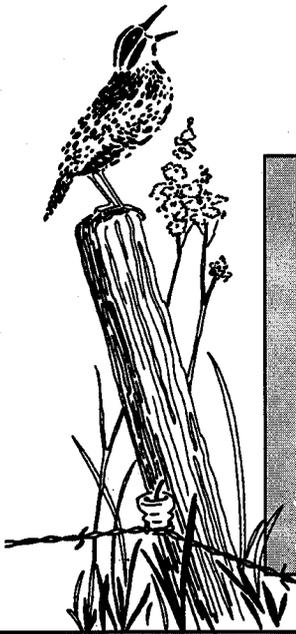


National Association
of Conservation Districts

How-To Guide

to



**Conservation
Education**

Inservice

PROGRAMS



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*The How-To Guide of Conservation
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Introduction

This *How-To Guide to Conservation Education Inservice Programs* is designed for conservation district officials and employees (especially those who have been assigned as information and/or education specialists or as members of the district education committee).

The primary objective of this guide is to help conservation districts carry out effective, inservice training for working teachers in the public and private classroom. A secondary objective is to give districts suggestions on ways to improve their conservation education outreach activities for students in the classroom.

A goal of the NACD Conservation Education Strategic Plan is to assist member districts interface with classroom teachers in a way that will help a greater number of teachers gain the confidence and skills to use natural resource conservation as a means to meet their education objectives. Every teacher who becomes a champion of conservation education will help create better stewardship values in the rising generation.

Districts Have Unique Education Opportunities

Conservation districts have much to offer the education community. District resource specialists have knowledge and resources to help teach sound, natural resource science objectives that are in harmony with state-mandated education standards.

The work of conservation districts is largely outdoors, an ideal setting for effective natural resource education. It is a well known fact that when teachers and students have an opportunity to feel and see real-life conservation at work, they will better see the relevance of such work in their lives and will be more apt to practice conservation on a personal level.

While it is often referred to as “environmental education,” conservation districts most often refer to their work as “conservation education,” leaving the implication that the work of protecting the environment takes “active” conservation actions that leave natural resources better than when they were found.

Whatever you may call it, the outdoor education we DO is what is important. Finding the path of least resistance in helping formal classroom teachers meet their state and national education mandates by utilizing conservation district resources is the focus of this guide.

**Conserving natural resources
for our future**

INSERVICE PROGRAMS

Types of Inservice Programs

Lectures

Lectures are one way for Conservation Districts to step into a classroom, but lectures generally don't create lasting behavior changes as do programs that include hands-on participation. Another thing to consider is that lecture topics may not meet the specific needs of the participants, in this case, teachers. One way to address this is to involve teachers and school administrators in the lecture topic planning, increasing audience involvement.

Teacher Workshops

Common professional-development activities can easily be formatted into a half-day or whole day workshop. In teacher development workshops, some subject topics can be studied in depth and can be extended over several days. Many times, workshops presented at schools are facilitated during teacher inservice.

The workshop site is one way to help facilitate the inservice topic. For example, workshops held at an outdoor site at the local nature center or conservation district can give teachers a chance to be both outdoors AND become familiar with potential partnerships with local conservation district specialists.

On the other hand, district specialists can also become familiar with elementary and middle school teaching styles. Many times, district specialists appreciate the local school education needs and end up becoming more interested in supplementing the science education in the classroom. However, poorly designed teacher inservice workshops will have the effect of discouraging everyone involved.

Education Standards

Education standards are measures used to evaluate the value of programs that teach students as well as the effectiveness of the support system for educators. These standards also measure progress toward national education mandates.

State and local school district administrations, in cooperation with the local community, use state and national education standards to decide which professional inservice programs and curriculum will help them best achieve these standards.

This is where conservation district education specialists can most effectively make use of their time and resources. By aligning education programs with the appropriate education or professional development standards, teachers and principals will be much more receptive to incorporating your conservation information.

For example, your local middle school's 7th grade science teacher is interested in what you have to offer. You may have considered a tour of a local farm to explain the importance of earthworms. This is a wonderful idea! This tour would do much to connect students to the land and food production. However, the school principal is not so easily convinced. This could appear to be a field trip with little educational value. It may be costly in terms of transportation, and they may have a difficult time justifying the time away from the classroom. Your solution is to make it easy to connect the key concepts of the educational program you offer to your state's education standards.

Via the internet, access any of a number of sites linked to your state's Education Standards or Benchmarks. A great website for state science standards is hosted by the Council of State Science Supervisors at www.csss.enc.org. In this example, search for Science Content Standards for the grade level you are targeting (in this case, 7th grade). You will find many content standard subheadings, such as Physical Science, Life Science, Earth and Space Science, Science and Technology, etc. Since you are focusing on the importance of an organism to food production, your program would most easily fit into the Life Science subheading. The state science education content standards for Life Science 5-8 are listed as follows: Characteristics of Organisms, Life Cycle of Organisms, Organisms and Their Environments. (Your state education standards may have slightly different categories or titles, but are organized in generally the same format.)

You would then match your key program points with the specific content standards or benchmarks. Make sure you reference in your pre-trip materials the key points you will cover as well as the corresponding science standard (Your state Science Education Standards, 5-8 Life Science, Characteristics of Organisms) after EACH key point. Be sure to reference the specific State Science (or

Education Terms with Which to Become Familiar

Curriculum

A set of experiences designed to help students to learn a body of concepts and supporting skills and knowledge; usually includes consideration of learners' experiences and understanding, current level of awareness, and factors likely to enhance their learning. Emphasis depends on context.

In the context of a school district or set of districts, such as a state, curriculum can be the body of learning that the schools provide for students. The conceptual framework and program themes are identified using suggestions for connecting the curriculum at various grade levels and in various subject contexts.

In the context of a teacher in an individual classroom, curriculum refers to specific concepts to be taught. In addition to concepts to be learned, the classroom curriculum will offer specific experiences to illustrate these concepts, opportunities for data collection to verify them, student-assessment materials and activities, and suggested experiences to augment conceptual understanding. A complete curriculum guide includes resource lists of laboratory and instructional technology, materials, and local field trips.

Educator

A person involved in assisting others to learn at any level of the educational system. *Science educators* are persons whose educational endeavors are concen-

trated on the teaching of the physical sciences.

Professional Development

Refers to commonly used terms such as *insewice*, *staff development*, and *teacher enhancement*.

Refers to the broad range of teacher involvement in out-of-school activities that are designed for professional growth.

Science Supervisor

An employee of a school district or regional or state education agency who coordinates professional development or curriculum development and implementation activities for science teachers.

Scientist

A scientist is anyone whose higher education was concentrated in the physical sciences, usually including preparation and experience in research.

Teacher Preparation

Prospective teachers' formal course work and teaching practice before certification or employment in teaching at the undergraduate or graduate level. (Also called preservice.)

Teachers

The term *teacher* refers specifically to individuals who teach students in K-12.

English Language Arts, Geography, History, Mathematics or Social Studies) Standard to each key point. This process can also be applied to inservice programs you develop. In this case, you would search the same state education websites for appropriate Professional Development Standards. You are now prepared to demonstrate how your program meets state education standards. Following are examples:

Your Program's key Topic: Earthworms
Your State Science Content Standards

Earthworms Are Beneficial to Soil

Content standard: **5-8** Grade Life Science: POPULATIONS AND ECOSYSTEMS: Explaining the interactions and interdependence of nonliving and living components within ecosystems

Earthworms Are Invertebrates

Content standard: **5-8** Grade Life Science: ADAPTATIONS OF ORGANISMS

Describing the importance of plant and animal adaptations, including local examples

Earthworms Have An Important Place in the food chain

Content standard: **5-8** Grade Life Science: POPULATIONS AND ECOSYSTEMS: Modeling and interpreting food chains and food webs

Matching your specific key points with specific science, arts, geography, history, mathematics or social studies content standards makes it easy for school administrators to see the link between your program and what they are responsible for in the classroom. In addition, feel free to add anecdotes, field testing (which you can also match to

content standards), and other interesting information. You have made your program educationally worthwhile to the school administration, the educator, students, as well as enhancing your own credibility as an educational resource.

Hallmarks of Effective Inservice Training

Generally, effective inservice programs shared the following elements that can be applied to conservation education inservice programs as well:

- Program development involved input from teachers
- Teachers were viewed as professionals
- Programs were designed to meet individual school needs
- All participants were asked to evaluate the program and recommend changes
- The program was promoted by teachers, and teachers were actively recruited for participation

Inservice Program Development

A next logical step would be to invite teachers to the district offices for initial brainstorming on educational partnerships. Some things to consider could include:

District Personnel Discipline and/or Research
 State Science Standards
 Service Learning Projects
 Research Projects
 Current District Education Programs

HOW TO RECRUIT TEACHER INVOLVEMENT AND PARTICIPATION

The following are some ways to attract teachers:

Use many methods to reach teachers.

- Mail materials directly to teachers, science supervisors, and principals. Direct mail to targeted teachers is probably the most effective of these strategies. Usually, less than 5% of targeted teachers respond. Many times, lack of communication between administrators and teachers is common, so follow up soon after mailing can be successful in reaching teachers.

- Distribute materials at teachers' meetings and conventions
- Make presentations at professional meetings
- Advertise in teacher professional publications, newsletters, and electronic bulletin boards.

Identify lead teachers. Teachers who have been science-resource teachers, science-department heads or participated in science committees can be helpful in recruiting and publicizing your teacher inservice program. These same lead teachers would be ideal members of your planning committee.

INVOLVING TEACHERS IN WORKSHOP DESIGN

If several teachers have agreed to serve on a planning or advisory program committee, there are several effective ways to use their skills and expertise:

- *Treat the teachers as peers.* Make them feel comfortable and valued committee members. Listen carefully to their comments and suggestions. They should be fully involved in all planning activities not just the "teaching" aspects.
- *Solicit teachers' opinions about their needs, interests, and problems.* Partnership with teachers in developing programs will ensure that the programs provide the help they need and want.
- *Use the teachers' experience to learn how they will react to the program being planned.* These teachers may have acquired a feel for what will be seen by teachers as workable. They can also provide realistic feedback on proposed activities. Input from teachers can, for example, help to develop programs that are intellectually challenging and rigorous, yet appropriate to the backgrounds of the participants.
- *Have teachers conduct some of the program activities.*

Teachers can:

- Demonstrate how teaching strategies should look in the classroom,
- Facilitate science content when they are competent to do so,
- Facilitate laboratory investigations.

ADDITIONAL BENEFITS TO PARTICIPANTS

To attract the largest number of teachers, conservation districts may want to consider offering the following:

- College credit. Many times, teachers will consider enrolling and then supporting a new program (which supplements their established curriculum) if they gain some sort of professional recognition. Conservation districts should contact local, state and college administration to determine college credit guidelines for district programs.
- Stipend to purchase supplies for student use. Money for equipment and supplies often comes out of teacher's personal funds, and any sponsorship provided for a "starter kit" of supplies can help propel a new program. A budget to purchase equipment and supplies for use in the classroom with students would be very useful. Even a small amount of money can help teachers implement new ideas in their school.

Conservation Education Across the Curriculum

Meaningful learning requires students to integrate ideas from many different disciplines, and teachers must be able to be flexible enough to incorporate knowledge of different subjects in the classroom.

It is possible for teachers to emphasize interdisciplinary teaching in the classroom especially through the topics and examples they use. It is very important for teachers to coordinate and cooperate in order to provide interdisciplinary opportunities for students. Conservation of our natural resources can be a unifying theme in this endeavor.

Gaining Access to the School

How do you approach your local school district with your proposal for a conservation education inservice workshop? A good first step is to contact the school secretary to determine the current inservice training schedule. This will give you a better idea of when you may be able to be most successful in promoting your workshop.

Whom to approach is also very important. Contact your local school district science coordinator for information and help. They can direct you to the curriculum and science specialists at each school. Approaching classroom teachers with ideas for collaboration on a short classroom presentation is also a good way to introduce conservation education into the classroom as well.

Carrying Out an Inservice Evaluation

Program development is strongly tied to its eventual evaluation. Program evaluation will be most effective if it is designed in the planning stages of a program, if it measures the success of a program against its stated goals, and if it continues throughout the life of the program. If program planners include evaluation in program design, they will find that it will help them:

- Define specific, realistic, important, and measurable program goals.
- Identify scientific content that are appropriate for teachers and their students.
- Establish mechanisms for receiving continuing participant feedback.
- Establish, before the program begins, procedures and instruments for collecting overall program-evaluation data.

Presenting an Inservice Workshop

As a representative of your conservation district, you are a source of information. It is critical to be familiar with your workshop information. Be familiar with current local issues, national trends, and other information that impacts your local community. Collect newspaper articles as a resource for future workshops.

TEACHING TEACHERS

Teachers are not children, and therefore require a completely different method of teaching. Do not expand a program geared toward students. Find ways to present in-depth information in a way that addresses teacher needs in the classroom.

Presenting information in certain ways can help teachers bring back conservation education to the classroom.

Inservice instructors would do well to follow this formula:

- **Talk**—give background information
- **Demonstrate**—give an example of what was just discussed. If water testing was the focus, demonstrate how to conduct a water test
- **Do**—allow and facilitate participants in conducting their own water test
- **Evaluation**—debrief the Participants. What worked? What didn't? How can this activity be adapted in the classroom?

Another important aspect of inservice is the opportunity for these participants to call on you for information or coaching **as** they incorporate new activities and information into their curriculum. Be available. Offer support to teachers by calling them back and asking how the activities are going. In addition, partnering with other organizations in the school district or community encourages teachers to try new ideas. Partnering also adds to the inservice program's credibility.

LEADING A WORKSHOP

Background Preparation

Since you have already are extremely familiar with your subject matter, and know what activities and materials you will require, the next step is getting it all together. A smooth workshop incorporates the following:

State the workshop goals. Tell the participants what they will learn. For example, "At the end of this training, participants will be able to conduct soil and water tests successfully, identify soil types, and identify major conservation measures used to combat soil erosion."

Determine how you want to close your workshop. Will it be with a tour outdoors?

Determine how you want to start your workshop. Will you have a slide show, demonstration, tour, lecture?

Create the workshop outline

What audio/visual aids will help you get your point across?

Practice your presentation! Do this until you are confident enough to be able to change the direction of the workshop, if need be, or to make use of an interesting teachable moment. Be familiar with your materials and

mentally walk through your presentation **as** you expect it to happen.

Have additional activities planned just in case your workshop runs short, and make sure you don't run over the scheduled time.

Logistics

In addition to workshop resource materials, visual aids and partners, you must consider where your workshop will be held. Make sure you have seen the room you will be presenting in. Is the room too small or too large? Where are the restrooms located? Get there early to rearrange tables and chairs the way you want it. Find out who you can contact if the room is too hot or too cold.

Teaching Techniques

There are many ways to present information. **Vary** your methods within the workshop to accommodate different learning styles. There are four basic teaching techniques you can use:

- Lecture
- Discussion
- Demonstration
- Participant practice

Consider incorporating some of all these styles of teaching in your presentation.

Workshop Evaluation

1. Did the workshop reach its stated goals? What can the participants do or know now that they couldn't do or know before?
2. Evaluate the effectiveness of instructors and others involved in delivering the workshop.
3. Collect specific incidents or stories that support how the workshop improved or enhanced conservation education in the classroom.
4. Evaluate the information and activities presented in the workshop. Were they "real-life"? Relevant?
5. Was the presentation clear to all learners?
6. Evaluate workshop objectives. Did participants achieve the workshop goals?
7. Identify the strongest features of the workshop.
8. Identify the weakest features of the workshop.
9. Have participants list new ideas they picked up as a result of the workshop.

Examples of workshop goals and evaluation follow:

Goal In service workshop should improve educator's understanding of soil and water conservation issues

Objectives

Educators will improve their understanding of conservation, of the methods of resource conservation, and of the social and personal implication of conservation.

Evaluation

Preprogram and postprogram evaluations of instructional materials.

Goal

Scientific content should be accurate.

Objectives

Teachers will receive scientific information that **informs** their teaching and improves their understanding of conservation

Evaluation

Assessment of accuracy and currency of materials that instructors use in the classroom.

Goal New partnerships, projects and networks are encouraged and supported among participating teachers and between teachers and conservation district resource specialists.

Objectives

Resource specialists will establish relationships that help improve conservation education and establish a pattern of involvement of specialists.

Evaluation

Number of partnerships after the formal program.
Number of school visits by resource specialists.

Sample Workshop Outline: Full Day

- I. Conservation
 - A. What is it? State of conservation on Earth (VIDEO)
 - B. Conservation and Habitat
 - C. Soil Conservation Practices: What Good is It?
 - D. Water Conservation Practices: What Good is It?
- II. Soils: **An** Overview
 - A. Soils: What Are They?
 - B. Soil Ecology: Plants & Animals Under Your Feet
 - C. How is Soil Formed
 - D. U.S. History Was Affected by Soils
- III. Soil Activities
 - A. Activity 1 – Does Organic Matter Help Soil?
 - B. Activity 2 – Splash Erosion
 - C. Activity 3 – Compare Water Movement through Soils
 - D. Activity 4 – How is Soil Formed?
 - E. Activity 5 – What are Soil Horizons?
 - F. Activity 6 – Organic Matter
 - G. Activity 7 – Determine Soil Texture by Feel
- IV. Water: **An** Overview
 - A. The Hydrologic Cycle
 - B. Groundwater
 - C. What's In Groundwater?
- VI. Water Activities
 - A. Activity 1 – Infiltration and Pollutants
 - B. Activity 2 – Water Testing
 - C. Activity 3 – How Does Groundwater Travel
- VII. Conservation Activities
 - A. Activity 1 – demonstration
 - B. Activity 2 – explanation
 - C. Activity 3 – explanation
 - D. Activity 4 – demonstration

TIPS FOR EDUCATION OUTREACH

Outreach Programs: WHERE DO YOU START?

So how would someone get started? How do you get your foot in the school door? How can you help bring conservation education to the teacher and into the school? It's tough to brainstorm ideas for effective conservation outreach programs that your local schools can use. This is usually made more difficult if you are unfamiliar with how science or environmental education is taught inside the classroom. Environmental education can be a very useful

tool in evaluating the environment and helping students to develop critical thinking skills. However, conservation Education is the next active step! Many times, a short presentation or show is one of the first steps to getting your message out to students AND teachers.

Next, if you can, try to visit the classroom **as** an observer during science class to get an idea of how science is taught, topics covered in class, as well as to develop ideas for possible conservation district/teacher collaboration.

HOW TO STRUCTURE A CLASSROOM VISIT

Most of us have some familiarity with doing an outreach program or presentation to a classroom. Classroom visits are an obvious way to introduce you and your conservation district. Generally, classroom programs are short, and therefore necessarily shallow —having only enough time to introduce the subject, offer exciting or important information and perhaps answer any class questions. Generally, students do not retain a great deal of what is presented in these classroom programs —unless it included live animals! Does this mean don't do it? No. Make your classroom visit educational and supplemental to the science curriculum being taught.

Teachers have a lot to teach. Conservation districts are a resource of highly educated and experienced specialists on insects, soil, water, erosion, ecology, plants and animals. How can you connect teachers with these resources, without adding to their list of things to teach? By supplementing their curriculum. Not replacing or supplanting what they need to teach their students, but by learning what it is they need to accomplish and cooperatively designing a program that will be valuable to that teacher and make his/her job easier. If you can do that for the school teacher, you have made your conservation district a resource for that teacher and that school —and, at the same time, you have established the importance and usefulness of conservation districts and conservation education.

You are a valuable asset in the classroom; you are the specialist, you are the visitor, and you are the interesting diversion for the day. Ideally, you want to present information and stimulate thought and discussion with your audience. This can be done with all ages.

Sometimes presenters don't want to present the science content because it is "dry" or "too difficult for the audience to understand." Don't buy into this; by not presenting your field of science, you are adding to the negative public attitudes about science and doing a disservice to everyone involved. Invest the time to make sure the relevance, interest, and excitement of your field come through!

OUTREACH PRESENTATION CHECKLIST

If you are visiting a classroom upon request, it will definitely help your presentation to ask the instructor about their current curriculum. Some questions to ask are:

J Student age?

Even better, the teacher will be able to give you some inside information on how to interact with the class. Be sure to request input from the instructor on any presentation you design. Some students may be able to follow a more technical presentation, but a talk that is too far beyond the student's level becomes frustrating for everyone. Ask the instructor —they want you to succeed.

J How long should the presentation last?

✓ Should you prepare to facilitate lab experiments?

J What topics have already been covered in class?

✓ Are there any other classes that could benefit from this (or similar) presentation?

If you've gone to the effort to prepare a program, perhaps you could be available as an "expert for the day" on the school campus. You may consider facilitating a demonstration on tree planting, be available for laboratory investigations and present your program to the school via assembly —try to find a way to make the most of your time on campus.

Develop pre and post event activity materials for the teacher. Work with the class instructor to include appropriate inquiry based, hands-on activities that support your point and class studies. **This** extension helps to clarify your point. All educational outreach personnel should become familiar with the National Science Education Standards <http://books.nap.edu/> Published by the National Research Council (1996), the Standards offer a guide for the concepts students should be tackling at a given age level. The Standards also provide guides for teacher professional development and student assessment and a vision for science education programs. In your pre and post event materials, match up the topics you present with the appropriate science standard reference number. This correlation will make linking your science presentation to classroom learning objectives much, much easier for the instructor —another added value to the classroom!

- ✓ What time should you start the presentation?
Get there 15 to **20** minutes early —just in case.

Don't assume the school has any presentation equipment to loan. Bring your own slide projector or VCR if needed. An extension cord and masking tape (to tape the cord down) will help alleviate any problems with a power source.

Bring visual aids such as posters, curriculum, videos, maps. Try to plan on leaving these at the school. Your host will appreciate it.

TIPS TO REMEMBER

- 1) Tell your students what you are going to tell them. In two or three sentences, tell your group that you will discuss the water cycle, water pollution, and water conservation. Then begin your presentation.
- 2) Elementary school students: **30** minutes
Junior and High school students: 40 minutes
- 3) Stones are interesting! Whenever possible, tell a story or anecdote that demonstrates the point you are trying to get across. Tell the students you remember catching fish at such and such creek, but silt has choked almost all the life out of the water. Tell them a little of your background and what interested you in science.
- 4) **AT ALL COSTS, AVOID JUST TALKING.**
Ask for volunteers and have these kids help you hold a map or other artifact, give them a round of applause and invite them back to their seat after a short time. Or, divide the room into teams. Only call on those whose hands are raised. Avoid calling on the same kids every time. Remember to tell actual stories of how you test water and **WHY** it is important. Relating what you do to your local community or people will help emphasize how important what you do is.
- 5) Students **WILL** have questions. Make sure you set time aside for a Q & A session at the end of your presentation.
- 6) Watch the body language of the students; if they are squirming or falling asleep, wrap up, pick up the pace, move around, challenge their minds with interesting questions, call up volunteers - what ever works! **OR**, ask if they are too cold! Sometimes their discomfort is enough to cause them to zone out!
- 7) After the Q&A session, give a summary of your presentation. Tell them what you just told them.

- 8) If possible, check with the instructor before hand to see if the students could begin an activity that supports and helps demonstrate your points. For ideas about classroom activities: ask the teacher; he/she may have activities that relate to your work/presentation.

Conduct a planning meeting in which program content/subject matter is covered.

- What topics are critical to cover?
- What can be deleted?
- Will there be hands-on activities?
- Are materials easily available and inexpensive?
- Will the program fulfill state education standards?

Why Should Conservation Districts Consider Conservation Education?

- Builds a knowledgeable and skilled citizenry
 - Promotes a balanced analysis of social, economic and ecological needs
 - Improves the quality of education, better preparing tomorrow's leaders
 - Makes conservation relevant to students

BENEFITS OF CONSERVATION EDUCATION

- 1) **Teaching more science to students**
The results of a National Science Foundation study found that an average elementary student participated in 2.5 laboratories per year!

Participation in a conservation education programs would introduce students to the practical science behind the production of our nation's food and fiber.
- 2) **Provides a great academic learning environment**
Learning and familiarity with the outdoors contributes to providing each student with an optimum learning experience. Connection between textbook knowledge and real life translates into understanding the critical need for soil and water conservation.
- 3) **Teach and Reinforce Safety**
This is something that can be overlooked at the elementary level and really should be introduced from kindergarten on. Students will learn valuable outdoor safety skills so they will be prepared if need be later in life.