SEEDS: Student Environmental Education and Development Studies
Program Descriptions

Pre-Kindergarten

Project 1: Senses through the Seasons

Students will study changes in plants and the environment over the course of the school year through "nature" walks around the schoolyard and garden areas. They will learn about seasons and what causes seasonal changes. They will learn about life cycles and the differences between living and non-living things. They will also learn about their five senses and use them during their explorations to help describe what they are experiencing. Using the information and collections they make, students will create a class tree that changes with the seasons. Students will also create a class "book" that they work on as a group to complete over the course of the year.

Project 2: Sensory Garden

Students will further their sensory explorations in a Sensory Garden that includes aromatic, colorful, and texturally diverse plants. Fairy tales will be used to enhance the experience and inspire more in-depth exploration of plant structure, smell, texture, etc. Through gardening students will learn that plants are living things with needs for growing. They will explore soils and seeds using simple tools and will care for the garden by planting, watering and weeding as needed.

Kindergarten

Project 1: Plants, Animals and Human Waste: What's the Connection?

Kindergarten students will explore both plant and animal life to learn about things organisms need to grow and be healthy. They will learn about connections between different organisms that result in natural cycles as they begin to understand the importance of soil nutrients for plant growth and the role that worms play in the development of healthy, fertile soils. Students will build a vermicomposting system or "worm bin" in which red wiggler worms rapidly digest food waste, yielding a useful and valuable product called worm castings. The class will be engaged in the process from start to finish as they collect food waste from lunch, feed their worms, and finally, contribute to the health of the gardens by using the resulting castings as fertilizer when they plant in the spring.

Students will grow beans in the classroom and learn about basic plant structure and needs for growth. As the class explores both plant growth and the maintenance of the worm bin, they will discover some basic needs of and interactions among plants, animals, and humans. Students will integrate this understanding into the concept of re-use and recycling, and they will learn how these actions impact their environment and community.

Project 2: A Class Recipe Garden

In the spring, students will help to plant and tend to a Class Recipe Garden. The garden will focus on a dish that they can make, for example, a soup garden or a salad garden, and students will grow as many of the ingredients as possible for this dish. Because the school year ends before many fruits and vegetables are ready to harvest, there will be a limited number of recipes that can be completed by the end of school. Students, with teacher and parent help, will research the foods that they want to grow, determining their growing requirements. They will then plan a garden with the help of teachers and will help prepare the site with soil amendments, tilling, weeding, etc. They will use the compost available from the worm bins to fertilize the soils as needed. Class discussions will help link together ideas about nutrient cycling, life cycles, reducing human waste, and gardening.

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First Grade

Project 1: Structure and Function of Plants/Weather Studies & Patterns in Nature

In the fall, students will explore plant structure and function through the Johnny Appleseed myth. They will discover how plants are adapted to their environment.
Students will learn to use appropriate tools to record and measure different aspects of the weather. Over the course of the school year students will look for patterns in weather and will practice summarizing and presenting data in simple graphs and charts.

Project 3: Folktale Garden

In the spring, students will help design, plant, and tend to a Folktale Garden. Students will explore different folk tales and the plants represented in them.

Second Grade

Project 1: Plant and Animal Interdependencies

In this set of lessons students first learn about what makes a habitat and the different habitat needs of animals from different systems. They compare their own needs to those of animals and then begin to look at ways plants and animals are adapted to their habitats. Students explore the many ways that plants and animals interact together, including defense tactics, strategies for hiding, mechanisms for dispersing seeds, and more. Students learn about plants and animals from different parts of the world, and also locally as they explore their neighborhood and school for evidence of plant-animal interactions.

Project 2: Butterfly Life Cycle and Habitat Needs

In the spring, students help create and maintain a butterfly habitat garden in conjunction with studying the butterfly life cycle and its habitat requirements. Students continue their study of plant-animal interactions by learning about the relationship between Monarch Butterflies, the milkweed plant, monarch mimics, and would-be predators.

Third Grade

Project 1: Connections among Ecosystem Processes, Recycling, and Composting

In this set of projects students will learn basic characteristics of ecosystems, with an emphasis on nutrient cycles, and will look for ecosystem elements in their schoolyards and neighborhoods. They will reexamine plant structure and function and will extend that understanding to ecosystem level processes. Students will spend much of the year developing a thorough understanding of waste management programs, recycling, and composting, collecting data and developing a program centered around waste reduction for the school and vermicomposting. They will develop skills in scientific observation, data analysis, problem identification, and project planning.

Project 2: Native Plant Garden

Students will also develop and monitor a low-maintenance native plant garden. In the garden students will reinforce their understanding of ecosystem structure and soil development. Students will also develop and use dichotomous keys and a class herbarium using plants from the school gardens.

Fourth Grade

Project 1: Understanding Plants and Plant Growth Using the Scientific Method

Fourth grade students will develop a greater understanding of the structure and function of plants through plant dissections of both vegetative and reproductive parts. They will compare structures in different types of plants and flowers, looking for analogous parts and for features that are different. Students will then learn about the scientific method, practicing using that approach by developing simple hypotheses and experiments about magnets. Next students will apply what they learned about using the scientific method to a larger project. Students will ask questions and research various factors affecting plant growth. Each pair of students will design their own study and they will present their work and results to the class.

Project 2: Establishing a Micro-Green System

Students will build upon what they have learned about plant structure, function, and requirements for growth by designing a micro-green system. Students will learn about Controlled Environment Agriculture and some of the environmental and social benefits associated with producing food with this method. Students will grow their own micro-greens and will be able to taste the various plants they grow. In addition to growing the plants, students will research some of the factors influencing nutritional value of micro-greens and their ability to grow. They will document all stages of their work and will prepare public display boards and brochures to share with the school and the community.

Fifth Grade

Project 1: Using Maps and Food to Understand Our World

Fifth grade students will learn to interpret maps and will gain an understanding of the diverse types of information that is presented on maps. Students will practice making their own map of different features occurring in the schoolyard. Some of these features will be physical structures, while others are conditions relating to gardening. Students will continue developing their map skills by examining the USDA Plant Hardiness Zone map and learning to interpret it. They will begin to consider how climate change has influenced agriculture and how it is represented by the USDA map. They also explore the relationship between climate and culture as expressed through foods, traditional dress, and activities. Students research foods and plants that represent their own cultural heritage. They will help plan and manage a garden area with some of these foods and will end the year with a shared meal with foods representing their different family backgrounds.

Project 2: Climate Change, Energy Use and Sustainable Living

With the second project students will research diverse topics relating to climate change and will become student experts through research of the internet and of newspapers and magazines. They will test their knowledge base in a class game that quizzes them on these different climate change themes. Students will assess how their current lifestyle affects the environment through an ecological footprint assessment, and they will use this assessment to compare our lifestyle with those of people around the world. They will also examine strengths and limitations of the ecological footprint analysis. Students will spend many weeks developing a sustainability audit for the school and performing the assessment. They will use the results to make recommendations for action and will then use their experience to develop resources for their families and neighbors.

Sixth Grade

Project 1: Understanding Earth's Cycles

Students learn about spheres in the Earth System and how they interact with one another. They study different types of cycles on earth, including the hydrologic cycle, rock cycle, atmospheric cycles, nitrogen cycle, and carbon cycle. From this basic understanding of cycles, students will make connections to previous work with composting and with decomposition of plant material. Students will design and carry out scientific experiments looking at the effects of different factors on rates of decomposition. They next use their knowledge to better understand factors affecting decomposition of trash with a series of experiments. Finally students will identify a school or community-based need relating to trash and will complete a project on that topic.

Project 2: Genetically Modified Organisms: Examining the Benefits and Risks to Humans and Ecosystems

In their exploration of genetically modified organisms, students will learn about the pros and cons of GMO's and will develop a broad understanding of the diverse interests represented in both the scientific community and in the area of public policy. Through a role-playing exercise, research of GMO-related topics in the news, and an examination of foods from home and local grocery stores, students will begin to formulate their own ideas about GMO's and will share these in an informational brochure that they develop for others in the school and community.

Project 3: Environmental Summit

Students will end their year by organizing what they have learned over the past several years into a cohesive presentation of ideas, suggestions, research, and resources to be presented to the community at an Environmental Summit. Students will determine the topics to be presented at the event and will help organize, plan, and host it, serving as moderators or panel members to answer questions, and working to bring in guest speakers that can enrich the experience.

Seventh Grade

Project 1: Understanding Energy Trends in the Past, Present, and for the Future

Students will research non-renewable and renewable energy sources and will develop a baseline understanding of various aspects of energy use. They will then research a single topic more fully, developing Power Point presentations that will be used in an energy fair later in the year. Students will learn about the history of energy development and use and will prepare a timeline that will be on display in school halls for others to see. Using the information they have learned, opinion pieces, new research, and energy puzzles, students will develop a school energy newsletter (either in print or on the school website) once a month for the remainder of the school year. Finally, students will design and build a small tool or piece of equipment that can complete a task without the aid of batteries, gas, or plugs. They will present their projects, along with the Power Point presentations, at an energy fair for the school and parents.

Project 2: Can We Live Sustainably?

Students will also explore the concept of sustainability and sustainable development. They will learn about the interactions between social, economic, and environmental systems, and their necessary interdependence for achieving sustainable development. They will develop an appreciation for the differences in opinion about sustainable development as a possible goal.

Students will research the characteristics and goals of a sustainable city and will develop physical models of an imaginary sustainable community. They will present their community to the rest of the class and will exchange ideas about the pros and cons of each model. Following this activity, students will research the city of Chicago's environmental programs and will assess where the city stands on the road to sustainability. Students will prepare an informational presentation on their work for display in the school. Finally students will develop debating skills in a debate over several controversial topics relating to the sustainable development theme.

Eighth Grade

Project 1: Watershed Workings around the World

Students will build on knowledge of aquatic ecosystems with an exploration of watersheds. They will begin by developing a basic understanding of watersheds and the impacts of different land use activities on aquatic habitat health. They will further their understanding of aquatic habitats and watershed development by researching several of Earth's longest rivers and comparing geographic, economic, historical, biological, industrial, and cultural factors for each. They will build models and will develop written and verbal/visual presentations. Students will develop a stronger sense of the diverse issues and positions relating to development of watershed areas through a role-playing exercise. Students will work to resolve conflict among different stakeholders and will develop a plan for development that addresses the various interests. Finally, students will identify sites in the community for performing chemical and physical site assessments. The will use their results to make recommendations for improving the water quality and watershed health through changes at those locations.

Project 2: Relationship between Climate and Ecosystem Structure and Function

Students will also build on previous exposure to climate change science as they begin to examine how climate change might affect ecosystem functioning. Students will consider local ecosystems and will make predictions or inferences about how these ecosystems might be affected by different climate change scenarios. Students will next learn about different techniques scientists use to recreate climates in the distant and more recent past. They will have the opportunity to use actual databases and practice interpreting their meaning. Students will spend several months of the school year developing a research project that examines the relationship between an aspect of climate or weather and ecosystem functioning. Students will collect original data, but will also practice using large databases available from different science institutions on the internet. Students will research some of the latest technologies or ideas that have the power to slow or reverse climate change trends.