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Learning with a Purpose: Academic Service-Learning Curriculum

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Learning with a Purpose:
ACADEMIC SERVICE-LEARNING CURRICULUM

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Compliments of the
Office of Academic Service-Learning
Eastern Michigan University
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Table of Contents

Academic Service-Learning Integrated Units & Lesson Plans

Introduction ................................................. 4
Project Read A.L.O.U.D. (preschool/adult education reading skills class) 6
Plants and the Environment (kindergarten) 10
Plant Life (first grade) 16
Electricity - What a Shock! (first grade) 20
Park Restoration and Maintenance (first grade) 24
Recycling and Environmental Effects (first grade) 28
"Soup"er Pots and Plants (first/third grades) 32
Wick Garden (third/sixth grades) 36
Bat Houses (fourth grade) 42
Human Effects on the Environment (fourth/fifth grades) 52
Human Effects on the Environment (fifth grade) 58
Restoration of the Park: How Humans Adapt to the Landscape (fifth grade) 66
Help Save the Trees! (fifth grade) 74
Ecosystems (fifth grade) 80
Greens N' Things: A Thematic Unit Utilizing the Community to Learn About Ecosystems (fifth grade) 86
School Beautification Project (sixth grade) 90
A Nature Walk for the Community (sixth grade) 96
Project Management: A Unit Developing Student Management & Application Skills for Task Completion (sixth grade) 102
Weather (sixth - eighth grades) 114
Reclaiming the Courtyard (ninth/tenth grades) 118
Sampling and Reasoning through Recycling 122
Websites 134
Introduction

The Dwight D. Eisenhower Professional Development Program is authorized under Title II of P.L. 103-382. It provides institutions of higher education the opportunity to partner with K-12 teachers and administrators to assist with professional development through sustained, high-quality professional development activities in mathematics, science, reading, and other areas of the core academic curriculum.

The Dwight D. Eisenhower Professional Development project shared here was undertaken by Eastern Michigan University and Romulus Community Schools to provide Romulus teachers professional development to integrate the teaching methodology of academic service-learning into their mathematics and science curriculum. The goal was to increase academic achievement and civic participation. This monograph contains sample units and lesson plans produced by teachers who participated in this grant.

The purpose of this publication is to share with others the use of academic service-learning as a teaching methodology in the science and mathematics content areas. Other content areas are also integrated into these units. Academic service-learning is a teaching methodology that encourages and enhances the integrated curriculum as well as authentic assessment with an authentic audience. It is a powerful teaching methodology.

What Is Academic Service-Learning?

Academic service-learning as a teaching methodology utilizes community service as a means of helping students gain a deeper understanding of curriculum objectives, acquire new knowledge, and engage in civic activities. This teaching methodology consists of three essential components. They are:

- Service to the community with community representatives identifying the service activity.
- A clearly conceptualized connection to the curriculum, most notably national and/or state standards, and,
- Structured opportunities provided by the teacher throughout the academic service-learning activity for students to synthesize and extract learning from their service activity.
Introduction

Through service activities such as creating charts for the local police department, restoring ecosystems in a local park, or hosting student symposiums, students learn content knowledge in science and mathematics as well as gain knowledge about their community, the problems facing them, and the democratic processes needed to affect change. All children learn more and provide greater service to society if teachers challenge them, hold higher expectations for them, and enrich course content by applying subject matter in real-life settings (Beisser, 1996).

Through the Eisenhower Project, the students of Romulus became engaged, knowledgeable citizens—with their heads, hands, hearts and feet. They exercised their franchise as citizens through volunteer efforts supported by dedicated teachers and community agencies that respected their passion to create a better world. All the while they learned concepts of science and math at the conceptual and applied level.

While elementary and secondary students may not change the world, they can lean curriculum content and make small, meaningful differences in their own schools and communities through academic service-learning. As Margaret Meade once said, “Never doubt that a small group of concerned citizens can change the world. Indeed, it’s the only thing that ever has.”

This monograph represents unit and lesson plans of many teachers in the Romulus Community Schools who participated in the Eisenhower Professional Development Program.

We want to say thank you to these teachers who “went the extra distance for children” through their work in academic service-learning in Romulus.
Project Read A.L.O.U.D.
(Achieving Linguistic & Oral Understanding while Developing reading skills)

Grade Level: Preschool/Adult Education Reading Skills
Class

Time Line: Seven, 2 hour class sessions extending over a period of six weeks

UNIT OUTLINE

Service-Learning that Project Identifies:
Once a week for four weeks, adult education students will read aloud to their “reading partners,” children from the day care center in the same building as the Adult Education Reading Skills class.

Community Needs that Project Identifies:
1. Children in the child care program will receive individualized attention from adults. Children will see adults participating in the learning process. (positive role models for school)
2. The children’s chances of becoming good readers will be increased by early exposure to and positive experiences with books.
3. Notes to parents as dictated by the children about the books they read will encourage increased awareness and reading activities at home.
Unit Description:
The students will explore writing in a variety of forms. Guided activities, discussions, and demonstrations will be used to analyze voice, style, text features, and so on. The students will keep a log of self-selected readings throughout the course. He/she will also analyze, through personal writings and class exercises, the use of reading strategies at home, school, and/or work situations. On-going assessments will help each student discover his/her reading style, strengths, and needs. This is an active learning class with the emphasis on building reading skills through practice in a variety of situations. Topics will relate to four basic areas: 1) "mental aerobics" or reading as thinking, 2) "toolbox" of skills or comprehension strategies, 3) "reading as writing," and 4) the joy of reading.

Subject(s) Addressed: Language Arts

Standards and Benchmarks:
Language Arts:
1. Read with developing fluency a variety of texts.
2. Employ multiple strategies to construct meaning.
3. Employ multiple strategies to decode words.
4. Respond to the ideas and feelings generated by written texts and share with peers.
5. Select, read, listen to, view, and respond thoughtfully to text.
6. Develop a sense of voice and style in written work.
7. Reflect on their emerging literacy.

Non-Academic Outcomes:
1. Students will demonstrate increased ability and confidence when reading aloud.
2. Students will be able to identify children’s literature appropriate to a child’s age level and addressing the child’s interests.
3. Students will become more aware that children’s literature is not written exclusively for children.
4. Students will become familiar with some of the other occupants of the building, will feel more comfortable when attending classes, and will develop a greater sense of community.
5. Improve attendance in class.

Reflection Activities:
1. Class discussion
2. Journal writing
3. Related assignments on Mondays
4. Reading sessions on Wednesdays
Project Read A.L.O.U.D.

Assessment:
1. Participation in in-class activities and exercises.
2. First and last reading sessions will be tape recorded for individual comparison and assessment.
3. Feedback during reflection.
4. Reading assessments to evaluate the student’s interests, reading style, and strengths.
5. Student goal plan for reading development and personal progress reports.
6. Reading logs.
7. Creative reading project.
8. Student writings.

WEEKLY PLANNER

Week 1: Opening Activity:
Wednesday-
* meet partners
  * biopoem assessment
  * parent introduction note

Week 2: Bookstore Visit:
Monday-
* Read ALOUD demonstration by a child care teacher and a children's bookstore employee
  * selection of books

Week 3 - 6: Reading Sessions:
Every Wednesdays-
* welcome partner
  * read story
  * record child’s reflections
  * closure

Week 7: Closing Activity:
Monday-
* pizza celebration
  * awarding of certificates
  * selection of souvenir books
Project Read A.L.O.U.D.
Plants and the Environment

Grade Level: Kindergarten

Time Line: This unit will take four weeks to complete with most lessons lasting approximately 20 minutes. It will begin in April so that it can be tied to Earth Day and the environment. At the end of the unit, the students will plant seeds to grow flowers. After the plants are big enough, the students will transplant their flowers around the school community.

UNIT OUTLINE

Service-Learning that Project Identifies:
Kindergarten students will be growing and planting flowers to be used to beautify the school grounds.

Unit Description:
In this unit, students will realize the importance of plants in our environment. They will identify basic needs of plants, compare different types of seeds, explore the life cycle of plants (from seed to flower), and identify a plant's main parts. Students will culminate the unit by growing their own flowers which will be used as part of a school beautification project.
Plants and the Environment

Subject(s) Addressed: Science, Language Arts, and Math

Standards and Benchmarks:
Science:
1. Design systems that encourage growing of particular plants and animals.
2. Describe the life cycle of familiar organisms.
3. Describe the function of selected plant parts.
4. Compare and contrast food, energy, and environmental needs of organisms.
5. Describe the requirements for living things to maintain their existence.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas or feelings generated by texts.

Math:
1. Explore models and relate them to real objects.

Non-Academic Outcomes:
1. Citizenship - Students will develop a connection to their school community.
2. Increased Self-Esteem - Students will feel good about themselves through helping the environment and their school community.
3. Personal Responsibility - Students will take responsibility for caring for the plants/flowers as they grow and once they are transplanted (watering, weeding, etc.).
4. Beautification of the Environment - The school community benefits from the service that the students are providing because the flowers make the school look better. The new flowers also provide a habitat for the butterflies that the second graders raise and release.

Reflection Activities:
Students will create a model of a plant and name its parts (roots, stem, leaves, flowers, and seeds). Students will use journals to record their observations and ideas throughout the unit. Students will also be involved in group discussions throughout the unit on the importance of plants in our environment. Why do we need plants? How do plants help us?

Assessment:
Most assessment will be done by teacher observation of students. Students will also be evaluated on identifying the parts of a plant using their models. Group discussions and journal work will be used as reflection activities to evaluate what students have learned from this unit (Week 3 - Day 1)
Plants and the Environment

LESSON PLANS FOR UNIT

(Week 3 - Day 1)

Objective(s):
Identify basic plant parts - roots, stem, leaves, flowers, and seeds.

Duration: One class period, approximately 25-30 minutes

Materials:
* a variety of plants and flowers
* chart paper
* marker
* worksheet on plant parts

Instructional Procedure:
1. Bring in several types of plants and flowers. Set on table in classroom.
2. Give students time to observe each plant. Compare/contrast. Use guided questions to help students verbalize their observations. Are all plants the same? How are the plants alike? How are the plants different from one another? Discuss student observations.
3. From the student observations, form a list of plant parts. Write the parts on chart paper and illustrate. (The parts should include: roots, stem, leaves, flowers, and seeds.)
4. Then use the chart and identify each plant's parts one at a time. Have the students locate the parts on each plant and flower in the classroom. If necessary, remove the plants from their containers to show students the roots.
5. Have students complete a cut-and-paste worksheet on plant parts.

WEEKLY PLANNER

Week 1: Seeds

Day 1 - Do a KWL on seeds. What are seeds? What do they look like? Where have you seen seeds? Have students bring in seeds from home or collect a variety of seeds for students to look at.

Day 2 - Look at the class seed collection. See who can find the biggest seed, the smallest seed, a round seed, etc. Count how many seeds are in the collection. Then sort the seeds by color.
Plants and the Environment

Day 3 - Put the students in pairs. Use magnifying glasses to observe the seeds. Students can observe/compare the seeds by various attributes: color, shape, size, texture, and how they travel.

Day 4 - Go over directions for classifying objects by one property. Sort seeds into groups classifying by one property. (For example: big and not big, brown and not brown, round and not round, travels by the wind and does not travel by the wind, etc.)

Day 5 - Make a mosaic picture using seeds. Students draw a simple picture or design and then cover their picture with different types of seeds.

Week 2: Needs and Life Cycle of Plants

Day 1 - Read the story Everything Grows. Talk about types of living things (animals and plants). Go back through the story and have students tell whether each page shows a plant or an animal. Discuss differences and similarities between the two.

Day 2 - Have students find and cut out pictures of plants and animals in magazines. Sort the pictures into two sets: plants in one, animals in another. Glue the pictures on a chart. Then have the students complete a worksheet on identifying plants and animals.

Day 3 - Read the science story Plants and Seeds. Discuss. How do plants begin? What do they need to grow?

Day 4 - Look at stages of plant growth sequencing cards. As a group, put each set of cards in order. Discuss the stages (seed, sprout, small plant, full grown plant/flower).

Day 5 - Have students cut and paste a plant life cycle sequencing worksheet. In their journals, students will make a mini-booklet on the life cycle of plants. Students draw the picture for each stage and then copy the word from the board.

Week 3: Parts of a Plant

Day 1 - See Lesson Plans for Unit.

Day 2 - Review the main parts of plants: roots, stem, leaves, flowers, and seeds. Give the students a plant parts worksheet. Name off each plant part and have the students point to that part of the plant on their worksheet.

Day 3 - Using flannel board plant pieces, have the students put together different plants. Name the parts. Using the same flannel board plant pieces, put plants together incorrectly on the flannel
Plants and the Environment

board or have one part of the plant missing. Students then tell what is wrong or missing. They come up to the board and fix it.

Day 4 - Make thumb print geranium flowers. Label the plant parts.

Day 5 - Give students clay or playdough. Have each student create a model of a plant out of the clay/playdough. The model must include the main parts of a plant. Then have each child explain their model to you.

Week 4: Plant Part Functions

Day 1 - Review the main parts of a plant. Begin discussion about roots. What do the roots of a plant do? What would happen if a plant didn’t have roots? etc. Explain the functions of roots (carry water and minerals from the soil to the plant, and hold the plant in place). Look at pictures of plants. Find the roots in each picture. Do a worksheet on roots. Notice that some types of roots, such as carrots, can be eaten. Then have the students draw two examples of roots in their journals. Set up an experiment using a sweet potato to show how roots grow on a plant. Observe over the next several weeks.

Day 2 - Discuss stems and leaves and their functions. Using classroom plants and pictures of plants, have the students identify the stems and leaves. Explain the functions of stems (carry the water and minerals to other plant parts) and leaves (to make food for the plant, take in carbon dioxide, and give off oxygen). Notice that some types of stems (celery and rhubarb) and leaves (lettuce) can be eaten. Then have the students draw several different stems and leaves in their journals.

Day 3 - Have the students sit in a circle. Go around the circle and have students name a type of flower. Read the story What is a Flower? Explain that flowers are important because they make the seeds for the plant. Look at the flowers already in the classroom and find where the seeds are on each flower.

Day 4 - Review plant parts and their functions. Why are plants important to us? How do we use plants? Use picture cards to show the many things we get from plants (cotton for clothing, fruits and vegetables, lumber, paper, medicine, etc.). Help students come up with additional ways that plants benefit us.

Day 5 - Review importance of plants in our environment. Students draw pictures of three ways plants help us in their journals and dictate a sentence for their pictures.
Plants and the Environment

Service-Learning Project

After completing the unit on plants, students will be planting seeds and growing flowers to be used to beautify the school community. Once the flowers are grown, they will be transplanted outside and the kindergartners will be responsible for taking care of the flowers - watering, weeding, etc. While the flowers are being planted, the class will once again review all the ways that plants help our environment. Hopefully, this activity will help make the students aware of their environment and realize that people must be responsible for helping to take care of the environment.
Plant life

Grade Level: First
Time Line: Approximately four weeks

UNIT OUTLINE

Service-Learning that Project Identifies:
Students will embrace the elderly in their community and work together with them to make their community a beautiful place where the elderly and youth can live and learn from one another.

Unit Description:
The students will be able to describe the life cycle of the plant. They will also be able to describe and discuss the stages of growth and the life requirements which are necessary for all plants to live and grow.
Plant life

Subject(s) Addressed: Science, Social Studies, and Language Arts

Standards and Benchmarks:

Science:
1. Identify the parts of a plant: roots, stem, leaves, seeds, and flowers.
2. Use measurement devices in scientific investigations.
3. Name the main requirements necessary for plants to grow: water, soil, sunlight, air, and a seed.

Social Studies:
1. Define cardinal directions: north, south, east, and west.
2. Explain and discuss which region on the map would be best climatically for plants to live and grow.
3. Discuss and describe weather conditions: snow, rain, drought, and floods.
4. Discuss and explain how different weather conditions effect the growth of plants.
5. Participate in a project designed to help others in their community.

Language Arts:
1. Write an essay about what a plant needs to grow.
2. Draw a picture of a plant and show their drawings to their surrogate grandparent(s), explaining what the plant parts are and how they function.
3. Write a poem about the significance of a flower and what it represents and read aloud their poem to their surrogate grandparent(s).

Non-Academic Outcomes:
Students will learn a sense of pride. Students will learn to be more accepting and giving to the elderly in their community. Students will bridge the gap between the elderly, community, and the school.

Reflection Activities:
Students will be involved in group discussion activities throughout the unit. They will use journals to record their observations and ideas throughout the unit. They will also write a poem and essay, give oral presentations, and make a map.

Assessment:
Teacher observation, journal entries, and group discussions will serve as the major evaluation pieces. Students will also be evaluated on their oral presentations, essay, and poem.
Lesson Title: Needs of Plants

Objective(s):
Identify the requirements for a plant to grow.

Duration: One class period, approximately 25-30 minutes

Materials:
- four pots
- seeds (radish, mustard, or birdseed)
- soil
- water

Instructional Procedure:
1. Fill each of the four pots with equal amounts of soil. Plant the same number and type of seeds in each pot at the same depth. Water equally.
2. Place each of the pots in a strategic place in the classroom. One plant is placed on the window sill, one in a closet, the third enclosed in plastic, and the last one will not be watered.
3. Every few days have the students draw pictures of the four plants in their journals.

Weekly Planner

Unit Title: Plant Life

Week 1:
Day 1 - Students will be introduced to the unit. Discuss how a plant grows. Discuss the energy sources needed for a plant to grow. Discuss an estimated time of growth. Discuss the materials needed to start the project. Discuss how the students will be providing a service to the elderly in their community.

Day 2 - Invite a Senior Citizen’s Director into the classroom to explain the effects of aging.
Plant life

Day 3 - Read and discuss the books *Carrot Seed* and *The Living Plant*. Use a Venn Diagram to compare and contrast the growing process of plants in each of the books.

Day 4 - Do a KWL chart on the board about the growing process of a plant.

Day 5 - Go to the library and find the book *The Giving Tree*. Read and discuss the characteristics that made this tree so special. Discuss how the Giving Tree and other trees are important and their role in the food chain.

Week 2:

Day 1 - Students will estimate, measure, and record the amount of soil needed to plant the seeds in the pots as well as the amount of water needed for each plant.

Day 2 - See Lesson Plans for Unit.

Day 3 - Discuss what makes plants grow fast. Each student will state their hypothesis and rationale as to what particular source of energy promotes growth.

Day 4 - Discuss which direction in the classroom allows the most sun to shine through. Discuss which direction is north, south, east, and west.

Day 5 - Prepare a map from the school to a senior citizen’s facility. Focus in depth on directionality.

Week 3:

Day 1 - Begin designing and decorating flower pots that will hold the soil and seeds.

Day 2 - Continue with flower pot decorating.

Day 3 - Begin the planting process. Have parent volunteers and micro-society helpers come into the classroom and assist with the planting process.

Day 4 - Establish a rotating schedule assigning students to water the plants.

Week 4:

Take pictures every week to create a class portfolio of the beautiful plants and the wonderful unit.

*Learning With a Purpose*
Electricity - What a Shock!

Grade Level: First
Time Line: 8-10 days

UNIT OUTLINE

Service-Learning that Project Identifies:
The students will create and distribute an electrical safety brochure to elementary students in the Romulus Community Schools.

Unit Description:
Students will learn about electrical safety through class discussions and a video. They will brainstorm ways to avoid electrical shock. They will utilize the writing process to write captions for illustrations showing ways to avoid electrical shock. They will preview the printing press process and publish their ideas into a brochure. Students will go on a field trip to another school in the district where they will distribute their brochure and talk to students at their grade level about the dangers of electric shock and how to avoid it. After the field trip, the students will engage in a reflection activity to bring closure to the unit and project.
Electricity - What a Shock!

Subject(s) Addressed: Science and Language Arts

Standards and Benchmarks:
Science:
1. Describe possible electric shock hazards to be avoided at home or at school.

Language Arts:
1. Begin to plan and draft texts, and revise and edit in response to the feelings and ideas expressed by others.
2. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
3. Use effective listening and speaking behaviors that enhance communication.
4. Explore and begin to use language appropriate for different contexts and purposes.
5. Use oral, written, and visual texts to identify and explore school and community issues and problems.

Non-Academic Outcomes:
1. Citizenship skills
2. Increased self-esteem
3. Increased personal responsibility
4. Public speaking
5. Capacity for action
6. Increased personal efficacy
7. Problem solving and critical thinking skills

Reflection Activities:
1. Dialogue focusing on the four levels of reflection (facts, implications/causes, feelings and thoughts/evaluation, solutions and integration) involving all those who participated.
2. Completion of KWL chart.
3. Role-playing the ways to avoid electric shock.
4. Students draw and write about their experience and how it made them feel.

Assessment:
Criteria for assessment will be participation, observations by the teacher, the writing process, community responses, and writing activities during reflection.
Lesson Plans for Unit

(Week 1 - Day 3)

Lesson Title: Safety First!

Objective(s):
An introduction to the dangers of electrical shock through a video about electricity and electrical safety precautions. Students will brainstorm ways to avoid electrical shock. Areas covered will be the proper use of electrical outlets, water and electricity, downed power lines, power lines and kite flying, types of signs such as danger, keep out, watch your step, and emergency phone numbers.

Duration: One 60 minute class period: 5 minutes for introduction, 30 minutes for the video, 25 minutes for discussion and brainstorming

Materials:
* video
* chart paper or chalkboard
* chart markers or chalk
* safety signs: danger, keep out, watch your step

Instructional Procedure:
1. Discuss with students that on the KWL chart there is an empty portion. Tell the students that one way to learn more about electrical safety is through a video. Instruct them to watch carefully for things that they don't already know and ways to be safe around electricity.
2. Watch video, pausing occasionally for discussion.
3. Discuss video, brainstorming ways to be safe around electricity. Be sure to discuss the proper use of electrical outlets and appliances, electricity and water, downed power lines, power lines and kite flying, types of warning signs, and emergency phone numbers.
4. Ask students how they feel now that they know about electrical safety.
5. Tell students that tomorrow they will be getting into their cooperative groups and writing a brochure telling other children about how to be safe around electricity, and that they will be going on a field trip to pass out their brochures and teach other first graders in Romulus how to be safe around electricity.
6. Send a note home explaining these activities.
Electricity - What a Shock!

WEEKLY PLANNER

Unit Title - Electricity: What a Shock!

Week 1:

Day 1 - Inform students that they will be studying electrical safety and discuss what the terms electrical and safety mean. Read a story about storms, Storm in the Night.

Day 2 - Start a KWL chart (what we Know, what we Want to know, and what we Learned) about electrical shock. Fill in the what we know and what we want to know portions. Have the students draw a picture of what they think electricity looks like.

Day 3 - View video about electrical shock safety and discuss. Brainstorm ways to avoid electrical shock inside and outside (see lesson plans for unit).

Day 4 - Assign cooperative groups a portion of the ideas brainstormed on Day 3. Allow students to "think, pair, and share" ways that they could illustrate and write about these ideas. Begin the writing process.

Day 5 - Continue the writing process, having students conference with the teacher or parent volunteers.

Week 2:

Day 1 - Complete writing process with final edit and recopy.

Day 2 - Illustrate recopied captions as a cooperative group.

Day 3 - Publish brochure either at a printing press or in the classroom on the computers and the copy machine. Read another story about electricity or electrical storms.

Day 4 - Field trip to another elementary school in the district. Teach other first graders by sharing with them the brochure about the dangers of electricity and how to avoid electrical shock.

Day 5 - Reflection activities: discussion using reflection levels, role-playing, completion of KWL chart, and writing activity.

Learning With a Purpose
Park Restoration and Maintenance

Grade Level: First

Time Line: Approximately one month (three times a week)

Service Learning that Project Identifies: Recycling

UNIT OUTLINE

Community Need that Project Identifies:
The park restoration project is definitely needed by the Parks and Recreation Department and would probably get more people using the park. This park has a lot of potential and who better to help restore it than students who live in the community.

Unit Description:
Students will participate in the restoration and maintenance of a local park. They will participate in cleaning up the park and setting up materials to keep the park clean. The students will also participate in a recycling program at school to raise enough recyclable materials to make a bench through a program called “Bottles to Benches.”

Thematic Essential Questions:
Why do we need to recycle? What could we do in our everyday life to help? What will the world be like if we don’t start to recycle?
Park Restoration and Maintenance

Subject(s) Addressed: Social Studies, Science, Math, and Language Arts

Standards and Benchmarks:

Social Studies:
1. Describe the ways in which their environment has been changed by people, and the ways their lives are affected by the environment.
2. Suggest ways that people can improve their environment.
3. List ways that individuals can conserve limited resources.
4. Pose a question about matters of public concern that they have encountered in school or in the community.
5. Compose brief statements expressing a decision on an issue in the school or local community.
6. Participate in projects designed to help others in their local community.

Math:
1. Collect and explore data through counting, measuring, and conducting surveys and experiments.
2. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Science:
1. Describe positive and negative effects of humans on the environment.
2. Demonstrate ways to conserve resources and recycle manufactured materials.

Non-Academic Outcomes:
Students will be able to work as a group and realize that things will change if everyone helps. They will also get an idea of what they need to do to keep the earth alive for years to come.
Reflection Activities:
Students will be involved in group discussion and journal activities throughout the unit.

Assessment:
There are many ways in which I will be able to assess my students. This can be by observing them or by written assessments. Also, orally summarizing things that they have learned can be used to assess their learning. Assessment pieces will be done according to the activity for the day. For example, if I do an activity of making a recyclable object, then at the end of the activity I might just grab objects out of the room randomly and ask students the kinds of things that I might be able to make out of the objects. This will assess if they realize that most objects are recyclable and can be used for other things than what they were originally intended for.

LES S ON PL A NS FOR UNIT

Lesson Title: Composting

Objective(s):
Introduce the principles of composting.

Duration: Approximately two weeks (depending on individual results)

Materials:
* plastic bag
* apple peels
* leaves
* old bread
* coffee grounds
* green tops of vegetables
* potato peels

Instructional procedure:
1. Chop and mix the materials with water.
2. Twist and tie the materials in a plastic bag securely.
3. Open the bag once a day to allow oxygen in. This is needed to breakdown materials.
4. Students will observe daily and record results (color, texture, and odors).
5. This can also be done outdoors in a marked area instead of a plastic bag. You cover the pile with earth.
Park Restoration and Maintenance

6. To do this activity the students need to be aware that:
* Composting is a process by which plant material is returned to the soil.
* There are organisms that are involved in the process of decomposition.
* Compost may be used to fertilize gardens.
* Composting is done in most communities to reduce waste.
* This can be done at their homes.

**WEEKLY PLANNER**

**Week 1:**

Introduction of recycling by discussion and by reading related books on the subject. This is a great time to get prior knowledge from the students and get their minds working on recycling.

**Week 2:**

This week the students will be doing projects on recycling. They will get recyclable materials and use them as an art project. One example would be to take a used milk jug and make it into a piggy bank. This week will be dedicated to reusing materials for other useful things.

**Week 3:**

This would be a good time to get someone from the community to come in to discuss the importance of recycling in their community as well as other communities. Do projects out of the book, "50 Simple Things Kids can do to Save the Earth."

**Week 4:**

This week will be dedicated to going to the park to clean up and make decisions on what needs to be done to make it a better park. This may take the full week since the park is so close. The students will post recycling signs and hopefully they will have a bench to provide the park by this time.

**The “Bottles to Benches” program will be on-going throughout the year. The above is just a rough idea of the kinds of things that will be going on during the four week period.**

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**Learning With a Purpose**
Recycling and Environmental Effects

Grade Level: First (school-wide project)
Time Line: Year round activities

UNIT OUTLINE

Service-Learning that Project Identifies:
* animal shelter adopt-a-pet program
* make bird feeders, houses, and bat boxes
* pick up a park

Community Need that Project Identifies:
This unit is designed to clean up a park to make it safer and more enjoyable to people and animals. The students will make bird feeders and houses to help birds survive during the winter, and bat boxes in order to attract bats as to aid in mosquito control during the summer. Items will be donated to various points identified as in need throughout the city. The students will also adopt a pet from the local animal shelter to help identify the need and costs to supporting homeless animals. This unit's purpose is to teach children what litter is, does, where it belongs, and what will (continue to) happen to animals and the environment if not disposed of properly.
Recycling and Environmental Effects

Unit Description:
Students will identify various animals native to Romulus, their habitats, and their needs for survival. They will explore littering and the changes in habitats as a result. Through active participation, students will address the needs of the Romulus Animal Shelter.

Subject(s) Addressed: Science, Language Arts, Math, and Social Studies

Standards and Benchmarks:

Science:
1. Describe the basic requirements for all living things to maintain their existence.
2. Describe positive and negative effects of humans on the environment.
3. Demonstrate ways to conserve resources and recycle manufactured materials.
4. Compare and contrast food, energy, and environmental needs of organisms.
5. Describe systems that encourage growing of particular plants and animals.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Math:
1. Collect and explore data through counting, measuring, and conducting surveys and experiments.
2. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.

Social Studies:
1. Describe the ways in which their environment has been changed by people, and the ways their lives are affected by the environment.
2. Suggest ways that people can improve their environment.
3. List ways that individuals can conserve limited resources.
4. Pose a question about matters of public concern that they have encountered in school or in the community.
Recycling and Environmental Effects

5. Compose brief statements expressing a decision on an issue in the school or local community.
6. Participate in projects designed to help others in their local community.

Community Outcomes:
1. Service to the unmet needs of the shelter.
2. Aid to various animals in the community in danger of losing their habitats.
3. Students begin to identify themselves as an important part of the community.
4. Better control of the mosquito population.
5. A clean park in which to play and enjoy.

Non-Academic Outcomes:
Students will:
1. gain the respect of responsibility for their actions, and
2. feel as if they are an active and important part of their community.

Reflection Activities:
1. A quiz
2. Group sharing and problem solving
3. Presentation of projects
4. Drawings

Assessment:
1. Participation and teacher observations
2. Drawing and writing activities
3. Group discussion and problem solving
4. A quiz
5. Creation of bird feeders, houses, and bat boxes
6. Gathering of products needed for the shelter

LESSON PLANS FOR UNIT

(Week 1 - Day 4)

Lesson Title: Pollution and Recycling
Recycling and Environmental Effects

Objective(s):
1. Learn that pollution is improper waste disposal.
2. Learn to sort and classify classroom waste.
3. Become more aware of trash in the community.
4. Learn to properly dispose of daily personal waste.

Duration: 30 minutes

Materials:
* waste cans for separation of classroom trash
* worksheet
* permission slips for the walk to the park

Instructional Procedure:
1. Discuss trash: What is it?, Where does it go?, Who makes it?
2. Define pollution and litter. Have children identify the litter in their own classroom and how it got there.
3. Discuss proper disposal of litter. Sort through classroom trash and place in waste cans labeled paper, plastic, or compost.
4. Ask students what happens to parks if they aren't kept free of litter. Ask what happens to animals and their habitats in the same situation.
5. Have children brainstorm ways to help keep parks and habitats free of litter. Send home note explaining the next day's walk to the park to collect litter.
6. Worksheet: Have children color, cut, and glue the litter in its proper place in the park.

Reflection:
Children will show understanding through their clean-up actions at the park. Children will also become more aware of their own waste disposal.

WEEKLY PLANNER

Week 1:

Day 1 - Discuss what animal habitats are. Brainstorm a list of animals and their habitats. Reduce the list to animals native to the area.

Day 2 - Show pictures of animals in their natural habitats. Draw a picture of an animal in its habitat.
Day 3 - Discuss dangers and health hazards to people. Brainstorm dangers to animals and their habitats.

Day 4 - Discuss pollution and the importance of recycling. See lesson plans for unit.

Day 5 - Field trip: Walk to a park in need of a clean-up, and clean it up.

Week 2:

Day 1 - Review habitats and recycling. Draw before and after pictures.

Day 2 - Quiz on pollution, animals, and their habitats. Discuss needs of animals in the wild and in shelters. Brainstorm ways to help both.

Day 3 - Make bird feeders with pine cones and peanut butter. Hang on trees throughout the community.

Day 4 - Discuss homeless pets. Brainstorm ways to help them.

Day 5 - Discuss pets in a shelter. Brainstorm items they need.

Week 3:

Day 1 - Dictate ideas and/or feelings about homeless animals. Create a letter to send to shelter.

Day 2 - Discuss ways to acquire supplies for the shelter. Make drawings and posters using grocery papers to advertise the shelters needs.

Day 3 - Begin collecting items. Graph the items.

Day 4 - Discuss responsibility for the care of animals. Discuss expenses. Put an approximate value on each item and add together.

Day 5 - Visit the shelter. Deliver the donations.

Week 4:

Discuss and evaluate the visit to the shelter. Are there other needs to address?
Service-Learning that Project Identifies:
The community is made up of many transitional neighborhoods. The children in the classrooms come to school without their basic needs met. One of the staff members belongs to a church group that regularly creates baskets of basic items for families who are in need. Organizations who distribute goods are already in existence in Romulus. What these organizations need is funding to keep their programs running. The classes decided to raise money to assist Goodfellows in meeting the needs of the people in Romulus.

Unit Description:
In Part I of the project, the children prepared posters, placements, centerpieces, a music video, and vegetable soup for a Soup Dinner. The dinner cost $1 for soup, salad, bread, and dessert. Local businesses donated all but the soup. The class collected over $200 which was donated to the Romulus Goodfellows.
"Soup"er Pots and Plants

In Part II of the project, the children created flyers, posters, painted flower pots, and transplanted seedlings. The finished item was a wonderfully designed pot of flowers for someone special. The children hosted a Flower Power Walk where children paid a dollar to play the popular variation of musical chairs. The winners of course received a great potted plant for mom or dad. The proceeds from this event were again donated to the Romulus Goodfellows.

Subject(s) Addressed: Science, Mathematics, Language Arts, and Social Studies

Standards and Benchmarks:
Science:
1. Describe life cycles of familiar organisms.
2. Describe functions of plant parts.
3. Design systems that encourage growing of particular plants.
4. Identify the needs of plants in order to grow.

Mathematics:
1. Develop strategies for estimating.
2. Apply measurement to describe the real world and to solve problems.
3. Collect and explore data through counting, measuring, and conducting surveys and experiments.
4. Represent and record patterns.
5. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.

Language Arts:
1. Write with developing fluency for multiple purposes to produce a variety of texts.
2. Begin to plan and draft texts.
3. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.

Social Studies:
1. Participate in projects designed to help others in their local community.
2. Recognize economic exchanges in which they participate.
3. Identify an unmet local economic need and propose a plan to meet it.
4. Understand needs the wants of the community.

Non-Academic Outcomes:
In holding a charity soup dinner and a plant walk (like a cake walk), the classes will not only earn money to assist needy families, but will create situations where teamwork and social bonding can occur. Having families come together for a good cause and to celebrate their children's hard work creates a sense of belonging and togetherness that all good communities need.
Reflection:
After the successful completion of Soup Night, the children gathered together for a special snack and final viewing of the Soup Night video tape. Representatives from the Romulus Goodfellows were in attendance and the children were able to hand deliver their gift of money.

After the Plant Walk is done, the students will do a reflection journal as part of both an assessment and reflection activity. They will discuss their journals and brainstorm other things they would like to discuss. The organization they helped will be asked to write a letter to the students to tell them how the money was used.

Assessment:
The first assessment will be the district plant unit test. The second is a teacher designed service learning assessment piece. Third grade students will also do a journal reflection activity.

WEEKLY PLANNER

Activities for Soup Night:

Day 1 - Discussion of needs and wants. What happens when we don’t get things we need to survive? How could we help people in Romulus who don’t have their needs met? What could we provide that had something to do with our unit on plants? Review what people need from plants.

Day 2 - Make a list of things we will need to do to create a charity soup dinner. What will we need to do first? What types of things can we serve that are plants? Read the book, Growing Vegetable Soup. Revise the list.

Day 3 - Match up children from first and third grades and give some the assignment of creating posters for the hallways advertising the event. The other children can create placemats for the dinner.

Day 4 - Decorate the aluminum can vases for the table centerpieces for the dinner using acrylic paints. Decorations must include a pattern.

Day 5 - Continue working on the centerpieces. This time create construction paper flowers with straw stems.

Day 6 - Sort and match vegetables that will be going in the soup into categories: root vegetables, leaves, stems, etc.

Day 7 - Group first and third graders together to slice, dice, peel, and mix up vegetable soup. Also record the happenings of this eventful day on video tape.
“Soup”er Pots and Plants

Day 8 - Create a musical information and entertainment video for Soup Night. Children will tell what is in the soup. They will be shown making the soup along with versions of their favorite songs. This is also Soup Night (after school).

Activities for Plant Walk:

Day 1 - The Seed Within: Introduce seeds and how they will grow into a plant. This is only part of the unit on plants that the third graders will work on.

Day 2 - A Seed Grows: begin growing a selection of seeds.

Day 3 - Producing a Producer: continue planting.

Day 4 - Discussion of needs and wants. Reflection of what Service-Learning accomplished with Soup Night. What did the students do for Soup Night? Why did they organize it? How did it help people in the community? How could they use the things that they have learned about plants to help someone?

Day 5 - Brainstorm things to do to organize a Plant Walk. List the ideas and come up with jobs, a time line, materials needed, and outside help that may be needed.

Day 6 - Check on the number of seedlings that the students will be able to use. Make flyers for the event. Include all needed information. Third grade students can work with first graders to assist them with flyers and posters.

Day 7 - Match first and third grade students together. Get the pots for the plants. One pot can be shared by two students. They can brainstorm designs and colors to use.

Day 8 - Paint the pots with their partners.

Day 9 - Work with the first graders. Use the seedlings to show the first graders the different parts of a plant. Review needs of plants, the importance of plants, and different uses of plants.

Day 10 - Transfer the seedlings to the pots. The third graders can help their partners transfer the seedlings.

Day 11 - Create flyers to remind people of the Plant Walk. Design care cards that are to be attached to the plants. Peer edit for grammar.

Day 12 - Set up for the Plant Walk.

Day 13 - Plant Walk takes place. Students will help count and sort the money that is made.

Day 14 - Reflection/journal writing. How well did they work together? What did they do well? How do they feel about what they did? How did they help someone in the community?

Learning With a Purpose
**Grade Level:** Third and Sixth

**Time Line:** Ongoing - This unit will incorporate several lessons that may be repeated throughout the year.

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**UNIT OUTLINE**

**Service-Learning that Project Identifies:**
Third and sixth grade students will work together to create a school garden. Students will create a garden to donate food to needy families. The goal is to feed the community through the teaching of the curriculum.

**Unit Description:**
This unit will incorporate several components of the academic curriculum. Third and sixth grade students will work cooperatively to create a school garden. They will explore concepts through the use of hands-on math and science. Specific activities will include: literature incorporation, letter and journal writing, comparing and classifying different vegetables, the life cycle of a plant, soil testing, finding percentages, constructing boxes, measuring and staking a section for the garden, identifying what plants need to grow and survive, graphing the growth of the garden, distributing vegetables to families in need, creating a mural, and sharing vegetable soup with seniors.
Wick Garden

Subject(s) Addressed: Mathematics, Science, Language Arts, Social Studies, and Technology

Standards and Benchmarks:

Mathematics:
1. Explore scale drawings, models, and maps and relate them to measurements of real objects.
2. Apply measurement to describe the real world and to solve problems.
3. Collect and explore data through counting, measuring and conducting surveys and experiments.
4. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.
5. Present data using a variety of appropriate representations and explain the meaning of the data.

Science:
1. Design systems that encourage growing of particular plants and animals.
2. Describe the life cycle of familiar organisms.
3. Describe the function of selected plant parts.
4. Compare and contrast food, energy, and environmental needs of organisms.
5. Describe the requirements for living things to maintain their existence.

Language Arts:
1. Write with developing fluency for multiple purposes to produce a variety of texts.
2. Begin to plan and draft texts.
3. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.

Social Studies:
1. Pose a question about matters of public concern that they have encountered in school or in the community.
2. Compose brief statements expressing a decision on an issue in the school or local community.
3. Participate in projects designed to help others in their local community.

Non-Academic Outcomes:
1. Students will be able to work cooperatively with others to achieve a common goal.
2. Students will be able to relate their learning experiences to the needs of their community.

Reflection Activities:
Students will keep a daily journal in which they will reflect upon their learning experiences.
Assessments:
1. Survey results and graphs
2. Letter writing
3. District grade level unit test
4. Class presentations
5. Observation sheets

LESSON PLANS FOR UNIT

Lesson Title: Garden Introduction

Objective(s):
1. Identify the needs of plants in order for them to survive,
2. Conduct a survey, and
3. Create graphs.

Duration: one week

Materials:
* book: One Watermelon Seed
* variety of vegetables
* graph paper

Instructional Procedure:
1. Read story: One Watermelon Seed.
2. In cooperative groups, students will research using Golden Book (technology): How long is the growing season for a particular vegetable? What do these vegetables need to survive?
3. Survey the class to find out which vegetable is the most popular.
4. Graph results.
5. Survey the school to find out which vegetable is the most popular.
6. Graph results. Have students share findings school wide.

Lesson Title: Guest Speaker: A Gardener
Objective(s):
1. Practice listening skills,
2. Use note taking skills, and
3. Compose a letter.

Duration: one day

Materials:
• a professional gardener

Instructional Procedure:
1. The guest speaker (A staff member from Michigan State Horticultural Department) will visit the school to speak to students about plants and what they need to survive. She will also discuss and demonstrate growing techniques.
2. Students will write thank you letters. These letters should include at least three things that they learned from the presentation.

Lesson Title: The Life Cycle of a Plant

Objective(s):
1. Identify what plants need to survive, and
2. Observe the life cycle of plants.

Duration: three to four weeks

Materials:
• seeds
• soil
• water source
• small plastic containers (planters)

Instructional Procedure:
1. Display a variety of seeds and vegetables for students to observe.
2. Discuss each stage in detail.
3. Identify what plants need to survive.
4. In cooperative groups, students will plant vegetable seeds.
5. Students will do daily observations and begin to see the life cycle of plants.
6. When the plants are ready, they will be transplanted into the school garden.
Lesson Title: Comparing and Classifying Different Vegetables

Objective(s):
Compare and classify plants and graph results.

Duration: 2-3 days

Materials:
* variety of plants
* Internet
* Golden Book

Instructional Procedure:
1. Students will identify two particular vegetables.
2. With the use of reference tools (Internet, Golden Book, informational texts), students will compare two vegetables finding similarities and differences through the use of a Venn diagram.
3. Students will share their findings with their classmates.

Lesson Title: Measuring Plant Growth

Objective(s):
Measure and observe plant growth.

Duration: on-going

Materials:
* rulers

Instructional Procedure:
1. In cooperative groups, students will observe the growth of the vegetables that they transplanted in the garden on a weekly basis.
2. Students will measure the growth of the plants once a week.
3. Students will record the growth using a table and later convert their data into a graph.
Wick Garden
Bat Houses

Grade Level: Fourth
Time Line: Six, 1 to 1 1/2 hour lessons over 2 weeks

UNIT OUTLINE

Service-Learning that Project Identifies:
As part of the Wick Elementary School team working to establish the Elmer Johnson Park as a viable natural learning area for Wick students, the "Bat Houses" unit was developed. The Elmer Johnson Park has been largely ignored over the last few years. It is mostly overgrown and somewhat littered. A group of teachers from Wick Elementary School is in the process of reestablishing the natural elements of the park, as well as using it as a learning environment for students. According to latest research, bat habitats are being destroyed by human development, and Romulus is growing at an alarming rate. The park has a large population of mosquitoes, making it uncomfortable for human interaction. The installation of three bat houses will provide shelter to about 200 mosquito eating bats, and provide the students with educational and service experience. The project will lead fourth grade students through activities that not only cover science standards and benchmarks, but will help to develop an appreciation for natural areas and an understanding of bat interaction.
Bat Houses

Community Need that Project Identifies:
The Elmer Johnson Park is over-run with mosquitoes, making the park uncomfortable for human interaction. The bat's natural habitats are being destroyed by human development. The installation of bat houses will provide shelter to bats who will then eat the mosquitoes that are making the park unpleasant.

Unit Description:
The fourth grade class will investigate and develop an appreciation for bats and the need to preserve them. They will then determine that the bat is a mammal, based on observable physical characteristics. We will investigate the bat as part of a food web and what effects humans have had on the habitat of bats. Then, they will work cooperatively to assemble precut bat houses and paint them. They will take a nature hike to the park and install the houses. Lastly, the students will write a letter to an environmental group about the need to preserve bat habitats, and they will create a "Save the Bats" poster for the school.

Subject(s) Addressed: Science and Language Arts

Standards and Benchmarks:
Science:
1. Explain common patterns of interdependence and interrelationship of living things.
2. Compare and classify familiar organisms on the basis of observable physical characteristics.
3. Identify familiar organisms as part of a food chain or food web and describe their feeding relationship within the web.
4. Design systems that encourage growing of particular plants or animals.
5. Describe the basic requirements for all living things to maintain their existence.
6. Describe positive and negative effects of humans on the environment.

Language Arts:
1. Write with developing fluency for multiple purposes to produce a variety of texts
2. Begin to plan and draft texts.
3. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
4. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
5. Generate questions about important issues that affect them.
6. Develop and present conclusions based on the investigation of an issue or problem.

Non-Academic Outcomes:
The students will develop an appreciation for local nature parks and recognize the importance of preserving areas for nature. They will also develop a recognition of the importance of bats and learning with a purpose.
Bat Houses

their usefulness in nature.

Reflection Activities:
The students will write a friendly letter to a local representative about the need for bats and bat habitat preservation. The student will create a "Save the Bats" poster for the school.

Assessment:
The assessment for each benchmark will be done visually and orally as an ongoing assessment. The friendly letter will be assessed as to the science content as well as the language skills used. A pre- and post-assessment of bat appreciation and facts is included in the unit.

LESSON PLANS FOR UNIT

Lesson 1:

Lesson Title: Getting to Know Bats (Adapted from AIMS "Bats Incredible")

Objective(s):
Explain common patterns of interdependence and interrelationship of living things. Demonstrate feelings for and knowledge of bats, and begin to develop an understanding and appreciation for bats and their habitats.

Duration: One hour

Materials:
* "Nerf" ball
* tape recorder and blank tapes
* class graph
* 30, 3" X 5" pieces of white construction paper
* 30 copies of informational text on bats

Instructional Procedures:
Pre-assessment: Information Ball
1. Seat students in a circle
2. Place a tape recorder near the center of the circle.
3. Explain to students that the ball will be tossed around the circle. When they catch the ball, they are to tell something that they know about bats. They can "pass" if they have nothing to say.
Bat Houses

4. Turn on the tape recorder, indicate the subject, date, and year. Also indicate that this is a pre-assessment. Ask the question: "What do you know about bats?"

5. After students catch the ball, allow time for them to respond to the question. (Do not stop and clarify or correct misconceptions at this time.)

6. When all have shared, stop the recorder and save the tape for the post-assessment.

7. Explain that they will be exploring concepts about bats and creating bat houses over the next two weeks. As they learn more about bats, some of their ideas may be true and some may not.

Pre-assessment: "How Do You Feel About Bats?" Graph

1. Post a large class graph at the front of the room. (Categories: I Like Bats, I Don't Like Bats, I'm Not So Sure)

2. Give each student a 3'' X 5'' piece of white construction paper. Have each student draw a picture of a bat on paper. When they have completed their bat, have them come up and glue their picture on the graph under the title indicating how they feel about bats.

3. Examine the drawings of bats and compare similarities and differences.

4. Save the graph for the post-assessment.

Classwork/HomeWork:

1. Pass out informational text on bats.

2. Students are to read the information and in one paragraph, explain why bats are important to the environment.

Lesson 2:

Lesson Title: Bats Are Mammals (Adapted from AIMS "Bats Incredible")

Objective:
Explore characteristics of and analyze information about bats to determine their fit into the category of mammals.

Duration: One hour

Materials:
* chalkboard or chart paper
* 30 copies of informational text on mammals
* picture cards or cut out pictures of animals from National Geographic
* scissors

Instructional Procedures:
Bat Houses

1. Give each pair of students picture cards and scissors. Instruct them to cut the animal pictures apart and then sort them into groups. (Don’t provide any more instruction at this time.)

2. Have the teams share with the class their grouping rules. If students share names of classifications (mammals, reptiles, birds, fish, amphibians, insects, etc.), have them list some characteristics of each group. Record group name and characteristics on the chalkboard or chart paper.

3. Hold up each picture and list the characteristics of each animal and write under each animal a group name.

4. Hand out informational text on mammals to each student. Have students decide which of the animal pictures are mammals and the attributes each possess.

5. Hold up a picture of a bat. Discuss what they know about bats. Have students write “Bats” on a sheet of paper and then list their characteristics, noting which are similar to other mammals.


Classwork/Homework:

1. Pass out copies of “A Mammal Is....” from AIMS “Bats Incredible.”

2. Students are to complete the booklet identifying mammal characteristics and one characteristic that mammals do not have.

Lesson 3:

Objective:
Identify familiar organisms as part of a food web and describe their feeding relationship within the web.

Duration: One hour

Materials:
- overhead projector
- leaf showing insect damage
- transparency of food chain cards reduced to 50% (cut apart)
- sets of food chain cards
- scissors

Instructional Procedures:

1. Use the overhead projector to show the class the leaf with evidence of insect damage. Have the students list possible scenarios to explain the damage.

2. Ask students for ideas of ways they could find out what is eating the leaf in the play-
Bat Houses

ground.

3. Give each group of students a set of food chain cards. Explain that the cards show some typical animals in a school yard. Have groups cut apart the cards. Have students sort cards in any way. Share some sorting rules. If no one chooses to sort according to producer, consumer, and decomposer, or omnivore, carnivore, and herbivore, discuss the categories and have them resort according to one of these ways. Teach, discuss, and reinforce terms.

4. Direct one student in each group to choose a card showing an insect or another invertebrate. Ask the other group members to find another card that represents a plant or animal eaten by that animal. Have them find a card of an animal that would eat card number 2, and so on.

5. Using the overhead and transparencies of cards, create one group's set. Explain that what they have created is a food chain. Display other groups' chains. Describe the similarities and differences.

6. Challenge the class to look for relationships connecting two different chains. Use an overhead marker to connect the chains. (For example: a mouse eating a cricket in one chain could also eat grain or nuts in another.) Explain that the whole process of who eats what is so interwoven that we call it a food web. A food chain is just one link of a food web.

7. Consumer Concentration: Have groups of four students lay down the food chain cards face down in neat rows and columns. Two students are on each team. The first team flips over two cards. If they are a linking pair (two cards that are next to each other on the food chain), the first team gets to keep the cards. If not, the cards are turned back over. If a linking pair is found, the team gets another turn and keeps the cards. If not, it's the other team's turn. The game ends when all cards are gone or when all agree that there are no more linking pairs. The winning team is the team with the most cards.

8. Have groups pull out the bat cards. Have one student read what it eats and what eats it.

9. Discuss what would happen to the mosquito population of a certain area if all of the bats were killed or prevented from living there because their homes were destroyed.

10. Tell the class about Elmer Johnson Park and what has happened to the mosquito population. See if the class can come up with any ways to encourage natural mosquito predators to the area. Describe the bat houses they will be making in another lesson.

11. Ending questions for discussion:
   * Which organism is eaten by the most predators? How do they think that the species survives?
   * Which animals are picky eaters? Do they think that makes it easier or harder to survive?
   * Describe a food chain. How is it different from a food web?
   * Why are bats important in a food chain or web?
Lesson 4:

Lesson Title: Assembling Bat Houses (Design by Bat Conservation International)

Objective:
Build a system that encourages growing of particular animals.

Duration: 1 1/2 hours

Materials:
* 3, 6' of 1" X 12" rough saw, western red cedar or pine
* 3, 10' of 1" X 10" rough saw, western red cedar or pine
* 3 small hammers
* 6 pairs of safety goggles
* finishing nails
* silicon caulk
* dark color of outdoor paint
* 3 sets of colored 3" X 5" cards numbered 1-10 (one color per set)

Prior:
Have the lumber cut to the required dimensions with 1/16" horizontal grooves at 1/2 inch intervals on the smooth sides of all partitions for bat climbing and roosting. The precut lumber and hardware should then be brought to the school for assembly. Arrange for at least three parent volunteers with some carpentry ability to be present for the following assembly. Go over the assembly guide and directions with parents prior to the lesson.

Instructional Procedure:
1. Have desks and students arranged in three work stations. Appoint one parent as a leader at each station. Color code stations according to the 3" X 5" cards.
2. Provide one set of lumber and hardware for each station.
3. Number students off by 3's. Give each student a colored 3" X 5" card. The groups of students (about 10 to a group) will be rotated to one station, one student at a time.
4. Rotate students numerically. Have parents guide one student at a time safely (goggles on) as to how to nail. Using the Bat Conservation International guide, nail together the bat houses, rough edge in. (Rough for bats to grip onto and make sure the space between the inner partitions does not exceed 2 inches.)
5. Apply a bead of silicon caulk along each exterior joint to prevent heat loss.
6. When construction is complete, have the students rotate again to paint the outside of the bat houses a dark color (solar warmth).
7. Assign seatwork while waiting to be rotated to a station: Have students read informational text on bat caves and write ways the bat houses are like caves.
Lesson 5:

Lesson Title: Nature Walk and Bat House Installation

Objective(s):
Describe the basic requirements for bats to maintain their existence and the positive and negative effects of humans on the environment.

Duration: 1 hour

Materials:
* 3 bat houses
* tall step ladder
* hammer
* several large nails

Instructional Procedure:
1. Take students on a walk to Elmer Johnson Park (near school). Have student helpers carry bat houses, step ladder, hammer, and nails.
2. Locate three tall, solid trees near water as sites for the bat houses. Teachers or parents install the bat houses about 12-15 feet up the tree, facing south or southeast to catch the morning sun.
3. Have students sit in a circle on a dry, grassy area. Have the students describe the park and what they see.
4. Ask the group, "What kind of animals live here?" Draw on prior knowledge from earlier discussions.
5. Have students describe the needs of the listed animals: water, food, habitat, shelter, air, and sunlight.
6. Ask, "Will the bats have all they need to survive in our bat houses?" List all of the things that the park provides.
7. Now discuss human interaction. Look at the condition of the park. Discuss the effects of humans on the park, how it has been negatively impacted and how they are now in the process of positively affecting the park. Ask, "What would happen if humans were to interfere with the bats or houses? What should we do to prevent any interference by humans?" (stay away, not disturb the bat houses)
8. Hike around the area. Discuss any other animal homes they see. Review terms like producer, consumer, decomposer, carnivore, herbivore, omnivore, food web, etc.
9. Hike back to school.
Bat Houses

Homework:
Illustrate and write a paragraph about the first bat that will inhabit the bat house. Name it, describe it, and tell what it will find to meet its needs of food, habitat, water, shelter, air and light.

Lesson 6:

Lesson Title: Bat Habitat Preservation Letters and Post-Assessment (Adapted from AIMS “Bats Incredible”)

Objective(s):
Integrate science and language skills to write a letter to a city representative about the need for bat habitat preservation.

Duration: One hour

Materials:
* transparency of friendly letter format with labels
* overhead
* 30 copies of friendly letter format without labels
* 1 large manila mailing envelope
* “Nerf” ball
* tape recorder and cassette used in Lesson #1 “How Do You Feel About Bats?” graph

Instructional Procedure:
1. Distribute friendly letter format page to each student.
2. Using the overhead projector and the letter format transparency, review the friendly letter format.
3. Tell the students that they are going to write a letter to the Romulus City Mayor about the need for bat preservation. Tell the students to include facts about physical and behavioral characteristics, habitats, and influences of bats on the environment.
4. Collect the letters for evaluation. Send them to the Romulus City Offices.
5. Have students form a circle. Place tape recorder with cassette in the middle of the circle. Turn on the tape, indicate the subject, date, and year as well as stating that this is a post-assessment.
6. Ask the students, “What have you learned about bats?” Toss the ball as in Lesson #1. Correct any misconceptions that the students may have about bats at this time.
7. After all students have had an opportunity to say something, play back both recordings for the class.
8. Listen to the tape recorder later and evaluate individuals.
9. Revisit the "How Do You Feel About Bats?" graph from Lesson #1. Have the students examine what they now know about bats. Allow them to move their bat picture if their feelings about bats have changed.

10. Pass out drawing paper. Have the students create a "Save the Bats" poster for the school.

11. Discuss the following questions:
   * What is the most important thing you have learned about bats and bat habitats?
   * What could you tell your family about bats?
   * How have humans impacted the habitat of bats and what are the most important things you can do to help them?
Human Effects on the Environment

Grade Level: Fourth/Fifth

Time Line: Six weeks
The unit will begin late February for the first implementation. The main day of focus for the unit is Earth Day. Eventually the unit will serve as a year round project with emphasis on the month of April.

UNIT OUTLINE

Service Learning that Project Identifies: Earth Day Calendar for the month

Community Need that Project Identifies:
Creating an Earth Day Calendar will provide the community members with insightful ideas that will help to protect and preserve the environment.

Unit Description:
Students will be involved in describing the positive and negative effects that humans have on the environment. All of the activities will lead up to the creation of the Earth Day/Month Calendar. Students will recognize Earth Day terminology, identify positive and negative environmental effects, and create an Earth Day/Month Calendar.
Human Effects on the Environment

Subject(s) Addressed: Science, Mathematics, Language Arts, Social Studies, and Technology

Standards and Benchmarks:

Social Studies:
1. Describe the ways in which their environment has been changed by people, and the ways their lives are affected by the environment.
2. Suggest ways the people can improve their environment.
3. List ways that individuals can conserve limited resources.
4. Pose a question about matters of public concern that they have encountered in school or in the community.
5. Compose brief statements expressing a decision on an issue in the school or local community.
6. Participate in projects designed to help others in their local community.

Math:
1. Collect and explore data through counting, measuring, and conducting surveys and experiments.
2. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Science:
1. Describe positive and negative effects of humans on the environment.
2. Demonstrate ways to conserve resources and recycle manufactured materials.

Non-Academic Outcomes:
1. Citizenship: Children will become better citizens by learning ways to keep our earth clean.
Human Effects on the Environment

2. Role Model: The children will serve as role models for other students to see the importance of keeping our earth clean.

Reflection Activities:
The students will reflect on activities, thoughts, and questions in an Earth Day journal throughout the course of the unit. Upon completion of the unit, the children will look back through the journal at thoughts they feel are important. The class will formulate topics and questions from the journal. The fourth and fifth grade students will hold a discussion with the third grade students.

Assessment:
The students will collect the Earth Day Calendars at the end of the month from the teachers. Each group of students will be responsible for entering the information/results into the computer. A comparison graph will be created from the information gathered and specific questions will be asked. For example:

1. What do the words reduce, reuse, recycle mean?
2. What is one positive effect humans have on the environment?
3. What is one negative effect humans have on the environment?

LESSON PLANS FOR UNIT

(Week 4 - Day 1)

Lesson Title: Trash Troopers Rescue the School!

Objective(s):
1. Observe the types and amount of trash around the school.
2. Use classification skills to categorize the trash.
3. Use math skills to count and graph the trash.
4. Infer how people at school and in the community care for the environment.

Duration: 45 minutes

Materials:
* one trash bag
* rubber gloves for each team member
* newspaper
* markers
* bar graphs

Instructional Procedure:
Human Effects on the Environment

1. Discuss as a group how many people litter by leaving trash in places other than garbage containers.
2. Explain to the students that they are going to become “Trash Troopers” and help clean up the school environment.
3. The students will be broken into four groups.
4. Students will put on rubber gloves and be given a designated area to clean up the trash. The students will be given fifteen minutes. Students will be reminded not to pick up glass or any dangerous materials.
5. After the collection, students will spread out their trash on the newspaper. Students will sort the trash into the following categories: cloth, plastic, food waste, cans, paper, and other.
6. Students will count items and use the markers to graph accordingly.
7. Each group will present results to the other teams.

WEEKLY PLANNER

Week 1: Introduction

Day 1 - Read: “For the Love of Our Earth” by P.K. Hallinan. Talk about why the students need to do the things in the book. Make a list of what things they should do in their Earth Day Journals.

Day 2 - The students will make an entry in their Earth Day Journals. The students respond to the question: “What is an environmental problem?” Talk about journal entries in a group. Define what is an environmental problem. Ask if there have always been environmental problems. For homework, the students will interview a senior citizen. The students will interview a senior citizen about environmental problems now as compared to when he/she was a child. The class will develop interview questions.

Day 3 - The class will discuss the interview results and type some of the responses on the large computer monitor. The teacher will introduce the Service-Learning Project to the class. The teacher will discuss the development of an Earth Day/Month Calendar. The class will discuss how some of the interview responses could be used for the calendar. The students will write one idea in their Earth Day Journals.

Week 2: Reduce, Reuse, Recycle

Learning With a Purpose
Human Effects on the Environment

Day 1 - Earth Day Journal entry. The children will respond to the statement: "Last week I saw a sign that said: Reduce, Reuse, Recycle." What do these words mean and how can we do this at school?" After making their journal entries, the class will share their journal ideas about reducing, reusing, and recycling. The teacher will put the ideas on the large computer monitor. The teacher will give each student a brown paper bag. The teacher will tell the students about the Brown Bag Day. The children will keep a brown bag next to their desk for one day. The student will put all of his/her own garbage in the bag for one entire day. The children will bring the bag with the garbage to computer class the next time for discussion.

Day 2 - The class will analyze the type and quantities of trash accumulated in the brown bags. The class will make a list from the following questions:
* Who had the least trash?
* Who had the most trash?
* Could any of the trash have been recycled?
* How can we reduce the amount of trash?
* Can any of this trash be reused?

The students work in groups to create a waste policy for the classroom and post it near the trash can. The students will type the policy on the computer.

Day 3 - The teacher will explain the Recycling Run Around Game. The students will use their knowledge of recycling along with information cards to communicate through play ways to reduce, reuse, and recycle.

Week 3: Make a Stand

Day 1 - The teacher will divide the students into four groups. The teacher will pass out the Pollution Problem Cards and explain the assignment. The students will gather information from the technological materials in the classroom. The group will present their results to the class later in the week. The last five minutes of class the students will add one calendar day idea to their Earth Day Journals.

Day 2 - The groups will continue to work on the Pollution Problem assignment. The last five minutes of class the students will add one calendar day idea to their Earth Day Journals.

Day 3 - Each group will present their Pollution Problem to the class. The last five minutes of class the students will add one calendar day idea to their Earth Day Journals.

Week 4: Trash Trooper and Calendar
Human Effects on the Environment

Day 1 - The students will serve as “Trash Troopers” and help clean the school environment. Begin the “Trash Troopers” lesson (see lesson plans for unit). The students will race to collect trash. Upon completion, the groups will sort the collection of trash and graph the results. Each group will present their graph to the other teams.

Day 2 - The class will begin to fill in the Earth Day/Month Calendar. The class will gather ideas from their journal entries and other students.

Day 3 - The students will enter the completed calendar information into the computer program. Each classroom teacher will be given a calendar to post in his/her classroom. The teacher will record each day the number of students who did the calendar activity. The completed calendars will go home with the entire school population. The calendars will also be circulated throughout the community.

Week 5: Reflection

Day 1 - The students will reflect on journal entries they feel are important. The class will formulate topics and questions from the journals.

Day 2 - The fourth and fifth grade students will hold a discussion with the third grade students.

Week 6: Overall Assessment
(This will take place at the end of April after the calendars have been collected.)

Day 1 - The students will collect the completed calendars from the teachers. The students will analyze the information and enter information into a spread sheet. The students will create a graph that correlates with the information on the calendar. Each student will be required to answer specific questions about the entire unit.
Human Effects on the Environment

UNIT OUTLINE

Service-Learning that Project Identifies:
Creation of a tri-fold brochure detailing facts about the hazards of landfills and the benefits of and advice on recycling.

Community Need the Project Identifies: Waste Management

Unit Description:
A two-month unit designed to introduce students to the hazards of landfills and the benefits and types of recycling. They will explore the problems of lack of space and ground contamination associated with garbage landfills. They will recognize why we need to recycle, and learn to identify what is a recyclable material and what should be done with it. They will also work with the ideas of reducing and reusing. With this knowledge, students will survey their community about their recycling habits and design a brochure about the drawbacks of landfills and the benefits of recycling.
Human Effects on the Environment

Subject(s) Addressed: Science (Conservation/Waste Management), Language Arts (Writing Skills), Social Studies, and Math (Graphing Skills)

Standards and Benchmarks:

Social Studies:
1. Describe the ways in which the environment has been changed by people, and the ways their lives are affected by the environment.
2. Suggest ways that people can improve their environment.
3. List ways that individuals can conserve limited resources.
4. Pose a question about matters of public concern that they have encountered in school or in the community.
5. Compose brief statements expressing a decision on an issue in the school or local community.
6. Participate in projects designed to help others in their local community.

Math:
1. Collect and explore data through counting, measuring, and conducting surveys and experiments.
2. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Science:
1. Describe positive and negative effects of humans on the environment.
2. Demonstrate ways to conserve resources and recycle manufactured materials.
Non-Academic Outcomes:
Understanding of the hazards of current waste disposal systems and the benefits of recycling will create student interest in the environment. Through the exposure to the idea of reducing, reusing, and recycling, the students' personal management of garbage will become environmentally friendly and remain that way into adulthood.

Reflection Activities:
Students will work in groups of three to five and have the following reflection options to express their feelings and thoughts about human effects on the environment:
1. Write a song.
2. Create a play.
3. Choreograph a narrated dance.
4. Give a short presentation on recycling to another class.

Assessment:
Assessment of students will be based on the following:
1. Daily participation and effort.
2. Daily assignments.
3. Written test and short quizzes.
4. Participation on project.
5. Reflection activity participation.

WEEKLY PLANNER

Lesson 1:
Introductory discussion on waste management. Survey the students on how many recycle and what. Gather their ideas about where garbage goes and what happens in a landfill. To give the students an idea of how much garbage is generated by people and how much room it takes up, tell them that we are going to bag and save the classroom garbage for a week. Finally, explain what the unit will be about and what their Service-Learning Project will be and have them make a simple folder to store all of their informational materials for the coming unit.

Lesson 2:
Designed to give students the idea that garbage is made up of different materials, which can be sorted and reused or recycled. Using a large picture of a garbage can, divide it horizontally into sections labeled with different materials. Pass out note cards with objects on them, i.e. aluminum foil, torn shirt, newspaper, empty glass jar. The students will place the cards on the appropriate section of the garbage cans.
Lesson 3:
As a continuation of lesson 2, write the words Reduce, Reuse, Recycle on the chalkboard. For each object on the garbage can, have students think of ways they could reduce, reuse, and recycle it. List some of the objects and ask students for guesses on how long it takes these items to break down. Explain that most of these have very slow decomposition times, which contributes to lack of space for future garbage.

Lesson 4:
Review the discussion about slow decomposition rates. Explain that we are going to see for ourselves at what rate small pieces of trash decompose. Using a dozen types of trash, put each into a compartment in an egg carton with soil and leave outside. Every other day, check on the decomposition status. Each student will receive a record sheet to record their findings. This experiment will last the duration of the unit and longer if necessary.

Lesson 5:
The students' spelling words for the week will be chosen from the readings on landfills that they will cover during the week. Students will be given a list of ten words. The class will talk about what they are and spell them together. Students will write each word ten times, as well as define it as a credited homework assignment for their spelling grade. During the week, they will encounter the words in their readings, play spelling games with them, and have impromptu practice tests. At the end of the week, a final test will be given.

Lesson 6:
This will take approximately four to five days to cover. Students will receive a four page informational handout on trash. During the next few days, they will read the material together, discuss it, and highlight information that will be of particular help with their project. Topics covered will be:

1. *Causes of Excessive Trash*: litter, over-packaging, not reusing or recycling.
2. *Problems of Landfills and Incinerators*: air pollution, lack of space, ground water pollution.
4. *Products of Recycled Goods*

Lesson 7:
Pass out a copy of the work sheet "Away With Waste". Read through the list of things the kids can do at home to help reduce garbage. Have each student pick four items to try at home during the next week. At the beginning of the next week, have everyone report on what they managed to do. This is a credited participation assignment.

Lesson 8:
Have students bring in old magazines to share. Each student should cut out pictures of inanimate
Human Effects on the Environment

objects. Draw a large chart on the chalkboard and label with the headings: Paper, Plastic, Glass, Aluminum, Cardboard, Wood, Fabric. The students will take turns taping their pictures in the correct recycling or reusing column.

**Lesson 9:**
Pass out a copy of a word puzzle to each student. After they complete the puzzle using the names of objects made from recycled material, discuss what material each object is made from and which of these objects the students use in their daily life.

**Lesson 10:**
Using pictures or names of items you can buy, have students take notice of each item's packaging. After listing the object and its packaging, think of ways to reduce the packaging material. Have them record the information on a chart to keep in their science folders along with all other handouts.

**Lesson 11:**
As an interesting comparison, read to the class from "A History of Trash." They will hear how humans have disposed of their garbage for the last 1.5 million years. Discuss their comments.

**Lesson 12:**
The students will rap a song called "Garbage Shuffle." Give them the words the day before so they can become familiar with them. The song deals with garbage disposal through the ages. Have them coordinate moves and hand actions. When they're ready, have them stand in a circle, letting each one take a chance as soloist, while the others are the chorus.

**Lesson 13:**
Divide the class into pairs. Each pair will be responsible for creating a drawing and caption for a time period they read and sang about. The drawings will be assembled into a timeline of waste disposal history.

**Lesson 14:**
Pose issues of conservation to students. They will debate the pros and cons of each. Examples: paper or plastic, cloth or disposable diapers, glass or plastic bottles, incineration or burial of garbage.

**Lesson 15:**
Pose situations to the students that put them in an environmental dilemma scenario. How would they handle the situation? Example: You really enjoy those disposable juice boxes your parents put in your lunch, but they create so much waste and decompose slowly. What do you do?
Lesson 16:
Field trip to a landfill. Students should pay very close attention to the tour, because they will be writing an essay on what they observed, their thoughts and feelings about the landfill. This is a credited assignment for their science grade.

Lesson 17:
This will take approximately two to three days to complete. Give the students informational sheets listing facts about the amounts and types of recyclable and reusable materials that are thrown away. The sheets will also have information on products that are environmentally unfriendly (hazardous or slow decomposers). Spend time reading, discussing, and creating solutions and alternatives. Record their ideas on large paper to keep for future class reference.

Lesson 18:
Students will have one week to complete this assignment. They are to reflect on all that they have been exposed to during the last few weeks and write a fictional story integrating this material. This will be a credited assignment for their English grade.

LESSON PLANS FOR UNIT __________

(Lessons 19 & 20)

Lesson Title: Take That Knowledge and Put it to Work!

Objective(s):
1. Create a survey.
2. Analyze survey results and make deductions about them.
3. Assemble an advisory brochure based on their deductions of needed information.

Duration: Three weeks

Materials:
* chalkboard and chalk
* writing paper and pencils
* approximately 400 sheets of plain paper made from recycled goods
* computer and printer
* colored pencils, crayons, or markers
* resource books on landfills and recycling for reference
Instructional Procedure:

**Lesson 19:**
1. Remind students that today they will begin creating the community survey. Have them get out their science folders for reference.
2. Ask them to take a few minutes to think about what they have learned about recycling and what they feel is important.
3. Field suggestions and write them on the board.
4. When they are finished giving their ideas, work together to organize the questions into a logical order.
5. Divide the class into three groups. Group A will design the survey format and create it on the computer. Groups B and C will design and type the brochure.
6. Group A will have time to create the survey while the rest of the class works on something else. Approximately 200 copies will be made. A copy will be sent to businesses in the community and home of each family in the school. The rest will be placed in the community library and city hall, and will have drop boxes for completed forms. The results will be gathered within one week.

**Lesson 20:**
1. Once the completed forms have been gathered, the class will work in groups of four or five to tally the results. Each group will be assigned specific survey questions to tally.
2. Each group will be required to create their choice of graph to show the results of one or two questions. They will then have to give an oral presentation of their findings, using their graph. This is a credited assignment for their science grade.
3. Students will work as a class to analyze the results to determine the community's weaknesses with regards to recycling. These weaknesses will be the areas the brochure will focus on.
4. In two groups, the students will plan the information to be published. One group will be responsible for information on current waste management and negative human effects on the environment. The second group will cover the benefits of recycling, offer advice on how to do it, and include addresses and phone numbers of recycling and earth friendly groups.
5. Once all the information has been decided upon, Groups B and C (see step 5 in lesson 19) will begin on the design and construction. Group B will be responsible for garbage information and C will cover recycling.
6. Approximately 200 copies will be made and distributed to school students, local businesses, community library, and city hall.

**Reflection Activities:** See unit plan.
Human Effects on the Environment
Restoration of the Park:
How Humans Adapt to the Landscape

UNIT OUTLINE

Service-Learning that Project Identifies:
The students will build a nature trail and create a map/brochure for community use.

Community Need that Project Identifies:
There is a need for more recreation facilities in the community.

Unit Description:
The purpose of this project is for students to learn how the land shapes people and people shape the land. Their learning will be centered around a local park within walking distance of the school. Students will develop a working knowledge base by interviewing the Parks and Recreation manager, and visiting other parks and a waste facility (this park was a dump in a former life). They will synthesize and apply this knowledge by mapping the park and then creating a brochure for visitors to see both the boundaries of the park as well as what else it has to offer.
Restoration of the Park:
How Humans Adapt to the Landscape

Subject(s) Addressed: Social Studies, Science, Language Arts, and Mathematics

Standards and Benchmarks:

Social Studies:
1. All students will describe, compare and explain the locations and characteristics of ecosystems, resources, human adaptation, environmental impact and the interrelationships among them.
2. Explain how various people and cultures have adapted to and modified the environment.
3. Draw sketch maps of the community, region, and nation.
4. Use a decision making model to explain a choice involving a public good or service.
5. Engage in activities intended to contribute to solving a local, state, or national problem they have studied.

Science:
1. Describe positive and negative effects of humans on the environment.
2. Design systems that encourage growing of particular plants and animals.
3. Identify familiar organisms as part of a food chain or food web.
4. Describe the requirements for living things to maintain their existence.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Math:
1. Explore scale drawings, models, and maps and relate them to measurements of real objects.
2. Apply measurement to describe the real world and to solve problems.
3. Collect and explore data through counting, measuring and conducting surveys and experiments.
4. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.

Learning With a Purpose
5. Present data using a variety of appropriate representations and explain the meaning of the data.

Non-Academic Outcomes:
1. Decrease number of times students choose to break rules of behavior, as measured by a "check" on the chart.
2. A newly created trail will enhance community fitness levels.
3. Students will become more interested in community service.

LESSON PLANS FOR UNIT

Lesson 1:

Lesson Title: Initial Exploration: Nature Detectives

Objective: State three positive and three negative things people can do to the land.

Preparation and Materials:
The following will be used for each visit to the park:
* 2 other adults to help manage 32 students
* one adult to drive to park, to have vehicle available in case of an emergency (severe cut, bee sting, etc.)
* simple first aid kit: band aids, sunscreen, bug repellent
* water bottles
* rubbing alcohol to wash hands with after they are done in the park
This lesson:
* class set of pocket notebooks
* pencils

Anticipatory Set: Visualize being a detective

Instructional Procedure:
1. Take students to forest area. Give 5-10 minutes for students to explore on their own.
2. Bring group together and discuss what they discovered. Highlight poison ivy and garlic mustard.
3. Move to oak savanna. Repeat steps 1-2. Highlight different kinds of garbage: some rusting, some in same form (tires) for many years. Compare amounts of garbage between two places.
Assessment:
Sit for 10 minutes and ask students to write in their pocket notebooks three good ways people can use this land and three bad ways. Share.

Lesson 2:

Lesson Title: Micro Parks

Objective(s):
Show 5 or more ways humans can use a natural landscape for recreation and education through the creation of their own miniature park. Identify more ways that landscape is special and to be enjoyed by the community.

Materials:
Same as lesson 1, plus:
* 1/2 classroom set (16) flags and thread system for park boundaries (each set has 6 flags plus a 6 foot length of thread)
* If other adults are going to be helping, you might want to have note-cards for them that explain goals of the parks, so they can more effectively help students and know what is going on.
Optional: class set of buttons that say “Park Manager”

Anticipatory Set:
From what we have seen of parks by visiting them or reading about them, what are some fun and interesting places to visit in them?

Instructional Procedure:
1. The students work in pairs and design their own parks. They need to make it interesting so that other people will want to visit it. They are Park Managers, and will be giving a guided tour to the rest of the class.
2. Once the students have chosen their spots and set up their boundaries, there are three ways to make it special. The first is to notice what is already there. Remember, this is a miniature park, so a rock might be a mountain. If it is flat on one side, that might be a cliff for rock climbing. A drop of water could be a lake. Then, on their tours, the students would want to talk about all the cool things people could do on their lake.
3. The second way to make their park special is to bring things to their parks. However, the students need to remember Rule #2. (Tell story about Chris the tele skier, highlighting “Our Goal is to Leave no Tracks” message.)
4. Students should name their parks.
5. Rule: You have to have at least 5 different kinds of special places in your park. Some should be for fun, others should be for learning.
6. In pairs, students lay out their park boundaries.
7. Spend about 15 minutes establishing “points of interest.”
8. Have the class tour each park. Best if you can split into 2 or 3 smaller sections.
9. Students gather materials and clean up site.

Note:
Students may need to learn and/or review each time how to “have a class outdoors.” It is even more important that everyone listen closely and not fidget when the whole group is trying to have a discussion. In turn, the instructor needs to keep discussions short.

Assessment:
Did students name 5 “Points of Interest?” Assessment should be ongoing by teaching and checking for understanding while students make their parks. Then, more formally, note whether they can talk about 5 points during their tour.

Application:
1. What kind of special places are already here in Elmer Johnson Park?
2. How can we make it easy for people to see them and experience them?
3. How can we let them know these special places are here?

Extension: Create a brochure for your miniature park.

Lesson 3:
Lesson Title: Mapping

Objective:
Display map skills as they identify and draw in special characteristics of their park.

Materials:
* class set of compasses
* class set of outline maps
* pencils
* hard writing surface, like clipboards

Anticipatory Set: What are some ways people use maps? Why are they important?

Instructional Procedure:
1. Orient students to a map. Stand next to the baseball field and work with each student
Restoration of the Park:
How Humans Adapt to the Landscape

until they understand exactly where they are standing and how this location is shown on the map. Test the students by having them point to other mapped items, like the archery range and the fence line.

2. Students use a compass to establish North on the map by standing along a fixed boundary (in this case, along a fence that is already drawn on the map). As they face in the direction of the fence line, they draw an arrow for North according to which way it points in relation to the fence line. (The fence line was chosen because it is in fact very close to running North/South.)

3. To help students put compass work in context, discuss how people use cardinal directions. For example, when you are lost in the city.

4. Point out that I-94, a major landmark in this part of the state, runs East/West at Romulus.

5. Walk to the park. Have students draw in characteristics (see list below) by estimating their position in relation with known objects and landmarks. In some cases, the skill of pacing may be useful. (This method will need to have been previously taught.)

Map following:
* dirt road
* wetland
* oak savanna
* forest
* "wet forest" site of current dumping
* Garlic Mustard
* Trillium
* other items (their choice)

Note:
If possible, the mapping is best done in small groups, so other adult group leaders are helpful.

Assessment:
1. Final copy of map, showing each of the characteristics above.
2. Quiz: Tell 5 situations where a map would help people adapt to the landscape.

Extension:
Make a legend and scale for the maps. Scale would involve measuring a known object that has been accurately drawn or copied from map with set scale. The students in this case have been given a map with boundaries accurately copied, but no scale. If they were to measure (pace) the Archery Range fence, they could convert this into a scale on their map.

WEEKLY PLANNER

Day 1 - Orientation with the Parks and Recreation Director and a visit to the park.
Day 2 - Map skills 1: Pacing and using a compass.

Day 3 - Map skills 2: Reading topographic maps and park maps. Learn characteristics of maps.

Day 4 - Map skills 3: Making map symbols and simple maps. Given a short list of elements, make a map.

Day 5 - Plants, animals, water and land forms. i.e. - characteristics of ecosystems - behind the school.

Day 6 - Field Trip to Metro Park and Waste Management Facility (double class period). More map and compass practice.

Day 7 - Visit park and set distances, directions, landmarks and some ecosystem characteristics for map (compass, topographical map). (Use a double class period.)

Day 8 - Mapmaking in class.

Day 9 - Research for human history of the park. Interview the Parks and Recreation Director. Generate questions to ask at home over the weekend to get a variety of perspectives.

Day 10 - Examples of brochure styles. (Including examples from Interlochen, MI where five students created a brochure for a local park.) Outline of critical information to include initial sketch.

Day 11 - Maps are due. Work on brochures.

Day 12 - People as land shapers: agriculture, cities, roads, dams, sculptures (video).

Day 13 - Brochures due. Reflection activity in the park. Make small "signs of hope" to place in special spots in the woods.
Restoration of the Park:
How Humans Adapt to the Landscape
Help Save the Trees!

Grade Level: Fifth
Time Line: Fall or Spring, about 7 days long

UNIT OUTLINE

Service-Learning that Project Identifies:
Investigate the shortage of trees in the City of Romulus and write to City Council about our concerns.

Community Need that Project Identifies:
Romulus is a growing city that needs to consider the impact of the destruction of so many trees.

Unit Description:
In this unit, students will learn about how the destruction of trees directly effects each one of them and their community.
Help Save the Trees!

Subject(s) Addressed: Science, Social Studies, and Language Arts

Standards and Benchmarks:

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Science:
1. Describe positive and negative effects of humans on the environment.
2. Demonstrate ways to conserve resources and recycle manufactured materials.

Social Studies:
1. Describe the ways in which their environment has been changed by people, and the ways their lives are affected by the environment.
2. Suggest ways that people can improve their environment.
3. List ways that individuals can conserve limited resources.
4. Pose a question about matters of public concern that they have encountered in school or in the community.
5. Compose brief statements expressing a decision on an issue in the school or local community.
6. Participate in projects designed to help others in their local community.

Non-Academic Outcomes:
1. Students will learn to construct a business letter to the mayor of Romulus.
2. They will learn the correct way to plant a tree.
3. Students will learn how humans are affected by nature.

Assessment:
Students will construct a letter to the mayor of Romulus to express their feelings about the lack of trees and landscaping in the city. They will also be planting a tree on/near school property and writing a short reflective paper.

Learning With a Purpose
Help Save the Trees!

LESSON PLANS FOR UNIT

Day 1:

Lesson Title: Examine the Rain Forest

Objective:
Examine the uses of the rain forest and learn how all humans are affected by their destruction.

Duration: 45 minutes

Materials:
* book: *Here is the Tropical Rain Forest* by Madeleine Dunphy
* rolls of pennies (4 rolls per group)

Instructional Procedure:
1. Read the book: *Here is the Tropical Rain Forest*
2. After reading the selection, brainstorm with the students different ways they are affected by the rain forests (*i.e. medicine, oxygen, large variety of unknown species, etc.*).
3. After the brainstorming session, split the class into groups of 3 or 4. Give each group four rolls of pennies (*one roll = 50 pennies*). Direct each group to open two rolls of pennies and lay out the 100 pennies end-to-end on a flat surface.
4. Explain that only 6% of the earth’s surface is covered by rain forests. Ask students how many of the lined up pennies this represents (six). Ask each group to move the six pennies away from the others. Then ask how the rain forest area compares in size to the rest of the earth. Next tell students that 50% of all species of animals and plants live in the rain forest. Instruct each group to open its remaining two penny rolls. Then have the group’s members stack 50% or 50 pennies atop the six that represent the rain forest. Have them stack the remaining 50 pennies atop the 94. Ask students “How does the rain forest compare to the rest of the earth?” Discuss again why this ecological environment is so important. (*The Mailbox, June/July 1999, pg. 6*)

Day 2:

Lesson Title: Rain Forest vs. Romulus

Objective(s):
Identify problems with nature conservation in the community. Recognize that the city has problems similar to those in the rain forests.
Help Save the Trees!

Duration: 30 minutes

Materials:
• Venn diagram for each student

Instructional Procedure:
1. Have a class discussion about the ecology of Romulus.
2. Take the students outside (have them take a pencil, paper, and something to write on). Have them sit quietly and observe the area. They should record what types of plants and animals they observe (i.e. grass, a few trees, small bushes, birds, neighbor dog, etc ...)
3. After returning to the classroom, discuss what they observed while outside. Discuss why the landscape is the way it is (development, homes) and possible ways it has changed in the last 50 years.
4. On the Venn diagram, have the students compare and contrast the rain forest to the city of Romulus.

Day 3:

Lesson Title: Don’t Kill the Trees

Objective(s):
Become informed about the local government and laws concerning the environment.

Duration: 30 minutes

Instructional Procedure:
1. Discuss the idea of more businesses developing in Romulus.
   • Metro Airport expanding.
   • The responsibility of local businesses to landscape.
   • Tearing down trees to make way for more buildings.
   • Mayor Oakley not insisting that businesses take responsibility for the beautification of the city.
2. Develop a class list of pros and cons of developing Romulus further.
3. When the list is completed, post it in the room for future use.

Day 4:

Lesson Title: Letter to City Council
Help Save the Trees!

Objective(s):
Students will construct a persuasive letter to city council concerning the beautification of Romulus.

Duration: 3 days, 45 minutes each day

Materials:
* list of pros and cons from day 3 lesson

Instructional Procedure:
1. Break the class into groups of four.
2. Using the writing process, have the groups construct a letter to city council about one of the following topics:
   * the tearing down of trees for more buildings,
   * businesses not having to landscape their land,
   * expansion of Metro Airport, or
   * any related (appropriate) topic the group can come up with.
3. Brainstorming: Brainstorm first in a large group. When done, have them brainstorm (make a word web, outline, list) in their groups. They can begin to develop their rough draft if enough time is left.
4. Rough Draft: Have the groups construct the rough draft. When the rough draft is completed, have them read it out loud to each other and make editing changes.
5. Final Copy: Have the groups reread the paper to make any last minute adjustments. Have them write a final copy.
6. When the final copies are completed, have the group address the envelopes and send the letters to the City Council.

Day 5:

Lesson Title: Replant the Forest

Objective(s):
Learn that a forest is built one tree at a time, and each person should take part to conserve our local environment.

Duration: one hour

Materials:
* a small tree from a local greenhouse
* shovel
* watering can
* wagon to transport the tree
Help Save the Trees!

Instructional Procedure:
Before class begins find a nice spot \(\text{(okayed by the principal)}\) to plant the class tree. (If time permits it is a good idea to dig a hole for the tree ahead of time)

1. As a class go outside to plant and water the new class tree.
2. Return to class and have the students write a reflection piece on what they have learned from their experience.
Ecosystems

Grade Level: Fifth
Time Line: Three weeks

UNIT OUTLINE

Service-Learning that Project Identifies:
Students will provide their assistance in creating a nature trail for their community (Elmer Johnson's Park).

Community Need that Project Identifies:
We will acquire labor and resources from the Romulus Parks and Recreation Department and through the use of volunteers.

Unit Description:
This unit will incorporate several components of the study of ecosystems. Specific activities will include: comparing and classifying organisms (plants and trees), identifying the life cycle of a flowering plant, finding out why energy from the sun is essential to the food making process, and finding the perimeter of a tree.
Ecosystems

Subject(s) Addressed: Science, Language Arts, Social Studies, and Math

Standard and Benchmarks:

Social Studies:
1. All students will describe, compare and explain the locations and characteristics of ecosystems, resources, human adaptation, environmental impact and the interrelationships among them.
2. Explain how various people and cultures have adapted to and modified the environment.
3. Draw sketch maps of the community, region, and nation.
4. Use a decision making model to explain a choice involving a public good or service.
5. Engage in activities intended to contribute to solving a local, state, or national problem they have studied.

Science:
1. Describe positive and negative effects of humans on the environment.
2. Design systems that encourage growing of particular plants and animals.
3. Identify familiar organisms as part of a food chain or food web.
4. Describe the requirements for living things to maintain their existence.
5. Compare and classify organisms into major groups on the basis of their structure.
6. Describe the life cycle of a flowering plant.
7. Describe evidence that plants make and store food.
8. Describe how all organisms in an ecosystem acquire energy directly or indirectly from sunlight.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Math:
1. Explore scale drawings, models, and maps and relate them to measurements of real objects.
2. Apply measurement to describe the real world and to solve problems.
3. Collect and explore data through counting, measuring and conducting surveys and experiments.
4. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.
5. Present data using a variety of appropriate representations and explain the meaning of the data.

Non-Academic Outcomes:
1. Students will be able to work cooperatively with others to achieve a common goal.
2. Students will be able to relate their learning experiences to the needs of their community.
3. Students will use tools to identify and classify trees.

Structured Reflection Activity:
Students will keep a daily journal in which they will reflect upon their learning experiences.

UNIT OUTLINE

Lesson Title: Comparing and Classifying Plants and Trees

Objective(s):
Compare and classify organisms into major groups on the basis of their structure.

Duration: One week

Purpose:
Students need to be able to compare and classify plants and trees in order to label the plants and trees found on our nature trail.

Experiential Component:
Students will label plants and trees on the nature trail.

Materials:
• tree finder guide
• Golden Book
• Internet
• trade books
Ecosystems

Notes for Instructor:
Tree finder guides should be used with pairs of students. Golden Book is a reference tool at the elementary level. (Compass Learning)

Introduction/Anticipatory Set:
Give pairs of students a specific plant/tree to identify and classify. As a group, they will compare their findings.

Instructional Procedure:
1. Give each pair of students a card with a specific plant or tree name on it.
2. Have them use reference tools such as a tree finder guide and Golden Book to identify and classify their plant or tree.
3. Bring the group together to compare their findings.
4. Design labels (signs) for their specific plant/tree.
5. Take the group to the nature trail to find and label their plant/tree.

Assessment:
By creating a sign for their plant/tree, students classified an organism into a major group.

WEEKLY PLANNER

Week 1: The Life Cycle of a Flowering Plant

Objective(s):
1. Describe the life cycle of a flowering plant.
2. Describe how all organisms in an ecosystem acquire energy directly or indirectly from sunlight.

Purpose:
Students must be aware of the life cycles of different kinds of organisms. In this case they will investigate the life cycle of a flowering plant. Since plants need sunlight to survive, students must also understand the sun's role in this cycle of life.

Experiential Component:
Students will plant flowering plants on our nature trail. They will be able to watch them germinate and grow into mature plants.
Materials:
  * seeds
  * Golden Book
  * life cycle chart.

Notes for Instructor:
Discuss the life cycle of a flowering plant with your students. They should have a clear understanding of the life cycle before you begin planting.

Introduction/Anticipatory Set:
Display various seeds, sprouts and mature plants for the students to observe.

Instructional Procedure:
1. Display various seeds, sprouts, and mature plants for the students to observe.
2. Discuss each stage in detail.
3. Identify what a plant needs in order to survive. (sunlight, water, air, space, food)
4. Use Golden Book as an informational tool.
5. In cooperative groups, students will plant flowering plants on the nature trail.

Assessment:
Students will be able to describe in detail the life cycle of a flowering plant. Have students put the life cycle stages into the correct order.

Week 2: Plants: How They Make and Store Food

Objective(s):
Describe evidence that plants make and store food.

Purpose:
Students should understand that plants are able to make their own food and the importance of how it is stored and used.

Experiential Component:
Students designate an area on the nature trail to plant a small vegetable garden. Vegetables can be donated to families in the Romulus community.

Materials:
  * seeds
  * examples of plants that store food
Notes for Instructor:
If an area cannot be designated on the nature trail, find out if you can use a small area at your school. This will also allow the students to monitor the growth of their vegetables more frequently.

Introduction/Anticipatory Set:
Display examples of plants that store food. Ask students where each came from. Discuss with them how certain plants store food.

Instructional Procedure:
1. Display examples of plants that store food.
2. Ask students where they find each food.
3. Discuss with students how they rely on plants that store food.
4. Designate an area on the nature trail to plant vegetables.
5. Donate the vegetables to the Romulus community.
6. Hold a taste testing day. Let students bring in foods from plants that store food.
7. Find out which foods are most popular with the class by constructing a graph.

Assessment:
Students will be able to give examples of plants that make and store their own food.

Extension:
Each year add something to the nature trail.
Greens N' Things:
A Thematic Unit Utilizing the Community to Learn about Ecosystems

Grade Level: Fifth
Time Line: Approximately five weeks.

UNIT OUTLINE

Unit Description:
This project will essentially serve as an opportunity for students to bridge what they learn in school to the real world. This is an authentic experience which integrates all of the core curriculum, instead of content areas in isolation. Students, many times, do not have an opportunity to connect what they learn to the real world.

Students will offer several services to the school and community. They will study and evaluate the ecosystem surrounding Cory Elementary School. In addition, they will research issues of survival of trees, plants, and flowers around the school. They will make decisions about the landscaping of a location, and how it will effect the area. Finally, they will design and landscape an area of the ecosystem.
Greens N’ Things:
A Thematic Unit Utilizing the Community to Learn about Ecosystems

Subject(s) Addressed:
Social Studies, Math, Language Arts, and Science

Standards and Benchmarks:

Language Arts:
1. Research information and make judgments.
2. Compare and contrast information.
3. Prepare written and oral presentations.

Math:
1. Relate fractions and decimals to concrete models.
2. Utilize various problem solving techniques.
3. Utilize standard and metric measurement.

Science:
1. Integrate constructing and reflecting skills.
2. Apply knowledge of ecosystems.

Social Studies:
1. Integrate Five Themes of Geography (Human-Environment Interaction).
2. Utilize Business and Economics Perspective information (choices).

Non-Academic Outcomes:
Students will gain an expanded respect of the environment, form community partnerships, and take ownership of the world they live in.

Reflection Activities:
1. Greens N’ Things Gathering - Positive Plants activity
2. Time Capsule - pictures, reflections, wishes for the future placed in a time capsule and buried
3. Present flowers to Senior Citizens/Grandparents

Assessment:
1. Romulus Community Schools Ecosystems Assessment Test
2. Brochure or Visual Display about preserving the environment and beautification of the community
3. Create a web site about Greens N’ Things Project

Learning With a Purpose
Greens N' Things: 
A Thematic Unit Utilizing the Community to Learn about Ecosystems

WEEKLY PLANNER

**Week 1: Introduction**

Day 1 - Brainstorm ecosystem concepts and vocabulary. Discuss the pros and cons of respecting the environment.

Day 2 - Narrow and categorize brainstorming activity to school community. Assess the needs of the community focusing on the ecosystem surrounding the school grounds. What can they do to address the needs of their community?

Day 3 - Distinguish between wants and needs for their environment. Brainstorm needs to implement a change. Formulate a plan of action: costs, design, landscape, permission, research, resources (natural, human, capital), and materials.

Day 4 - Students make decisions about the types of trees, plants, and flowers based on research and develop a landscape design using their cooperative groups.

**Week 2: Community Connections**

Day 1 - Students in cooperative groups locate business resources in local community through phone directory, Internet, and personal contacts (networking).

Day 2 - Explore careers in ecology field. Learn appropriate telephone etiquette.

Day 3 - Students schedule business visitations and send business/thank-you letters to confirm appointments and material donations.

Day 4 - Propose, plan, and implement budget and fund raising techniques.

**Week 3: Academy**

Day 1 - Students will participate in Academy Time to learn about ecology from business contacts.

Day 2 - Field Trip: orchard or nursery

Day 3 - Create proposal in small groups to present to principal. Develop, administer, and compile surveys to staff and students to gather information about attitudes toward the environment.
Greens N’ Things:  
A Thematic Unit Utilizing the Community to Learn about Ecosystems

Day 4 - Feedback to class from survey (graphic organizers)

Week 4: Preparation

Day 1 - Prepare earth for trees, plants, and flowers. Plan dedication ceremony for school.

Day 2 - Landscape area and dedicate project.

Day 3 - Design pamphlets about how to respect and preserve our environment.

Day 4 - Prepare workshops for other classrooms:
  * How to Help the Environment
  * Decision Making Skills
  * Our Ecosystem

Week 5: Reflection and Assessment

Day 1 - Follow up with school and principal about quality, satisfaction, and possible future projects.

Day 2 - Sharing and Reflection Activities:
  * Greens N’ Things Gathering - Positive Plants activity
  * Time Capsule - pictures, reflections, wishes for the future placed in a time capsule and buried.
  * Present flowers to Senior Citizens/Grandparents
  * “Observe a Tree” and “Tree Portraits” activities

Day 3 - Categorize experiences using subject areas. Review ecosystem concepts.

Day 4 - Extension: Ecosystem Unit Test and dissection of random Cory grown flowers (flower study).
School Beautification Project

Grade Level: Sixth
Time Line: May / June 1999 - ongoing during future school years

UNIT OUTLINE

Service-Learning that Project Identifies:
The fifth and sixth grade students at Barth Elementary will be constructing a garden on the school grounds. Activities involved include soil and erosion testing, charting various measurements, and maintaining a clean and well-groomed garden.

Community Need that Project Identifies:
The principal of Barth Elementary expressed an interest in a beautification project at the school site. Students, staff, and visitors should be able to enjoy the results of this project throughout the spring, summer, and fall.

Unit Description:
Activities involved include soil and erosion testing, charting various measurements, and maintaining a clean and well-groomed garden.
School Beautification Project

Subject(s) Addressed:
Science, Language Arts, Math, and Social Studies.

Standards and Benchmarks:

Science:
1. Identify some common materials that cycle through the environment.
2. Describe ways in which humans alter the environment.
3. Describe the likely succession of a given ecosystem over time.
4. Explain how surface features change.

Language Arts:
1. Use reading for multiple purposes.
2. Respond to the ideas and feelings generated by oral, visual, and written texts, and share with peers.
3. Write with developing fluency for multiple purposes to produce a variety of texts.
4. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.
5. Describe and use effective listening and speaking behaviors.
6. Use oral, written, and visual texts to identify and explore school and community issues and problems, and discuss how one individual or group can make a difference.
7. Generate questions about important issues that affect them.
8. Develop and present conclusions based on the investigation of an issue or problem.

Math:
1. Explore scale drawings, models, and maps and relate them to measurements of real objects.
2. Apply measurement to describe the real world and to solve problems.
3. Collect and explore data through counting, measuring and conducting surveys and experiments.
4. Organize data using concrete objects, pictures, tallies, tables, charts, diagrams, and graphs.
5. Present data using a variety of appropriate representations and explain the meaning of the data.

Social Studies:
1. All students will describe, compare and explain the locations and characteristics of ecosystems, resources, human adaptation, environmental impact and the interrelationships among them.
2. Explain how various people and cultures have adapted to and modified the environment.
3. Draw sketch maps of the community, region, and nation.
School Beautification Project

4. Use a decision making model to explain a choice involving a public good or service.
5. Engage in activities intended to contribute to solving a local, state, or national problem they have studied.

Non-Academic Outcomes:
Students will be working in cooperative groups during parts of this unit and will be able to improve various social skills. The classes will also be involved in goal-setting and be left with an improvement to the school that they can take pride in and feel directly responsible for.

Reflection Activities:
Through the use of journal writing, students will demonstrate a connection to the standards and benchmarks that are addressed. Students will also extend their learning by suggesting ways that the garden can be improved by other classes in the future.

Assessment:
Student journal entries and constructed response items that represent each standard/benchmark addressed will serve as evaluation tools.

LESSON PLANS FOR UNIT

Lesson 1:

Lesson Title: Let's do something for Barth School!

Objective(s):
Describe ways in which humans alter the environment.

Duration: One class period

Materials:
* overhead projector
* garden pictures

Instructional Procedure:
1. Introduction: Allow students to write a journal entry on their most memorable experiences at Barth. Share selected entries with the class.
2. Distribute pictures of various styles of gardens. Ask design questions - Why are they designed like this? Which show gardens from our climate area? What colors do you notice/like the best?
3. Announce that our class will be working with the 5th grade to make a "lasting gift" to the
School Beautification Project

school by creating a garden. This will be a learning activity as we make it and keep it growing healthy.

4. Brainstorm a list of possible garden “themes” that we could work into the design. (Lead the class to butterfly garden ideas.)

5. Closure: Where could we learn about gardens? Butterflies? How will we change the area we are working with? Will this change affect the local environment?

Lesson 2:

Lesson Title: Dig it up!

Objective(s):
1. Describe ways in which humans alter the environment.
2. Identify some common materials that cycle through the environment.

Duration: Two class periods

Materials:
* shovels
* gloves
* soil testing kits
* buckets
* overhead projector

Instructional Procedure:
1. Introduction: Show students the soil testing kits. Form cooperative groups of two students each. Have each collector obtain a sample of soil from random places within the designated future garden area and test these samples in class.

2. Recorders place results on class graph/overhead. Discuss results (positive or negative - why?)

3. With buckets, have students collectors get larger samples of soil from garden. Closely examine contents of bucket with partner. Recorders make list of everything found.

4. Class does a reading on carbon dating process. Would anything they found today be able to be carbon tested? Why/why not?

5. Closure: Could they recycle anything that they found? What items? Students are to do a journal entry.

Lesson 3:

Lesson Title: Will the garden last?
School Beautification Project

Objective(s):
Describe ways in which humans alter the environment.

Duration: One class period

Materials:
- shovels
- lumber for grading
- landscape ties
- pictures of coastlines.

Instructional Procedure:
1. Introduction: Showing the class examples of coastlines that have been eroded after extended periods of time (before and after), have them determine what the process is called (erosion).
2. Could erosion hurt or change their garden? (Keep in mind the roof drain that comes out of the side of the school above their garden.) Have the students write down reasons in their journals.
3. At garden site, ask for descriptions on ways to reduce the amount of erosion/loss of soil due to water, wind, etc.
4. Using lumber and shovels, grade the garden fairly flat, and place the landscape ties around border.
5. Closure: Have volunteers create their versions of garden overhead drawings on the board. Pose questions on erosion to check for knowledge. Did we help or hurt the garden today by altering the "natural" landscape?

Lesson 4:

Lesson Title: Planting the flowers.

Objective(s):
1. Describe the likely succession of a given ecosystem over time.
2. Describe ways humans alter the environment.

Duration: One class period

Materials:
- various flowers to attract butterflies
School Beautification Project

* shovels
* gloves
* references on butterflies/gardens

Instructional Procedure:
1. Introduction: Using references provided, go around the classroom and list the flowers that will attract butterflies to their garden.
2. With class volunteers, make list of flowers found to attract butterflies. Explain that they will be planting some of these flowers today.
3. Using cooperative groups, plant flowers in straight rows, keeping each type of flower together. (One flat of flowers per group.)
4. Inside, allow students to create a map of the garden, with each flower type labeled in the correct areas.
5. In journals, what will the garden look like in one year if they do nothing else to it? In ten years? Twenty years?
6. Reading and worksheet on succession process of ecosystems (groups of two, ear-to-ear method).
7. Closure: Would you rate the garden project a success? What could next year's class do to improve it? Did they make a difference in the school's appearance? What did they like best about planning/building the garden?
A Nature Walk for the Community

Grade Level: Sixth
Time Line: 2-3 weeks (with additional check-up visits)

UNIT OUTLINE

Service-Learning that Project Identifies:
The students will be part of a school-wide project that enhances the local park (Elmer Johnson). They will be creating a nature trail.

Community Needs that Project Identifies:
By creating a nature trail, the students will be providing a fun and educational experience for the families of their community. This will inevitably create another attraction for the area.

Unit Description:
Through the study of ecosystems, land, plants, and animals, students will become aware of the surroundings and how this project will affect the environment. Students will not only be developing a trail, but also using their knowledge to make decisions relative to the position of the trail. This unit will serve as an extension of previous units.
A Nature Walk for the Community

Subject(s) Addressed: Math, Science, Social Studies, and Language Arts

Standards and Benchmarks:

Science:
1. Describe evidence that plants make and store food.
2. Explain how selected systems and processes work together in plants and animals.
3. Describe common patterns of relationships among populations.
4. Predict the effects of changes in one population in a food web on other populations.
5. Describe how all organisms in an ecosystem acquire energy directly or indirectly from sunlight.
6. Identify some common materials that cycle through the environment.
7. Describe ways in which humans alter the environment.
8. Explain how humans use and benefit from plant and animal materials.

Math:
1. Construct an organized list or table to solve a problem.
2. Construct a drawing or uses a drawing, a graph, or a physical model to solve a problem.
3. Checks the solutions with the conditions of the problem.
4. Evaluate alternative processes for solving problems.
5. Recognize and develop valid conclusions from given information.
6. Construct tables from data.
7. Determine ratios from models that are part-to-part, part-to-whole, and recognize verbal expressions for ratios.
8. Solve problems involving ratios.
9. Use models to represent percents.
10. Recognize equivalent expressions involving selected fractions, decimals, and percents using models or easily recognized fractions.

Language Arts:
1. Recall information from an oral presentation.
2. Pose questions for clarification.
3. Speak individually before the class, expressing feelings and ideas about a certain topic.

Social Studies:
1. Describe, compare and explain the locations and characteristics of ecosystems, resources, human adaptation, environmental impact and the interrelationships among them.
2. Explain how various people and cultures have adapted to and modified the environment.
A Nature Walk for the Community

3. Draw sketch maps of the community, region, and nation.
4. Use a decision making model to explain a choice involving a public good or service.
5. Engage in activities intended to contribute to solving a local, state, or national problem studied.

Non-Academic Outcomes:
Students will be able to work cooperatively with others to achieve a common goal. They will also work together to meet a need in the community. This will in turn create community awareness and respect.

Reflection Activities:
Students will create a journal, logging daily information, activities, and information.

Assessment:
Students will be assessed on their awareness of the issues as well as daily activities, journals, participation, and written quizzes.

Lesson Plans for Unit

Lesson 1:

Lesson Title: Plant Parts

Objective(s):
1. Develop a puzzle using the process photosynthesis.
2. Locate the parts of a plant and flower on the given diagram.
3. Work cooperatively in group of 3 to meet a common goal.

Duration: 35-40 minutes

Materials:
* plant model
* markers (enough for each group)
* drawing paper (30)
* plant diagram (30)
* flower diagram (30)
* photosynthesis model (poster)
Instructional Procedure:
Groups will begin answering the warm-up question posted on the board: "What kind of puzzle could you develop to help someone else to learn about photosynthesis?" Students will plan and develop a puzzle with their group to present to the third grade students. They will work on this for the first ten minutes, the rest of the warm-up, if not completed it is to be assigned as homework. Students will use their prior knowledge to help create a brainstorm board to use as a resource in completing their plant and flower diagrams.

Lesson 2:
Lesson Title: Bill Nye/ Layers of the Forest

Objective(s):
1. Identify the different layers of the forest using information gained by a Bill Nye video on trees.
2. Create an outline recording important facts contained by this video.
3. Orally express new found knowledge about the forest by way of class discussion following the video.
4. Create a teacher's test to reinforce knowledge.
5. Create checklists to bring to the park.

Duration: 2 - 30 minute lessons

Materials:
* paper (30)
* pencils (30)
* journals (30)

Instructional Procedures:
Students will began their first lesson by watching a twenty-minute video on trees by Bill Nye. They will use their journals to take notes in an outline format for further use. Students will then create a teacher test consisting of: ten multiple-choice questions and three essay questions. This will be used as their authentic assessment of the material. This activity may carry on into the next class period. When they have completed this assessment, the class will collaboratively create a checklist to be used at the park. Students will categorize their lists by: things to look for, things to avoid, and new findings. These different categories will be extended upon during future lessons and the trip itself.
Lesson 3:

Lesson Title: Creating a Reference Book

Objective(s):
1. Accurately put together a wildlife booklet.
2. Color the plants and animals with appropriate color.
3. Identify the objects visually without using their booklet.

Duration: 40 minutes

Materials:
* construction paper (30)
* staplers (5)
* staples (if needed to refill stapler)
* crayons (30)

Instructional Procedure:
Students will be given a copy of various plants and animals that they may come in contact with at the park. They will be asked to identify each animal. On each card is important information such as their eating habits and where they live. Students will create this book to use as a reference guide to identify and locate various species at the park. The students will be responsible for doing some research to find out the proper color and look of an animal or plant to achieve the proper representation of that species. Students will be assessed on their ability to correctly locate and create booklet information.

WEEKLY PLANNER

Day 1 - Review plants and their parts. Discuss the phenomenon of photosynthesis. Start journals (include plant reference sheets with labeled parts and photosynthesis).

Day 2 & 3 - Watch a video on trees by Bill Nye. Students will take notes in their journals using information from the movie. Students will create checklists for their trip to the park. (2 - 30 minute lessons)

Day 4 - Students will create a book of field plants and animals to take with them for reference at the park. (1 - 40 minute lesson)

Day 5 - Activity called “Tree Houses”. The students will study what animals will be effected by the
development and use of the trail. (1 - 45 minute lesson)

Day 6 - Visit the Park. The students will walk through the area they wish to use. Students will write down (in their journals) any problem areas they see and suggestions for the plan. (1 - 90 minute lesson)

Day 7 - Brainstorm possible problems with the area. Write a plan using suggestions. (1 - 45 minute lesson) (Journals collected)

Day 8 - Activity: "Discovering Dirt." Before the class can start developing, they need to know what kind of ground they are dealing with. (1 - 50 minute lesson)

Day 9 - Topographic Map: At the park, the students will create a current map to take back to the classroom to manipulate into the nature trail. (1 - 90 minute lesson)

Day 10 - Manipulate maps. (1 - 50-minute lesson)

Day 11 - Decide on Map: Group students with job cards. (1 - 45 minute lesson)

Day 12 - Start trail.
Project Management:
A Unit Developing Student Management and Application Skills for Task Completion

Grade: Sixth

Time Line: Six Weeks - Introduction to Reflection
- Week 1: Introduction of Project and Proposal Creation
- Week 2: Acceptance of Proposal and Plan Submission
- Week 3: Selection of Project Plan and Material Gathering
- Week 4: Crew Assignments and Area Delineation
- Week 5: Crew Tasks and Managerial Status
- Week 6: Project Completion and Reflection

UNIT OUTLINE

Unit Description:
The class will create an exercise course on the school's playground for all community members to use, which will improve physical fitness and cardiovascular health. This unit is designed to apply the skills and knowledge students have gained, in various subjects throughout the year, to the building of an addition to an elementary school playground. Students will learn to use a hierarchical structure to manage fellow students and to apply a step-by-step procedure plan to an assigned task. Finally, students will create a physical manifestation of an idea with the completion of their plan.

Essential Question:
Are students able to apply the knowledge they have gained to plan, implement, and complete a project of their own design that will better their community and environment?
Subjects Addressed: Science, Language Arts, and Mathematics

Standards and Benchmarks:

Science:
1. Qualitatively describe motion in three dimensions.
2. Relate changes in speed and direction to unbalanced forces in two directions.
3. Describe forces exerted by magnets, electrically charged objects, and gravity.
4. Describe strategies for moving objects by means of the application of forces.
5. Explain how characteristics are passed on through generations.
6. Describe how heredity and environment may influence characteristics of an organism.
7. Explain how humans use and benefit from plant and animal materials.

Language Arts:
1. Comprehension of a variety of informational text.
2. Compares, contrasts, and classifies concepts and ideas.

Mathematics:
1. Whole number computations and usage.
2. Understanding decimals.
3. Fractions and fraction calculation.
4. Use of Geometry and calculator skills.

Non-Academic Outcomes:
1. Personal Organizational Skills: Students will develop the ability to plan, implement, and accomplish tasks in their daily, personal, and academic lives. Students will recognize the purpose in planning and organizing before attempting.
2. Increased Civic Pride: Students will gain a sense of personal contribution to their community through the creation of a useful source of recreation.
3. Respect for Curriculum: Students will recognize the value of daily lessons in contributing to their skill base, their ability to understand necessary concepts in building, and the value of being understood.
4. Increased Personal Pride: Students will gain a sense of personal pride at persevering through a project to its fruition and experiencing success.

Community Outcomes:
The students will provide a source of cardiovascular fitness information and an activity area at no cost to the community.

Assessments:
While each academic objective will have a district standardized assessment, students will also be assessed by their peers in a class discussion with a rubric. Students will have an opportunity to...
justify and explain the behavior of each member of the team as well as the ranking the students feel the team member deserves. This will then be averaged for each student as a grade in each of the three subject areas addressed.

Reflection Activities:
Following project completion, students will hold a ceremony for the course in which they will name and present the course they have created. Take a half an hour to discuss the project, its difficulties, and its benefit to each student prior to the celebration. Students will have the opportunity to recognize any team member for special recognition and appreciation at the ceremony.
To complete the reflection, students will discuss the science, math, and language arts objectives they recognize in the lessons as well as any they believe should be added.

**WEEKLY PLANNER**

**Week 1: Introduction of Project and Proposal Creation**

Day 1 - Introduce the students to Service-Learning and explain the project they will undertake. (The class will create an exercise course on the school’s playground for all community members to use, which will improve physical fitness and cardiovascular health.) Explain the exercise course and its purpose. Students will be broken into groups to brainstorm exercises for the course and narrow the choices down to five. One student will type these for submission with a brief explanation of why these are the best exercises.

Day 2 - Students continue to work in their groups and complete a list for submission.

Day 3 - Reconvene as a class and vote on the best exercises for the course from the suggestions. Base the decision on improving cardiovascular fitness and difficulty. Take the class outside to examine the proposed exercise course site and take rough measurements of the area necessary to begin the project. Suggest an area of coverage and a location. Have students record measurements and location on a rough map.

Day 4 - Use the lesson plan to create and layout a presentation to the principal for the exercise course.

Day 5 - Continue to create proposal and practice presentation with students offering criticism and advice.
Project Management:
A Unit Developing Student Management and Application Skills for Task Completion

LESSON PLANS FOR UNIT

Subject: Language Arts

Topic: Persuasive Writing

Duration: two class periods, 55 minutes each

Objective(s):
1. Compare, contrast, and classify concepts and ideas.
2. Draft a persuasive document.
3. Identify the audience for a document.
4. Revise writing for clarity and appearance.

Materials:
- butcher paper 5' X 3'
- chalkboard
- markers
- meter stick
- tape
- construction paper
- word processor

Instructional Procedure:
Review:
Review the five selected exercises from the previous submissions and write them on the chalkboard for display.

Purpose:
Create a proposal to present to the principal that outlines the size and activities of the course, while also highlighting the community benefits.

Preparation:
Use a meter stick to create centimeter grid lines across the entire sheet of butcher paper. Cut out the following shapes using construction paper:
6 - X
6 -
3 -

Information/Modeling:

Learning With a Purpose
Project Management:
A Unit Developing Student Management and Application Skills for Task Completion

Tape the butcher paper to the board at the front of the room and explain that the students will present a similar poster to the principal for approval, and that it must show the layout of the school yard and the location of the course with each activity labeled. Explain scale, compass directions, and grid lines to the students. Ask students to provide an easy scale to use for the playground and exercise area (1 cm = 1 ft. is good) and place it at the bottom of the sheet. Next, place a compass rose on the paper and ask students to fill in the directions. Finally, point out that a key would make the drawing easier to understand. Ask students to use the following symbols for the exercise stations (X), exercise directions ( ), existing playground equipment ( ), and school buildings (——).

Guided Practice:
Allow students to discuss and create rough maps of the course with people near them. Then ask those students with suggestions to come forward and show the class where they would put each exercise on the grid. Allow students to try different combinations and after about 5 minutes, put each location to a vote.

Information/Modeling:
Once the grid is complete and all exercises have been placed, ask students who their audience is. Once they have identified the principal, ask the students what they think he/she will look for in deciding whether or not the course should be built. After accepting suggestions, offer the following items to be addressed by the students in their proposal:
* What is the project?
* What are the goals of the project?
* What will this course do for the school and community?
* Who will use the course and who will maintain the course?
* What materials are necessary for the course?

Class Discussion:
Allow students to break themselves into groups and select one of the questions. Ask groups to word process their response and present it for the class.

Closure:
Each group will select one person to present the answer their group has written. The class may ask the student questions once the answer has been stated. Ask each group to revise their statement as necessary and turn it in for the final proposal.
Ask students to vote anonymously for one person to lead a presentation for the principal the following day. Collect and count the results. Select the top three voted students as the presentation team and ask one student to schedule a meeting with the principal. Combine the word processed document and print a copy for each presenter, saving the final copy for reflection later on.
Project Management:
A Unit Developing Student Management and Application Skills for Task Completion

WEEKLY PLANNER

Week 2: Acceptance of Proposal and Plan Submission

Day 1 - Class will watch the final presentation of the proposal and either accept or reject it.

Day 2 - Revise and present (or) present to the principal.

Day 3 - Await principal’s decision (or) present to the principal.

Day 4 - Work on resubmission (or) await the principal’s decision (or) begin material gathering.

Day 5 - Begin material gathering.

LESSON PLANS FOR UNIT

Lesson Title: Material Gathering

Subject: Mathematics

Topic: Pricing Material and Comparing Quantities

Duration: 3 days

Objective(s):
1. Calculate cost based on estimates and measurements of need,
2. Compare quantities and costs to find the “best” price,
3. Measure area and volume in a given space, and
4. Estimate material needs for building from a plan.

Materials:
* telephone with an outside line
* Yellow Pages
* pencils
* paper
* calculators
* yardsticks

Learning With a Purpose
Project Management: 
A Unit Developing Student Management and Application Skills for Task Completion

* course plans 
* overhead projector

Instructional Procedure:
Review:
Give each student a copy of the plans for each of the five exercise stations the students chose (available on the Internet and from Ann Arbor Parks and Recreation Department) and ask them to help the teacher create a materials total need list on the overhead. List these out and ask the students to write the totals down for each of the materials.

Purpose:
Explain that today they will become consumers looking for the best deal, and that they have a limited budget to work with. Students will be calling local retailers in search of the materials in need and identifying themselves as elementary students working on a community project.

Information/Modeling:
Using role play, the teacher should demonstrate the proper way to speak to a retailer on the phone and inquire about pricing.
Retailer: Hello. So & So Gardening.
Teacher: Hello, my name is Mr. Smith and my class is working on a community project to improve our playground.
Retailer: What can I do for you, sir?
Teacher: Well, I need to know the price of your 8 foot long 2 X 6's, and your 8 foot long landscaping ties.
Retailer: Sure, I'll get that for you. Can you hang on a moment?
Teacher: Certainly.
(Pause)
Retailer: Hello, sir?
Teacher: Yes, I'm still here.
Retailer: All right, the 2X6X8's are $2.49 each, and the ties are on sale this week for $1.69. Can I help you with anything else today?
Teacher: No, thank you. That about does it.
Retailer: Thank you, sir, and have a nice day.
Teacher: Thank you, too. Goodbye.

Assign each student to needed material and ask them to practice with their group members before calling.

Guided Practice:
Dismiss groups to begin making calls and getting figures at one of the available phones. Explain to students that they must provide comparisons from at least three businesses. Once they have
comparisons, ask the students to provide a total cost for the amount needed for each material and identify the best price.

**Class Discussion:**
Once all the calls have been made, ask each group to present the prices they found and their recommendation for a place to purchase the materials they inquired about. Record the sources and estimated prices from the students for each of the materials and total up material costs for the project.

**Closure:**
Once purchased materials have been identified, point out that they will still need tools to work with and brainstorm a list for the students to copy down as a class. Ask students to suggest sources for these items and ask if donated or borrowed items would be acceptable. Suggest that the students ask their parents what they have available at home to use, but be clear that nothing may be brought in yet.

### WEEKLY PLANNER

**Week 3: Selection of Project Plan and Material Gathering**

**Day 1** - Continue material pricing.

**Day 2** - Complete material pricing and begin material purchase and pick up.

**Day 3** - Ask students to create a list of parents who are willing to lend tools and time to the project both during and after school. Store and cover materials purchased.

**Day 4** - Draft a letter home to parents who have offered to lend tools explaining the procedure for drop off and retrieval.

**Day 5** - Begin collecting and labeling tools from parents.

**Week 4: Crew Assignments and Area Delineation**

**Day 1** - Students will break into crews and take responsibility for part of the task.

**Day 2** - Students will take measurements and mark off their work area. Students will learn the proper way to clean, retrieve, and store their tools daily.
Project Management:
A Unit Developing Student Management and Application Skills for Task Completion

Day 3 - The students will be taught safety rules and rules using tools.

Day 4 - Students will gather the necessary materials and tools to begin work.

Day 5 - Continue construction.

Lesson Title: Breaking Ground

Subject: Mathematics

Topic: Area Preparation and Marking

Duration: 55 minutes

Objective(s):
1. Measure and mark area using appropriate measurement tools and units.
2. Read multi-step directions to accomplish a task.
3. Mark and label measurements of length.
4. Estimate appropriate fraction lengths.

Materials:
* 5 tape measures
* 50 ground stakes
* 50 plastic flags
* 5 hammers

Instructional Procedure:
Review:
The teacher will take students out to the work site and review the safety rules for working with tools.
Five work crews will be assigned (arbitrarily) and students will gather as crews. Each group will consist of one leader and 4-6 crew members. (Crew leaders will be voted for by students in each crew.) If possible, one volunteer teen or adult will work with each crew as a supervisor, with the teacher acting as Chief.

Purpose:
comparisons, ask the students to provide a total cost for the amount needed for each material and identify the best price.

**Class Discussion:**
Once all the calls have been made, ask each group to present the prices they found and their recommendation for a place to purchase the materials they inquired about. Record the sources and estimated prices from the students for each of the materials and total up material costs for the project.

**Closure:**
Once purchased materials have been identified, point out that they will still need tools to work with and brainstorm a list for the students to copy down as a class. Ask students to suggest sources for these items and ask if donated or borrowed items would be acceptable. Suggest that the students ask their parents what they have available at home to use, but be clear that nothing may be brought in yet.

**WEEKLY PLANNER**

**Week 3: Selection of Project Plan and Material Gathering**

**Day 1** - Continue material pricing.

**Day 2** - Complete material pricing and begin material purchase and pick up.

**Day 3** - Ask students to create a list of parents who are willing to lend tools and time to the project both during and after school. Store and cover materials purchased.

**Day 4** - Draft a letter home to parents who have offered to lend tools explaining the procedure for drop off and retrieval.

**Day 5** - Begin collecting and labeling tools from parents.

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Day 3 - The students will be taught safety rules and rules using tools.

Day 4 - Students will gather the necessary materials and tools to begin work.

Day 5 - Continue construction.

LESSON PLANS FOR UNIT

Lesson Title: Breaking Ground

Subject: Mathematics

Topic: Area Preparation and Marking

Duration: 55 minutes

Objective(s):
1. Measure and mark area using appropriate measurement tools and units.
2. Read multi-step directions to accomplish a task.
3. Mark and label measurements of length.
4. Estimate appropriate fraction lengths.

Materials:
* 5 tape measures
* 50 ground stakes
* 50 plastic flags
* 5 hammers

Instructional Procedure:

Review:
The teacher will take students out to the work site and review the safety rules for working with tools. Five work crews will be assigned (arbitrarily) and students will gather as crews. Each group will consist of one leader and 4-6 crew members. (Crew leaders will be voted for by students within each crew.) If possible, one volunteer teen or adult will work with each crew as a supervisor, with the teacher acting as Chief.

Purpose:
Today the students will lay out their work areas and break ground on the project. The area to be used for the course should be marked in advance using string and stakes, and the students will use their original plans to identify what exercise station goes where.

Information/Modeling:
The teacher will demonstrate the use of the plan to identify where each site goes according to the compass and measurements from the edge of the area. Explain that students will have to estimate, but that they may not stake the areas until the location is verified by the Chief. Once the students get verification and stake the area, they should attach flags to it to limit the amount of space they use.

Guided Practice:
Allow crews to begin location and verification of planned construction sites. Once all of the crews are staked, ask them all to stand back and look at the area so that they know where they will be working.

Closure:
Ask the class to imagine what the course should look like when it is finished and work toward that goal as a team. Remind them that just like in sports, a good team must communicate to win. Allow students to break ground at their sites and begin following the directions.

WEEKLY PLANNER

Week 5: Crew Tasks and Managerial Status

Day 1 - Ask students to exchange tasks with someone in their group. Revote for Crew Leaders.

Day 2 - Continue construction.

Day 3 - Continue construction.

Day 4 - Continue construction.

Day 5 - Continue construction.
Week 6: Project Completion and Reflection

Day 1 - Continue construction.

Day 2 - Continue construction.

Day 3 - Continue construction. Gather and return unused tools and begin area clean-up.

Day 4 - Continue construction, complete construction, gather and return tools.

Day 5 - Complete construction and reflection assessment ceremony.

Lesson Plans for Unit

Lesson Title: Reflection on Project

Subject: Science/Mathematics

Topic: Evaluation of Service Activity

Duration: 55 minutes

Objective(s):
1. Identify skills and activities linked to school curriculum.
2. Judge the value of the project in terms of educational value.
3. Discuss personal benefits of the program with their peers.
4. Judge the value of the project in terms of community benefit.

Materials:
* student rubric forms

Instructional Procedure:
Review:
Display the original plan and proposal of the project beside the finished area and remind students of the goals identified at the opening of the project.
Purpose:
Examine the accomplishments of and possible improvements to the exercise course service-learning activity.

Class Discussion:
Students will be asked to respond to the following questions:

• How did the students meet the goals of the original plan?
• Were they unable to meet any of the original goals?
• What parts of the finished course could be better?
• How would they change the original plan to make it better?
• What skills that they learned in the classroom did they apply to this task?
• What do they want the community to know about this course and the work they put into it?
• What project ideas do they have for next year’s class?

Closure:
Ask students if there is anyone whom they feel deserves special recognition for their hard work on the project, and ask them to explain why to the whole class. Allow students to agree and applaud as they see fit.

Assessment:
Students will grade their team members using a four point rubric worksheet.
Weather

Grade Level: Sixth - Eighth

Time Line: Two 60 minute class periods

UNIT OUTLINE

Service-Learning that Project Identifies:
Teaching preschool students tornado safety and how to use simple wind instruments.

Community Need the Project Identifies: Teach tornado safety.

Unit Description:
Students will learn about tornadoes and tornado safety, how to measure wind speed and direction, and produce a tornado safety book for preschoolers.

Subject(s) Addressed: Science and Language Arts
Standards and Benchmarks:
Science:
1. Explain appropriate safety precautions during severe weather.
2. Describe weather conditions.

Language Arts:
1. Write with developing fluency for multiple purposes to produce a variety of texts.
2. Begin to plan and draft texts.
3. Integrate listening, speaking, viewing, reading, and writing skills for multiple purposes and in varied contexts.

Non-Academic Outcomes:
Students will be able to work cooperatively with their peers as well as with young children to achieve a common goal. Students will feel good about themselves through helping preschoolers learn safety information.

Reflection Activities:
1. Classroom discussion
2. Reaction questions
3. Create a picture book about tornado safety

Assessment:
1. Service site observations for participation
2. Classroom discussion participation
3. Reaction questions
4. Produce an informative picture book

Lesson Plans for Unit

Lesson Title: Weather

Objective(s):
1. Understand that tornadoes are made of wind.
2. Learn tornado safety precautions.
3. Use a compass to find wind direction and make a wind flower to find wind direction.
4. Use an anemometer to find wind speed and use wind flower to find wind speed (slow or fast).

Duration: Service site about 60 minutes.
Weather

Materials:
* tornado tubes (1 demo or 1 per group)
* compass (1 per group)
* anemometer (1 demo or 1 per group)
* wind flower (1 per preschooler)
* poster showing: tornado safety

Introduction:
Have a student show the tornado tube and swirl it to make a tornado appear for the preschoolers. Questions: What do you see? What does it look like? What am I doing to make it appear? Answers you are looking for: water moving in a circle, looks like a tornado, your moving it in a circle. Explain: tornadoes move in a circle but they are made of wind (air). When the water moves down the drain in the bathtub it looks like a tornado. When air is pulled into a circling motion it looks like a tornado.

Instructional Procedure:
1. Have a student/preschooler ratio (2 students / 3 preschoolers). Pass out a tornado tube for each group and allow preschoolers time to make the tornado appear with the older students help (collect tubes).
2. Question: Do you think the wind that makes a tornado is moving fast or slow? (fast) Explain there are instruments that measure how fast wind moves and the direction of the wind. Show a compass and explain that it can be used to find wind direction. The anemometer can be used to find wind speed. Blow into the anemometer so it rotates.
3. Tell the preschoolers that they are going to make an instrument to show wind speed and direction: a wind flower (show one completed). Have someone blow at it and explain how to find wind direction. Ask how would it move if the wind was moving just a little and with a lot of wind (slow and fast). Have preschoolers each make one with the help of the older students. Teacher to give directions in steps.
4. Take preschoolers outside to try their instruments staying in their assigned groups. Ask if the wind is blowing on their face, back, or side? Have them turn so the wind makes their instrument rotate. Have the older students show the wind direction with the compasses. If time, allow preschoolers to use the compass.
5. Ask if the wind is moving fast or slow? How will they know if it is fast or slow? (the wind flower will be rotating fast or slow). Show them the anemometer and explain how it works. If there are several, allow the older students to show the preschoolers how it works and let them try it. Return to the classroom.
6. Have the preschoolers put their wind flowers in front of themselves. Let them know they will be able to take them home later and use them again. (The teacher may want them put into their cubby).
7. Review how tornadoes are made of wind, very fast winds. Ask the preschoolers what they should do to stay safe if there were a tornado? Review safety with them and show
Weather

posters. (Students can draw these ahead of time for you.)

* If outside, go into the house.
* If there is a basement, go there and into the smallest room.
* Without a basement, go into the smallest hallway or room.
* If at school, the teacher will take you into the hallway. (The preschool teacher may want to have a practice tornado drill before you leave.)

8. Groups of three create a picture book: "What to do if there was a tornado." Give the books to the preschool for the children to use.

Reflection Questions:

1. Who did you work with on the service project?
2. What instruments did you use?
3. What service was provided for the preschoolers?
4. Did the preschoolers welcome a stranger? Why or why not?
5. How did you help a preschooler?
6. What three things do you remember the most about the service project?
7. What did you like the least and what did you like the best?
8. How did you feel about doing this service? Would you do it again?
9. What effect did your service have on the preschoolers?
10. What did you learn in the classroom which helped make the service possible?
11. What new thing did you learn while doing the service?
12. Do you feel the preschoolers know what to do in case of a tornado? Why?
13. Compare the anemometer to the wind flower (both are wind instruments). How are they alike and how are they different?
14. Compare the compass to the wind flower. How are they alike and how are they different?
Reclaiming the Courtyard

Grade Level: Ninth / Tenth

Time Line: Approximately 2 school weeks (3 days of introduction and planning, 5 days of service, 1 day of reflection, 1 day of assessment).

UNIT OUTLINE

Service-Learning that Project Identifies: Beautification of School
The service portion of this project includes clean-up (picking up trash), rudimentary landscaping, (replacing and raking the soil, planting new grass, flowers, and small shrubbery), and painting.

Community Need that Project Identifies: Beautification of School/Community
Due to the nature and location of this enclosed courtyard, when completed, it can be used as an alternative outdoor setting/classroom which can be used by any teacher/class, weather permitting.

Unit Description:
Students will be working together in small groups, while concurrently working as a whole group in taking pride in their school/community by fixing up the abandoned courtyard.
Reclaiming the Courtyard

Subject(s) Addressed: Science and Social Studies

Standards and Benchmarks:
Science:
1. Describe positive and negative effects of humans on the environment.
2. Design systems that encourage growing of particular plants and animals.

Social Studies:
1. Describe, compare, and explain the locations and characteristics of ecosystems, resources, human adaptation, environmental impact and the interrelationships among them.
2. Explain how various people and cultures have adapted to and modified the environment.
3. Draw sketch maps of the community, region, and nation.
4. Use a decision making model to explain a choice involving 10 public goods or services.
5. Engage in activities intended to contribute to solving a local, state, or national problem they have studied.

Non-Academic Outcomes:
Students will have an opportunity to experience feelings of accomplishment with visible results. Students will use their learned skills in the area of teamwork, responsibility, accountability, and positive participation. They will naturally invest, respect, and put pride into their hard work, hence, building a positive connection between themselves and their school/community.

Reflection Activities:
Students will be required to participate in a class discussion with each student commenting/making suggestions on both positive and negative aspects that they experienced or saw other students encounter. Students will also have to prepare and write a "Special Project" report.

Assessment:
1. Students will be assessed on their communication/participation skills toward other students.
2. Students will be assessed not only on the content, but also the presentation of their "Special Project" report.
3. Classroom assignments/reflection activities.

Learning With a Purpose
Lesson Title: Reclaiming the Courtyard.

Objective(s):
Use social skills in the areas of teamwork, responsibility, accountability, and positive participation while providing the service of beautification of their school. Work individually as well as in small groups while implementing the project. Clean-up, fix up the grounds, paint, and plant flowers, grass, and small shrubbery.

Duration:
Approximately 2 school weeks (3 days of introduction and planning, 5 days of service, 1 day of reflection, and 1 day of assessment).

Materials:
All materials provided by teacher and school maintenance which includes, but is not limited to:
- rakes
- shovels
- hoes
- gloves
- dirt
- grass seed
- flowers
- small shrubbery
- trash bags
- paint
- brushes

Instructional Procedure:
Day 1 - Go over unit outline with students. Ask and answer any questions.

Day 2 - Take students on a "tour of the courtyard." Have the students inspect all of the areas that are in need of improvement. Come back to class. Talk about what they just saw and how it made them feel. Did they like what they saw? Does this courtyard reflect the way they think about themselves and their school? Why or why not?

Assignment 1: Have students make a list of the possible changes they feel they need to make in order to make the courtyard more eye appealing. Have students get into 3 small groups and design a picture of the courtyard on how it would look if it was all finished and fixed up. Have the students present their picture to the rest of the class. Students will then decide as a class how they are going to fix up the abandoned courtyard. What will it look like when completed?
Day 3 - Students will break up into 3 small groups and decide who is going to do what (picking up trash, helping pull weeds, raking and planting, or drawing and painting). If consensus cannot be reached, then the teacher will aid and put students into respective groups. Each group will then start planning how they are going to accomplish all of their activities over the next five days so that it will turn out the way the whole class has pictured the finished court yard.

Assignment 2: Each of the three groups will fill out the "week at a glance" worksheet. Students will budget their time and efforts towards their goal for each day. Time will also be allocated for clean-up and putting away of the necessary tools.

Days 4-8 - Let the service begin. Students will use their week at a glance worksheets to structure their work and progress. After returning to class 15 minutes before the bell rings, students will update their week at a glance worksheet and make the necessary changes to stay on schedule. Students will also be required to update the other two groups on their progress.

Day 9 - Day of Reflection: Students will write a two page hand written report on what they did individually to contribute to the service-learning project as well as how it fit into the big picture of what they were trying to accomplish. They will include such areas as:

1. How they felt the project went.
2. What was working?
3. What they would like to have changed?
4. What were some of the problems that they encountered?
5. What solutions did they have?
6. What did they expect?
7. Did they have fun?
8. How does this project benefit the high school?
9. How does it benefit the city of Romulus?
10. How did each of the group members contribute? Was teamwork incorporated?

Day 10 -

Assignment 3 - Part I: Students will break into their 3 groups for 30 minutes. They will then have to present highlights of each person’s paper to the rest of the class. (Approximately 3-5 minutes but no more than 10 minutes.) Assessment will be made not only on the content, but also the clarity, and the organization of the presentation.

Assignment 3 - Part II: Students will have until Friday to turn in a typed version of their individual reflection paper, which will be handed back to them today. Class time will be allocated Wednesday and Thursday but NOT Friday.

Learning With a Purpose
Sampling and Reasoning through Recycling

Grade Level: 9 - 12 Geometry
Time Line: 3-4 Weeks

UNIT OUTLINE

Service-Learning Project: The Disposal Proposal
Students will closely examine the attitudes of students and staff at Romulus High School regarding recycling habits at school and home. Students will examine the current operation and efficiency of the RHS recycling program. Students will create a proposal for the School Improvement Team in how to better reduce, reuse and recycle.

Community need that project identifies:
Romulus High School needs assistance in reforming its recycling program

Unit description:
Use Integrated II Mathematics-Unit 1 (McDougall Littell, 1998) course materials and adapt its method of instruction to the pedagogical practice of service learning using the following key elements.
Sampling and Reasoning through Recycling

1. Service that meets a need identified by a community
2. Clear connection between curriculum objectives and service activities
3. Structured opportunities for student reflection and relation to curriculum goals and objectives

Students will use the internet to research recycling techniques and gather statistics about recycling programs. Students will create a survey and collect data regarding students' attitudes about recycling. Students will examine collected data and identify areas for improving the recycling program at Romulus High School.

Subject(s) addressed:
- sampling, methods and techniques
- simulation of probability
- cautions using statistics
- interpreting results of survey collection
- predictions using a simulation
- inductive reasoning
- deductive reasoning
- errors in reasoning

Standards and Benchmarks:

III. Data Analysis and Statistics

Content Standard 6:
Students collect and explore data, organize data into a useful form, and develop skill in representing and reading data displayed in different formats. (Collection, Organization and Presentation of Data)

9. Collect and explore data through observation, measurement, surveys, sampling techniques and simulations.
10. Organize data using tables, charts, graphs, spreadsheets and data bases.
11. Present data using the most appropriate representation and give a rationale for their choice; show how certain representations may skew the data or bias the presentation.
12. Identify what data are needed to answer a particular question or solve a given problem and design and implement strategies to obtain, organize and present those data.

Content Standard 7:
Students examine data and describe characteristics of a distribution, relate data to the situation.
Sampling and Reasoning through Recycling

from which they arose, and use data to answer questions convincingly and persuasively. (Description and Interpretation)

13. Use the data and their characteristics to draw and support conclusions.
14. Critically question the sources of data; the techniques used to collect, organize and present data; the inferences drawn from the data; and the sources of bias and measures taken to eliminate such bias.
15. Formulate questions and problems and gather and interpret data to answer those questions.

Content Standard 8:
Students draw defensible inferences about unknown outcomes, make prediction, and identify the degree of confidence they have in their predictions. (Inference and Prediction)

11. Make and test hypotheses.
12. Design investigations to model and solve problems;....
13. Formulate and communicate arguments and conclusions based on data and evaluate the arguments and those of others.
14. Make predictions and decisions based on data, including interpolations and extrapolations.
15. Employ investigations, mathematical models, and simulations to make inferences and predictions to answer questions and solve problems.

VI. Probability and Discrete Math
Content Standard 14:
Students develop an understanding of the notion of certainty and of probability as a measure of the degree of likelihood that can be assigned to a given event based on the knowledge available, and make critical judgments about claims that are made in probabilistic situations. (Probability)

15. Conduct probability experiments and simulations to model and solve problems, including compound events.

Non-academic outcomes:
Students will continue to increase their abilities in the areas of team building, and verbal and written communication.

Reflection activities:
1) Students will record reflection questions (see lessons) in their notebooks.
2) Time will be allowed throughout the unit as needed for class discussion. Students will continuously provide feedback to each other on progress they are making, as well as challenges they may face.
3) At the end of the unit, students will be asked to participate in a final reflection. Was the project successful? What determines success for this project? How has your attitude/actions toward recycling changed? Will you encourage your friends to recycle? How
Sampling and Reasoning through Recycling

strongly would you encourage them? How can you continue to encourage others to recycle in our school? Will you? Again, do you think this project was truly successful?

Assessment:
1) Several content quizzes throughout the unit.
2) One test based on unit content used in the unit.
2) Final presentation including the following...

The Disposal Proposal:
You have been asked to present the findings of your study to the School Improvement Team so they may implement a more effective method for recycling at the high school.

Please prepare a presentation with your team to include
1.) A copy of your survey
2.) A written analysis of student attitudes about in-school recycling and trash disposal
3.) A written summary of survey results
4.) A graph showing content of the classroom trash sample(s) you collected
5.) Your overall finding and recommendations for a new recycling plan.

Please create a poster, pamphlet, brochure, slide show or video (public address announcement, news cast, etc.) that can be distributed to teachers and administrators throughout the building to share with classes.

WEEKLY PLANNER

Week 1 - Simulation & Sampling (Lesson #1-#3)
Week 2 - Statistics & Inductive Reasoning (Lessons #4-#5)
Week 3 - Deductive Reasoning & Errors in Reasoning (Lessons #6-#7)
Week 4 - Completing the Unit Project (Assessment & Reflection)
Lesson 1:

Lesson Title: Sampling a Population

Objective(s):
Use a sample to predict results of a larger population.

Duration: 1 day

Materials:
* none needed

Instructional procedure:
1) Survey the class with a yes/no question and record results on the overhead.
2) "Do you think if we asked the entire student body this question, the results would stay the same? Might they be different?"
3) "How might the results change? What are some reasons they may change?"
4) Discuss the meaning of sample and population.
5) "What size sample do you think would best predict the student body's response? 2? 20? or 200?"
6) To predict how the entire population would respond to a given question set up the following proportion...

\[
\frac{\text{# in the sample "yes"}}{\text{total # in the sample}} = \frac{\text{# in the population "yes"}}{\text{total # in the population}}
\]

7) "How many of you recycle at home? How many recycle at school? What do you recycle at school?" (record results; note discussion answers)
8) "Do you think other classes in the building would answer the same as ours? Can you list some that you think would definitely answer differently?"
9) "Let's think about surveying a sample of students in the building. How large would
Sampling and Reasoning through Recycling

our sample need to be? What questions would we ask?"

10) Have students write a first draft of a survey with a minimum of 10 questions. Have students describe the population that would participate in the survey. Would we take a census or a survey of a sample?

Lesson 2:

Lesson Title: Design a Simulation

Objective(s):
Design an experiment to simulate results of a school survey.

Duration: 2 days

Materials:
* paper clips
* protractors
* compasses

Instructional Procedure:

Day 1 -

1) Use statistical information (U.S. Health Dept., U.S. Census Bureau) to predict the number of students who fit a specific category in the school. Example: The 1870 census recorded 80% of the total population of the U.S. (age 10 and up) were literate in some language.
2) With the class, design a spinner that displays appropriately divided sections based on the factual information used.
3) "How many people should fit into this statistical category if we choose a sample size of 10? sample of 25? sample of 100?"
4) Have students make a spinner to simulate a survey of 50 people. Each spin of the spinner represents 1 person's response to the survey question.
5) Discuss Theoretical and Experimental Probabilities

Day 2 -

1) Discuss with students the results from Lesson #1
2) "Given our answers to the questions we discussed about our own recycling habits, let's create a method for finding the theoretical and experimental probabilities for the recycling habits of other students in the building." (Review Theoretical and Experimental Probabilities.)
3) Have students reflect on the number of students in the class who regularly recycle paper in the classroom. Have students create a spinner based on the percent of the
students who said they did/did not recycle paper regularly. Carry out an experiment with
the spinner to find how many students out of 50 would be predicted to be regular
recyclers.
4) Have students compare this information to what they find to be the theoretical probabil-
ity.

**Lesson 3:**

**Lesson Title:** Sampling Methods

**Objective(s):**
Learn of different ways to collect data

**Duration:** 2 days

**Materials:**
- phone book
- list of students names in the class
- staff list and classes taught

**Instructional Procedure:**

**Day 1 -**
1) “We have discussed the types of questions we might ask other students in the building,
but how do we decide who to ask? Any ideas? Who do you think we should ask?
Could who we choose to ask cause the results to differ?“: “Do you know what biased
means?“

2) Discuss the different types of samples that can be taken from a larger population.
   a. random sample
   b. convenience sample
   c. stratified random sample
   d. cluster sample
   e. systematic sample

3) “We want to be sure that our sample does not overrepresent or underrepresent any
   one population, or behavior. We do not want our sampling to be biased.”

**Day 2 -**
1) “Let’s discuss random sampling. How might we proceed with this survey so the
results are from a random sample of our student population?” (Review yesterday’s
discussion of types of samples.)

2) “Have you ever been asked by a mall worker to complete a survey? Do they ask you
and your friend to complete it? Do you think they may have been given instructions
on who to ask? On how to choose people?”

3) Use the phone book during this discussion—have students look at the pages of numbers. “Have you ever been called to complete a survey over the phone? Do you think these people call all numbers? randomly dial numbers? might they have a list? How do they choose the numbers to call?” (Review: the larger the sample, the better the chances of obtaining more representative results of the entire population.)

4) “Based on our discussion on random sampling, create a set of instructions for a surveyor to follow when distributing our survey about recycling. How might you begin to choose students? Would you like to see a list of the staff in the building and what they teach? If surveying an entire class of students, might the subject taught in that class bias the results of your survey? Would time of day bias our results?”

5) Have students consider the draft survey they wrote earlier this unit. “Choose the sample size and the type of sample you would like to use. Explain your choice.”

Lesson 4:

Lesson Title: Cautions in Statistics

Objective(s):
Learn to raise questions about surveys and their results.

Duration: 1 day

Materials:
* none needed

Instructional Procedure:

1) Let’s compare two questions we might see on our survey.
   a. Do you think recycling reduces the amount of trash in landfills and keeps our cities cleaner?
   b. Do you think it is right to pollute the environment with trash when there are ways to limit or almost prevent this from happening?

2) How are these questions alike? How are they different?

3) Suppose we gave question a) to one unbiased sample of students and question b) to another. Would the results of the survey question differ?

4) We must be sure when designing questions for surveys we watch for...
   a) ...how the question is worded.
   b) ...how the survey is distributed.
   c) ...how the responses are collected.
   d) ...how the results are presented (ambiguity).
Sampling and Reasoning through Recycling

e) ...how the results are interpreted.

5) Here are some questions to ask yourself when you see survey results reported by the
news or in a newspaper, magazine article, website...
   a) How was the sample chosen?
   b) What was the population?
   c) What was the sample size?

6) Have students refer to their survey questions. “Could any of the questions you wrote
   bias the results of the survey? Rewrite those questions that might.”

7) “Think about your sample size and the type of sample you chose. Will your sample
give you an accurate representation of the student population? You may decide to
change your sample size.”

8) “Select the students to include in your sample. Edit your final survey and distribute it to
your sample.”

Lesson 5:

Lesson Title: Inductive Reasoning

Objective(s):
Use inductive reasoning to make conclusions about situations. Understand that inductive reasoning
does not always lead to good conclusions.

Duration: 1 day

Materials:
* protractor
* graphing calculators
* graph paper

Instructional Procedure:

1) Discussion with students:
   “In mathematics, a guess based on past experience is called a conjecture. When you
   make a conjecture based on several observations, you are using inductive reasoning.
   “What careers can you think of that regularly use inductive reasoning?
   - doctors when diagnosing a patient
   - auto mechanics when repairing your car
   - store owners when ordering stock to refill shelves
   “Inductive reasoning is also used to solve problems in mathematics.”

2) Present students with examples of inductive reasoning from the text.
3) Discuss shortcomings of inductive reasoning; **counterexamples**.
4) "What conjectures might we be able to make about the student body's attitudes about recycling at school? What counterexamples might we find when conducting our survey?"
5) "You will need gloves and a trash bag. Take a sample of the trash in one classroom (including the recycling bin). Record the number of each type of refuse recovered. Could you use these results to predict the amount of trash produced by the entire school in one day? Why or why not?"
6) "Use the results of your survey and some additional sampling to estimate the amount of materials students in our school reuse, recycle, or throw away each day."

**Lesson 6:**

**Lesson Title:** Deductive Reasoning

**Objective(s):**
Write if-then statements to make good conclusions from situations. Learn the difference between inductive and deductive reasoning.

**Duration:** 2 days

**Materials:**
*none needed*

**Instructional Procedure:**
1) Conductive an with the class on sorting using Venn Diagrams. Discuss how students in group A relate to students in group B in each diagram below.
2) Discuss how **deductive reasoning** is based on facts, definitions, logic, and accepted rules and properties to reach conclusions. Discuss examples that show this.

3) Discuss differences in inductive and deductive reasoning. Discuss the use of if-then statements.

4) "What are some things we might be able to "deduce" from the collection of our data? What are we going to use more: when making conclusions based on the data we collect, do you think we will be using more inductive reasoning or deductive reasoning?"

5) What conclusions can you make from the results of your recycling surveys? What type of reasoning are you using? Inductive? Deductive? Explain.
Lesson 7:

Lesson Title: Errors in Reasoning

Objective(s):
Recognize errors in mathematical reasoning and in logical reasoning.

Duration: 1 day

Materials:
* none needed

Instructional Procedure:
1) "When using inductive or deductive reasoning, errors are often made. To limit these errors we first have to be familiar with each type of reasoning. We also must think very logically. Often times, using past experiences can be helpful, but many times our own experiences can even confuse us."
2) Work with students finding errors in algebraic solutions as examples of incorrect deductive reasoning.
3) Work with students in finding errors in interpreting graphs (see exercise pg. 47).
4) "Can you think of some conclusions we might make from our collected data that could be false. We have discussed earlier that the way a question is stated could bias our results. Could that same biased question, bias the way we interpret the data?"
5) Gather your survey and trash sampling results. You are ready to complete your Disposal Proposal to the School Improvement Team. Create a format for presenting your survey and sampling results. Begin thinking about the recommendations you will make.
Websites

Academic Service-Learning at Eastern Michigan University  
www.emich.edu/public/office_asl/home.html

The Big Dummy's Guide to Service-Learning  
www.fiu.edu/~time4chg/Library/bigdummy.html

Center for Democracy and Citizenship  
www.publicwork.org

Character Education Partnership  
www.character.org

Civic Practices Network  
www.cpn.org

Close Up Foundation: Service-Learning Programs  
www.closeup.org/serviern.htm

Compact for Learning and Citizenship  
www.az.com/~pickeral/LearnCitizen.html

Do Something  
www.dosomething.org

Earth Force  
www.earthforce.org

ETR Associates  
www.etr.org

Future Problem Solving Program  
www.fpsp.org

International Student Activism Alliance  
www.sudentactivism.org

Kids Can Make a Difference  
www.kids.maine.org
Websites

Learn, Serve & Surf: An Internet Resource Kit for Service-Learning
www.edb.utexas.edu/servicelearning/

LSA Exchange
www.lsaexchange.org

Michigan K-12 Education in Philanthropy
k12.edphil.org

National Service-Learning Clearinghouse
www.nicsl.coled.umn.edu

National Service-Learning in Teacher Education Partnership
www.as.com/~pickeral/partnership.html

Quest International
www.quest.edu

Service-Learning Research and Development Center
www-gse.berkeley.edu/research/slc/

State of Michigan Department of Education: Service-Learning
cdp.mde.state.mi.us/servicelearning/default.html

Service Vote 2000
www.servenet.org

Wisconsin Department of Public Instruction: Learn & Serve Wisconsin
www.dpi.state.wi.us/dpi/dltcl/bbfcspslhppage.html

Youth As Resources
www.yar.org

Youth in Action Network
www.mightymedia.com/youth/

Youth Service America
www.youthlink.org
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