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ABSTRACT

This guide, designed for use by educators and interpreters, outlines principles and techniques for effective talks and discussions. Four main headings are included. The first, Introduction, describes the major premises of the guide, mainly (1) teaching is an art as well as a skill; (2) teaching involves a relationship between teacher and learner that goes far beyond the transfer of knowledge; (3) active involvement of the learner is central to good teaching; and (4) your audience may be free to leave physically or mentally. Setting the Direction, the second section, focuses on choosing objectives, audience characteristics, and deciding what to present and why. The third section, Reaching Your Audience, looks at the characteristics of talks and discussions and lists specific points on preparing both. Techniques useful for interpretation are summarized in section four. Topics dealt with include selecting and organizing the presentation, motivating and focusing the audience, getting feedback, questioning techniques, attention holding techniques, and others. A checklist and bibliography are also included. The guide is written in an informal style, with important words and phrases in bold face type, and includes many illustrations. (TM)

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EDUCATIONAL PRINCIPLES AND TECHNIQUES FOR INTERPRETERS

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And

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ABSTRACT

Outlines principles and techniques for effective talks and discussions. Covers objectives, selecting and organizing visitor experiences, motivation and attention-holding techniques, use of questions, and use of examples, analogies, and metaphors. Includes a checklist and bibliography.

KEYWORDS: Natural history, educational psychology, environment, recreation.

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Illustrations by Harold W. Street

PREFACE

Interpretation is in large part education, since it attempts to convey information, concepts, and principles while creating attitude changes and such emotional states as wonder, delight, and appreciation. Although interpreters might profit greatly by formal training in the principles and techniques of teaching, many have not had such training.

Some means of making the insights of educators available to interpreters seemed essential. Therefore, the Environmental Interpretation Research Project arranged for F. David Boulanger and John P. Smith to write this booklet.

Although the authors draw heavily upon classroom approaches, most interpreters should profit from the attention given to realistic objectives and known techniques for stimulating learners. The authors outline the major principles, methods, and techniques developed by educators and provide a bibliography for those who wish added sources of information.

J. ALAN WAGAR, Project Leader
Environmental Interpretation Research
Pacific Northwest Forest and Range
Experiment Station

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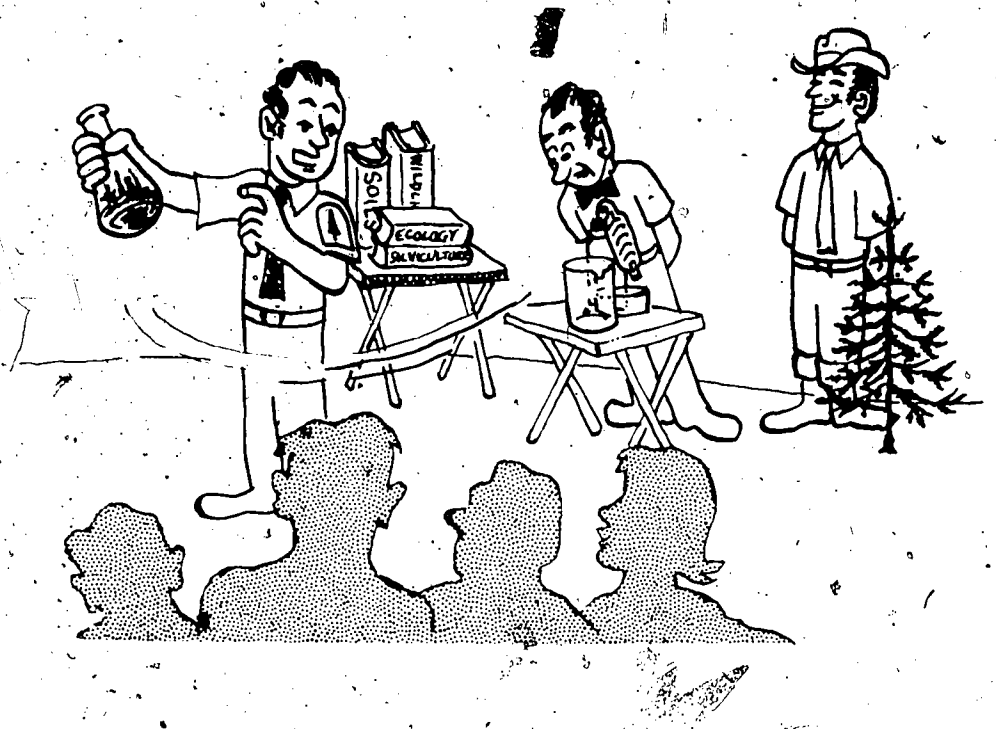
INTRODUCTION

Your role as an interpreter of natural and cultural resources is increasingly important now that more and more people are trying to understand the dynamics, protection, and management of the environment on which we all depend. As an interpreter, you are a vital link between your visitors and the scientific and historic insights that can enrich their experiences when presented in enjoyable and understandable terms.



Like most interpreters, you probably are seeking better ways to reach your visitors but have not had formal training in teaching. To give you greater insight into teaching methods, this booklet summarizes basic educational principles and techniques that can be useful for interpretation. A checklist is provided on page 22 to help in your planning of presentations. References are given in the bibliography to help you find additional information.

The major premises of this booklet are:

Teaching is an art as well as a skill. This booklet emphasizes principles and skills.

Teaching involves a relationship between teacher and learner that goes far beyond the transfer of knowledge and includes such factors as mutual respect and understanding.

Active involvement of the learner is central to good teaching.

Your audience may be free to leave but will be motivated to stay and learn if the process is enjoyable.

Although entertainment is not a primary goal of teaching, ***good teaching can be entertaining***.

Some important terms are used in this booklet as follows:

A ***CONCEPT*** is a set of characteristics common to a class of objects or events. Concepts are identified by assigned names. For example, *erosion, habitat, clearcutting* and *ecosystem* are all concepts.

PRINCIPLES are sequences of closely linked concepts or relations between concepts. An example is the statement: "Unrestricted erosion prevents new vegetation from rooting and growing." Nearly every word represents a concept.

KNOWLEDGE is a term that encompasses interrelated concepts and principles. Specific concepts and principles are usually organized around some broad concept such as forestry.

PROBLEM SOLVING means the application of concepts and principles to achieve some goal. Problem solving indicates learning beyond the level of concepts and principles.

A ***SKILL*** is the capability resulting from the repeated exercise of some physical or mental operation.

LEARNING implies that a visitor can describe appropriate concepts and principles in his own words or can apply problem solving and skills in new situations.

SETTING YOUR DIRECTION

When planning a trip, you first select objectives such as where you want to go and what you intend to do. When preparing an interpretive presentation for visitors, you also must first select objectives. With your objectives clearly defined, you can then assemble appropriate materials, outline content, and develop procedures to achieve your goals. ***In choosing objectives, then, consider audience characteristics and what you want to present and why.***

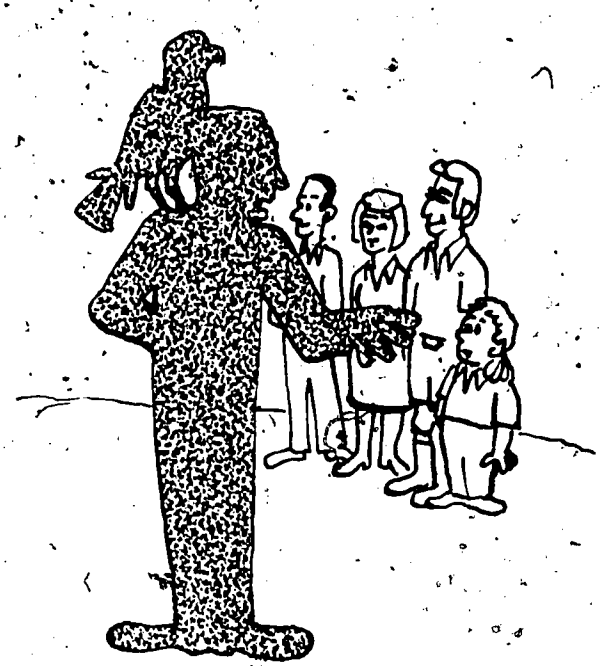
Audience Characteristics

Since effective teaching modifies the knowledge, attitudes, and skills of people, it is important to consider audience characteristics. What ages, educational backgrounds, occupations, and special interests are represented? Why are the people in the audience attending your presentation?

The more uniform the group, the easier to specify objectives. For example, molecular processes in trees might be right for visiting biology students, but probably too abstract a topic for 90 percent of a tourist audience. Since audience characteristics are often beyond your control, build enough flexibility into your objectives and plans to accommodate broad or even unexpected audience characteristics.

Deciding What To Present

Depending on the audience, you might emphasize concepts and principles, the research by which they were discovered and developed, or attitudes toward a topic. If your topic is bird life, for example, you might develop objectives around habitat and reproduction of local birds, methods for studying such concepts in the local environment, or why you enjoy studying birds and the feelings you have when watching bird behavior that few people ever see.



Write down as many objectives and points as necessary to make your intent clear. Consider the time available, your own strong points, the prior experience of the visitors, and what you want them to gain from the presentation. *Their gain* in ability is the measure of your success as an interpreter.

How much information should you present in the time available? As a rule it is better to limit concepts and principles and increase the number of concrete examples, visitor experiences, and opportunities for problem solving.

What are your strong points? Your own knowledge is important in your choice of objectives.

How does the topic relate to the day-to-day life of the visitors? Can you develop analogies that draw on things most of them experience in their daily lives? Are there controversial areas in which you might expect interest, questions, or challenges? Before plunging into controversy, consider what the audience might gain and whether the setting is appropriate.

Statements of objectives must define what your visitors should be able to do as a result of your efforts. In these statements, avoid words subject to a wide range of interpretation such as "to know," "to understand," or "to appreciate." If you have selected local marine life as the subject, a precisely stated objective could be: "The visitor should be able to describe, categorize, and compare local marine life according to feeding habits, reproduction methods, and typical habitats." This objective is stated clearly enough to aid you in selecting materials and outlining the presentation.

REACHING YOUR AUDIENCE

Although teaching or interpreting can range all the way from a well-defined interpreter-controlled situation to a broad dialog in which participants alternately teach and learn, the approach emphasized here is that which you control.

As an interpreter, you are a unique kind of teacher who seldom speaks to the same audience twice. Normally, you have only limited time with your visitors and seldom get well acquainted with them. On the other hand, you can polish your presentation with each new audience until you become very effective. These conditions usually limit your personal presentations to talks and discussions.

Talks

The talk or lecture is good for large audiences and for introducing or summarizing information gained from other sources. An introductory talk can tell your visitors what to expect in visiting the area or what to expect in subsequent talks. Such an introduction can set a positive tone for individual or group activities where understanding and insight can occur more easily. For visitors who have already been in the area or attended previous talks, you might plan another talk to summarize the concepts, principles, and insights gained.

POINTS ON PREPARING TALKS

Identify major concepts and principles to be learned. Use no more than four or five in a 1-hour talk and less in the more usual half-hour talk. Plan problem situations in which concepts and principles can be applied.

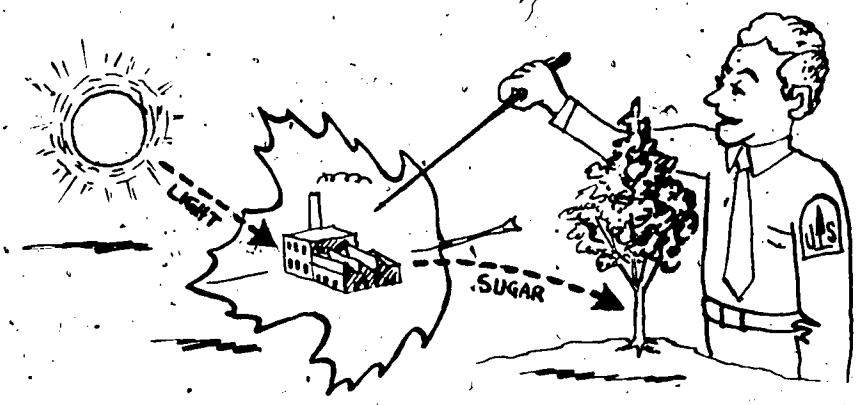
Choose and state objectives in terms of what the visitor should be able to do as a result of hearing your talk.

For each objective, decide what you will do and say to assure that your visitors will accomplish it.

Outline the talk on note cards or a sheet of paper. Your notes should include major topics and subtopics, key questions or problems for audience feedback, transitional statements, and cues for presenting specimens or visual aids.

Prepare an effective opening. For this you can use some of the "motivating and focusing" techniques explained in a later section.

Develop analogies and examples to illustrate difficult points. Your analogies should be taken from things within the experience of your audience. For instance, urban examples should be used in analogies for an audience of urban people. Be ready with alternative presentations in case audience feedback indicates puzzlement or misunderstanding.



Prepare a summary statement reinfocing major points in the talk. This statement could answer a question posed at the beginning or state another question to be left unanswered.

Rehearse your talk in private. If you plan to use teaching aids, practice handling them or operating them to avoid embarrassing breakdowns and delays during your talk. Indicate time allotments on your outline.

Use simple language, emphasizing major points by repetition.

Make your voice more interesting by varying pitch, loudness, and speed of delivery.

Prepare comfortable surroundings. With good ventilation, lighting, seating, and temperature, the audience can concentrate on your talk. Decide whether or not to allow smoking.

Other suggestions are given under "Specific Techniques."

Discussions

The discussion method works best with no more than 10 people. With a good leader who controls contributions to insure wide participation, up to 30 people can carry on a discussion. In larger groups, a vocal minority will do most of the talking.

Participants should have a sufficient information base to discuss a topic. Therefore a discussion might be especially suitable after a film, a field trip, or some other activity in which all members of the discussion group have participated.

In the discussion method we assume that each visitor has unique experiences valuable to the group and therefore should have the opportunity to contribute; that motivation for learning increases with participation; and that the individual will value and retain knowledge gained through personal interaction with others. The following suggestions should help you to plan and conduct discussions.

POINTS ON PREPARING DISCUSSIONS

Encourage participation and an informal atmosphere by arranging all participants facing each other in a circle. By joining the circle, you will emphasize your role as a participant. Be sure your visitors are comfortable.

Give an effective opening statement. You might summarize the preceding group experience, or you might open by a demonstration, by showing a provocative short film, by narrating a case study or anecdote, or by simply stating a question that requires thinking. In short, anything that creates doubt or question, or that offers the possibility of varied or conflicting responses, is a good way to begin.

Ask "higher order" questions that extend beyond simple memory and that require your audience to evaluate, infer, determine cause-effect relationships, and so forth. An example would be: "How have frequent fires affected the plants and animals in this forest?" Your questions should limit tendencies toward factual or rote learning by keeping the discussion at the concept, principle, and problem-solving level.

Don't answer your own questions. If you answer your own questions or give insufficient time for others to answer, you show that you are less interested in the group responding than in providing the right answer. Intervene too often and you may stifle discussion and discourage participation. Also, don't pass immediate judgment on each speaker's contribution.

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Be receptive to feedback. Listen to your visitors. Determine their level of understanding and use the information to guide your remarks or questions.

Be ready to guide, refocus, and summarize. Guiding means insuring that everyone has an opportunity to speak and that no one, especially yourself, dominates the discussion. Guiding also means stimulating the discussion when a lull occurs and asking clarifying questions when a participant's point is not clear.

If discussion digresses, refocus on the central topic. You can do this by restating the original question or by asking a related question. Such questions should be developed and written down before a discussion. This means you must anticipate the alternative paths a discussion might take.

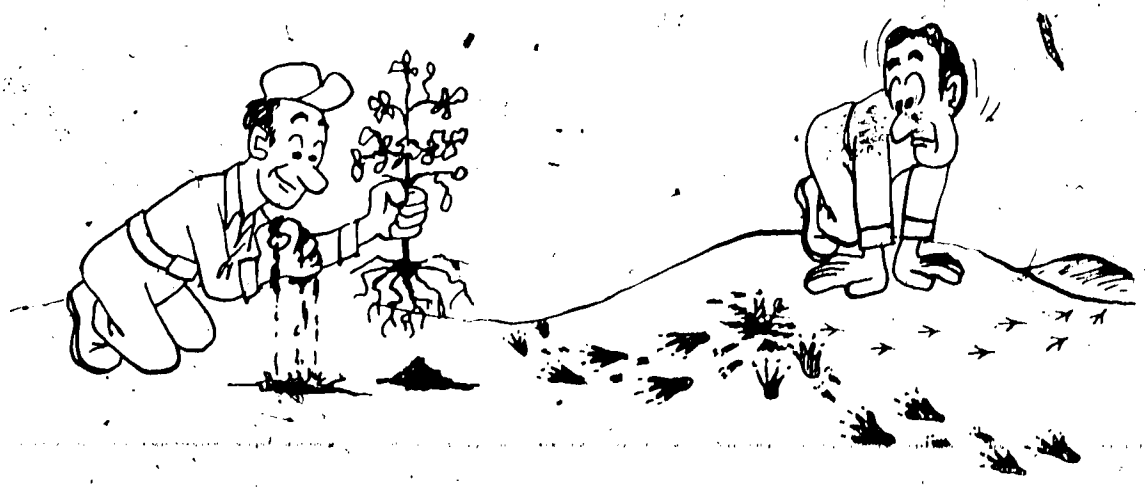
The summary of a discussion cannot be preplanned, since you do not know for sure where it will go or where it will end. You can record points to be summarized on a note pad. If the discussion has specific objectives, you may want to insure that each objective is summarized.

SPECIFIC TECHNIQUES

This section summarizes techniques useful for interpretation. You must decide when to apply particular techniques by using your own judgment and the principles discussed earlier.

Selecting and Organizing

One of the most creative aspects of interpetation is selecting and organizing experiences for your visitors. You must decide what kinds and sequences of experiences will best achieve your objectives.



One way to examine the content and sequence of a presentation is to ask, "What must the visitor already know to deal with this idea or experience?" For example, explanation of food chains may need to precede a discussion of DDT's effects on peregrine falcons. Other useful principles for selecting and sequencing content are:

Proceed from the simple to the complex (as from the one-celled to the many-celled organism);

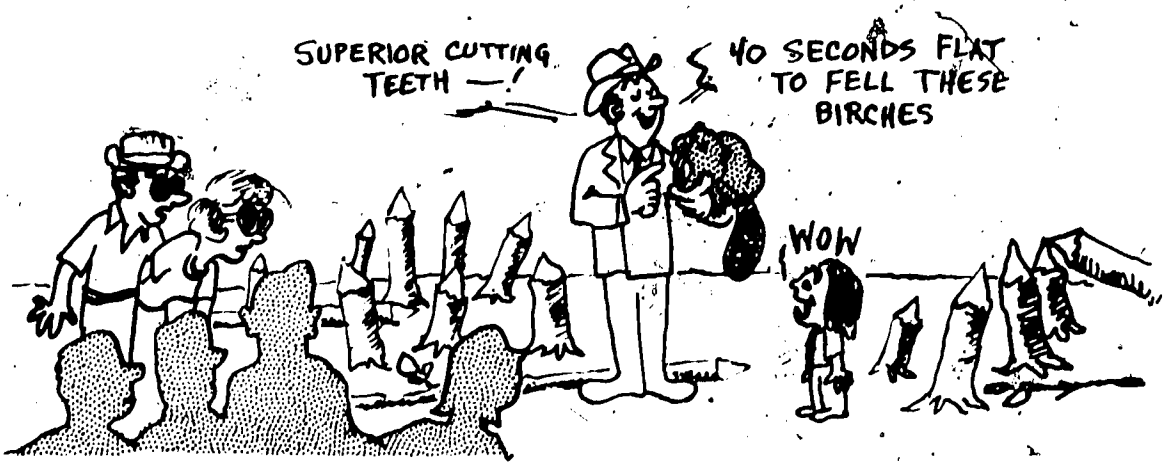
Proceed from the whole to the parts or vice versa (as from the ecological system to component processes or the reverse);

Present a chronological development (as in explaining the formation of geological structures);

Illustrate increasing breadth of application (as in showing the concept of balanced land usage, first for the forest, then gradually expanding it to include farms, suburbs, cities, and an entire region);

Progress from the familiar to the unfamiliar (since the urban dweller understands "home" he can readily understand "habitat");

Move from the seen to the unseen (from watching a beaver building a dam to describing the details of a beaver's anatomy that allow tree cutting and prolonged underwater excursions);



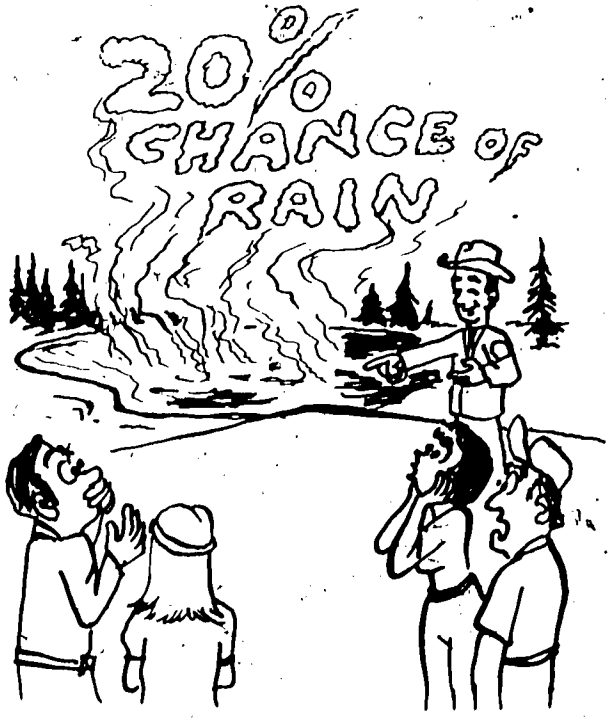
Simply let the visitor decide his own sequence of learning experiences, as is possible, for example, with the multifaceted display.

Motivating and Focusing

While you talk, your visitors have little chance to participate actively. They can become bored or distracted if you don't create a lively opening and then hold their attention. You can stimulate active listening with opening or transitional statements using some of these techniques:

Promise valuable knowledge or skills. Tell your visitors how this knowledge will be valuable to them by giving examples or by confronting them with situations in which they might realistically find themselves. For example ask, "What would you do if you came upon a mother bear with two cubs while hiking on a trail?" Such openings are useful when objectives involve practical knowledge and skills, as in topics about survival training, lifesaving, or forest management.

Arouse curiosity. Use an opening statement such as, "The local Ranger says he can predict tomorrow's weather by simply observing the mist on Basin Lake. Meteorologists were skeptical until they compared the factors influencing local weather with the factors influencing mist on the lake. In today's talk we will find out why Basin Lake is such a good weather indicator." Once the audience is curious about the relationship between the lake and the weather, it will be eager to share your knowledge.



Use several senses (sight, hearing, touch, smell, taste) relating such interesting objects as plants, rocks, soils, or animals and their habitats to your topic. If first-hand contact is not possible, provide pictures, illustrations, a demonstration, or a tour.

Ask provocative questions which your presentation will at least partially answer. For example: "How many salmon would you guess swim up this ladder each hour? Who can describe how a glacier is formed? What is the oxygen-carbon dioxide cycle and how is it evident in this pond?"

More ideas for provocative questions are given under "Questioning Techniques" below.

Identify discrepant events, that is, pieces of information that do not seem to fit logically into a story or explanation. For example, you could focus the attention of your audience with the following: "As more people use this area, the bear population,

rather than being scared away, increases." The explanation might be obvious to the forest-oriented person but not to the average visitor.

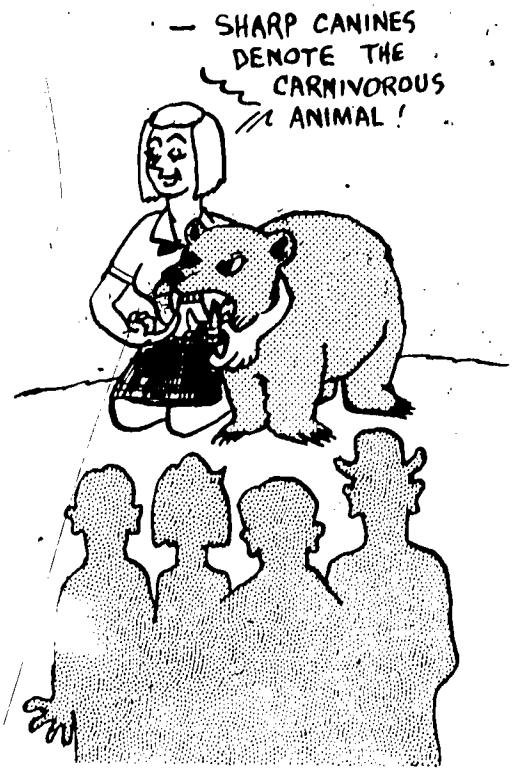
Use your visitors' natural desire for completeness. Give an incomplete illustration, film, picture, explanation, list, or example to create a desire to know the untold or unknown part. Your presentation should then fill in the facts, concepts, and principles needed for complete understanding.

You could create a symbolic "black box" to represent an unknown process. State the input and output. The presentation will center on what happens inside the "black box." For example, input: new power plant; output: diminished fish population.

The basic rule in motivational openings or transitions is to make the statements or problems factual and to pose related questions that can be answered from the talk to follow. If you can't think of an appropriate opening, you should make a straightforward, enthusiastic statement of what your visitors should be able to do as a result of the talk.

Using More Than Words

Words are never as effective as first-hand sensory experience. To bring your talk to life, use real specimens, demonstrations, visual aids, or on-site visits. When you talk to a group in a natural setting, choose your stopping places and position yourself so that the entire audience can hear you.



Getting Feedback

In informal settings and small groups, you can easily determine your visitor's comprehension and interest by listening and asking questions. Such "feedback" is more difficult to obtain in talks to large groups.

One way to get feedback is to stop after several minutes of talking and ask, "Any questions?" Or you can pose a problem whose solution requires the information you have just presented. For example, after talking about cloud formations, you might describe a set of climatic conditions and ask, "What kind of clouds would you expect under these conditions?"

The answers, or even the silence of your audience, provide valuable feedback that permits you to adjust the remainder of your talk. If the audience does not respond to your questions, you have one or more communication problems: the presentation may be too difficult; the question may be inappropriate (not answerable using the concepts and principles you have presented); or your visitors may feel timid in a large group or even alienated by your behavior.

You can repeat the question after giving more information. If you still get no response, you may have unconsciously created a barrier. To avoid this, be sure you don't put your audience in a defensive or inferior position, making people feel threatened or hostile toward you. Also, don't antagonize people by showing an air of detachment, by using unfamiliar words, or by talking down to them, as in emphasizing how obvious and easy a topic is to understand.

Subtle reactions also provide feedback. In order to observe and use this feedback, you must be so well prepared that you can divide your attention between talking and scanning the audience for expressions of interest, puzzlement, or boredom. This means referring only occasionally to notes and observing your listeners while displaying visual aids. Skill at interpreting nonverbal expressions and gestures will come with practice.

Questioning Techniques

An interpreter asks questions for a variety of reasons. You may want to determine what your visitors know about a subject, promote interest in a subject, obtain feedback on your teaching strategy, or merely provide a change of pace during a talk.

Once you decide what kind of response you want from your visitors, you can guide their thoughts by skillful questioning.

MEMORY QUESTIONS

Memory questions are basically of two kinds. Factual questions ask for recall of specific memorized information or experience. They often begin with *who*, *what*, or *where*. For example, "What is soil erosion? Where have you observed it?"

Descriptive questions are more complicated and usually require longer answers, but they are still answerable from memory or sensory experience. For example, "Can you describe the process of soil erosion?"

PROBING QUESTIONS

Probing questions ask the visitor to analyze, expand, or clarify his response to a preceding question. Probing questions may:

1. ***Seek clarification*** as by asking, "What exactly do you mean? Could you elaborate on that point?"

2. ***Increase critical awareness*** by asking a person to justify his response. For example, "What are you assuming? What are your reasons for thinking that is so? How would an opponent of this view respond?"

3. ***Refocus the response.*** For example, "If this is true, what are the implications for . . . ? Can you relate this to . . . ?"

4. ***Prompt your visitor*** by giving him a hint to help him answer a question.

HIGHER ORDER QUESTIONS

Higher order questions cannot be answered merely from memory or experience. They ask the learner to generalize, to relate facts, to compare and contrast concepts or principles, to make inferences, or to perceive causes and effects. Higher order questions ask the learner to discover principles, not just define them; to use ideas rather than just remember them. They are particularly appropriate when your objectives involve concepts, principles, and problem solving.

Imaginative use of higher order questions can enliven an otherwise dull presentation. Decide what kind of thinking you want to stimulate and select the most suitable kind of question.

You can use higher order questions to ask for:

1. ***Evaluations.*** An evaluation question requests judgment, value, or choice. It may or may not include a statement of standards. A standard is included in this example: "In terms of recreational value, which of these three areas do you believe should be preserved in its natural state? Why?" Without the reference to recreational value, your visitors could assume their own standards for judging.

2. ***Inferences.*** When you provide certain information and ask the visitor to reason his way to a conclusion, you ask for inferences. For example, deductive reasoning would be required by the following: "Precipitation occurs when moisture-laden air rises to high altitudes. Relate this principle to our local climate." A question requiring an inductive inference would be: "We have found soil acidity at several points around the camp. What might we conclude about the condition of the soil in this area?"

3. ***Comparisons.*** In a comparison question you ask whether ideas or objects are similar, dissimilar, unrelated, or contradictory. The simplest kind asks in what way two or more objects are identical, as: "In what way is man like the ape?" Another tests the degree of similarity between ideas or objects: "What are the similarities and differences between dog tracks and fox tracks?" A third asks a person to relate sets of ideas on similar points: "Compare the life style of the bumblebee with that of the ant."

4. ***Application of concepts and principles.*** You can test your visitor's understanding of a concept or principle by asking him to use it in a new context. For example, "Can you apply this principle of ecological succession to your own garden plot?"

5. ***Problem solving.*** Problem-solving questions require the use of previous knowledge to solve a new problem and often demand much creativity. For example, "Given this information, how would you solve the food shortage problem?"

6. ***Cause-and-effect relationships.*** These questions ask a person to find a link that connects one event or object with another. For example, "How is the disappearance of this animal related to man's entry into this area?"

DIVERGENT QUESTIONS

Divergent questions are open-ended and require your visitors to explore the unknown, to think creatively. The process may be more uncomfortable for you than for your visitors, because you cannot classify the answers as right or wrong. You and your visitors must free yourselves to explore new ideas and possibilities. An example of a divergent question would be: "How might you use this plant to help you survive in the wilderness?"

GENERAL RULES OF QUESTIONING

These general rules of questioning apply to all categories of questions:

1. Distribute questions widely among your visitors so that many are encouraged to speak. If necessary, redirect a question to several visitors to bring them into the discussion.

2. Balance the kinds of questions asked by using factual, probing, higher order, and divergent questions as appropriate.

3. Encourage visitors to give detailed responses. Ask questions that require such answers and follow with probing techniques.

4. Allow ample time to think over a question.

5. Ask clear and coherent questions. Frequent rephrasing should be unnecessary.

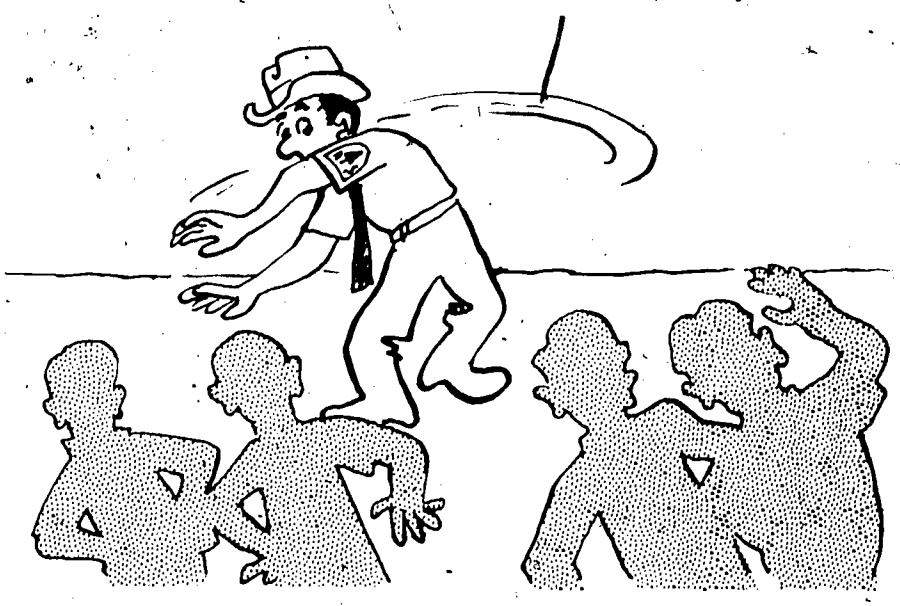
6. Encourage your visitors to confer with each other as well as with yourself.

7. Ask questions that require more than a "yes" or "no" answer.

Attention-Holding Techniques

Your visitors' attention may wander during a talk or lecture. Some techniques for holding their attention are suggested here. Try to develop techniques that fit your personal style.

GESTURES: Hand, head, and body movements are important in communication. Your verbal message is more effective when combined with gestures and facial expressions.



FOCUSING: You can focus your visitors' attention on significant objects, ideas, or events by gestures combined with statements. You might move toward an important object or diagram or point to it and say, "This feature is really important!" or "Look carefully at this diagram."

PAUSES: A deliberate pause during your presentation can be an effective attention-getter. Your audience will strain for cues alerting them to your next statement. Also, moments of silence break the presentation into more easily absorbed units.

SHIFTING SENSORY CHANNELS: Your presentation will be more vivid if it appeals to many senses. Use visual aids such as displays, film, or a blackboard. Or you can ask your visitors to handle such specimens as a rock or a live snake.

MOVEMENT: Allow your visitors a refreshing change in vision and hearing by changing your location. Requiring your listeners to adjust their vision and hearing to your movements helps maintain a high level of attention.

Use of Silence

Silence has subtle effects that can be used to advantage. Silence after an introductory statement suggests that the statement is important and has stimulated your audience to think about it. Silence after a question from a visitor indicates that you are considering the question and that the rest of the audience should do the same. It is courteous to be silent for a few moments after asking an audience or individual a question, thus allowing time to think of an answer.

Use of Nonverbal Cues

Nonverbal communication occurs whenever you address a group or an individual. Moods and attitudes such as pleasure, interest, puzzlement, weariness, and tension are communicated by nonverbal signals and may support or oppose your objectives. Here are some common examples:

1. *FACIAL EXPRESSIONS:* Surprise, approval, doubt, anger, and a wide range of other messages are sent automatically by your facial expression. A very powerful channel of communication, facial expressions are instantly understood by your audience.

2. *HEAD MOVEMENTS*: Nodding, a shake of the head, or a cocked ear all communicate standard meanings to your audience.

3. *GESTURES*: Besides holding attention, gestures can be used to augment your verbal message. Commonly recognized body motions can say, "Are there any questions?" or "Continue" or "I really don't know."

Use of Examples, Analogies, and Metaphors

You can use examples in two ways. One way is to state an idea or principle first and then illustrate it with clarifying examples. The other way is to give examples first and ask your audience to infer the general principle. In either case, you might give examples by using visual aids or by using analogies or metaphors.

An analogy emphasizes similarities between an object or event that is already understood and one that is not. For example: "An artesian well is like a burst water main." Be careful not to stretch analogies too far. Point out their limitations and imperfections.

A metaphor is a word or phrase applied to something to which it is not literally applicable. For example: "That animal is a bag of bones."

The following are guidelines for effective use of examples:

1. ***Start with the simplest examples*** and work toward complex ones. If you begin with complex examples, your audience may become confused by excess information and miss the point.

2. ***Use examples from the experience and knowledge of your audience.***

3. ***After presenting some examples, offer an irrelevant example.*** Recognizing negative instances is important in understanding a concept.

4. ***Don't assume the more examples you give the better.*** New examples should provide new information about the concept.

5. ***Be sure the relationship between the example and the idea is understood.***

6. ***Ask your audience for additional examples.*** This way you can make sure they understand the concept.

Use of Reinforcement

Whenever you respond to a statement or question, you may feed back to your visitors' approval (positive reinforcement), a neutral acceptance, or disapproval (negative reinforcement). With many people, especially children, your response can encourage or discourage the repetition of an act. Be conscious of the power of reinforcement whenever you seek contributions from your visitors.

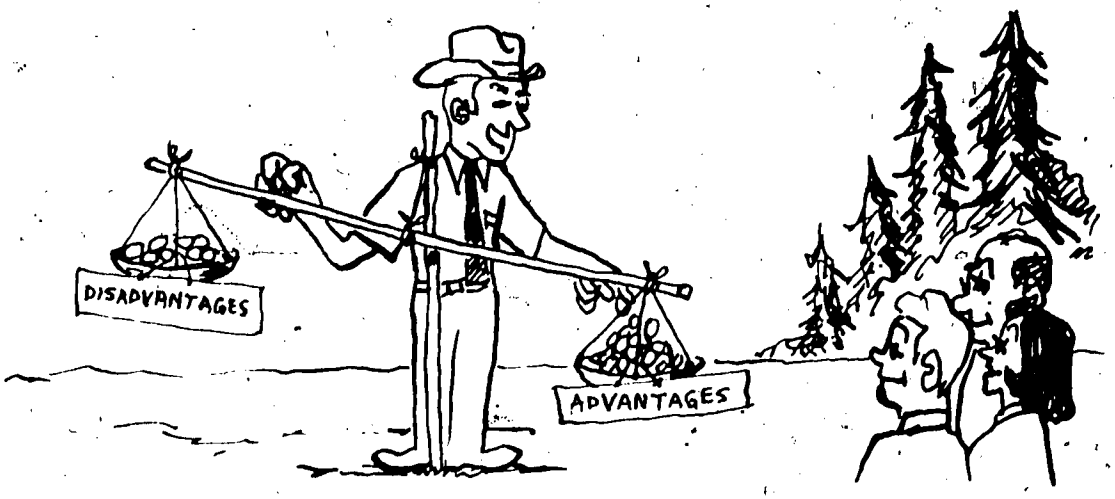
Examples of positive verbal reinforcement are terms like "good" or "excellent." Some positive nonverbal reinforcers are a nod of the head, a smile, sustained eye contact, and movement toward the speaker.

Handling Attitudes and Values

Attitudes and values depend in part on factual information, but often they are transferred in subtle ways. Your enthusiasm for the subject, your sensitivity to audience reactions and questions, and your care in preparing your presentation will all influence your visitors' attitudes toward the subject.

Remember, significant changes in attitudes and values rarely occur during a short presentation. However, if you are comfortable with your audience, and if it is not too large for discussion, you may want to discuss attitudes and values directly. Before doing this make sure you are not rigid in your own attitudes and examine the assumptions on which your attitudes toward the subject are based.

One way to make attitudes and values visible in a nonthreatening way is to quote two opposite views on a controversial or value-laden issue and describe opposing viewpoints. These views can be drawn at the ends of a line representing a spectrum of viewpoints.



Then invite individuals to express their own positions on the issue. You can remain entirely neutral during this process and stimulate discussion by asking such leading questions as:

"Under what circumstances do people holding this view begin thinking this way? Were they influenced by social contacts, news media, institutions, or anything else?"

"What assumptions about the place of man in the natural environment are implied in this viewpoint?"

"What might be the short and long range consequences if this viewpoint were to dominate forest management policy?"

"What other values should be considered when taking a position in this controversial area?"

When leading this kind of discussion, you should be open to diverse points of view, either remaining neutral yourself or advocating a moderate position. If you alienate half of the group by taking a strong position, the discussion may not be worth the loss of group confidence. Of course you can take a strong position as an obvious "devil's advocate," thereby forcing people to rethink their positions. However, you must be careful not to embarrass or antagonize your visitors by sarcasm or irony.

A Final Example

The following example suggests some general guidelines for planning a presentation.

Suppose your objectives are that your visitors will be able to identify the grasses, shrubs, and trees that compose the stages of forest regrowth following a forest fire, to describe the influence these stages exert on wildlife in terms of food and habitat, and to describe how modern fire-suppression efforts have altered the natural "fire-ecology" cycle in the past 30 years. Also you want to create an attitude that "all fires aren't bad," and that experimentation with controlled burning might hold potential benefits for both man and the environment. The general plan of the presentation might be:

1. Display specimens of the small plants and grasses, shrubs, and trees in order of their succession following a fire. Attach question-asking labels or signs to the specimens.

2. Show live specimens or illustrations of local forest wildlife, asking questions about the habitat and food preferred by each.

3. Show slides or a movie emphasizing the dependence of most wildlife on open areas and the scarcity of wildlife in old mature forests.

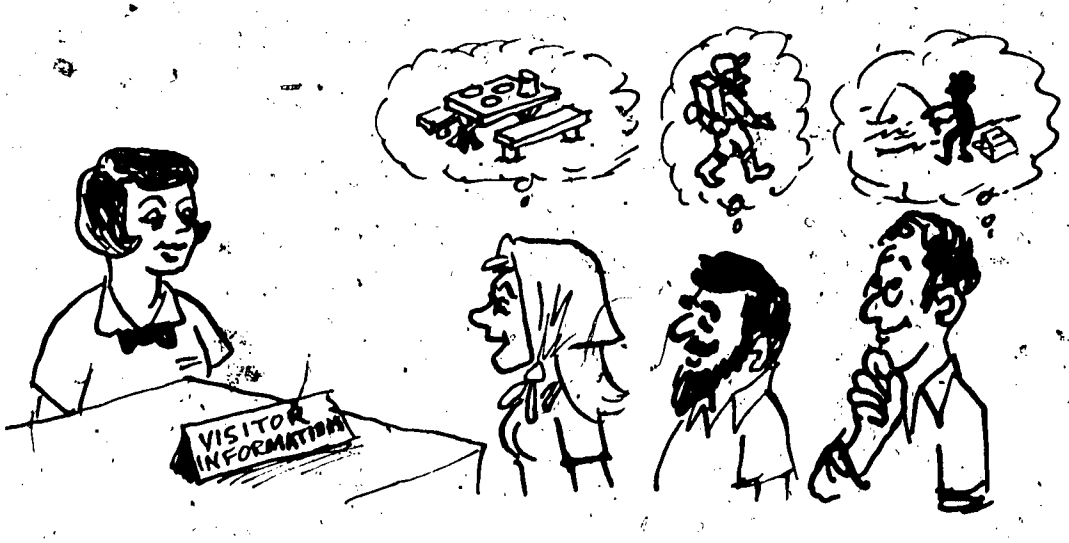
4. Describe how the huge wildfires of the past are now prevented by efficient suppression methods and how the game ranges that were created by those fires are being lost under a canopy of trees.

5. Conduct a brief walk to an observation point or provide directions to sites where different stages of forest regrowth are visible.

6. Throughout the presentation, ask questions and pose problems. To leave your visitors with a sense of wonder, the presentation should end on an authentic open-ended question which to your best knowledge has not been answered by anyone.

Several principles of learning are evident in this example:

1. *Individuals differ as much in their interests and styles of learning as they do in their personalities.* Diverse appeal is built into this presentation through the use of



examples, illustrated descriptions, visitor activities, and the use of differing media. Also the visitors can associate the content of each stage of the presentation with the medium used to present it, thus aiding memory.

2. *Repetition of concepts and principles via different media helps the learner assimilate new knowledge.* In this case, each stage of plant succession, its characteristics, and its value as a wildlife habitat might be encountered two or three times in different contexts.

3. *Learning is enhanced if the process begins with concrete examples and involves as many senses as possible.* Seeing and touching the specimens are excellent ways to begin.

4. *People are stimulated to think when they encounter an obstacle or challenge.* Concepts and principles learned in a problem-solving situation are better retained than if simply memorized. Also, by posing problems or higher order questions, you can determine whether concepts and principles were learned. Your success at teaching can be measured simply by observing how well your visitors reason their way to conclusions.

5. *People like to participate in the choice and planning of learning experiences.* Additional displays or printed material expanding the central concepts and principles could be included to allow more individual choice.

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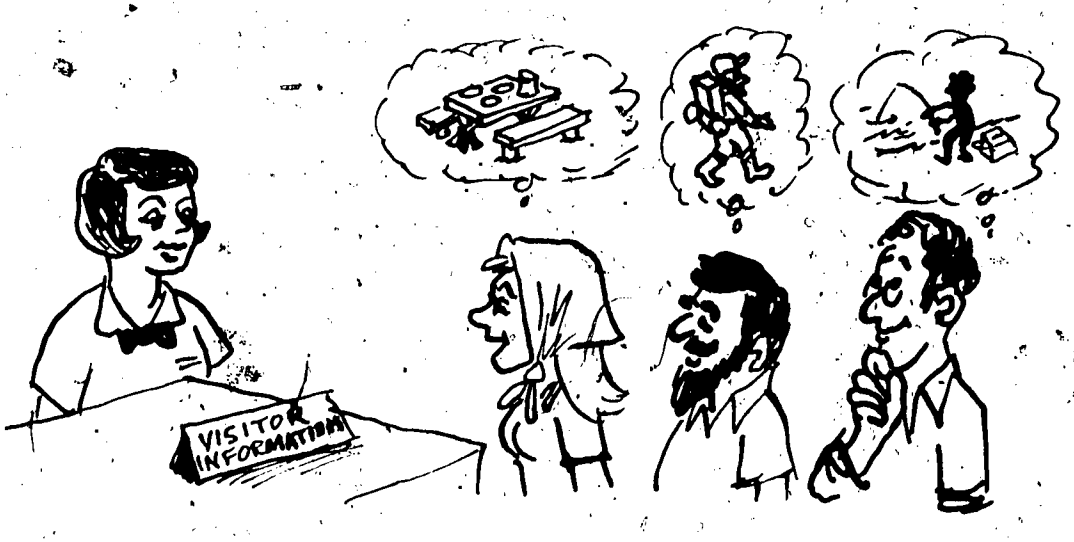

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CHECKLIST

The following checklist should help you prepare your presentation. Page numbers refer to the text of this booklet.

	Page
1. Choose and state your objectives precisely	3-4
2. Select the type of learning experience (talk, discussion, activity) best suited to your objectives and audience characteristics	5-9
3. If you plan to give a talk:	5-6
A. Outline your talk. Plan its content and sequence to insure that your visitors will fulfill each objective. In the process:	
(a) Prepare an effective opening	7, 9-11
(b) Plan to get feedback	8, 11-12
(c) Plan some questions	12-16
(d) Develop examples	6, 18-19
(e) Prepare a summary statement	6

B. Rehearse your talk. Page
(a) Practice attention-holding techniques and nonverbal cues 16-17
(b) Practice use of visual aids or demonstrations 6, 10-11
(c) Plan for the comfort of your audience 6

4. If you plan to lead a discussion: 6-8
A. Plan the discussion, and in the process:
(a) Prepare a good opening statement 7, 9-11
(b) Prepare higher order and divergent questions 7, 12-16
(c) Anticipate the directions the discussion might take, and how you will refocus on the central topic 8
(d) Consider whether to discuss attitudes and values 19-20
B. Conduct the discussion, and in the process:
(a) Provide comfortable, informal atmosphere 7
(b) Be receptive to feedback 8, 11-12
(c) Ask probing questions 13
(d) Summarize the discussion 8

BIBLIOGRAPHY

Anderson, Richard C., Gerald Faust, Marianne Roderisk, and others
1969. Current research on instruction. 396 p. Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Cooper, James M.; and Thomas Stroud
1968. The Stanford summer micro-teaching clinic, 1966. *In* Micro-teaching: a description. Stanford, Calif.: Stanford University Press.

Gage, N. L. (ed.)
1963. Handbook of research on teaching. 1218 p. Chicago: Rand McNally and Company.

Gagne, Robert M.
1965. The conditions of learning. 308 p. New York: Holt, Rhinehart, and Winston, Inc.

Ginsburg, Herbert, and Sylvia Opper
1969. Piaget's theory of intellectual development. 237 p. Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Hyman, Ronald T.
1970. Ways of teaching. 290 p. New York: J. B. Lippincott Company.

Knowles, Malcolm
1970. The modern practice of adult education. 384 p. New York: Association Press.

Kuslan, Louis, and A. Harris Stone
1968. Teaching children science: an inquiry approach. 464 p. Belmont, Calif.: Wadsworth Publishing Company, Inc.

Mager, Robert F.
1962. Preparing instructional objectives. 60 p. Belmont, Calif.: Fearon Publishers.

Raths, Louis E., Merril Harmin, and Sidney Simon
1966. Values and teaching. 275 p. Columbus, Ohio: Charles E. Merrill Publishing Company.

Rogers, Carl
1969. Freedom to learn. 358 p. Columbus, Ohio: Charles E. Merrill Publishing Company.

Rose, Homer C.
1961. The instructor and his job. 280 p. Chicago: American Technical Society.

Suchman, J. Richard
1966. Developing inquiry: physical science. Chicago: Science Research Associates.

Swan, Malcolm D. (ed.)
1970. Tips and tricks in outdoor education. 184 p. Danville, Ill.: The Interstate Printers and Publishers, Inc.

Tyler, Ralph
1969. Basic principles of curriculum and instruction. 128 p. Chicago: The University of Chicago Press.

USDA Forest Service
1968. Conservation tools for educators. 72 p. Pac. Northwest Reg., Portland, Oreg.

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Within this overall mission, the Station conducts and stimulates research to facilitate and to accelerate progress toward the following goals:

1. Providing safe and efficient technology for inventory, protection, and use of resources.
2. Development and evaluation of alternative methods and levels of resource management.
3. Achievement of optimum sustained resource productivity consistent with maintaining a high quality forest environment.

The area of research encompasses Oregon, Washington, Alaska, and, in some cases, California, Hawaii, the Western States, and the Nation. Results of the research will be made available promptly. Project headquarters are at:

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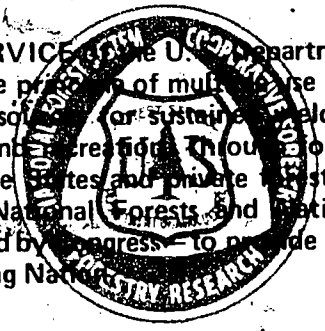

The FOREST SERVICE of the U.S. Department of Agriculture is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives — as directed by Congress — to provide increasingly greater service to a growing Nation.