn, review and critique.



Plant Part Chart

Plant	Description	Examples
Root	Usually forms below ground, acts as an anchor for the plant, absorbs water and minerals, and provides physical support and food storage.	Diakon, burdock, tapioca, carrots, parsnips, beets
Stem	Provides support for the buds and leaves, and gives the plant its form. Serves as a conduit for water, minerals, gases, and sugars.	Potatoes, celery, rhubarb, asparagus
Bud	An undeveloped shoot from which leaves or flowers grow. A flower bud includes a short stem with embryonic flower parts.	Broccoli, artichokes, brussel sprouts, cauliflower
Leaf	The part of the plant involved in photosynthesis and transpiration. Leaves are made up of: stoma, guard cells, epidermis, cuticles, veins, chlorophyll, and chloroplasts.	Parsley, onions, celery, lettuce, mint, chives, garlic, tea
Flower	The structure that contains the organs for sexual reproduction. Also the site where the pollination occurs.	Nasturtiums, chamomile
Seed	After pollination has occurred, fertilized ovules grow and swell to form seeds. A seed contains an embryo (which has all the necessary genetic information to create a new plant), an endosperm (the food required to sustain early growth), and a seed coat (which protects the seed from disease).	Shell peas, wheat products, oats, coconut, peanut butter, corn starch, coffee, dried beans, chocolate
Fruit	The enlarged ovary surrounding the newly developed seed is the true fruit of the plant. The fruit holds and protects the seed.	Pumpkins, tomatoes, vanilla, snap peas, green beans, avocados, peaches, grapes, zucchini, peppers

Simply Salads

For All Ages

Materials

- farm maps
- pictures of salad ingredients
- collecting bowls
- scissors for cutting greens and herbs
- cooler of water
- salad spinner
- plates
- forks
- napkins
- jars for salad dressing
- oil
- vinegar
- salt & pepper

OPTIONAL: 6-inch pots, lettuce, radish, chive seeds; soil, water, Popsicle sticks, and pencils to label.

OPTIONAL: Have ingredients to make a salad dressing.

Extension:

Sort collected items by plant part.

Summary

Participants explore the vegetable farm through a scavenger hunt: identifying, collecting, and eating wild and cultivated greens, herbs, and flowers.

Procedure

1. In advance, make farm maps and a picture guide to the salad ingredients to be collected. The map can be a simple line drawing that shows major buildings and fields. Salad ingredient pictures can be cut out from a seed catalog. Label and number each picture. Put the corresponding number on the map where the item can be found.
2. After introductions, break into three groups for collecting. Distribute maps and explain that each group will go to one area at a time, return with what they gather, and then go to the next area. Be specific on quantity to gather!
3. Show each group the pictures of what they need to collect and locate the first plant on the map. Have students go to that location and search for the plant.
4. Teach students careful ways to harvest (e.g., stand in the path, cut low for lettuce, high for perennial herbs) and collect a little from each area.
5. Depending on how far students have to walk, it takes about 15 minutes to collect four to five plants. Do fewer plants for preschoolers, and more for middle and high school students.
6. At the spot groups meet and switch, have three collecting bowls for each plant group — wild and cultivated greens, flowers and herbs.
7. After all groups have collected all three plant groups, wash greens and cut the herbs.
8. Make a dressing by putting two parts oil to one part cider vinegar, 1-2 pinches of salt and about $\frac{1}{4}$ of the chopped herbs. Almost any combination of herbs will work if they are cut up finely enough to release flavor.
9. (Optional) After eating, students can fill a pot with soil and plant a salad-type seed to take home and grow.

Recipe Scavenger Hunt

Summary

Students discover the connections between the foods they eat and the foods produced on Vermont farms.

Procedure

1. Make copies of a simple recipe containing farm products. Common recipes include vegetable stew, squash soup, vegetable rice pilaf, carrot parsnip beet salad, etc. (Include your farm's name on the recipe.)
2. After a tour of the farm, divide into groups and give each group a copy of the recipe (or give each child a copy of the recipe).
3. Talk about the ingredients that are not produced on the farm, and where they will come from.
4. Take the group(s) out around the farm to collect the ingredients.
5. If there is enough time and the necessary facilities, the students can use the ingredients to make the recipe. If not, make the recipe in advance so the children can taste it, or give the ingredients and recipe card to the teacher for the students to make it at school.

For All Ages

Materials

- bags or gathering baskets are helpful
- copies of a simple recipe made from farm products

Extensions:

- Make sweet dips or dairy dips for harvested fruits and vegetables.
- Dry harvested items for tasting later or mixing into cereals, yogurt (for fruit), or soup with pasta (for vegetables).

Carrot, Parsnip & Beet Salad

Yield: 25 servings

INGREDIENTS

- 2 ½ lbs. parsnips
- 1 ½ lbs. carrots
- 1 lb. beets or ½ lb. green cabbage and ½ lb. red cabbage
- 2 Tbsp. grated fresh ginger or 1 Tbsp. dried ginger
- ¼ cup honey or ½ cup of brown sugar (sweeten to taste depending on vegetables)
- ¼ cup lemon juice
- ¼ cup orange juice
- ½ cup olive or vegetable oil

DIRECTIONS

1. Clean and grate all vegetables.
2. Make a dressing by mixing ginger, honey, lemon juice, and orange juice.
3. Add vegetables to dressing. Mix well.
4. Let stand for one hour to marinate before serving.

Variations:

Add dried fruits such as cranberries.

Squash Soup

Yield: 50 servings • Serving size: 2 oz.

INGREDIENTS

12 lbs. raw winter squash
1 lb. or 3 medium onions, chopped
5 cloves of garlic, minced or
4 Tbsp. garlic powder
3 stalks of celery or celeriac,
chopped (about 1 cup)
4 oz. butter or margarine
¼ cups olive oil
5 bay leaves
6 cups orange juice
6 cups apple juice or cider
2 tsp. vegetable bouillon cubes
1 Tbsp. pepper
Salt to taste

DIRECTIONS

1. Roast **WHOLE** squash on sheet trays in a 325° F oven until fork tender (about 45 min.). May be cooked the day prior and refrigerated until ready to use. Soup has much better flavor, sweeter, when squash is roasted prior to boiling.
2. Scoop out flesh into bowl.
3. Sauté onions and garlic in the butter and oil in a large kettle.
4. Add squash and celery or celeriac, coat in oil, cook 1 minute.
5. Add water to cover vegetables, add 5 bay leaves, and boil until tender.
6. Take out bay leaves and puree the vegetables, squash, and liquid in food processor.
7. Return puree to pot, add orange juice, apple juice, vegetable base, pepper & salt.
8. Reheat on low. Do not boil. Hold at 160° F for service.

Confetti Rice Salad

Yield: 8 servings

PREPARATION: Cook 1 cup white and 1 cup brown rice, each in 2 cups of water. Cool.

INGREDIENTS

4 cups cooked rice
1 cup red or green pepper, chopped small
1 cup red cabbage, chopped small
2 carrots, grated
2 scallions finely chopped
¾ cups chopped parsley
(or mix chopped parsley with chopped cilantro)

DRESSING

6 Tbsp. sesame oil (or use vegetable oil)
4 Tbsp. cider or white vinegar
1 Tbsp. tamari or soy sauce
2 tsp. toasted sesame oil
(or 4 Tbsp. toasted and crushed sesame seeds)

DIRECTIONS

1. Toss rice and vegetables until mixed.
2. Pour all dressing ingredients into a jar or blender and mix vigorously.
3. Drizzle dressing on rice and vegetables and toss gently.

Smelly Plant Scents Match

Summary

Encourage students to explore the scent of plants, herbs, and flowers on the farm and begin to identify them by scent; demonstrate how animals use their sense of smell to identify other animals and food.

Procedure

1. After introductions, encourage students in partners to explore a particular area of the farm with fragrant plants.
2. After they have explored for a short while, give each student pair two film canisters and two cotton balls. In each canister, they place a piece of plant with a unique or obvious smell. The same plant should go in both canisters. Take a moment to demonstrate to students proper harvesting techniques — “pick only 1 leaf, not the whole plant.”
3. Students then place cotton balls or tissues on top of the plant to conceal its identity. Encourage students to find plants different from their friends.
4. Gather the students and their canisters in an area where they can move around easily.
5. Set aside half of the canister pairs for a second round. Give one canister to each student pair.
6. Make a large circle. Direct students to mingle, sharing their scent and trying to match up with like scents. Discourage students from talking or peeking; encourage them to concentrate on their noses. Everyone should find a partner; there may be groups with the same scent.
7. Play again with the remaining canisters.
8. At the end of the second round, have the pairs try to match the smell of their canister with the actual plant where they found the scents originally. If students are having a hard time with this, they can peek at the plant to compare appearance.
9. Ask students to answer some or all of the following questions: How hard was it to find your matching smells? Are there places on your plant that have more smell than others? Where? Why do you think plants have smells? How do humans use their sense of smell? How about other animals? How about farm animals?

For All Ages

Materials

- film canisters (available free in film stores) or small yogurt containers with lids
- cotton balls or tissues
- access to garden, vegetable fields, and other areas with fragrant plants

Blindfold Walk in the Garden

**For
Grades 3-12**

Materials

- blindfolds—one for every two people
- access to a garden

Summary

Encourage students to discover the scents and textures of various garden plants.

Procedure

1. Split the group into pairs.
2. In each pair, one person is blindfolded, the other is the guide. Chaparones can be used for each pair of children to guard against injury. Hats may also be pulled down over eyes in lieu of using blindfolds.
3. The guide carefully leads the blindfolded partner to an area in the garden by holding one hand of the blind person and placing the other hand on his or her shoulder. Make sure the blindfolded person feels safe.
4. Try not to step on plants or obstacles.
5. When the pair reaches a the chosen spot, the guide shows the blindfolded partner where the plants are with his or her hands. The blindfolded partner squeezes the plant and smells its aroma. Encourage the students to feel for other things in the area – soil texture, row size, etc., without moving their feet too far from the chosen spot.
6. When the blindfolded person is ready, the guide leads the blindfolded partner back to the starting point. When the blindfolded person is back at the starting point, the student may remove the blindfold. Now, can that person find the same plant?
7. Switch roles, and do it all again.
8. Share observations. Which plants smell similar? Do they look similar? What makes it easy to find your plant? Describe the texture.

Count the Seeds

Summary

A hands-on introduction to the number and variety of arrangements of seeds in fruit and vegetables.

Procedure

1. With students, or in advance, collect an assortment of seed-bearing fruit and vegetables. Items not available on the farm can be purchased.
2. With students, make estimates of the size and number of seeds in each fruit.
3. Have samples of the seeds available before you cut open the fruit for students to try and match the seed with the fruit.
4. Cut open the fruit or vegetable, and examine the arrangement of the seeds. Count, or estimate the number of seeds per item.
5. Compare the size of the produce to the number of seeds within or on each.
6. Find out how many fruits are on the plant and figure out (or estimate) how many seeds each plant will produce.
7. Ask students to consider how many second-generation plants will be produced. Why won't apple trees and tomato plants overtake us all? What are some of the growing conditions and factors that affect the success rate of second generation plants?



**For
Grades 4-12**

Materials

- access to a wide variety of garden vegetables and fruit
- bags or baskets
- knives and cutting boards or plates

See "Learning About Seeds," p. 84.

Extension:

Ask students to discuss what the farm would look like without seeds. Have them form a circle, facing outward, and describe what they see. What would not be part of the scene if there were no seeds?

Three Sisters Improvisation

**For
Grades K-4**

Summary

Introduce students to companion planting by acting out the planting and growing of the “Three Sisters” — corn, beans and squash.

Materials

- optional: bean, corn, and squash seeds

Procedure

1. Explain to the students about the plants they will be “growing” — corn, beans and squash. Discuss how plants begin to grow from seeds.
2. Each student pretends to be a seed by crouching down in a ball. Explain the growing cycle and ask the students to act it out.
3. Pretend to cover them with soil and warm them with sunshine. Describe the seed sprouting and growing into a plant. Ask the students to act this out as you describe it.
4. Ask a volunteer to come to the front of the group to be a tall corn plant. Then plant a “bean seed” (student) next to the corn plant. Describe how the corn provides a trellis for the bean plant to grow tall on. Next, plant a “pumpkin seed” (another student) next to the corn and bean. Describe how the pumpkin seed grows into a plant that is long and sprawling along the ground.
5. Choose a fourth student to role play a raccoon. What does the raccoon want? Ask the students, why can’t the raccoon get it? Have the child who is role playing the squash act “bristly” toward the raccoon, not letting the raccoon get through the plants to the corn. The squash’s bristles protect the fruits of the three sisters.
6. Summarize how the “Three Sisters” plants help each other out. The corn provides a trellis for the beans. The pumpkin protects the corn and beans, trapping moisture and shading out weeds. The bristles repel the raccoon. The bean roots provide soil nutrients for the corn and pumpkins.
7. How are plants on the farm grown in relation to one another?
8. What animals might damage the plants grown on the farm?

Extension:
If time allows, play
Three Sisters Tag
afterward.

Three Sisters Tag Game

Summary

A version of freeze tag to help students remember the “Three Sisters” and run off some energy during a farm visit.

**For
Grades K-6**

Procedure



1. Briefly discuss the “Three Sisters,” a companion planting of corn, beans, and pumpkins. Explain how interplanting the three crops helps each. The tall corn plant provides a trellis for the beans, the pumpkin vines and foliage help trap moisture and shade out weeds, and the beans roots help provide important nutrients for the other two plants.
2. Briefly explain the rules of the game. One person is “it” and is the chaser. In this case, “it” is Jack Frost. The rest of the students are plants — corn, beans, and squash. Each student decides for himself or herself which plant to be. If a plant is tagged by “it,” she or he must stand still and raise her or his arm as a signal that she or he is frozen. To be set free, two free plants must come to the frozen plant and hold hands around the frozen plant while all three chant loudly, “Corn, beans, squash!”
3. The game continues until all are tired out.
4. Be sure to set boundaries for the game ahead of time and make sure everyone knows the chant and how to hold hands around a frozen person.

Materials

None needed

Plant Needs Inventory

**For
Grades 6-12**

Summary

Students learn about what different plants need to grow and why some plants grow well together in certain conditions.

Materials

- plants started in a greenhouse representing various plant groups that grow well together
- books/magazines/catalogs/manuals that students can use to identify and research the plants
- seeds for planting
- various fertilizer and insecticide packages in clear bags (so students can't touch them directly)

Procedure

1. Discuss with students what plants need to grow. Include in the discussion how different plants need varying amounts of light, heat, nutrients, and water in order to grow.
2. Split the group into two. Give half the group a number of different plants that are started in a greenhouse. Have them research their plants to find out their growing requirements. Have other students guess the identity of each plant and their growing requirements.
3. Ask, which plant groups might be grouped together? Why?
Some plant sets might include:
 - tomatoes, peppers, eggplants (*need a lot of light*)
 - lettuce, spinach, cabbage (*grow early in the season*)
 - melons, hot peppers, okra (*like hot temperatures, grow late in season*)
 - ferns, moss, impatiens, hostas (*like light shade*)
4. Have students then plant in the greenhouse while discussing what the specific plants need for optimum growth such as: sifted soil for the smaller seeds, low light for shade plants, extra fertilizer for perennial starts.
5. Set out various fertilizers, soil amendments, and insecticides with their labels, in clear plastic bags. In small groups led by a chaperone, have students read the labels and decide which plants benefit from which product and why.

Stages of Growth Scavenger Hunt

Summary

Students will discover the various stages of plant growth and learn the distinguishing characteristics of these stages.

Procedure

1. Break the class into small groups.
2. Give each group a sheet that lists the five stages of plant growth (seed, seedling, immature plant with true leaves, mature/reproducing plant, and dead plant).
3. In the greenhouse or in the field, display plants in various stages of growth.
4. For each plant species, have the small groups try to answer the following questions on their questionnaire:
 - Which stage lasts the longest?
 - Which stage is like a toddler, a teenager, an adult, a grandparent?
 - Can you still see the seed attached to the plant?
 - When does the plant flower?
 - How can you tell when the plant is ready to have its edible parts harvested?
 - How do these chosen plants reproduce? (Have a sample of reproduction styles available to discuss — seed, tuber, runner, bulb, etc.)
5. With the whole group back together, ask students to share their findings. Review the questions and the answers with the whole group. Use plant markers to distinguish the stages.

**For
Grades 5-12**

Materials

- plants in varying stages of growth
- small group questionnaires

Working in the Greenhouse

Greenhouse stations

**For
Grades 4-12**

Materials

- seeds and pots for planting
- a variety of plant foods
- components for potting soil
- soil-making screens (could use window screens, tennis racket, food sieves)

Extension:

Examine greenhouse tools with students. Search for tools that aid in growing the greenhouse plants. For example: fans, screens, watering wands, heater, flats, trowels, etc.

Summary

Students learn the ins and outs of working in a greenhouse by planting, working with plant foods, and making soil.

Procedure

Set up three stations at various places in the greenhouse:

STATION 1: Making Soil

Have students sift potting soil components and mix the components into a growing medium. Experiment with different size screens and determine how each component is important to the mixture. What are the origins of the components? Fill seed trays with the soil.

STATION 2: Learning About Plant Food

Have students smell different plant foods such as fish emulsion, compost tea, egg shells, seaweed extract, or “Miracle Grow.” Using the information on the labels mix some of the fertilizers. What is the proper use of each plant food? What are these foods made from? Which fertilizer is the strongest? Which is best for leaf growth? Root growth? Would you use one over the other? When and why?

STATION 3: Planting

Start a variety of seeds in appropriately sized pots or plugs. Remember to label each planting and write varieties in the calendar. Count days to harvest, where appropriate. Discuss with students why each seed needs the size container it is being planted in. Tie in the previous stations with discussions about why the seeds are being planted in that particular soil or in that particular plug or pot size.

Greenhouse Pests

Summary

Students learn about pest management in a greenhouse.

Procedure

1. In small groups, have students look for and record evidence of large and small pests in the greenhouse. Suggest that they look at the tops and underside of leaves, at stems, and at the base of the plant at soil surface for pest damage. Who might eat seeds? Who would eat mature leaves? Who would suck the sap out of young seedlings? You can hide pictures of pests in appropriate places for students to find if no real pest evidence is apparent.
2. Bring group back together. Have samples of the different types of pest damage ready to show and discuss. Have students share what they found and then show the samples you have.
3. Have pictures or samples of the pests that caused the damage. Discuss how these pests created the damage. Did they use teeth, claws, chewing mandibles, pinchers, etc.? Identify some of the body parts on the pests that caused the damage.
4. Discuss strategies that a grower may use to deter pests from damaging their plants. Look in seed catalogs to find some more strategies that deter greenhouse pests. Discuss varying approaches of dealing with pests, including integrated pest management.



**For
Grades 5-12**

Materials

- plants that have been damaged by pests
- pictures of pests
- cards with definitions of different ways of dealing with pests, names of pesticides, explanation of integrated pest management, etc.

Extension:

Visit other crops around the farm and determine what the pests are (both large and small) for each crop.

Learning about Seeds

**For
Grades 2-6**

Materials

- seeds
- seed catalogs
- potting mixture

Extensions:

• **VIABILITY TESTING**
Put seeds on moist paper towels and slip into plastic bag. Check moisture after ½ hour. Keep in greenhouse for further observation or send the test home with the kids. Record % of germination.

• **COMPARING PLANTS**
Dissect a number of different plants. Compare root systems, stems, leaves, flowers. Use this information to make a key or field guide.

Summary

Students learn about seeds by examining their size and guessing what kind of plants they will become.

Procedure

1. Allow students to handle a variety of seeds. Have them guess what kind of plant each seed will become. Examine and discuss the purpose and morphology of the seed. Why are some seeds shaped the way they are? Discuss different types of seeds you might find in a greenhouse and in a crop field (hitchhikers, flyers, helicopters, floaters); how they are different from one another and why.
2. Match the seeds to pictures of the adult plant (cut from catalogs), or to actual plants.
3. Look for seed requirements in seed catalogs. Discover the requirements for seed-to-plant maturity. Find the pictured vegetables, herbs, flowers in the greenhouse.
4. Measure seed widths with the students. Plant a variety of seeds in various growing mediums in the greenhouse or directly outdoors.



What Does It Take to Make Milk?

Summary

Introduce the students to the cow. Learn about the milking process, different breeds, feed, and manure.

Procedure

1. Introduce the students to the different parts of a cow by using post-it notes to label the different parts of a cow on a large diagram.
2. Go through the milk house and explain where the milk goes and how it is filtered. Introduce students to the milking equipment.
 - a. Explain the cooling system and the washing system.
 - b. Ask students if they know what pasteurization and homogenization mean. Explain these two processes to the students.
 - c. Explain the tests that are performed on milk before it is used for consumption. The tests help make dairy food safe.
3. Visit the grain/TMR/feed area. Explain the feed and give a simple explanation about how the food is turned into milk.
4. Have the students milk a cow (or demonstrate for them). Show the sanitary steps used to prepare the teats for milking.
5. Go through the manure system used on the farm. Ask students if they know about the free fertilizer that farmers have. Have them guess how much manure (free fertilizer) a cow makes in one year.
6. Introduce students to the different breeds of cows and their characteristics: Holstein, Jersey, Milking Shorthorn, etc.
7. Have each student find a favorite cow. Name it if it doesn't have one.
8. Give students the outline of a cow handout and have them color in the cow to look like their favorite cow.
9. Have students present to the group which cow was their favorite, the name they gave it, and what made it special or unique.

For All Ages

Materials

- large diagram of a cow
- an outline of a cow (multiple copies for handouts)
- access to a dairy barn

If I Were A Cow, What Would I Eat?

**For
Grades K-12**

Materials

- access to rotationally grazed pastures
- plastic bags
- pencils, markers
- notebooks
- poster board
- glue
- white sheet
- field guides for older youth

Summary

Students discover the variety of plants that grow in pasture and begin to identify which plants farm animals eat.

Procedure

1. Ask students the following questions to see what they already know. Do they know what cows eat? Is there a difference between lawn grass and the grass cows eat? They're about to explore your pastures to find out.
3. Split the group into pairs. Each pair will need a bag to collect vegetation. For older groups, add a notebook (or paper) and pencil to record their observations.
4. Ask each pair to explore the pasture, observing and collecting the different grasses growing in different areas. Encourage students to look under trees, along the fenceline where cows can't eat, in the pasture, and near manure. Older students should record where they found the plant, and may draw pictures. While they are collecting, students should consider whether they think the plant is something cows like to eat or not. How might they tell?
5. Spread white sheet out and have students lay their samples on the sheet, then sort them into groups of similar plant varieties. Have older students use field guides to identify the different plants. Discuss with the group which plants cows like to eat and which they do not.
6. Students may glue their samples to a piece of poster board. Label each plant (if they know what it is) and where they found it. Leave a space under each plant so students can write if this is a plant that cows think is "Yummy" or "Yucky." This board can be taken back to school and displayed as a pasture field guide.

Dairy Food Tasting

Summary

Introduce students to a variety of dairy products (cow, sheep, and goat).

Procedure

1. Cheese tasting

- Cut up different cheeses in advance. Number each sample group.
- Let students taste each type of cheese.
- List on a whiteboard/chalkboard or piece of paper the name of the cheeses they are tasting. Can they match each taste with the correct name? What type of animal did each cheese come from (cow, sheep, goat)? Discuss some common uses of the cheeses they are trying (mozzarella is often used on pizza, cheddar is often used in macaroni and cheese, etc.).

2. Yogurt tasting

- Have several different flavors and name brands of yogurt available for sampling. Hand out each sample one at a time in a Dixie cup.
- Write a letter — A, B, C, for example — on the bottom.
- Have a key to which milk goes to which letter.
- Have students guess the flavor of yogurt and if it is nonfat, low fat, or whole milk. Many children have not tried the different yogurt flavors available so this is a good way to turn them on to something.
- Read labels to discover ingredients of each product.

3. Milk tasting

- Have skim milk, 1%, 2%, whole milk, and half-&-half in Dixie cups.
- Write a letter — A, B, C, for example — on the bottom.
- Create a key to match milk with corresponding letter.
- Have the students put in order their favorite milk.
- Have students tell the group which milk they usually drink at home and then give them the key to see if they picked that kind of milk.
- For older students, discuss and explain the descriptions on each container (homogenized, organic, Seal of Quality, USDA certified).

For All Ages

Materials

- cheese samples cut up
- a white board and marker
- yogurt samples
- Dixie cups for sampling
- milk samples

Ice Cream in a Bag

For All Ages

Materials

- 1 Tbs. sugar
- ½ cup of whole milk or half and half
- 2 cups crushed ice
- ¼ tsp. vanilla extract
- 2 Tbs. coarse salt (found in the baking aisle)
- freezer ziplock bags: gallon and quart size
- duct tape
- spoons

*If you find that bags break, you can use plastic containers with lids (like a small yogurt container inside a large yogurt container). If you decide to use containers, seal the lids with duct tape after ingredients are added.

Summary

Introduce students to a yummy dairy product through an easy activity.

Procedure

1. Put sugar, milk (or half & half), and vanilla into the quart-size bag and seal it. Secure the seal with duct tape.
2. Fill the gallon-size bag with the crushed ice. Add the salt.
3. Place the small bag inside the large bag. Nest it within the ice and seal the large bag. Shake it until the liquid inside the small bag looks like soft serve ice cream (about 10-15 minutes or less).* Don't let students squish the bags.
4. Wipe the salt off the small bag before you open it. If you forget this step the ice cream is very salty and melts too quickly.
5. Use the spoon to eat it right out of the bag.
6. Ask the students if they have eaten Vermont-made ice cream. Who consumes Vermont-grown dairy products? What would Vermont look like if our dairy farms that produce milk (to make ice cream!) disappeared?

Note: *You can double the ice cream mix quantity, but it will take longer to freeze.*



There's No Such Thing as a Free Lunch

Summary

Through a tour of the farm, students will examine energy flows on a farm and energy needed to produce food. Buttermaking may be used as a hands-on demonstration.

Procedure

Note: *This activity assumes that students have a working understanding of energy concepts. You may want to check with the teacher beforehand to make sure students have studied what energy is and how we make energy.*

1. While touring the farm, look for energy consumption. Have students identify where the energy is coming from — directly from the sun, from “purchased” sources such as fossil fuels and electricity, or some combination.
2. Before beginning buttermaking, have students discuss and draw pictures or charts of where butter comes from. Start with butter and go back to identify the ingredients and energy needed to make butter:
 - *Butter* comes from *cream* that is mixed using *electricity*.
 - *Cream* comes from *milk* which comes from a *cow*.
 - The *cow* is milked using *electricity*.
 - The *cow* needs *water*, *grain*, and *grass* to make milk.
 - The *water* is pumped using *electricity*.
 - *Grain* is grown using *sunlight*, *soil*, and *water* (rain and irrigation). *Planting*, *cultivating*, *harvesting*, and *processing* all use *fossil fuels*.
 - The *grass* is grown using *sunlight*, *soil*, and *rain*.
3. Make butter with the students. Either put heavy pasteurized cream in a bowl and mix it with an electric mixer, or put the cream in a glass jar with lid and shake it until it turns to butter. If you can, try both options and discuss which type of energy each option took. Serve butter on crackers.

For Grades 5-10

Materials

- cream
- bowls
- electric mixer(s)

Extension:

Ask students to identify ways to reduce purchased energy on the farm. What are the trade-offs? What other energy needs are there to get food from farm to table (delivery, storage, refrigeration).

Flocks of a Feather

**For
Grades K-4**

Materials

- paper
- pencils
- candle
- access to eggs and chickens

Extensions:

- For students in 2nd grade and older, ask them to write a story about your chickens/ducks. What is life like? What does it think about? How does it fill its day?
- Discuss the difference between wild birds and your domesticated birds living on the farm. Introduce and visit any other birds that use your farm for their home. Look for nests and habitats of these birds.
- Visit various hatchery web sites to discover additional breeds of farm birds.

Summary

Introduction to the feathered friends on a farm through comparing, drawing, writing, investigating, observing, hypothesizing, and experimenting.

Procedure

1. Ask some introductory questions:
 - What is a chicken and why do we have them on farms?
 - What kinds of chickens are on the farm? (meat vs. laying)
2. Discuss the various characteristics of chickens compared to those of humans. How do they eat? How do they keep warm? How do they hear? How do they get around? How is what they use to see, eat, hear, walk, different from what we use?
3. Gather feathers from the chicken coop.
4. Gather eggs and count them and compare to the number of chickens. Discuss how egg production varies according to the age and health of the bird, the season, and other factors such as weather and stress.
5. Draw a picture of the chickens, their home, incubated eggs, etc.
6. Candle eggs to see the growth of the chickens. Grade the eggs according to size and quality.

If you have ducks:

1. Visit them and have the students discuss the differences between chickens and ducks.
2. Check out a duck before and after it has gone swimming and have students make some observations.

How Does Your Food Behave?

Summary

Encourage students to value the food they eat and the sources of that food by exploring the behaviors, lifestyles, and actions of poultry they eat. (Other animals may also be observed using procedures below. Poultry works well because they move more often.)

Procedure

1. Provide a little background about the farm and the animals students will observe. Describe the behaviors that students may see: territorial, dominance, hierarchy, and courting.
2. Ask each student to choose a bird to watch. Have each student record his or her bird's height and approximate weight, color, and distinguishing markings.
3. Have each student observe and record his or her bird's behaviors for five minutes. Every 10 seconds time will be called, and students will use tick marks to record what their birds are doing: walking, eating, sleeping, pecking, standing, scratching, grooming, or laying down.
4. Have students total the marks for each behavior, and identify which behavior their birds displayed most frequently. (Optional: have students calculate the percentage of time the animal spent in each behavior.)
5. Ask students to respond (in discussion or writing) to the following questions:
 - a. Identify three stimuli that produced behaviors you observed. Label the stimuli "internal" or "environmental."
 - b. Pick three behaviors and describe the message the bird communicated through each.
 - c. Describe a behavior you think is innate. Describe another that is learned.
 - d. Where is your bird's approximate place in the pecking order? What did you observe that supports that conclusion?

**For
Grades 4-12**

Materials

- access to chickens (and/or other poultry species)
- copies of a behavior chart
- pencils and notebooks for recording observations

Extensions:

- Offer students time to draw or photograph the chickens and the chicken area, particularly if they will be asked to complete a report or poster at a later date.
- Repeat at a second station with a different species or chicks. Have students compare behaviors.

Behavior Chart (Ethnogram)

Use this chart to record your bird's behavior. (It may be taped or stapled into your notebook.) Ethnography is the study of behavior that uses observations and descriptions of the behaviors shown by the animals under study as a learning tool. Every 10 seconds, time will be called and you will mark down (using a tick mark) what your bird is doing in the appropriate row.

BEHAVIOR		TOTAL
Walking: taking one or more steps forward while in an upright position		
Eating: head down at ground, picking food up with beak		
Sleeping: eyes completely closed		
Pecking: poking another bird or object with beak		
Standing: staying in an upright position with both feet on the ground		
Scratching: scraping the ground with one foot at a time		
Grooming: using beak to smooth out feathers on its body		
Laying Down: full body in contact with ground, legs tucked underneath		

Date: _____ Name (s): _____

Farm Animal Travels

Summary

Students explore animal behavior and identify patterns by keeping track of one animal during a 10-minute observation. (Poultry work well for this activity.)



**For
Grades 3-6**

Materials

- safe access to farm animals
- pencils and paper
- watch or timer

Procedure

1. Sketch a map of the animal's immediate environment, which should include food, water, and shelter for that chosen animal. Depending on the group, you can provide the map to the students, or they can draw it themselves. Be sure to include important locations for the farm animal, including the shelters, feeders, water, terrain (tall grass, short grass, dirt, shrubs, etc.), shady spots, and sunny spots.
2. Have each student select his or her favorite animal, or one that is easy to identify.
3. Have each student watch his or her chosen animal for 10 minutes. Students should stand at distance so as not to disturb usual routines. Every time the animal visits one of the locations on the map, students will make a check mark to show it was there. If they can, they may draw lines to show what paths it travels to get from one place to another.
4. Have the students analyze their map.
 - a. What routes are used most?
 - b. Where did your animal spend most of its time?
 - c. How often does it eat in one minute?
 - d. How often does it drink?
 - e. Compare your animal with other students' animals.

Extension:

Research how much area each farm animal needs in order to maintain health. Generally speaking, a turkey needs 7 square feet (indoor captivity), a cow needs 1 acre, and a sheep needs 1/3 acre.

Feathers, Feathers, Feathers

For All Ages

Materials

- a variety of feathers
- hand lenses

Note:

This information is found in *Hands-On Nature: Information and Activities for Exploring the Environment with Children*, edited by Jenepher Lingelbach and Lisa Purcell. Vermont Institute of Natural Science, Woodstock, Vermont. Copyright 2000. The book contains a good illustration of types of feathers on page 38. Used with permission.

Summary

Students learn about the kinds and parts of feathers through hands-on examination.

Background

All birds — from chickadees to eagles — have three basic kinds of feathers:

- **Flight feathers**, found on the wings and tail. They have strong shafts running the entire length of the feather, with flat webs on two opposite sides. This makes a lightweight but solid surface for flight.
- **Down feathers**, found close to the skin and body of the bird. They have very short shafts with many non-interlocking barbules to create dead air spaces for insulation.
- **Contour feathers**, found over down feathers. They help streamline the bird and, along with the flight feathers, carry the colors and patterns that are distinctive of the species.

Close examination of a feather reveals three parts: the *shaft*, which is the central hollow tube that gives the feather its rigidity; *barbs*, the parallel strands that attach on either side of the shaft to create the feather's flat surface, or *vane*; and *barbules*, which run along barbs and connect them together with tiny hooks on one side and bumps on the other.



Procedure

1. Take the students on a feather search around the chicken yard and house. Try to find an example of each of the three kinds of feathers — flight, down, and contour — for each group of students. Ask students to sort the found feathers into like groups.
2. After finding the feathers, closely examine them to find the different parts. Encourage students to observe the different parts of the feathers, and to compare and contrast them. Ask them to use hand lenses if needed. Can they guess which job each feather might have?
3. Have students gently pull apart the web of the feather. Students can use hand lenses to see the tiny barbules that project from the barb. Ask them to try to zip the feather back together by pinching and drawing their fingers along the separated from the shaft to the outer edge.



Chicken Choices

**For
Grades 1-4**

Materials

- access to chickens
- access to a variety of foods (weed seeds, insect pests) for the chickens
- a collecting basket (or bags)
- chicken choices chart (below)
- paper and pencils

Summary

Students discover how chickens use their feet and beaks to forage and obtain a variety of different foods.

Procedure

1. Collect a variety of seeds from wild plants growing along a hedgerow, or left over from weeding. (It can be done before students arrive or with them, or some of both, depending on the group and time frame.)
2. Try to catch some insect pests — e.g., potato beetles, squash bugs, bean beetles. (Again, it can be done before students arrive or with them.)
3. Go to the chickens. Briefly explain that chickens eat a variety of foods: in addition to grains and vegetable scraps offered them by farmers, they also forage on their own for insects and worms in the grass and in the top layer of the soil. Before offering your items to the chickens, ask students whether they think the chickens will eat it.
4. Offer the various seeds to the chickens by spreading them out on the ground. Watch the chickens while they scratch and peck at the food. Encourage students to observe how chickens forage. Which seeds do they seem to prefer? Which ones do they avoid?
5. Spread the insects out on the ground. Which ones do the chickens seem to prefer? Which ones do they avoid? Have the students record their observations.
6. On a whiteboard, chalkboard, or big piece of paper, make the chart below with a list of all the food items you offered the chickens. Ask students: Will the chickens eat it? Did the chickens eat it? Ask why they think the chickens liked some of the foods better than others.

Chicken Choices Experiment *(sample chart)*

FOOD OFFERED	WILL THEY EAT IT?	DID THEY EAT IT?
Sumac berries		
Potato Beetles		
etc.		
etc.		

Grinding Grain

Summary

Students learn about chicken grain by hand-grinding it and feeding it to the birds. (This activity may also be done with other animals that eat grain.)

Background

Farmers generally feed chickens grain that comes from the mill. It is made up of corn and soybeans and other grains. These grains have a lot of protein to help the chickens grow and enough energy to help them lay eggs. It is easier for chickens to eat grains that are already partly ground up. Chickens don't have any teeth, but they eat small stones and collect them in their crop. When they eat the grain it goes into the crop and is ground up into smaller bits by all the stones. Then the food moves on to the stomach and is digested more thoroughly.

Procedure

1. Have the students place a handful of dried corn (or other grains) in a wooden bowl or on a flat rock. Cover the corn with a piece of canvas to keep the corn from flying around as the student pounds.
2. Use the rounded rock to pound the corn, checking occasionally to see how small the pieces are getting. Explain that this is just like what is happening in the chicken's crop.
3. When the corn is ground to the desired coarseness, students collect it in a cup and bring it to the chickens to eat.
4. Have students observe which size kernels (and which grains) the chickens like best.

For All Ages

Materials

- whole kernel, dry corn
- other dried grains if available
- rounded grinding stones (to fit in a child's hand)
- wooden bowls or flat rocks
- circular pieces of canvas cloth or leather
- yogurt cups or containers for carrying ground corn

Signs of Sugaring

**For
Grades 6-12**

Materials

- access to a sugarbush with varying altitude and aspect

optional for extensions for older students:

- poles to measure snow depth
- measuring tape
- thermometers
- notebooks (or paper) & pencils
- surveyor's tape
- waterproof marker
- compasses

Extensions:

- In advance, mark site numbers at several spots in the sugarbush with different altitude and aspect. Have students measure snow depth and aspect (north to east, south to west). Use the data collected to make charts and graphs.

- Repeat the exercise on two or three dates. Prior to going out, have students predict how recent weather is likely to have affected conditions in the sugarbush, and then test their hypothesis.

Summary

Discover, in small groups, signs of changing weather — one important component of maple sugaring.

Procedure

Prior to Visit:

Two weeks prior to visit, have the teacher and students collect daily weather information and put it into a calendar format. You will compare this to your sap flow each day (high or low).

1. Ask the students if they understand the effects of temperature on sap flow. If needed, explain the basics of sugaring. Brainstorm with the group some factors that affect temperature (and therefore sap flow) in different parts of your sugarbush (altitude, aspect, sun angle, wind, cold pockets, etc.).
2. Explain that in small groups, they will be walking through the sugarbush looking for indicators of temperature differences. Brainstorm with the group some of the indicators they should look for to tell temperature differences without using a thermometer. (snow consistency, sap flow, wind, bird songs, water flowing, etc.)
3. Split into small groups. Have them walk through the sugarbush, observing and recording these indicators.
4. As a large group, discuss what they found and where they found it.
5. Have students look at their weather data and your sap flow for those days and discuss the effects weather has on sap flow.

Maple Stations

Summary

Introduce students to maple sugaring process, vocabulary, products, and history through small group discovery at educational stations. Each station should take approximately 15 minutes. Many other activities can be used as stations as well.

Procedure

1. Divide students into small groups with one adult chaperone per group.
2. Describe each station and the rotation process thoroughly.
3. Choose an indicator sound (bell or whistle) to let everyone know when it is time to rotate. Space out the home bases for each station so that students have room to work with their group.
4. Provide printed instructions and materials needed at each station.

STATION 1: Scavenger Hunt

At the home base is a scavenger hunt card listing different things for students to find: sugarhouse, sap lines, sap bucket, storage tank, sugarbush, a spile, wood pile, etc. Let students roam around to familiarize themselves with sugaring vocabulary and equipment. Ten to twelve items can be covered in 15 minutes.

STATION 2: Taste Testing

Encourage students to taste a variety of sweeteners provided at this station. Items to taste can include honey, corn syrup, molasses, and imitation maple syrup, among others. Be sure to have a supply of paper cups, napkins, and trash bags at this station. Discuss where different products come from, and common uses. Taste pure maple syrup, and follow the same discussion. Have students taste fresh sap and

For Grades K-8

Materials

For each station:

- maple scavenger hunt cards
- tasting samples
- trash bag
- paper cups
- napkins
- tape
- stapler
- string
- crayons or markers
- a sugaring legend
- vocabulary/picture matching page



compare it to maple syrup. You could also try sap at different stages of the boiling process as well as different grades. With student help, make a list of maple syrup uses (especially for different grades of syrup).

STATION 3: Visit the Sugarhouse

Give students a tour of the large equipment within the sugarhouse and explain the process of boiling. Introduce the students to all the large equipment in the sugarhouse: filter press, evaporator, sap pump, syrup drum, syrup grade tickers, syrup canner, etc. If boiling, demonstrate as best you can the different tasks: testing with the thermometer, testing with the hydrometer, sheeting/aproning, etc.

STATION 4: Tools of the Trade

Collect a variety of smaller maple-related tools and label them with numbers. On index cards, write the name of the tool and describe its purpose. Have students match the cards to the tools. Examples: grading kit, splies, tubing, bucket, drill, filter, maple syrup container, scoop, gloves, etc. To make it a little harder, exclude the name of the tool and only provide the description. Students can take photos or draw the different tools for later use back in school.

Every Tree is Different

Summary

Students discover how to identify different trees.

Procedure

1. Brainstorm with the students the many ways to tell different tree species apart (bark texture and color, bud, leaf, branching pattern, seed, shape, and silhouette).
2. Ask a volunteer to describe a specific maple tree to all the other students, who have their eyes closed. Can the listeners find the particular tree?
3. Collect twigs from maple, ash, and birch trees. Have students identify the differences in the twigs.
4. Ask students to observe the shape of a prime maple tree. How is it different from one found deep in an early growth forest?
5. Do the same activity in an apple orchard or within a Christmas tree plantation.



**For
Grades 6-12**

Materials

- access to a mixed forest, orchard, or tree plantation

Extension:

Pair up students and give each pair a blindfold. Explain to them that one partner is going to lead the other partner blindfolded to a tree. Stress that this will require trust and care of your partner. The leading partner needs to very carefully guide the blindfolded partner safely to their tree. The blindfolded partner will "meet" the tree and then be led back to the beginning spot.

They should use their sense of touch and smell to get to know the tree. What does the bark feel like? Reach above, what do the branches feel like? Reach below, what does the base of the tree feel like? What does it smell like? After they have returned to their starting spot, take the blindfold off and try to find the tree. After they have found the tree, let them switch roles.

Food from Trees

**For
Grades 1-5**

Materials

- access to a sugar-bush
- a variety of maple-made items such as bowls, a chair, a crate, a floor board, wooden toys, maple candy, maple syrup
- a variety of food products from trees such as: fruit leather, sauces, jams, dried fruit
- large easel-sized paper & markers

Extension:

For older audiences or to make the activity more difficult, add some more processed wood products like: artificial snow, coffee filters, varnish, diapers.

Summary

Introduce students to human and animal uses of maple or fruit trees.

Procedure

1. In advance, hide items that are made from food producing trees around a select group of trees.
2. Have the children find these items and bring them to the group's gathering space.
3. Discuss your findings.
4. Ask children to consider who else uses food producing trees. Go back around the trees and look for evidence of animal life. How many different animals utilize just a small number of trees?
5. Brainstorm all the foods that people eat that come from trees (syrup, nuts, fruits). Which ones are grown in Vermont?
6. Which wild animals depend on food from trees?
7. Draw a large fruit or maple tree at the center of a large piece of paper. Have students call out the names of the animals they listed that depend on food from trees. Write the name of each animal around the sketched tree, then draw a line from the tree to each animals name. (remember to include domestic and wild, and people).



Tree Life Cycle Sort

Summary

Students will learn about the developmental stages in the life of an organism by focusing on a tree life cycle.

Procedure

1. Tell students that you have a collection of photographs of a person over the years and you'd like the students' help putting the photos in chronological order. Ask them to brainstorm important events in a person's life that might be recorded in the photographs.
2. Allow students to study the photographs. Have them guess the proper sequence and record their guesses. When everyone has finished, ask the class what they think the right order is. Have them match the photos to the stages and events they brainstormed.
3. Explain that all living things go through different stages of development in their lives just as we do. The sequence of these stages from beginning to end is called a *life cycle*. Can they think of any obvious examples in nature? (Egg, tadpole, frog; egg, chick, chicken; calf, heifer, cow.)
4. Divide the class into two or three groups, depending on size. Have the students in each group stand in a circle. Hang one life-cycle card around each student's neck with the picture on his or her back. Explain that they may look at everyone's card but their own.
5. As a group, the students must determine the order of the life cycle of a tree. Explain to the students that they may not tell each other what cards they have on their backs. As they decide the order they can sit in that order on the ground. As they sit they can guess what card they have on their backs by looking at who comes in front and behind them in order.
6. Allow students to see cards on their backs and discuss the tree life cycle. Finish by comparing the stages in a tree's life with stages in human life. Discuss the life cycle of other plants on the farm.

**For
Grades 3-6**

Materials

- a selection of photographs of one person from infancy through adulthood
- Tree Life Cycle cards hung on long strings.
Cards show: seed, seedling, sapling, pole, mature tree, dying tree, rotting log

Those Tappable Trees

**For
Grades 6-12**

Materials

- tape measures
- taps
- drills

Summary

Introduce students to basic practices for tapping maple trees and include an opportunity to do it themselves.

Procedure

1. Show students how to measure diameter at breast height (DBH) of various sugar trees (DBH = 4½ feet). Have them measure a sampling of different trees for practice.
2. Have students tap trees suitable for one tap (DBH = 12-17 inches), two taps (DBH = 17-24 inches), three taps (DBH = 25+ inches). Explain circumstances under which trees are not suitable for tapping (old, diseased, in cemetery, home to specific animals).
3. Calculate tappable trees in a given plot. What will the expected yield be for a variety of plots? This will of course be dependent on your sugarbush's make up and your maple's yield per tap. Explain to the students your sugarbush statistics and how this may be different from other sugarmakers' yields.



Tapping Sugar Maples

Summary

Exploration of the basics of maple sugaring.

Procedure

1. Using rulers, measure tap hole depths, diameters and distance away from each other.
2. Discuss reasons for each specific measurement.
3. Measure distance to next oldest visible tap hole.
4. Discuss how trees heal their tap holes and other wounds. Look for other tree wounds and wounds that are healing.

**For
Grades 4-12**

Materials

- rulers
- tape measures
- taps
- drills



The Boiling Process

**For
Grades 4-12**

Materials

- standard sugar-house equipment and tools

Extension:

Make index cards and have students put the sugaring process steps in order.

Summary

Engage students in the process of making maple syrup.

Procedure

1. Have students participate in each chore.
 - a. Stack firewood next to the firebox.
 - b. Check the sap storage tank for quantity and open intake valve to evaporator.
 - c. Determine the level of sap in back pan.
 - d. Monitor temperature of sap and cream when necessary.
 - e. Strain debris from sap.
 - f. Regulate flow from back to front pans.
 - g. Monitor temperature, sugar content, and depth of syrup in front pan (using scoop and hydrometer).
 - h. Open valve for draw off.
 - i. Filter syrup for impurities. Check sugar content.
 - j. Can.



Insect Safari

Summary

Introduce students to the biology of insects by collecting and examining insects in the field.

Procedure

1. Following introductions, find out what students know about insects and give a little background. Insects are arthropods, related to spiders, crabs, lobsters, millipedes, and centipedes. They have segmented bodies with jointed legs and exterior skeletons. Insects have three body parts: the head, thorax, and abdomen, with two antennae on the head and six legs on the thorax. Most adult insects have wings and these are also attached to the thorax. Spiders are not insects because they have two main body parts, eight legs and no wings or antennae.
2. In small groups, go to the garden or a place where students will look for insect life.
3. Ask students to be quiet and listen for insect noises. How many can you hear? Can you find an insect that is making the noise you heard?
4. Turn over flat stones or logs to observe the creatures living there.
5. Look for insects flying, on plants, on the ground.
6. Spread the white cloths in an area with tall plants. Walk through the plants toward the cloth and observe the insects that hop and crawl onto the cloth.
7. Carefully watch one insect in its natural environment for at least two minutes. What is it doing? How does it move?
8. Gently collect an insect observed while doing this search and inspect it more carefully using the hand lens.
9. Share any interesting observations.
10. How are insects helpful to farmers? How are they not helpful?

**For
All Ages**

Materials

- small glass jars with lids
- hand lenses
- pieces of 2x3-ft. white cloth
- access to a garden or place with tall grass or weeds
- field guides of insects

Bees A-Buzzin'

**For
Grades 4-12**

Materials

- access to an observation hive
- bee-tending tools
- honey processing tools
- glass jars and lids

For more information on bees, visit:
www.vtbeekeepers.org

Summary

Introduce students to bees through an observation hive. Students learn about bee behavior and social patterns. Students also learn about bee-tending tools and processing honey.

Procedure

1. Introduce students to a bee hive. Ask them to watch the bees and try to figure out what they are doing.
 - a. *Find a queen.* What is the queen doing? What makes the queen different? What does she do for the hive?
 - b. *Find a worker bee.* Find one coming out of the hive and one coming in. Where is she going? What is she looking for? How is the bee entering the hive different from the one leaving it? What do bees do with the food they have gathered?
 - c. *Find a guard bee.* Are they different in size? Where do they guard?
 - d. *Find a bee dancing in the hive.* What is the dance? Does the queen dance? Why not?
 - e. *Find a drone bee.* How is a drone different? What is the drone's job?
2. Introduce the students to the clothing worn while working with bees. Have students try on and model the gloves, helmet, and white overalls. Discuss why it is a good idea to wear white, and the way to act around the beehive. Slow steady movements are best.
3. Introduce all the tools used for beekeeping including the hive tool, the boxes, supers, frames, spinner, and decapper.
4. Introduce the students to a super with honey in it still on the comb. Pick up a frame and have them help decap the comb for spinning. Have each student take a turn spinning the centrifuge. Take turns filtering the honey after it is off the comb. Let anyone who wants to, taste the comb that is left.
5. Bottle the honey into clear bottles so they can observe the final result of the bees' work (and their work). Have a honey-tasting party with honey on crackers.
6. Write a story about being a bee. Draw a picture of this story.
7. Why are honeybees important to farmers? To students?

Bibliography

Bellows, Barbara C., Rex Dufour, and Janet Bachmann. **Bringing Local Food to Local Institutions: A Resource Guide for Farm-to-School and Farm-to-Institution Programs.** Fayetteville, AR: ATTRA, National Sustainable Agriculture Information Service, 2003. Available at <http://attra.ncat.org/attra-pub/PDF/farmtoschool.pdf>

The Center for Agroecology and Sustainable Food Systems, **Teaching Organic Farming & Gardening: Resources for Instructors.** University of California, Santa Cruz, 2003. Available at <http://zzyx.ucsc.edu/casfs/instruction/tofg/contents.html>

The Center for Ecoliteracy. **Rethinking School Lunch Guide.** Berkeley, CA, 2004. Available at <http://www.ecoliteracy.org/programs/rsl-guide.html>

Community Involved in Sustaining Agriculture (CISA), **Supplying Local Food to Educational Institutions: A How-To Manual.** South Deerfield, MA. Available at 413-559-5338; e-mail: cisa@buylocalfood.com. See also www.buylocalfood.com

Jaffe, Roberta and Gary Appel. **The Growing Classroom: Garden Based Science Curriculum.** Developed by Life Lab Science Program, Inc. Published by the Addison-Wesley Innovative Division, 1990. Available at <http://www.lifelab.org/products/productorder.html>, or by calling 831-459-3833

Kalb, Marion, Kristen Markley, and Sara Tedeschi. **Linking Farms with Schools, A Guide to Understanding Farm-to-School Programs for Schools, Farmers and Organizers.** Venice, CA: Community Food Security Coalition, 2004. Available to order at: <http://www.foodsecurity.org/pubs.html#linking>

Kiefer, Joseph and Martin Kemple. **Digging Deeper, Integrating Youth Gardens Into Schools and Communities.** Montpelier, VT: Food Works, 1998. 802-223-1515

Lay-Dopyera, Margaret & John Dopyera. **Becoming a Teacher of Young Children.** New York, NY: McGraw-Hill, Inc., 1993.

Lingelbach, Jenepher and Lisa Purcell, eds. **Hands-On Nature: Information and Activities for Exploring the Environment with Children.** Woodstock, Vermont: Vermont Institute of Natural Science, 2000.

Massachusetts Ag in the Classroom. **Farm Field Trip Manual.** Available at: PO Box 345 Seekonk, MA 02771, Massachusetts Ag in the Classroom 508-336-4426, www.agintheclassroom.org

National Farm to School Program. <http://www.farmtoschool.org>, www.foodsecurity.org/farmtoschool

Northeast Organic Farming Association of Vermont. **Vermont Farm to School Directory.** Richmond, Vermont, 2004.

Ohmart, Jeri L. **Direct Marketing to Schools: A New Opportunity for Family Farmers.** University of California Sustainable Agriculture Research and Education Program, July 2002. Available at <http://www.sarep.ucdavis.edu/CDPP/directmarketingtoschool.htm>

Parrella, Deborah, **Project Seasons: Hands on Activities for Discovering the Wonders of the World.** Shelburne, VT: Shelburne Farms, 1995. Available to order at: <http://www.shelburnefarms.org/prodinfo.asp?number=PS> or at 802-985-8686

-
- Sanger, Kelli and Leslie Zenz. **Farm-to-Cafeteria Connections: Marketing Opportunities for Small Farmers in Washington State.** Small Farm and Direct Marketing Program, Washington State Department of Agriculture, November 2003. Available at <http://agr.wa.gov/Marketing/SmallFarm/102-FarmToCafeteriaConnections-Web.pdf> or 360-902-2976
- Seefeldt, Carol and Nita Barbour. **Early Childhood Education: Introduction.** New York: MacMillan College Publishing Company. 1994.
- Strohbehn, Catherine H. and Mary Gregoire. **Institutional and Commercial Food Service Buyers' Perceptions of Benefits and Obstacles to Purchase of Locally Grown and Processed Foods.** Ames, Iowa: Leopold Center for Sustainable Agriculture. Available at http://www.extension.iastate.edu/hrim/localfoods/downloads/ISU_localfoods_summary_2002.pdf
- US Department of Agriculture. **Innovative Marketing Opportunities for Small Farmers: Local Schools as Customers.** Washington, DC, February, 2000. Available at: <http://agmarketing.extension.psu.edu/begfrms/SmllFarm.pdf>
- VT Food Education Every Day, (VT FEED). **Vermont Farm to School: A Guide for Using Local Foods in Schools.** January 2006. Available at www.vtfeed.org or 802-985-8686
- VT Food Education Every Day, (VT FEED). **"How Do We Feed Vermont's School Children? An Insider's Guide to Vermont School Meals and How to Improve Them."** May 2005. Available at www.vtfeed.org, or 802-985-8686
- VT Food Education Every Day, (VT FEED). **Taste Test Guide.** To be published in 2007. Available at www.vtfeed.org, or 802-985-8686
- Visher, David. **Selling Directly to Local Schools.** Davis, CA: Small Farms Center, University of California, 1996. Available at: <http://www.sfc.ucdavis.edu/pubs/SFNews/archive/96032.htm>