THE DEVELOPMENT AND EVALUATION OF A GRADE 7 INSTRUCTIONAL PACKAGE ENTITLED "SOME COMMON WILDFLOWERS OF NEWFOUNDLAND"

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BY

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Abstract

The project, Some Common Wildflowers of Newfoundland, involves a report on the development of a media package on the identification of Newfoundland wildflowers. The package includes slides on fifty species of wildflowers, fifty student cards to help with the identification of the flowers, and a teacher booklet containing information about each wildflower. The media package is designed to be used with the Searching for Structure science program in junior high school.

The need for the package was established through informal and formal means. Wildflowers were photographed, student identification cards were designed, and information on each wildflower was obtained. These components were put together in an instructional package for presentation to students. Before the package was presented it was examined by experts, content specialists, learning specialists, and a media specialist, for their evaluation.

The media package was tested at three different schools throughout the province of Newfoundland and Labrador. Data from the testing process revealed that the package was well received and helped students identify wildflowers. Using this as evidence of the value of the package it was decided to make it available to schools of Newfoundland and Labrador.

Acknowledgements

Many people gave assistance toward the completion of this project, Some Common Wildflowers of Newfoundland. I express my gratitude to Anne Power, Barry LeDrew, Clyde Watton, Peter Baird, all teachers and students who completed questionnaires and worksheets, and the staff of the Division of Learning Resources at Memorial University. In addition, I thank Gaileen Marsh and Anne Bardou for their help and Beverley Freake, Bill Bennett and Tom Mercer, who tested the package and gave constructive criticism. I thank especially my supervisors, Dr. Fizzard and Dr. Braffet, most especially Dr. Braffet, who saw me through all the rough spots. I extend a very special thank you to Celia Philpott for her typing and assistance. I also thank my mother and father for their encouragement.

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CHAPTER 1

INTRODUCTION

Plants are the producers of our world. They supply animals with food either directly or indirectly. Without plants and their valuable process of photosynthesis, most living things would cease to exist because they would be cut off from the energy and nutrients that plants provide.

The curriculum for Newfoundland schools has little emphasis on the identification and appreciation of common plants found outside our communities. Wildflowers, which are so much in evidence around us in the summer time, are probably viewed in the same manner as plants in general. Reed (1925) wrote that "a plant is a wonderful organism, yet how few of us realize it as we casually glance at the flowers growing by the wayside" (p.7). Hylander (1954) expressed a similar view: "How few of us fully appreciate these flowers, recognize their individual characteristics, call them by name, or experience the satisfaction of searching out rare specimens!" (p.v).

At various times throughout the year the countryside is covered with wildflowers. In the eastern part of the United States there are millions of them, which make up thousands of distinctive species (Hylander, 1954). There are many species of wildflowers in the province of Newfoundland. Although many of these flowers can be found in areas throughout North America, there are some distinctive varities here

(Lady Rockley, 1935). It is this researcher's belief that the students of the province do not appreciate the variety of wildflowers that are around us. In the experience of this researcher, most of them cannot identify the common wildflowers that grow in such profusion in the fields and along the highways.

The intent of this project is to provide students with the necessary skills to identify common local wildflowers and to provide them with information which should heighten appreciation of their beauty and importance. A greater recognition of wildflowers should lead to a greater appreciation and respect for the outside environment (Ferguson, 1976). It is to be hoped that a project of this type will make students more alert "so they would not carelessly step on some half-hidden bloom, pass some marvel of creation with an unseeing eye, or gather great armfuls of gorgeous color that would be wilted in the next half hour" (Linn, 1978, p.vii). Linn (1978) also pointed out that no one should miss the thrill of recognizing wildflowers by name. Today's curriculum is placing increasing emphasis on environmental education, and this project is designed to help provide materials to meet the needs of this aspect of the curriculum.

This project, Some Common Wildflowers of Newfoundland, is intended to be valuable to many parts of the school curriculum. Science teachers in particular can use a unit on the wildflowers. Biology and Environmental Science

students should find field trips more interesting if they learn to recognize the common wildflowers. The Searching for Structure science program in the junior high school, particularly the ecology section in Grade 7, has activities in which field trips are taken to identify plants. A unit on wildflowers can help in this identification. Some parts of the Stem Science program in the elementary grades deal with the study of flowers. English teachers can integrate the unit into the literature program by using a selection of poems on wildflowers, which can be studied as a unit, and can be expanded to include field trips on the wildflowers of Newfoundland.

Social studies teachers, when studying conservation, can emphasize the preservation of wildflowers. They can arrange field trips in which students can learn to recognize some common Newfoundland wildflowers, which can lead to greater appreciation and conservation.

A project of this type need not be restricted to the school curriculum. There are many youth groups in the province, some of which include the outdoors among their activities. A special outing on wildflowers should be interesting and educational.

The opportunities for a project of this type to be integrated into the school curriculum and into the activities of special groups are only restricted by the user's imagination. A project on wildflower identification can add a greater degree of interest to any science program in

particular and to many areas of the school curriculum in general.

Most schools in Newfoundland are either in or very near to rural environments that provide access to the many wildflowers and plant life found in the province. In many areas of North America schools are surrounded by steel and concrete, a situation which makes field study of wildflowers or any other part of the natural environment difficult. Since human activity is destroying much of the natural landscape throughout North America, many wildflowers are disappearing because of land clearing, and indiscriminate and thoughtless destruction (Bryan, 1978). It is particularly important that young learners develop an awareness and concern for the preservation of the natural environment.

CHAPTER 2

NEEDS ASSESSMENT

Statement of Needs

The evidence of personal experience, dialogue with colleagues teaching science and other subjects in junior and senior high school, and interviews with students indicated that there was a need for a unit of instruction which teaches the identification of Newfoundland wildflowers. In order to establish the existence of an actual need at a province-wide level, it was decided to conduct a formal assessment.

When the decision was made to examine this problem, a plan for development was given serious consideration. Instructional models that were developed by Thiagarajan, Semmel, & Semmel (1974), Coger (1975), Davis (1974), and Edwards (1977) were examined and studied in detail. The ideas presented by these writers were used to develop an instructional plan (see Figure 1), which was used as a guide in the development of this project. A plan of action based on the instructional model was adopted.

Because the results of an informal assessment indicated interest and a need for a unit which taught the identification of Newfoundland wildflowers, a decision to conduct a formal assessment was made. A questionnaire was distributed to a random sample of Grade 7 science teachers throughout the province. The questionnaires were distributed to twenty-eight Grade 7 science teachers. A copy of the questionnaire is included in Appendix A. The results of the

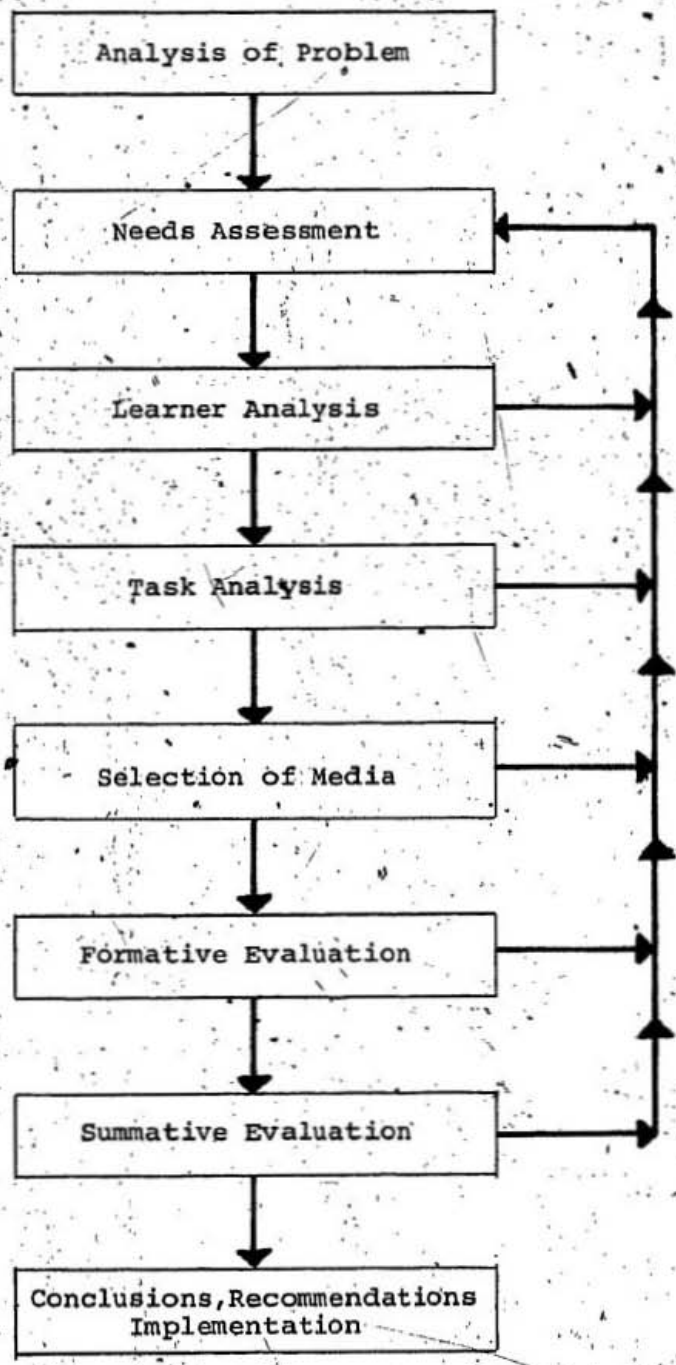

Figure 1. Instructional package development model.

survey are shown in Table 1.

Table 1. Results of needs assessment survey.

ITEM	YES	NO	TO SOME EXTENT
1. Presently using materials to identify Newfoundland wildflowers	8	11	-
2. Familiar with materials to identify Newfoundland wildflowers	7	12	-
3. Satisfied with materials if using them	0	7	7
4. Need for more materials	19	0	-

Nineteen teachers returned the questionnaires. Eleven of the nineteen replied that they were not using any materials to help identify Newfoundland wildflowers. Twelve of the nineteen were not familiar with any materials to help students identify Newfoundland wildflowers. Those respondents who answered "yes" to Item 2 listed materials with which the author of this project is familiar, and these materials are discussed later. No one expressed satisfaction with the materials that were being used. Comments indicated that some of these materials had poor illustrations, lacked color, or used inappropriate terminology for junior high school students. One hundred percent (nineteen out of nineteen) responded

that more materials on Newfoundland wildflowers would be valuable in teaching the Searching for Structure science program.

The results of the teacher survey indicated that Grade 7 science teachers felt a need for materials that would provide instruction for the identification of Newfoundland wildflowers. After examining the results, the decision to provide an instructional package to meet these needs was made.

Alternative Solutions

After a need has been identified, the instructional development process indicates that the need can be met by any of the following means:

1. Find materials already in existence that can be used without modification to meet the need.
2. If there are existing materials which meet part of the need but are for one reason or another unsatisfactory, establish whether these materials can be modified or adapted to satisfy the need.
3. Produce new materials if existing materials cannot be found or modified to suit the need.

Survey of Available Materials

With these alternatives in mind a search was conducted of various resource centres for materials relating to the wildflowers of Newfoundland. Some of the resource centres that were searched are listed:

Public Library (St. John's and Gander)

Memorial University Library

Centre for Newfoundland Studies (Memorial University)

Terra Nova National Park

Provincial Archives

Instructional Materials Division (Department of Education)

Provincial Parks Division

Department of Tourism

National Film Board

Centre for Audiovisual Education (Memorial University)

The Memorial University Botanical Garden at Oxen Pond

The criteria that were used when examining these materials were reading level, terminology, and quality of pictures.

The results of a search of the literature identified the following as relevant to the problem:

Ayre, A.M. Wild Flowers of Newfoundland. St. John's: A.M. Ayre, 1935.

A.M. Ayre's book contains 250 wildflowers of the province. The wildflowers presented in the book are photographs of the line drawings, which were reduced in size, of

actual paintings. The book is very detailed, probably too detailed for the junior high school level. The photographs are quite small. The print is also small, which makes the descriptions hard to read. Although the text is a good reference book for science teachers, it was not considered appropriate for the reasons already outlined. It was felt that the book's presentation and terminology were too difficult for Grade 7 students.

Marsh, G., & Burrows, R. Annotated Checklist of the Wildflowers of Terra Nova National Park. Bonavista Bay: Terra Nova National Park, 1981.

This is a brochure, which lists 250 wildflowers that are found in Terra Nova National Park. It contains very few pictures. The pictures that are included are line drawings which are not colored. The brochure gives the common or descriptive name, the botanical name, color, and habitat of each wildflower that is listed. The list is comprehensive and is good supplementary material for any science program; however, it would not provide much assistance for the identification of wildflowers for Grade 7 primarily because of its lack of suitable pictures.

Rockley, Lady A.M. Wildflowers of the Great Dominions of the British Empire. London: Macmillan & Co., Ltd., 1935.

Lady Rockley wrote a very comprehensive volume on wildflowers. It covers the variety of wildflowers that were

found throughout the British Empire of that time. There are only a few references to the wildflowers of Newfoundland. The text contains very little on Newfoundland wildflowers that would be useful to Grade 7 students.

Ryan, G. Some Peatland Flowers. St. John's: Provincial Parks Division, 1978.

Ryan's brochure contains sixteen line drawings of flowers fouhd on the province's peatlands. The descriptions of the flowers are well written and informative. It would be useful as supplementary material for the Grade 7 science program and every school should have several copies. However, it does not contain enough varieties of wildflowers for a province-wide study.

Ryan, G. Some Woodland Flowers. St. John's: Provincial Parks Division, 1978.

The brochure contains line drawings of thirteen wildflowers that are found in the wooded areas of the province. The wildflowers included are ones that bloom in spring and early summer. Again descriptions are well written and informative. The brochure would be a valuable addition to the junior high science program; however, the variety of wildflowers that it illustrates is too limited to meet province-wide needs. Even with the other brochure, Some Peatland Flowers, the variety is inadequate.

Smallwood, J.R. (Ed.). The Book of Newfoundland (Vol. 1). St. John's: Newfoundland Book Publisher's, Ltd., 1937.

This volume contains an article on Newfoundland Flowers by A.M. Ayre. The article describes various flowers that grow in Newfoundland. It describes garden scenes and not the wildflowers that one would expect to find in wilderness areas and as such was not considered adequate for this particular project.

Spring Wildflowers of Newfoundland. Ottawa: The National Film Board of Canada, 1964.

This material is a filmstrip that contains twenty-six wildflowers with subtitles. It is very well done and the photography is good. It should be shown to junior high school students, since it contains valuable information. However, adequate descriptions of the flowers are lacking.

Waghorne, Rev. A.C. A List of Wildflowers, Etc. in Newfoundland. St. John's: The Daily Colonist, July 4, 1887.

The list contains fifty wildflowers of the province. It includes the color, English name, flowering date, Newfoundland name, and habitat of each flower that is listed. It is a very interesting list. However, it is of little use to junior high school students, apart from its historical value, since it contains no pictures and has very little description of the wildflowers that are mentioned.

Rationale for Development of Materials

Most of the materials that were reviewed were good and could be used as supplementary materials. However, all materials were rejected because none suited the nature of the project. The materials either did not adequately deal with the wildflowers of Newfoundland or were judged inappropriate for junior high school students.

Modification of any of the materials examined is either very difficult or impossible. Major modifications, including rewriting and illustrating, would be necessary in order to adapt the materials to the needs of the students and teachers of the junior high science program.

Since all the materials that were reviewed had limitations that made them unacceptable, a decision was made to develop new materials on the identification of wildflowers of Newfoundland. It was decided to limit the project to the common middle and late summer wildflowers of the island of Newfoundland for these reasons:

1. The total number of flowering plants during a full year's growing season is too large to be encompassed in an individual study unit.

2. Physical and financial constraints made it virtually impossible to do any field work on the wildflowers in Labrador. Consequently, the project was restricted to the island portion of the province.

3. The National Film Board of Canada has produced an excellent filmstrip on the spring wildflowers of the province. Ryan's Some Woodland Flowers also deals with spring and early summer wildflowers. However, there is nothing similar to these on the middle and late summer wildflowers.

4. Children start back to school in early September and the ecology section in Grade 7 science is usually done early in the school year. It is at this time that students go on field trips and come into contact with wildflowers. In addition, the wildflowers that students saw on their summer hikes are still fresh in their minds and they may still be curious about the flowers' identities. Materials on the middle and late summer wildflowers are the most appropriate for this ecology unit.

Summary

A need for the development of materials on the identification of Newfoundland wildflowers was established through analysis of results of a survey of junior high school science teachers and through examination of existing available materials. From this research a decision was made to design and produce an original unit, Some Common Wildflowers of Newfoundland.

CHAPTER 3

LEARNER ANALYSIS

After the need has been established, the next step in instructional development is learner analysis. Cavert (1974) pointed out that when an instructional package is being developed, it is important that the learners for whom the package is being developed be identified. Coger (1975) stated that the ability and achievement level of the learners should be determined as accurately as possible. The statements of these authors underline the importance of knowing who the learners are when designing instructional materials. A knowledge of their particular characteristics should increase the effectiveness of the instructional package and improve its chances of success.

General Characteristics of the Learner

The learners for whom this package is intended are Newfoundland students who have reached the academic level of Grade 7. The students are both male and female and they vary in ability, interest, and background. It is assumed that the majority of them have little experience in identifying wildflowers. They are, however, probably quite familiar with the outdoors and wilderness areas, since many of them live in the rural areas of the province.

The author of this instructional package assumes that the students have easy access to wilderness areas. Given the rural nature of Newfoundland, many students probably attend schools that are located close to a variety of species of

wildflowers. It must be pointed out that the students of some schools, particularly those in urban areas, are not within easy access of wildflowers. In such cases, however, a field trip on wildflowers is not out of the question. A short ride can put any student in the province close enough to wildflowers for a worthwhile study.

Age

According to figures obtained from the Department of Education, Grade 7 students in the province range in age from 11 to 14 years. The average age is 12 years.

Reading Level

Information regarding the reading level of Grade 7 students in the province was not available from the Department of Education. However, the Department of Education has released information, which is based on the results of the Canadian Test of Basic Skills, on Grade 8 students. This information indicates that the province's Grade 8 students are slightly below national norms in reading. It is assumed that a similar situation applies to Grade 7 students.

Achievement Level

There are no overall results available to indicate the achievement level of the Grade 7 students throughout the province. The Canadian Test of Basic Skills' results are available from the Department of Education for Grade 6 and Grade 8. These indicate that Grade 6 and Grade 8 students in the province are below the national norms in achievement. It is assumed that a similar situation exists for Grade 7.

Attitude

There are no data available to indicate the attitude of the Grade 7 students in the province toward wildflower identification. However, it was assumed that the students have few negative attitudes toward a study of wildflowers. The researcher's experience in dealing with this age group has been that they generally approach field study projects in science with open minds and with an eagerness to learn about their environment.

Additional Characteristics

It was assumed that the students have no difficulty in identifying the various colors of the flowers. The majority of the students should have normal eyesight and should be able to distinguish color without difficulty. This aspect is important if the instructional package is to be successful. In addition, it is assumed that the students are familiar with the metric system and will have little difficulty in judging the heights of the flowers using this system. All measurements, which help to identify the flower, are given in the metric system.

Summary

The target learners for the Unit, Some Common Wildflowers of Newfoundland, were identified as having four characteristics. The learners are in Grade 7, have an average age of 12 years, have an achievement level of average or slightly below the Canadian norm, and have attributes generally positive toward learning about their environment.

CHAPTER 4

TASK ANALYSIS

When the learner analysis is completed the instructional developer normally examines the tasks that the instructional package requires from the learners. Davis (1974) wrote that "a task analysis involves a careful examination of the task description and/or a set of behavioral objectives to identify the knowledge and skills required to perform the task described" (p.15). Such an analysis is necessary in order to ensure that all aspects of the instructional package are relevant and suit the objectives that are identified. The task analysis forces the developer of the package to examine the components of the unit in minute detail. In this way aspects of the package that are trivial and redundant can be eliminated at an early stage and it can be ascertained that vital components are not overlooked. In completing the task analysis the main skill should be identified and this main skill should be divided into subskills (Thiagarajan, Semmel, & Semmel, 1974). The main skill of this unit, that of identification of Newfoundland wildflowers, is subdivided into six major skills, which in turn are further subdivided into minor subskills. The breakdown of this analysis is presented graphically in Figure 2.

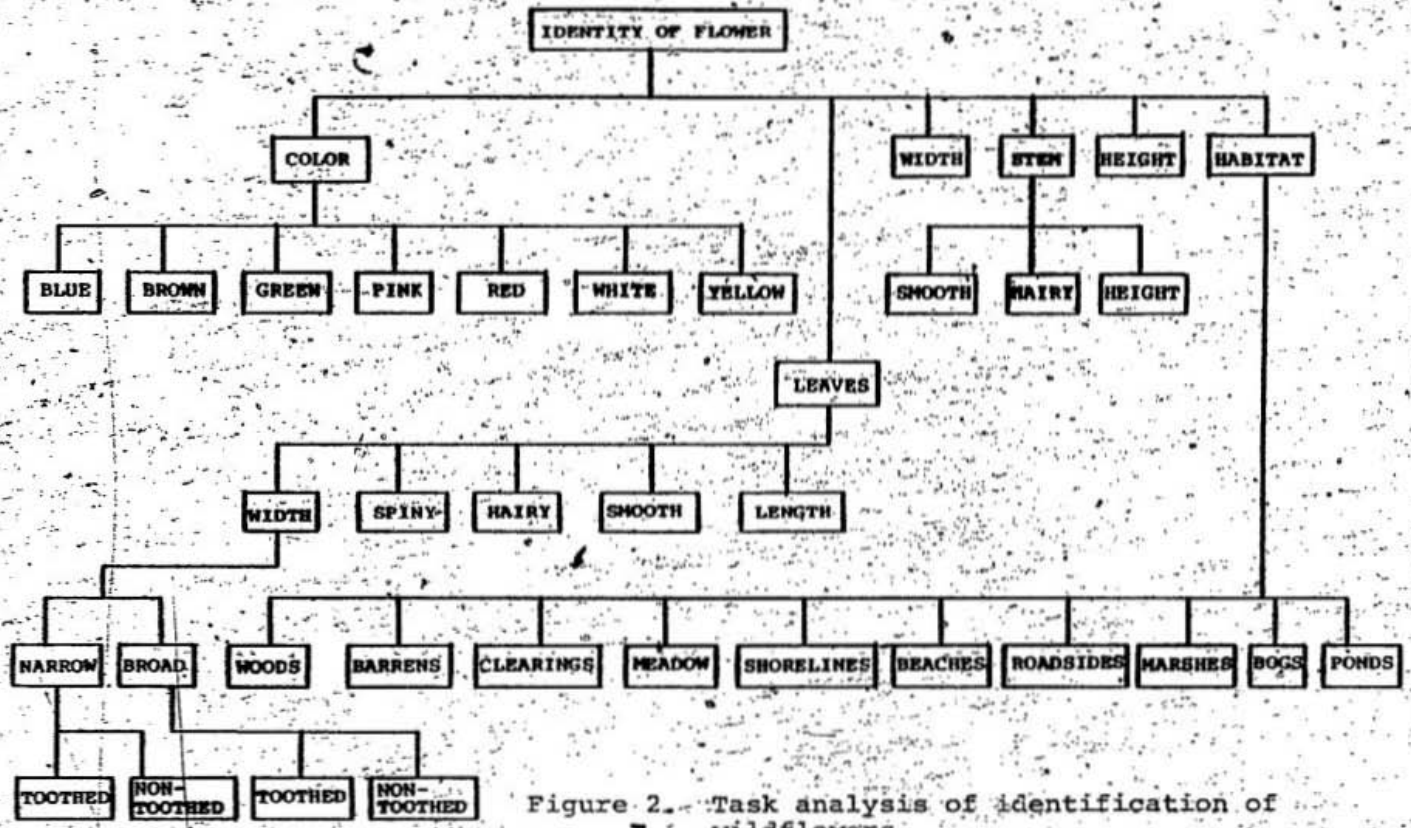

Figure 2. Task analysis of identification of wildflowers.

Assumptions Regarding Entry Behavior

In making decisions concerning the nature of the tasks that the learners were expected to perform in accomplishing the objectives of the unit, the following assumptions were made:

1. Teachers and students have a willingness to conduct field trips. (In order for the package to be a success it is necessary for a field trip to be taken to where wildflowers are in bloom. The flowers need to be studied where they grow if the identification of them is going to be lasting.)

2. Teachers and students will agree to a study of wildflowers.

3. Students are willing to complete some written exercises that are used to help determine whether learning has taken place.

4. Teachers are able and willing to follow most or all of the recommended procedures in order to gain the optimum effectiveness of the package.

Intended Learning Outcomes

Mager (1962) emphasized the importance of stating the objectives of any learning situation. He put forward three conditions that should be followed when writing learning objectives.

1. Describe the terminal behavior in some measurable way.

2. Describe the condition under which learning occurs.

3. State the level of performance.

Objectives provide direction and guidance to both teachers and students as well as informing them of the instructional package's expectations. Thiagarajan, Semmel, & Semmel (1974) pointed out that the objectives should be derived from the results of the task analysis.

Objectives can be divided into three categories, (1) cognitive domain, (2) affective domain, and (3) psychomotor domain (Coger, 1975). The cognitive domain involves knowledge, information, and other intellectual activities. The affective domain is centered around attitudes, feelings, appreciation, and values. The psychomotor domain involves performance and skill using the skeletal muscles. This instructional package attempts to involve each of these categories of objectives, although all domains cannot always be measured in precise terms.

Cognitive Domain

Once the students have seen the slides and have been taken on a field trip they will be able to:

1. Identify three wildflowers.

2. Write the name of each of the three wildflowers on a worksheet.

3. Provide two physical characteristics, color and height, of each wildflower.

4. Show evidence that they can match the wildflower with the correct identification card.

Affective Domain

After the students have seen the slides and completed the field trip they should be able to:

1. Express an appreciation of wildflowers to a greater degree than before studying them.

2. Demonstrate this appreciation in their writing of descriptions of the wildflowers.

Psychomotor Domain

After examining real wildflowers and studying pictures of them, students should be able to:

1. Physically locate three wildflowers in their natural habitat.

2. Draw an acceptable diagram of the three wildflowers that they have identified.

A worksheet was designed to reflect the objectives that are outlined above. It is included in Appendix B. The

intent of the worksheet is to give the students an opportunity to use psychomotor skills in drawing diagrams of the wildflowers, to give their impressions of the flowers in their descriptions, and to provide specific information, such as height and color, about each flower. It is expected that at least eighty percent of the students will attain a minimum score of eighty percent on the worksheet.

Summary

The task analysis identified the main skill and the subskills required for learners to complete this instructional unit. These skills, along with some assumptions arrived at through the needs assessment and learner analysis, were used to derive the behavioral objectives and instruments for measuring the intended learning outcomes.

CHAPTER 5

RATIONALE FOR CHOICE OF MEDIA

Introduction

After the specific tasks that are expected of the students were determined and the intended learning outcomes were outlined, a decision was made regarding the most appropriate media that would best present the instructional package. Relevant literature was reviewed to help make this decision.

Anderson (1976) wrote:

> Sight is by far the most powerful of the senses through which we perceive the world around us. Research supports this flat statement, although the relative contribution of sight in comparison to the other senses seems to vary according to numerous circumstances (p.37).

This statement seems to say that media should be selected that would emphasize the sense of sight as much as possible. The goal of this project, which involves the identification of wildflowers, emphasizes that the sense of sight is of primary importance. Media should be selected that would make maximum use of the sense of sight.

The importance of the sense of sight to this project meant that a variety of media was logically available for presenting the instructional package to the students. The package could use filmstrips, slides, film, videotape, or posters - to name the primary possibilities. The relative effectiveness of different media in instructional settings.

has not been unequivocably established. Coger (1975) pointed out that research has not yet determined "whether one medium is more effective than another in promoting learning" (p.62). In view of this, the decision regarding the selection of media for this instructional package required the consideration of a variety of factors. Two of these factors are that:

1. The media for the instructional package must be convenient and easy to use by both teachers and students.

2. The schools in the province must have the appropriate equipment to utilize the package.

These two factors were among others that were considered. Smith (1972) writes that there is "considerable evidence which seems to prove that the greater the sensory involvement, the more effective and permanent the learning" (p.9). This statement implies that this instructional package, or any instructional package, should endeavor to utilize as many of the senses as possible.

Survey of Attitudes toward Media

In the process of assessing the need for this project, the developer of the package sent twenty-eight questionnaires (see Appendix A) to a number of schools throughout the province. In this questionnaire it was proposed that the instructional package on the identification of wildflowers include slides of wildflowers, a chart describing the wildflowers for

student use, and a teacher's guide containing additional information on the wildflowers, which the teacher could make available to the students. The reaction to this proposal is given in Table 2.

Table 2. Response to proposed media.

ITEM	YES	NO
5. Suitability of media selected for the project	17	2

As mentioned earlier a total of nineteen questionnaires was returned. Seventeen of the nineteen responses indicated that the proposed media for the instructional package were acceptable. Two teachers disagreed with the proposed selection and suggested alternative media. Other teachers, while agreeing with the initial choice of media, offered alternative suggestions for media as well. It was suggested that samples of wildflowers, which might be enclosed in hard plastic, be included in the instructional package. It was also suggested that the student chart be large enough to be placed on the wall for all to see or that a number of smaller charts be supplied so that they could be passed around from student to student giving more students access to information on the wildflowers at a particular time. It was suggested that the materials be easy to duplicate since some schools might want

their own copies.

Survey of Availability of Media Equipment

The instructional package, as originally proposed, required no special equipment except the use of a standard 35 mm slide projector. None of the teachers responding to the needs assessment questionnaire indicated that obtaining equipment for presenting slides was a significant problem in their school systems. In the experience of this researcher, the majority of schools throughout the province have access to slide projectors. The Department of Education and other educational agencies have produced many instructional packages requiring slide projectors, and these are in use in the schools of Newfoundland. It was concluded that the presentation of standard 35 mm slides through projection was a viable method for most Newfoundland classroom situations.

Cost Considerations

Any producer of instructional materials must consider the cost of producing these materials. Materials should be produced that are reasonably inexpensive to reproduce and deliver both in terms of time and money. However, it must be kept in mind that these materials must obtain the desired educational results. If learning does not take place, the cost can be considered high (Anderson,1976); hence media must be selected that are within budget limitations, yet effective in promoting learning.

Selection of Media

In view of the above statements the selection of media for the instructional package was given serious consideration. Stolovitch (1978) using a quote from L.J. Briggs demonstrated the difficulty with the following statement: "Unfortunately, it is not possible to make optimum media selections by simply following a chart, or table, or 'cookbook'" (p.98).

Since color is important in identifying wildflowers, it was decided that the media selected would use color. A number of different types of media was considered. A presentation of wildflowers using posters was considered but rejected because of the high cost of full color printing. Other media, such as 16 mm film and videotape, were considered but rejected because of the high cost and the difficulty of production. The final decision to use 35 mm color slides as originally proposed was made in light of the following reasons:

(1) Color slides can be produced economically.

(2) Large quantities of slides can be produced if the need arises.

(3) Slides give the teacher a great degree of flexibility. The teacher can select the wildflowers that are most probably found in the area for presentation to the students.

Use of an audiotape to accompany the slides was considered and rejected because its use would reduce the flexibility of the instructional package. With a fixed, pre-recorded tape, both teachers and students would necessarily be presented with information about wildflowers that may or may not be found in their particular area. Rather than a pre-recorded tape, the decision was made to produce a teacher's guide that contains information about the flowers on the slides; thus the teacher can arrange the materials so that only information about the wildflowers of a particular area need be presented if desired. A teacher is able to select slides of the wildflowers of the area, consult the teacher's guide for information, and present this information along with the slides to the students.

Originally it had been proposed that a large chart or charts be produced that would help students identify the wildflowers. Because of the high cost of full color printing and the difficulty of circulating large charts throughout the classroom this medium was rejected. The decision was made to place a picture of one flower along with a brief description, each on a 10 cm by 15 cm card. These cards were designed to be more easily circulated among students within the classroom. The small cards also made identification easier in the field because of the accompanying brief description beside the picture of the wildflower.

Summary

The decision was made to produce an instructional package that included colored slides of individual wildflowers and a teacher's guide that contained information on each of these flowers. These two media were proposed to teachers in the needs assessment questionnaire and were found acceptable by them. It was decided to produce a student card containing a picture of each wildflower and a brief description of the flower which could be used in the classroom for study or carried into the field as an identification aid.

CHAPTER 6

FORMATIVE EVALUATION

Initial Production

When a decision was made regarding the types of media that were to be used in the instructional package, the developer of the package started production. The developer spent two summers photographing the wildflowers in various areas throughout the province. The wildflowers were photographed on 35 mm color slide film using natural light for all photographs.

When a sufficient quantity had been photographed, the slides were developed, examined and selected for inclusion in the instructional package. A total of fifty wildflowers of the province was selected. The developer attempted to select wildflowers that were common and reached bloom from middle to late summer. An attempt was made to include wildflowers that are found close to community areas. Wildflowers that are found in remote areas of the province were not included.

The wildflowers were arranged by color and organized alphabetically using their common names within each color section and were coded numerically. Multiple copies were made of each slide to provide sufficient numbers for testing the instructional package.

Once the photographic slides had been collected, the developer completed research on each of the wildflowers that

was selected. Sources at Memorial University were consulted and extensive information about each wildflower was gathered and rewritten for the teacher's guide. An attempt was made to include incidental information that would be interesting to the students. The information includes a brief description of the wildflower and things about the flower such as its use as a beverage, food, medicine or any use that it may have had. The information was compiled and bound in booklet form for teacher use. A large code number was placed on the lower right of the page so that the teacher could easily find information on a particular flower by noting the number on the slide and turning to the appropriate page. A list of the wildflowers included in the instructional package was given as well as a general introduction, teaching suggestions, and intended learning outcomes. A copy of this teacher's guide is included in Appendix C.

After the teacher's guide had been completed the developer set out to produce a student card on each wildflower. A brief description was written to help the student identify the flower in the field. Basically the information included the color of the flower, its width, its height from the ground, its leaf structure, and its habitat. A copy of this information is included in Appendix D. The information was then typed on bond paper and was copied onto cardboard and trimmed to 10 cm by 15 cm size cards.

In addition to written information for flower identification it was important that an illustration be

included on the student card. The following techniques for presenting a visual representation of the flower were considered:

1. A line drawing.
2. A black and white photograph.
3. A full-color artist's rendition.
4. A color photographic print.
5. A color slide mounted on the card.

The use of line drawings as illustrations had the advantage of easy and economical reproduction, but was rejected because they revealed too little detail and provided no color cues.

Black and white photographs, reduced to half-tone prints to facilitate reproduction were tried, but proved to be inadequate in detail and provided no color cues.

Full-color artist's renditions were not available and could not be reproduced economically.

Full-color photographic prints provided an acceptable solution, except that they could not be reproduced economically.

Finally it was decided to produce three sets of color transparencies like the ones used in color slides. The transparencies were mounted on the student cards in such a way that the student could see the wildflower when it was

held before the light. A card for each wildflower was produced. The cards were numbered to match the slides and the information in the teacher's guide. They were arranged as the slides were arranged - by number and by color. Each color section was arranged alphabetically. Each card was given a color band across the bottom to match the color of the flower to help students make the correct identification.

In preparation for evaluation, all three media were packaged in kits. Each kit included slides of fifty wildflowers, a teacher's guide, and a student card of each wildflower.

At this stage the instructional package was subjected to a process of formative evaluation. Before the package was field tested it was examined by experts for possible modification and revision (Thiagarajan, Semmel, & Semmel, 1974). Experts asked to evaluate this package included: (1) content specialists, (2) learning specialists, and (3) a media specialist. The results of the evaluation by these specialists are given as follows:

1. Evaluation by Content Specialists

Two interpreters at Terra Nova National Park agreed to examine the instructional package for content. One of them is the assistant Chief Interpreter and has co-authored a brochure entitled Annotated Checklist of the Wildflowers of Terra Nova National Park. They confirmed that the content was accurate; however, they

offered the following suggestions:

(1) Additional flowers could be added to the instructional package. These flowers are:

(a) Blue flag (Iris versicolor)

(b) Marsh blue violet (Viola cucullata)

(c) Pitcher plant (Sarracenia purpurea)

(d) Lady's slipper (Cyripedium acaule)

(e) Starflower (Trientalis borealis)

(f) Wild lily of the valley (Maianthemum canadense)

(g) Bunchberry (Cornus canadensis)

(h) Coltsfoot (Tussilago farfara)

(2) A small viewer (magnifier) would help to see the slides on the cards.

(3) Cibachrome processing (direct positive developing) could be used to produce a small print of the flower from the slide.

(4) Small diagrams of the leaves could be used on some cards to show more detail.

(5) Cotton, grass should be cotton grass or grass, cotton.

Each suggestion was seriously considered. The developer's reaction to the suggestions is presented as follows:

(1) Additional flowers were not added to the instructional package because each of the suggested flowers bloom early in the summer. As already indicated the developer selected wildflowers that bloom from middle to late summer.

(2) Small viewers (magnifiers) would help the students identify the wildflowers. However, viewers were not added to the package because of additional cost and because it was felt that schools should have sufficient magnifiers (hand lenses) to distribute to students for the study of wildflowers. The suggestions that teachers distribute magnifiers to the students will be added to the teacher's guide.

(3) Cibachrome processing was rejected at the time of the initial production because of financial cost. Large color prints were also considered and rejected for the same reason. However, if there are requests for copies of the instructional package, the developer recommends that this process be used in the future because it would speed up the package's reproduction.

(4) Diagrams and line drawings of the wildflowers had been considered but were rejected because they lacked sufficient detail. One of the reasons for the production of a color slide of each wildflower was to show more detail. The content specialist did not specify which wildflowers should have diagrams of the leaves; thus it was not viewed as a major weakness. The suggestion does have merit. The developer recommends that if a similar project is attempted in the future an artist be employed to produce diagrams of the wildflowers involved.

(5) Cotton, grass was a typographical error. It was corrected to read cotton grass.

2. Evaluation by Learning Specialists

Three junior high school teachers from different parts of the province served as learning specialists. The instructional package was taken to each of them for his or her initial reaction. The developer conducted a personal interview in which the contents of the package were subjected to constructive criticism and discussion by each of the experts. After an initial examination all three concluded that the instructional package was acceptable in terms of reading level, accuracy of content, appropriateness of content, interest level, etc. and that it should help students identify wildflowers. At this stage of the examination no

major drawbacks in the package were detected.

3. Evaluation by Media Specialists

A media specialist at the Division of Learning Resources, Memorial University, examined the final package. The results were very positive and there were no areas which were identified as unacceptable.

The media specialist provided suggestions and technical assistance throughout the development of the package, so that most potentially troublesome design problems were discovered and corrected before the package reached its final assembly stage. Because of this trouble-shooting procedure the final assembled package contained no apparent major design errors and was accepted by the media specialist as ready for target learner testing.

After the formative evaluation was completed and the results indicated that the package was ready for use, a schedule for conducting summative evaluation was established.

CHAPTER 7

SUMMATIVE EVALUATION

Procedure

The final evaluation step in the developmental process is the summative evaluation. At this stage the instructional package is tested in the field with groups of target learners. The testing is essential in order "to determine the degree and level of effectiveness of educational outcomes" (Coger, 1975, p.93). In this case the target learners were Grade 7 science students. A traditional pretest-posttest format was not used. Briggs (1977) implied that the test should be interpreted in the broad sense, and that "any appropriate observations and measurements of learner performance needed to determine whether the instructional objectives have been reached" (p.149) could be used. A pretest-posttest procedure was not used because the design of the project made such a procedure impractical. The wildflowers that are identified in an area depend on where the area is located. Wildflowers that are found in one area may not be found in another; thus tests for one area would be inappropriate and invalid in another. Rather than a predesigned test, a worksheet was devised in which students were required to identify three wildflowers. A copy of the worksheet is found in Appendix B. For each of the three wildflowers that was identified the student was required to give the common name of the wildflower, record its number from the student card,

record its color and height, write a description, and draw a diagram of the flower.

A complete instructional package was given to each of three teachers in three different areas of the province. The teachers' schools were located on the South Coast, the East Coast, and in Central Newfoundland. The teachers who agreed to test the package were given identical instructions. These instructions can be summarized as follows:

1. Select a number of slides of wildflowers which are probably found in your area.
2. Show these slides to the students and present some of the information given in the Teacher's Guide to them.
3. Distribute the student cards to the students. Magnifiers (hand lenses) should be distributed as well.
4. Take the students out into the field to see how many wildflowers they can find and identify.
5. Collect some of the wildflowers and bring them back to the school for further study.
6. Show the students the slides again. All of the slides can be shown at this time.
7. Have students complete the worksheets.

In addition, both students and teachers were asked to complete questionnaires on the effectiveness of the instructional package. Opportunities for individual comments were available on both questionnaires. Copies of these questionnaires are included in Appendix E.

The instructional packages were delivered to the schools, the packages were presented, worksheets were completed, and questionnaires were filled out by both teachers and students. Each of these items was returned to the developer for examination.

Results of Worksheets

The worksheets were examined and scored. Each student could score a possible thirty points, ten points for each wildflower identified. The scoring system for each flower is shown in Table 3.

Table 3. Scoring system used for worksheets.

	Name of Wildflower	Number On Card	Color	Height	Descr-iption	Diagram	Total
Score	1	1	1	1	3	3	10

A student was expected to write down three things that were noted about the wildflower in the description and to show the flower, stem, and leaves in the diagram

A total of 102 students completed the worksheets. The worksheets were scored as indicated in Table 3 to obtain a raw score for each student. The raw scores were then converted

to percentages. Because there was a large number of percentage scores it was decided to group these scores into fifteen score classes in order to make the data more manageable for presentation (Glass, 1970). This grouped frequency is presented in Table 4.

Table 4. Grouped frequency distribution of percentage scores.

Scores	Frequency
97 - 100	15
90 - 96	33
83 - 89	30
76 - 82	11
69 - 75	2
62 - 68	6
55 - 61	3
48 - 54	
41 - 47	1
34 - 40	
27 - 33	
20 - 26	
13 - 19	
6 - 12	
0 - 5	1
Number	102

A histogram was constructed to present a clearer picture of the distribution of the percentage scores. This histogram is shown in Figure 3.

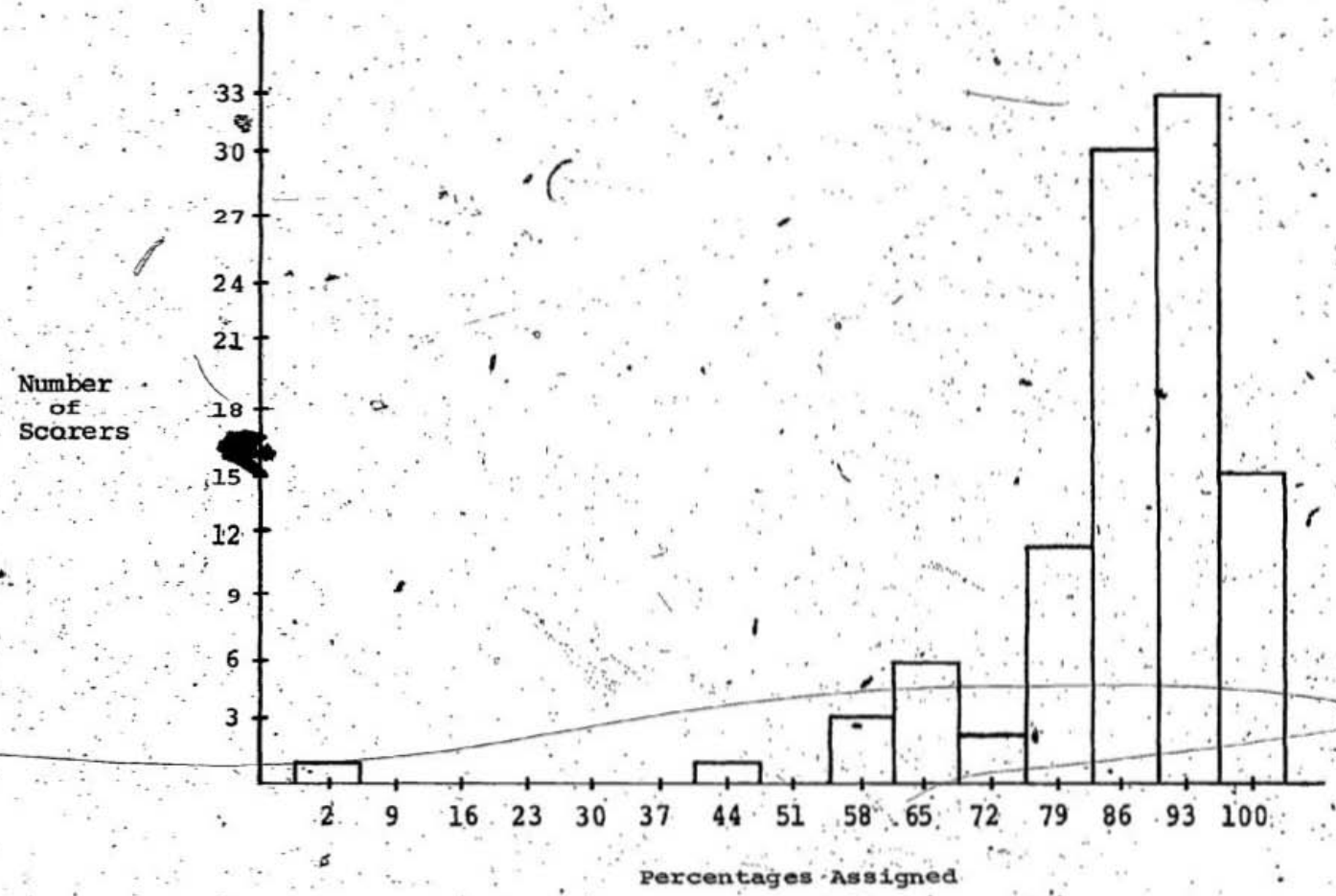

Figure 3. Percentage scores assigned to worksheets.

Both the histogram and the frequency distribution table indicate that the majority of the students did very well. The expected performance success rate for this package was previously established. The expectation was that in order to be considered a successful package at least eighty percent of the learner scores would exceed eighty percent. Table 5 was constructed to show the number of students who achieved eighty percent or higher and the number who did not achieve eighty percent.

Table 5. Number of students achieving eighty percent.

	80% and above	Below 80%	Total
Number	85	17	102
Percent	83.3	16.7	100

Table 5 indicates that 17 scores or 16.7 percent of the students achieved less than eighty percent correct. Table 5 further indicates that 85 scores or 83.3 percent achieved eighty percent or higher correct responses; thus affirming that the program achieved the established goal of having at least eighty percent of the learners obtain scores of at least eighty percent or better. The total results were then analyzed to determine where the areas of weakness were. This analysis is presented in Table 6.

Table 6. Analysis of total results.

	Total Possible Score	Total Actual Score	Percentage
Name of Flower	306	294	96.1
Number on Card	306	290	94.8
Color	306	286	93.5
Height	306	238	77.8
Description	918	783	85.3
Diagram	918	721	78.5
Total	3060	2512	82.1

Table 6 reveals that students found the flower height and the diagram more difficult than the other items on the worksheet. A further analysis of the worksheets revealed that there was some confusion over just what height implied. There were a number of wrong answers, even though 77.8 percent did respond correctly. The drawing of the diagram of the wildflower also presented some difficulty; however, 78.5 percent of the drawings were judged to be correct. The writing of the descriptions presented some problems to some students, even though 85 percent did it correctly. Some students did not appear to understand exactly what was

expected of them in these items. The table shows that the students had little trouble identifying the flower by name (96.1 percent correct), matching the identification card with the found flower (94.8 percent correct), or with identifying the correct color (93.5 percent correct).

Results of Questionnaires

A total of 102 students completed the student questionnaire, which was designed to determine student reaction to the instructional package. Each student was asked to assign a letter grade to each of fifteen items concerning the quality and effectiveness of the package. The letter grades were:

A - Excellent
B - Good
C - Fair
D - Poor
F - Very Poor

The numbers for each letter grade were tabulated and converted to a percentage of the total number of responses for each item. These percentages are presented in Table 7.

Table 7. Percentages for each item on student questionnaire.

Item	A	B	C	D	F
1. Slide presentation	65.4	32.7	1.9		
2. Field trip	41.9	46.2	9.4	.9	1.9
3. Student cards	61.9	32.2	1.9		
4. Worksheet	30.5	53.3	14.3		1.9
5. Information given by teacher	56.2	38.1	4.8		1.0
6. Organization	36.2	50.5	11.8	1.0	1.0
7. Interest level of unit	49.5	34.3	12.4		3.8
8. Amount learned about wildflowers	53.8	35.8	7.5	2.8	
9. Usefulness of unit	67.0	24.8	7.5	.9	
10. Clarity of unit	50.9	42.5	5.7		.9
11. Enjoyment of unit	42.9	43.8	10.5	1.9	.9
12. Understanding of unit	31.1	50.9	17.0		.9
13. Difficulty of unit	46.7	32.2	9.5	1.9	5.7
14. Length of unit	54.8	25.0	14.4	1.9	3.8
15. Grade for unit as a whole	60.3	26.4	10.4		2.8

Table 7 shows that the majority of the students gave each item either an A or B rating. 98.1 percent of the students gave Item 1 and Item 3 either an A or B. This ranged down to 79.8 percent for Item 14.

Table 8 shows the total number of letter grades given for the whole package. The percentages of the total are given for each letter grade as well.

Table 8. Total number and percentage for each letter grade on student questionnaire.

	A	B	C	D	F
Number	788	607	146	12	26
Percentage	49.9	38.4	9.2	.8	1.6

Some students added individual comments to the questionnaire. Most of the comments were positive. A sample of the comments follows:

> I think that this unit was excellent and you should make up more of them about different things, for example animals or rocks.

I think that this unit helped me a lot. Some of these flowers I didn't even see. Now I see them and know what I'm looking at. It was excellent.

Very good, extremely well-organized, good slides, and worksheets, super dandy, far out.

The unit was pretty good, but I found it uninteresting because I knew most of the stuff before.

I enjoyed your unit. Make one on animals. If you do please contact Mr. Mercer.

I think it was so good, I also think you should keep lending it out to Grade 7's and hope they learn a lot from it. Because before I saw it I didn't know hardly anything about flowers.

I think overall, the unit was really excellent and well put together

I thought the unit was so so, but would have been better on animals.

I think that the unit was excellent. The unit was helpful and was good to identify plants and flowers. It was easy to use and easy to find the things you were looking for. Nothing in the whole unit was poor.

The teachers who agreed to test the instructional package also completed questionnaires. The teacher questionnaire contained nineteen items on the quality and effectiveness of the instructional package. As in the student questionnaire, teachers were asked to give a letter grade to each item. The results are given in Table 9.

Table 9. Results of teacher questionnaire.

Item	A	B	C	D	F
1. Purpose of unit clearly seen	2	1	-	-	-
2. Method of Presentation	2	1	-	-	-
3. Organization of material	2	1	-	-	-
4. Quantity of information	1	2	-	-	-
5. Quality of information	2	1	-	-	-
6. Quality of slides	2	1	-	-	-
7. Value of student cards	1	2	-	-	-
8. Value of worksheet	1	1	1	-	-
9. Value of teacher's guide	2	1	-	-	-
10. Ease of presentation	1	2	-	-	-
11. Usefulness of unit in teaching wildflowers	2	1	-	-	-
12. Interest to students	2	1	-	-	-
13. Suitability of materials to students	2	1	-	-	-
14. Appropriateness of material to grade level	2	1	-	-	-
15. Appropriatnesss of materials to Grade 7 Science Program	1	2	-	-	-

Table 9 (cont.)

Item	A	B	C	D	F
16. Indication that learning took place	1	2	-	-	-
17. Topic adequately covered	1	2	-	-	-
18. Value to other grades	1	2	-	-	-
19. Overall value of the unit	2	1	-	-	-

Table 9 shows that with one exception all items were given a letter grade of A or B.

Table 10 shows the number of letter grades that was given for all the items. The percentage of the total for each letter grade is also given. 98.2 percent of the total number of letter grades that were given are either A or B.

Table 10. Total number and percentage for each letter grade on teacher questionnaire.

	A	B	C	D	F
Number	30	26	1	-	-
Percentage	52.6	45.6	1.8	-	-

In addition, two of the three teachers added comments to the questionnaires. Both comments were positive. One teacher wrote:

> I thoroughly enjoyed using this kit in the classroom. It was a learning experience for me as well as the students. Many of the flowers described in the unit could be found within five minutes walking distance from the school. Similar units on trees, insects, and animals of Newfoundland would be extremely useful.

The other teacher who provided a written comment wrote that it was an "excellent unit of work in light of ecology concepts being taught". This teacher added that the worksheet should have required the identification of more than three plants. All three teachers indicated that they would recommend the instructional package to other teachers.

Conclusions

An analysis of the data indicated that the instructional package was well received. According to the questionnaire both teachers and students found the package acceptable and worthwhile. On the whole the worksheets indicated that the instructional package helped students identify wildflowers. Analysis of individual items on the worksheet revealed a number of problems which will be corrected for future use of the package. For example, students had trouble determining the height of the flower,

indicating that the definition of height needs clarification. There was confusion about what was expected in writing the description of the flower and drawing the diagram. The instructions can be clarified by explaining that the description requires at least three attributes and that the diagram requires a minimum of a flower, a leaf, and a stem.

Analysis of the total scores achieved on the worksheet showed that the criterion established as an indicator of the package's success (at least 80 percent of the students would score at least 80 percent) was achieved. Of 102 students tested, 83.3 percent achieved 80 percent correct or higher. The analysis identified areas of weakness that can be corrected. With these corrections made, there is no reason to believe that this instructional package would not be even more successful.

CHAPTER 8

CONCLUSIONS, RECOMMENDATIONS, IMPLEMENTATION

Conclusions

After reviewing the evidence the developer felt that the instructional package on the identification of wildflowers was successful in achieving its intended learning outcomes. From this evidence the developer concluded that the package should be made available to all teachers and students of Grade 7 science throughout the island portion of the province of Newfoundland and Labrador. The instructional package would add to the resources that are available to aid the teaching and learning of junior high school science. It is to be hoped that the package will help students to be more observant and appreciative of the wildflowers that they see growing around them.

Recommendations

The developer of this instructional package recommends that:

1. An instructional package or packages be developed that would include wildflowers that bloom at other times during the growing season.

2. An instructional package or packages be developed that would deal with other wildflowers which bloom during middle and late summer, that this instructional package did not include.

3. An instructional package or packages be developed to deal with the wildflowers that grow in specific regions throughout the province.

4. An instructional package or packages be developed to present the wildflowers of Labrador.

5. Similar instructional packages be developed that deal with animals, insects, trees, and other aspects of the environment.

Implementation

The instructional package can be made available to teachers and students through the Clearinghouse at Memorial University of Newfoundland or through the instructional materials section of the Newfoundland Provincial Department of Education. The Clearinghouse functions as a distributor of locally made materials and circulates materials in its collection to schools or individual teachers upon request. The instructional materials section of the Department of Education has a large collection of audiovisual materials that are distributed throughout the province.

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APPENDIX A

Apt. 402, 1A Birchview Apts.
Gander, Newfoundland
A1V 1M7
January 8, 1984

Dear Teacher:

I am a graduate student in Learning Resources at Memorial University, and I am planning to develop instructional materials on the late summer wildflowers of the island of Newfoundland.

The materials could be used with the Searching for Structure science program in Grade 7. These materials would help students identify wildflowers that they might find on field trips.

The proposed package of materials would include the following:

1. Slides on late summer flowers

   There would be approximately 80 slides on the common, late summer wildflowers of the island of Newfoundland. All (or a selection of them) could be shown to the students prior to or subsequent to field trips.

2. A chart describing the flowers

   The chart would be designed for use by the student after he/she has been out on a field trip and has observed and/or collected specimens of wildflowers. The chart would help identify the flowers that have been collected and observed.

3. Teacher Booklet

The booklet would give the teacher additional information on the wildflowers presented in the slides and on the chart. The information would include descriptions of the flowers and their habitats, historical significance if any, and other points of interest.

In order to determine whether such a project is worthwhile, could you please answer the following questions. Each question pertains to common, late summer wildflowers of the island of Newfoundland.

1. Are you presently using any instructional materials that could be used to help identify Newfoundland wildflowers?

YES ☐ NO ☐

2. Are you familiar with any instructional materials that could be used to help students identify Newfoundland wildflowers?

YES ☐ NO ☐

If yes, please list them below.

3. If you are using materials on Newfoundland wild-flowers, are you satisfied with them?

YES ☐ NO ☐

To some extent ☐

Comment:

4. Would materials such as the ones described on the preceding pages be of value to you in teaching the Searching for Structure program?

YES ☐ NO ☐

5. Do you feel that the media selected for the project are suitable?

YES ☐ NO ☐

If no, please list other media below. Keep cost and practical considerations in mind.

Could you please return the foregoing pages to me in the envelope provided. Thank you for your cooperation.

Yours truly,

Edwin Watton

APPENDIX B

TO THE STUDENT

After you have seen the slides on Newfoundland wildflowers, your teacher will take you out on a field trip. You are expected to be able to identify three wildflowers. Use the cards that your teacher will give you to help you do so. When you come back from your field trip, you are asked to give some information on the following sheet about each wildflower that you have identified. Included in this information is a drawing of the wildflower and a written description of it. Your drawing should include flower, stem, and leaves. Your description should include three things, such as where you found the flower, what it looked like, or anything else that you may have noticed about it. Please note that height means the distance from the ground to the top of the flower. Pass the information sheet back to your teacher.

Thank you.

Student Worksheet Student Name _____

Wildflower #1: Name of Flower _____

Number on Card ___ Color _____ Height _____

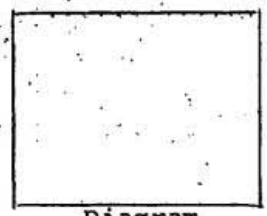
Description:

_____

_____

_____

_____



Diagram

Wildflower #2: Name of Flower _____

Number on Card ___ Color _____ Height _____

Description:

_____

_____

_____

_____



Diagram

Wildflower #3:

Number on Card ___ Color _____ Height _____

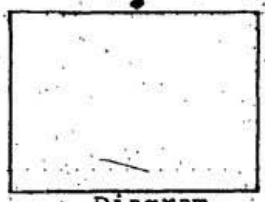
Description:

_____

_____

_____

_____



Diagram

If you want to make comments, please use the back of this sheet.

Thank you.

APPENDIX C

TEACHER'S GUIDE

TO

SOME COMMON WILDFLOWERS OF NEWFOUNDLAND

TO THE TEACHER

This instructional package is designed to help Grade 7 science students identify some of the common wildflowers that are found throughout the island portion of the province of Newfoundland and Labrador. The package contains students' cards, slides, a worksheet, and a teacher's guide. The intended learning outcomes are also included.

INTENDED LEARNING OUTCOMES

Cognitive Domain

Once the students have seen the slides and have been taken on a field trip they will be able to:

1. Identify three wildflowers.
2. Write the name of each of the three wildflowers on a worksheet.
3. Provide two physical characteristics, color and height, of each wildflower.
4. Show evidence that they can match the wildflower with the correct identification card.

Affective Domain

After the students have seen the slides and completed the field trip they should be able to:

1. Express an appreciation of wildflowers to a greater degree than before studying them.
2. Demonstrate this appreciation in their writing of descriptions of the wildflowers.

Psychomotor Domain

After examining real wildflowers and studying pictures of them students should be able to:

1. Physically locate and identify three wildflowers in their natural habitat.

2. Draw an acceptable diagram of the three wildflowers that they have identified.

This package offers some degree of flexibility. It can be used in any way that you feel is best for your students and your situation. However, the author suggests that the following steps be taken:

1. Select a number of slides of wildflowers that are probably found in your area.

2. Show them to your students and present some of the information given in the Teacher's Guide to them.

3. Distribute the cards to the students.

4. Take them out into the field to see how many wildflowers they can find and identify. The author suggests that the students should identify a minimum of three. (If you have field guides, take them along too).

5. Collect some wildflowers and bring them back to the classroom or laboratory for further study and examination. Please do not collect any more than one of each type of flower per student and do not deplete a species in one area. Leave some to propagate the species. Do not pick lady's slippers or pitcher plants. Lady's slippers take seven years to bloom.

6. Show the students the slides again. You may show all of them if you wish.

7. Have students complete the worksheets. You may use these worksheets for your evaluation purposes.

SOME COMMON WILDFLOWERS OF NEWFOUNDLAND

Contents

Blue

1. Aster, New York (Aster novi-belgii)
2. Bluebell (Campanula rotundifolia)
3. Chicory (Cichorium intybus)
4. Skullcap, Common (Scutellaria epilobiifolia)
5. Vetch, Cow (Vicia cracca)

Brown

6. Cattail, Common (Typha latifolia)

Green

7. Plantain, Common (Plantago major)
8. Plantain, Seaside (Plantago juncoides)
9. Sarsaparilla, Bristly (Aralia hispida)

Pink

10. Fireweed (Epilobium angustifolium)
11. Joe-Pye Weed, Spotted (Eupatorium maculatum)
12. Knapweed, Black (Centaurea nigra)
13. Oysterleaf, or Sea Mertensia (Mertensia maritima)
14. Rose, Northeastern (Rosa nitida)
15. Thistle, Bull (Cirsium vulgare)
16. Twinflower (Linnaea borealis)

Red

17. Clover, Red (Trifolium pratense)
18. Heal-all, or Selfheal (Prunella vulgaris)
19. Sorrel, Garden (Rumex acetosa)
20. Sorrel, Sheep or Common (Rumex acetosella)

White

21. Burnet, Canadian (Sanguisorba canadensis)
22. Cinquefoil, Three-toothed (Potentilla tridentata)
23. Clover, White (Trifolium repens)
24. Cotton Grass (Eriophorum spp.)
25. Cow Parsnip (Heracleum maximum)
26. Daisy, Ox-Eye (Chrysanthemum leucanthemum)
27. Everlasting, Pearly (Ananphalis margaritacea)

White, cont'd:

28. Eyebright (Euphrasia americana)
29. Lily, Fragrant Water (Nymphaea odorata)
30. Meadow-Rue, Tall (Thalictrum polygamum)
31. Meadowsweet (Spiraea latifolia)
32. Stitchwort, Lesser or Common (Stellaria graminea)
33. Sundew, Round-leaved (Drosera rotundifolia)
34. Turtlehead (Chelone glabra)
35. Yarrow, Common (Achillea millefolium)

Yellow

36. Black-Eyed Susan (Rudbeckia hirta)
37. Butter-And-Eggs (Linaria vulgaris)
38. Buttercup, Common or Tall (Ranunculus acris)
39. Cinquefoil, Shrubby (Potentilla fruticosa)
40. Dandelion, Common (Taraxacum officinale)
41. Goldenrod (Solidago spp.)
42. Honeysuckle, Northern Bush (Diervilla lonicera)
43. King Devil, Common; or Yellow Hawkweed (Hieracium pratense)
44. Lily, Yellow Pond (Nuphar variegatum)
45. Pineapple-weed (Matricaria matricarioides)
46. Ragwort, Tansy (Senecio jacobaea)
47. Silverweed (Potentilla anserina)
48. Touch-Me-Not, Pale (Impatiens pallida)
49. Trefoil, Birdsfoot (Lotus corniculatus)
50. Yellow-Rattle (Rhinanthus crista-galli)

1. Aster, New York

There are many flowerheads on this branching plant, which can reach heights of 30 - 90 cm. Its stem is slender and mostly smooth. The species is abundant in low, coastal areas. It blooms from July to October.

Uses:

Medicine

Some species of Aster were used by native people to make a medicine.

Other

Asters were also burned as incense during some Indian ceremonies.

1

2. Bluebell or Harebell

These bell-shaped flowers can be borne singly, or in clusters on a slender stalk, 15 - 20 cm high. They are graceful flowers and prefer open areas along the shore or in meadows. They bloom from July to September.

Uses:

Medicine

Properly prepared rootstocks were taken in water to produce sweating, which was considered a good thing in certain types of diseases.

3. Chicory

Chicory prefers open, dry ground along roadsides and in waste areas. The flowers are attached to an almost leafless stem which grows to a height of 30 - 120 cm. It was introduced to this continent from Europe, where it was regarded as a pest. Only a few of the flowers open at a time. It continues to bloom from June to October.

Uses:

Beverage

The roots can be dried and ground, and used to make a type of coffee.

Food

Young leaves and shoots can be used in a salad, or cooked and served as greens. They are rich in vitamin A and C.

Medicine

A tea made from the roots has been reported to be good for an upset stomach and kidney disorders. Bruised leaves have been used as a poultice to reduce swelling. Flowers can be soaked and used to bathe sore eyes.

4. Skullcap, Common

Stalkless flowers are attached to the stem, which ranges from 30 - 90 cm in height. Skullcaps are found along shorelines and in moist meadows. They bloom from June to September.

Uses:

Medicine

A tonic was once made from this plant to relieve nervous disorders, sleeplessness, and headaches. It was also used to prevent coughs. However, an overdose of this tonic causes giddiness and confusion.

Other

An extract from the plant has been used to make perfume.

5. Vetch, Cow

Flowers are arranged in spikes on one side of a long stalk. Cow vetch is a climbing plant and is found quite often intertwined with grasses and other plants. It blooms from May to August along roadways and shorelines, and in meadows.

Warning:

It has been reported to produce disease and death when eaten by livestock.

6. Cattail, Common

A spike of yellowish flowers is located above a cylinder of brown flowers. The stem grows from 90 - 270 cm high. The leaves are even taller than the stem. The plant is found in fresh marshes and shallow areas of ponds. Flowers bloom from May to July.

Uses:

Food

The new shoots can be cooked or eaten raw. They also make a fine addition to homemade soups. The pollen from the spikes can be mixed with flour and used in baking. The rootstocks are high in starch and can be cooked and eaten like potatoes, or ground into meal or flour.

Medicine

Some native people used the down for dressing wounds.

Other

Early pioneers used the leaves for making rush-bottomed furniture and caulking barrels. Leaves were also used for stuffing pillows.

Cattails provide good homes for birds and muskrats.

7. Plantain, Common

The small flowers are located on a spike on a 15 - 45 cm stem. Leaves are broad. The plant is considered a weed by gardeners. It can easily be found in waste areas and along roadways. It blooms from June to October.

Uses:

Beverage

The leaves make a healthy tea that is rich in vitamin A and C.

Food

Young leaves can be eaten raw in salads, or cooked and served. They are quite high in potassium and calcium. The seeds can be eaten parched or ground into meal. Some native people of North America ground the seeds to use as flour. In some places the plant is called Indian Wheat.

Medicine

A poultice from the leaves has been used to dress wounds, sores, stings and insect bites. A powder made from the root is said to be good for toothache.

8. Plantain, Seaside

Tiny flowers are attached to a spike on a plant 5 - 20 cm high. The leaves are long and narrow and are arranged around the base of the plant. The plant is found along the seashore poking out of cracks and crevices. It blooms from June to September.

Uses:

Food

Leaves can be eaten raw in a salad or cooked and served as greens.

9. Sarsaparilla, Bristly

The flower clusters range from 30 - 90 cm high on a leafless stalk. The leaves are on separate stalks and are much lower than the flowers. Flowers are found in wooded areas and produce dark berries. Flowers bloom from June to August.

Uses:

Beverage

The roots were once used to flavour root beer. Now, however, the ingredient can be artificially produced. The roots also make a good tea.

Medicine

Plant parts have been used to make a tonic to improve the appetite. The tonic has also been used to relieve fever and rheumatism.

10. Fireweed

Spikelike clusters of flowers reach anywhere from 60 - 180 cm in height. They are found in waste areas, particularly in areas where a fire has recently occurred. Its white, hairy seeds are carried over a broad area by the wind. Flowers bloom from July to September.

Uses:

Beverage

The leaves can be dried to make a tea.

Food

Young shoots can be steamed and eaten. The central part of the stem makes a nice addition to soup.

Medicine

Fireweed has been used as a tonic for sore throat, and can be applied externally to relieve sore joints and speed the healing of some types of skin infection.

11. Joe-Pye Weed, Spotted

The flowers are arranged in wide, fuzzy clusters on top of a purple spotted stem, 60 - 180 cm high. The foliage smells like vanilla when it is crushed. The plant is found in marshes, meadows and wooded areas. Flowers bloom from July to September.

Uses:

Medicine

The roots can be boiled and used to aid rheumatism and kidney disorders. One American doctor used it to treat an outbreak of typhus during the early days.

12. Knapweed, Black

The flowers are pink with a blackish, globular base and stand 30 - 90 cm high. The black base gives the flower its name. The plant is quite common and is found in meadows and along roadsides. It blooms from July to September.

12

13. Oysterleaf or Sea Mertensia

The flowers are pink and change to blue over summer. The plant forms a low mat-like structure along coastal beaches. The wax-like leaves taste like oysters and can tolerate salt spray. The flowers bloom from June to September.

14. Rose, Northeastern

Northeastern roses are the most common ones found in Newfoundland. They grow on a prickled, bristly shrub, which reaches to a height of one metre. The leaves turn orange or red in the fall. The shrub has not been reported in Labrador nor on the Northern Peninsula. It is found along shorelines and in marsh areas. Flowers bloom from June to September.

Uses:

Beverage

Rose hips can be used to make juice or tea, and they make an excellent wine. They have a high concentration of vitamin C. The petals and twigs can also be used to make tea.

Food

Rose hips can be ground to make meal or flour. They are also used in jams or jellies. Also the petals and hips can be boiled and rolled in sugar to make candy.

Medicine

The flower petals make a good tonic. A medicine can be made from the hips and roots for sore throats and colds.

Other

Oil from the flower petals makes an excellent perfume.

15. Thistle, Bull

The flower sits on top of a very spiny stem, which is 60 - 180 cm high. It should be handled only with gloves on. The leaves are also spiny and woolly underneath. The seeds are carried around by thistledown. The plant flowers from June to September.

Uses:

Beverage

Young leaves make a good tea.

Food

Young stems can be peeled and eaten raw or cooked. The roots can be eaten raw, boiled, or roasted. The seeds are good raw or roasted. The plant is very nutritious. Several early explorers were saved from starvation by eating this plant.

Medicine

The thistle plant has been steeped and used to relieve weakened stomach conditions, reduce fever, and help get rid of worms.

Other

Thistledown makes an excellent tinder. The flowers have been used to curdle milk in the making of certain milk products.

15

16. Twinflower

A quick glance tells how this flower got its name. These bell-shaped flowers grow on a creeping woody stem that grows anywhere from 7.5 - 15 cm high. They prefer cool, moisted woods. The botanical name comes from Carolus Linnaeus, father of modern botany, who liked the flower so much that he got his picture painted with it.

16

17. Clover, Red

Red clover was introduced from Europe as a hay and pasture crop. The flower stands on a hairy, erect stem 16 - 60 cm high. It can be easily recognized in fields and along roadsides. It blooms from May to September.

Uses:

Beverage

The seeds or flowers can be steeped in boiling water to make a very nice tea.

Food

The whole plant can be eaten raw or cooked. However, raw flowers are hard to digest. The leaves and flowers can be used in salads. Young plants can be cooked as greens. Some people make clover flower sandwiches. The plant is high in protein and is very nutritious. It also makes very good honey.

Medicine

Clover tea is said to be good for colds, coughs and bronchial conditions. A cup of blossoms, boiled until thick and applied as a poultice, is reported to be a good treatment for athlete's foot.

Other

The plant, because of its ability to store nitrogen, is used in crop rotation to improve the soil.

18. Heal-All, or Selfheal

The flower is located on a spike at the end of a low creeping stem anywhere from 15 - 30 cm long. The stem is squareish and the spike becomes longer after flowering. The plant prefers lawns and shady spots. It blooms from May to September.

Uses:

Medicine

This plant when properly prepared is said to cure throat ailments. It also has been used as a remedy for the stomach and intestines following some types of sicknesses.

Other

The plant was burned as an incense by some early people.

19. Sorrel, Garden

Tiny reddish-brown flowers cluster in spikes that are about one-half of the 15 - 30 cm plant. The upper leaves clasp the stem. The flowers are quite common in fields and along roadsides. They bloom from June to September. The plant is well known in Europe and was cultivated during the Middle Ages by both rich and poor.

Uses:

Beverage

The leaves make a nice drink to cool the body.

Food

The leaves make good seasoning for salads, soups, and egg dishes. They can be made into a jam or a sort of rhubarb pie. However, they should be eaten sparingly because of their high acid content.

Medicine

The juice or tea made from the leaves is said to be a good tonic. A leaf poultice soothes the itching of insect bites and nettle stings.

20. Sorrel, Sheep

Sheep Sorrel is about one half as tall as garden sorrel, and the leaves are arrow shaped. The flowers cluster on spikes 15 - 20 cm high. The flowers can be attractive and are pollinated by bees and butterflies. They bloom from June to October. The plant grows well in acid soil low in nutrients.

Uses:

Food

This plant is similar to garden sorrel. Its leaves can be used in soups or as a seasoning for fish, pork, or potatoes. Young leaves are good in salads. Again, the leaves have a high acid content and should be eaten sparingly.

Medicine

See Garden Sorrel

Other

The seeds are eaten by birds and the rest of the plant is eaten by rabbits.

21. Burnet, Canadian.

It can easily be seen why this flower is sometimes called bottle brush. Small flowers grow in clusters on spikes about 15 cm long. The whole stem can reach as high as 150 cm. The plant grows on bogs and in other moist areas. It blooms from July to October.

Uses:

Food

Young leaves can be used in salads.

Medicine

The juice of the plant has been used to stop bleeding.

21

22. Cinquefoil, Three-toothed

The flowers grow on stems ranging in height from 2.5 to 25 cm. They prefer open, acid soil and rocky barrens. They bloom from June to August. The shape of the leaflet tells why it is called three-toothed.



Uses:

See Cinquefoil, Shrubby

22

23. Clover, White

White clover is quite common on lawns and in grassy areas. The flowers and leaves grow on stalks from creeping runners 10 - 25 cm in length. The head of the flower may be white or tinged with pink. It blooms from May to October. The flowers turn brown as they age.

Uses:

See Red Clover.

24. Cotton Grass

There are many species of these flowers, which are quite common on open bogs throughout the summer. The white, silky hairs of the flowerhead are located on the top of a stem ranging from 45 - 120 cm in height. The botanical name of the flower comes from a Greek word meaning wool. The flowers bloom from June to September.

24

25. Cow-Parsnip

This is a huge plant with flowers in flat clusters on a stem anywhere from 1 - 2.5 m high. The stem is grooved, woolly, and hollow. The leaves are tall and huge. The plant prefers moist ground and flowers from June to August.

Uses:

Food

Young stems can be peeled and eaten raw but they are best when cooked. Very young shoots are good in salad. The dry, hollow, basal part of the plant serves as a substitute for salt when mixed with other food. Care should be taken in identifying this plant since it is similar to the Water Hemlock, which is extremely poisonous.

Medicine

The cooked root of this plant aids digestion and relieves stomach cramps.

26. Daisy, Ox-Eye

This familiar flower is found in fields and along roadsides. Solitary flowerheads sit on top of erect stems, which range from 30 - 90 cm in height. The plant was originally introduced from Europe. Flowers bloom from June to August.

Uses:

Beverage

The flowers make a mild tea.

Food

Young leaves are sometimes used in salads, although they have a strong flavor. Rootstocks are reportedly eaten as a potherb in some places.

Medicine

The leaves and flowers have been used to make a soothing tohic. A lotion made from the leaves has been used for wounds and bruises and to relieve asthma.

Other

Farmers dislike the plant because it gives an unwanted flavor to milk.

27. Everlasting, Pearly

Globe-shaped flowers are borne in clusters on a woolly stem, which is 30 - 90 cm high. The leaves are woolly and white underneath. The flowers are found in dry fields and along roadways. They bloom from July to September.

Uses:

Beverage

The leaves and flower buds make a good tea.

Medicine

Some native people and early colonists chewed the leaves and flower buds to relieve sore throats. A medicine made from the plant was said to relieve internal bleeding. The plant is good for external wounds if it is applied as a poultice.

Other

The flowers are often dried and used in floral arrangements.

28. Eyebright

The tiny flowers are clustered on a hairy stem, 10 - 38 cm long. The flower has a distinctive shape with purple or violet markings. It is found in fields and along roadsides and blooms from June to September. The plant depends on the roots of other plants for some of its nutrients.

Uses:

Beverage

It has been reported that some people make eyebright tea.

Medicine

A solution from the plant was once used to treat eye diseases and improve vision. It was also used to prevent the formation of stones in the kidneys.

29. Lily, Fragrant Water or White Pond Lily

These large flowers are very pleasant to smell. The floating leaves are large and purplish underneath. The plants prefer quiet ponds and bloom from June to September.

Uses:

Food

Young leaves and flower buds can be boiled and eaten. The seeds are rich in starch, oil, and protein. They can be parched and eaten like popcorn or ground to make a flour. The rootstocks are very nutritious and can be boiled and eaten.

Medicine

The seeds were believed to have some healing power.

Other

Rootstocks provide a good source of food for muskrats and beaver. The flowers were once used in the gardens of the rich to make the gardens more beautiful.

30. Meadow-Rue, Tall

Clusters of flowers cover the top of this tall plant, which can grow as high as 240 cm. It can be found in marshes, in meadows. and along the sides of streams. It blooms from July to September.

30

31. Meadowsweet

Clusters of white or pink flowers grow on this 60 - 150 cm high shrub. The plant can be found in fields and marshes throughout most of Newfoundland. It is absent from the Northern Peninsula and Labrador. The leaves turn yellow or orange during the fall. It blooms from June to September.

Uses:

Beverage

Parts of the plant have been used as an ingredient in some homemade beers to save sugar.

Medicine

A medicine can be made from the plant to treat some types of intestinal disorders.

Other

The shrub is used by some people in landscaping. Flowers and leaves can be placed in the house to freshen the air. The dried, winter seed pods make beautiful dried flower decorations.

32. Stitchwort, Lesser

The small flower is located at the end of a stalk on a stem between 30 and 50 cm in length. Many flowers may bloom close together. The plant prefers grassy areas and blooms from May to September.

Uses:

Medicine

A medicine from this plant has been known to produce some healing ability for internal membranes.

33. Sundew, Round Leaved

Tiny flowers grow on a leafless stalk, 10 - 25 cm high, from a rossette of reddish basal leaves. The flowers are arranged in clusters, and only one opens at a time. The leaves are very sticky, and they trap insects, which the plant uses for food. In this way, Sundew is able to survive in poor soil. It is found on bogs and blooms from June to August.

Uses:

Medicine

Sundew has been used as a treatment for whooping cough.

Other

The plant was used in Northern Sweden to curdle milk when certain milk products were being made.

33

34. Turtleheads

The flowers, which resemble the heads of turtles, are borne in clusters on top of a plant 30 - 90 cm high. The upper lip of the flower folds over the lower one. The plant is found in moist areas and along streambanks. It blooms from July to September.

Uses:

Medicine

At one time the plant was used to relieve symptoms of jaundice.

34

35. Yarrow

Flowers are arranged in flat, tight clusters on top of a 30 - 90 cm stem. The leaves are fine and fernlike and have a pleasant smell when crushed. These flowers are found in abundance in meadows and along roadways. They bloom from June to September.

Uses:

Beverage

The leaves, when dry, can be used to make a tea.

Food

A pleasant broth can be made from this plant.

Medicine

The tea has been used to relieve colds, sore throats, stomach disorders and fevers. The leaves are reported to be good to stop bleeding. Early warriors treated their wounds with Yarrow. Some people chewed the leaves to stop toothache.

Other

The plant gives an unpleasant flavor to milk if eaten by cows. A solution made with leaves makes a good hair tonic. Some early people used to present the plant at weddings to ensure seven years of love.

36. Black-Eyed Susan

This plant produces leaves during the first year and flowers during the next year. The stem is 30 - 90 cm high and is rough and bristly. The flower is found in meadows and along roadsides and blooms from June to October.

Uses:

Medicine

The plant has been used to treat boils and other skin diseases. It has been demonstrated scientifically that the juice from the plant is effective in killing some bacteria.

37. Butter-And-Eggs

The flowers are arranged in terminal clusters with their lower parts tinged with orange. The plant starts as a leafy stem, 30 - 90 cm high. It was introduced from Europe and grows well in dry areas. It blooms from June to October.

Uses:

Medicine

Medicine made from this plant has been used to treat jaundice and other liver disorders.

Other

The plant provides a good source of nectar for insects. The orange color serves as a guide to the nectar.

37

38. Buttercup, Common

This glossy yellow flower is found in moist areas and along roadsides. Its hairy stem grows from 60 - 90 cm high. The plant contains an oil that causes soreness and blisters if rubbed on the skin or swallowed. It blooms from May to September.

Uses:

Food

The roots, which are not as poisonous, were boiled and eaten by some Western Indians. They also parched and ground the seeds to make bread.

Other

Some Indians obtained a yellow dye by crushing and washing the leaves.

38

39. Cinquefoil, Shrubby

The yellow flowers grow on a shrub 30 - 90 cm tall. The stems are woody and often have loose bark. The plant prefers moist areas and shorelines. It blooms from June to October.

Uses:

Beverage

The leaves and roots can be used to make a tea.

Food

The roots can be eaten like potatoes, either boiled or roasted.

Medicine

The roots when boiled in vinegar have been used to treat sores and other infections of the skin. The plant is also known to reduce bleeding and to relieve stomach cramps, stomach ulcers, and toothache.

40. Dandelion, Common

This very common flower can be found almost everywhere for much of the year. It prefers lawns, meadows, and roadsides, and blooms from March to September. A solitary flower is borne on a slender stem, 5 - 45 cm high. The stems are hollow and milky. The seeds are distributed by fluffy, white seedballs. The plant is usually regarded as a troublesome weed.

Uses:

Beverage

Dried leaves can be used to make herb beer or tea. The flowers can be used to make wine. The roots can be dried and ground to make a coffee substitute or a beverage tasting like coffee.

Food

The leaves make an excellent food either in salads or cooked as greens. They contain large amounts of Vitamin A and smaller amounts of Vitamin B, D, and E. The flowers can be cooked and eaten. The roots can be cooked as a vegetable.

Medicine

Dandelion greens have been reported to be good for the digestive system, liver, and kidneys. The roots have been used for jaundice and some skin diseases. The juice of the stem and the flower is supposed to be good to remove warts.

41. Goldenrod

This native of North America has about 125 different species. It occupies a number of different areas - roadsides, meadows, shorelines, marshes, and woods. It ranges in height from 30 - 90 cm. It blooms from August to October. In the past it was blamed for causing hay fever, but this is not so. It does not release its pollen into the air because it is pollinated by insects.

Uses:

Beverage

Dried leaves and flowers make a good tea.

Food

Young leaves can be used in a salad or as a potherb. The seeds can be used in soups.

Medicine

Some native people chewed Goldenrod flowers to relieve sore throats. An antiseptic lotion has been made from the stem and leaves for cleaning wounds.

Other

A yellow dye can be made from the flowers. The sap of the plant has a high rubber content. Efforts have been made to cultivate it for this rubber content

42. Honeysuckle, Northern Bush

The funnel-shaped flowers may be tinged with red. The flowers are generally arranged in clusters of three at the end of branches on a 30 cm - 120 cm shrub. The leaves are toothed, which distinguishes them from other honeysuckles. The plant has not been reported on the Northern Peninsula or in Labrador. It blooms during July and August.

42

43. King Devil, Common; or Hawkweed

The yellow flowers sit on top of a mostly leafless stem anywhere from 30 - 90 cm high. The stem is hairy as are its basal leaves. The plants were first introduced from Europe and are considered weeds by farmers. They spread quickly by leaf runners. They are found along roadsides and in meadows, and bloom from May to August.

Uses:

Medicine

The plant has been used to treat eczema and other skin diseases. It was also used to treat poor eyesight. Some early people believed that hawks received their good eyesight by eating the plant.

Other

Parts of the plant have been used for chewing gum.

44. Lily, Yellow Pond

This floating, cup-like flower is very familiar in quiet ponds and streams. The leaves are heart-shaped and usually float on the water. They range from 8 - 38 cm wide. The flowers bloom from May to September.

Uses:

Food

The rootstocks, which are buried in the mud, have a high starch content. They are an excellent food either boiled or baked. They can also be dried and ground into meal to make a gruel or a thickening for soup. The seeds can be removed from the pods, parched, and eaten like popcorn.



44

45. Pineapple-weed

The flowers sit on top of a branching, leafy plant 15 - 46 cm high. The plant smells like pineapple when crushed. It grows along roadsides and in waste areas. It blooms from June to October.

Uses:

Beverage

Dried flowers can be steeped to make a tea.

Medicine

The leaves are said to make a relaxing tea for insommnia, upset stomach, and indigestion. The leaves have also been used as a poultice for swelling, earache, and insect bites.

45

46. Ragwort, Tansy

This cluster of flowers grows by roadsides and in fields. It ranges from 30 - 90 cm in height. Its leaves are deeply cut. The plant probably causes much hay fever because its pollen is wind blown and not carried from plant to plant by insects. It blooms during July and August.

Uses:

Medicine

The plant was once used to cure a disease called "staggers" in horses. However, it is generally regarded as poisonous to livestock.

46

47. Silverweed

The flowers grow on a leafless stalk, which is attached to a creeper 30 - 90 cm long. The leaves are silvery color underneath. The plant prefers wet, sandy shores and blooms from June to August.

Uses:

Food

The roots are tasty when boiled or roasted. They taste something like parsnip. They can also be added to soup.

Medicine

The roots when prepared and applied properly have been known to stop bleeding.

47

48. Touch-Me-Not, Pale

This flower is yellow with a few brown spots. The seeds when ripe pop out of the seed capsule when it is touched. The plant is 90 - 180 cm high and blooms from July to October. It prefers meadows and moist woods.

Uses:

Medicine

The juice from the plant seems to cure the rash caused by poison ivy.

48

49. Trefoil, Birdsfoot

Flowers form long clusters on 50 - 60 cm stems. The leaves are clover-like in appearance. The plant grows in fields and along roadsides. The seed pods look something like a birdsfoot. The flower blooms from June to September.

50. Yellow-Rattle

Erect stems bear stalkless yellow flowers in leafy spikes. The stems reach a height from 10 - 80 cm. The seeds rattle in the pods when they mature. The plant obtains some of its nutrients from the roots of other plants. It blooms from June to September.

50

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APPENDIX D

1. Aster, New York — Blue; 2.5 - 3 cm wide and 20 - 90 cm high. Narrow leaves. Nearly smooth stem. Shorelines, marshes, meadows.

2. Bluebell — Blue, bell-like; 2 cm long and 15 - 20 cm high. Narrow stem leaves; broadly ovate basal leaves. Shorelines, meadows.

3. Chicory — Blue; several stalkless flowers attached to stem 30 - 120 cm high. Basal leaves 7.5 - 15 cm long. Smaller stem leaves. Roadsides, meadows.

4. Skullcap, Common — Blue, violet; 5 mm - 1 cm wide attached to stem 30.5 - 90.4 cm high. Slightly toothed leaves. Shorelines, meadows.

5. Vetch, Cow — Blue to lavender; 1.3 cm long on 1.2 m vine. 8 - 12 pairs of narrow leaves. Shorelines, meadows, clearings, roadsides.

6. Cattail, Common — Brown; tiny yellowish flowers on 15 cm spike attached to brown 15 cm cylinder. Plant 90 - 270 cm high., Very tall leaves, 2.5 cm wide. Marshes.

7. Plantain, Common — Green; very tiny flowers on 5 - 10 cm spike. Plant 15 - 45 cm high. Leaves 10 cm wide and 15 cm long. Meadows, roadsides.

8.	Plantain, Seaside	Green; tiny flowers on 3.6 cm spike. Plant 5 - 20 cm high. Long, narrow leaves, Shorelines.
9.	Sarsaparilla, Bristly	Greenish-white flower clusters on 30.5 - 90.5 cm high, bristly stem. Leaves 20 - 40 cm tall. Clearings, woods.
10.	Fireweed	Deep pink; 2.5 cm wide on 60 - 180 cm tall stem. Narrow leaves. Clearings, meadows.
11.	Joe-Pye Weed, Spotted	Pinkish-purplish, fuzzy; 8 mm wide in clusters 10 - 14 cm wide on 60 - 180 cm stem. Toothed leaves 6.3 - 20 cm long. Clearings, marshes, meadows.
12.	Knapweed, Black	Pink; 2 cm wide with blackish globular base on stem 30.5 - 91.4 cm high. Narrow leaves. Meadows, roadsides.
13.	Oysterleaf, or Sea Mertensia	Pink to blue; 1 - 2 cm long on low mat-forming plant. Leaves 2 - 3.5 cm long. Shorelines, beaches.
14.	Rose, Northeastern	Deep pink, fragrant; 4 - 6 cm wide on bushy shrub 1 m high. Toothed, oblong leaves 1.3 cm long. Shorelines, marshes.
15.	Thistle, Bull	Pink-red; 3.8 - 5 cm wide on 60 - 180 cm stem. Spiny leaves 7.5 - 15 cm long. Clearings, roadsides.

16.	Twinflower	Pinkish white; 1.3 cm long on creeper 7.5 - 15 cm high. Rounded leaves 1 cm wide with toothed edges. Woods.
17.	Clover, Red	Purple-red; 1.3 cm long on 15 - 60 cm stem. Leaves 1.3 - 5 cm long. Roadsides, meadows.
18.	Heal-All, or Selheal	Purple; 1.3 cm long on 15 - 30 cm stem. Smooth or toothed leaves 2.5 - 7.5 cm long. Roadsides, meadows.
19.	Sorrel, Garden	Red to brown; flowers clustered on spikes. Plant 15.2 - 30.5 cm high. Leaves 10 - 15 cm long that clasp stem. Meadows, roadsides.
20.	Sorrel, Sheep or Common	Red to green; flowers 2 mm long clustered on spikes. Plant 15 - 2 cm high. Arrow shaped leaves 2 - 5 cm long. Shorelines, meadows, roadsides.
21.	Burnet, Canadian	White; 6 mm wide clustered on spikes 15 cm long on 30 - 150 cm high stem. Toothed, oblong leaves 2.5 - 7.5 cm long. Bogs, marshes.
22.	Cinquefoil, Three-Toothed	White; 1 - 1.5 cm wide on stem 2.5 - 25 cm high. Leaflet 1 - 2 cm wide with "three tooth" shape at tip. Rock barrens.
23.	Clover, White	White or pinkish; 2 cm wide on creeper with stem 10 - 25 cm in length. Leaves 2 - 2.5 cm long. Roadsides, meadows.

24. Cotton grass — White, silk hairs; 2.5 cm wide on 45 - 120 cm stem. Leaves 4 mm wide; flat, grass-like. Bogs.

25. Cow-Parsnip — White; 1.3 cm wide in clusters 10 - 20 cm wide on 1.2 - 2.7 m stem. Lobed, toothed leaves 7.5 - 15 cm wide. Moisted areas.

26. Daisy, Ox-Eye — White and yellow; 2.5 - 5 cm wide on 30 - 90 cm stem. Toothed leaves 7.5 - 15 cm long. Roadsides, meadows.

27. Everlasting, Pearly — White; 6 mm wide in clusters on 30 - 90 cm woolly stem. Narrow leaves 7.5 - 13 cm long. Roadsides

28. Eyebright — Pale lavender; 8 - 13 mm long clustered on hairy stem 10 - 38 cm high. Toothed leaves 6 - 20 mm long. Roadsides, meadows.

29. Lily, Fragrant Water — Water or pink; 8 - 13 cm wide. Leaves 10 - 30 cm wide. Ponds.

30. Meadow-Rue, Tall — White; 8 mm wide in clusters on top of 60 - 240 cm high plant. Three-lobed leaflets 2.5 cm long. Marshes, meadows, clearings.

31. Meadowsweet — White or pale pink; 6 mm wide arranged in clusters on plant 60 - 150 cm high. Toothed leaves 3.8 cm long. Marshes, meadows.

32.	Stitchwort, Lesser or Common	White; 8 mm wide on 30.5 - 50.8 cm stem: Flowers tend to cluster. Small, narrow leaves. Meadows, roadsides.
33.	Sundew, Round-Leaved	White; 6 mm wide on 10 - 25.5 cm stem. Circular, reddish, sticky leaves 1.3 cm long. Bogs.
34.	Turtlehead	White; 2.5 - 3.8 cm long on 30 - 90 cm high stem. Narrow, toothed leaves 8 - 15 cm long. Marshes.
35.	Yarrow	White; 6mm wide in clusters on top of 30 - 90 cm stem. Fine, fernlike leaves 15 cm long. Roadsides, meadows.
36.	Black-Eyed Susan	Yellow; 5 - 7.5 cm wide on hairy stem 30 - 90 cm high. Rough, hairy leaves 5 - 17.5 cm long. Meadows, roadsides.
37.	Butter-And-Eggs	Yellow; 2.5 cm long in terminal clusters on leafy stem 30 - 90cm in height. Leaves 2.5 - 6.3 cm long. Meadows, roadsides.
38.	Buttercup, Common	Glossy yellow; 2.5 cm wide on hairy stem 60 - 90 cm high. Deeply cut, basal leaves 2.5 - 10 cm wide. Roadsides, meadows.
39.	Cinquefoil, Shrubby	Yellow; 1.5 cm wide on woody stem 30 - 91.4 cm tall. Narrow, silky leaves. Bogs, meadows, shores.

40.	Dandelion, Common	Yellow; 3.8 cm wide on 5 - 45 cm stem. Deeply toothed, basal leaves 5 - 40 cm long. Meadows, roadsides.
41.	Goldenrod	Yellow; 5 mm wide near top of 30 - 90 cm stem. Leaves of various shapes and sizes, depending on species. Roadsides, meadows, shorelines, marshes, woods.
42.	Honeysuckle, Northern Bush	Yellow; 2 cm long funnel-shaped on 30 cm - 1.2 m bush. Toothed leaves 5 - 10 cm long. Roadsides woods, clearings.
43.	King Devil, Common; or Yellow Hawkweed	Bright yellow; 1.3 cm wide on 30 - 90 cm stem. Hairy, oblong, basal leaves 5 - 25 cm in length. Roadsides, meadows.
44.	Lily, Yellow Pond	Yellow, cup-like; 3.8 - 6.3 cm wide. Heart-shaped leaves 7.5 - 37.5 cm long. Ponds.
45.	Pineapple-weed	Yellow; 5 mm across on 15 - 46 cm stem. Finely cut leaves. Clearings-roadsides.
46.	Ragwort, Tansy	Yellow; 2 cm wide in clusters on top of 30 - 90 cm stem. Fine, deeply cut leaves. Fields, roadsides.

47.	Silverweed	Golden yellow on leafless stalk; 1.6 - 2.5 cm wide on creeper 30 - 90 cm long. Toothed leaflets 3.8 cm long; silver color underneath. Shorelines, meadows.
48.	Touch-Me-Not, Pale	Yellow with brown spots; 3.8 cm long on stem 90 - 180 cm high. Toothed leaves 2.5 - 10 cm long. Meadows, moisted woods.
49.	Trefoil, Birdsfoot	Yellow; 1.3 cm long in clusters on 15 - 60 cm high stem. Clover-like leaves with leaflets 1.3 cm long. Fields, roadsides.
50.	Yellow-Rattle	Yellow; 1.3 cm long on 10 - 80 cm stem. Mature seeds rattle inside pods. Toothed leaves 2 - 6.3 cm long. Roadsides.

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APPENDIX E

STUDENT QUESTIONNAIRE

You have just completed a unit on Newfoundland wildflowers. The following page contains fifteen items. Please give a letter grade, either A, B, C, D, or F to each. Think about each item carefully and put an X on the letter that you feel is the right grade. The letters have been given the following values:

A - Excellent
B - Good
C - Fair
D - Poor
F - Very Poor

	Excellent	Good	Fair	Poor	Very Poor
1. Slide Presentation	A	B	C	D	F
2. Field Trip	A	B	C	D	F
3. Did you find the cards helpful?	A	B	C	D	F
4. Was the worksheet useful?	A	B	C	D	F
5. What did you think of the information that your teacher gave you on wildflowers?	A	B	C	D	F
6. Did you like the way the unit was organized?	A	B	C	D	F
7. Did you find the unit interesting?	A	B	C	D	F
8. Did you learn anything about wildflowers?	A	B	C	D	F
9. Was the unit useful in helping you identify wildflowers?	A	B	C	D	F
10. Was the information clearly presented?	A	B	C	D	F
11. Did you like the unit?	A	B	C	D	F
12. Did you understand almost everything?	A	B	C	D	F
13. Did you find the unit difficult?	A	B	C	D	F
14. Was the unit too long?	A	B	C	D	F
15. How would you grade the unit as a whole?	A	B	C	D	F

If you want to make comments, please use the back of this sheet.

Thank you.

TEACHER QUESTIONNAIRE

When you have finished the unit on Newfoundland wildflowers, please fill in the following questionnaire. Please give a letter grade, either A, B, C, D, or F, to each item that is listed. As in the student questionnaire, the letter values are:

A - Excellent
B - Good
C - Fair
D - Poor
F - Very Poor

1. Purpose of unit clearly seen

   A B C D F

2. Method of presentation

   A B C D F

3. Organization of material

   A B C D F

4. Quantity of information

   A B C D F

5. Quality of information

   A B C D F

6. Quality of slides

   A B C D F

7. Value of student cards

   A B C D F

8. Value of worksheet

   A B C D F

9. Value of teacher's manual

   A B C D F

10. Ease of presentation

    A B C D F

11. Usefulness in teaching about wildflowers

    A B C D F

12. Interest to students

    A B C D F

13. Suitability of materials to students

    A B C D F

14. Appropriateness of materials to grade level

A B C D F

15. Appropriateness of materials to the Grade 7 Searching for Structure Science Program

A B C D F

16. Indications that learning took place

A B C D F

17. Topic adequately covered

A B C D F

18. Value to other grades

A B C D F

19. Overall value of the unit

A B C D F

20. Comments:

21. Would you recommend these materials to other teachers of Grade 7 Science?

Yes ☐

No ☐