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Our Mission

Our mission for the Lakes Environmental Association's education program is to encourage an understanding of and connection to place, with the belief that a connection to the local environment is the foundation for lasting environmental stewardship. LEA's place-based approach to environmental education incorporates important science skills to help students understand the environment. LEA's continuous educational programming in MSAD 61 builds and reinforces understanding of scientific concepts over students' educational careers.

With the use of the Pondicherry Park Curriculum, and the help of their teachers, the region's students will build stronger connections to their local environment while learning the important information required by the Maine Learning Results.

An Introduction to the Pondicherry Park Curriculum

From the back doors of Stevens Brook Elementary School, Pondicherry Park is a five-minute walk. On the other side of the Ham Bridge, under a canopy of trees sits the park's outdoor classroom. This classroom, with its granite benches and teaching platform is the perfect place to conduct an outdoor lesson. The Pondicherry Park Curriculum includes a wide range of interactive activities for teachers to use that allow for continued focus on core subjects while also creating opportunities for students to connect with the park.

Lessons within the Pondicherry Park Curriculum are aimed to benefit teachers in a variety of ways. Each lesson meets the Maine Learning Results, and can easily be adapted to meet new standards. Both teacher and student worksheets are included in this curriculum guide. Each lesson can also be opened, modified or printed out as a PDF file or word document from www.mainelakes.org. Core subjects such as mathematics, science, technology, reading, writing and social studies are all interconnected within the lessons, and are aimed at grades K-2 and 3-5. The curriculum also includes a teacher's guide with quick tips for taking groups of students into the park.

As well as being able to integrate core subjects with the use of the natural environment, the curriculum will also provides multiple health benefits for the students. Richard Louv, author of "Last Child in the Woods" describes the disconnection between children and the nature as an important factor in the increase in childhood obesity, attention disorders and depression. The more time students spend outside reading, writing, completing math problems, and studying the ecosystems and history of the park, the healthier they will be.

Destinee Higgins, a 4th grade student at SBES, has been given the chance to build strong connections between science class and the natural environment in Pondicherry Park. Destinee describes her time in the park as "fun and exciting! You feel just like a scientist and an explorer. I wouldn't trade the one time we go out into the park each month for a brand new, awesome looking bike!"

If you are interested in giving more students the chance to make connections to Pondicherry Park by incorporating the curriculum into your classes, volunteering as an extra adult figure outside, or would simply like to find out more information on the Pondicherry Park Curriculum, contact LEA at mary@leamaine.org or sarah@leamaine.org.

Benefits of the Pondicherry Park Curriculum

- All lessons meet the Maine Learning Results, and are easily adaptable to meet new standards.
- All lessons can be modified to fit your classes needs and can be printed off to be used as easy step-by-step tool for teachers.
- Each lesson includes teacher and student worksheets as well as detailed instructions.

- Lessons incorporate all learning subjects including math, science and technology, reading, writing, and social studies.
- The curriculum includes a teacher's guide for taking students outside into the Park.
- Lessons are aimed for grades K-2 and 3-5.
- Outdoor classes provide multiple health benefits for children including the improvement of childhood obesity, attention disorders and depression.

A Teacher's Guide for Taking Students into Pondicherry Park

Helpful hints for a successful trip into Pondicherry Park

- Remind students a few days before their outdoor activity, of the proper clothing and accessories they will need for their outdoor activity.

- It is required for teachers to contact the office, and get a walkie-talkie before heading out to the park. Students do not need permission slips from their parents, although it would be nice for teachers to send a note home telling parents when trips to Pondicherry Park are happening.

- Contact parents and ask if they would like to be added to the chaperone list; parent chaperones are a great way to get parents involved with taking their children out into the park.

- It is beneficial to have a basic first aid kit out with any group.

- Explain each outdoor activity to the students before they leave the class. Remind the students before every activity, that class in the in Pondicherry Park doesn't mean it is recess. The park will be their classroom outside, and they still have to follow all of the rules of their indoor classrooms.

- Before heading outside, have the students hold up each item (one at a time) that they will need for their outdoor activity.

- The use of games during the walk over to the park will help the students stay focused while traveling to the park. Example: Owl & Mouse - Line leader is the owl and periodically makes an owl call, the rest of the students in line are mice, and must freeze when they hear the call. If the owl hears or sees any movement, the mouse has the go to the back of the line.

- Set clear boundaries when you take a group outside so students know where they can and cannot go. Have the students be responsible for staying within sight of teachers and chaperones.

- When explaining rules, sharing observations, or answering questions, have the students get into a circle so that everyone can be seen and heard.

- Give the students specific jobs during each activity so that they stay more focused at the task at hand.

- In the fall, talk to students about hunting season. There is ***no hunting allowed*** in Pondicherry Park, but always be aware of your surroundings.

- Remember to check for ticks when the group gets back to the school yard, and encourage students to do more thorough checks when they get home.

- Black flies and mosquitoes are out in force in the spring. We encourage the use of natural bug repellents as opposed to DEET.

- Share with the students your own experiences, and enjoyment of the natural environment and Pondicherry Park. If you are enthusiastic about being outside, they will become enthusiastic as well!

Have fun learning and exploring Pondicherry Park!

How to Use the Pondicherry Park Lessons

Each lesson description includes:

Grade K-2
Science

Learner Outcomes:
What the student will be able to do after completing the lesson.

Objectives:
The overall goals of the lesson, what information and activities the lesson will cover.

Step-By-Step Teacher Instructions:
A detailed list of what the teacher can do to prepare and conduct each lesson. This list of instructions is meant to be a guide, not necessarily a strict itinerary. We want teachers arranging lessons to fit their schedule, classroom needs, and comfort level.

Materials:
A list of all the items both teachers and students will need to complete the lesson. Some materials and worksheets will be attached to the lesson, other materials the teacher may need to gather from the school, or borrow from LEA.

Connections to the Maine Learning Results:
A list of the requirements in the Maine Learning Results that will be fulfilled by the completion of the lesson.
A1. Whole Number:
Students recognize that parts work together, and make up whole man-made and natural objects.

a. Explain that most man-made and natural objects are made up of parts.
b. Explain that when put together, parts can do things they could not do separately.

Extensions:
How the teacher could extend the lesson into other activities. Examples of other tools, lessons, websites, and articles the teacher could use.

Let's Make a Map!
Grades K-5

Learner Outcomes:
Students will understand how maps are made and why. Students will be able to create a map including a compass rose, legend and scale.

Objectives:
Students will learn about the study of geography and why we make maps. Students will go out to the park and identify landmarks they think should be on the maps they make. Students will create a simple map of the park including parts that they have visited. The maps will include scale, legend, compass rose and important landmarks.

Teacher's Step-by-Step Instructions:

1. Ask the students what the word "geography" means to them. Hopefully you will get answers about studying the Earth and maps. Show a map and tell them about how maps are part of studying the world and how important it is to know where we are.
2. For older students talk about how map makers use scale to create a map. This means that everything is correctly placed on the map, only much smaller.
3. If you want you can show the trail map of Pondicherry Park. Tell the students that they will be making their own map based on their experience in the park.
4. There is a handout to bring out to the park. With younger students, however, you may want to verbally decide what landmarks you want on the maps. The entire class can decide and the teacher can make a list.
5. Tell students they will go out to the park to walk around and take note of what they think is important to include on their maps. Inform them that they will not be walking all the trails and to only include landmarks that they see on the walk.
6. Hand out paper for a list if you want.
7. Get students ready to go outside.
8. The school would be a great landmark to put on the map. Even though it isn't technically in the park it is a part of the students' experience.
9. Depending on the amount of time you have to be outside, walk the trails to find good landmarks. The Kneeland Spring and the Bob Dunning Bridges are good landmarks. Also students can be encouraged to write down the smaller foot bridges that they cross. Encourage them to be as observant as possible.
10. Included here is a blank outline of the park over an aerial photo. Help students decipher where things are by using a map that has markings on it. Depending on their age and ability, you may require that they draw in parts of the trail system. One map has the school labeled and the other does not. Challenge the older students to find where the school should be. It's only the parking lot.

11. Students finish the map inside or as homework by coloring and labeling different landmarks. Older students should have a legend and a scale.

Materials:
Blank map worksheet, pencils, clipboards. Older students will need rulers for scale and possibly a compass.

Connections to the Maine Learning Results:
Grades K-2
Social Studies
D1 Geographic Knowledge, Concepts, Themes and Patterns
Students understand the nature and basic ideas of geography.

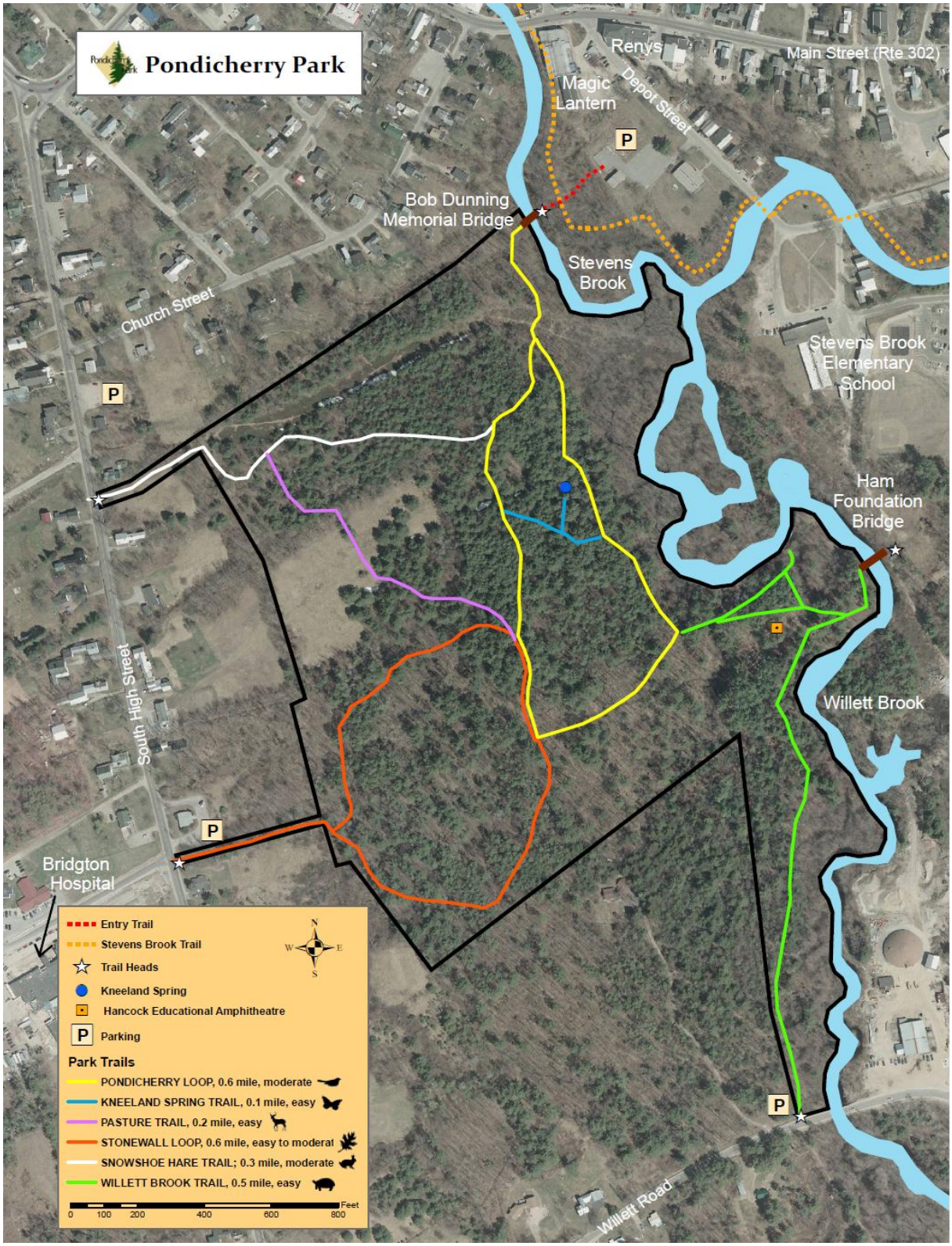
a. Explain that geography is the study of Earth's surface and peoples.

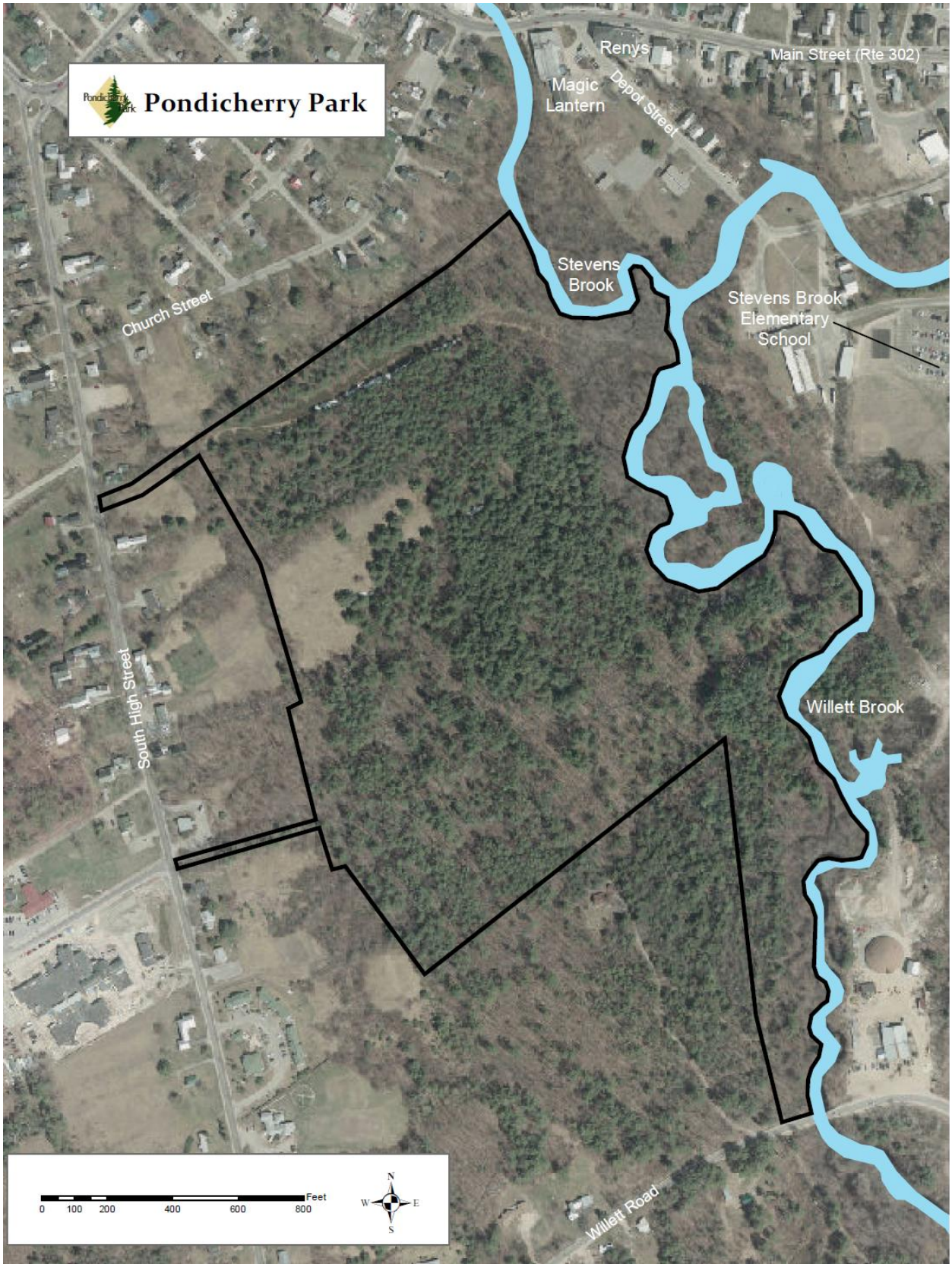
b. Create visual representations of the immediate and distant places and locations, directions (including N, S, E, and W), and basic physical, environmental, and cultural features.

Grades 3-5
Social Studies
D1 Geographic Knowledge, Concepts, Themes, and Patterns
Students understand the geography of the community, Maine, the United States, and various regions of the world.

a. Explain that geography includes the study of Earth's physical features including climate and the distribution of plant, animal, and human life.

Extensions:
For grades 3-5 have the students add plants and animals they know are in the park.


Pondicherry Park
Renys
Main Street (Rte 302)
Magic Lantern
Depot Street
P
Bob Dunning Memorial Bridge
Stevens Brook
Church Street
Stevens Brook Elementary School
P
Ham Foundation Bridge
South High Street
Willett Brook
P
Bridgton Hospital
Entry Trail
Stevens Brook Trail
Trail Heads
Kneeland Spring
Hancock Educational Amphitheatre
P Parking
Park Trails
PONDICHERRY LOOP, 0.6 mile, moderate
KNEELAND SPRING TRAIL, 0.1 mile, easy
PASTURE TRAIL, 0.2 mile, easy
STONEWALL LOOP, 0.6 mile, easy to moderat
SNOWSHOE HARE TRAIL; 0.3 mile, moderate
WILLETT BROOK TRAIL, 0.5 mile, easy
Feet
0 100 200 400 600 800
P
Willett Road


Pondicherry Park
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Church Street
South High Street
Willett Brook
Willett Road
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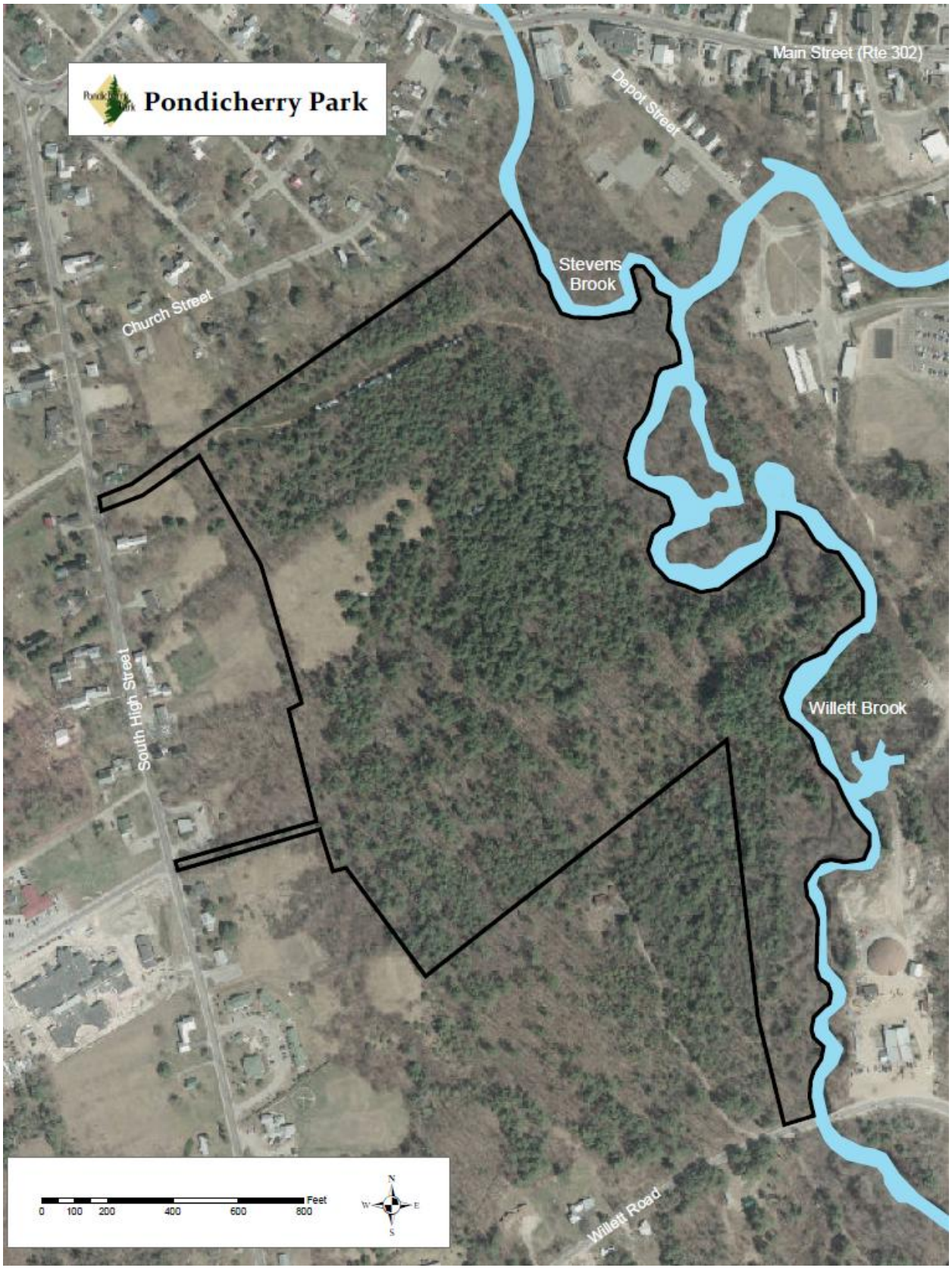

Pondicherry Park
Main Street (Rte 302)
Depot Street
Stevens Brook
Church Street
South High Street
Willett Brook
Willett Road
0 100 200 400 600 800 Feet
N
W E
S

Pondicherry Park Clean Up
Grades K-2

Learner Outcomes:
Students will have come up with a plan to help LEA keep its trail systems clean and clear for pedestrians. Students will have helped clean up a section of the trails, or the Outdoor Classroom within Pondicherry Park. They will have written a response describing the evidence of the project's effectiveness and civic contribution.

Objectives:
Students will work collaboratively to come up with a plan as to how they want to clean up the trail system, or the Outdoor Classroom within Pondicherry Park. The students will understand what it feels like to participate in a service-learning project. The students will also get the chance to express to each other how they believe their work was effective.

Teacher's Step-By-Step Instructions:
DAY ONE:

1. Hand out the Pondicherry Park Clean Up worksheets to each student. Ask them what some of their rights, duties, and responsibilities are as citizens within the class, within the school, and within the community. Create a list with the students of these rights, duties and responsibilities. How can we as a class, fulfill some of our rights, duties and responsibilities as citizens?
2. Ask the students what it means to volunteer. Explain that volunteering time and energy is a great way to help either your class, school or town communities. How does volunteering fulfill some of our rights, duties, and responsibilities? Explain to the students, that for class they will be volunteering their time to cleaning up Pondicherry Park.
3. Have the students work together to discuss how and where they would like to clean up Pondicherry Park.
4. Once the class has decided on where they would like to clean up, work with them to come up with a plan of action. They can start by filling out some of the questions on the Pondicherry Park Clean Up worksheets.
5. Make sure each student knows his or her specific job for the project, and have them fill out all of the Personal Planning questions on the worksheet.
6. Explain that on (a specific date) they will be going out and completing their plan to clean up a section of the park.

DAY TWO:

1. Gather all the tools the students will need for cleaning. (Suggested tools: rakes, garbage bags, wheel barrow, branch clippers etc.) Divide tools among students, and walk to the designated cleaning area in Pondicherry Park.

2. Make sure each student knows what job they are supposed to be doing.
3. Work until designated time, or until the project is complete.
4. Have the students spend time writing down their thoughts about the project. How did they feel once they were finished? What evidence do that have that this project was effective?
5. Have each student share how they felt about their work.

Materials:
Student worksheets, tools needed to clean up park
Connections to Maine Learning Results:
Social Studies
Grade K-2
A2. Making Decisions Using Social Studies Knowledge and Skills
Students make individual and collaborative decisions on matters related to social studies using research and discussion skills.

a. Share ideas and listen to the ideas of others to reach individual and collaborative decisions and make plans.
b. Make a real or simulated decision related to the classroom, school, or beyond by applying appropriate and relevant social studies research skills, and relevant information.

A3. Taking Action Using Social Studies Knowledge and Skills
Students select, plan, and participate in a civic action or service-learning project based on a classroom, school, or local community asset or need, and describe evidence of the project's effectiveness and civic contribution.

Pondicherry Park Clean Up

Name:_____	Rights	Duties & Responsibilities
Class		
School		
Community		

Selection Process:

1. Do you want to clean up the Outdoor Classroom? Yes No
2. Do you want to clean up a section of trails? Yes No

Outdoor Classroom Questions

1. What section of the Outdoor Classroom do you want to clean up?
2. What tools will your class need to do this?
3. How many classes will it take to complete this project?
4. How will the project jobs be divided up?

Trail Section Questions

1. What section of trails do you want to clean up?
2. What tools will your class need to complete this project?
3. How many classes will it take to complete this project?
4. How will the project jobs be divided up?

Personal Planning:

1. What is my job for this project?

   _____
   _____
   _____
   _____

2. How can I perform my job well?

   _____
   _____
   _____
   _____

3. How will this project make Pondicherry Park a better place?

   _____
   _____
   _____
   _____

4. How do you feel after completing your work?

   _____
   _____
   _____
   _____
   _____

The History of Pondicherry Park I

Through Guided Imagery

Grades 3-5

Learner Outcomes:
Students will have walked through Pondicherry Park observing both man-made objects and the physical landscape of the park. They will have brainstormed ideas as to how the artifacts in the park came to be there, what they were used for, and what the landscape and the artifacts can tell them about the history of the park.

Objectives:
Students will have a better understanding of the landscape and artifacts within Pondicherry Park. They will begin connecting geographic features and man-made landmarks within the park to the history of the area.

Teacher's Step-By-Step Instructions:

12. Prepare for class by printing out the Pondicherry Park Guided Imagery, along with the student worksheets.
13. Ask the students what history is. Have them share all of their ideas out loud. Explain that history includes the study of past human experience based on available evidence from a variety of sources.
14. Ask the students what geography is. Have them share all of their ideas out loud. Explain that geography includes the study of Earth's physical features including climate and the distribution of plant, animal and human life. Explain that knowing the climate, physical features, and the distribution of plant, animal and human life in an area, can tell you a lot about its history.
15. Explain to the students that they will be taking a walk through Pondicherry Park looking for evidence of how the land was used in the past. Explain to them that historical evidence, both man-made objects and natural features in the land, will help them discover the history of Pondicherry Park.
16. Hold up a map of Pondicherry Park, and allow the students to look at the 66 acres of land within the park, and the town around the park. Ask them, "What do you think this land has been used for throughout different time periods?" Explain that as they walk through the park, they will make a list of things they see in the park that may be evidence of another time period. Explain that they will also write down possible reasons for the object being in the park, or what it could have been used for. For example, if a student finds a section of barbed wire, have them jot down ideas as to what it was used for, and what its purpose was.

17. Walk with the students through the park. Enter at the Ham Foundation Bridge. Follow the Willet Brook Trail into the park, and stop by the old Cook house foundation (now the outdoor classroom). Allow students the time to write down what they see. Continue straight past the foundation toward the Pondicherry Loop. At the trail intersection, head southwest up the Pondicherry Loop. Follow the loop slowly allowing students to take notes as they walk. Stop at the Kneeland Spring Intersection and head east down the trail to the spring. Allow the students enough time to write about the spring. Head west back up Kneeland Spring trail, and continue along the Pondicherry Loop. The trail will intersect with the Snowshoe Hare Trail. Take a right and head down the hill. At the next intersection, take another right to follow Pondicherry Loop. Continue straight until you are back at the old Cook house foundation.
18. Ask the students to share their findings with the class, along with why they think these artifacts are in the park.
19. While in the park, or back in the classroom, have the students write a paragraph or two about one specific object they saw. Have them use their imagination to come up with what they believe the object was used for.

Materials:

Pondicherry Park Maps, student worksheets, clipboards, pencil or pen

Connections to the Maine Learning Results:

<u>Social Studies</u>

D1. Geography: Geographic Knowledge, Concepts, Themes, and Patterns

Grade 3-5. Students understand the nature and basic ideas of geography.

b. Explain that geography includes the study of the Earth's physical features including climate and the distribution of plant, animal, and human life.

E1. History: Historical Knowledge, Concepts, Themes, and Patterns

a. Explain that history includes the study of past human experience based on available evidence from a variety of sources.

<u>English Language Arts</u>

B1. Writing: Interconnected Elements

Grade 3-5. Students use a writing process with an emphasis on the development of a central idea, for a variety of audiences and purposes.

e. Write coherent paragraphs that have supporting sentences and a concluding sentence.

g. Edit for correct grammar, usage, and mechanics.

h. Create legible final drafts.

D2. Writing: Mechanics

Grade 3-5. Students apply the rules of capitalization, punctuation, and spelling to communicate.

a. Use end marks correctly.
b. Capitalize correctly.
c. Spell high-frequency grade-level word

Name: _____
Date: _____

History of Pondicherry Park Walk

Instructions:
Create a list in the space below of historical sites, both man-made objects, and natural features in the land, that you discovered on your walk through Pondicherry Park. All of these historical artifacts are pieces of evidence that can be used to figure out the history of the park. Next to each object, or natural land feature, write what you think each historical artifact was used for, what you think its purpose was?

1. _____: Use/Purpose_____
   _____
   _____
   _____
2. _____: Use/Purpose_____
   _____
   _____
   _____
3. _____: Use/Purpose_____
   _____
   _____
   _____
4. _____: Use/Purpose_____
   _____
   _____
   _____
5. _____: Use/Purpose_____
   _____
   _____
   _____
6. _____: Use/Purpose_____
   _____
   _____
   _____
7. _____: Use/Purpose_____
   _____
   _____
   _____

The History of Pondicherry Park II

Through Guided Imagery

Grades 3-5

Learner Outcomes:

Students will read or listen to the history of Pondicherry Park and the Bridgton area. They will pull major events out of the story into a timeline. They will list ways in which the geographic features of the area affected the way of life in the community, and they will write a short story as if they lived in the area during another time.

Objectives:

Students will have a better understanding of the history of Bridgton and the land within Pondicherry Park. They will be able to connect geographic features and man-made landmarks within the park to the history of the area. The students will be able to identify major events, people, and timeframes in the history of the community.

Teacher's Step-By-Step Instructions:

20. Walk with the students to the outdoor classroom. Have them find a comfortable place to sit. Explain that you'll be reading a piece of guided imagery about the history of Pondicherry Park.
21. Hand out the Guided Imagery worksheet. Explain that the first time you read through the guided imagery, the students will just sit back and listen with their eyes closed. The second time you read the piece, the students will take notes on the major events that took place, important people they heard about, the different time periods they heard about, and how the geographic features of the land shaped the history of the park and Bridgton. They should also make sure to jot down any words they don't know so that they can learn their meanings.
22. Have the students share all of their notes. Have the students write a short story as if they got stuck back in time as one of the characters in the Guided Imagery. Teachers may make up their own rubrics for the stories, but it would be beneficial if the stories were about a day in the life of their character, how the land around them looked, and how it affected their daily routine.
23. Have the students share the stories with the class.

Materials:

Pondicherry Park Maps, student worksheets, Guided Imagery of Pondicherry Park, clipboards, pencils or pens.

Connections to the Maine Learning Results:

Social Studies

D1. Geography: Geographic Knowledge, Concepts, Themes, and Patterns

Grade 3-5. Students understand the nature and basic ideas of geography.

c. Explain that geography includes the study of the Earth's physical features including climate and the distribution of plant, animal, and human life.

d. Explain examples of changes in the Earth's physical features and their impact on communities and regions.

D2. Geography: Individual, Cultural, International, and Global Connections in Geography

Grade 3-5. Students understand geographic aspects of unity and diversity in the community, Maine, and regions of the United States and the world, including Maine Native American communities.

b. Identify examples of how geographic features unify communities and regions as well as support diversity.

c. Describe impacts of geographic features on the daily life of various cultures, including Maine Native Americans and other cultures in the United States and the world.

E1. History: Historical Knowledge, Concepts, Themes, and Patterns

d. Explain that history includes the study of past human experience based on available evidence from a variety of sources.

e. Identify various major historical eras, major enduring themes, turning points, events, consequences, persons, and timeframes, in the history of the community.

English Language Arts

B1. Writing: Interconnected Elements

Grade 3-5. Students use a writing process with an emphasis on the development of a central idea, for a variety of audiences and purposes.

e. Write coherent paragraphs that have supporting sentences and a concluding sentence.

g. Edit for correct grammar, usage, and mechanics.

h. Create legible final drafts.

D2. Writing: Mechanics

Grade 3-5. Students apply the rules of capitalization, punctuation, and spelling to communicate.

8. Use end marks correctly.
9. Capitalize correctly.
10. Spell high-frequency grade-level words.

The History of Pondicherry Park
A Guided Imagery

As you walk through Pondicherry Park, you may find the remainders of another time tangled amongst the ferns and hemlocks. Rock walls stand weathered amongst the ancient white pines, barbed wire bends in and out of the forest floor covering, and an old spring quietly spills cold water over its stone barriers.

Close your eyes and I will take you on a journey through the history of Pondicherry Park, traveling back through the ages to the first people who walked these woods. Listen closely for the sounds of the past; children laughing as they scamper through the woods, the piercing whistle of the narrow gauge railroad as it chugs along, or the light clanking of bells as cattle graze in open fields.

Imagine time zipping past you in films of blurred motion, as we voyage back 18,000 years ago when the 66 acres that is now Pondicherry Park, and a large portion of northern North America, were covered by the Laurentide ice sheet. Under the weight of over 5,000 feet of ice, the land is being crushed, pushed and shaped into hills and valleys, leaving behind lakes, streams, and mountains as the glacier melts and retreats.

Skipping ahead in time, it is now only 12,000 years ago, and the land where the park will later exist, looks like the arctic tundra. Life here is similar to living in a freezer, and the only organisms surviving here are the toughest of the tough. You are a gargantuan wooly mammoth thundering along amongst the giant bison and elk. All alone, you fight off the cold and search for food wherever you can. Now, let us move forward in time to only 3,000 years ago. The temperatures are rising, and the modern day forest is beginning to develop. White pines are sprouting up to reach the sky, creating shade for other plants and launching the cycle of forest succession.

Let us jump ahead in time to the 1700s where you and the native Pequawket Indians are standing along the gentle banks of what will later be known as Stevens Brook, fishing and trapping for your village. The main Pequawket village is located in Pequawket (later known as Fryeburg); however, your village and other smaller villages are spread all along the Saco River Valley and the Lakes Region. Most of these local villages including yours, are associated with or a part of the larger tribe, the Penobscot Indians.

Your days in the village are spent hunting, fishing and cultivating crops such as beans, squash, and corn. One of your least favorite daily chores is to take the fish scraps left over from meals, and bury them in the community garden to use as fertilizer for the vegetables. At night, you and your family sleep in a conical wigwam that you helped to build using birch bark and grass mats. From time to time you and other members of your village travel by foot to the main Pequawket Village using a trail hidden beneath the forest canopy. This worn path connects villages in the Fryeburg area to points south, becoming the main passageway into what will one day be known as Bridgton, Maine.

Your work is done for the morning, so you sit beside the swift brook watching a brook trout swim this way and that. The white pine you lean against groans in the wind, bending slightly to brush against the neighboring beech, birch, and maple trees. A slight movement catches your eye and you swivel your head slowly to watch a white-tailed deer drink peacefully from the cold water. A beaver swims along, initially oblivious to the drinking deer, before it takes notice and slaps its tail against the water's surface in warning. You chuckle to yourself and hunker down further in the jewelweed and high bush blueberry hoping to see more. A broad-winged hawk calls from high above, circling round and round in the warm air. Just as you are about to head back up the slope to your village, you glance down at your feet and realize you have been sitting inches away from a painted turtle basking in the sun this whole time! What a day! You run back to tell your siblings.

Let us fast forward a few years to 1767. You are now an early Maine settler who has traveled with your family, a long distance from Massachusetts. You helped your parents build a simple cabin along a beautiful brook in the woods with the hopes of clearing some land for farming. By late summer you and your family chop down the trees on your property, and the following spring you burn the area to clear out all remaining debris. This will open the land up for a larger house, agricultural fields, and animal pastures. The clearing of this land is very hard work, but when it is complete, you and your family are able to plant apples, grain, corn, strawberries and other vegetables. Although the vegetables are delicious, you are more excited to have large fields where you can run around with the grazing cattle, horses, and swine.

The land your family has moved to is known as Pondicherry, and was supposedly named as such because of the many ponds and cherry trees visible from the local mountain tops. One of the first settlers in Pondicherry, Moody Bridges, has petitioned for Pondicherry to become a township. It takes some time, but eventually the land is surveyed and the township is granted.

More and more settlers arrive in the area, including Captain Benjamin Kimball, Jacob Stevens, Stephen Gates, and David Kneeland. Each time new settlers arrive, the town gets together to help build a home for each family, far enough apart from each other to allow for land cultivation. Each time your family helps to build a house, you dread the hard work of building the stone walls that determine woodland boundaries and keep animals contained. Not only does the entire community help to build these simple houses and boundaries, but they also stand together to defend them against the local natives. There have been some recent violent encounters, which keep you and your family nervous and cautious. Soon after the first houses are built, churches, schools and roads begin popping up along the landscape. Your days once spent entirely in the fields working with the horses and oxen to plow the earth and move heavy stones, are now partially spent in the school house learning grammar and mathematics.

We are fast forwarding once again to the following year, 1768. This time, you are now a young merino sheep farmer whose land runs adjacent to the same babbling brook where the Indians had fished. This brook is now known as Stevens Brook, after Jacob Stevens, a settler in town, who has recently identified 12 potential power sites along the brook, and built the first saw mill of the area. While walking through town to check out the new mill, you hear the news

that the town itself has been renamed to Bridgton, after one of its original proprietors, Moody Bridges. For a while after, you have a hard time remembering this name, and continue calling the town Pondicherry. But over time, the name Bridgton is mentioned so much, it begins to stick. By 1789, Bridgton includes a tavern where you like to visit to catch up with your neighbors, a general store where you buy your tools, and Jacob Stevens' new saw mill.

One day, after building a large stone wall to keep your merino sheep from getting loose, you come down with a terrible fever. It is now 1790, and a good thing at that, because 1790 is the year that the new physician, Dr. Samuel Farnsworth, moves into town. With the help of Dr. Farnsworth, you are out of bed and back to the fields and sheep in a few days. You count your lucky stars that you are healthy again, for the sheep don't take care of themselves when you're sick, and the work keeps piling up.

It is now 1794 and exciting news has come to Bridgton! A town census will be conducted. You make guesses with your friends as to how many people live in town, and are surprised when you find out that the population has already reached 471 people! A few years later, in 1800, with more businesses arriving including stores, hotels, mills, a print shop, a barber shop, and an opera house, 647 people live in Bridgton! As the population grows, you watch more and more farms spread out over the landscape and by 1840, your land is included in the 75% of total land in Bridgton being used for agriculture and crops.

We will skip ahead now, to the late 1850s. In this time period you are now a hard-working laborer at the Tannery located alongside Stevens Brook. The land that your house is situated on is located across from the Tannery on the other side of the Stevens Brook, and was once used as merino sheep pasture fields. But with the hours that you are putting in at the Tannery, you've allowed your property slowly to transition back into a young forest.

There are still plenty of agricultural tracts of land and farm animals throughout Bridgton and surrounding your property, including 834 acres of corn, 232 horses, 597 cows, 402 oxen, 603 cattle, 189 swine, and 660 sheep. However, as time goes on, it becomes obvious to you how much the town is shifting from an agricultural town to a mill town. Slowly families are switching from working on the farms to working at the mills. Even the families who still work hard on the land have begun changing their ways by using new technologies including the latest light-weight fencing, barbed wire.

In 1882, you begin buying bottled spring water for $0.50 a carboy or $1.20 a barrel. Your neighbors, the Keene and Kneeland families, have built a stone wall around their spring and started up a business of selling the water to the Hannaford Brothers in Portland and locals in town. You decide to visit the Kneelands and their spring, and learn after talking with them, that the spring water is considered beneficial for some diseases and illnesses!

By the early 1900s your body is tired from working all the time at the Tannery. So after work, you spend an hour or two sitting on your porch watching the warblers flit in and out of the woods, while listening to the sound of the narrow gauge railroad chugging along, up and over Stevens Brook. You can hear the laughter of children coming from the old Cook family camp down where Stevens Brook and Willet Brook meet, and you smile, content with the changes before you.

Let us fast forward one more time to the year 2011. You are now a student at the Stevens Brook Elementary School. You are sitting in class finishing a fun activity involving rules of addition and subtraction. You love math, and are excited to practice these new skills. It's hard to stay focused though, because you only have one week left of school before summer vacation, and this summer is going to be the best! Your best friend is coming back to Bridgton with her family this summer. Their summer house is next to yours, and the two of you are going to spend the summer water skiing, swimming, sailing, and kayaking at camp. This will be the first summer at camp, and you can't wait for all of the fun! Just last night your dad took you out on Highland lake for some tubing, and the town was already filling up with summer residents. You think back to the quiet of this past winter when the town emptied out, and the snow blanketed everything. Skiing at Shawnee Peak is fun, but its way better on the water in the summer sun!

Now, quietly, I would like you to rejoin me in the present day. Open your eyes. Glance around the park. What do you see? Do you see the brook trout that the Pequawket Indians once fished? Do you see any old stone walls marking the wooded boundaries and keeping sheep from wondering off? Do you see scraps of metal and leather along the Stevens Brook shores, left behind from the many mills and the Tannery? Can you spot barbed wire left over from old farm fences? Do you see the old Kneeland Spring still spilling its cold, clean water? Can you find the Cook Family's old camp foundation blending in with the surrounding wooded landscape?

Each of these historical sites are little snapshots into Pondicherry Park's past. With the help of LEA, LELT and the generous donations of the four families who previously owned the land, this wooded landscape is now protected and kept safe for you and generations of visitors to come. While you are here today, make sure to take a moment and look closely at the park. Take notice of the giant white pines, the bounding mink, the nodding lady slippers and the hammering Pileated woodpeckers, for the forest is ever changing; and what you see today will quietly slip into tomorrow.

Name: _____
Date: _____

The History of Pondicherry Park; a Guided Imagery Worksheet

Instructions: As you listen to the Guided Imagery the first time around, close your eyes and relax. Try to imagine what is happening in the story. The second time the story is read out loud, write down as many notes as you can about the big events and changes that are taking place, as the story moves through time. Take note of how the geographic features of the land might have had an effect on the community. Try to identify important events, turning points, and people in the story. Use the following guideline to help organize your notes.

1. Important events:

2. Turning points:

3. Important people:

4. The impacts of the geographic features on the daily lives of people throughout time:

Pondicherry Park Clean Up
Grades 3-5

Learner Outcomes:
Students will develop a plan to help the town keep its trail systems clean and clear for pedestrians. Students will help clean up a section of the trails, or the Outdoor Classroom within Pondicherry Park. They will write a response describing the evidence of the project's effectiveness and civic contribution.

Objectives:
Students will work collaboratively to come up with a plan as to how they want to clean up the trail system, or the Outdoor Classroom within Pondicherry Park. The students will understand what it feels like to participate in a service-learning project. The students will also get the chance to express to each other how they believe their work was effective.

Teacher's Step-By-Step Instructions:
DAY ONE:

24. Hand out the Pondicherry Park Clean Up worksheets to each student. Ask them what some of their rights, duties, and responsibilities are as citizens within the class, within the school, and within the community. Create a list with the students of these rights, duties and responsibilities. How can we as a class, fulfill some of our rights, duties and responsibilities as citizens?
25. Ask the students what it means to volunteer. Explain that volunteering time and energy is a great way to help either your class, school or town communities. How does volunteering fulfill some of our rights, duties, and responsibilities? Explain to the students, that for class they will be volunteering their time to clean up Pondicherry Park.
26. Have the students work together to discuss how and where they would like to clean up Pondicherry Park.
27. Once the class has decided on where they would like to clean up, work with them to come up with a plan of action. They can start by filling out some of the questions on the Pondicherry Park Clean Up worksheets.
28. Make sure each student knows his or her specific job for the project, and have them fill out all of the Personal Planning Questions on the worksheet.
29. Explain that on (a specific date) they will go out and complete their plan to clean up a section of the park.

DAY TWO:

d. Gather all the tools the students will need for cleaning. (Suggested tools: rakes, garbage bags, wheel barrow, branch clippers etc.) Divide tools among students, and walk to the designated cleaning area in Pondicherry Park.

e. Make sure each student knows what job they are supposed to be doing.
f. Work until designated time, or until the project is complete.
g. Have the students spend time writing down their thoughts about the project. How did they feel once they were finished? What evidence do they have that this project was effective?
h. Have each student share how they felt about their work.

Materials:
Student worksheet, tools needed to clean up trails.

Connections to Maine Learning Results:
Social Studies
A2. Making Decisions Using Social Studies Knowledge and Skills
Students make individual and collaborative decisions on matters related to social studies using relevant information and research and discussion skills.

d. Contribute equitably to collaborative discussions, examine alternative ideas, and work cooperatively to share ideas, and individually and collaboratively develop a decision or plan.
e. Make a real or simulated decision related to the classroom, school, community, or civic organization by applying appropriate and relevant social studies research skills, and other relevant information.

A3. Taking Action Using Social Studies Knowledge and Skills
Students select, plan, and participate in a civic action or service-learning project based on a classroom, school, or local community asset or need, and describe evidence of the project's effectiveness and civic contribution.

Pondicherry Park Clean Up

Name:_____	Rights	Duties & Responsibilities
Class		
School		
Community		

Selection Process:

f. Do you want to clean up the Outdoor Classroom? Yes No

g. Do you want to clean up a section of trails? Yes No

<u>Outdoor Classroom Questions</u>

11. What section of the Outdoor Classroom do you want to clean up?
12. What tools will your class need to do this?
13. How many classes will it take to complete this project?

14. How will the project jobs be divided up?

Trail Section Questions

5. What section of trails do you want to clean up?
6. What tools will your class need to complete this project?
7. How many classes will it take to complete this project?
8. How will the project jobs be divided up?

Personal Planning:

1. What is my job for this project?

_____
_____
_____
_____

2. How can I perform my job well?

_____
_____
_____
_____

3. How will this project make Pondicherry Park a better place?

_____
_____
_____
_____

4. How do I feel after completing my work?

_____
_____
_____

Town Meeting
Grades 3-5

Learner Outcomes:
Students will work together to pass or veto a proposal for Pondicherry Park. They will play the role of a citizen in the town of Bridgton, and voice the opinions of their specific role. They will understand the importance of sharing ideas and collaboratively making decisions. They will understand their rights and duties as town citizens as well as their role in Bridgton's decision-making process.

Objectives:
Students will understand the importance of town meetings, sharing ideas, and understanding different points of view. They will understand that their role as children is just as important as any other person in a town. They will have a better idea about how to voice the importance of non-voters in a town. They will end the class understanding that they should stay involved in town matters.

Teacher's Step-By-Step Instructions:

30. Prepare for class by collecting the LEA map of Pondicherry Park (including props), along with the role playing cards/voters chips. Decide whether or not you want to perform the "guest speaker" role, or if you want another faculty member to help you out. The kids really get a kick out of any sort of dress-up garments the "guest speaker" might have on. Get the kids excited for the town meeting the day before. Let them know that they will all participate in a town meeting in Pondicherry Park, where they will listen to a guest speaker propose a change to the park. Discuss role playing with the students. Have them practice playing the roles of different people in the school. If they were the principal, what would they be concerned about? If they were a teacher what would they be concerned about? If they were the janitor, what would they be concerned about?
31. Walk to the outdoor classroom with the students and set up the map of Bridgton. Welcome the students to the Bridgton town meeting. Show them the map of their town and the places within it including their school and Pondicherry Park. Inform them that they have all been called to the town meeting as members of the community to discuss and vote on some proposed changes to the park.
32. Remind the students about what role playing is. Explain that during this town meeting they will each be playing a different role in the town. Go through each of the roles and have the students give examples of what concerns each role would have when faced with a development project in their town (this takes time).
    i. **Owner of a Bridgton gas station:** Will more people stop in for gas? Will less people stop by for gas?

j. **Unemployed Worker:** Will the development provide any new jobs for the town?
k. **Caretaker of Highland Lake Public Beach & Boat Launch:** Will the development ruin Highland Lake beach or boat launch at all? Will it increase or decrease the amount of people using Highland Lake?
l. **Realtor:** Will the development help or hurt my business? Will it make me more money, or make me lose money?
m. **Carpenter:** Will local carpenters be hired to build the housing development?
n. **Town Mayer:** Will the housing development increase families' desires to live in Bridgton?
o. **Children:** Will the development create more or less fun things to do on the weekend?
p. **Parent:** What will the prices for the houses be? Will they be affordable for year-round residents?
q. **Air:** Will the development create more pollution in the air?
r. **Water:** Will the development make the water dirtier or cleaner?
s. **Deer:** Will we have more or less places to browse?
t. **Beaver:** Will the development decrease my tree supply for food and lodging?
u. **Fish:** Will the development pollute the Willet or Stevens Brook where I live?
v. **Trees:** Will I be cut down during the development?

33. After the students have gone through the concerns of each role, assign each student a role card and explain that starting now, they are role playing.
34. Explain the steps of the town meeting:

#1. The "guest speaker" will propose their development plan for Pondicherry Park.
#2. The students will pair up and practice asking each other questions that their role would be concerned about regarding the development plan. The teacher will help students develop their questions.
#3. The students will each stand up, state who they represent, and ask the "guest speaker" one question they have about the proposal. There may need to be a limit to the number of questions each student can ask the "guest speaker" depending on time limitations.
#4. The "guest speaker" will answer all of the students' questions to the best of his/her ability without trying to sway the students vote one way or the other. Just give them the facts.
#5. The "guest speaker" will sit back down and each of the students will be given a few minutes to discuss their opinions (still role playing) about the proposal.
#6. Each student will stand up with their role card, state whoever they represent, and vote either "yes, I approve the development" or "No, I don't approve the development." They will give at least one reason for their vote, and will put their role playing card in either the "yes" or "no" pile.
#7. The votes will be counted and a decision will be made as to allow the development or not.

35. Go through each of the steps of the town meeting. Make sure that the "guest speaker" speaks honestly about the proposal and answers questions without putting a biased spin on answers, covering all the positive aspects of the proposal as well as the negative aspects. This activity is meant to give students the chance to decipher between all of the pros and cons of the proposal. "Guest speakers" should read the Guest Speaker Presentation worksheet.
36. Once all of the votes have been tallied up, announce the decision. Allow for the students to show their emotion about the outcome. Then say "Wait! Hold on a minute… Is this an accurate town meeting? Do all of these roles actually vote in a town meeting?" Pick up the two containers holding the voting chips. Go through each one asking "Can this role vote?" If yes, keep the voter chip in the container. If no, toss the voter chip aside. It doesn't count. Allow the students to realize that "No," not all of these town roles can vote including, air, water, trees, deer, beaver, fish AND THE CHILDREN!
37. The results of the vote may have changed! The students usually get pretty worked up about a change in the vote.
38. Ask the students if these non-voters matter. If they do matter, how can we represent them in a town meeting? We can speak for the air, the trees, the beaver, the water, and the fish. Ask the students what they can do? They may not be able to vote at a town meeting, but they can go to a town meeting and speak, voice their opinions about the matter. Adults will be VERY impressed by a student speaking at a town meeting.
39. If there is time, ask if anyone has ever been to a town meeting. Share experiences. Discuss how attending town meetings are a part of their rights, duties, and responsibilities as citizens.

Materials:
Town map and props, role-playing ID cards, voter chips, voter containers, props for the "guest speaker"

Connections to Maine Learning Results:
<u>Social Studies</u>
A2. Making Decisions Using Social Studies Knowledge and Skills
Students make individual and collaborative decisions on matters related to social studies using relevant information and research and discussion skills.

f. Contribute equitably to collaborative discussions, examine alternative ideas, and work cooperatively to share ideas, and individually and collaboratively develop a decision or plan.

g. Make a real or simulated decision related to the classroom, school, community, or civic organization by applying appropriate and relevant social studies knowledge and skills, including research skills, and other relevant information.

B2. Rights Duties, Responsibilities, and Citizen Participation in Government

Students understand the basic rights, duties, and responsibilities, and roles of citizens in a democracy.

h. Identify the rights, duties, and responsibilities of citizens within the class, school, or community.

h. Provide examples of how people influence government and work for the common good including voting, writing to legislators, performing community service, and engaging in civil disobedience.

Extensions:

Read to the students, or discuss the attached examples of students swaying a vote in town meeting.

Guest Speaker Presentation

Instructions:
Keep the "guest speaker" proposal brief. Don't be a salesperson; you want the students to be voting for or against the proposal, not the presenter. Keep the proposal general rather than explaining how the development plan would affect each role. Make the students decide how the proposal will affect them on their own. If such a question comes up, turn it around so that they have to decide how it will affect them.

Sample Speech:
Proposal:
Hello class, thank you for having me here at your town meeting. My name is Sally Still-Waters (make up any name), and I am here representing a company called Safe Community Developers. I am here to propose the building of a safe housing development in Bridgton. The housing development will be built where Pondicherry Park is now. The town will harvest the trees in the park, and the proceeds from the logging will go directly to Bridgton. The housing development will include 35 houses, each with its own fenced-in yard. The houses will be reasonably priced to accommodate average-income families. At the center of the development, there will be a common green area and playground for the children of the community to play in. Thank you again for inviting me to your town meeting. I will let you all take a minute to come up with any questions you may have for me.

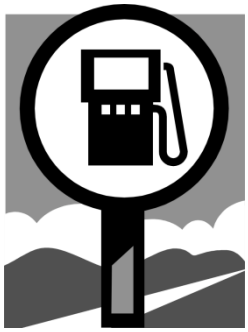
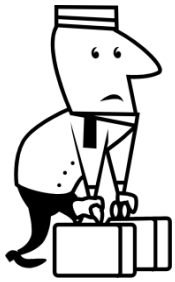
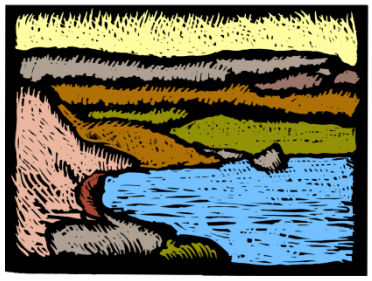
Information/Answers about the Development Project:

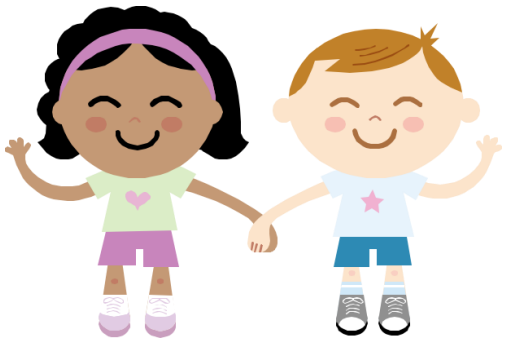
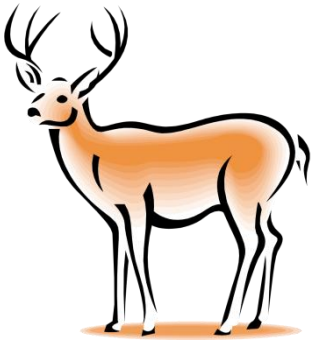
15. The project will hopefully bring more families into Bridgton because it will offer more affordable housing. That means more people buying groceries, more people buying gas, more people looking for work, more people using all of the attractions and amenities Bridgton has to offer.
16. During the development, Safe Community Developers will hire loggers to clear out the trees, contractors within Bridgton to build the houses, and landscapers to create the yards. The Safe Community Developers will also hire realtors in Bridgton to help sell the houses. After all of the construction is finished, the project will no longer create more jobs.
17. The housing development will be an attractive place to live for average-income families. It will be a safe, quiet place to live. This may increase the amount of families moving into Bridgton.
18. Pondicherry Park will no longer be around for the children or adults to visit, but we will have a smaller playground and common green for the children to play at in the middle of the development.
19. The houses will be aimed at families in the middle to lower-end incomes. Each house will feature three bedrooms, two floors, two bathrooms, and a two-stall garage.

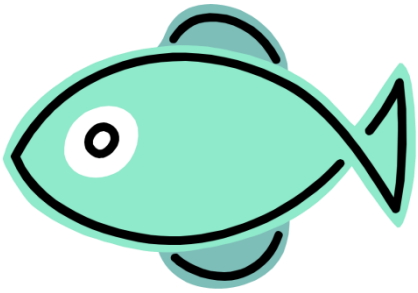
20. The development will cut down most of the trees in Pondicherry Park. Trees filter carbon and other pollutants out of the air, so the air quality may lessen a bit. Without the trees, the sun will be able to reach most places, making the houses sunny and warm. There will be a few trees per lawn, and owners can choose to grow more once they buy the property.
21. The roads and driveways in the housing development will be paved which will increase the amount of water runoff when it rains. There will be culverts and gardens used to decrease the amount of storm water runoff, but it won't stop it entirely, so there is a possibility of pollutants and sediments running into the streams, rivers and lakes. This could harm the health of the waterways.
22. Animals will have a lot less habitat. There are still other areas of Bridgton that are forested, but the animals in Pondicherry Park will have to relocate, or they will pass away.
23. The total percent of forested land in Bridgton will decrease.

*** Any questions that the students ask that are too specific, such as "How much money will I make if I were to work as a carpenter for you?" the guest speaker can answer, "That is a question we'll have to bring up at the next town meeting. I can't tell you just yet."**

Any other questions that there aren't already answers to, the guest speaker may make up the answer however they would like to, while keeping in mind to be truthful and unbiased. We want the students to decide for themselves whether the proposal will have a positive or negative effect on them.

Owner of Bridgton Gas Station 	Unemployed Worker 
Caretaker of Highland Lake Public Beach 	Realtor 
Carpenter 	Town Mayor 

Children 	Parent 
Air 	Stevens Brook 
Deer 	Beaver 

Fish	Trees
	

Pondicherry Story
Grades K-2

Learner Outcomes:
Students will use writing skills to create a story about Pondicherry Park. They will use their imaginations to complete a story with a beginning, middle and end.

Objectives:
Students will be given time outside to develop a storyline in the park. They will use the inspiration of the woods and water to create characters and plots. Each student should have their own basic story planned before going back inside.

Teacher's Step-by-step instructions:

1. At the start of class ask the students what their favorite stories are. Do they like fairy tales or real life? Tell them that today they will be creating their own story in Pondicherry Park. If the teacher wants to give a specific genre they can, but it is not necessary.
2. Before going outside, hand out and explain the worksheet to students. Go over each part of the worksheet so there is no confusion about what each part means.
3. This can be an individual or paired activity, depending on the level of the class. Working in pairs with the younger students may help get ideas flowing.
4. Once outside set up clear boundaries where students can sit and focus. Discourage a lot of wandering since they do have the worksheet to fill out and if they sit in one place quietly they will be able to use their sense of hearing and sight more.
5. Give the students about twenty minutes to fill out the worksheet. This should give them enough time to get ideas down on paper.
6. Gather together and let the students each share one thing about their story. Examples of sharing could be a character's name, the genre of their story or the basic plot.
7. Either assign writing the story as homework or use more classroom time to write. The stories should be complete with a beginning, middle and end.

Materials:
Students will need:

- Clipboard
- Pencil
- Worksheet

Teacher should bring:

- Extra pencils/sharpener
- Extra worksheets just in case

Connections to the Maine Learning Results:

English Language Arts

B1 Interconnected Elements: Students use a writing process to communicate their ideas.

w. Select a focus for writing and develop an idea, including a beginning, middle, and end.

b. Respond to clarifying questions and suggested revisions.

c. Edit, with assistance, for correct grammar, usage, and mechanics.

d. Create legible final drafts.

A Pondicherry Story

Name:

Title of your story:_____

Characters: What do they look like? How do they act? What do they care about?

Main Character:

Supporting Characters:

Major Events: These are events that happen to the character or things the character does in the story.

Beginning:

Middle:

End:

Use a separate piece of paper to write a rough draft of your story.

Word Scavenger Hunt
Grades K-2

Learner Outcomes:
Students will develop vocabulary looking for scavenger hunt words in the park.

Objectives:
Students will be given a scavenger hunt of vocabulary words that they will find in the park. Students will define words by describing or drawing what they find.

Teacher's Step-by-Step Instructions:

1. Teacher gives boundaries for the activity. The students must be able to see teachers/chaperones at all times. Also, the teachers must be able to see students.
2. Teacher breaks students into groups of two or three. Remind students that this is class time, not recess and that if they do not behave they will have to sit the activity out.
3. Give each student their own worksheet. Pairs can work together, but each person must have their own worksheet to hand in.
4. The students will have 10-20 minutes to work on the scavenger hunt. It is important to leave time at the end for each pair to share one word that they defined. This sharing can be done in the outdoor classroom or inside depending on the mood of the class. Sometimes bringing them inside to share helps them focus on each other.

Materials:
Each student needs:

- Clipboard
- Pencil

Teacher should bring:

- Extra pencils/sharpener
- Worksheet for each student

Connections to the Maine Learning Results:
English Language Arts

A1: Interconnected Elements: Develop vocabulary using knowledge of word parts and relationships among words including action words and different words that describe the same meaning.

A1: Interconnected elements: Read fluently and accurately with appropriate pacing and expression.

E2: Share stories and information and support opinions using oral and visual examples.

Extensions:
Assign students to write a sentence including each word for homework.
Create a poster for the classroom using some of the drawings and definitions found outside.

Word Scavenger Hunt

Name:_____

Directions: Try and find as many of these nature words as you can. Draw or describe what you see in the space below the word.

a. Water

b. Flower

c. Leaf

d. Sun

e. Teacher

f. Bark

g. Tree

Dear Pondicherry Park
Grades 3-5

Learner Outcomes:
Students will get practice writing a personal letter. Students will practice speaking in front of the class in the outdoor classroom.

Objectives:
Students are asked to write a letter to Pondicherry Park telling it what they like most about it. The letter is revised and when ready students will read the letter out loud in the park. Students will get a chance to be in the park to brainstorm ideas before the letter is written.

Teacher's Step-by-Step Instructions:

40. Introduce the reason we write letters. It is nice to let someone know how we feel. It is especially nice to get letters of recognition if someone likes something.
41. Tell them that the staff of LEA would like them to write a personal letter to the park saying what they like most about the park. Read the example letter if you want to.
42. Hand out the worksheet for the field trip.
43. Before going out to the park let the students know they will need to pay attention to their surroundings so they can write a detailed letter about what they like best.
44. Once at the outdoor classroom allow students to spread out a little so that they can focus on their worksheet.
45. Give students enough time to finish all the questions on their worksheet.
46. If they finish the questions they can start a rough draft of their letter while other students finish.
47. Assign the letter as homework or finish in class. The letter should have a heading (date), greeting, body, closing salutation and signature. The body should consist of two or more paragraphs about the park and what they like about it.
48. When the letters are ready assemble in the outdoor classroom. Remind students to give respect to people reading their letters.

Connections to the Maine Learning Results:
<u>English Language Arts</u>
B3 Argument/Analysis
Students write to indentify and explain a position to an identified audience

x. Summarize information from reading, listening or viewing.
y. Write about a central question or idea by using relevant supporting facts and details.

B5 Practical Application

Students write letters, other requests for information or directions for completing a process.

i. Write a letter including a date, salutation, body, closing, signature and, when appropriate, an inside address.
j. Write multiple-step directions for completing a task.

D1 Grammar and Usage

Students use parts of speech and vary sentence structure to communicate.

a. Use forms of nouns, verbs, adjectives, adverbs, prepositions, conjunctions, pronouns, and interjections correctly.
b. Use simple, compound, and complex sentences.

D2 Mechanics

Students apply the rules of capitalization, punctuation, and spelling to communicate.

i. Use end marks correctly.
j. Capitalize correctly.
k. Spell high-frequency grade-level words.

E1 Listening

Students apply active listening skills.

z. Attend and respond appropriately to classmates and adults.

E2 Speaking

Students use active speaking skills to communicate effectively in a variety of contexts.

aa. Speak using eye contact, clear enunciation, clear gestures for emphasis, and appropriate volume and rate.

Dear Pondicherry Park

Name: _____

Directions: Complete this worksheet and then write a letter to the park including details from your answers.

24. Do you like visiting the Park? _____

25. What is your favorite thing about visiting the Park? Give details so that you can use them in your letter.

_____
_____
_____
_____

26. What is your favorite time of year? What would be fun in the Park at that time of year?

_____
_____
_____

27. What would make the park more fun for you?

_____
_____
_____

28. Do you think it is important for people to spend time outside? Why or why not?

_____
_____
_____
_____

*If you have extra time you may start your rough draft on the back of this paper.

July 15, 2011

Dear Pondicherry Park,

My name is Mary and I really enjoy visiting you for many reasons. I come out with my class sometimes and learn about nature and the environment. I like being here for so many reasons it is hard to choose a favorite. I love learning about the different trees and plants with class. I come walking here with my family and one time I saw a white-tailed deer bounding through the forest.

But since I have to choose a favorite thing about you I will choose life. Pondicherry Park, you are full of so many living creatures it is amazing. I love to come out in the winter and see all the animal tracks in the snow. It makes me wonder about the secret lives of these animals and if they are seeing me looking at their tracks. In the spring I see many tracks in the mud including beaver, otter and mink.

I think it is important to spend time outside because the parts of the Earth's ecosystem support all life and you help us to understand that. I like learning about new things and every time I come outside I see something new. Thank you for being here and letting us learn about you.

Sincerely,

Mary

Nature's Geometry

Grades K-2

Learner Outcomes:
The students will be able to identify, describe and classify familiar two-dimensional shapes including circles, triangles, squares, and rectangles. They will be able to identify these objects in the physical and natural environments as well as in pictures.

Objectives:
The students will practice identifying familiar two-dimensional shapes from photographs of natural objects. They will then practice their identification skills by going into Pondicherry Park and making a list of shapes they see in the natural environment around them.

Teacher's Step-By-Step Instructions:

1. Ask the students to draw on the board, or at their desk, the following two-dimensional shapes: square, rectangle, rhombus, circle and triangle. Go over the edges, vertices, and right angles of these shapes.
2. Once the students are comfortable with each shape, hand out the Nature's Geometry worksheet, and have the students practice finding shapes in the photographs.
3. Have the students compare their work with the photographs with the shapes pre-drawn into them.
4. Hand out the List of Geometric Shapes in Pondicherry Park worksheet, and walk with the students into Pondicherry Park. Have the kids walk single file as you make your way to the park. Tell the students that they are all detectives and their job is to find as many hidden shapes in the natural environment as possible. Have the students raise their hands when they think they have found a geometric shape in the environment. The class will decide together if it is indeed a geometric shape, and each student will add the shape to their list and say where they found the shape. For example "I found a circle made by the woodpecker hole in the tree."
5. As you walk through the woods make sure all of the students are sharing with the group what characteristics they see about the shape that make them think it is a circle or a square, or whichever shape.

Materials:
Nature Geometry worksheet, List of Geometric Shapes in Pondicherry Park worksheet, pens, pencils, clipboards.

Extensions:

Have the students count up how many of each shape they have. Create a classroom count of all of the shapes they found. Have the kids draw their own nature photo hiding geometric shapes within the drawing.

Connections to Maine Learning Results:
<u>Mathematics</u>
C1. Geometric Figures

Students recognize, classify and create geometric figures in two and three dimensions.

a. Identify shapes in the physical environment.
b. Classify figures as circles, triangles, and quadrilaterals by focusing on their properties.
c. Create shapes by using objects to combine and decompose other shapes.

Name: _____

Nature's Geometry Worksheet

Instructions: In the pictures below, look for any geometric shapes you may see. Draw the shapes right on the paper. And label below what shape you've found.

What shape/shapes do you see?

_____

What shape/shapes do you see?

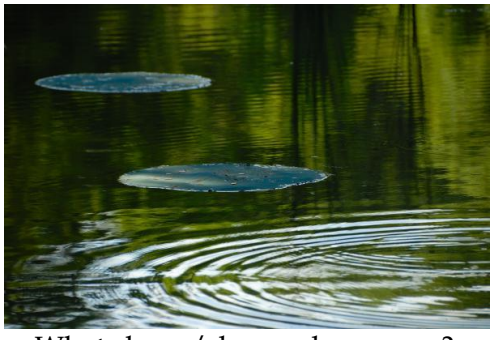
_____

What shape/shapes do you see?

_____

What shape/shapes do you see?

_____



What shape/shapes do you see?

_____

What shape/shapes do you see?

_____

What shape/shapes do you see?

_____

What shape/shapes do you see?

_____

What shape/shapes do you see?

_____

What shape/shapes do you see?

_____

What shape/shapes do you see?

_____

What shape/shapes do you see?

_____

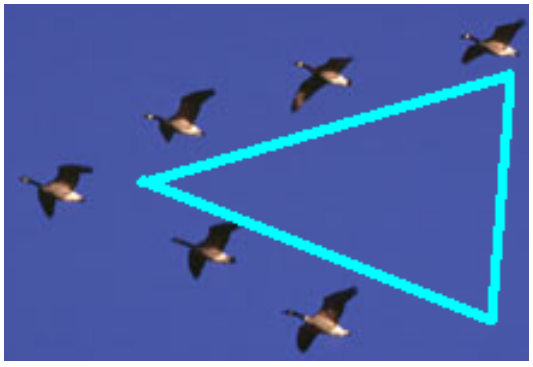
What shape/shapes do you see?

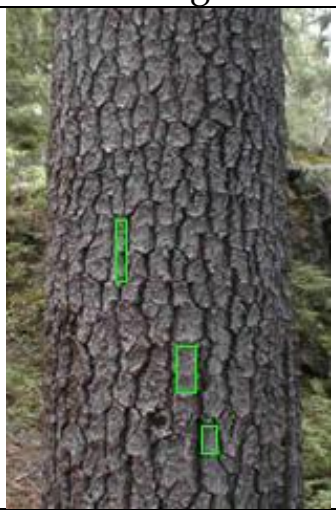
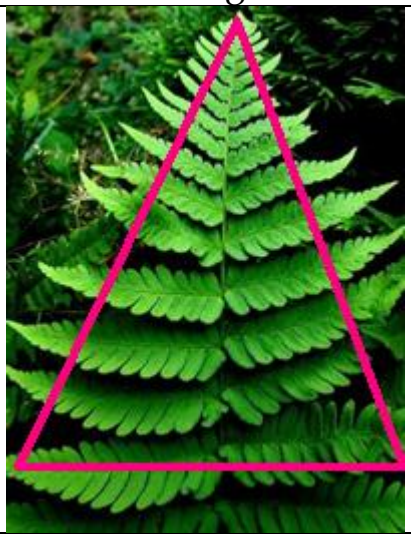
_____

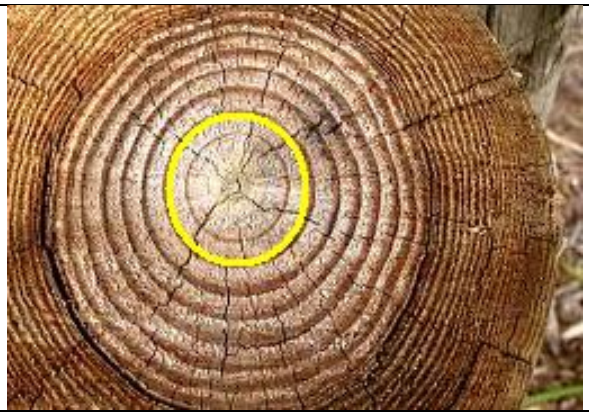
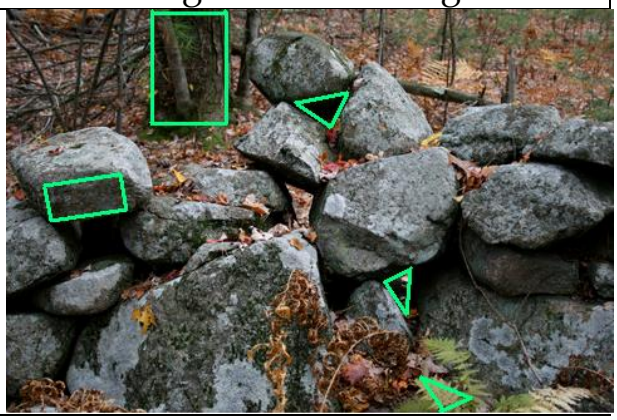
What shape/shapes do you see?

_____

Did you see these shapes as well?

Circles	Squares
	
Triangle	Triangle
	

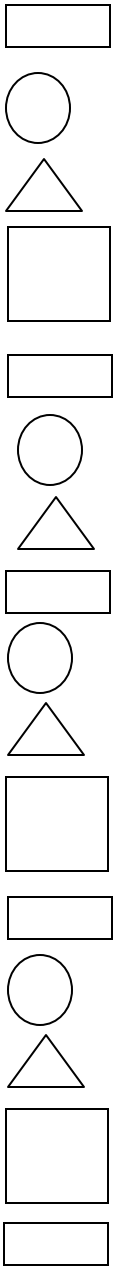
Circles	Rhombuses
	
Circles	Rectangles
	
Triangle	Circle
	

Triangles	Circle
	
Circles	Triangles and Rectangles
	

A List of Geometric Shapes in Pondicherry Park

Make a list of the shapes you see in Pondicherry Park. Where are these shapes found? For example, are they found in the rocks of a stone wall, in the rings of wood, or in the petals of a flower?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____



The Counting Classroom
Grades K-2

Learner Outcomes:
The students will be able to read, write and count the total amounts of different objects found in their Counting Classroom. They will have a better understanding of how to add and subtract whole numbers, as well as order one-digit, two-digit, and three-digit numbers.

Objectives:
The students will practice identifying different trees, leaves, stumps and other objects in the Counting Classroom. They will organize the groups in order of their quantities, indicating whether they are in the one-digit group, two-digit group, or three-digit group.

Teacher's Step-By-Step Instructions:

49. Prepare for class by printing out the Counting Classroom worksheet, and gathering a large ball of yarn for the Counting Classroom boundary.
50. Ask the students to give examples of whole numbers. Explain to the students that they will be working with partners while practicing their counting skills in a special outdoor classroom called the Counting Classroom.
51. Show the students the Counting Helper worksheet. Pick a student to be your counting partner. As your partner goes from chair to chair counting, show the rest of the class how to check off each number as the partner counts the chairs out loud. Have the students practice counting the chairs in the classroom using the Counting Helper and a partner. For older students, instead of just checking off the numbers as they count, they can copy the numbers to get practice writing them.
52. Walk to Pondicherry Park with the class. Pick an area inside Pondicherry Park that has a wide variety of trees, stumps, stones, and natural debris. Make sure the area is fairly flat and safe for the students to walk around counting objects.
53. Tie one end of the yarn to a tree, and have the students follow you as you walk a wide circle that ends up back where you started. Explain to the students that the yarn is the magic wall of the Counting Classroom. They are not to go outside the boundary, and they are only to count the objects within the boundary. The magic wall of the Classroom goes all the way to the soil, and all the way up to the highest clouds.
54. Have the students pair up. Hand each pair a Counting Helper worksheet. Let the partners count the trees, boulders, stumps, flowers, and other objects in the outdoor classroom.
55. Once the students have counted all the objects using the Counting Helper worksheet, have the partners take a seat and work on the rest of the worksheet together, writing the total counts, adding and subtracting the groups, and ordering the objects into one-digit, two-digit, and three digit groups.

56. Once every pair has had a chance of completing the Counting Classroom worksheet, have the students share their findings with the rest of the class.

Materials:
Counting Classroom and Counting Helper worksheets, a ball of yarn, pencils, and clipboards.

Connections to Maine Learning Results:
Mathematics
A1. Numbers: Whole Number
Students understand and use number notation and place value to 1000 in numerals.

bb. Read and write numbers to 1000 using numerals.
cc. Recognize the place values of digits in numbers (hundreds, tens and ones).
dd. Compare and order one-digit, two-digit, and three-digit numbers.

Students understand and use procedures to add and subtract whole numbers with one and two digits.

k. Use and explain multiple strategies for computation.
l. Use an operation appropriate to a given situation.

Name: _____

Counting Classroom Worksheet

Collected Data:

l. How many chairs did you count? _____

m. How many trees did you count? _____

n. How many large rocks did you count? _____

o. How many stumps did you count? _____

p. How many fallen logs did you count? _____

Number order:

Write the number you counted for each object in the right place value box.

Ones	Tens	Hundreds

Addition and Subtraction:

29. Number of trees

    + (plus)
    Number of fallen logs =

30. Number of trees

    9. (subtract)

    Number of stumps =

31. Number of rocks

    + (plus)
    Number of chairs =

32. Number of chairs

    10. (subtract)

    Number of fallen logs =

Forest Funds
Grades 3-5

Learner Outcomes:
Students will practice adding, multiplying, and dividing decimals. They will figure out the percent of leaf species composition in their collection, and will be able to identify trees growing within Pondicherry Park.

Objectives:
The leaves in the forest will be given monetary values. The students will collect a bag of the most "valuable" leaves they can find. They will then figure out how much money they have made from the leaves they were able to collect within a given time frame. The students will understand the importance of calculating slowly and carefully to decrease the number of mathematical mistakes they make. Finally, (only for older grades) the students will have to correctly figure out what percentage of their income came from beech, white oak, red oak, red maple, sugar maple and white ash leaves.

Teacher's Step-By-Step Instructions:

57. Prepare for class by collecting the same size grocery bags from a local store, or ask all students to bring in a paper grocery bag. Get enough to give every student one bag. Print out a set of the Forest Funds Rules & Tree Identification and mathematic worksheets for all the students. Review with the students how to add and subtract decimals. For older students review rules of division and calculating percents.
58. Review all of the leaf species with the students, covering the easy ways to identify each leaf.
59. Begin class by handing out and reviewing the game rules with students. Go over the example math worksheet so that students have an idea of what they are going to do once they have collected their own leaves.
60. Once all questions are asked, take students to the outdoor classroom.
61. Make sure students know that there will be no running or pushing of any sort, and remind them that the leaves must only be collected from the ground or fallen branches. Allow the students five minutes to collect the most valuable leaves.
62. Have students carry their bags back to the classroom where they will use the worksheets to calculate their earnings. Remind students that all of the steps for calculating their earnings must be written out.
63. Correct their math problems. Deduct $0.25 for each mathematical error. See who can collect the most amount of money.
64. Review with students the importance of calculating slowly and taking time when doing math problems. Ask students if they had any strategies for finding leaves. How many students double checked their work before handing it in to teachers?

65. Make sure to dump the leaves back outside when the lesson is done. Inform the students about the importance of allowing leaves to decompose naturally instead of throwing them in the trash.

Materials:
Same size (or similar size) bags for every student in class, Forest Funds Rules & Tree Identification and Forest Funds Mathematics worksheets.

Connections to Maine Learning Results:

Mathematics
A1. Numbers: Whole Numbers
Grade 3. Students understand and use number notation and place value to 10,000 in numerals.

ee. Read and write numbers up to 10,000 in numerals and words.
ff. Recognize the place values of digits in numbers up to 10,000.

Students understand and use procedures to add and subtract whole numbers with up to four digits.

m. Display an understanding of the base ten place value system.
n. Use an operation appropriate to a given situation.

Students understand and apply meanings of multiplication and division.

q. Multiply single-digit numbers and divide using single-digit divisors and up to two-digit dividends.
r. Use and operation appropriate to a given situation.
s. Recognize and use models for multiplication and division situations.
t. Use multiple strategies for multiplication and division.

Grade 5. Students multiply and divide numbers up to two digits and by tens, hundreds and thousands and interpret any remainders.
Students solve problems requiring multiple operations (addition, subtraction, multiplication, and division) and use the conventions of order of operations.

A2. Numbers: Rational Number
Grade 4. Students understand and use number notation and place value in numbers with two decimal places in real contexts including money.

33. Compare, order, read, round and interpret decimals with up to two decimal places.
34. Add and subtract decimals with up to two decimal places.

Grade 5. Students understand and use number notation and place value in numbers with three decimal places.

11. Compare, order, read, round, and interpret decimals with up to three decimal places.
12. Add and subtract decimals with up to three decimal places.
13. Multiply and divide decimals with up to three decimals places by a two-digit whole number.

14. Develop the concept of a fraction as division through expressing fractions with denominators of two, four, five and ten as decimals and decimals as fractions.

Grade 5. Students understand concepts of positive and negative integers.

5. Compare and order positive and negative integers.
6. Find the difference between two integers in a context.

Forest Funds Rules & Tree Identification

Goals:

The goal of the game is to make the most amount of leafy "money." In order to do this, one must collect the largest number of high-valued leaves while leaving behind the leaves that are negatively valued. Next, players must calculate how much total "money" they've collected in leaves, at the same time, making sure to make the least amount of mathematical errors. For students in higher grades, participants must also correctly calculate the percent composition of the species of leaves in their collection, i.e.: What percent of their collection is made up of white oak leaves? What percent of the collection is made up of striped maple leaves?

Rules:

Collecting Your Green:

1. Your teacher will give you five minutes to gather as many leaves as you can into your bag. The leaves **cannot** be taken from live trees, and can only be collected from the ground. It will be obvious if you are taking leaves off of live branches, and you will be disqualified. You'll also want to pay attention to the leaves that will bring you more income, as well as the leaves that will cause you to lose money. **You don't just want to scoop up everything from the ground, because any pine needles collected cost you $1.00 each!** Look at the chart below for the value of each leaf type.

Value	Leaf Type
+.50	Northern Red Oak
-.50	Eastern White Oak
+.10	American Beech
+1.00	Striped Maple
+.25	Red Maple
+.75	Sugar Maple
+.25	White Ash
-1.00	Any Needle (White Pine, Red Pine, Hemlock)
No Value	All other Leaves

2. Once time is up, you will take the leaves out of your bag one by one adding up, first the amount of "money" you made per leaf type, and then the total amount of "money" you

made all together. See the following page for an example. You will need to show every step of your calculations so your teacher can correct your work.

Amount of "Money" made per leaf species:

Leaf Type	Value of Leaf
Northern Red Oak	+ $0.50
Northern Red Oak	+ $0.50
Northern Red Oak	+ $0.50
Northern Red Oak	+ $0.50
Northern Red Oak	+ $0.50
Sum of Northern Red Oak	**= $2.50**

American Beech	+ $0.10
American Beech	+ $0.10
American Beech	+ $0.10
Sum of American Beech	**= $0.30**

White Ash	+ $0.25
White Ash	+ $0.25
White Ash	+ $0.25
White Ash	+ $0.25
Sum of White Ash	**= $1.00**

Leaf Type	Value of Leaf
Eastern White Oak	$0.50
Eastern White Oak	$0.50
Sum of Eastern White Oak	**= -$1.00**

Red Maple	+ $0.25
Red Maple	+ $0.25
Red Maple	+ $0.25
Sum of Red Maple	**= $0.75**

Striped Maple	+ $1.00
Striped Maple	+ $1.00
Sum of Striped Maple	**= $2.00**

Sugar Maple	+ $0.75
Sum of Sugar Maple	**= $0.75**

White Pine Needle	$1.00
Sum White Pine Needle	= -$1.00

Total amount of "money" made:

Total Red Oak	+ $2.50
Total American Beech	+ $0.30
Total White Ash	+ $1.00
Total White Oak	$1.00
Total Red Maple	+ $0.75
Total Striped Maple	+ $2.00
Total Sugar Maple	+ $0.75
Total Pine Needles	$1.00
TOTAL "Money" Made	**= $5.30**

3. **For higher grade levels**, add up the total amount of leaves that you have collected. Next, calculate the percent species make up of the entire collection. What percent of your total leaf collection is made up of red oak leaves? What percent of your total leaf collection is made up of American beech leaves? Continue calculations for each leaf species. See the following example:

Total Amount of Leaves Collected:

Leaf Species	**# of Leaves Collected For Each Species**
Red Oak	+ 5
American Beech	+ 3
Eastern White Ash	+ 4
White Oak	+ 2
Northern Red Maple	+ 3
Striped Maple	+ 2
Sugar Maple	+ 1
Pine Needle	+ 1
Total Amount of Leaves Collected	**= 21**

Percent Composition of Leaves:

Percent of Northern Red Oak Leaves	
Total Amt Red Oak Leaves	5
Total Amt of All Leaves	21
Divide Numbers	5/21 = 0.238
Multiply By 100%	0.238 X 100%
Percent of Red Oak Leaves	**= 0.238**

Percent of American Beech Leaves	
Total Amt American Beech Leaves	3
Total Amt of All Leaves	21
Divide Numbers	3/ 21=0.143
Multiply By 100%	0.143 X 100%
Percent of American Beech Leaves	**= 14.3%**

Percent of White Ash Leaves	
Total Amt White Ash Leaves	4
Total Amt of All Leaves	21
Divide Numbers	4/21 = 0.190
Multiply By 100%	0.190 X 100%
Percent of White Ash Leaves	**= 19%**

Percent of Eastern White Oak Leaves	
Total Amt White Oak Leaves	2
Total Amt of All Leaves	21
Divide Numbers	2/21 =0.095
Multiply By 100%	0.095 X 100%
Percent of White Oak Leaves	**= 9.5%**

Percent of Red Maple Leaves	
Total Amt Red Maple Leaves	3
Total Amt of All Leaves	21
Divide Numbers	3/21 = 0.143
Multiply By 100%	0.143 X 100%
Percent of Red Maple Leaves	**= 14.3%**

Percent of Striped Maple Leaves	
Total Amt Striped Maple Leaves	2
Total Amt of All Leaves	21
Divide Numbers	2/21 =0.095
Multiply By 100%	0.095 X 100%
Percent of Striped Maple Leaves	**= 9.5%**

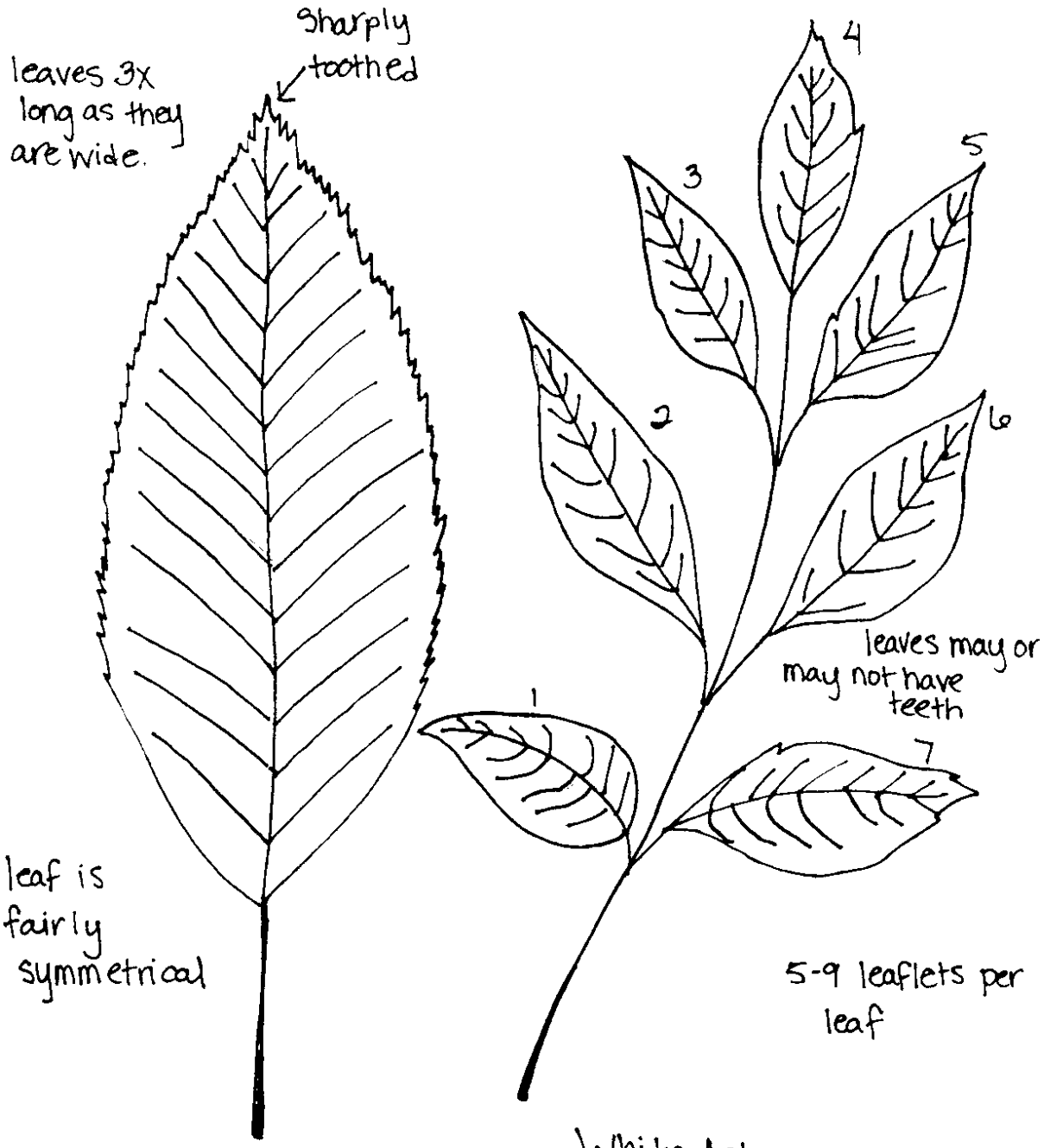
Percent of Sugar Maple Leaves	
Total Amt Sugar Maple Leaves	1
Total Amt of All Leaves	21
Divide Numbers	1/21 =0.050
Multiply By 100%	0.050 X 100%
Percent of Sugar Maple Leaves	**= 5%**

Percent of Pine Needles	
Total Amt Pine Needles	1
Total Amt of All Leaves	21
Divide Numbers	1/21 =0.050
Multiply By 100%	0.050 X 100%
Percent of Pine Needles	**= 5%**

4. Students must show all of their work when calculating either the total amount of "money" they collected, or the percent leaf composition of their collection. They must then hand in their worksheets to their teacher. Each mathematical error made by the students will cost them $0.25 off of the total amount they made from their leaves.

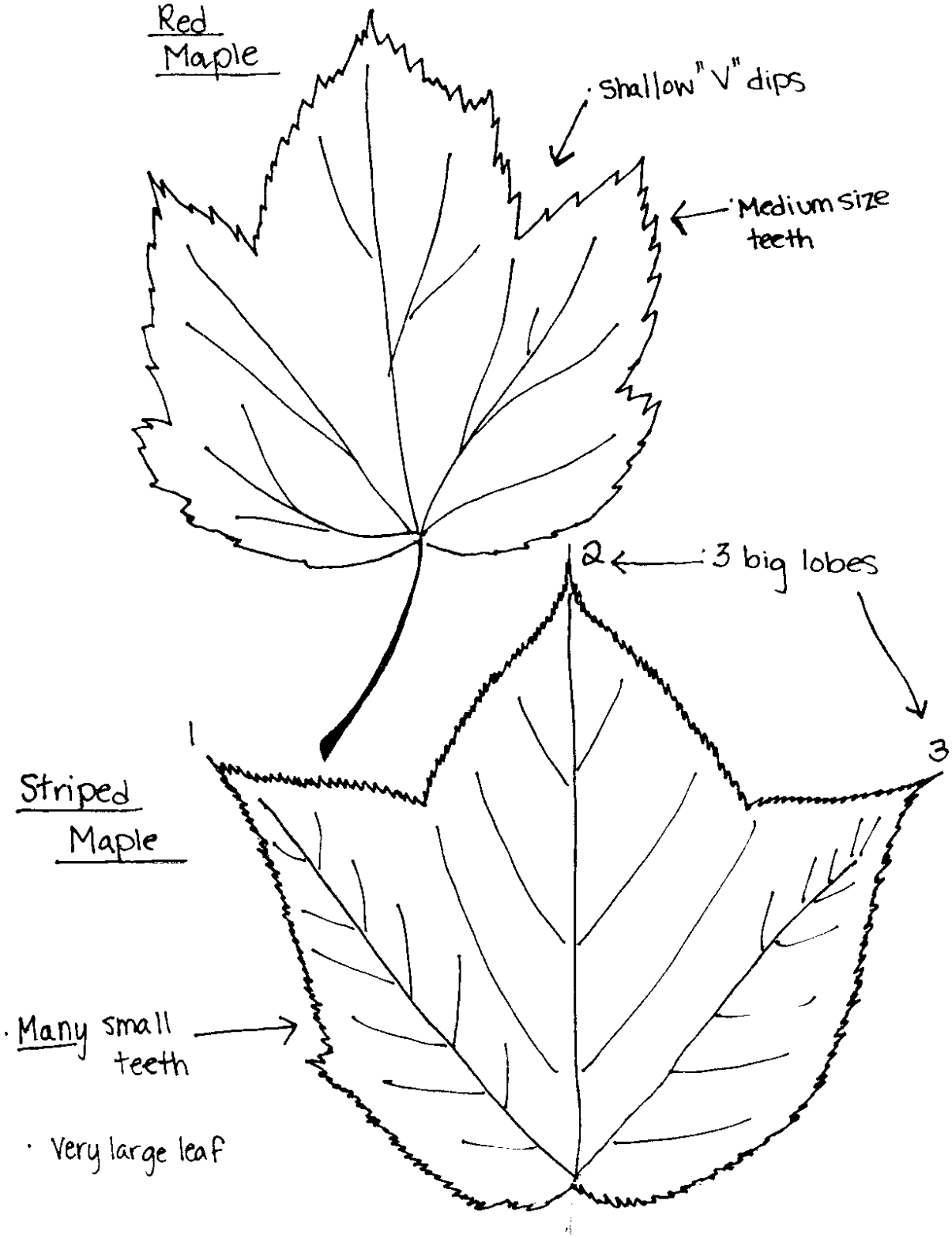
5. The student with the most "money" in the end wins the game!

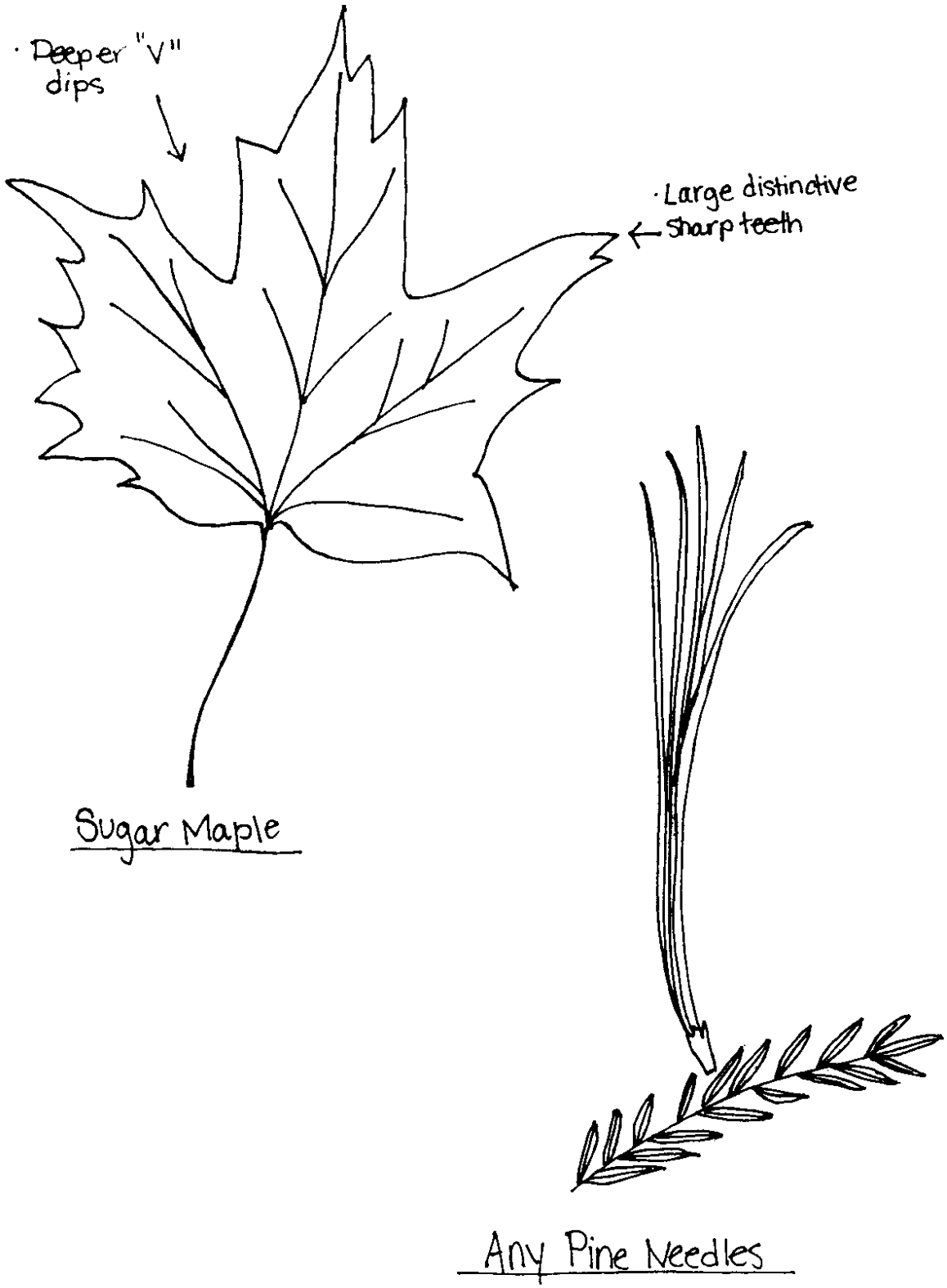
REMEMBER, NO RUNNING, NO PUSHING, DO YOUR MATH SLOWLY AND CAREFULLY, SO AS NOT TO LOSE "MONEY."

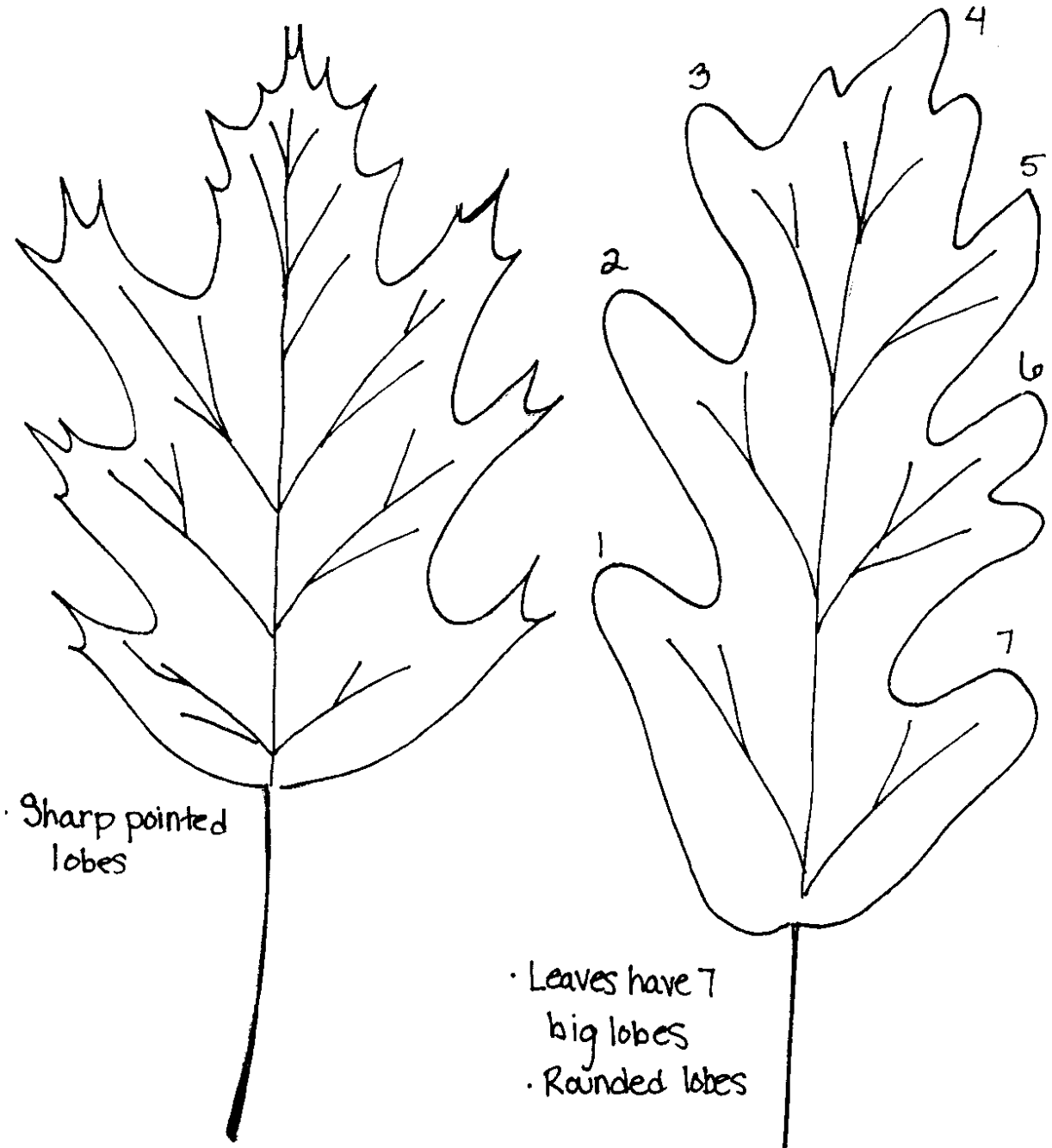


American Beech

White Ash


Red Maple
· Shallow "V" dips
· Medium size teeth
2
· 3 big lobes
1
3
Striped Maple
· Many small teeth
· Very large leaf


· Deeper "V" dips
· Large distinctive sharp teeth
Sugar Maple
Any Pine Needles



- Sharp pointed lobes

Northern Red Oak

- Leaves have 7 big lobes
- Rounded lobes

Eastern White Oak

Man-Made or Natural Walk
Grades K-2

Learner Outcomes:

Students will develop an understanding of what is natural and what is man-made by exploring the park and categorizing what they see.

Objectives:

Students will make two lists while on a walk in the park. They will write down what they see that is man-made and what is found naturally in the park.

Teachers' Step-by-step instructions:

a. In the classroom give a brief description of what is natural and what is man-made. Show one example of each. Example: Show a leaf for natural and point to a desk for man-made. It is important that they understand that a real leaf is natural but the cut out leaves that are trail markers in the park are man-made.

b. Hand worksheets out in the classroom so that students can start brainstorming on the walk to the park.

c. Teacher gives boundaries for the activity. The students must be able to see teachers/chaperones at all times. Also teachers must be able to see students.

d. Give each student their own worksheet. If you want them to work in pairs that is fine but it is good writing practice if each student has to hand in their own worksheet.

e. The students will have 10-20 minutes to work on their own. It is up to the teacher if they want to require a certain number of words for each category. Leave time at the end to share at least one word per student or pair. Share time can be done either outside at the outdoor classroom or inside depending on the behavior of the class. Sometimes bringing them inside to share helps them focus on each other.

Materials:

Each student needs:
- Clipboard
- Pencil
- Worksheet

Teacher should bring:
- Extra Pencils/sharpener

Extra worksheets

Connections to the Maine Learning Results:

Science and Technology

C2 Understandings About Science and Technology:

Students recognize that people have always engaged in science and technology and that there is a difference between the natural and designed worlds

b. Distinguish between objects that occur in nature and objects that are man-made.

Man versus Nature!

Name: _____

Directions: Make a list of the man-made things you see. And make a list of all the natural things you see.

Natural	Man-Made

Nature's Puzzle Pieces
Grades K-2

Learner Outcomes:
Students will be able to piece together the different parts that make up a whole tree, person, and house. Students will be able to explain how the tree, person and house need all of their parts in order to function as a whole.

Objectives:
Students will work as a group to piece together the different parts of a tree, person, and house. They will read and explain what each piece does and why it is important to the whole.

Teacher's Step-By-Step Instructions:

66. Prepare for class by making copies of the puzzle piece worksheet and backdrop worksheets of the tree, person, and house.
67. Have the students cut out each of the puzzle pieces.
68. Separate students into small groups that best match group dynamics.
69. Ask students what different parts make up the entire human body (Legs, arms, stomach, head, neck etc.). Explain or ask students what it means if an object is natural or man-made.
70. Introduce the idea that all natural and man-made objects are made up of many parts.
71. In the classroom piece together the human and the house puzzles.
72. Demonstrate how to piece together the human puzzle. Have the students start by picking one piece out of the group. They will say the name of the piece out loud, and figure out what that piece does when it is attached to the whole person.
    Ex. "This looks like it is the person's head. The head allows the person to see, taste, and smell everything around them. It also helps people think."
    The piece will then be placed in the correct spot on a backdrop sheet, and glued in place.
73. After placing each puzzle piece, have the students ask themselves, "Can this person or house function properly?" The answer should be "No," until all of the pieces are placed together.
74. Have the students count the total number of pieces that make up the entire object. Have them write the number down.
75. Next, explain to the class that they will be walking through Pondicherry Park to the outdoor classroom. In the classroom they will learn about the different parts of that make up some natural objects found in the park and around Bridgton. Have the students bring their final tree puzzle with them.

76. Walk as a group to the outdoor classroom. As you walk point out the different parts of natural things. Parts of the small vernal pool or pond would include: the banks, the water, the bugs, the frogs, and the muck at the bottom.
77. When you arrive at the classroom, have students take a seat, and point to a tree growing in the park. Ask, "Are trees made up of different parts like humans?" The answer is yes, they are made up of leaves, branches, a trunk, and roots. Explain that, "We are going to piece together all the parts of a tree to make our own trees."
78. Once the students have had the chance to build their puzzles, walk back to the school.
79. Have the students share the parts of their puzzles.

SIDE NOTE: If students are too young to use scissors on their own, have the students use the puzzle piece worksheets as a visual aid to help them draw each piece onto the backdrop worksheet.

Materials:

Scissors, puzzle piece worksheets (tree, person and house), the backdrop worksheet (tree, person and house), glue sticks for each group. (Bring drawing materials instead of scissors if students are too young to cut out puzzle pieces).

Connections to Maine Learning Results:

<u>Science and Technology</u>

A1 Systems:

Students recognize that parts work together, and make up whole man-made and natural objects.

gg. Explain that most man-made and natural objects are made of parts.

hh. Explain that when put together, parts can do things they could not do separately.

<u>Mathematics</u>

A1. Whole Number:

Students understand and use number notation and place value to 1000 in numerals.

o. Read and write numbers to 1000 using numerals.

Extensions:

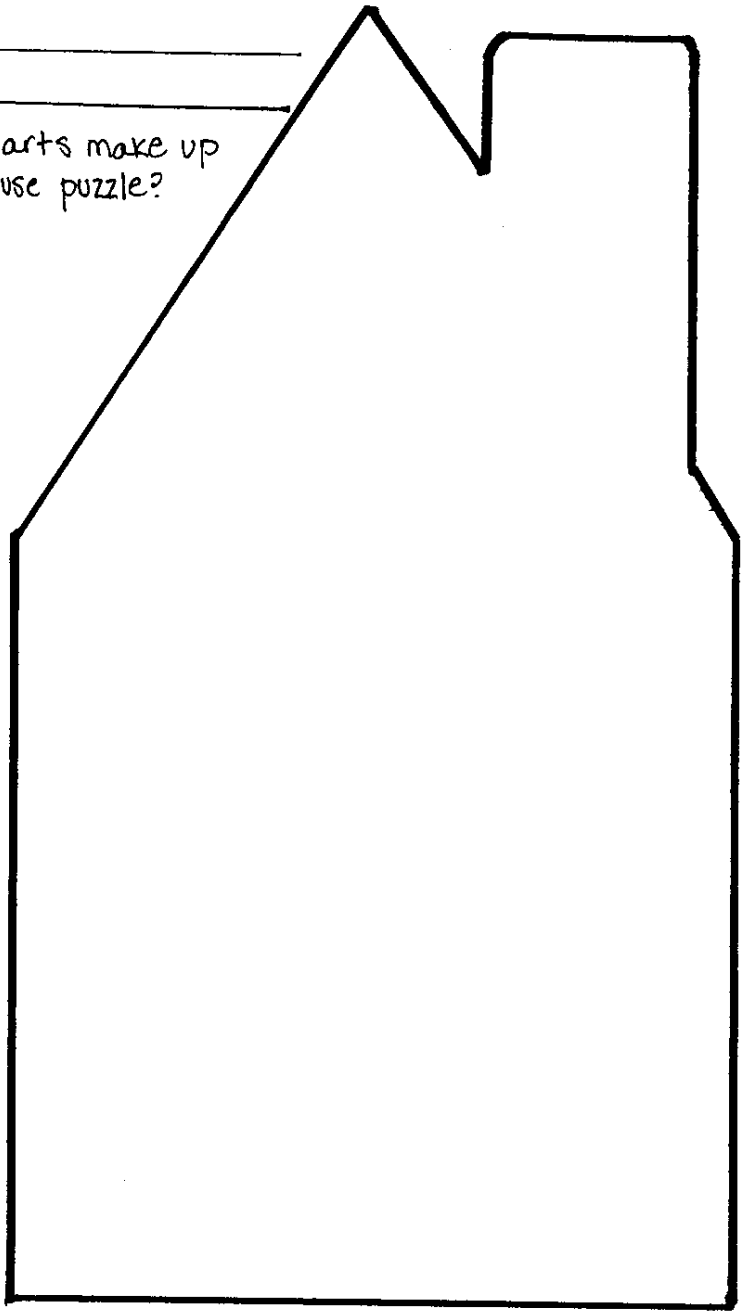
Have the students learn the "Bones of the Body" song, in order to repeat the idea that all things are made up of different parts.

Have the students give other examples of things in the outdoor classroom that are made up of parts.

Name _____

Date _____

How many parts make up the whole house puzzle?



Check list

Did you find the walls? ☐

Did you find the door? ☐

Did you find the windows? ☐

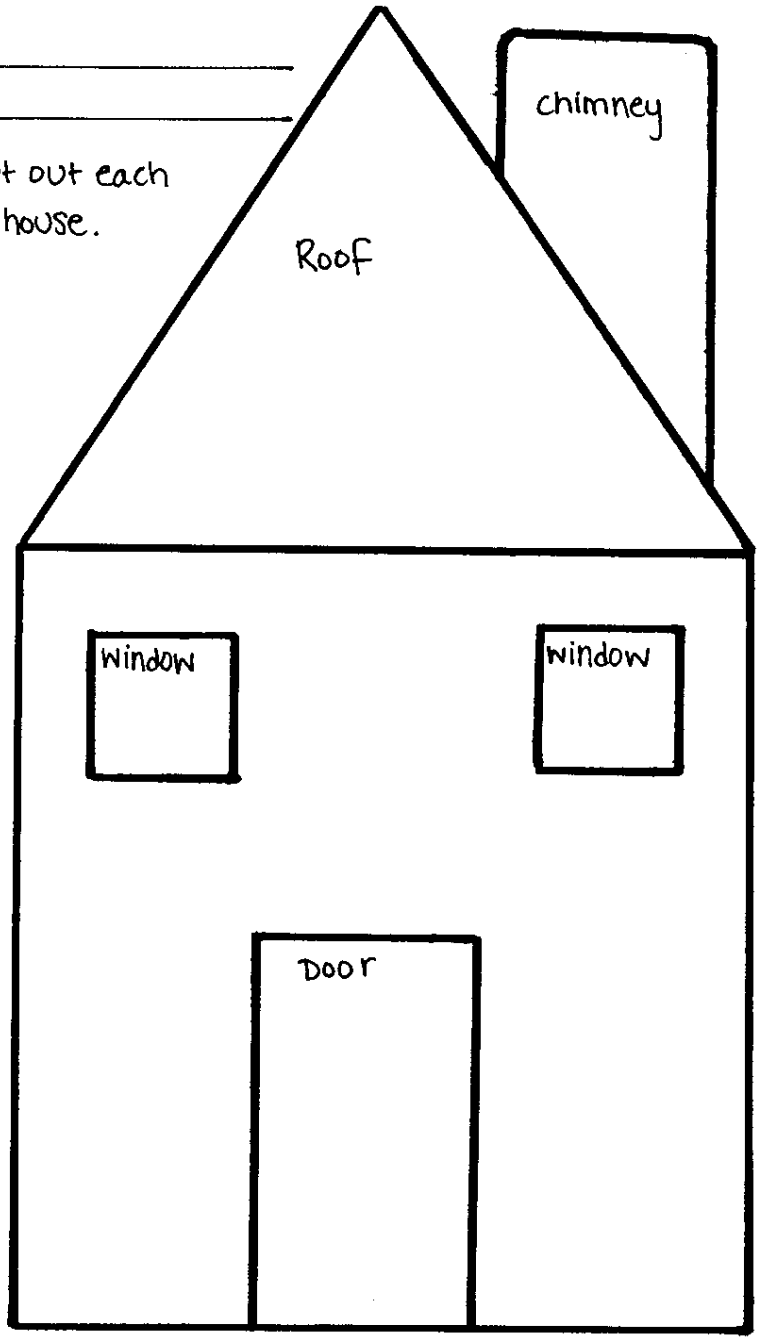
Did you find the roof? ☐

Did you find the chimney? ☐

Name _____

Date _____

Carefully cut out each part of the house.

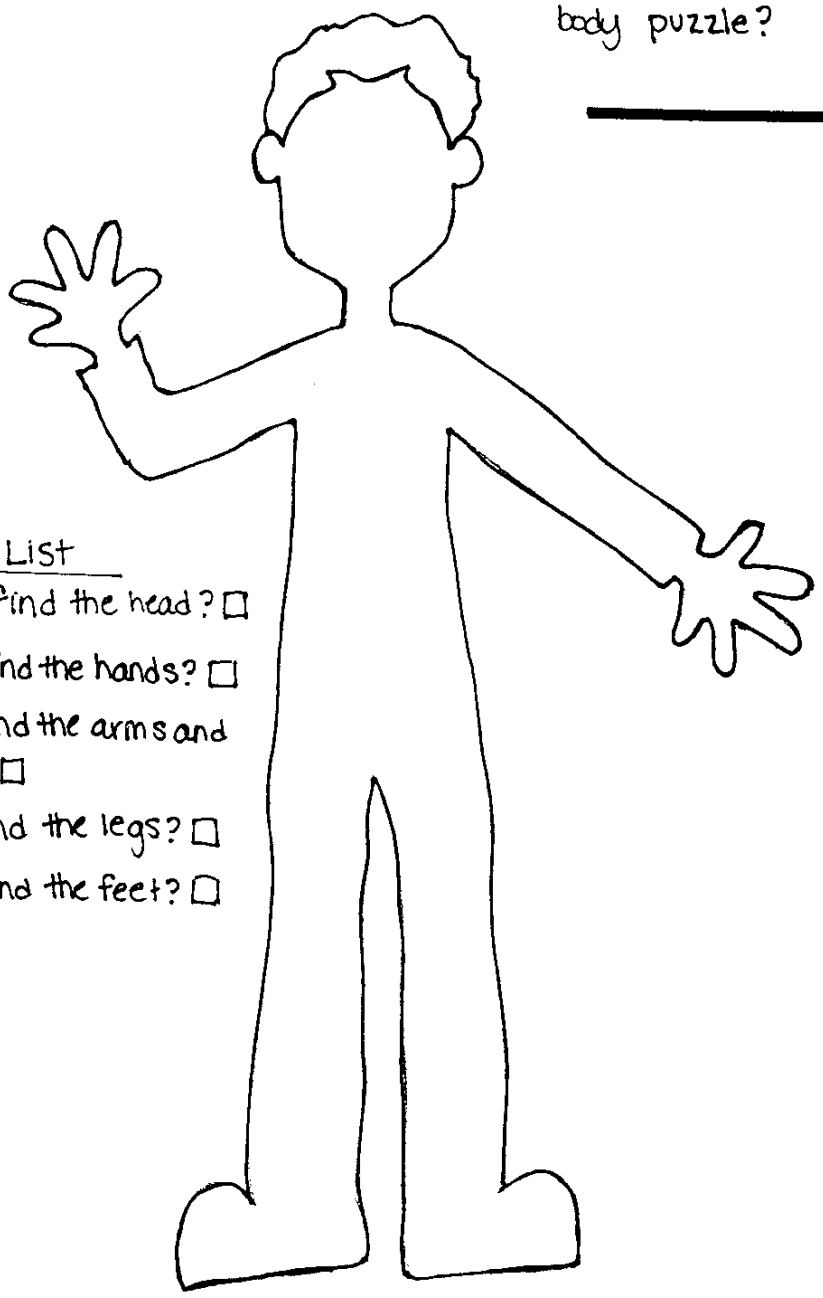


Name: _____

Date: _____

How many parts make up the whole body puzzle?

_____



Check List

Did you find the head? ☐

Did you find the hands? ☐

Did you find the arms and stomach? ☐

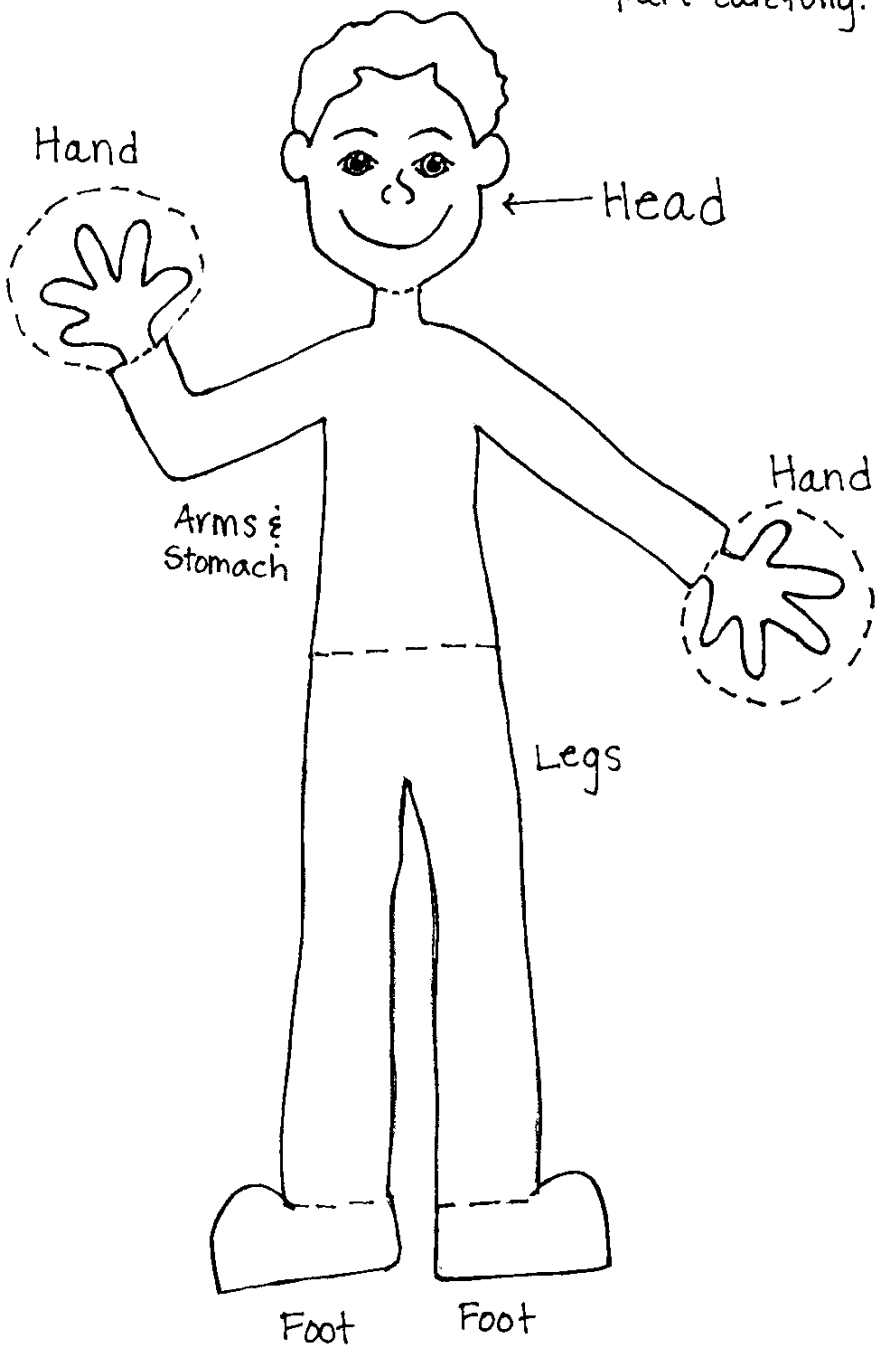
Did you find the legs? ☐

Did you find the feet? ☐

Name: _____

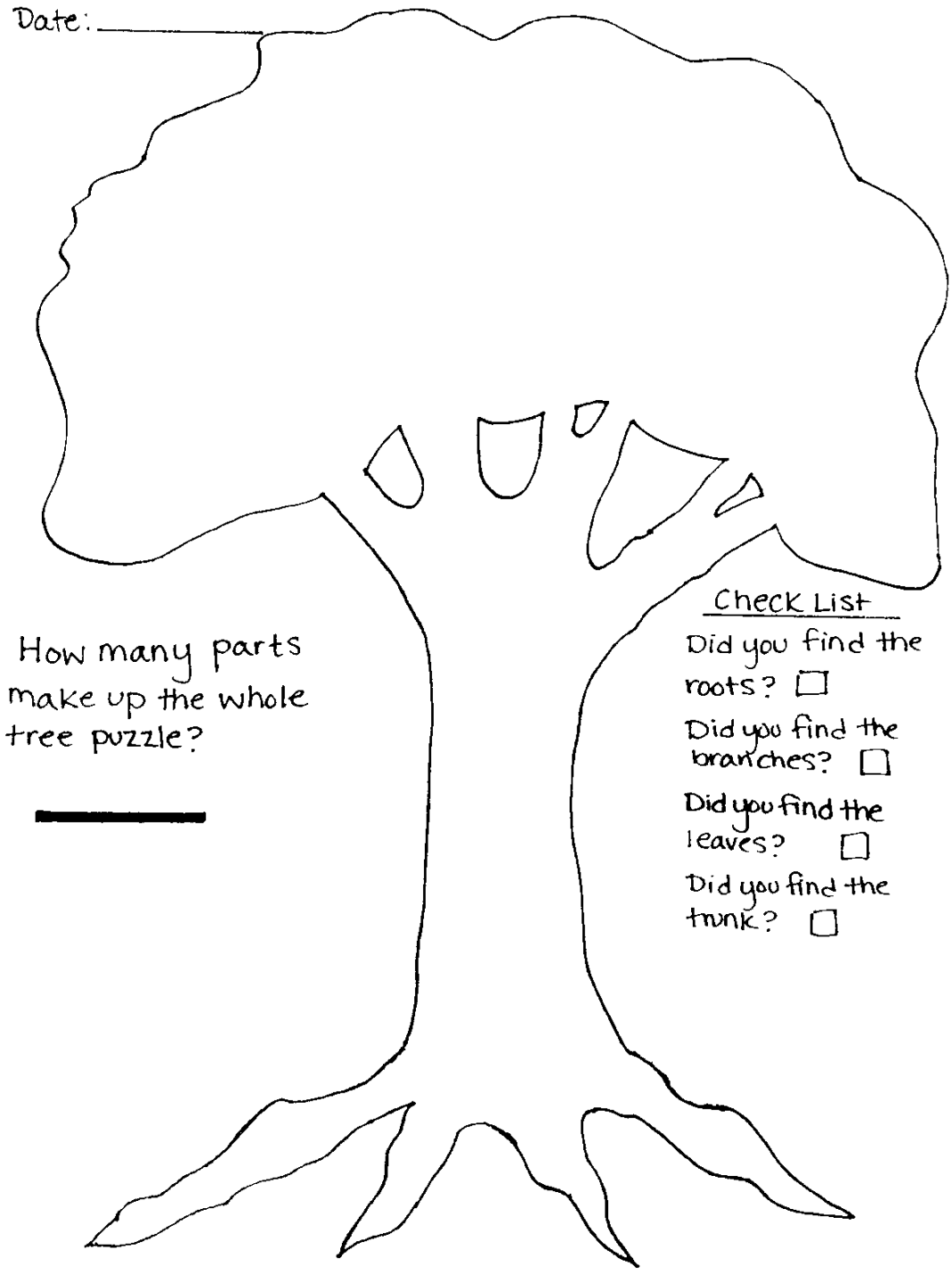
Date: _____

Cut out each body part carefully.



Name: _____

Date: _____



How many parts make up the whole tree puzzle?

_____

Check List

Did you find the roots? ☐

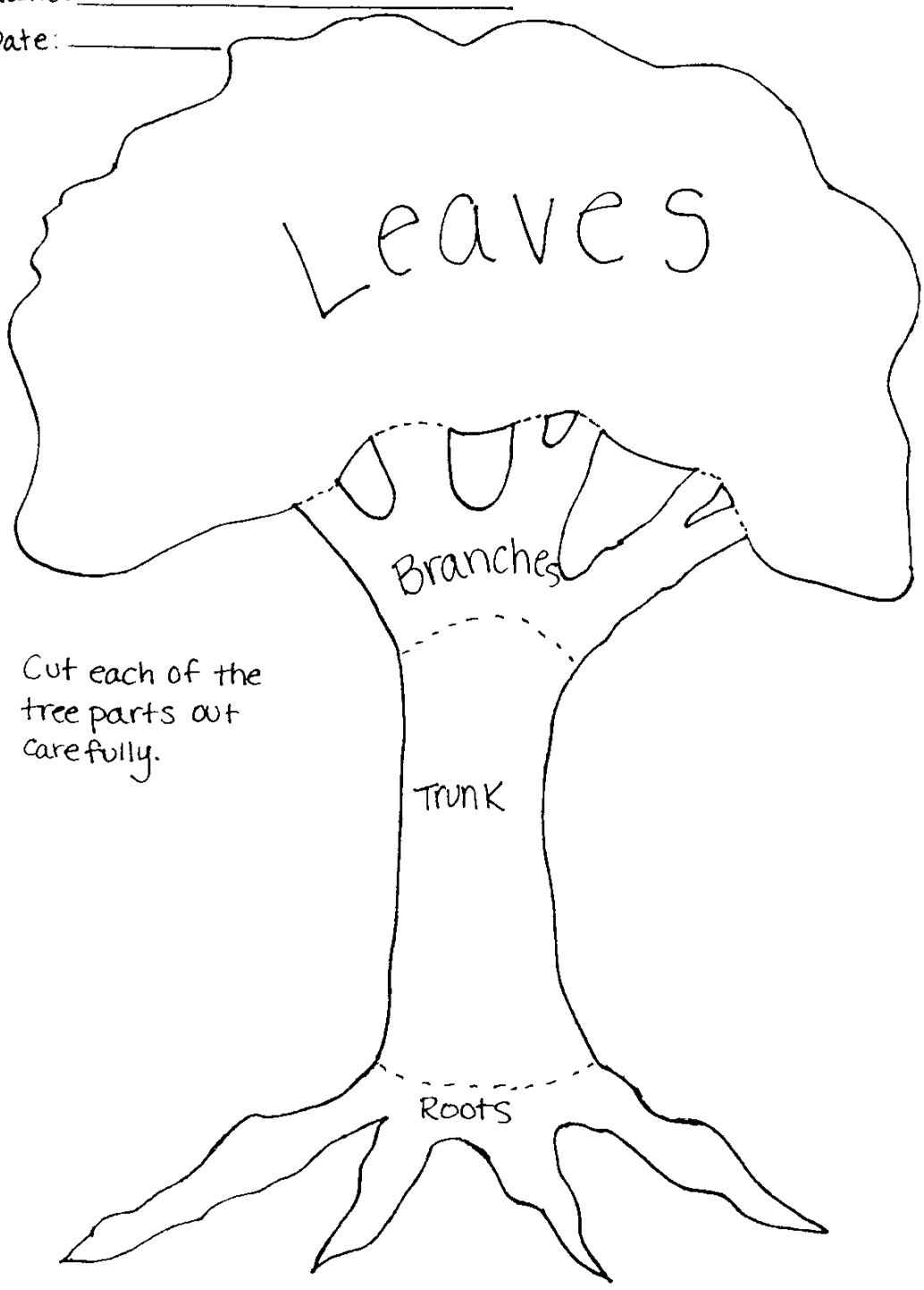
Did you find the branches? ☐

Did you find the leaves? ☐

Did you find the trunk? ☐

Name: _____

Date: _____



Cut each of the tree parts out carefully.

THESE BONES THESE BODY BONES

So you wanna be a doctor Well the getting there is slow A whole lot of school to learn the Things you gotta know We're going to call on our friend The skeleton And name these bones one by one You got the foot bones connected to the shin bones
The shin bones connected to the thigh bones
The thigh bones connected to the hip bones
These bones, these body bones. Now what we've got here is the lower Half of the body
The other bones of the body we need You see Cause put together neatly They make you and me
These bones, these bones, gonna Walk around These bones, these bones gonna Jump around
These bones, these bones gonna Dance around These bones, these body bones We got the finger bones connected to the hand bones,
The hand bones connected to the arm bones,
The arm bones connected to the shoulder bones,
These bones these body bones. Now, you and me are gonna play a little game I'll point to the bone And you say the name Foot bone Shin bone Thigh bone Hip bone Finger bone Hand bone Arm bone Head bone And all these bones together Make the curvy backbone Now that is good And now you all know How the bones fit together From head to toe Just stand close together And do your thing We'll put all the bones Together again As we sing One, two say what's in your shoe The foot bones connected to the Shin bones The shin bones connected to theThigh bones The thigh bones connected to the Hip bones These bones gonna walk around And the finger bones connected to the Hand bones The hand bones connected to the Arm bones The arm bones connected to the Shoulder bones And all the bones connected to the Head bone These bones of the body love to Walk around These bones of the body love to Jump around These bones of the body love to Dance around We love these body bones We love these body bones

Collecting the Annual Weather I
Grades 3-5

Learner Outcomes:
Students will understand the process of creating an investigable question relating to the seasonal changes in the environment throughout the year. Students will understand how to use simple tools such as thermometers, phases of the moon charts, their senses, and weather forecasts to measure and gather data.

Objectives:

Students will work together to come up with a yearlong data collection project to answer questions they would like to investigate about seasonal changes in the environment.

Teacher's Step-By-Step Instructions:

80. Start the first class by asking students what changes they might see in the natural world throughout the year. Some changes might include temperature, weather, and the amount of sunlight in a day. How might they be able to record these changes?
81. Have the students put on their thinking caps, and brainstorm a list of all the different questions they would like to investigate about the **changes** in the natural world throughout the seasons. Give examples such as: "How much does the temperature change from the winter to early summer?" or "How much does the amount of daylight in a day change from the start of school to the end?" (For younger grades, the teachers can come up with a set of sample questions the students can pick from to investigate.) Explain that scientists ask questions about the natural world all of the time and find the answers by collecting data.
82. Pick two or three questions that the students will be able to investigate using the Weather Data Collection worksheets.
83. Hand out one of the Weather Data Collection worksheets to each student. Explain that once a week, or once a month, they will be going to the same spot in Pondicherry Park to record data. (The students or teacher will use a reliable weather forecast site (intellicast.com) to collect some of the data such as the phase of the moon and the time of sunrise and sunset.) Explain that at the end of the year they will use all of the data they collected to seek the answers to their scientific questions.
84. If there is time, show the students the finished sample Weather Data Collection worksheet.

Materials:
Pencils and Weather Data Collection worksheets.

Connections to Maine Learning Results:

Science and Technology:

B1. Skills and Traits of Scientific Inquiry

ii. Pose investigable questions and seek answers from reliable sources of scientific information and from other investigations.

jj. Plan and safely conduct investigations including simple experiments that involve a fair test.

Extensions:

Have the students conduct a similar study in an area at their own home.
Have the students research other scientists that have asked questions about the natural world, and collected data to find out answers.

Date:	Time:
Place:	Temperature:
What's the weather like?	

Phase of the moon:			Time of Sunrise:	Hours of Daylight in a Day
% Illuminated			Time of Sunset:	

What do you see?	What do you feel?
What do you hear?	What do you smell?
Draw the horizon. Next, draw the placement of the sun in the sky in relation to the horizon.	

Date: January 13, 2011	Time: 9:13 A.M.
Place: Behind LRMS, behind the large boulder.	Temperature: 29°F

What's the weather like? Sunny, Chilly, Breezy, Beautiful

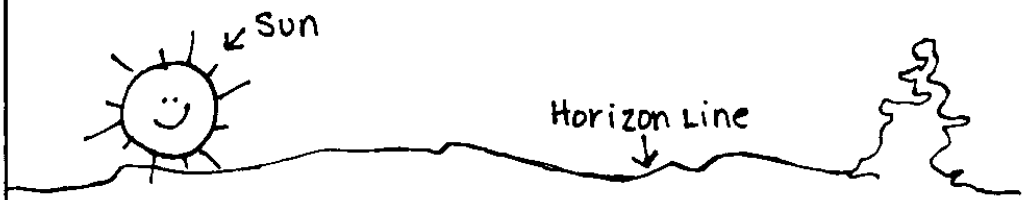
Burr...

Phase of the moon:			Time of Sunrise:	7:16 A.M.	Hours of Daylight in a Day
% Illuminated	61%		Time of Sunset:	4:28 P.M.	9 Hours & 12 Minutes

What do you see?	What do you feel?
Drifts of snow falling off trees	A fresh breeze on my face
Fresh snow covering everything	Snow melting down my back
Tracks in the snow	Happy because it's so pretty outside

What do you hear?	What do you smell?
The wind across the field	Fresh, crisp air
The crunch of snow under feet	Soggy gloves
The sound of other kids laughing	White pine needles

Draw the horizon. Next, draw the placement of the sun in the sky in relation to the horizon.



Name: _____
Date: _____
Group #: _____

Collecting the Annual Weather I
Investigable Question

p. What changes might you see in the natural world throughout the school year?

_____
_____
_____
_____
_____

q. Brainstorm a list of questions you would like to investigate about the changes in the natural world throughout the seasons.

_____
_____
_____
_____
_____

r. Write your final question here. You will be spending the year collecting data in order to answer this question, so make sure it's well thought out!

_____
_____
_____
_____

Collecting the Annual Weather II
Grades 3-5

Learner Outcomes:
Students will learn how to collect weather data throughout the school year. They will be able to recognize patterns and changes within the weather data as the seasons change. The students will understand the importance of having a consistent method to collect data. The students will have collected enough data to come up with answers to the scientific inquiries they came up with in the introductory class.

Objectives:
Students will go out into the park once a week (or once a month) to collect data on the weather. The students will use the same Weather Data Collection worksheet each outing in order that they have a consistent way of collecting information. They will also use thermometers, weather forecasts, and their senses to gather their data. As the students collect more and more information, they will begin to look for patterns and changes they see in their data that might help solve some of their scientific questions.

Teacher's Step-By-Step Instructions:

85. Prepare for class by finding out the time of sunrise and sunset, calculate the amount of daylight hours (or have the students calculate this amount), and record the phase of the moon for that specific day.
86. Find a spot in Pondicherry Park where you will take the students each week or month to collect data including air temperature, position of the sun in relation to the horizon, and other seasonal changes. Wherever you take the students into the park, should be a spot close enough to the school so that you can still take them there in the winter. It may be easier for the students if you pick a spot in the school yard, on the way to the park, where the students can draw the sun in relation to the horizon. It is best to find a spot in a clearing where the students will have a good view of the sun. During your class visit, place a thermometer somewhere in the data collection spot so that the students can find out the air temperature.
87. Distribute one of the data collection worksheets to each student. Remind everyone that once a week (or once a month) they will go outside to the same spot to record data. The students or teacher will use a reliable weather forecast site (intellicast.com) to collect some of the data such as the phase of the moon and the time of sunrise and sunset.
88. Take the students outside to their data collection site. Walk them through the first data collection experience. Make sure the students use as much detail as possible. Explain to them that the more detail they collect, the more they will be able to remember and use when they look back at their data throughout the year.

89. Date, Time, Place, & Temperature: Remind the students to use A.M. and P.M. when writing the time as well as ^{o}F or ^{o}C for the temperature. Walk through reading the thermometer with the students. Throughout the year have all of the students read the temperature at least once. When describing the place, have students use as many details as possible. They are behind the school, but where behind the school are they? Pondicherry Park. Where in Pondicherry Park are they? The Outdoor Classroom.
90. What is the weather like? Have the students draw pictures and use adjectives to describe the weather that day.
91. Phase of the Moon: Show the students the provided chart of the different phases of the moon. Explain that as the moon rotates around the earth and the earth rotates around the sun, the sun shines on different parts of the moon. Have the students draw the phase of the moon for that day, and write the % of the moon that is illuminated or lit up by the sun.
92. Sunrise & Sunset: Ask the students to think back to the early morning. About what time did the sun rise above the horizon? What time the previous night did the sun set? What time do they think it will set tonight? Give them the answers. Students may also look up the sunrise, sunset and phase of the moon before they go out to their data collection spots in order that they get experience using a weather forecast Web site. Pre-calculate the amount of sunlight in the day, or have the students finish it in class.
93. Next, the students should spread out and write or draw as many things they can see, feel, hear, and smell. They should have at least three things written or drawn in each column. Finally, the students should draw a rough sketch of the horizon using just one line. They should draw a circle representing where the sun is located in the horizon. You'll want to have the students all facing the same direction to draw the horizon line so that they will all have similar data.
94. Discuss with the students how their data represents what was happening in the environment that day.
95. Make sure the students keep their data sheets in their own Weather Data Collection folder as soon as they are done so they don't get lost. As more and more data is collected, the students should spend class time looking over the numbers for patterns and changes they see in the information.

Materials:

Air thermometer and a place to attach it outdoors, phases of the moon chart, pencil, clipboards, and Weather Data Collection worksheets.

Connection to Maine Learning Results:

<u>Science and Technology</u>

A2 Models:

Students use models to represent objects, processes, and events from the physical setting, the living environment, and the technological world.

kk. Represent the features of a real object, event or process using models including geometric figures, number sequences, graphs, diagrams, sketches, maps, or three-dimensional figures and not ways in which those representations do (and do not) match features of the originals.

A3 Constancy and Change:

Students identify and represent basic patterns of change in the physical setting, the living environment, and the technological world.

s. Recognize patterns of change including steady, repetitive, irregular, or apparently unpredictable change.

A4 Scale:

Students use mathematics to describe scale for man-made and natural things.

u. Measure things to compare sizes, speeds, times, distances, and weights.

B1 Skills and Traits of Scientific Inquiry

Students plan, conduct, analyze data from, and communicate results of investigations, including fair tests.

v. Plan and safely conduct investigations including simple experiments that involve a fair test.

w. Use simple equipment, tools and appropriate metric units of measurement to gather data and extend the senses.

D1. Universe and Solar System

Students describe the positions and apparent motions of different objects in and beyond our solar system and how these objects can be viewed from Earth.

t. Observe and report on observations that the sun appears to move across the sky in the same way every day, but its path changes slowly over the seasons.

<u>Mathematics</u>

A1 Numbers: Whole Number

Grade 3. Students understand and use number notation and place value up to 10,000 in numerals.

35. Read and write numbers up to 1000 using numerals and words.
36. Recognize the place values of digits in numbers up to 10,000.

Students understand and use procedures to add and subtract whole numbers with up to four digits.

15. Display an understanding of the base ten place value system.

B1. Data: Measurement and Approximation

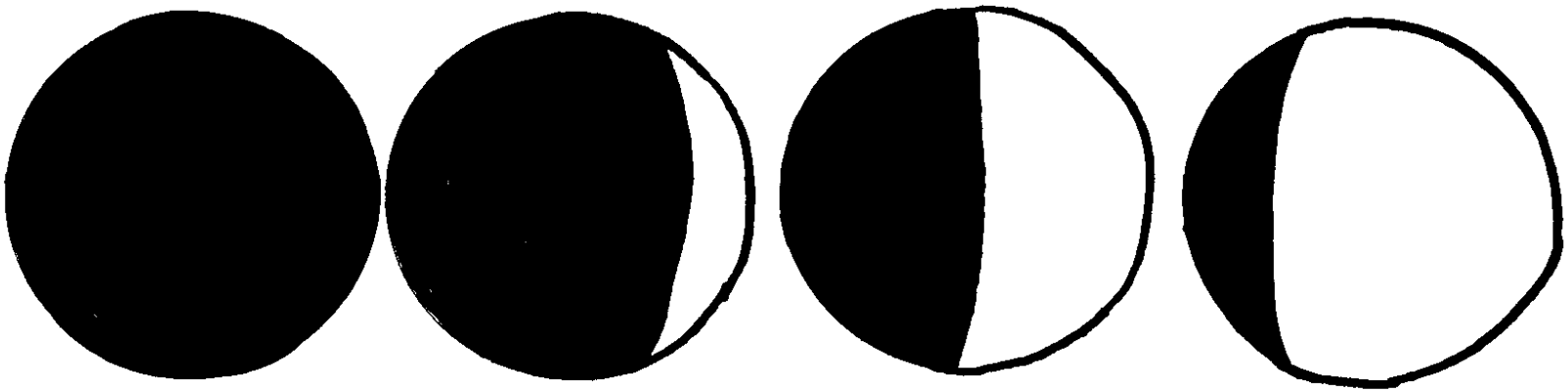
Grade 3 & 4. Students understand and use units of time, temperature.

7. Select appropriate tools and units for these measures.
8. Solve and justify problems with these measures.

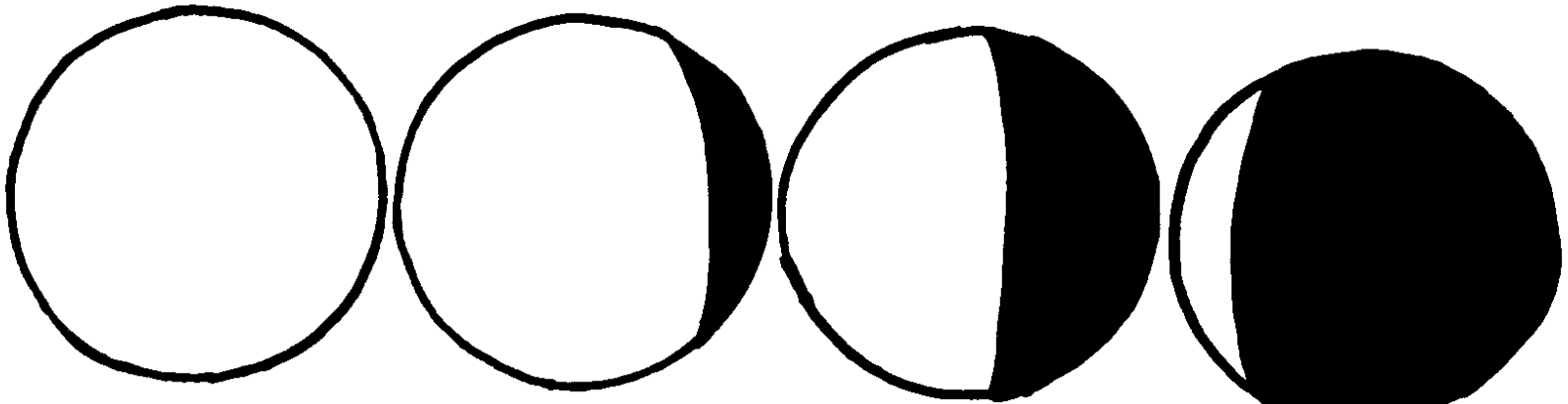
Grade 5. Students understand and use measures of elapsed time, temperature, capacity, mass and use measures of mass and weight.

6. Select and use appropriate tools and units for these measures.
7. Solve and justify problems with these measures.

Date:			Time:	
Place:			Temperature:	
What's the weather like?				
Phase of the moon:			Time of Sunrise:	Hours of Daylight in a Day
% Illuminated			Time of Sunset:	
What do you see?			What do you feel?	
What do you hear?			What do you smell?	
Draw the horizon. Next, draw the placement of the sun in the sky in relation to the horizon.				



New Moon Waxing crescent first quarter waxing gibbous



full Moon waning gibbous last quarter waning crescent

Phases of the Moon

Collecting the Annual Weather III
Grades 3-5

Learner Outcomes:
Students will understand how to make tables and graphs that represent the changes they see in the outdoor environment throughout the year. The tables and graphs made will be used to model the changes in the data collected from the living environment. The students will put together their findings to answer the original scientific inquiries they had about changes in the natural world throughout the seasons.

Objectives:
Students will create at least one table and one graph depicting the changes in data they collected over the course of the year. The students will create a report of their total findings including the answers to their scientific inquiries.

Teacher's Step-By-Step Instructions:

96. Prepare for class by printing out the example collaborative data worksheet, table, and graph (or create your own).
97. Have the students take out their Weather Data Collection folders, and import all of their data onto the "Weather Data Inventory spreadsheet" on Excel.
98. Have the students look specifically at the data collected that is specific to their original scientific questions.
99. The students should make a table of the data specific to their question, and a graph representing their findings.
100. For older students, have them calculate mean, median and mode of the air temperatures they collected throughout the year.
101. Have the students write a summary of how they, as scientists, answered their own questions by developing explanations based on their observations, evidence and data of the natural world.

Materials:
Computer, all Weather Data Collection worksheets from the year, pencils, graph paper, colored pencils or crayons.

Connections to Maine Learning Results:
Science and Technology
A2 Models:
Students use models to represent objects, processes, and events from the physical setting, the living environment, and the technological world.

ll. Represent the features of a real object, event, or process using models including geometric figures, number sequences, graphs, diagrams, sketches, maps, or three-

dimensional figures and note ways in which those representations do (and do not) match features of the originals.

A3 Constancy and Change

Students identify and represent basic patterns of change in the physical setting, the living environment, and the technological world.

u. Recognize patterns of change including steady, repetitive, irregular, or apparently unpredictable change.
v. Make tables and graphs to represent changes.

B1. Skills and Traits of Scientific Inquiry

Students plan, conduct, analyze data from, and communicate results of investigations, including fair tests.

d. Use data to construct and support a reasonable explanation.
e. Communicate scientific procedures and explanations.

C1. Understandings of Inquiry

Students describe how scientific investigations result in explanations that are communicated to other scientists.

x. Describe how scientists answer questions by developing explanations based on observations, evidence, and knowledge of the natural world.

<u>Mathematics</u>

A1 Numbers: Whole Number

Grade 3. Students understand and use number notation and place value up to 10,000 in numerals.

37. Read and write numbers up to 1000 using numerals and words.
38. Recognize the place values of digits in numbers up to 10,000.

Students understand and use procedures to add and subtract whole numbers with up to four digits.

16. Display an understanding of the base ten place value system.

B1. Data: Measurement and Approximation

Grade 3 & 4. Students understand and use units of time, temperature.

9. Select appropriate tools and units for these measures.
10. Solve and justify problems with these measures.

Grade 5. Students understand and use measures of elapsed time, temperature, capacity, mass and use measures of mass and weight.

8. Select and use appropriate tools and units for these measures.
9. Solve and justify problems with these measures.

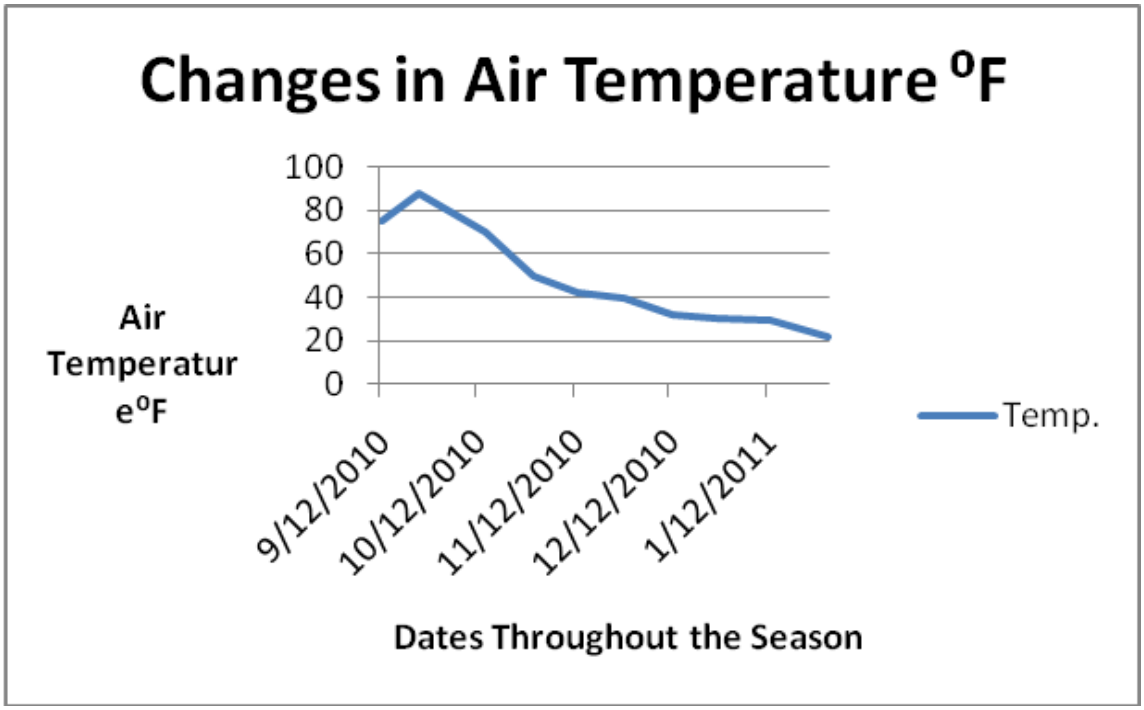
B2. Data: Data Analysis

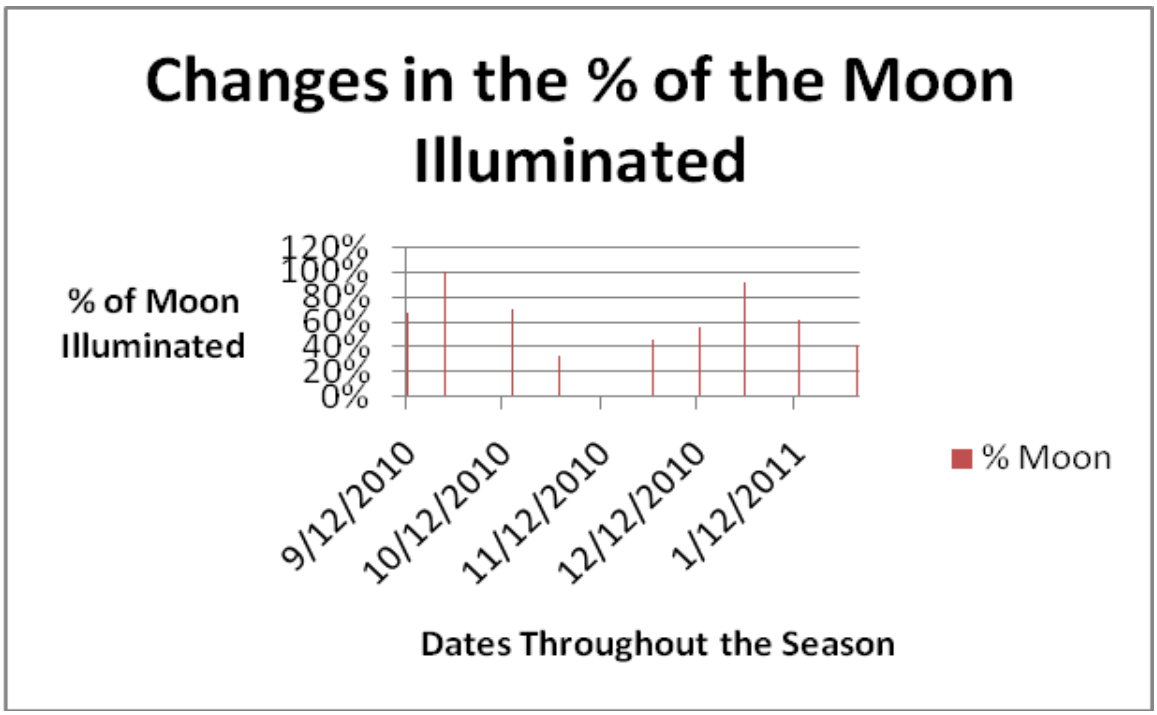
Grade 3. Students read, construct, and interpret bar graphs.

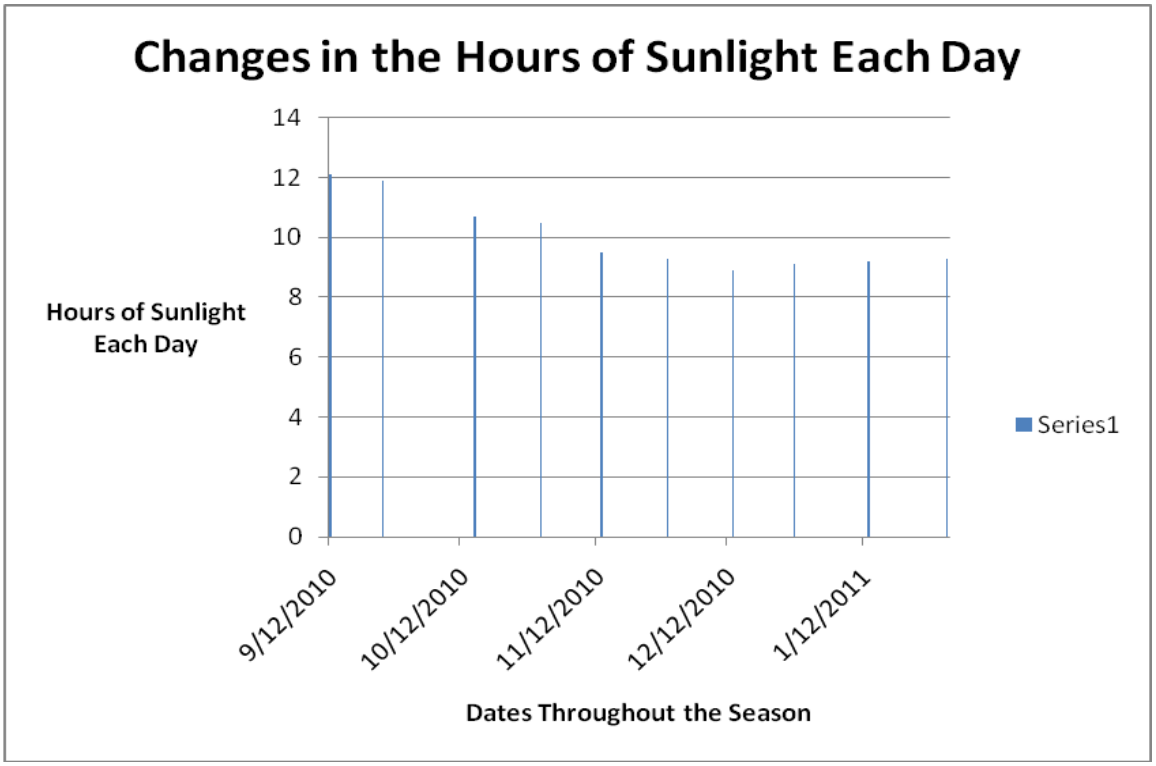
Grade 4. Students collect and represent data in tables, line plots, and bar graphs, and read and interpret these types of data displays.

Grade 5. Students read, construct, and interpret line graphs. Students find and use median, mode, and range for a set of data.

DATE	Time	Place	Temp.	Weather	% Moon	Hrs of Sun
9/12/2010	10:30	Large Boulder	75	Sunny, Hot, Humid	68%	12.1
9/24/2010	10:30	Large Boulder	88	Cloudy, drizzling, muggy	100%	11.9
10/15/2010	9:30	Large Boulder	70	Clear Blue Sky, Windy	70%	10.7
10/30/2010	10:00	Large Boulder	50	Cloudy, Windy	32%	10.5
11/13/2010	10:30	Large Boulder	42	Clear Blue Sky	0%	9.5
11/28/2010	9:30	Large Boulder	40	Partially Sunny, Breezy	45%	9.3
12/13/2010	10:00	Large Boulder	32	Cloudy, Slight Flurries, Breezy	56%	8.9
12/27/2010	9:30	Large Boulder	30	Partially Sunny	92%	9.1
1/13/2011	10:00	Large Boulder	29	Sunny, Windy, Crisp	61%	9.2
1/31/2011	10:00	Large Boulder	22	Sunny, Cold	41%	9.3




Changes in the % of the Moon Illuminated
% of Moon Illuminated
120%
100%
80%
60%
40%
20%
0%
9/12/2010
10/12/2010
11/12/2010
12/12/2010
1/12/2011
% Moon
Dates Throughout the Season


Changes in the Hours of Sunlight Each Day
Hours of Sunlight Each Day
14
12
10
8
6
4
2
0
9/12/2010
10/12/2010
11/12/2010
12/12/2010
1/12/2011
Series1
Dates Throughout the Season

WEATHER DATA INVENTORY SPREADSHEET

Date	Time	Place	Temp.	Weather	Phase of Moon	Sunrise	Sunset	Hours of Sunlight

Pondicherry Ecosystems I
Grades 3-5

Learner Outcomes:
Students will understand what an ecosystem is and why each organism is important.

Objectives:
The class will participate in an activity that demonstrates how living and non-living factors work together to form an ecosystem. The activity will include creating a web with string to show how everything is connected.

Teacher's Step-by-Step Instructions:

1. Note: This lesson is similar to the Web of Life lesson. This is a little simpler, however, and has more focus on abiotic factors.
2. Prepare for class by printing out the list of living and non-living parts of an ecosystem. Cut them into slips and make sure there is enough for each student in class. Try and have a good mix of living and non-living items since both are important.
3. While inside, distribute worksheet to students. Write brief definitions of vocabulary words on the board and have students copy them.
    a. Ecosystem: A group of living and non-living things working together.
    b. Biotic: Living. Plants and animals.
    c. Abiotic: Non-Living. Sun, water, soil and air.
4. Tell students that today they will create their own ecosystem in Pondicherry Park using students as parts of the environment.
5. Bring students to the outdoor classroom. Students should bring their worksheets and something to write with. This activity works best when everyone is sitting in a circle where they can see each other.
6. After everyone is seated give each student a slip of paper. Quickly have each student say what their ecosystem factor is. Discuss any that the students don't understand so that they are able to fully participate. Also tell them that there may be more than one of an abiotic factor because the sun and water are so abundant.
7. Explain that the students are now going to make connections between the different factors in an ecosystem. They have probably studied food chains or webs before and this is similar to that only we added the non-living parts of the ecosystem.
8. Start at any student by giving them the ball of string or yarn. Remind them that almost all of the factors can be connected but some need to be thought about a little harder. Have the first student choose their connections and gently toss or roll the ball to that person. Remind them to hold on to the end of the string so it doesn't get away.
9. To avoid a lot of distraction and tangled string tell students to hold the string on the ground when they are not passing it along.

10. When each student has made a connection ask the students to look at the ecosystem they have made. Get them to discuss the effects of one or two factors being taken out.
11. Roll string back up.
12. Give students time to fill out the remainder of the worksheet. You can assign the last two questions as homework because they would make nice short essays.
13. In preparation for the ecosystems diorama activity you can have the students choose one item from the park to use in their model. Remind them not to pick anything that is alive, only something from the ground.

Materials:
Teacher: Ball of string or yarn (braided yarn works best but time consuming to make), slips of paper with ecosystem factors (hint: try using cards from Web of Life and adding on abiotic factor), extra pencils and worksheets for outside.
Student: Worksheet, pencil, clipboard

Connections to the Maine Learning Results:
Science and Technology
E2 Ecosystems:
Students describe ways organisms depend upon, interact within, and change the living and non-living environment as well as ways the environment affects organisms.

c. Describe some of the ways in which organisms depend on one another, including animals carrying pollen and dispersing seeds.
d. Explain how the food of most animals can be traced back to plants and how animals use food for energy and repair.
e. Explain how organisms can affect the environment in different ways.

English Language Arts

B3 Argument/Analysis:

Students write to identify and explain a position to an identified audience.

b. Write about a central question or idea by using relevant supporting facts and details.

River Otter	Water
Brook Trout	Water
Dragonfly	Water
Mosquito	Water
White Tailed Deer	Sun
Red Fox	Sun
Green Frog	Sun
Lily Pad	Sun
Beaver	Soil
Maple Tree	Soil
Bald Eagle	Soil
Painted Turtle	Fresh Air
Red Squirrel	Fresh Air
Acorn	Fresh Air

Ecosystems

illustration by Jeff Grader / property of Delta Education

Name:_____

Vocabulary

Abiotic:

Biotic:

Ecosystem:

Activity

What card did you have during the activity?

Was it an abiotic or biotic factor?

How was the factor on your card important in the ecosystem?

If the factor on your card was removed from the ecosystem, what could happen?

Pondicherry Ecosystems II
Grades 3-5

Learner Outcomes:
Students will understand that there are different ecosystems within Pondicherry Park. They will create a model of one ecosystem to show the interaction of different organisms.

Objectives:
Students will create a diorama including plants, animals and non-living factors to demonstrate understanding of ecosystems.

Teacher's Step-By-Step Instructions:

102. Students should have a basic understanding of what an ecosystem is. Pondicherry Ecosystems I or Web of Life thoroughly explain through activities.
103. Explain to the students that there are two very important but different types of ecosystems in the park, aquatic and forest. The students will choose one of these types to create a diorama.
104. Get students ready to go out to the park. You will explore both the forest ecosystem and aquatic ecosystem so that students can decide which they want to focus on. Students will need writing equipment so that they can sketch their ecosystem.
105. Take students to the park and point out the forest and aquatic ecosystems along the way. Students should observe their surroundings so their dioramas are complete.
106. Pause on the Ham Bridge to show the flowing water where beavers, mink and otters have been seen swimming. Many aquatic insects live in the banks here, including dragonflies.
107. Stop at the outdoor classroom where students can observe both ecosystems. Have them sit and sketch the ecosystem. Remind them to include a few details so that they can recreate them in their projects. The level of detail can depend on the grade.
108. After students are done with sketches or time is up, tell them they can choose one small item off the ground in the park to include in their diorama. The rest should be found in the classroom or at home. It is important to limit the disturbance to the park but it will be fun to include a little piece.
109. Back in the classroom you can give students time to work on their diorama or assign the rest as homework.
110. Hint: For grade 5 it would be good to include a requirement of connections within the ecosystem. There are lists including important species for each ecosystem and you can give students all or some of these to include in their projects.

Materials:
Teachers: Option of providing materials to make diorama. This would include cardboard or shoe boxes, construction paper, popsicle sticks and various craft items. List of ecosystem requirements.
Students: Paper, clipboard and writing utensil for making sketch and taking notes outside.

Connections to the Maine Learning Results:
Science and Technology
A1. Systems:
- mm. Give examples that show how individual parts of organisms, ecosystems, or man-made structures can influence one another.
- nn. Explain ways that things including organisms, ecosystems, or man-made structures may not work as well (or at all) if a part is missing, broken, worn out, mismatched, or misconnected.

A2. Models:
- w. Represent the features of a real object, event or process using models including geometric figures, number sequences, graphs, diagrams, sketches, maps, or three-dimensional figures and note ways in which those representations do (and do not) match features of the originals.

Wetland Ecosystem	Forest Ecosystem
Beaver	White Tailed Deer
River Otter	Red Fox
Brown Trout	Porcupine
Great Blue Heron	Snowshoe Hare
Painted Turtle	American Crow
Mink	Broad winged Hawk
Muskrat	White-Footed Mouse
Dragonfly Larva	Pileated Woodpecker
Mosquito Larva	Dragonfly
Mallard	Mosquito
Green Frog	Red Backed Salamander
Bullfrog	Eastern White Pine
Razor Grass	Sugar Maple
Cattails	White Ash
Red Maple	Wintergreen
Plankton	Moss
Water	Water
Sun	Sun
Soil	Soil
Air	Air

Pondicherry Park Research Questions
Grades 3-5

Learner Outcomes:
Students understand how to conduct a simple experiment based on a research question and how to communicate results of an experiment.

Objectives:
Students are taught about what a scientist does and how they conduct experiments. Students choose a research question about Pondicherry Park and design an experiment around that question.

Teacher's Step-by-Step Instructions:

111. Talk to students about how scientists conduct experiments and why.
    a. Pose a question they want an answer to.
    b. Hypothesize what the answer is going to be.
    c. Design an experiment to test their question.
    d. Collect data from the experiment.
    e. Analyze data.
    f. Use data to answer their question.
    g. Communicate the results of the experiment. Were they right or wrong?
112. It is important to tell students that many times scientists are wrong about what they think will happen in an experiment. This opens doors for more questions and often contributes more to the scientific community.
113. Ask students to come up with a simple question about Pondicherry Park. A list is included just in case students have a difficult time thinking of a question.
114. Challenge students to create a simple experiment in the park to test their question.
115. You may choose to conduct the experiments or choose one as a class to complete. With older students you may break them into small groups to conduct experiments.
116. Depending on the nature of the data you may choose to analyze it as a class, in small groups or individually. For younger students making simple tables is helpful. Older students can make graphs to support conclusions.
117. Have students write up their experiment and conclusion clearly. Have them explain what they did and why.

Materials:

This will vary depending on experiments. Make it clear to the students that materials for the experiments must be easy to find, possibly found in the classroom.

Connections to the Maine Learning Results:

Science and Technology
B1 Skills and Traits of Scientific Inquiry
Students plan, conduct, analyze data from, and communicate results of investigations, including fair tests.

oo. Pose investigable questions and seek answers from reliable sources of scientific information and from their own investigations.
pp. Plan and safely conduct investigations including simple experiments that involve a fair test.
qq. Use simple equipment, tools, and appropriate metric units of measurement to gather data and extend the senses.
rr. Use data to construct and support a reasonable explanation.
ss. Communicate scientific procedures and explanations.

English Language Arts
B3 Argument/Analysis:
Students write to identify and explain a position to an identified audience.

x. Write about a central question or idea by using relevant supporting facts and details.

Extensions:

Students choose a scientist or experiment to research and write about. As homework they have to explain why that scientist was important or describe the experiment.

List of Research Questions for Pondicherry Park:

Does the water move faster under the Bob Dunning Bridge or the Ham Foundation Bridge?

Is the Eastern White Pine the thickest tree within 20 feet of the outdoor classroom?

When does a red maple change color? (Long term)

How tall does a blueberry bush get?

Is a cup of river water heavier than a cup of classroom water?

How many species are found in one square foot of forest?

What is the most common tree within 20 feet of the outdoor classroom?

How long does it take to get from one bridge to the other in the park?

What tree keeps its leaves the longest in autumn? (Long term)

THE WEB OF LIFE
Grades 3-5

Learner Outcomes:
Students will be able to understand how individual parts of ecosystems can influence one another. The students will be able to explain that all of the things in an ecosystem, living and non-living, may not work well if parts of it are missing.

Objectives:
Students will work as a large group in order to create their own forest ecosystem in Pondicherry Park. Each student will play a role in the forest ecosystem. They will read to the class who or what they are and explain how they affect the ecosystem. The students will understand what happens to the rest of the ecosystem when a part of the ecosystem stops working, is missing, broken, or destroyed.

Teacher's Step-By Step Instructions:

118. Prepare for class by cutting out each of the ecosystem cards, and preparing the right amount of yarn.
119. Ask the students if they know what an ecosystem is. Explain that an ecosystem consists of the living and non-living things in an area, which work together as a whole. Pretend that the classroom is a newly discovered wild ecosystem. Scientists need to make a list of all the living and non-living things in the classroom ecosystem that allow the classroom to work effectively as a place of learning.
120. Have the students give examples of these living and non-living things and write them on the board.
121. Example:

Living Things in the Classroom Ecosystem	Non-Living Things in the Classroom Ecosystem
Children, Teachers, Plants	Desks, Board, Paper, Lights, Pencils

122. Explain that the class will be walking through Pondicherry Park to the outdoor classroom where they will each play a role in the forest ecosystem.
123. Walk to Pondicherry Park.
124. Once at the outdoor classroom, have the students form a large circle.
125. Explain that in your hand you have a deck of cards. On the cards are many of the living and non-living parts that make up the forest ecosystem around them. Each student will receive their own card, which describes the role they will play in the ecosystem. They should read their cards and become comfortable with what they are.

126. Next, one by one, each student is going to inform the class about what part of the ecosystem they are.
127. Hand each student three long pieces of yarn.
128. After everyone has shared, the first person to share is going to pick two other parts of the ecosystem that it needs in order to survive. The student will hand one end of their yarn to each person who represents those roles in the ecosystem, while holding onto their own ends of the yarn.
129. As each student in the circle does this, they will find themselves holding onto many pieces of yarn.
130. Once everyone has connected themselves with three other roles in the ecosystem, students close their eyes. Explain that sadly one of the parts of the ecosystem no longer exists. Ex. "I am sorry to say that the red maple trees in the park were all logged for their lumber this year."
131. The student whose role was the red maple has to slowly and carefully pull all of his strings away. All of the other parts of the ecosystem, who have now lost a string due to the loss of the red maple, should explain why they had been connected to the red maple. Explain that if at this time, any students have less than three pieces of yarn in their hands, they no longer have enough things they need to survive, and they too must pull away (carefully and slowly) their strings.
132. Again, students who find themselves losing strings must explain how they were once connected to the part of the ecosystem that no longer exists.
133. If you find yourself at a standstill where no one is dying, or leaving the game, create another scenario where a part of the ecosystem no longer functions properly.
134. Continue this pattern until everyone in the ecosystem has been affected.
135. Ask the students how this activity is a model of a real ecosystem? What about this activity accurately represents the forest ecosystem? What about it does not? How are different parts of the ecosystem connected?
136. Have the students share the emotions they felt throughout the game.
137. Have the students fill in the Web of Life worksheet in order to keep track of all of the other parts of the ecosystem that they had been connected to in the beginning of the game. The worksheet can be completed during another class if there isn't enough time.

Materials:
Web of Life cards, enough long pieces of yarn for each student in the class to have three pieces.

Connections to Maine Learning Results:
<u>Science and Technology</u>
A1. Systems:

tt. Give examples that show how individual parts of organisms, ecosystems, or man-made structures can influence one another.

uu. Explain ways that things including organisms, ecosystems, or man-made structures may not work as well (or at all) if a part is missing, broken, worn out, mismatched, or misconnected.

A2. Models:

y. Represent the features of a real object, event or process using models including geometric figures, number sequences, graphs, diagrams, sketches, maps, or three-dimensional figures and note ways in which those representations do (and do not) match features of the originals.

Extensions:

Have the students create an ecosystem of their own (drawing, diorama). Make sure they represent how each part of the ecosystem is connected to the other parts.

Striped Skunk

Eats: ground birds, centipedes, frogs and toads, fruit, fungi, plant vegetation, and mice.
Lives: in holes under rocks, fallen trees, and roots.

Black Bear

Eats: deer, frogs and toads, fruit, mice, nuts, porcupines, insects, rabbits, seeds, shrews, fish and turtles.

Lives: in caves, dens, holes in ground, and under rocks.

Bobcat

Eats: birds, mice, opossums, owls, porcupines, insects, rabbits, hares, raccoons, skunks, squirrels, and shrews.

Lives: in rock crevices, hollow logs, and beneath fallen trees.

Ribbon Snake

Eats: birds, centipedes, earthworms, frogs and toads, mice, moles, insects, shrews, spiders, and small fish.

Lives: on the ground near ponds, lakes, rivers, and streams.

Eastern Cottontail

Eats: bark, buds, twigs, fruit, grass, and herbs.

Lives: in underground dens close to shrubbery.

White-footed Mouse

Eats: centipedes, fruit, herbs, millipedes, nuts, insects, seeds, spiders, and decaying matter.

Lives: underground, old bird or squirrel nests, buildings, stumps, and logs.

Opossum

Eats: birds, fruit, nuts, insects, and seeds.

Lives: in trees hanging from branches, old dens, beneath buildings, in hollow trees or logs, and in brush piles.

Beaver

Eats: bark, small twigs.

Lives: in lodges in the water, built of chewed logs and branches.

Muskrats

Eats: water plants, and some fish.

Lives: builds burrows in shallow water, and along banks. Burrow entrances are underwater.

Painted Turtle

Eats: earthworms, fruit, fungi, leaves, seeds, insects, and water plants.

Lives: in shallow waters with slow moving currents, along ponds, lakes, streams, and swamps.

Centipede

Eats: insects, and decaying matter.

Lives: along the forest floor, under and throughout leaves, logs, and stumps.

Earthworm

Eats: decaying matter, grass, herbs, and leaves.

Lives: in the soil.

Black & Yellow Garden Spider

Eats: insects

Lives: in spiral webs it creates in tall grasses, fields, meadows and gardens.

Black-Capped Chickadee

Eats: insects, seeds.

Lives: In woodlands, parks, yards, nesting in trees.

American Robin

Eats: worms, snails, and fruit.

Lives: in woodlands, fields, and yards.

Ostrich Fern

Makes its own food from the sun.

Lives: along river banks, likes areas prone to flooding.

Eaten by: deer, insects, squirrels.

Mushrooms

Eats: decaying matter.

Lives: on the ground, logs, stumps, fallen plants.

Leaves

Makes its own food from the sun.

Lives: on tree branches.

Eaten by: deer, earthworms, insects, porcupines, squirrels, turtles.

Seeds

Gets its food from the sun.

A part of plants.

Eaten by: bears, birds, deer, mice, moles, opossums, insects, raccoons, squirrels, and turtles.

Berries

Gets its food from the sun.

A part of plants.

Eaten by: bears, birds, coyotes, deer, foxes, mice, opossums, insects, porcupines, rabbits, raccoons, skunks, squirrels, and turtles.

Green Frog

Eats: centipedes, earthworms, millipedes, plant-eating insects, preying insects, and spiders.

Lives: in bogs, ponds, swamps, and moist areas.

Great Horned Owl

Eats: birds, mice, moles, insects, rabbits, shrews, skunks, and squirrels.

Lives: in holes in trees.

Gray Squirrel

Eats: bark, birds, buds and twigs, ferns, fruit, fungi, herbs, leaves, nuts, and seeds.

Lives: in nests in tree hallow or in branches near the trunk. Nest built of leaves, twigs, or shredded bark.

Coyote

Eats: birds, decaying matter, frogs and toads, fruit, mice, opossums, insects, rabbits, hares, shrews, snakes, and turtles.

Lives: in dens in the ground and under fallen vegetation.

Red Fox

Eats: birds, deer, frogs, toads, fruit, mice, opossums, and porcupines.

Lives: dens in forests and fields.

Mole

Eats: centipedes, earthworms, fungi, herbs, millipedes, seeds, spiders, and other insects.

Lives: underground, and in moist soil near streams, lakes.

Porcupines

Eats: Bark, buds, and twigs, fruit, herbs, leaves, nuts, and hemlock branches.

Lives: in hollow trees or natural caves and crevices.

Raccoon

Eats: earthworms, frogs, toads, fruit, mice, moles, and nuts.

Lives: in hollow trees and logs, rock crevices, and ground burrows.

Whitetail Deer

Eats: buds, twigs, ferns, fruit, fungi, grass, herbs, leaves, nuts, and seeds.

Lives: in dense shrubs, thickets, and tall grasses.

Millipede

Eats: decaying plants, grass, and herbs.

Lives: along the forest floor, under and throughout leaves, logs, and stumps.

Grasshopper

Eats: bark, buds, twigs, ferns, fruit, fungi, grass, herbs, leaves, nuts, and seeds.

Lives: In fields, and areas of tall grasses.

Dragonfly

Eats: spiders, mosquitoes, beetles and other small insects.

Lives: in the air, landing on grasses, and other plant vegetation.

Broad-Winged Hawk

Eats: birds, frogs, toads, mice, insects, rabbits, shrews, snakes.

Lives: builds stick nests in trees. Lives in mixed woodlands, open waters and rivers.

Chipping Sparrow

Eats: insects, and small seeds.

Lives: in nests on ground made of grasses and twigs. Lives in fields, woodland openings and forest edges.

Pileated Woodpecker

Eats: insects, ants, beetles, fruits, and nuts.

Lives: in tree cavities, in forests with large trees.

Razor Grass

Makes its own food from the sun.

Lives: in fields, wetlands, along rivers.

Eaten by: deer, earthworms, millipedes, rabbits, muskrats.

Buds and Twigs

Makes its own food from sun.

Lives: on branches of trees.

Eaten by: birds, deer, insects, porcupines, rabbits, squirrels.

Bark

Needs nutrients and water from the soil, as well as energy from the sun.

Exists on tree trunks.

Eaten by: insects, porcupines, beaver, rabbits, squirrels, and deer.

Nuts

Gets its food from the sun.

A part of plants.

Eaten by: bears, birds, deer, mice, opossums, insects, porcupines, raccoons, and squirrels.

Photo Credit:

American Robin: suesbirdphotos.co.uk

Beaver: animals.nationalgeographic.com

Bark: commons.wikimedia.org

Black And Yellow Garden Spider: thirstylight.com

Black Bear: allamericanpatriots.com

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White-tailed Deer: white-tail-deer-pics.blogspot.com

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