The Use of Films in Elementary Science

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THE USE OF FILMS IN ELEMENTARY SCIENCE

The selection of motion picture films for their contributions to educational objectives, and the optimal use of such films, have been primary problems for all teachers. This is especially true in the field of elementary science.

The purposes of this bulletin are to suggest objectives to which films may be expected to contribute, and to suggest methods for obtaining the maximal values from the use of such films. In addition, specific films are suggested for use in the various areas of elementary science.
INTRODUCTION

The purpose of this bulletin is two-fold: (1) to suggest methods by which motion picture films may be used more effectively for teaching elementary science; and (2) to provide an annotated list of films which may contribute to the attainment of the major objectives of science teaching at this level. These objectives are the development of understandings of scientific principles, the development of scientific attitudes, and training in the skills of the scientific method.

The opinions of teachers toward the use of films are diverse. Some teachers believe films are among the most effective of all visual aids; some believe they have little or no value; and others have considered films as devices for entertainment. There is reason to believe that, depending upon the use of the film, any of these viewpoints may be justified. The writer is, however, in accord with the first viewpoint. Therefore, suggestions are here given for their most effective use.

The writer wishes to extend his gratitude to the individuals who assisted him in various phases of this study. Acknowledgement is due Waldemar Gjerde of Iowa State Teachers College, Harold E. Sturm, University of Michigan High School, and Mrs. Charlotte Bishop, Western Michigan College of Education for assistance in evaluating the films listed in the study. Credit is extended to Miss Dorothy Cook of Western Michigan College of Education for typing and editing the final manuscript. Credit, also is due Mr. Erwin Schumacher, Instructor in Science, Burlington High School, Burlington, Iowa for developing the form used for evaluating the films as well as for his assistance in evaluation.

George G. Mallinson
Western Michigan College of Education

(Copies ten cents each postpaid)
As instructional media, both sound and silent films are relatively new. Despite the many problems involved in using these visual aids effectively, it is common knowledge that films are here to stay.

There is no dearth of published material concerning the use of films. Nearly all professional journals devote space to this phase of educational experience, and some journals are devoted almost entirely to it.

However, a survey of these articles and reports of research indicates that a very small proportion of them deal with the use of films at the elementary-school level. Further, a survey of the various film catalogues indicates that an extremely large percentage of films available for schools are prepared for use at the secondary level, and a small percentage for use at the elementary.

The need for attention to the use of films at the elementary level has not been unnoticed. A recent report prepared by the Committee of Publishers (1) evinced the following information:

1. Most of the motion pictures available for school use have been aimed at high-school students.

2. The only fields in which there is any substantial use of motion pictures in elementary schools are social studies and science, with social studies well in the lead.
3. The teachers in elementary schools would like to make greater use of films but are deterred by lack of equipment, lack of knowledge of how best to use films, lack of knowledge of the films available, and the difficulty of obtaining films when they are needed.

4. Teachers of science are more critical of the problems attending the use of films than are teachers of other fields.

It would seem, therefore, that teachers of elementary science might well benefit by receiving information on how to use films for maximal effectiveness, where such films may be obtained, and what specific films are available.

It is therefore the purpose of this bulletin (1) to suggest ways for using films to obtain their maximal effectiveness, and (2) to list specific films which may be used in various areas of elementary science.

PART I

Procedures for Using Films
In Elementary Science

Why Show Films

There is nothing inherently valuable in the use of the motion picture film. The film should be evaluated in the same manner as any other teaching technique. Films should be used when they serve a teaching purpose that no other material or technique will serve, or when they serve that purpose better. If some other device, material, or technique will provide the desired learning experiences in a simpler or more direct fashion than will a film, then the use of the film should be disregarded.

Films may serve any one of the following purposes in elementary science (5):

1. To introduce a new unit of study.
2. To stimulate further study and exploration in an area of subject matter.
3. To develop understandings of basic concepts or generalizations.

4. To illustrate abstract ideas.

5. To illustrate interrelationships among various environmental factors.

6. To develop the habit of critical thinking.

7. To provide students with vicarious experiences of events otherwise inaccessible to them.

8. To provide a summary of an area of subject matter.

It must be emphasized strongly that the teacher should not order a film and then attempt to determine the purpose or purposes that the film may serve. The film should be selected only if it will contribute to the aims and purposes set up by the teacher.

The following films, selected from the list in Part II of this bulletin, are used to illustrate how such films may be used for the purposes just mentioned.

The success of any unit of study depends largely upon the extent to which interest is stimulated initially. The film, Our Animal Neighbors, can be used effectively for introducing and stimulating an interest in a unit on animal life. The film acquaints the children with the habits and appearances of many small animals living about them. It shows them what to look for, since few children realize how many small animals are their neighbors. This film encourages children to watch for these animals near home.

Although all films should stimulate thought and further study, some are more effective than others for this purpose. What Makes Day and Night is especially effective for stimulating students to study further the many heavenly bodies. This film deals mainly with the relative positions and movements of the sun and earth, but also will stimulate interest in studying other stars and planets.

The development of understandings of scientific principles is one of the primary objectives of science teaching at the elementary level. The film, How Nature Protects Animals,
can be used effectively for contributing to the understanding of the scientific principle, "Protective adaptations are an aid to survival." The film shows how fleetness of foot, coloration, and secluded homes are used by animals as defenses.

The illustration of abstract ideas and concepts is extremely difficult with younger children. The development of an understanding of the nature of electricity is an outstanding example of this. **The Flow of Electricity** is especially designed to teach young children the elements of the electron theory and how the flow of electrons is responsible for the electricity in our homes.

**Wearing Away of the Land** illustrates clearly the interrelationships among various environmental factors in wearing down the surface of the earth. The combined effects of chemical decomposition, glacial action, and wind and wave movements on the land and the effect of these agents of erosion on local industry are depicted.

The development of scientific attitudes and skills in the scientific method are major objectives of the teaching of science at the elementary level. The development of the habit of critical thinking involves both the scientific attitudes and the elements of the scientific method. **Science and Superstition** emphasizes the need for habits of critical thought. The film shows how students use the scientific method to prove that certain common beliefs are false.

While direct experiences are the best learning activities, the time required for observing certain phenomena, or the inaccessibility of the location, may make the direct experiences impracticable. In such cases vicarious experiences must suffice. **The Growth of Flowers** uses time-lapse photography to show in ten minutes a process which requires ten weeks. The sequence of development of the flower from sprouting to dying as shown by the film could not be observed by the child.

The summary at the end of a unit frequently determines whether or not the student develops an understanding of the total area of study. **What Makes Rain** depicts the processes of evaporation, condensation and precipitation as they apply to the water cycle. These processes are summarized as parts of the total cycle in a most effective fashion.
These films, therefore, have possibilities for contributing to the purposes and objectives of science teaching at the elementary level.

**Securing the Film**

Once having decided to use a film to accomplish one or more of the above purposes, the problem of securing a film must be faced. It is first necessary to select a film which seems to fit the needs of the particular learning situation.

There are two excellent sources for locating such films. One of these is the *Educational Film Guide* (2) and the other is *1000 and One* (6) film guide published by *Educational Screen*. A search through the topical index and an examination of the descriptions of possible films will indicate those which may be desirable for the purpose intended. It then becomes necessary to write the film publisher who, or library which, according to the guides, has the film available for rental.

For optimal results the film should be used at a time when children want to learn, or become interested in, a certain area of subject matter. This makes the advanced scheduling difficult. Unfortunately, films are extremely difficult to obtain exactly when they are desired. With few exceptions they must be booked at least one month in advance, and in many cases as much as six months. Therefore, it is usually necessary to plan the lesson for the time the film is available, rather than obtaining the film when the topic emerges from student interests.

**Previewing the Film**

Once the film has arrived it is of upmost importance that a careful preview be made. It must be stressed that although the film has arrived at the desired time, the contents of the film may not be satisfactory for the intended purposes. In such cases more harm than good will result from its use. The teacher can determine during the preview whether it will suffice. In this preview the teacher should study the material carefully to determine if it is authentic and understandable. A list of the concepts presented by the film should be made.
The vocabulary should be checked carefully, and the unfamiliar words should be noted. The important points emphasized in the film should be listed. The grade level of the material should be considered also, since a film that is too difficult for the group is of little value.

It is unlikely that any film will be wholly satisfactory. As evidenced in a recent study (4), errors in subject-matter content in the film are not uncommon. Frequently films cover too much ground, and sometimes the subject matter is not covered adequately. It will be necessary for the teacher to decide whether or not the advantages of the film outweigh its disadvantages.

If teachers’ manuals are provided with the film, they should be examined, since much valuable information may be obtained from them.

**Preparing the Class**

When the teacher has decided that a certain film serves the desired purposes and objectives, a number of procedures must be carried out. The film of course will have been previewed, and the teacher will have made certain that it will be available when needed. It will be necessary to arrange for a room in which to show the film, and to make certain that the projection equipment is available, and in proper operating condition. If an audio-visual director has charge of the equipment, a projector and screen should be reserved well ahead of time.

The class should be prepared well in advance of the actual showing of the film. It should be emphasized however that the unit should not be centered about the film. The film is merely a device for contributing to the objectives of the unit. Immediately preceding the showing of the film, the teacher should discuss thoroughly with the students the material needed to understand the film. The contents of the film, however, should not be described verbatim, as this will likely detract from its novelty. The unfamiliar vocabulary should be presented to the class, and the difficult words defined. If concepts are presented in a way which might cause misunderstanding, they too should be clarified. Problems to the solution
of which the film contributes should be discussed, and the pupil stimulated to investigate further the material presented in the film. It also desirable that pupils be given a number of questions to which answers should be sought in the film. Note-taking during the showing of the film should be discouraged, since there is evidence that it detracts from the pupil's attention.

At this time any inaccuracies should be pointed out. It is easier to caution the students against accepting erroneous information before the film is shown rather than to eradicate false ideas afterward.

**Showing the Film**

It is generally difficult for the teacher to make many changes with respect to the physical features of the classroom, but attention to a number of factors can improve the showing of the film.

First, the teacher should be thoroughly familiar with the operation of the projector. Although the machine is operated by a student, the teacher should be able to correct any difficulties that arise.

It is desirable that the film be shown in the regular classroom. In elementary schools this is usually necessary, since projection rooms are seldom available. The regular classroom is usually best since the class will feel that the use of the film is a part of the regular procedure in the classroom rather than a special form of entertainment.

It is unlikely that every elementary classroom will have dark shades. If such shades are not available the teacher need not be discouraged entirely. If the room cannot be darkened completely the use of colored films is impracticable. However, black and white films can be used effectively in rooms where only light shades are present. Nearly all projectors are so made that a lamp of 1000 watts can be used. In a partially-darkened room it is advisable to use this strength lamp in the projector. The screen should be placed in the darkest part of the room in such a position that direct light from the windows does not fall upon it. A beaded screen is most satisfactory in a rectangular room if the students are so seated that none views it at an angle greater than thirty degrees with a
line perpendicular to its surface. If the room is so shaped that part of the group must view the film at an angle greater than that mentioned above, a painted screen is likely to be most effective. If the group is small the projector may be moved closer to the screen without blocking the view of some of the students. This does reduce the size of the image. Therefore, care must be taken to assure that the image is not too small for students to recognize pertinent detail.

**Re-showing the Film**

A film may be shown once, twice, or many times to a group. After the first showing, many questions may arise which may best be discussed and answered immediately. A second showing may provide opportunity for clarifying any questions or misunderstandings which have arisen. One method which may be used to advantage with sound films is to show the film the second time without using the sound. This enables the teacher to explain parts of the film not thoroughly explained in the commentary. It also permits students to raise questions during the showing of the film. Needless to say, if all information is presented clearly and no misunderstandings arise, one showing is enough.

**The Follow-up Activities**

The follow-up activities are among the most important steps in the use of the film.

It is obvious that the film has not fulfilled its purpose if the curiosity of the students has not been aroused, or if students are not able to answer the questions to which the film was expected to contribute information. The more important values come in later discussion, not about what the students saw, but what they thought about what they saw. A test measuring the facts retained from the film is probably useless, but a measurement of conclusions drawn and the opinions crystallized is of great value.

The follow-up activities may consist of, among others, discussions, reports by committees, field trips to experience directly what was obtained vicariously from the film, collections of material, supplementary readings, and possibly the use of other related films.
The habit of critical thinking, to which the showing of the film may contribute, is probably the major objective toward which the activity should be directed. Whatever may be the objectives, however, the follow-up activity cannot be omitted.

PART II

Motion Pictures
for Elementary Science

The purpose of this section of the bulletin is to suggest, for use by elementary-school teachers, those films which may have value for courses in elementary science. This section describes the content of these films, presents other data pertinent to the use of them and suggests the subject-matter areas in science for which they may be used for contributing to the major objectives.

Although this bulletin lists films that are, in the opinion of the reviewers, excellent for science courses at the elementary-school level, it does not contain all of the films that are available in the various categories. New films are being produced steadily, many of them being of value for the purposes just stated. Information concerning these new films may be obtained from the Educational Film Guide (2), or from the current issue of 1000 and One (6) published by Educational Screen.

It was decided arbitrarily to select for each of the categories of topics for general science identified by Curtis (3) those films which in the opinion of the reviewers were best suited for contributing to the major objectives of science teaching at the elementary-school level.

From the various science films listed in Educational Film Guide (2) were selected those whose content might be of value for the purposes just mentioned. These films were then obtained from various film libraries, chiefly those of the University of Michigan and the University of Iowa. All of the films were then reviewed by the author, and by a specialist in the field of elementary education, and in some cases by an additional person who was either a specialist in science education or in
elementary education. After having viewed the films the reviewers filled out the Rating Sheet for Films for Elementary Science (See Appendix A). Those films which were judged as "Excellent" or "Acceptable" for use in elementary science by all reviewers were included in the list which follows.

The following list includes the categories of science topics for which the films were recommended, the title of the film, whether best suited for the primary (P) and/or intermediate (I) levels of the elementary school, whether a sound (Sd) or silent (Si) film, the number of minutes required for presentation, a series of code letters designating the film publisher (ex., COR), and a brief statement of the content of the film. If the film is colored the letters, "cld" follow the type of film. Appended to the bulletin are the addresses of the various publishers together with their designated code letters.

**AIR**

*Air in Action*  
I—Sd (cld) 10 COR

Demonstrates the science of aerodynamics by explaining simple parlor tricks in terms of scientific principles. Animated drawings are used to explain the principles and applications of air in action.

*The description of the film is read thus: The film, Air in Action, was judged to be of value for developing the topic, "Air". The film has a sound track, is colored, has a running time of 10 minutes, and is published by Coronet Instructional Films (COR). It is of value for the intermediate level.*

**ASTRONOMY**

**The Earth and Its Seasons**  
I—Sd 10 KB

Explains the changes of seasons and the equinoxes and solstices. The angles at which the sun's rays strike the hemispheres in the different seasons are used to explain the differences in amount of light and heat.

**What Makes Day and Night**  
I—Sd 8 YA

Shows how day and night are caused by the rotation of the earth, and how the side of the earth toward the sun is
experiencing day, and the side away from the sun is experiencing night. Uses a globe to illustrate this movement, as well as the direction of it.

**BUILDING MATERIALS**

**Shelter**

I—Sd 10 EBF

Depicts the effects of climate and materials on type of shelters man uses, and how man uses the raw materials available to suit his needs, i.e., adobe houses, use of brick, cement and steel in modern structures.

**Trees and Homes**

I—Sd (cld) 18 W

Shows the history of the tree from standing timber to the completed home. Shows how trees are grown, harvested and how various sizes and types of lumber are manufactured from the tree. Depicts the use of waste products and scrap for manufacturing construction materials.

**CLOTHING**

**Clothing**

I—Sd 10 EBF

Shows the development of manufacturing processes for textiles from the early hand methods to modern mass production. Stresses the influence of climates on type of clothing worn.

**Clothing for Children**

I—Sd (cld) 11 COR

Presents the styles and types of clothing for young children. Emphasizes the types for various ages with respect to health value and practicality.

**Making of Shoes**

I—Sd 11 EBF

Shows how shoes are manufactured in modern American factories from the leather to the finished product.

**CRUST OF THE EARTH**

**The Earth’s Rocky Crust**

I—Sd 11 EBF

Shows the formation of sedimentary, igneous and metamorphic rock using animated diagrams. Shows how soil is formed by the weathering of rock.
The Work of Running Water

Describes the effects of running water on the surface of the earth. Shows how dikes, alluvial fans, meanders and waterfalls are formed.

Wearing Away of the Land

Relates how land is affected by chemical action, glacial movements, and wind and wave action. The formation of caves, icebergs and glaciers is shown.

What is Soil?

By using simple experiments shows the nature of soil. Describes how soil is formed and how man depends upon soil for his life.

ELECTRICITY AND MAGNETISM

Magnets

Demonstrates a few of the basic facts about temporary and permanent bar magnets and their behavior. By means of experimentation two young children learn how magnets repel and attract one another and how the lines of force pass through materials such as glass and paper.

The Flow of Electricity

Describes the flow of electricity by means of a simple demonstration in a home situation. Explains the phenomenon of electricity as the flow of electrons through a closed circuit. Shows the use of insulation on wires.

ENVIRONMENT

Science and Superstition

Teaches students how to differentiate between science and common superstitions by means of simple classroom projects. Emphasizes the need for developing the habit of thinking critically.

Spring on the Farm

Shows how plants and animals become adapted to changes in seasons. Shows appearance of animals, growth of plants. Covers the months of March, April and May.
Summer on the Farm

Illustrates the growth of plants and animals during the summer season. Shows the activities of such animals as fish, frogs and dragon flies. Shows crops growing in summer, cultivation of corn and growth of flowers. Covers the months of June, July and August.

What is Science

Presents the application of the “scientific method” which begins with curiosity and proceeds through observation, setting up and testing of hypotheses and arrives at a conclusion.

Winter on the Farm

Depicts winter as the time when plant and animal activities slow down, when food is scarce, and when domestic animals need the maximum of care. Shows tracks of winter animals and activities of birds. Covers the months of December, January and February.

FIRE

Our Common Fuels

Depicts how man takes basic fuels from nature and then makes other fuels from them. Compares the values of these fuels on the basis of heating value, cost, convenience, and cleanliness.

FOOD

Bread

Tells the story of bread from the wheat harvest, through the flour mill, and finally to a modern bakery. Illustrates the importance of machinery and mass production in the food industry.

Eggs

Shows the production of eggs on a large commercial farm. Emphasizes the care and feeding of flocks, gathering and cooling of eggs, and finally candling, grading, cleaning and packing.
Fundamentals of Diet

Classifies food in terms of its function in nutrition. Shows how the young of both plants and animals are provided with these foods. Gives examples of many foods in each of the classifications and shows what happens when the diet is deficient in them.

Milk

Shows how milking is carried on by hand and machine at a dairy farm. Shows the need of immediate cooling, transporting to bottling works, pasteurizing and finally bottling.

HEALTH EDUCATION

About Faces

Portrays the gradual appreciation of an American family for the necessity for preventative dentistry, early dental care, and proper mouth hygiene. Relates the dental experiences of a young man from pre-school age through adulthood.

Defense Against Invasion

By animation shows how antibodies are built up in the bloodstream to counteract diseases. Emphasizes the values of immunization.

Joan Avoids a Cold

Shows how violation of rules of good health makes one susceptible to colds. Shows how a young child avoids a cold, and how parental cooperation is needed.

Your Ears

Explains and illustrates the structure and function of the human ear. Animated diagrams are used to show how sound waves are received and are transmitted to the inner ear. The effect of colds upon the ear are stressed.

Your Eyes

Uses animation, as well as action, to illustrate the structure and function of the human eye. Shows how the eye is
protected by eyebrows, eyelashes, and eyelids. Shows causes of, and methods of correction for, nearsightedness and farsightedness.

Your Teeth

Illustrates and explains the structure, growth and care of the teeth using live action and animation. Shows how baby teeth are replaced by permanent. Explains how and why teeth decay, and shows proper methods for brushing them.

HEAT

Distributing Heat Energy

Describes the various sources of heat such as coal, gas, electricity, oil and wood. Shows how heat is distributed by conduction, convection and radiation. The use of insulating materials for houses and containers is explained.

LIGHT

None Judged As Suitable

LIVING THINGS

Baby Animals

Introduces and explains such concepts as degree and type of parental care in different animals, and the relationships among the number of young, amount of parental care, and chances for survival.

Birds to Prey

Shows the characteristics of various birds of prey such as hawks, owls, vultures and eagles. Shows the unusual structure of their eyes, beaks, feet and feathers.

Birds of the Dooryard

Uses a telescopic lens color camera to show the details of living habits of common birds, such as the sparrow, robin and wren. Shows the common nesting places of these birds.

Butterfly Botanists

Dramatizes the life histories of some of the more common butterflies throughout the egg, larva, chrysalis and adult
stages. Shows how these animals find the plants they need for food.

**Cecropia Moth**

A photographic reproduction of the life history of the Cecropia moth from the egg to the adult stage. Depicts the eating habits and the spinning and shedding of the cocoon.

**How Animals Defend Themselves**

Deals with the way in which animals have become adapted for protection against other animals and nature. Protective adaptations, such as speed, claws and beaks, camouflage and mimicry are shown.

**How Animals Eat**

Deals with the concept of how animals have become adapted for food-getting in order to survive. The film deals with food-getting mechanisms such as webs, teeth, claws and poison mechanisms.

**How Animals Move**

Shows how animals are adapted to move in order to get food and to survive. Emphasizes the various ways in which animals have become adapted such as the development of wings, fins and legs.

**How Nature Protects Animals**

Shows how animals survive by means of protective coloration and by other protective adaptations such as speed, mimicry, armor, odors, and hidden homes.

**Honey Bee**

Depicts the life history and activities of the honey bee. Stresses the community life of the honey bee and its part in pollination of flowers.

**Leaves**

Shows how the leaves are related to the other parts of the plants. Using cross-sectional views of trunks and leaves of trees, describes the processes of photosynthesis. Animation, microphotography and time-lapse photography are used.
Life in a Drop of Water

Uses microphotography to show the tiny organisms such as amoeba, spirogyra and paramecium living in a drop of water. Shows how the life processes of these plants and animals meet the same life problems as do the higher forms of plants and animals.

Our Animal Neighbors

Acquaints children with the habits and appearances of the many small animals which make their homes near them. Shows animals such as rabbits, squirrels, chipmunks, mice, moles, and bats. Encourages the child to look for these animals.

Pigs and Elephants

Explains how the common pig is related to such animals as the wart-hog, the elephant and the hippopotamus. Their similarities, and the characteristics which distinguish them from each other are illustrated.

Plant Growth

Uses the pea plant to illustrate the life cycle of plants from the opening of the flower, through seed germination, growth of roots, stalk and tendrils. Cross-pollination and streaming of protoplasm in pollen tubes is shown by microphotography.

Poultry on the Farm

Pictures the appearances and habits of young and adult chickens, ducks, geese, and turkeys. The natural sounds of these birds are reproduced on the sound track.

Robin Redbreast

Tells the story of a family of robins from the time of nest building until the fledgling robins are old enough to take care of themselves.

Snakes

Emphasizes the fact that most snakes are harmless and describes the four poisonous snakes found in the United States.
Shows the life habits and adaptations of the harmless varieties.

**The Bear and Its Relatives**

Attempts to correct false beliefs concerning the raccoon, panda, brown bear, polar bear and black bear. Depicts the living habits of these various animals which are related.

**The Care of Pets**

Dramatizes the proper care of household pets such as the dog, cat, canary and goldfish. Emphasizes the need of humane treatment of animals.

**The Cow and Its Relatives**

Shows how the cow is related to such animals as the zebu, the yak, the kudu, and the giant eland. These animals are photographed in their native habitats.

**The Deer and Its Relatives**

Describes the adaptations of members of the same family of animals to life in different parts of the world. The deer, camel, llama, and giraffe are used to show how related animals vary when living under different conditions of environment.

**The Growth of Flowers**

Uses time-lapse photography to show flowers sprouting from the ground, blooming and finally dying. In ten minutes it shows a process covering a period of about ten weeks.

**The Horse and Its Relatives**

The characteristic habits of the members of the horse family are illustrated. The zebra, tapir, rhinoceros, burro, draft horse and saddle horse are described from the viewpoint of their social and economic significance.

**The Robin**

Relates the story of the robin from arrival in the North at spring, until return to the South in the fall. Shows life activities of gathering food, building nests and rearing a new brood. Shows the relationships among robins, thrushes and bluebirds.
MATTER AND ENERGY

Simple Machines

Shows the basic features of the simple machines — the lever, the inclined plane, the wedge, the pulley and the screw. Applications of these devices to modern complex machines are demonstrated. Animated drawings are used to clarify the mechanical principles.

STUDY OF INDUSTRY

Behind the Scenes at the Airport

With a transport pilot as a guide the class is taken on a trip about the airport. Shows the overhauling and testing of engines and the activities necessary for operating and maintaining an airport.

New Automobiles

Describes the many products needed for building automobiles and shows the activities taking place on the assembly line for constructing automobiles.

Paper

The story of modern paper-making from the forest to the finished sheets. Shows how trees are cut, sawed, chipped, made into pulp and then into paper.

Trees to Tribune

Traces the manufacture of paper from the forest tree to the final printed edition. Emphasizes the activities involved in publishing a modern daily newspaper.

SOUND

None Judged As Suitable

WATER

Clean Waters

Portrays the importance of our natural waters. Tells the story concerning the annual loss in the United States due to water pollution. Emphasizes the danger of such pollution to fish, wild life, water systems, recreational facilities and public health.
Our Water Supply

Shows how the water supply originates from rainfall, how it is purified naturally, and how later it becomes contaminated. Depicts the various processes used in purifying the public supply.

WEATHER AND CLIMATE

What Makes Rain

Explains the processes of evaporation, condensation, and precipitation as they apply to the water cycle. Shows how water evaporates from puddles, wet clothes and tea kettles, and how the water vapor condenses when it cools. These processes are used to explain the occurrence of rain and other forms of precipitation.

BIBLIOGRAPHY


APPENDIX A

RATING SHEET FOR FILMS

For Elementary Science

TITLE ______________________ So.______Si.______Time.______Bw.______Color.____
Publisher ________________________________________________________________
Is the aid accurate and authentic? ______________
Is the photography good? ______________
Is the sound good? ______________
Is it up to date? ______________
Are the titles or commentary adequate? ______________

Use of film
Introduction ______________________
Contributory ______________________
Summary ______________________

Grade level for which best suited
Primary ______________
Intermediate ______________
Secondary ______________

Subject area for which best suited

______ Air __________ Health Education
______ Astronomy __________ Heat
______ Clothing __________ Light
______ Crust of the earth __________ Living things
______ Elec. & magnetism __________ Matter and Energy
______ Environment __________ Study of Industry
______ Fire __________ Sound
______ Food __________ Water
______ Weather and Climate

General Description:
Rating of film as whole for use in Elementary Science

Excellent ______________
Acceptable ______________
Not Acceptable ______________

Name of Reviewer
### APPENDIX B

**ADDRESSES OF FILM PUBLISHERS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name and Address</th>
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</table>
| (AM) | Automobile Manufacturers Association  
320 New Center Building  
Detroit 2, Michigan |
| (COIA) | Coordinator of Inter-American Affairs  
U. S. Office of Inter-American Affairs  
Washington, D. C. |
| (COR) | Coronet Instructional Films  
65 E. South Water Street  
Chicago 1, Illinois |
| (EBF) | Encyclopedia Brittanica Films, Inc.  
20 N. Wacker Drive  
Chicago 6, Illinois |
| (EFS) | Educational Films Service  
180 N. Union  
Battle Creek, Michigan |
| (FI) | Films Inc.  
330 W. 42nd Street  
New York, New York |
| (GE) | General Electric Company  
Visual Instructions Service  
1 River Road  
Schenectady, New York |
| (GR) | Greenwich High School Photoplay Club  
Greenwich, Connecticut |
| (HNP) | Heidenkamp Nature Pictures  
538 Glen Arden Drive  
Pittsburgh 8, Pennsylvania |
| (KB) | Knowledge Builders  
625 Madison Avenue  
New York 22, New York |
(TF) Teaching Films Inc.  
2 West 20th Street  
New York, New York

(USPHS) United States Public Health Service  
Washington, D.C.

(W) Weyerhaeuser Sales Company  
First National Bank Building  
St. Paul 1, Minnesota.

(YA) Young America Films, Inc.  
18 E. 41st Street  
New York 17, New York
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