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A Guide for Extending Nature Lessons at the Yakima Arboretum

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A Guide
for
Extending Nature Lessons
at the Yakima Arboretum

A Project Report

Presented to

The Graduate Faculty

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Master of Education

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by

Marilou Cori Kinder

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A GUIDE FOR EXTENDING NATURE LESSONS

AT THE YAKIMA ARBORETUM

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The importance of providing a hands on natural environment curriculum was examined. Sources from 1938-1996 were found supporting the importance of such a curriculum. A search was conducted on the availability of a natural habitat curriculum that used a local resource. The search discovered the Yakima Arboretum had seven areas of interest along with a packet of brief lesson suggestions. These lessons were extended to include classroom activities that would provide students with background knowledge prior to a field trip to the Arboretum.

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CHAPTER 1

BACKGROUND OF THE STUDY

Introduction

Teaching students about ecology and the importance of environmental awareness is a growing concern among educators and curriculum specialists. According to Angell (1995), an environmental education experience is a strategy for learning a vast range of skills and knowledge throughout every grade level and discipline. One method of instruction supported today is firsthand experience. Experiencing lessons in a student's own backyard is being advocated by environmental education experts and school districts. Angell (1995), stated that "ultimately, the most effective learning experience is going to take place in the real environment itself " (p. 1). The Yakima, (WA) School District's philosophy (1988) includes this statement, "Teachers should go beyond the classroom and include community resources in a variety of lessons" (p. 5).

Using a local community resource is not a new concept. Earlier, Dewey (1938) had the same concern. He suggested teachers know how to utilize their surroundings, physical and social, and extract from them all that they have to contribute to building experiences that are worth while. If an education system is based upon the necessary connection of education with experience, teachers must become acquainted with local community resources. Dewey believed learning resulted from experiences which were real, life-like, and available to the learner for firsthand examination, questioning, and cognition.

Becoming familiar with a local environment is one way to experience nature first hand. According to Elwood and Shaw (1995), "getting in touch

with nature is the first step to discovering how all living things are connected to each other and the environment" (p. 7). Each aspect of an ecological system depends on the intricate interactions of its separate parts for the continued existence of the system. Learning about the many aspects of a local habitat will encourage an appreciation of the neighborhood environment, and the world's environment in general.

One of the goals in the Yakima (WA) School District 's philosophy. (1988) is to have students describe the basic ways organisms, within a living community, depend on other living things. The Yakima Arboretum, and its surrounding habitat, is a natural resource for ecological studies. The Arboretum contains numerous opportunities for lessons on environmental education and can become a laboratory setting to demonstrate how plant and animals depend on each other for survival.

Another Yakima School District goal is to have students participate actively in the learning process. Students should be challenged, inspired, and able to see the relevancy of what they learn. Using a local park for a resource will help students make a connection between what is taught in the classroom and what is in their own community. The Yakima School District (1988) believes, "teachers should utilize a variety of methods, and the community, as a laboratory to promote learning" (p. 4). For the purposes of this project the community laboratory will be the Yakima Arboretum.

Statement of the Problem

According to O'Neal and Skelton (1994), sensing and experiencing the environment firsthand has a profound educational and motivational value.

They indicated outdoor parks are valuable educational resources and could serve as outdoor laboratories.

Few environmental curriculum guides exist for the elementary teacher. According to Asmussen (1970), one of the problems of outdoor programs has been that students and teachers have no study guide for activities designed to give the program continuity and overall meaningfulness.
Lessons for intermediate and upper level grades are available but these lessons have to be adapted for primary grade students. Lessons about plants and animals are abundant. However, the problem is how to plan and organize a group of lessons that will integrate the environment and all its aspects into the curriculum.

Statement of the Purpose

The purpose of this project was to develop an environmental education curriculum that uses a Yakima area resource. The lesson plans and activities developed for this project incorporated aspects of the habitat found at the Yakima Arboretum. Project ideas were collected and lessons developed accordingly. Background information about the habitat of the Arboretum was incorporated into the project. Field trip lessons as well as follow up activities were included. This project was intended to decrease, not eliminate, the amount of time an instructor spends gathering information and creating lessons based on a field trip to the Yakima Arboretum.

Definition of Terms

For the purpose of this project the following terms have been defined.

Bench Mark

A bench mark is a method of determining at what level a student has achieved mastery of a subject. These bench marks are being developed and refined and will be used statewide.

Community

A community is a group of plants and animals living and interacting with one another in a specific habitat.

Conservation

Conservation is the controlled management of natural resources, such as forests, streams, soil, and animals.

Ecology

The branch of science concerned with the relationship between organisms and their environment.

Environment

Environment is the total surroundings in which an organism or a group of organisms lives.

Habitat

Habitat is defined as the place where a plant or animal naturally lives and grows. A habitat may be a very small area or may cover miles of territory within a given set of climatic conditions.

Outcome Driven Developmental Model (ODDM)

A method of creating and sequencing lesson plans to meet the requirements of the Yakima School District.

Wetland

A lowland area, such as a marsh or swamp, that is saturated with moisture, especially when regarded as the natural habitat of wildlife.

Limitations of the study

The purpose of this project is to provide Yakima area teachers with an environmental curriculum for extending classroom lessons at a local nature habitat. The lessons and activities developed for this project contain ideas for use at the Yakima Arboretum. The Arboretum contains numerous opportunities for environmental studies. The lessons and activities were developed for third grade students. With some adaptation these lessons could be used for a younger age group. Teachers outside the Yakima area could adjust these ideas to fit the opportunities at a park near their school.

CHAPTER 2

REVIEW OF THE LITERATURE

A review of literature was conducted to determine if a need existed for an environmental education curriculum and to determine the most effective methods of teaching environmental education to primary level students. The possibilities of utilizing a local park, as an environmental laboratory resource, were investigated. Initially, there was some concern that environmental education could be considered only a science curriculum. Research indicated that environmental education crossed all content areas.

Educators are interested in developing outdoor lessons to enhance students' knowledge of the environment. Environmental conservation is a common subject taught in schools today. According to Bergeson (1996) Washington state's new Essential Learning Benchmarks will be the main driver of the state's efforts to improve student learning in all areas of education including environmental education . These guidelines will be used throughout Washington State as curriculum frameworks. Specific guidelines will be given on what students will be expected to know about the environment, and its preservation. Sumrall and Criglow (1995) maintain many recent science and environmental education reform initiatives have called for changes in the way science is taught. These changes include developing activities that eliminate rigid boundaries between subjects. Sumrall and Criglow found they could apply scientific ways of thinking to all subjects through thematic teaching. They indicated thematic units can span the disciplines of science, geography, history, mathematics and language arts. When a topic is taught across the curriculum, students can see the connections between science and daily life.

Environmental education is a perfect topic for developing problem solving skills and integrating numerous subject areas. A local nature habitat could be the perfect backdrop for environment and preservation studies. Allard (1994) advocated taking field trips when possible. However, when field trips are not possible he suggested bringing parts of the field trip habitat into the classroom to study. He maintained students use a variety of skills examining habitats, even in the confines of the class setting. Observation and record keeping skills were honed. Identification and labeling specimens could be done in the classroom. Students could also note the changes in a habitat through cause and effect lessons.

Bones (1994) contended, "environmental education seeks to build awareness" (p.13). Through first hand experiences, students gain an understanding of the integral relationship between nature and man. When a student is familiar with frogs and their intricate life cycles, the impact of spilling pollutants into area streams and rivers becomes more apparent. Before we can strive to preserve nature we must first be familiar with all the aspects of it, plants and animals alike. Current educators are advocating hands on lessons. The instructor can include a variety of teaching formats when developing lessons on environmental education. Science and nature studies lend themselves easily to reading, writing, and math. Students with an interest and talent for the arts, would find environmental education contained numerous subjects for painting, drawing and poetry writing. DeBuhr (1995) agreed with this view:

> It is also clear that an interactive science program whereby children are actively engaged in problem identification, investigation, data collection and analysis, and synthesis is far better than passive approaches that only utilize lecture, observation, or watching. (p. 5)

Today's educators are being asked to stimulate student interest and provide activities for students who are not motivated by passive lessons. However, the idea of students having first-hand learning experiences is not new. Dewey (1938) believed that in order to build experiences that are worthwhile, teachers should know how to utilize community resources. If an education system is based upon the necessary connection of education with experience, teachers must become intimately acquainted with local community resources.

Hall (1955) described school journeys in Great Britain with children going out into the country to study nature and geography. According to Hall, field trips gave students accurate firsthand information. The use of field trips allowed the classroom to be expanded and gave the child a closer view of the outdoor environment. Lewis (1993) believes, "the experiential approach toward education brings students out of the classroom by encouraging them to resolve real world issues" (p. 1). By becoming familiar with a local park, the importance of environmental preservation becomes personal.

This concept can transfer to other areas of the community. Watson (1994) contends, " there is pride in ownership. An effective way of minimizing vandalism is the building of student attitudes of pride and ownership in public property" (p. 4). When students have pride, and a feeling of ownership in a local park and the community, the problem of vandalism is often eliminated. Stimulating an interest and respect for the environment is just the beginning of teaching students about the preservation of our planet.

According to Moody (1994), the study of our environment can "relate environmental sensitivity, knowledge, problem solving skills, and values

clarification to every age, but with special emphasis on environmental sensitivity to the learners' own community in early years" (p. 11). The emphasis of environmental education is not just to discourage pollution and the destruction of natural habitat. The goal is to encourage an awareness and intimate knowledge of all aspects of the environment and how they affect each other.

Dean (1975), contends there is a link between understanding of the environment and a concern for the environment. She also points out that the outdoor experience can link several disciplines. Science, humanities, social studies, art, and geography can all be enhanced through outdoor environmental studies. Cadet and Bruchac (1989) agree with the importance of linking the various educational disciplines. They proposed that instructors, "keep tying the meaning of each activity to the overall theme. The interactions between living things and their environment completes the circle of the study of ecology" (p. 10).

Trying to connect the classroom lessons to the students' real world has been a concern for over 25 years. Stark (1968) stated, "it is not enough for children to remain in classrooms and look out at the world. They must directly experience some of the excitements, pressures, and problems of the world and reality" (p. 2). Stark believed, utilizing the environment to enhance school curricula would awaken curiosity, stimulate additional interest, and teach aesthetic appreciation of the environment.

More recently, Moody (1994) has given instructions for how teachers can use field trips, excursions and outdoor education in the instructional curriculum at school. In his words, "each field trip must be integrated with the curriculum and coordinate with classroom activities which enhance its usefulness" (p. 27).

The field trip can be a great teaching opportunity. Going outside the

classroom helps students make a connection between classroom lessons and the world outside the school setting. Mollo (1994) found that studying trees was an excellent way to introduce environmental concepts to children. She recommended taking students outside where they can observe a variety of trees. Her students were encouraged to use all of their senses to observe a tree, and then describe orally what they saw, and felt, comparing shapes and textures. Mollo said, "These outdoor excursions are wonderful opportunities for your students to revel in the beauty of nature and to develop environmental awareness" (p. 30). Building awareness of our surroundings is vital to environmental education and using a local park or even the school playground can encourage concern for protecting all aspects of our planet.

According to Wittich and Schuller (1967), the use of community resources is a less foreign and a highly interesting way of becoming informed about the social, economic, and physical aspects of the environment. Schools encourage the use of community resources. This interaction between the community and the school helps bridge the gap between classroom and a student's home.

Cohen (1992) stated:

> We are beginning to recognize that environmental education is an important component in the preservation of our planet. Relatively little research has been conducted on children's cognitive understanding of ecological issues. Several factors contribute to this scarcity of information. First, children growing up in contemporary Western society have little direct experience with living things or with complete chains of physical systems. Second, ecologically based learning among young children must allow for real interactions with

> nature, a difficult perquisite for learning, particular among children living in settings far removed from the concerns of natural ecological events. (p. 259)

Cohen and Trostle (1990) stipulated that an issue common to both children and adults, was the need to find more effective ways of promoting ecological awareness and behavior directed toward conservation and preservation of our limited natural resources. Among very young children, this problem has assumed critical importance as educators strive to instill a greater concern for the reasonable use of our endangered planet. According to Cohen and Trostle, "experiences designed to increase children's awareness of important ecological issues must be developmentally appropriate, take place in real settings, and involve the child's active exploration" (p. 304). Ignorance about the environment is a real threat to the preservation of the environment. It is vital to expose as many students and adults to environmental issues as possible. Finding ways to integrate all the aspects of ecological awareness into the classroom is difficult and time consuming.

Heimlich, Lorson, and Wagner (1993) found that very little time was spent in the classroom on environmental education. They felt, "students should have an opportunity to be educated so they can properly respond to environmental problems that will arise in their lives" (p.1). Before we can expect our students to respect the problems facing our environment, we must educate them about what an environment is.

Oppenheir (1995), defined environment as the physical, biological, and social setting for living things. The definition of environmental education has not changed in the past 25 years, but our perception of the schools' role in providing education about ecology has. One of the most significant changes

was an increasing emphasis on connectivity. In the future, this concept of connectedness will expand beyond relations between environmental problems and issues previously viewed as social and economic. For children to recognize the role that humans play in the environment, they need to observe plant and animal life first hand. If students are to help protect the environment, they need a willingness to act, as well as an understanding of ecological and scientific fundamentals. Lessons in natural settings need to have follow-up discussions that help children recognize man's relationship to everything around him.

According to Koran (1983), parks and other informal settings offer opportunities to enhance environmental learning beyond formal education. Field trips provide novel, thought provoking experiences that stimulate students' curiosity and interest, which in turn facilitated information processing. The park setting also encourages a desire to find methods of habitat protection. Students who are intimately familiar with all aspects of a habitat are greatly concerned with preventing destruction and damage to the area surrounding "their" park. Outdoor education can make learning meaningful to the students.

Tamarkin and Bourne (1995) indicated that an integrated hands-on science curriculum can empower students. After attending an elementary science integrated project program, they declared, hands-on integrated science projects enable students of all ability levels to explore and learn. Hands-on activities can touch on all learning styles and be integrated naturally into other subjects in the curriculum. Direct involvement with nature promoted ecological understanding. Campbell and Burton (1994) adopted a science method that highlights hands on activities, cooperative learning, literature based instruction, cultural diversity, student choice and portfolio assessment.

By doing so, Campbell and Burton believed they could meet the needs of the myriad of learning styles present in the classroom.

The variety of instructional methods gave students the background information to look at the problems of environmental preservation and their role in protecting the environment from several points of view. According to Lewis (1991), environmental studies could be the interdisciplinary core that many reports on school reform and many curricula specialists recommend. When done right, ecological studies cut across all the disciplines. They incorporate hands-on activities, problem solving opportunities, and even awareness of the local community.

Perry and Rivkin, (1992) found that elementary teachers felt they did not have to be experts in science. When teaching new concepts, teachers felt they could learn along with the students, demonstrating looking things up, observing, and wondering, thereby supporting the students' curiosity. When an instructor is not knowledgeable about a course of study, it becomes easy to neglect the subject matter. However, when both the teacher and the student are exposed to first hand exploration of a subject, they both benefit. The teacher becomes a better resource for the student and the student gains valuable information. Charron and Jones, (1992) concurred when they suggested leaving the resource guide on the shelf and asked students to tell them about what science activities they would like to explore outside the classroom. In doing so, science became much more appealing to instructors and students.

Dighe, (1993) wrote, "outdoor experiences are the only authentic foundation for environmental education" (p.58). Touching and seeing the student's local environment is an important aspect of environmental education. Children's feelings about nature are fundamental to any environmental

education program. These feelings about the natural world are not likely to grow and thrive in the classroom. According to Dighe (1993), when children are outside, they not only began to feel comfortable in the outdoor environment, they also learn about nature the way young children learn best, by experiencing it. Getting children outdoors to touch and experience nature is the starting point of environmental education.

Science curricula in early childhood education have meant the investigation of objects and close observation of butterflies and bugs. New content, new experiences, and development of strengths are needed. Educators should emphasize the environment and the role humans play in using and protecting the earth's resources. According to Rivikin (1992), "humans affect their environments, and vice versa. Each child's interactions with the world affect not only the child but the world" (p.4). Bringing environmental education into primary classrooms and emphasizing each student's part in protecting the "bugs and butterflies" will add to the students ownership of the earth and all its inhabitants.

Ford and Smith (1994), stipulated that when teachers discussed environmental awareness, they often told students how all living things were mutually dependent. If one living thing is disturbed, there are consequences for the other organisms in that environment. After telling students this information, teachers moved on to another topic, thinking they had increased students' knowledge about the environment. However, Ford and Smith believed more in depth lessons were needed to help students understand the inter- relatedness of living things. Visits to an outdoor habitat, along with discussions about environmental needs, can enhance lessons.

Students need to see it and touch it to truly understand it. According to Watson, (1995) the goal of environmental education is, " to enhance knowledge and appreciation of the natural environment and to promote habits, skills and attitudes which will lead to the appreciation and preservation of our natural environment " (p. 1). Karmozyn, Scalise, and Trostle (1993) found that children learned more about themselves in relation to the world through sensory experiences with the natural environment. They engaged children in an activity called "beautifying the playground". Students picked up litter, pulled weeds, planted flowers, and made bird feeders. The authors wrote that these activities taught responsibility and respect for all living things. Ron Hirschi is just one instructor who is certain students gain valuable information from outdoor experiences. Hirschi (1994) suggests environmental activities can and do span a variety of curriculum areas. A land lab, or local park habitat, can be used for observations, recording, and all sorts of "discovery learning".

Many schools are celebrating Earth Day. However, is one day, or even one week of ecology studies enough? Needleman (1995) indicated setting aside a special day, like Earth Day, promotes respect and appreciation for nature. However, teachers need to emphasize earth's uniqueness on a daily basis. Lifelong habits for environmental responsibility can be taught through a variety of hands-on lessons and activities. Whenever possible, these lessons should be taught in a natural environment. Caduto (1989), agrees with this concept when he suggests, "help children to experience the subject first hand. If the lesson is about trees take them to a tree in the backyard, forest, a park or school grounds. If you are studying water, take them to water" (p. 10). Instructors can extend this concept. When studying trees, have your students

use all their skills to internalize information about trees. Observe trees, count rings on a tree, draw leaves of trees and write a poem about trees.

One example of this type of daily learning experience is journal writing. Walley (1992) had her students keep a journal on their seasonal visits to a park. Keeping park journals helped children focus on nature and see its beauty. At the end of the year, the students performed for their parents, sharing drawings, stories, and poems they wrote about plants. Walley's comment was, "the audience watched in awe as the children shared their written and visual creations. These nature memories would be cherished by the parents and children who created them" (p. 270).

Allard, (1994) wrote that combining field-trips, with long term indoor activities, could extend environmental lessons throughout the year. He stated he had great success with lessons he called, "pond in a jar". In these lessons, students collected samples of pond water containing a variety of microorganisms. They studied the mud and plankton samples, as well as minnows in jars. These pond habitats could be studied throughout the day. They were easily available and portable. According to Allard, (1994) An entire habitat could be studied in the school classroom.

Matsikas (1995), found "Bugs" were a perfect format for teaching a variety of skills in his third grade classroom. He started sharing insects with his students while taking a college course. What started as a few anecdotes about the problems of collecting and identifying specimens soon turned into an entire curriculum. Working in small groups students observed the specimens with hand lenses, listing the features they believed to be characteristic of all insects. Later the observations were pooled and common sets of insects traits emerged. The diversity of insects met both the art and the science objectives.

The students created three dimensional insects with paper mache and painted pictures. The research on insects spanned numerous curriculum areas. According to Matsikas (1995), "Once the bug hit, students examined, collected, researched insect societies and participated in numerous lab activities."

Ferrell (1995) states, "Exploring a pond habitat can open students' eyes to an unexplored world." Through brainstorming students discovered what they knew about ponds and what they wanted to know. The class illustrated what lives in a pond and did group drawings in class of pond habitats. These habitats led into classification lessons and creative writing assignments.

After the students gained some background information on the life of a pond the class was ready to take a field trip to a local pond. With ample adult supervision the students experienced first hand the abundant life a a pond. The students collected specimens and gathered information to take back to the class for further study. According to Ferrell (1995), the pond lessons provided "an opportunity for both teachers and young children to discover that there's much more to the water than meets the eye" (p.37).

State and Local Guidelines

The Environmental Education Guidelines for Yakima Washington Schools (1980), include many of the same goals as the environmental experts reviewed for this paper.

Goal 1. The student will develop knowledge of the components of the environment and their interactions. (p. 9)

Goal 2. The student will value the environment as the basis of our physical lives, economy, and emotional well-being. (p. 19)

Goal 3. The student will apply personal decision making skills to enhance the environmental quality. (p. 29)

The Yakima School District Educational Philosophy (1988), includes these statements and course outcomes:

1. Learning should be an active process which has meaning for all students. Students should be challenged, inspired, and able to see the relevancy of what they learn. (p. 1)
2. Teachers should go beyond the textbook by utilizing a variety of methods and the community as a laboratory to promote learning. (p. 1)

Course outcomes for elementary education include;

1. Describe the basic ways that organisms within a living community depend on other living things, i.e., prey-predator and food web. (p. 7)
2. Participate in community field trips to learn about the natural resources of Yakima. (p. 4)
3. Observe and record how the changes in the seasons affect living things. (p. 5)

Hands-on lessons help children understand the interdependence of our environment. Caduto and Bruchac (1989), state

> Lead children to touch and understand a grasshopper, a rock, a flower, a ray of sunlight, and you begin to establish connections between the children and their surroundings. Have them look at a tree-feel it, smell it, taste its sap, study its many parts and how they work. Help them to understand how it is part of a forest community of plants, animals, rocks, soil and water. Build on these experiences with activities that help them to develop a conservation ethic. (1)

Summary

According to Grumbine, (1988) "outdoor education programs can benefit children's physical, emotional, and spiritual growth, as well as intellectual growth" (p. 5). After reviewing the literature, I believe there is serious concern for the quality and quantity of environmental education for young children. Nearly all the literature reviewed indicated that environmental education needed to include outdoor experiences.

Combining a variety of academic disciplines and skills within a theme like environmental education enhances learning. In Billings' (1993) words:

> Environmental education teaches an understanding of how our eco [sic] systems work and what strategies are needed to keep them healthy and productive. The process can happen anywhere... at home, in classrooms, at work, within the community and on playgrounds, parks or wilderness areas. Environmental education integrates the sciences, language arts, mathematics, social studies, health and physical education by using the environment as a model. It teaches the skills and creates the awareness necessary for individuals and institutions to make environmentally sound decisions. (p. 2)

CHAPTER 3

PROCEDURE

A comprehensive review of literature on environmental education was conducted. This review clearly indicated a need for environmental education at the primary level. Research also indicated innovative methods for teaching environmental education need to be developed.

The opportunities for environmental education lessons at the Arboretum were considered. A facility local educators can use for this type of nature study is the Yakima Arboretum. It is near enough for classes to visit and is open to the public for visits after school. Local schools are taking advantage of the Arboretum's close proximity. Walking field trips are common. Classes can visit during the various seasons and note the differences that occur in the numerous plants and animals with the weather changes of Yakima Valley.

The Yakima Arboretum is a tree museum, a botanical garden created for the study of trees. It includes ten acres of natural riparian wetland which showcases indigenous (native) plants as well as 30 acres of exotic (non-native) plants. The Arboretum has several varieties of shrubs, vines, grasses, flowers, aquatic plants, as well as a Japanese garden with a pond and fountain. The Arboretum is not a park. A park offers open space for recreational purposes. The Yakima Arboretum is a botanical garden developed and maintained for science study and education. To protect the plants, active recreation is limited and no pets are allowed. The Yakima Arboretum has over 1,000 species of plant life.

The Arboretum attracts many forms of wildlife. Hummingbirds, quail, ducks, and Canadian geese are just a few of the birds you might see. The

wetland area is used by many birds as a refuge during migration. Insects, numerous amphibians, reptiles, rabbits, and beaver all enjoy the natural habitat the arboretum provides. The inhabitants of the Arboretum are all interdependent, each living thing is an integral part of the cycle of life. If one part of the cycle is disturbed a chain reaction is commenced.

The Yakima Arboretum encourages teachers to take their students on tours of the area. A packet is provided with a map of the areas of interest. This packet includes brief lesson suggestions. The purpose of this project is to provide classroom lessons that will give the students a broad knowledge base to build on. When they visit the arboretum first hand they will have some background knowledge for making observations and recordings of what they observe.

CHAPTER 4

THE PROJECT

The purpose of this project was to develop an environmental curriculum using a Yakima area habitat teacher could use to extend and enhance classroom lessons. The curriculum format utilized was in concurrence with the Outcome driven developmental model used by the Yakima School district.:

1. Subject or topic area was listed.
2. The objective was clearly stated.
3. Suggested materials were listed.
4. Prerequisites were recommended if necessary.
5. Cue set or best shot instructional process was developed.
6. Closures and extensions were recommended.
7. Arboretum connections were provided.

The lessons developed for this project contain lessons for the classroom as well as field lessons. Primary grade instructors could pick lessons to supplement a variety of topics. This project was intended to incorporate a number of subject areas, including art, science, language arts and social studies. The lessons could be used individually or as an entire unit.

A Guide to the Yakima Arboretum

The Arboretum has several areas specified for lessons and observation. These areas are:

1. The pond area, where students can explore wild plants living in and around the pond. Students will be able to observe the natural habitat of beaver, frogs, turtles, snails, muskrat, ducks, and many others.

2. The deciduous tree area where students can explore the different characteristics of deciduous trees.
3. The wetland area and activities allow the student to see how wetlands absorb water during floods, and how wetlands clean dirty water. Students can also see natural composting, and the animals wetlands attract.
4. The dawn redwood area where students can see a species of tree that was once thought to be extinct. This species of tree is over 50 million years old. It was discovered living in China and in 1944 seeds were brought to the United States. The dawn redwood is nicknamed the "dinosaur tree" because it was living on earth when dinosaurs roamed the earth.
5. The evergreen area where students can study various evergreens. They can compare the differences in needles, pine cones, and bark.
6. The Ginkgo area where students can see and learn about the unique characteristics of the ginkgo tree.
7. The flower area where students can observe several varieties of flowers. They can observe the parts of flowers, and discuss pollination.

CHAPTER 5

SUMMARY, RECOMMENDATIONS AND CONCLUSION

The purpose of this project was to explore the need for environmental education, discover the recommended method of teaching environmental education, and provide an appropriate curriculum that would incorporate a local resource. Experts believe there is a great need for environmental education. In the Yakima school district environmental education has become a part of the student learning objectives.

Hands-on, real life experiences were highly recommended. Students relate to new concepts best when lessons are taught in a linked sequence rather than in isolation. Field trips are a good way to bring students in touch with a natural environment. Classroom lessons prior to and after a field trip can make it more meaningful.

Designing a curriculum to connect with a field trip can be time consuming. This project has taken advantage of a local resource, the Yakima Arboretum, and designed a nature curriculum that coincides with the opportunities there. The Yakima Arboretum offers a variety of plant and animal life for students to observe. It includes a wetland area. The lesson units in this project are trees, birds, seeds, wetlands, freshwater life, and insects.

Funding for field trips is often limited so many classrooms may only visit the Arboretum one time during the school year. Many schools are within walking distance of local parks. A trip to a park may provide students with opportunities to reinforce the dryland curriculum. It would be best to utilize the wetland curriculum when a field trip to the Arboretum is planned.

The lessons can be adapted to meet the needs of primary or upper

elementary grade students. The Arboretum offers lesson suggestions that will further enrich a field trip experience.

The connections between man and his environment should be a common thread in all lesson discussions. The interdependency between the plants and animals of a habitat and the impact of man on this habitat is essential to a students understanding of environmental preservation.

In the words of Chief Seattle:

> The Earth does not belong to man; man belongs to the Earth. Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web he does to himself. All things are connected like the blood which unites one family. All things are connected. (cited in Caduto & Bruchac, 1989, pp 4-5)

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APPENDIX A

A GUIDE TO THE YAKIMA ARBORETUM

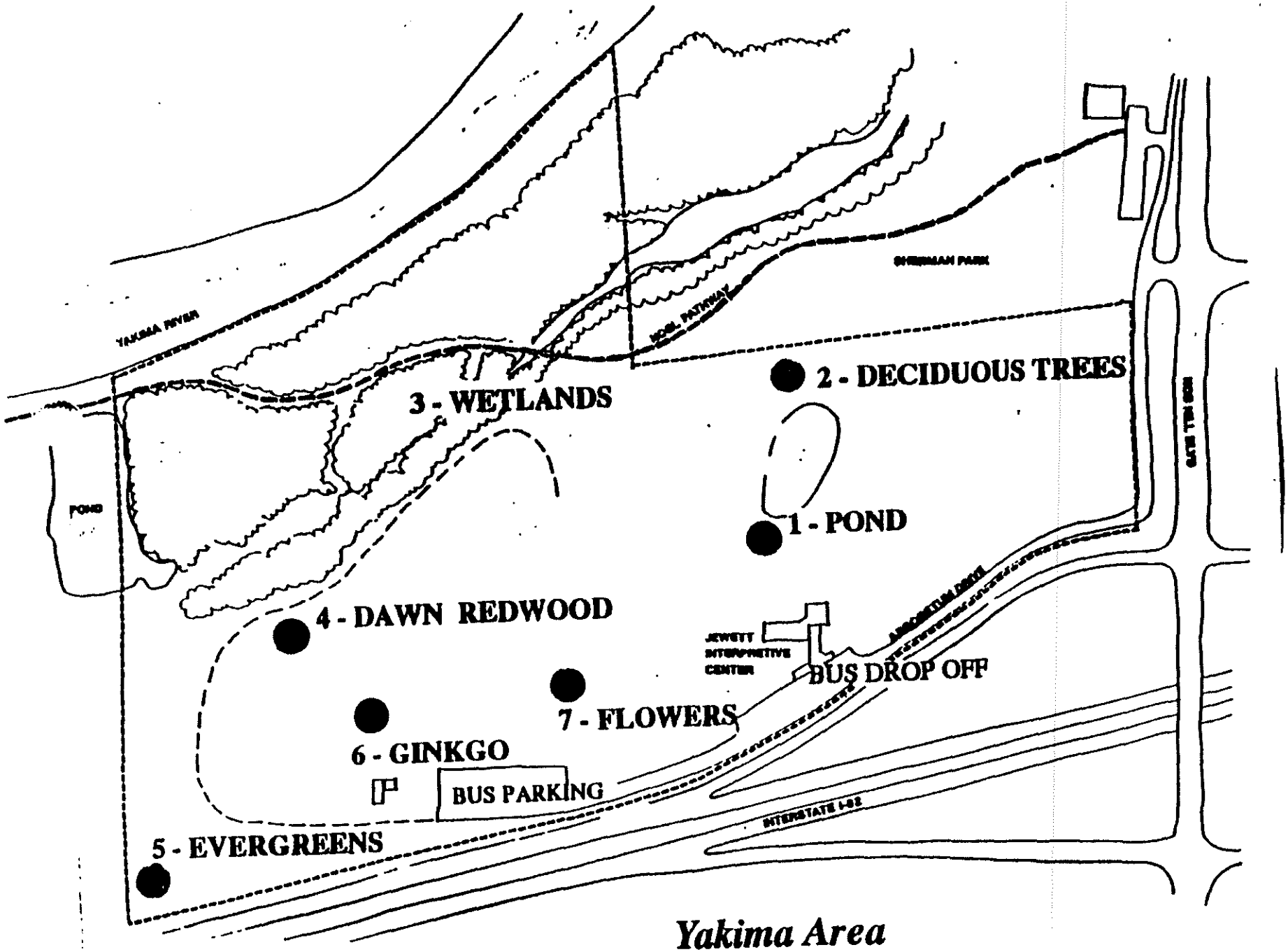
TABLE OF CONTENTS

Tips for a trip to the Yakima Arboretum

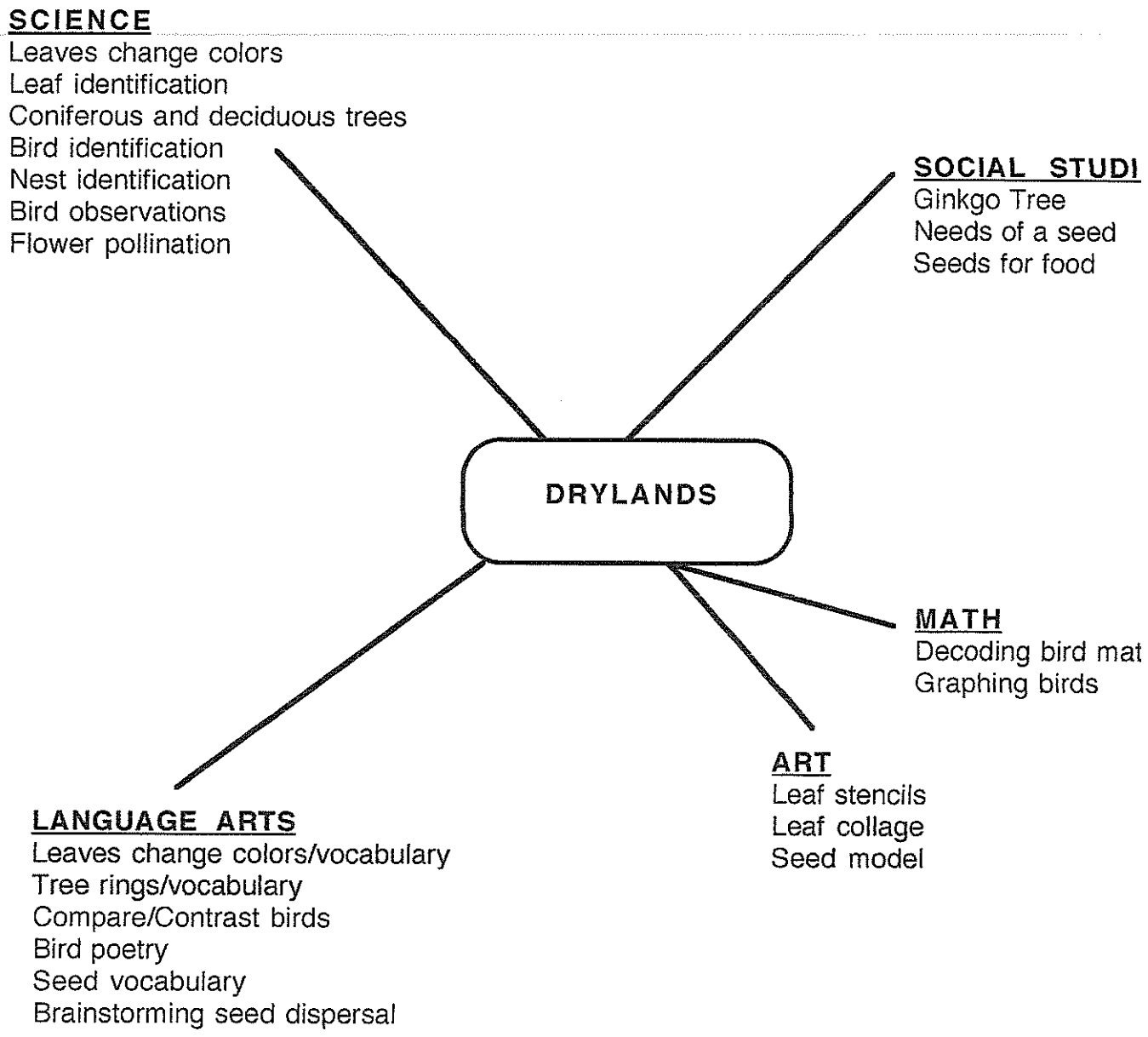
The Arboretum offers these suggestions to make your tour a successful adventure.

1. A restroom stop before boarding the bus will save quality tour time.
2. Disembark at the loading pad in front of Jewett Center. Follow the walkway towards the entrance and lead the children onto the gravel path on your right. this path leads to the pond-station number one. You will see orange cones at each station and critical turning points.
3. One person should report to the office to sign out the lesson pack, and clipboards. Your students do not need to bring any materials, except for drinking water (optional). We will assign one clipboard for every two students.
4. If students need restroom facilities during the trip, a maximum of three students may use the restrooms at one time. We often have meetings at the center so they need to keep voices at a whisper.
5. The Japanese garden is not part of the tour.
6. When entering the wetland area, do not stop on the asphalt pathway, since bikes passing make it dangerous.
7. All trees have metal identification bands bearing the common and botanical names. These are located on the south side of the tree.

Observe and enjoy, do not destroy!


YAKIMA RIVER
SHERMAN PARK
NOB. PATHWAY
2 - DECIDUOUS TREES
3 - WETLANDS
POND
1 - POND
4 - DAWN REDWOOD
JEWETT INTERPRETIVE CENTER
BUS DROP OFF
7 - FLOWERS
6 - GINKGO
BUS PARKING
INTERSTATE I-82
5 - EVERGREENS

Yakima Area


SCIENCE
Leaves change colors
Leaf identification
Coniferous and deciduous trees
Bird identification
Nest identification
Bird observations
Flower pollination
SOCIAL STUDI
Ginkgo Tree
Needs of a seed
Seeds for food
DRYLANDS
MATH
Decoding bird mat
Graphing birds
ART
Leaf stencils
Leaf collage
Seed model
LANGUAGE ARTS
Leaves change colors/vocabulary
Tree rings/vocabulary
Compare/Contrast birds
Bird poetry
Seed vocabulary
Brainstorming seed dispersal

UNIT 1

TREES

Unit 1 Trees

Lesson 1 Leaves changing color
Lesson 2 Leaf stencils
Lesson 3 Leaf identification
Lesson 4 Leaf collage
Lesson 5 Tree rings
Lesson 6 Distingish coniferous and decidiuous trees
Lesson 7 Ginkgo tree

RESOURCES

Suggested Materials

Books:

Why Do Leaves Change Color? by Betsy Maestro

Discovering Trees by Douglas Florian

A Gift of a Tree by Henry Quin

Fun with Leaves-Stencils by Paul E. Kennedy

Look What I Did With a Leaf! by Morteza E. Sohi

Trees a Golden Guide by Golden Press

Video:

Trees and their anatomy-ESD

Posters:

Leaf and Tree Poster U.S. Forest Service

Leaf Poster from Pied Piper

Leaf Poster from Arboretum

Footwork:

gather a variety of leaves, some evergreen branches and some deciduous, include the bark if possible. A round cut of wood, showing the inner and outer bark and rings.

A table to use as a tree and leaf information center.

SUBJECT: Leaves color changing

OBJECTIVE:
As a result of this activity students will identify and define vocabulary words.

MATERIAL:
1. Why do Leaves Change Color by Betsy Maestro
2. Posters of different leaves
3. Paper for journals

PREREQUISITES:
Have paper ready and stapled in colored paper covers to be used as a journal.

CUE SET:
Ask students what season it is. If it is fall, how can they tell? Why are the leaves falling off the tree?

BEST SHOT:
Read the story and write vocabulary words on the board for students to write in the journal. Students will write two or three sentences in their journals about fall leaves. Have them choose a leaf to draw on the cover of the journal, label what kind of leaf it is.

CLOSURE:
Use the words chlorophyll and pigment, ask questions to check for understanding. The students will share their journals with the teacher. The teacher can check for accuracy of definition and make corrections.

EXTENSIONS:
Put celery sticks in paper cups with water, add food coloring, watch celery change colors.

SUBJECT: Leaf stencils

OBJECTIVE:
Students will identify and match the different shapes of leaves with the name of a specific tree.

MATERIAL:
1. Leaf stencil booklet (make extra stencils from originals).
2. Colored paper
3. Pencils or markers
4. Papers with predrawn tree trunks which match the kinds of leaves available

PREREQUISITES:
An awareness that different kinds of leaves come from different kinds of trees and that all trees have a name, common and scientific. All trees have different leaves and the tree trunk is different too.

CUE SET:
Review previous lesson

BEST SHOT:
Teacher demonstrates tracing a leaf. The leaf is glued onto the matching tree.

CLOSURE:
Discuss some of the parts that make leaves different.
example: some leaves have pointed ends, some are round, some have separate points and some are smooth edged.

EXTENSIONS:
Send home a note with students to bring in a collection of as many different kinds of leaves, he/she can find.

SUBJECT: Leaf identification

OBJECTIVE:
As a result of this lesson the student will identify leaves.

MATERIAL:
1. Posters of different kinds of leaves
2. Leaves, from home and teacher
3. Student journals

PREREQUISITES:
Review previous lessons. Review why leaves change color.

CUE SET:
Show the students your leaves, and tell them how you identified them.

BEST SHOT:
Now students can identify the leaves. They can compare them with the posters. They will label the types of leaves they have identified and list in their journals. After identifying the leaves, the student will use descriptive language and new vocabulary words to describe them in the journal.

CLOSURE:
List the types of trees identified. Was there a large variety? Discuss.

EXTENSIONS:
1. Graph the leaves on large chart paper.
2. Make leaf rubbings

SUBJECT: Leaf collage

OBJECTIVE:
Students will create a collage using leaves of different colors and shapes.

MATERIAL:
1. Look What I did with a Leaf by Morteza E. Sohi.
2. large collection of leaves, gathered by students or brought in from home
3. large piece of paper
4. glue

PREREQUISITE:
The teacher makes a collage for an example.

CUE SET:
Suggest making something artistic with all the extra leaves in the class. Show the students the picture in the book. Tell how shapes and color of the leaves can make the collage interesting.

BEST SHOT:
Have the students begin making their picture. Share ideas and suggestions as you work with students.

CLOSURE:
Show and tell pictures. Display in classroom.

EXTENSIONS:
1. Write a poem or story describing the leaf picture.
2. Iron leaves between waxed paper, and hang in window.

SUBJECT: Trees rings

OBJECTIVE:
Students will observe a piece of wood cut in a round so they can see the rings. They will estimate the age of the tree by the number of rings.

MATERIAL:
1. Discovering Trees by Douglas Florian.
2. Sclence text with pictures of trees
3. Piece of tree limb with bark intact
4. Video - *Trees and Their Anatomy* available at E.S.D.

PREREQUISITE:
Tell students what words they need to look for in the video. (teacher should preview video) Students will need to be familiar with inner and outer bark of a tree.

CUE SET:
Ask students if they know what bark is for. What does it do for the tree? Read the book, and show the video.

BEST SHOT:
If school yard has trees, go out to trees and making bark rubbings. Note the differences in the bark on the various types of trees.

CLOSURE:
Brainstorm the differences found on the bark. Why do some trees have heavy bark and some thin?

EXTENSIONS:
Do bark rubbings at home.

SUBJECT: Distinguish coniferous and deciduous trees

OBJECTIVE:
Students will be able to compare and contrast a coniferous and deciduous tree. The student will add the new words to their vocabulary list.

MATERIAL:
1. Posters of trees
2. Samples of pine and fir needles

PREREQUISITE:
Check for basic awareness, "Have you ever noticed that most of the trees in the mountain areas are different from the leaf baring trees?" "What color are these trees in the winter?"

CUE SET:
Show students a twig with leaves and one with needles. What looks different?

BEST SHOT:
Explain terms coniferous and deciduous. Coniferous- any of various mostly needle-leaved or scale-leaved, chiefly evergreen, cone-bearing gymnospermous trees or shrubs such as pines, spruces, and firs. Deciduous-shedding or losing foliage at the end of the growing season. Brainstorm the differences in these two types of foliage.

CLOSURE:
Check for understanding. Have students determine if the trees on the playground or at home are coniferous or deciduous.

EXTENSIONS:
Why do some types of trees grow in different areas?

SUBJECT: Ginkgo Tree

OBJECTIVE:
As a result of this lesson the students will predict why the Ginkgo tree has been able to survive the changes in the plant life of the earth.

MATERIAL:
1. Chart paper
2. Markers

PREREQUISITE:
None needed

CUE SET:
Can you think of a life form that was alive during the dinosaur days, that is still alive today?

BEST SHOT:
Read students the information about the Ginkgo tree. This unusual tree grew during the Triassic period-180 million years ago. It has not changed through all of those years. Volcanoes erupted, dinosaurs became extinct, the earth underwent tremendous changes, but this tree continued to grow. Ginkgos grew in Washington-you might visit the petrified forest in Vantage sometime.

CLOSURE:
Brainstorm why this tree has been able to survive all these years.

EXTENSIONS:
Find Vantage on a map and locate the Ginkgo tree on the map of the Arboretum.

* Information about the Ginko tree is available in the backpack at the Yakima Arboretum.

UNIT 2

BIRDS

Unit 2 Birds

Lesson 1 Bird Identification
Lesson 2 Compare and contrast birds of prey with non-prey birds
Lesson 3 Math: Solve the bird message, Bird word problems
Lesson 4 Graphing with birds
Lesson 5 Nest identification
Lesson 6 Bird observations
Lesson 7 Poetry writing

RESOURCES

Suggested Materials

Books:

Birds of North America by Osborne Spotter's Guide

Feathers for lunch by Lois Ehlert

Birds of North America: A guide to field identification by Golden

Eagles, Hawks, and Owls: A Golden Junior Guide

Birds-Thematic Unit by Barbara Hollis printed by Teachers Created Materials Inc.

Zoobooks: Eagles, wildlife education LTD.

Ravens Crows Magpies and Jays by Tony Angell

Video:

Alphabet of birds-VS1657

Birds of Prey-VS7181.1

Backyard birds-VS5312.3

Posters:

North American Birds- Free from National Forrest Service

Bring any bird related items you can find, nests, feathers, etc.

SUBJECT: Bird identification

OBJECTIVE:
The students will identify characteristics of 12 birds common to North America.

MATERIALS:
Copies of bird dittos, a book with descriptions of these birds. Suggested books listed in the appendix. Bird poster from the Forest service. Crayons, and colored paper to make folders.

PREREQUISITES:
Teacher reviews classification sheet and has a colored a bird sheet for an example.

CUE SET:
We are going to start a unit about birds. Ask students why the think it's important to learn about birds.

BEST SHOT :
Brainstorm with class, list the things students already know about birds.
Discuss identification marks of birds.

CLOSURE:
Check for knowledge by asking students about the birds . "Example: "Which bird is black with a red patch on his wing?"

Answer Key:

1. Red headed woodpecker
2. Red wing blackbird
3. American robin
4. Ruby-throated hummingbird
5. American goldfinch
6. House sparrow
7. House wren
8. Mourning dove
9. Northern cardinal
10. Blue jay
11. Northern cardinal
12. Northern flicker

EXTENSION:
Brainstorm what types of birds they have seen in the school yard or local parks.

This Bird Folder belongs to

_____

*

1

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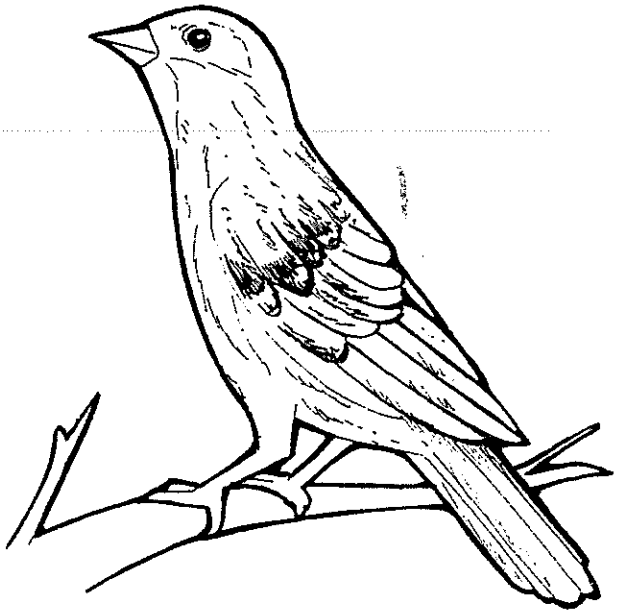

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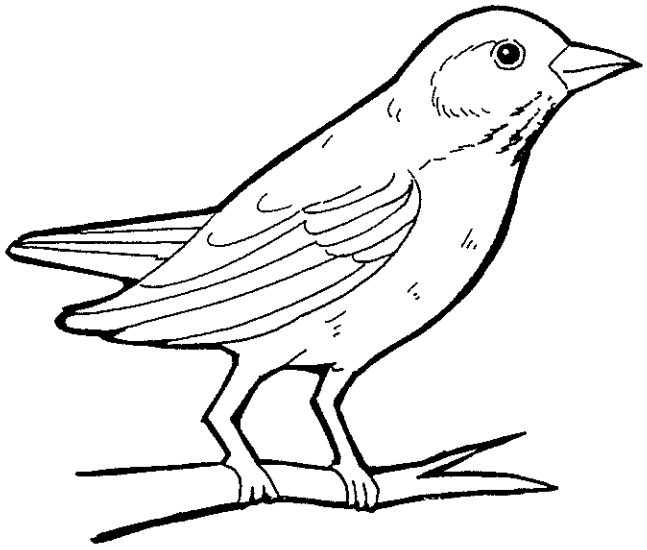

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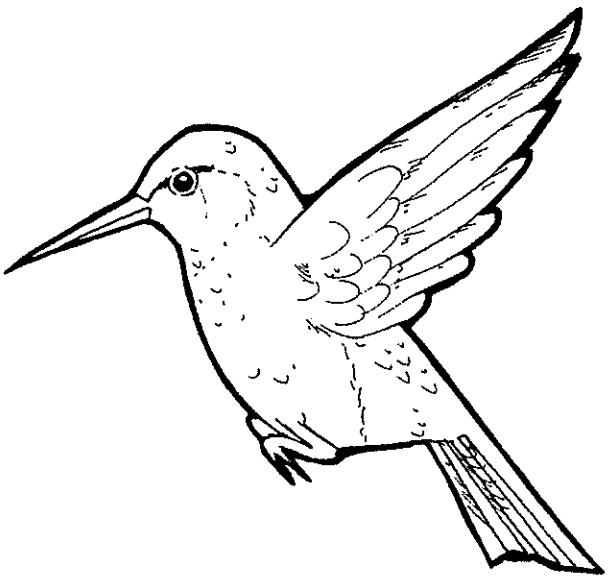

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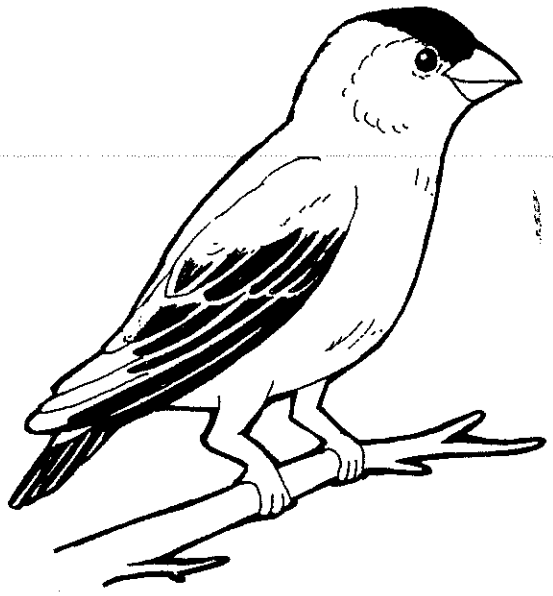

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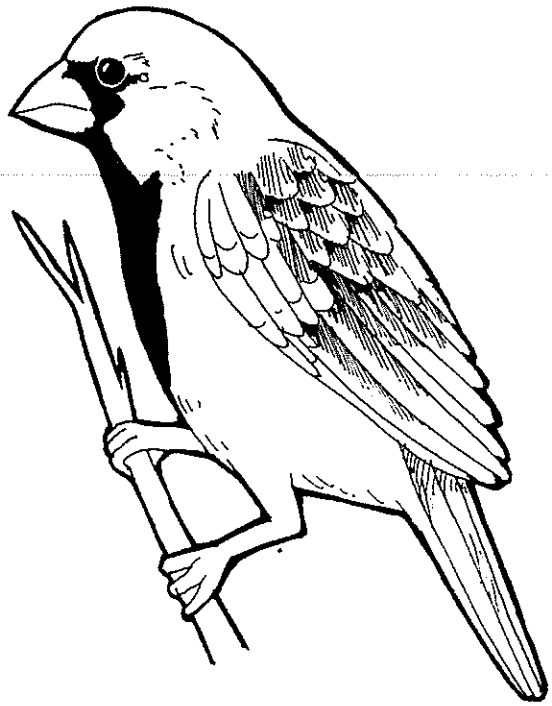

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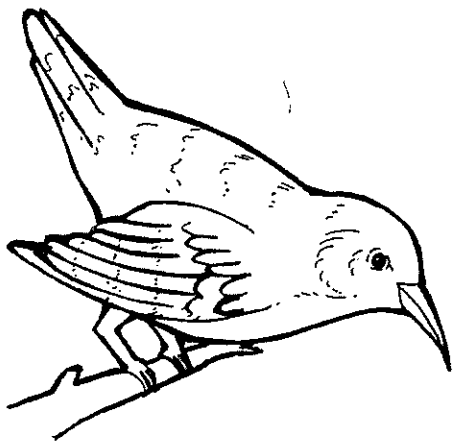

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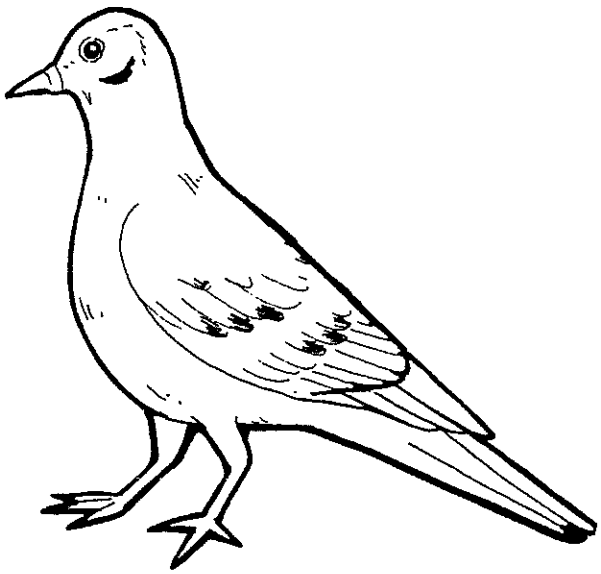

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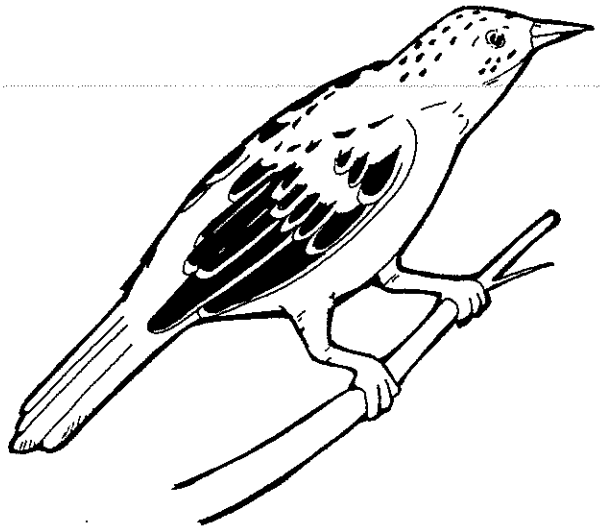

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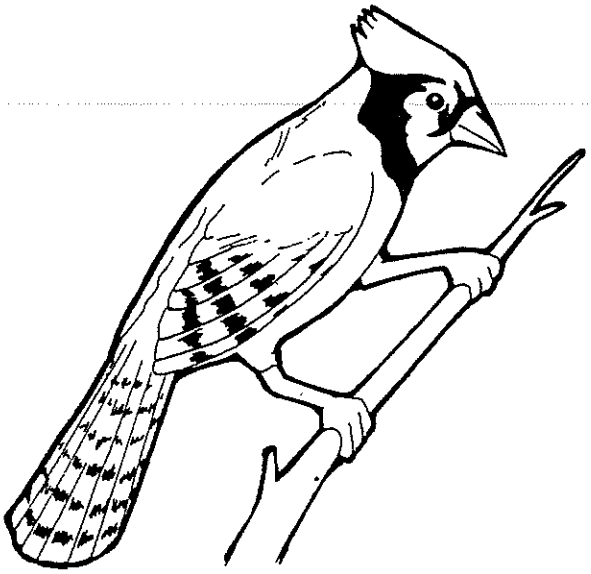

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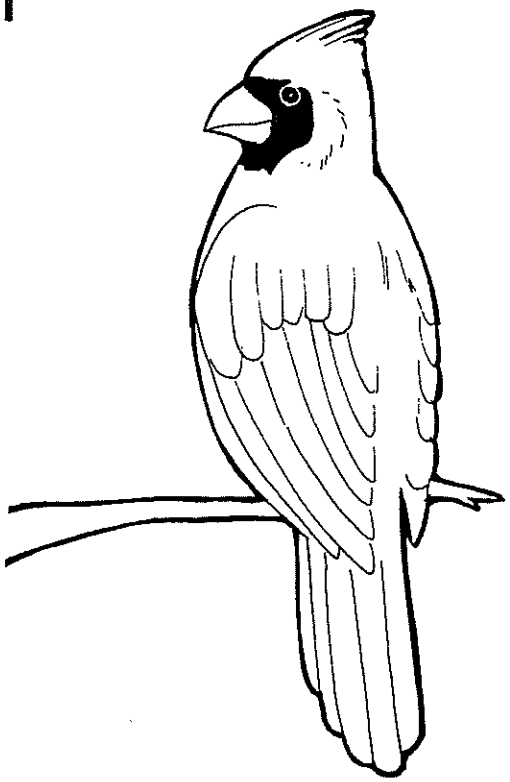


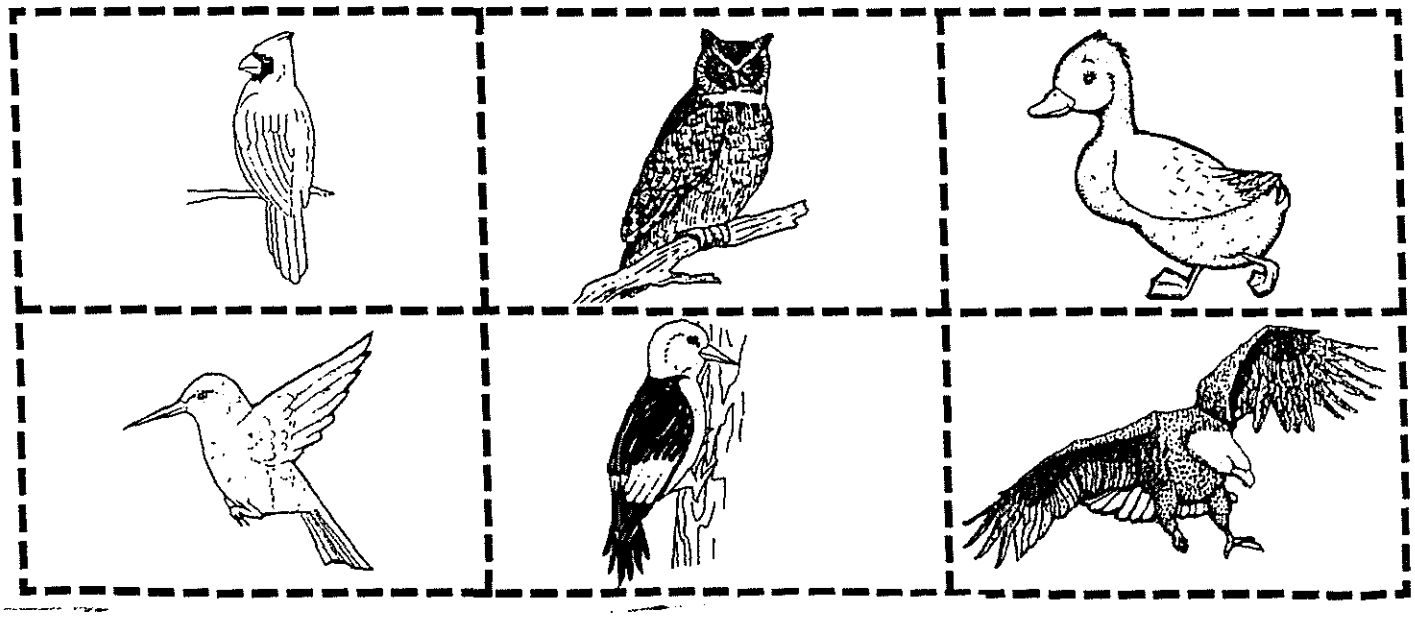
12

Name _____

Who's Who?

Match the birds to the description. Cut the pictures at the bottom of the page along the dotted lines. Glue each bird's picture next to its description.

1. An owl is thought to be wise. It hunts at night.	2. The cardinal is the only red bird with a crest.	3. The hummingbird collects nectar with its long bill.
4. Woodpeckers peck holes in trees to gather insects.	5. Eagles' long, broad wings help them fly high.	6. A duck is a bird with webbed feet.



SUBJECT: Compare and contrast birds of prey and non-prey birds

OBJECTIVE:
The class will compare and contrast eagles, hawks, and owls to other common birds such as robins and sparrow.

MATERIAL:
Students will need their bird folders so they can write down the new information.
Recommended books: Eagles, Hawks and Owls, (A Golden Junior Guide) Zoobooks: Eagles, or other resources containing information on eagles hawks and owls.

PREREQUISITES:
Students will need their book about eagles, hawks, and owls. Teacher should familiarize herself with the information, before reading it to students.

CUE SET:
Ask students what they know about these particular birds. Why are they called birds of prey?

CLOSURE:
Pass put bird watching sheets , along with bird facts and prepare students for bird watching and recording at home.

EXTENSIONS:
If possible, find owl pellets and have students dissect them
Torn owl art, tear brown bags into small pieces to layer on and glue onto owl ditto sheet. Cut out eyes and beak and glue on. Make eagle puzzle.

Bird Sightings

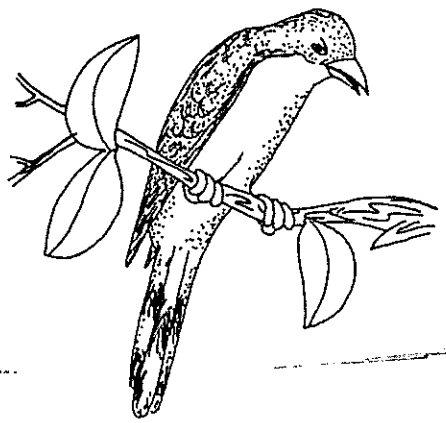
Name: _____ Date: _____

I predict I will see _____ birds today.

I saw:

Tally	Bird	Tally	Bird
☐	American Robin	☐	Red-headed Woodpecker
☐	Blue Jay	☐	Red-winged Blackbird
☐	Northern Cardinal	☐	Mourning Dove
☐	House Wren	☐	Ruby-throated Hummingbird
☐	Northern Oriole	☐	House Sparrow
☐	Northern Flicker	☐	American Goldfinch
☐	Other _____	☐	Other _____

I saw _____ birds today.



Name _____

Bird Watch Diary

Use this diary to keep a record in your folder of how many birds you see each day of birdwatching. Tell about and draw pictures of them. Watch your bird diary grow!

Day_____Date_____

Tally of birds I saw: ☐

One bird looked like: _____

_____

Draw.

Day_____Date_____

Tally of birds I saw: ☐

One bird looked like: _____

_____

Draw.

Day_____Date_____

Tally of birds I saw: ☐

One bird looked like: _____

_____

Draw.

Day_____Date_____

Tally of birds I saw: ☐

One bird looked like: _____

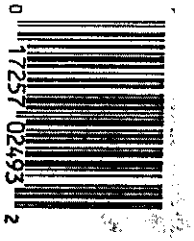
_____

Draw.

Name

Bird descriptions

Birds



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Nam

E descriptions

Birds

© Frank Schaffer Publications, Inc.

Name _____

Mystery Picture

Cut out the box below. Then cut the puzzle pieces apart along the dashed lines and put the pieces together to make a bird picture. Glue them onto another sheet of paper. Color the picture.

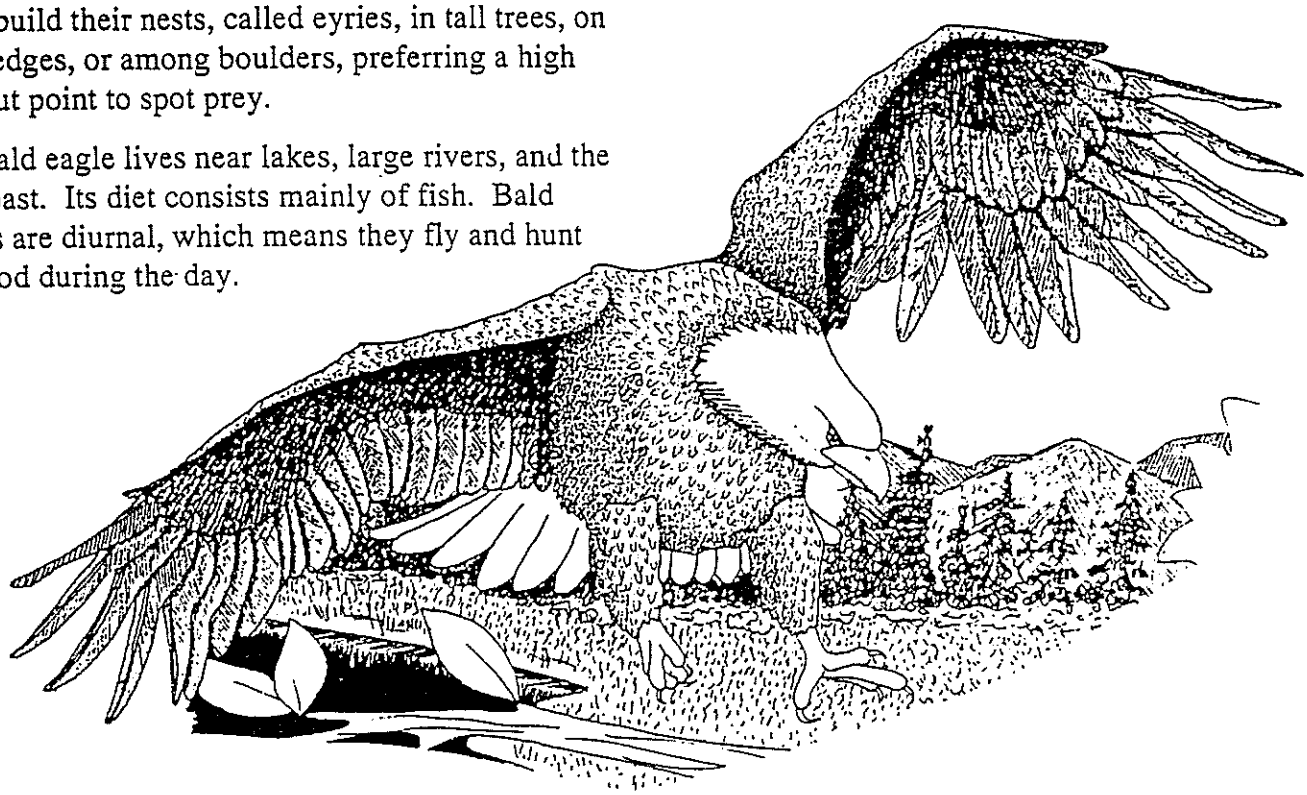
Mighty Eagle

Background Information

Eagles are one of the largest, most powerful birds in the world. When viewed up close, they appear fierce. While soaring above in search of food, they are incredibly graceful. Such traits have made the eagle a symbol of power and freedom. Roman warriors considered the figure of an eagle to be a sign of bravery and great strength. North American Indian warriors wore eagle feathers as a sign of bravery. In 1782, after some debate in Congress, the United States chose the bald eagle as its national bird.

Eagles generally live 20-30 years (50 years or more in captivity). The population has dropped due to pollution from industrial wastes and pesticides. They build their nests, called eyries, in tall trees, on cliff ledges, or among boulders, preferring a high lookout point to spot prey.

The bald eagle lives near lakes, large rivers, and the sea coast. Its diet consists mainly of fish. Bald eagles are diurnal, which means they fly and hunt for food during the day.



SUBJECT: Math

OBJECTIVE:
As a result of this lesson the students will use basic math skills to decode a message.

MATERIAL:
Math dittos

PREREQUISITE:
"Have you ever decoded a message before?"

CUE SET:
We have been learning about birds this week, today our math problems will involve birds.

CLOSURE:
Ask students what they did if the message had spelling errors? Did they go back to the problem and check for mistakes? What other bird expressions can the class think of?

EXTENSIONS:
Students can make up some problems of their own to share with the class.

Name ____________________________________

Solve the Bird Message

Below is a famous saying about birds. Solve the problems in each box below. Then find the answer under the word blank and place the letter from the box on the matcing blank.

__ __ __ __ __   __ __ __ __   __ __ __ __ __,   __ __ __
32 13 43 38 13   38 35 87 29   21 43 10 48 33   33 13 29

__ __ __ __ __ __ __   __ __   __ __ __   __ __ __?
38 13 43 38 65 29 64   1 10   33 13 29   29 59 59

O 16 − 15	**H** 26 − 13	**T** 30 + 3	**W** 42 − 10	**E** 22 + 7
I 67 − 24	**F** 38 − 17	**G** 48 +11	**A** 22 +13	**C** 15 + 23
M 63 + 24	**R** 42 − 32	**N** 68 − 4	**S** 23 + 25	**K** 89 − 24

I think the ______________________ came first because ____________________

____

____

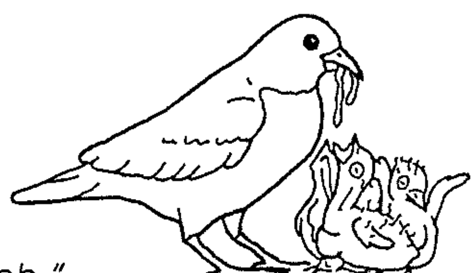
Here are 4 other sayings you may have heard:

"A bird in the hand is worth 2 in the bush."

"The early bird catches the worm."

"Don't put all of your eggs in one basket."

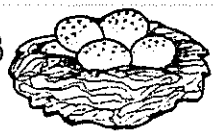
"Don't count your chickens before they hatch."



Try to find out what these mean. Ask friends, family, and teachers, or use library books. Report back to class on what you learned.

Name _____

Bird Word Problems

1. 4  3  in each 

How many nests in all?

2. 16 

5 more 

How many birds in all?

3. 18 

13  fly away

How many birds left?

4. 19 

Only 13 have 

How many birds do not have worms?

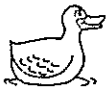
5. 37 

12 hatch

How many  left?

6. 28 

3  join them.

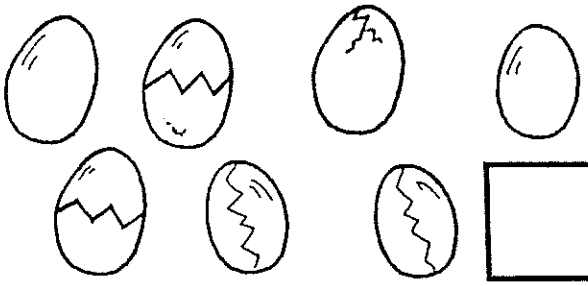
How many  in all?

7. 11 

6 

How many more penguins than hens?

8. How many eggs are cracked in half?



SUBJECT: Graph

OBJECTIVE:
Students will discuss the types of birds they have recorded on their bird sighting sheet. The class will create a group graph of the types of birds.

MATERIAL:
1. student bird recording notebooks
2. graph paper for student graph
3. glue, tape, markers

PREREQUISITES:
Students will have studied different types of birds. The students will have used a recording sheet to track the types of birds they have observed.

CUE SET:
Have students look at bird tracking notebook and be prepared to discuss their finds.

BEST SHOT:
Ask students which birds they think should be listed on the graph.

CLOSURE:
The group can discuss the most common bird sightings. Why would it be most common? Were there any birds not common to our area? Why might they have been seen in this area at this time? If the studies have indicated a certain species would be easily seen and was not, why not?

EXTENSION:
Graph the number of birds seen in the city and the country. Are they the same? Why or why not?

SUBJECT: Nest identification

OBJECTIVE:
As a result of this lesson the students will research different types of nest and identify them.

MATERIAL:
1. Posters of bird nests
2. Books about bird nests
3. Bird nests

PREREQUISITE:
Teacher needs to have knowledge of different kinds of nests and as many types of nests as possible. Teacher can ask local science instructors if they have any nest collections for loan. Check with arboretum experts on the advisability of gathering nests for your own collection. Some birds build new nests each season, and others depend on the old ones, gathering nests could be detrimental to some species. Books and posters are also available at the Forest Service.

CUE SET:
Ask class what they know about bird nests. Have they ever seen a nest?

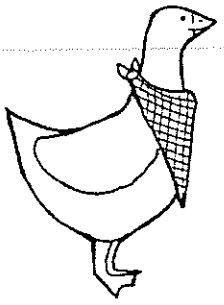
CLOSURE:
Make "Nibble Nests"

EXTENSIONS:
Asks students to note the large Osprey nest on the freeway pond near Zillah. The nest was moved from a pole on the freeway and rebuilt in a safer location away from the road.

Nibble Nests

Imagine a nest you can really eat!

Follow this recipe and enjoy a "sweet tweet."



Ingredients:

1 jar (7 oz./210 g) marshmallow cream

1/2 cup (125 mL) creamy peanut butter

4 tablespoons (60 mL) butter (soft)

1 (8 ½ oz./250 g) can chow mein noodles

1 bag jelly bean "eggs"

butter for fingers

plastic wrap

Equipment:

muffin liners

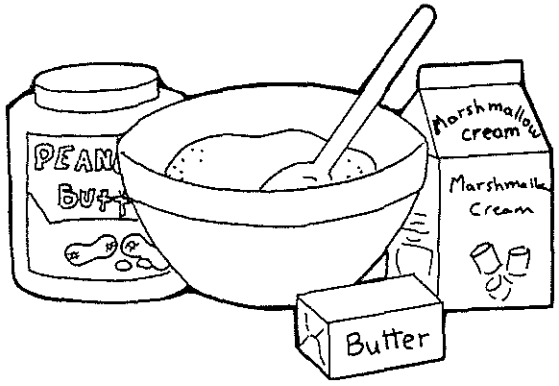
measuring cups and spoons

medium size bowl

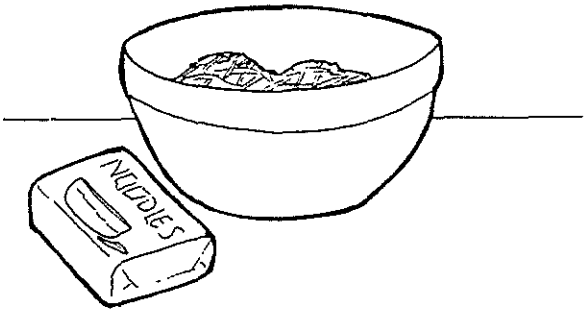
large spoon

Directions:

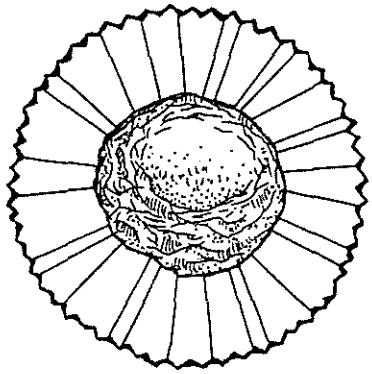
1. Mix marshmallow cream, peanut butter, and soft butter until blended well.



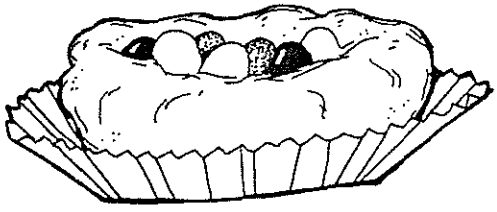
2. Add noodles and mix well.



3. Drop a large spoonful into a paper muffin liner. Shape into nests with greased fingers. Let stand until firm.



4. Fill with jelly bean "eggs." Enjoy in class or wrap to take home to share.



SUBJECT: Bird observations

OBJECTIVE:
As a result of this activity the students will record the attributes of birds they see to help them identify them.

MATERIAL:
1. Several pencils
2. Bird fact sheets/provided by the teacher
3. Posters of birds
4. Books on birds

PREREQUISITE:
Students should have participated in previous bird identifying activities.

BEST SHOT:
What kind of birds do you expect to see and why. What kind would they not expect to see and why.

CUE SET:
Today we will use our observation skills and recording skills to find out what types of birds live at the Yakima Arboretum. Keep careful records on the colors and markings of the birds you observe. If you notice anything special about its beak, feet or where you observed it write it down.

CLOSURE:
Share with the class some of the observations each child made.

EXTENSIONS:
Graph the birds identified.

Name _____

Bird Facts

Bird Name	Colors and Markings	Where It Lives	Interesting Facts

SUBJECT: Poetry writing

OBJECTIVE:
As a result of this lesson the students will write a cinquain poem about birds.

MATERIAL:
1. Ditto "all about birds"
2. My cinquain poem sheet
3. Paper to write on

PREREQUISITE:
Students should have participated in previous discussions about writing poems. Previous lessons on verbs, adjectives, adverbs and nouns will be helpful.

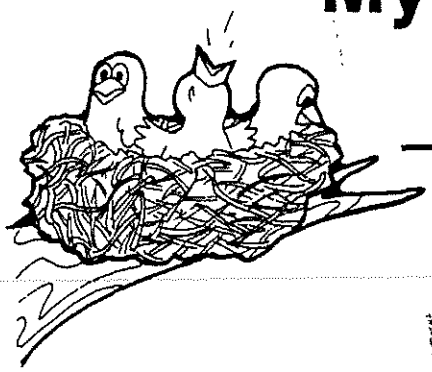
BEST SHOT:
Students create their own cinquain poems using the bird observations they have recorded. The instructor should encourage use of creative language.

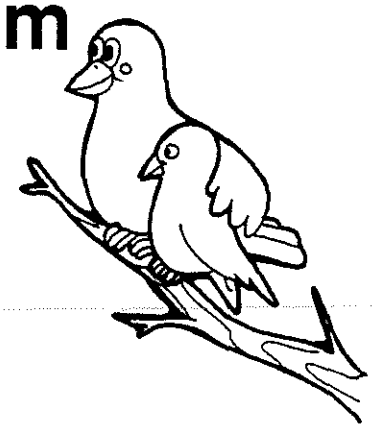
CLOSURE:
Students share poems with class.

EXTENSIONS:
Illustrations could be added to poems and poems could be bound into a big book for the class to enjoy and share with other classes.

Name _____

My Cinquain Poem





_____

noun
(the subject)

_____ , _____

adjective
(describing word)

adjective
(describing word)

_____ , _____ , _____

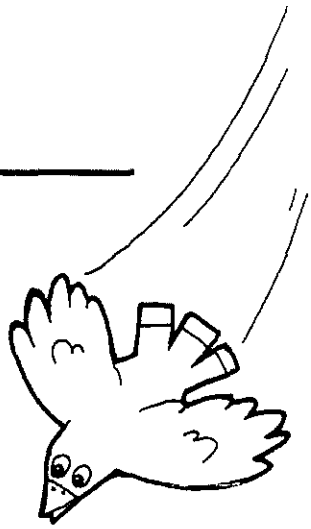
verb
(action word)

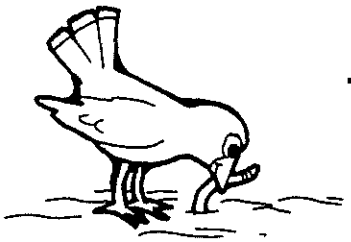
verb
(action word)

verb
(action word)

_____

4 word phrase
(about the subject)





_____

synonym
(another word for subject)

Name _____

All About Birds

Directions: Read about different birds. Then write about and draw a picture of your favorite one. Be ready to share this information with the class.

_____
(bird name)

Where does your bird live? _____

_____

What does your bird eat? _____

_____

What kind of nest does it build? _____

_____

Where does your bird usually nest? _____

_____

Some interesting facts about my bird: _____

_____

_____

_____

UNIT 3

SEEDS

Unit 3 Seeds

Lesson 1 All about seeds
Lesson 2 Parts of a seed
Lesson 3 Pollination
Lesson 4 Seed dispersal
Lesson 5 Needs of a seed
Lesson 6 Seeds for food

RESOURCES

Suggested Materials

Books:

All about Seeds by Troll Associates

What Makes a Flower Grow? by Susan Mayes

Fun Facts for Curious Kids: Plants! by Annabele Donati

The Tiny Seed by Eric Carle

Plants: The World of Science by David Black and Anthony Huxley

Let's Look at Flowers by Harriet E. Huntington

Seeds by Wind and Water by Helene J. Jordan

Plants are Like That by Harris Stone

Flowers and Flowering Plants by Arthur Aldrich

Videos:
Seeds in Motion VS5735

Posters:
How Seeds Travel

Footwork:
Gather a variety of seeds, have students bring in seeds.

SUBJECT: All about Seeds

OBJECTIVE:
As a result of this lesson the students will compare seed forms.

MATERIAL:
1. All About Seeds by Susan Kuchalla
2. A variety of seed forms

PREREQUISITE:
The teacher should have seed examples ready to show after reading seed information. Be prepared to ask open ended questions to prompt a discussion.

CUE SET:
Teacher holds up a pine cone and a walnut. "These are both forms of seeds." "Lets see what we can learn about seeds."

BEST SHOT:
Read the story and review by asking questions such as;
1. "How do seeds get planted?"
2. "What do seeds need to in order to grow?"
3. "What are two ways plants get water?"

CLOSURE:
Brief discussion on why students think plants are important.

EXTENSIONS:
Have students gather seeds from the yards and homes, and bring them to school for a discussion.

SUBJECT: Parts of a Seed

OBJECTIVE:
As a result of this lesson the students will identify the parts of a seed.

MATERIAL:
1. Student journals
2. Paper model of the seed
3. Lima beans that have soaked overnight in a wet paper towel
4. Magnifying glasses
5. Construction paper to make seed models

PREREQUISITE:
The teacher will prepare a paper model of a seed and it's parts: dicotyledon, testa, plumule, embryo, and radicle. Explain that seeds go through stages of being dormant and germinating.

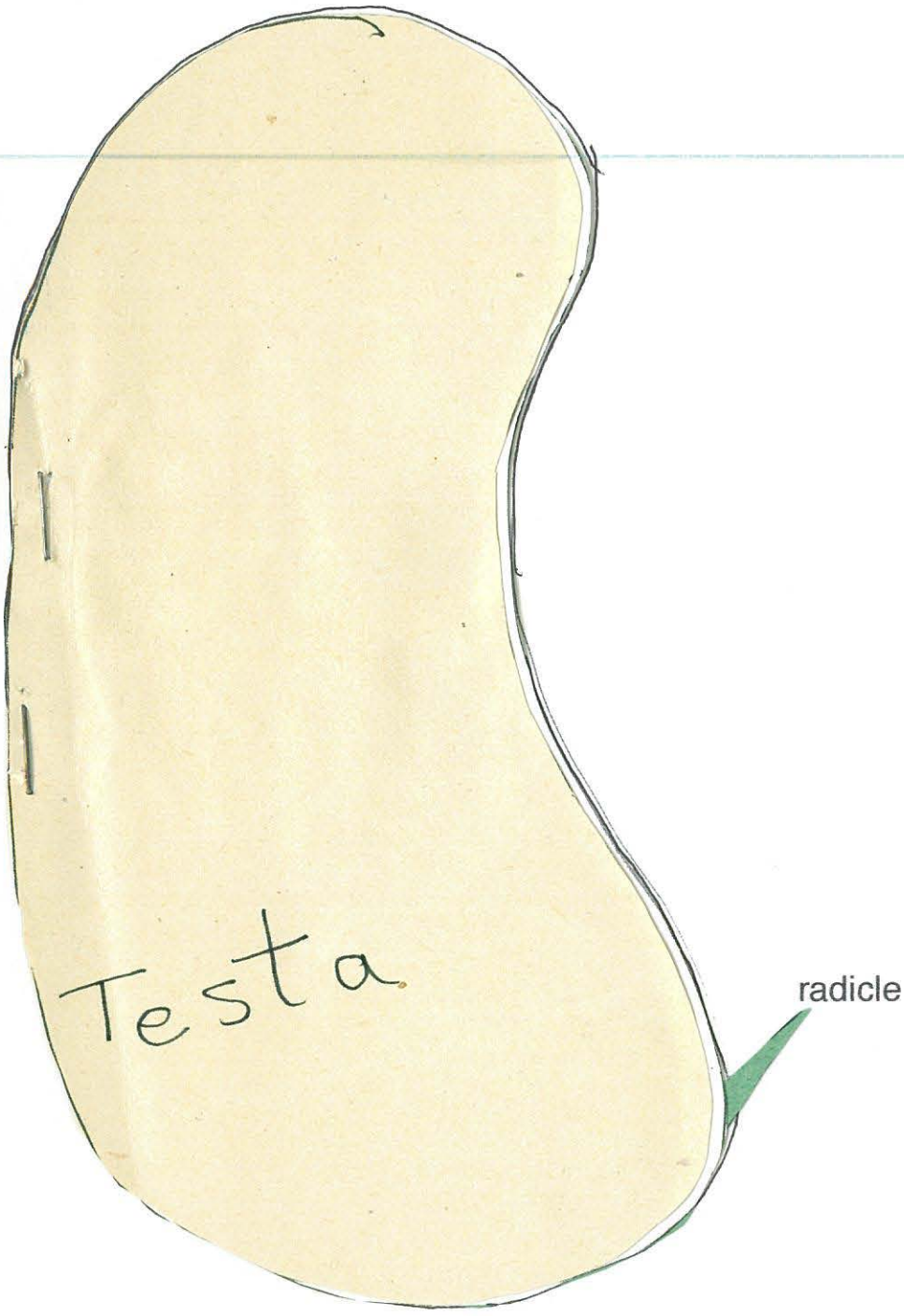
CUE SET:
Ask students if they have ever examined a seed closely. Show them the model and it's parts.

BEST SHOT:
The students will take apart the soaked lima beans and examine the seed parts. They will write the new words in their seed journals.

CLOSURE:
Have the students hold their models and recite the parts.

EXTENSIONS:
Discuss and list all the foods we eat that are seeds.

PARTS OF A SEED



SUBJECT: Flower parts and pollination

OBJECTIVE:
As a result of this lesson the students will identify and label the parts of a flower.

MATERIAL:
Have several flowers on hand that have distinctive parts. Copies of flower part sheet, and a transparency. Journals for the seed unit.

PREREQUISITE:
Teachers need to be prepared to explain the pollination process.

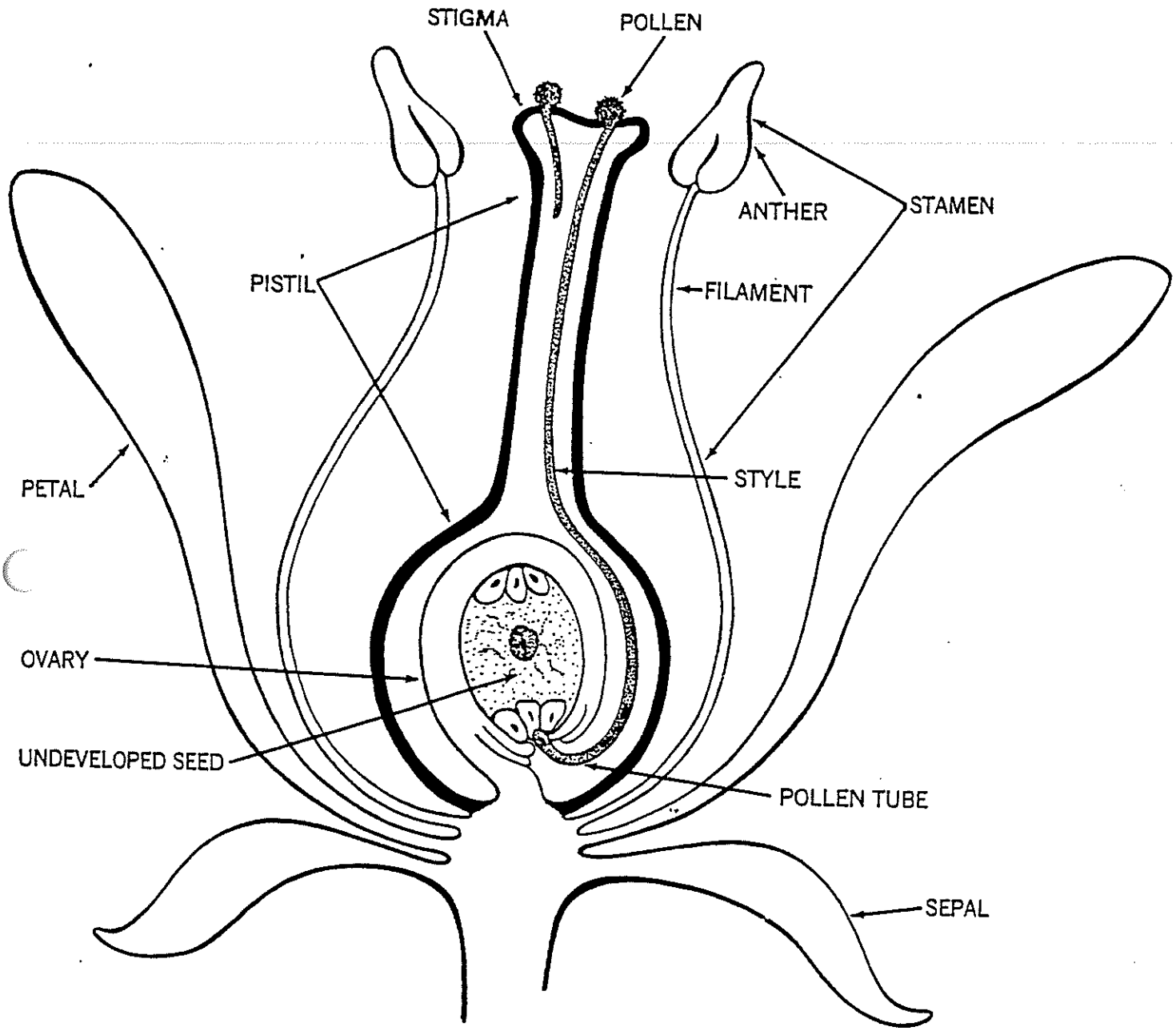
> In order for flowers to make seeds they must pollinate. This happens when pollen from the stamen or anther lands on the stigma. When this occurs, the stigma grows a long tube that goes into the ovary. In the ovary the tube enters an egg, this is called fertilization, and now the egg will develop into a seed. The stigma is sticky so the pollen will stick to it but how will the pollen get to the stigma?

CUE SET:
Teacher holds up a flower, expose the reproductive parts. Tell students that today they will be learning how a flower makes it's seeds.

BEST SHOT:
Pass out the flowers. Have the students carefully examine them, explain plant parts using the overhead as the students examine the flowers and label the parts on the ditto.

CLOSURE:
Review terms pollinate and germinate.

EXTENSIONS:
Give a flower part quiz. Use a diagram without labels, have students fill in the blank parts, choosing from a plant part word list.


STIGMA
POLLEN
ANTHER
STAMEN
PISTIL
FILAMENT
PETAL
STYLE
OVARY
UNDEVELOPED SEED
POLLEN TUBE
SEPAL

SUBJECT: Seed dispersal

OBJECTIVE:
As a result of this lesson the students predict how seeds are dispersed compose and illustrate a story about seed dispersal.

MATERIAL:
1. The Tiny Seed by Eric Carle
2. Paper for writing and illustrating

PREREQUISITE:
Students will need to be familiar with various types and forms of seeds.

CUE SET:
Brainstorm how students think seeds get spread, discuss the possibilities.

BEST SHOT:
After a discussion of how seeds spread, read The Tiny Seed. Ask students to write their own story about the life of a seed, and illustrate.

CLOSURE:
Students share their stories.

EXTENSIONS:
Show the video "Seeds in Motion."

SUBJECT: Needs of a Seed

OBJECTIVE:
As a result of this lesson the students will observe that plants need soil, air, water and light in order to grow.

MATERIAL:
1. Containers for planting seeds
2. Seeds
3. Planting soil

PREREQUISITE:
None needed

CUE SET:
Class, what things do seeds and plants need in order to grow? Today we will discover what a plant needs.

BEST SHOT:
Discuss the needs of plants, soil, air, water, light, and warmth. Compare them with the needs of humans. Have students plant seeds. Have extra plant containers. Plant extra seeds for an experiment. Have a plant that will receive no water, one will get no air, and one will get no warmth.

CLOSURE:
Record daily observations.

EXTENSIONS:
Plant flowers around the school, assign teams to tend the plants.

SUBJECT: Seeds for food

OBJECTIVE:
As a result of this lesson the students will list what seeds can be used for food.

MATERIAL:
1. Edible seeds (peanut butter, rice, bread, cereal, nuts, pop corn etc.)
2. Chart paper
3. Markers

PREREQUISITE:
None needed

CUE SET:
Teacher holds up a peanut, or walnut and asks students if they know what part of a plant it is?

BEST SHOT:
Before showing students the variety of seed forms, tell them that many seed forms have nutritional value. The class brainstorms and lists seed foods. Discuss that many animals eat seeds as a main part of their diet.

CLOSURE:
Class has a seed feast.

EXTENSIONS:
Discuss different foods you eat with seeds inside them, tomatoes, avocados, oranges, etc. Plant an avocado seed and fruit seeds.