

BULLETIN 1946, No. 5

HOW TO BUILD A UNIT OF WORK



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CONTENTS

	Page
Foreword	
I. The Unit of Work	
Preliminary inventory of interests and resources.....	1
Choosing units of work.....	2
The place of units of work in the total curriculum.....	4
Planning and carrying out units of work.....	5
II. Units of Work for Younger Children	
For younger and less mature children.....	8
Characteristics of units for the 5-, 6- and 7-year-olds.....	8
Provisions for retarded and gifted children.....	9
Curriculum areas for kindergarten and primary grades....	9
Sketch giving suggestions for the preliminary planning of a unit on travel for 7-year-olds.....	11
III. Units of Work for Middle-Grade Children	
Characteristics of units at this level.....	15
Suggestions for the preliminary planning of a unit on communication.....	16
IV. Units of Work for Older Boys and Girls	
Different ways in which a study of aviation might be developed with an upper-grade group.....	21
Emphasis upon economic, social, and international problems.....	21
Emphasis upon the science and mechanics of aviation.....	22
Emphasis upon study of the air and weather.....	23
Suggestions for building a unit of work about required textbook material.....	24
V. Adaptations and Variations in Units of Work	
Unit on aviation in a rural school.....	27
Short and incidental units of work.....	44
Long-term studies which reappear intermittently.....	45
A concluding comment.....	47
VI. References to Help a Teacher Build Units of Work	

[Illustration on cover, courtesy of the Los Angeles, Calif., Public Schools]

HOW TO BUILD A UNIT OF WORK

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Federal Security Agency
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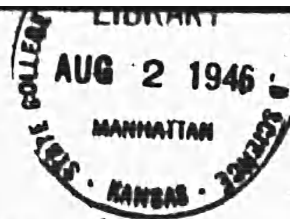
U. S. Office of Education
J. W. Studebaker, Commissioner

FOREWORD

FREQUENT REQUESTS come to the U. S. Office of Education for units of work for the elementary grades or for help with writing units of work. Many of the requests come from teachers of rural schools or schools in areas in which there is no supervisory help. These teachers wish to improve the quality of their work with children by enriching and unifying it and integrating some of the work of the required subjects about a central interest. The teachers who ask for help recognize their role as curriculum makers, but wish guidance in the process of building the units. This bulletin has been prepared as a service bulletin to help teachers select, prepare, and carry through units of work which fit the needs of the children in their groups. A number of suggestions are offered so that a unit of work may be modified to fit the needs of individuals and groups as to time, organization, level and difficulty of content, and types of activities. Among the many suggestions there may be some which will fit the needs of each teacher.

Bess Goodykoontz,

Assistant U. S. Commissioner of Education.



I. THE UNIT OF WORK

UNITS OF WORK represent an effort on the part of the school to relate subject matter and the development of skills in the organization of children's learning about important interests, topics, or problems. The units are made by teachers with their children and are designed to fit the situation in which they are to be used. There is no single pattern for a unit of experience. It can be carried out in a variety of ways depending upon the teacher's interests, her resources, the needs and interests of the children, and the course of study requirements.

The unit organization provides an opportunity for all children to have a common experience, each contributing to it in accordance with his abilities and interests. Gifted children can enrich the total experience through many types of individual contributions, while retarded children participate in learning activities which are meaningful and valuable to them. Each child can work on his own level, yet each can contribute to the worth of the common experience.

Preliminary Inventory of Interests and Resources

Any teacher will plan a better program of work with her children if she knows them well and knows also the resources of interests, activities, and materials that are available in her environment. The outline which follows suggests important points for the teacher to study as preparation for building units of work.

1. The teacher can study the children's interests through:

- Drawing them into discussion
- Observing their activities in the classroom
- Observing their activities in the community
- Noting their choices of work during unassigned periods
- Noting their choices of books and available materials
- Noting the things children make, draw, and paint
- Recognizing the contributions children bring from home
- Listening to their conversation and comments

2. The teacher can study the characteristics of her group of children, their needs and abilities through:

- Observation of children as individuals and as a group
- Records and reports of the progress of these children
- Records of units carried on in previous grades
- Study and diagnosis of skills
- Consideration of special aptitudes and abilities

3. The teacher can study community activities and interests through:

- Articles and items in the local newspapers
- Incidental discussion with parents and other citizens
- Observation of local and community-wide activities
- Participation in church and club groups

HOW TO BUILD A UNIT OF WORK

4. The teacher herself can study community resources and opportunities for worth-while first-hand experiences for children such as:
 - A building under construction
 - New enterprises being launched
 - Industries
 - Libraries and museums
 - Playgrounds and recreational resources
 - Parks, woods, and opportunities for nature trips
5. The teacher individually or as a member of a group can study resources such as:
 - Libraries
 - Textbooks, source books, supplementary books
 - Audio-visual aids
 - Materials for construction and art projects
 - Material for science experiences

Choosing Units of Work

Selecting a unit of work can be done in a number of ways. The methods presented here are those in current use.

1. The unit of work can be chosen cooperatively by teacher and children out of the interests and on-going activities of the group and in line with their self-appointed goals for the year.

Some modern schools would select this method as being the one sure to fit the needs and interests of the children and offering the most opportunities for practice in democratic procedures. The children would have many opportunities to plan, think through problems, seek out facts and information, test their knowledge, and act in relation to it. This method tends to result in a unified and coordinated curriculum for each year, and to lead to scholarship and growth that suits the maturity of the children. In a school such as this, the teacher and children are the curriculum makers, though the wise teacher will consider the contribution each year makes to the children in the light of their total school experience. There is always the danger of repetition, omission of important areas, and selection of less significant experiences unless the choice of each unit of work is checked against the growing pattern.

2. The unit of work can be chosen cooperatively by teacher and children within the framework of a flexible curriculum requirement so that it fits the needs and interests of the children.

Some schools prefer this method of selection to unguided choice because it provides a pattern of continuity from grade to grade and helps to insure contact with important areas and the development of significant experiences. Many modern schools tend to set up a framework of curri-

THE UNIT OF WORK

Curriculum content which is the result of cooperative, long-term planning by many people. It is based upon study of the environment with its resources and liabilities, the needs which life and adult society expect children to meet at these levels, and study of the general abilities and needs of children in this environment.

In such a school the teacher is furnished with a broad outline (which she probably helped to make) of areas of work and some general goals; she and the children fill in the details through the units of work which they develop. If the social studies area assigned to first grade is the study of home, school, and community life, there are many units of work which would fit into this framework and meet the growth needs of the children. An upper grade assigned the study of the Americas would also have a broad field in which to choose and develop units of work. The cooperative work of children and teacher in selecting units of work and carrying through the details of the study could result in approximately the same values to the children as would be derived from the first method of selection.

3. The unit can be selected from source volumes which list units of work or from collections of units and logs or diaries of units which are available commercially.

Selecting units of work from source volumes or ready-made unit materials or records of any sort must be done with thoughtfulness and awareness of the difficulties and pitfalls which exist in this method. One of the characteristics of a good unit of work is that it is made for and with a specific group of children and is carefully planned to fit their needs. Rigid adherence to any plan not made for the specific teaching situation in which it is being used may result in poor teaching. Ready-made units, records of work done by other teachers with other groups of children, and commercial materials may offer suggestions of method, content, activities, and materials, but the teacher is the curriculum maker who evaluates, selects, and makes out of the available possibilities a curriculum unit which fits her group of children.

4. The unit of work can be developed from and around required textbook material so that it meets the textbook-course-of-study requirement and still incorporates as much as possible of child interest and opportunities for initiative, enrichment, and differentiated work.

Teachers in another type of school must begin with definite, exacting requirements of subject matter, textbooks, and tests for evaluation. Required basic textbooks may be the actual course of study. In this situation, too, there is opportunity for the teacher to build worthwhile units of work though she is limited in her choice of content. The mate-

HOW TO BUILD A UNIT OF WORK

rial of the basic textbook or course of study can become the core requirement for units of work and around this core the teacher and children can build enrichment and activities of many sorts. The children can help with planning and organization, can do supplementary and recreational reading in the area of study, and can carry on a variety of related activities.

The series of units developed during a year should provide a well-rounded program of experience. Each unit grows out of the one which preceded it and leads into the next unit so that the flow of experience is continuous, but each unit also tends to emphasize certain types of experience and subject matter more than others. The total year's experience should result in a balance of emphasis and activities.

Responsibility for selecting units of work should be shared with the children in the greatest possible measure because of the experience values to be gained from exploring areas and evaluating their significance. A brief unit might be undertaken occasionally merely because it caught the children's interest; however, there would not be much justification in a modern program of education for carrying on studies of but little significance even though the children might suggest them. One of the responsibilities of good teaching is to guide children to higher levels of purposing. When children choose to do inconsequential things it is usually because of immaturity and lack of understanding; they have not lived long enough nor accumulated sufficient experience to realize that one study has relatively little value, while another has high social or educational significance. There may be an occasional time when the teacher will find it wise to make a selection herself and utilize existing interests to guide children into acceptance of a unit which she is convinced will meet the requirements of the course of study. If she finds it impossible to enlist the children's interest, wisdom would demand that the plan be modified so that it does seem worthwhile to the children. Little real learning takes place in any situation which, in the children's eyes, lacks value.

The Place of Units of Work in the Total Curriculum

Units of work form a large part of the curriculum but not the whole of it. Just as a business man or a housewife may have many interests besides business or homemaking, such as hobbies, recreation, church, clubs, and community service, so in the school the teacher and children have many interests. The major units of work tend to occupy a central place and take a large share of time. In addition, children read many books that do not fit the units. Some of the books are for information, to open up new interests and explore new fields, and some are just for the enjoyment the reading affords. Many of the most delightful of children's

THE UNIT OF WORK

stories and books fit into no unit of work, but are valuable just for themselves and because children like them. There is music for its own sake as well as music that fits the units; art expression is an end in itself as well as a means of furthering the interests of the unit. Some aspects of skill will need practice for mastery and this frequently does not fit into the unit, though the motivation for the mastery can come from need for the skill in carrying on the activities of the unit. Science topics, such as weather and seasonal changes, may be worked upon occasionally throughout the year; news items may kindle an interest which is followed up for a time, or children's contributions brought in from home may cause the class to turn aside to something else, then go back to the main unit again. The organization of work in the classroom must be kept flexible if good learning is to take place.

Planning and Carrying Out Units of Work

When an interest has been selected which merits study over a period of time, the teacher is ready to work out an overview of possibilities and set up teaching objectives. The more thoroughly she has thought through the learning possibilities of the area and her own objectives the better prepared she is to recognize and pick up leads from the children and to guide their thinking as they make their plans and set up their own goals for their work. It has been wisely said, "The teacher must plan so that the children may plan." The children's planning will fall within the framework of the teacher's planning, for the most part, though there are times when their thinking brings out points which had not entered into the teacher's plan. If teacher and children are convinced that these points are good, they are accepted. Plans are always flexible and adjustable so that what is good can be added and any elements which do not fit the needs of the study as it progresses can be taken out. The teacher's overview should be a comprehensive one and may contain many more possibilities than appear in the actual study with the children. It is a reservoir upon which the teacher and children draw as they have need.

Guide to Points to Consider in Planning and Carrying Out a Unit of Work

1. Survey the needs and interests which justify this unit and make it significant. Are there any general needs and problems of life which make this study important? Are there community needs which might be helped? Do these children have need for the study and are they interested in it?
2. List important objectives or goals which might be achieved through this study.
3. Make an overview of the subject matter which might enter into the study, the kinds of experiences which would be good, and any ways in which different subjects could be drawn in or integrated with this unit.

HOW TO BUILD A UNIT OF WORK

4. List books and other materials for the children to use as well as some for teacher reference.
5. Plan possible ways of introducing the study and getting children interested in it.
6. Plan the working period, keeping in mind the fact that only part of the working plan can be arranged in advance because the children are to help plan it.
 - (a) Carrying on discussion and other activities which help the teacher find out what children know about the subject, their attitudes toward it, and what they are interested in.
 - (b) Planning the unit with the children and getting the work underway by: Listing questions on which information is wanted; making charts showing what to do; planning excursions, construction, and other activities; finding and listing sources of information, tools, and materials; and arranging committees to work on some of the questions or problems.
 - (c) Gathering information and ideas from books and other sources and sharing through discussions, reports, and other means. Carrying out the plans for excursions and other projects.
 - (d) Organizing the ideas gathered, checking the list of questions to see whether adequate answers have been found, and to see that the children really understand the material they have been studying.
 - (e) Summarizing the total learnings in some way. It could be done through giving a program for parents or another group of children, writing an original play, painting a mural, or making a record for the class year-book. Evaluating would be necessary to give the children an opportunity to consider the worth of the work they have been doing. There might be a group-made test on important points to be mastered.
7. Plan the evaluation of the total unit of work. Final evaluation would be concerned with two main points:
 - (a) Growth and changes which have taken place in the children.
 - (b) Individual strengths, weaknesses, and problems which need further attention.

The teacher's notes and records, as a unit progresses, form an important part of her total program. During a busy school day the most she can do sometimes is to jot down a few words or a sentence that will recall a particularly interesting point, an unexpected happening, a plan that worked particularly well, or that was changed in the doing. Often the note will be a remark made by a child which revealed insight or lack of it, an interest that can be built upon, or a weakness that needs attention. Children's remarks and behavior are frequently the best source of evidence of the growth and changes taking place in them. Since educating an individual is in reality bringing about change for the better in that individual, the teacher feels a need for knowing what is happening to each child, what is going on in his thinking, and what changes in attitudes are taking place. The remarks a child makes, the pictures he draws, the

THE UNIT OF WORK

stories he tells, the books he selects, and what he does with them, all paint a picture of the growth and change taking place in him and reveal his strengths, his weaknesses, and his need for help.

Many teachers find it worth while to keep two types of records. One is a diary of the daily progress of the unit. This record may be kept in a calendar diary or notebook and probably consists of two or three sentences or phrases or at most a brief paragraph or two which will recall today's happenings when the teacher is ready to review the whole unit in her own mind in order to write it up for the next teacher who will have the children, or to write it for her own use so that she will have it as a guide when she works out another unit. The other type of record is one of individual children. A convenient form in which to handle it is a loose-leaf notebook with an index tab at the edge for each child. Then the teacher can turn quickly to Tom's page and jot down a few words or the remark Tom made last hour so there is no danger of its being lost or forgotten. As a unit or a year progresses, these incidental jottings become valuable material for use in guiding the child, in evaluating his growth for a report to the home, and for discussion in conference with the child's parents so that home and school together can work upon the child's problem.

Writing up a unit that has been lived through with the children is a valuable experience for the teacher. The unit which has evolved bit by bit through daily living becomes an organized whole and she can check it against her goals. Was it a valuable experience? Did the children really learn? Did it meet some of their needs through improvement in skills, growth in attitudes, and in understanding of democratic ways of living and working, as well as growth in knowledge of the area studied? What has the teacher learned through this unit that she can apply in working out other units? These are some of the questions the teacher can answer through writing up the unit and it leaves her with the deep satisfaction that comes with the realization that she herself has grown.



II. UNITS OF WORK FOR YOUNGER CHILDREN

For Younger and Less Mature Children

Teachers of all ages of children begin their work in September with activities designed to help them get acquainted with the children, learn their interests, and share summer experiences. Brief studies may be made of interests opened up by the children's contributions. For example, a child has brought in his summer's collection of shells from the seashore and the group spends a little time with pictures and stories learning something about sea and shore life. Or a number of the children come in bubbling with enthusiasm over a visit to the circus, and a brief circus study is in order ending perhaps with a simple circus of the children's own creation. While these studies are of high interest value they are largely means to ends, the purpose being getting acquainted with each other and with the interests and abilities represented in the group.

With a class of beginners in kindergarten or first grade, the period of getting acquainted is sure to include exploration of the school environment to learn what goes on there, who the workers are, and what each does, so that the children feel at home in the school and a part of its life.

Characteristics of Units for 5-, 6-, and 7-Year-Olds

Units of work with younger and less mature children differ in a number of ways from units of work with older children:

Interests grow out of experience in the immediate environment. Interests follow the logic of experience, not the logic of subject matter. A trip to see a child's pet kittens may lead to an interest in cooking as the result of a gift of fresh cookies by the child's mother.

Units are of the survey type. Young children are interested in an overview of many aspects of environment. There is no evidence that this decreases interest in later, more extensive study.

The time span of interests tends to be short. Many interests last only a few days though some which provide for a wide variety in activity might last several weeks.

Participation by the total group would be for brief periods. It is likely that some children will be mainly onlookers and others eager participants.

The goals the children set for themselves are definite and concrete—to build an airplane, to paint a mural, to read a book, to write a story—things which can be done immediately and which bring satisfaction immediately. They are not interested in the long-time values seen by adults.

Subject matter is a product of first-hand experience by the group supplemented by stories, visual and auditory aids, the contributions by individual children, their parents, and the teacher.

Books are used for reference to pictures and any reading of easy related stories which the children can do. The teacher may read simple content to the children to add to their information or to reinforce learning from concrete experiences.

UNITS OF WORK FOR YOUNGER CHILDREN

Work with construction and expression materials will hold a large place.

Brief, simple excursions into the environment are taken whenever they offer values in added knowledge, clearer understanding, or increased interest.

Provisions for Retarded and Gifted Children

What has been said of units of work for younger children is also true for retarded children who are older chronologically but whose minds are immature. Retarded children can participate in the activities of units of work in whatever grade they may be, but their participation will be in many ways like that of younger children. They will read simpler books and can study and contribute ideas from pictures. They will especially enjoy any excursions and construction work that is done. They can draw, paint, model in clay, and carry on other types of art expression if they are given help with the ideas and factual material they need for their work. They will learn through visual aids, listening to the reports and discussions of other children, and having material read to them. Seriously defective children who have been placed in special classes need units of experience which are organized around such activities as have just been listed.

Gifted children, on the other hand, can do more reading and in more difficult books; can bring in more material; and can make additional contributions to the work of the group through art, music, dancing, dramatics of various types, science activities where they fit in, photography, and use of various audio-visual aids.

Curriculum Areas for Kindergarten and Primary Grades

There is general agreement among those who study children and curriculum that the units of experience which are developed in the kindergarten and early grades spring from the immediate environment and that the subject matter with which they deal is learned largely through first-hand experience. Since there is wide variation from group to group in ability and interests, these suggestions need to be used with a great deal of flexibility.

Experiences for kindergarten tend to deal mainly with the following interests:

The school.—Exploration of what goes on in the school. Becoming acquainted with the people who work there and what they do. Becoming acquainted with the routine and adjusting to the life of the school.

The home.—The activities and interrelationships that take place in an average American home. The work of father, mother, and the ways in which children can help. Seasonal change in home activity. The way the home supplies some of its needs. Holidays in the home. Obviously, what goes into a study of home depends upon the economic level of homes the chil-

HOW TO BUILD A UNIT OF WORK

dren live in. If the homes are very poor, the children will need to be introduced through dramatic play in their playhouse to the meaning of such terms as living room, dining room, kitchen, and napkin.

The community and some of its workers.—Workers studied are apt to be those who visit the school and the home and who come in contact with the child himself. These might include the postman, the milkman, the groceryman, the policeman who protects the children on the school corner, and the fireman whose truck the children love to watch as it dashes past. In rural areas the teacher needs to be skillful in finding ways of bringing workers to the school.

Seasonal and nature interests.—These will be picked up from time to time through interest in weather and other outdoor experiences and the ever-present interest in pets.

Holidays which have meaning for children.—Those which genuinely appeal to children are Halloween, Thanksgiving, Christmas, Valentine's Day, Easter, and May Day.

First-grade interests include those that are listed for kindergarten and start at the same point if children have not had kindergarten experience. Other interests which might be added for 6-year olds are:

The farm.—If children live in a town or city, a study of the farm has a special appeal to them. Farm children would be interested in the relationship of the farm to the city's food supply. All children would be interested in living and growing things.

Airplanes, boats, and trains have a fascination for young children. A study of the ways people travel, kept on a simple level, would be of great interest.

Safety and health problems which deal with the child's own living would always have a place.

Toy making, with a toy store at Christmas time is fun for 6-year-olds and has learning values.

Second-grade children continue the study of the neighborhood and the wider community, placing their emphasis upon the ways in which the community provides the necessities of life and the interrelationships and interaction which exist in community living. Such interests as the following might become units of work:

Overview of the wider community through making a picture map of the district about the school. This might include consideration of the different kinds of work which parents do and further study of community workers, including the librarian, doctors, carpenters, telephone linemen, and others of interest to the children.

Food, clothing, and shelter as basic community needs could be studied without too much technical detail.

Seasonal interests, nature, and holidays continue to be important. A number of units of work may deal with nature and science interests.

UNITS OF WORK FOR YOUNGER CHILDREN

Travel and transportation as a unit of work is always popular with 7-year-olds. A study of travel and transportation has been selected for partial development to show the planning of a unit of work for younger children. The sketch will deal first with travel as it might be studied by 7-year-olds and suggestions will follow for the addition of content on transportation which would enlarge the study to make it fit more mature children of 8 years.

Sketch Giving Suggestions for the Preliminary Planning of a Unit on Travel for 7-Year-Olds

This sketch of a teacher's preliminary planning for the unit of work lists only enough points to call attention to the kind of thinking and planning which is needed. It is not in any sense a complete and exhaustive plan. Each teacher will think of many more points to add under each heading to make the outline fit her children and the possibilities in her situation. The plan follows the outline for the development of units of work given on page 5 and following.

A survey of the interests and needs to be served by the study of travel would include such points as those which follow:

All young children are interested in things that go. Trucks, trains, boats, and airplanes all fascinate them. Interest in means of travel has been sharpened by the return of servicemen who have traveled to far away places by boat, train, and plane. Pictures of airplanes and vehicles of all sorts appear constantly in magazines, newspapers, and books, and children are eager to know more about them.

A number of the teacher's objectives for her children can be achieved at least partially through this unit. Some of such objectives may be:

Increased knowledge of means of travel and the use man makes of them.

Some understanding of kinds of work done by different transportation workers.

Some slight concept of the great numbers of workers who participate in transportation systems and some of the interrelationships which exist.

A slight beginning of understanding of how the present has grown from the past.

The beginning of understanding of man's increasing control over nature and natural resources and his utilization of natural laws.

Keener observation and enlivened interest in all that goes on about the child.

Some knowledge of sources to which he can turn to answer his questions.

Growth in vocabulary of words and ideas.

Increase in interest in books and reading.

Growth in ability to interpret pictures and other visual aids.

HOW TO BUILD A UNIT OF WORK

Development of greater confidence, poise, and fluency in speech and in discussion.

Growth in quantitative and number concept through construction, building, and making various objects for dramatic play.

Growth in ability to work and play with others, leading or following as occasion demands.

An overview of the subject matter which might enter into the study would differ greatly in different localities. If children live near an airport or see planes passing overhead they would certainly turn first to a study of airplanes; if they know trains best, trains would form the starting point; and if they live near a harbor and have experience with boats, their study would begin with boats. One form of travel might occupy a larger place in the unit than other forms, depending upon the children's interest. The historical aspect suggested here might be omitted entirely if children are especially immature, or might be enlarged if it catches their interest.

Water travel

Travel experiences of children in the group. Where they went and kinds of boats they traveled on.

The kinds of boats the children know; work they do; and where they travel.

Other kinds of boats which travel on inland waterways.

The big passenger liners for ocean travel. Their size and the number of people who can live on them.

How people live when they travel on big liners. The sleeping accommodations, the dining rooms, and living rooms of all sorts. Promenade decks, game decks, and swimming pool.

Some of the people who work on a ship and what they do—the captain, stewards, engineers, and others.

Boats people used to travel on long ago—rafts, canoes, sailing vessels, and early steamships.

Uses made of small boats nowadays for recreation and sport.

Length of time it took to travel across the ocean years ago compared with present speeds.

Increased amount of travel. Few people traveled in earlier years because of the time required and the discomforts.

Land travel

Experiences the children have had with trains. Length of the trip and whether they slept on the train or ate in the dining car.

Modern passenger trains—day coaches, Pullman coaches, dining car, observation car, and the huge engine. New postwar developments.

Some of the train workers—the engineer, brakeman, conductor, porters, and the waiters in the dining car.

UNITS OF WORK FOR YOUNGER CHILDREN

How people traveled on land long ago:

Indian drag, two-wheeled carts, crude wagons, stagecoach, early trains compared with modern trains in size, speed, and comfort.

Length of time it took to cross our country with earlier forms of travel compared with trains of today.

Air travel

Air travel the fastest kind today.

Airplanes the children have seen or experiences they have had in visiting an airport.

Some of the kinds of aircraft—land planes, sea planes, autogiro, balloons, and dirigibles.

Study of the way birds fly helped man learn to fly.

Airplane speeds compared with speed of trains and fast ships.

Passenger planes—seating, berths, food service on planes.

Increased use of air travel because of speed, comfort, and safety.

Improvement in airplanes will result in better, faster ones by the time the children are grown.

An overview of kinds of experiences which would fit the unit would depend upon the resources available in the community. Such experiences as the following may be suggestive of other possibilities:

Encourage the children to tell of their experiences with each form of travel. Write the stories from the child's dictation, put them on charts or in a booklet, and let the child illustrate them.

Take excursions to the airport; to the dock, to board a boat; to the railroad depot; to a hilltop to watch the harbor or train activity; to a bridge to watch the boats pass—any available first-hand observation and experience is highly important.

Arrange attractive bulletin board exhibits showing kinds of boats, planes, and trains.

Send letters to airline, steamship, and railroad companies asking for posters or other pictorial material. Let the children construct simple boats or airplanes of wood. Arrange a space on the floor for a harbor or airport. Cover it with wrapping paper and paint water or runways in it. Bridges, lighthouses, buoys, and docks, or hangars and a signal tower can be added. Toy boats and planes can be brought from home.

Encourage dramatic play in the harbor or airport. Give suggestions, show pictures, or read stories from time to time which clarify children's ideas of activities in a harbor or airport so that their play becomes more and more meaningful and realistic.

Build a large boat, train, or airplane with blocks, or boxes and wrapping paper. Equip it with simple furnishings and carry on dramatic play from ticket selling to arrival at destination.

Draw; paint; make booklet; create songs, stories, poems, plays utilizing the children's creative ideas.

HOW TO BUILD A UNIT OF WORK

Integration with other subjects can be brought about in a great many ways.

Reading interest and skill will be developed through bulletin board captions, chart stories, booklets, stories in readers and library books which the children read, stories and poetry read to the children, and through the use of audio-visual aids.

Language development takes place through discussions; dictating chart stories, poems, or letters; dramatic play; free conversation; addition of new words to vocabularies; printing signs for the harbor or airport; and countless other means.

Number and quantitative concepts of size, speed, distance, and time grow through discussion and dramatic play as well as through construction and other work with materials.

Music and art development is brought about through songs, rhythms, painting, drawing, many forms of activity and creative work of other sorts.

Initiation of the unit will doubtless come through the children's day-by-day interests—their remarks, their drawings, or the stories and pictures they enjoy in books.

The working period and its activities will follow the children's interests closely at this age though the teacher will plan ways of adding new knowledge and of bringing new inspiration into the construction, dramatic play, reading, and other activities. The teacher not only follows the children's interests, but guides them into new and more fruitful ones as opportunities arise.

Evaluation for the children may come through sharing a summary of some of their experience and learning with their mothers, or with another grade. It may come through making a picture story of the most important things they have learned.

Evaluation for the teacher will be in part a summary of the accomplishment of the unit. She will also study her notes to learn the nature of the development which has taken place in each individual child. Did this timid child lose himself in the play activity? Did this aggressive child learn to let others have their turns to make decisions? Did the disinterested child become alert and interested? Did the child who rarely manifested interest in books learn to turn to them spontaneously for help and interest? The teacher's evaluation covers all aspects of her original goals and all aspects of the children's growth.

Mature children in second grade could expand the study to include the transportation of goods as well as passengers. They might start with a simple meal in their study of foods and find out where the foods came from and how they were transported to the children. They would be interested in methods of transporting perishable goods by plane or refrigerator car, and in the slower transportation methods which involve less speed but lower cost. The historical development of methods of transportation would interest them and they would go more deeply into that aspect than would the average child.

III. UNITS OF WORK FOR MIDDLE-GRADE CHILDREN

Children in the middle grades have developed a fairly broad understanding of their home, school, and community and the interdependence which exists within them. They have enough knowledge and maturity to participate in many types of community activities. They are eager to push back horizons and add to their knowledge of the rest of the world.

Characteristics of Units at This Level

Units of work for middle-grade children show clearly this need for expansion. Characteristics of the work of these levels include such developments as the following:

Interests are expanding rapidly during these years and children are widening their social contacts outside the home.

Children are beginning to understand time and space in relation to their own experience.

Because of this growing understanding and the background of first-hand experience previously gained in the immediate environment, children 8 to 10 years of age enjoy studies which start at home and go afield in both space and time. In a study of communication, for example, they delight in tracing means of communication back to their primitive beginnings, or in a study of shelter, studying homes under various geographic conditions in all parts of the world. They enjoy surveying and dramatizing life in typical, contrasting areas of the world.

Increased skill in the use of the tools of communication, the language skills, makes it possible for the children to gain more of their subject matter from books. They are interested in factual material and their curiosity may lead them to read widely for information and background.

First-hand experience is still an important method of learning and there should be enough excursions and other experiences to supplement reading and to make the material of the printed page live for the children.

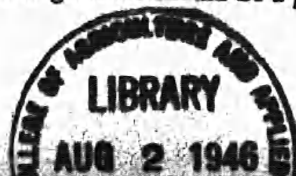
Collecting becomes a real interest during these years and children enjoy learning to file and organize the quantities of material they bring to school.

Attention span has increased somewhat over that of previous years and children will carry the same unit through a longer time when there is variety in activity. The span of time between setting a goal and its achievement can be lengthened gradually without loss of interest.

Children are beginning to distinguish between the real and unreal. They sense human motives quickly. They can give attention to abstract ideas and relationships for brief periods of time.

There is increasing ability in self-direction and the children tend to be critical of their own accomplishment.

This period marks the beginning of club and gang interest. Leadership is developing. Boys prefer to work with boys and girls with girls. There is rivalry between the sex groups. This means that some work in small groups and committees is profitable though there should be a place for individual interests as well.



HOW TO BUILD A UNIT OF WORK

Children's enjoyment in working with their hands and in dramatizing calls for many opportunities to use graphic and plastic materials and to reproduce what they are learning in dramatic form.

The range of ability and achievement in each group of children makes it necessary to provide a wide variety of reading materials and types of activity so that all children can contribute to the development of the unit. Gifted children will read more widely and share their findings with the group while retarded children will read simpler material which also deals with the unit and will contribute content and expression on their level. Retarded children will find the excursions, audio-visual aids, dramatization, and expression with art materials particularly valuable.

There is less agreement with regard to the areas to be studied in the middle grades than on either the primary- or the upper-grade levels. Some schools place studies of transportation and communication at the third-grade level and use these studies to lead the child's thinking back into history and out into the world beyond the home community. Other schools place studies of the history of the home community at this level, including Indian life, the early explorers, and the settlements of the pioneer period, ending with a survey of the town, county, or region as it is today and some of the rural-urban relationships that exist there.

Fourth grade appears to be the level about which there is least agreement. Curriculum offerings vary from regional study with emphasis upon the geography and history of the home region to studies of life in certain widely different climatic and cultural areas of the earth as hot, cold, wet, and dry lands, or life in countries as different in topography and culture as Norway, Holland, China or Japan.

Suggestions for the Preliminary Planning of a Unit on Communication

A study of communication is well suited to the needs and interests of children of the middle grades and is a good vehicle for the development of some of the skills and abilities which should be emphasized at this time. A brief sketch is given of suggestions which will help the teacher to see some of the possibilities.

A survey of the interests and needs to be served by the study would doubtless reveal that communication is a genuine interest of children. They see it as a source of satisfaction and benefit to adults. They receive gifts and letters through the mails and share in those received and sent by the home. They enjoy using the telephone. They are interested in knowing how and why things happen as they do—how the telegrams are transmitted, how a voice can be heard at long distance from the speaker, what happens to a letter between the time it is put into the mail box and its arrival at grandmother's house.

UNITS OF WORK FOR MIDDLE-GRADE CHILDREN

The objectives which might be listed for such a study are numerous and many of them deal with growth in the language arts and mathematics and science. The objectives may be similar in kind to those listed in the unit for younger children, but standards to be attained will be higher and some new possibilities such as the following may be added for this level.

Increased knowledge and understanding of historic and modern communication and the extent of man's achievement in a comparatively brief span of time. Some appreciation of the work of inventors and realization of the magnitude of their contribution to the world.

Beginning of appreciation of the scientific method. Growth in interest in experimentation and original thinking and reasoning. The sharpening of intellectual curiosity. Increased knowledge of sources to which to turn for information and ability to evaluate them.

Growth in simple study skills—selecting the main thought of a paragraph, recognizing supporting details, evaluating and using material read, and note taking.

Learning to use glossaries, dictionary, and children's encyclopedias under guidance.

Learning some of the resources of the library and how to use them.

The subject matter of a study of communication is interesting to middle-grade children. There are a number of good books and pamphlets for them to read which contain accurate information and portray some of the romance and adventure of communication as well as the struggles and hardships that had to be endured to give new opportunities to mankind. Readers carry some of the stories, and the simpler encyclopedias present the material in a form which most children of this age can read. The teacher's sharing of material from her own source books, together with first-hand experience and audio-visual aids, rounds out the picture. The study should by all means begin in the present with the aspect of communication which the children know best and can understand most easily, the mail system.

The present United States mail system

Progress of a letter from a distant place to someone in the group. Consider each step in handling from the time the letter is mailed until it is received by the person to whom it is addressed.

Sketch of the organization of the postal system from the postmaster general down to rural and city mail carriers, calling attention to star mail routes.

Duties of postal clerks in handling incoming mail and outgoing mail in the postoffice.

Correction department—looking up addressees and making every effort to deliver mail before consigning it to the dead letter office; rewrapping and addressing poorly prepared packages or storing them if impossible to deliver.

HOW TO BUILD A UNIT OF WORK

Railway postoffices on the special mail trains or the mail car of fast passenger trains.

Overseas mail—incoming picked up at quarantine, outgoing handled as other mail.

Airmail—rapid handling and meeting of flying schedules.

Classes of mail.

Special services of the U. S. postoffices.

Evolution of Present Methods of Message Transmission

Primitive, such as signal fires and telegraph drums, through systems of the early period of civilization and the colonial period in this country down to the present time.

The Telegraph

Early attempts at code signalling.

Morse and his invention.

How the telegraph works.

Extension of the use of the telegraph.

Types of service.

A visit to a large telegraph office—real or through pictures, reading, and discussion.

Ocean Cables

The work of Cyrus Field in paving the way.

The problems of cable construction and early attempts to lay a cable. The work of the Great Eastern.

Cable lines across Atlantic and Pacific Oceans.

Fleet of ships in constant service repairing cables.

Sending messages by cable—relay service.

The Telephone

Alexander Graham Bell and his invention.

Extension of the telephone. More telephones in the United States than in all the rest of the world.

Telephone wires taken from poles in cities and put in cable underground.

Local telephone hook-up.

A real or vicarious visit to a telephone exchange.

Long-distance telephone service in the United States.

Wireless and Radio

Time span from the earliest telegraph drums to modern wireless is filled with a vast amount of experimentation.

Brief sketch of Marconi's work.

Early radios—many of them homemade.

Radio is "king of speed" today. Message can be sent half-way around the world and reply received in less than 5 minutes.

Regulation of wave lengths—some for commercial ships, some for the Navy, large broadcasting companies, and amateurs.

Radio as an aid to ships. A ship in distress can get help more quickly. Further possibilities of radio.

UNITS OF WORK FOR MIDDLE-GRADE CHILDREN

Many of the experiences which would be profitable are suggested or implied in the subject-matter outline. There is excellent motivation for a number of types of experimentation that would emphasize science.

Take trips to the local postoffice and to a larger postoffice. Postmasters are usually willing to guide the children and answer their questions.

Gain firsthand information from the mail man who comes to the door. Children can be encouraged to watch for him on Saturday morning and ask permission to walk with him for a few blocks to gain answers to their questions, or to watch for him on a rural route in order to learn about special problems of rural mail delivery.

Collect envelopes to illustrate: Air mail, special delivery, registered mail, letters returned for postage, addresses corrected at the postoffice, permit instead of stamp, and unscaled third-class mail.

Start stamp collection, both United States and foreign stamps.

Write letters to relatives and friends, perhaps to children of another country through Junior Red Cross correspondence exchange plan.

Draw or paint a series of pictures telling the story of communication from the earliest time to the present.

Experiment with magnets. Try them on everything to see what they attract. Experiment with steel filings to study lines of force. Let children discover for themselves through play with a pair of magnets that like poles repel and unlike poles attract.

Wire an electromagnet using a large nail and bell wire and battery from the 10-cent store to understand magnets used in telephone and telegraph.

Attach a bell or buzzer to dry-cell batteries and experiment with sending code messages.

Make a telegraph set as suggested in children's science books, and send and receive messages.

Plan an assembly program to show phases of communication through brief scenes or tableau.

Integration with other subjects will be possible in many ways. The children can help with the final planning.

Reading widely, gaining information and enjoyment, and sharpening the reading tool will help to improve study skills at many points. Individual reading and reports or contributions through discussion are important.

Oral language development comes through conversation and discussion, reports, story telling, and dramatization.

New vocabulary is added and new meaning for old words developed.

Written language is improved through letter writing, stories, poems, plays, reports, and note taking.

Letter writing provides motivation for improvement of handwriting.

HOW TO BUILD A UNIT OF WORK

Arithmetic functions in many ways—dates, stamps, time intervals are a part of the study. Many problems will arise or can be drawn in which call for use of facts and processes.

Art opportunities are present in great number and variety. Drawing, painting, making a simple backdrop for a dramatization, singing, and rhythm will fit at many points.

Initiation of the unit might come through letters from servicemen overseas, Christmas and Valentine's Day mail, or any one of many sources. Materials are ever present in the children's interest and environment.

The working out of the unit in the classroom will follow both the logic of the children's interests and the logic of subject matter. The teacher will find many possibilities to choose from and no lack of material for many days of work.

Evaluation of the work by the children might center about the mural or picture sequence showing the development of communication or the dramatization of present forms. Children would undoubtedly list questions at the beginning and at various points in the study and these could be checked for adequate answers. The collection of the children's reports and creative work would form a part of the evaluation experience also.

The teacher's evaluation of the total study would be made in the light of her original objectives and would include both evaluations of the worth of the study, and of the growth made by each child.

IV. UNITS OF WORK FOR OLDER BOYS AND GIRLS

Curiosity about themselves, the world, and their place in it makes older children eager for new experiences. They are pushing out from the home and adult domination and their social and intellectual horizons are widening rapidly. Units of work for older children are influenced by the following points:

The breadth of their interests is the world itself, both in its present form and in the historic past.

There is fair command of the tools of communication. Ideas can be gained from books, graphic materials, and personal interviews. It is possible for older children to conduct and to hold their own in discussions. They enjoy expressing their ideas in many simple forms.

Hobbies begin to develop during this period and collections are organized.

The span of interest and attention has increased greatly and an extensive study can be carried on in an area of interest, especially if it provides a wide variety of activities.

Group and committee work is highly profitable and satisfying because of the strong need for companionship with others like themselves.

Many opportunities to think through problems and make decisions and to develop leadership take care of the developing independence and initiative which children show at this age.

Simple relationships can be understood at this age and children are capable of drawing fairly accurate conclusions. Their thinking tends to be idealistic.

The wide range in ability and achievement within these older groups makes differentiated work essential. Gifted children need to be challenged with ideas and opportunities and guided into making worth-while individual contributions. Retarded children need opportunities to work on the same topics with others, but to read on their own levels and to do things which they can do with profit for themselves and others.

The unit of work on aviation which appears in the sections which follow, and the unit on Australia serve as samples of two types of units of work which may appear at upper-grade levels.

Different Ways in Which a Study of Aviation Might Be Developed With an Upper-Grade Group

A unit of work can be developed in different ways for the same maturity level. Children's backgrounds differ from group to group, the immediate motivation for the interest may differ, and so may the slant which the children and teacher give the study through the goals they set up.

Emphasis upon Economic, Social, and International Problems

A study of aviation by upper-grade boys and girls may deal largely with the economic, social, and international problems that have arisen

HOW TO BUILD A UNIT OF WORK

with the development of aviation. Study of changes in the pattern of living in the United States might lead them into this interest as also might study of world geography, the spread of western influence throughout the world, causes of world conflict, or postwar problems.

Content in this case might deal largely with such topics as the expansion of aviation in this country with its attendant expansion of markets for perishables, increased use of air travel, air mails and freight, and the rapid growth in the number of privately owned planes; recent uses of aviation such as fighting forest fires, spraying crops, aerial photography and map making; development of international air lines which has brought concern for air bases in strategic positions throughout the world and for international trade; problems of vulnerability during war because of the development of more and more dangerous air weapons. International problems are current which deal with national monopolies vs. competitive commercial companies for international traffic; economic problems of distribution of raw materials and manufactured goods; opening of new areas to world trade; and enforced revamping of the economy of defeated, aggressor nations. Social problems and problems of human relationship include need for understanding which calls for new maps, textbooks, and literature of all kinds to interpret areas and peoples; and health problems grow out of the fact that speed of transportation creates new possibilities for the spread of disease and pests.

Some of the subject matter and opportunities for integration listed on the third column of the following outline would function in this study also. Newspapers and magazines would be available sources of material. The group might work upon the study intensively for a time then go on to other interests, returning to this whenever new material was brought to light through reading or current happenings.

Emphasis upon the Science and Mechanics of Aviation

Another slant which a study of aviation might take in the upper grades is in the direction of the mechanics and science of aviation. In this case, more time would be spent upon the development of aircraft structure and mechanism with less emphasis upon the social and economic implications, though no study would be complete without some attention to the significance of the problems of aviation in modern life. Special interest of members of the group in model airplanes or in the types of airplanes that fly the airways in peacetime or did the sky fighting in wartime might lead to this emphasis. It would be the responsibility of the teacher to guide the group into a well-rounded study so that emphasis upon one aspect of aviation would not crowd out other important aspects.

UNITS OF WORK FOR OLDER BOYS AND GIRLS

Activities in this study would include work with model airplanes, testing and experimenting with form and function of parts, and problems dealing with the forces that act upon an airplane during flight. The group might wish to visit a machine shop to see demonstrations of the operation of various kinds of motors and the way in which the combustion of the air and fuel mixture produces power. They could make diagrams of planes and parts and collect samples of materials used in airplane construction. They might also experiment with models of balloons, gliders, and parachutes. The emphasis in this unit would be upon history of aviation in terms of lighter-than-air and heavier-than-air craft, structure of airplanes, the airplane motor and power plant, identifying airplanes, airways and airports, civil air regulations, communications, the weather bureau, theory of flight aerodynamics, air navigation, and workers in aviation.

Emphasis upon Study of the Air and Weather

This emphasis might grow out of interest in local weather or news items about the effect of weather upon aviation. Again the suggestions which follow would be only a portion of a total study. Other material is found in the cross-sectional study which follows this section.

Activities would be of the sort recommended for middle and upper grades in the cross-sectional study. The trip to the weather station, study of weather through the use of available instruments and home-made ones, and experiments with air pressure and air currents, would be valuable.

Content would involve more detailed study of the Weather Bureau and weather itself and the problems it creates for aviation. Useful meteorological information would include: The different divisions of the atmosphere; the heating of the earth's surface; causes of differences in temperature and pressure of the atmosphere at different levels; the way in which the structure of the atmosphere is affected by layers of warm and cold air, unequal heating of the atmosphere, differences in the earth's topography; the expansion, compression, and movement of air masses; the effect of the rotation of the earth and unequal absorption of heat upon the origin and direction of winds; the formation of different types of clouds, hail, snow, ice, sleet, fog, rain, and the hazards they create for pilots. Modern weather prediction is based on study of movement of air masses.

The theory of flight might be given some attention in this study also. This would include study of what makes an airplane rise and fly and the forces that act upon it during flight.

This emphasis on the air and weather could extend over a long period of time after the intensive study. The children could watch for news items, and study weather maps in the daily papers. Study of air routes over land and sea and the effect of weather and climate in various parts of the world upon aviation would add interest to other units in the social studies.



Suggestions for Building a Unit of Work About Required Textbook Material

In schools where certain selected textbooks form the required course of study, the textbook materials would of necessity be the center about which the teacher built her units of work. The study of Australia has been selected to use as a sample unit for this purpose since it is one of the geographic areas dealt with in social studies books for the upper grades and since it has added significance for classroom study because of conditions which have grown out of the War.

Preliminary Plans for a Unit on Australia

A survey of the values which might exist in a study of Australia would undoubtedly include recognition that Australia provided refuge and care as well as millions of tons of food for our fighting men in the Asiatic theater of war. Americans need to understand the points of common interest which exist between Australia and the United States both in peace and in war. Boys and girls are interested in Australia because many of them have brothers, fathers, or friends who have visited that country during the war period.

Objectives for the study would probably be enlarged to include growth in all types of reading, desire to read widely, and further development of certain aspects of study skills including use of encyclopedias, the dictionary, and the resources of the library. Growth in oral and written language and some functional utilization of arithmetic are also possible.

The subject matter which entered into the study would probably follow the outline of the material in the textbook though the teacher would find points at which to enrich, enlarge, and supplement that offering with graphs, charts, visual aids, and supplementary reading.

Worth-while experiences for the group might include inviting a returned veteran to tell of his experience in Australia or asking a person who once lived in Australia to talk to the group. The children might take a trip to a museum to see an exhibit depicting the life of the Australian bushmen or visit a zoo to see kangaroos, koala bears, and other animals native to Australia.

Studying the effect of aviation on Australia would also be interesting. The isolation of the island continent has been broken in recent years by transoceanic aviation, and life within the country itself greatly changed by the ease with which air communication can be maintained across vast, sparsely populated areas.

The group could correspond with the Australian News and Information Bureau in New York and obtain publications and free visual aids.

Possibilities of integration with other subjects would be many. Reading, writing reports and letters, book reviews, news items, and orig-

UNITS OF WORK FOR OLDER BOYS AND GIRLS

inal stories or poetry would be called for as well as many uses of oral English, especially through discussions and oral reports. Arithmetic would be drawn upon in considering the distance to Australia going east and west around the world, and time in Australia compared with time where the boys and girls live. An interesting picture graph could be made showing sailing time to Australia in the early days of exploration and settlement, sailing time by modern ship, flying time on the clippers, and distances from Australia to other countries by air. Seasons, climate, latitude and longitude, the international date line would all enter in. Spelling and vocabulary building would include new terms peculiar to this area. Music and art would offer other avenues of expression.

A bibliography of reading material for the children could be obtained from the Australian News and Information Bureau¹ and from *Subject Index to Books for Intermediate Grades*.²

A Few Books for Children on Australia

FOLLETT, Mrs. HELEN THOMAS. *Ocean Outposts*. Illustrated with maps by Armstrong Perry. New York, Charles Scribner's Sons, 1942. Gr. 6-8. 133 p.

FOOTE, K. S. *Walkabout Down Under*. Illustrated with photographs. New York, Charles Scribner's Sons, 1944. Gr. 5-8. 92 p.

HARRIS, LEILA GOTT and HARRIS, WALTER KILROY. *Blackfellow Bundi, a Native Australian Boy*. Pictured by Kurt Wiese. Chicago, Albert Whitman & Co., 1939. Gr. 4-6.

———. *Sunny Australia*. A photo picture book, with drawings by Margery Aspen. New York, David McKay Co., 1941. Boards. Gr. 3-5. 39 p.

MACINTYRE, ELISABETH. *Susan Who Lives in Australia*. Illustrated by the author. New York, Charles Scribner's Sons, 1944. Boards. Gr. 2-3. 32 p.

The approach to the study could be made through any point which would be meaningful and worth while to the children. Discussion of the experiences of servicemen adjusting to life in Australia, a display of gifts sent from there, a bulletin board with well-chosen pictures, or items from the newspaper would serve, as would a discussion of the quantity of food furnished by Australia to our Army and Navy in the Pacific theater of war.

The shape of plans for the working period would be clear to the teacher by the time she had followed through this preliminary planning. They would have to be patterned upon her own situation and shaped by the resources that are available in it.

¹ Australian News and Information Bureau, 610 Fifth Avenue, New York, N. Y.

² Rue, Eloise. *Subject Index to Books for Intermediate Grades. First Supplement*. Chicago, American Library Association, 1943. 197 p.

HOW TO BUILD A UNIT OF WORK

Evaluation for the children would need to include consideration of what they had learned in relation to the textbook requirement with which they started. A plan which has been found satisfactory by some teachers of children of fifth grade and older is to encourage the children to organize committees, each of which would summarize the important points of the total study, select the points they felt should be mastered and remembered, and hand in questions for a final test. The total group would then evaluate the committee reports and arrive at some agreement on points of greatest significance. A test might then be built which would incorporate a selection from those points considered most important. This type of procedure provides thorough review and evaluation which are even more valuable than the final check on mastery.

Other summary and evaluation techniques might be used. Each committee could select its own method of summarizing the study. A play, a program for the assembly, a panel discussion, or a picture story are other possibilities.

Evaluation of the total work by the teacher would include all that the children had done in their evaluation and also her own evaluation of the growth in skills, habits, attitudes, and understanding which formed a part of her original objectives.

V. ADAPTATIONS AND VARIATIONS IN UNITS OF WORK

Unit on Aviation in a Rural School

Some broad, general interests can form the core of studies that run through several grades. A one-room rural school with its different levels of maturity can be used as a laboratory in which to carry on a sequence of experiences, all dealing with the same basic interest. Science interests, conservation, housing, and aviation are examples of areas broad enough to concern all ages.

Aviation is a subject which lends itself to innumerable modifications in units of work. It looms large in the interests of boys and girls of all ages and demands the attention of the whole population in increasing measure as the speed, sizes, and uses of planes change old patterns of thinking and living and raise new and perplexing national and international problems. Because of the universal nature of this interest it has been selected as an illustration to demonstrate variations in planning to meet the needs of different age and maturity levels and differing purposes and shades in interests. A number of avenues are listed which might lead to a study of aviation. There are also brief lists of types of experience which would be valuable at all grade levels but for different purposes, adaptations to meet the needs of younger children, and several lines of emphasis which would be of interest to older children. This material is arranged in the form of a source unit. Obviously, it contains too much material to be used in its entirety at any grade level. From the many suggestions, the teacher would select some possibilities that suit the interests of her group; draw inspiration for ideas of her own from other parts; and revise and adapt her plan to fit her children, her own resources of ability, and the materials and experiences available in her situation.

General Needs and Problems of Modern Life Which Call for a Study of Aviation

The needs and interests of modern life which call for a study of aviation are numerous, and highly significant. Many of the postwar problems dealing with the peace and security of the world are tied up with aviation. It is a force which can be destructive of life and security or can add to the richness and security of life depending upon the wisdom with which it is used. The rapid development of world-wide aviation is creating serious national and international problems which may require many years to solve, but which must be solved because they are basic to building world goodwill. Some of these are:

Science problems

- Weather and weather forecasting
- Science of plane construction
- Principles of flight

HOW TO BUILD A UNIT OF WORK

Geographic problems

- Distances and air routes over the earth's surface
- Control and use of strategic bases

Health problems

- Rapid transmission of disease
- Need for controls and quarantine regulations

Governmental problems

- Ownership and control of airlines
- Safety controls in flight and at ports
- Control of traffic from foreign bases

International relations

- Understanding of other people and their problems
- Working relationship with other nations

Approaches for Initiation of the Study

There will be many avenues of approach to the study of aviation with rural children or any grade group. Children bring their toy and model airplanes to school, build or dramatize with airplanes when they have un-directed time, and read items and look at pictures in newspapers and magazines. Their interest in the wartime exploits of aviators is keen and many of them have friends or relatives who have flown Army or Navy planes. A study of aviation might be part of a study of transportation, might grow out of a unit on communication, regional or community study, or study of other countries and their relation to the United States.

The material which follows is arranged in cross-sectional form to aid the rural teacher who must adjust her plans to meet the needs of the different levels of maturity within her group. It should also help teachers of single grades through suggestions as to the type of activities and content suited to the various age levels. Teachers may draw some material from a higher level for gifted children and from a lower level for retarded children.

The Teacher's Evaluation of the Unit

The final evaluation of the unit by the teacher will include the evaluation made with the children and also her own study of the growth made by the group as a whole, and by each child individually. She will want to check through her original objectives for the children to ascertain how much has been accomplished with each of them. Her diary of happenings and brief notes regarding child responses will be her most valuable working material. Writing up the unit as a whole can be done quite easily at this time and it provides excellent help for the next year's work.

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION

I. GENERAL OBJECTIVES

Younger Children	Middle-Grade Children	Older Boys and Girls
Enlarging concept and adding knowledge of airplanes and the airport	Adding knowledge and enlarging concepts of present-day aviation	Growing in knowledge of historical and present-day development of aviation.
Learning about the personnel	Gaining some knowledge of the historical development of aviation	
Gaining some concept of inter-relationships in aviation	Beginning of interest in air-age problems	Developing understanding of air-age problems.
Growing in concepts of time, space, distance, number, and measurement	Enlarging understanding of space, distance, time, and other mathematical learning	Clarifying impressions of distance, space, and time.
		Utilizing mathematical knowledge in solving problems.
Gaining some understanding of the weather and its relation to aviation	Increasing in knowledge of the air and of weather and the part they play in aviation	Increasing in knowledge of air, weather, and machinery as they function in aviation.
	Beginning of understanding of the principles of flight	Increasing in understanding of the principles of flight.
Beginning of appreciation of man's control over nature and his environment	Growing in appreciation of man's increasing control over nature and the resources of his environment	Realizing the growth that lies ahead in aviation.
Appreciating fliers and airplanes and some knowledge of the services they render	Appreciating the skill of fliers and the value of aviation	Increasing appreciation of the skill of fliers and the effect of aviation on modern living.

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued

1. GENERAL OBJECTIVES—Continued

HOW TO BUILD A UNIT OF WORK

Younger Children	Middle-Grade Children	Older Boys and Girls
<p>Gaining elementary knowledge of how and where to get needed information:</p> <ul style="list-style-type: none"> Use of books Use of visual aids Talking with people who know <p>Growing in skill in using the common tools of education—reading, writing, spelling, and arithmetic</p> <p>Beginning concept of study skills</p> <p>Growing in initiative and creative ability</p> <p>Growing in all forms of expression</p> <p>Sharing ideas and interests</p> <p>Learning to use materials cooperatively and to contribute materials</p> <p>Beginning of understanding of democratic procedures through participation in planning, working, and evaluating on own level of maturity</p>	<p>Increasing knowledge of how and where to get information:</p> <ul style="list-style-type: none"> Uses of books, dictionaries, encyclopedias, libraries, visual aids Services of experts Uses of maps and charts <p>Growing in skill in using the common tools of education.</p> <p>Growing in study skills</p> <p>Growing in initiative and creative ability</p> <p>Growing in all forms of expression</p> <p>Growing in understanding and appreciation of the contribution of others</p> <p>Developing sense of responsibility for contributing material for cooperative sharing.</p> <p>Increasing understanding of democratic procedures through opportunities and responsibilities in carrying them through</p> <p>Growing in understanding of the fact that freedom carries with it responsibility</p>	<p>Gaining skill in utilization of resources for knowledge:</p> <ul style="list-style-type: none"> Interviews with experts Visual aids Books, dictionaries, encyclopedias, libraries, maps, charts, and graphs. <p>Growing in skill in using the common tools of education.</p> <p>Refining study skills.</p> <p>Growing in initiative and creative ability.</p> <p>Growing in all forms of expression.</p> <p>Developing sympathetic appreciation of the ideas and interests of others.</p> <p>Developing sense of responsibility for contributing material for cooperative sharing.</p> <p>Gaining sufficient understanding of democratic procedure to plan, organize, and carry on work and classroom relationships in democratic manner.</p> <p>Accepting responsibilities that go with freedom.</p>

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued

II. EXCURSIONS AND OTHER ACTIVITIES

Younger Children	Middle-Grade Children	Older Boys and Girls
<p>Visiting a nearby airport: Seeing hangars, tower, runways. Watching planes come and go Seeing a plane at close range and noting its form, parts, etc.</p>	<p>Visiting an airport: Seeing plan of runways Visiting hangars Visiting tower Observing directions to planes taking off and landing</p>	<p>Visiting an airport: Studying plan of runways Visiting hangars and studying planes: Kinda, form, parts, mechanism, motors, instrument panels, etc.</p>
<p>Noting kinds of planes. Learning to identify broad classifications: Training planes Transport, etc.</p>	<p>Learning to identify: Air-line transports Training planes Planes for private use</p>	<p>Learning to identify planes—any and all available. "Spotters Club".</p>
<p>Noting operations on field when planes land and take off—passengers, porters, ground crew, etc.</p>	<p>Visiting tower. Observing directions to planes landing and taking off. Talking with experts</p>	<p>Seeing telegraph devices, phones, signal gun etc. Talking with experts.</p>
<p>Building airport on the floor, large table, or playground. Using toy planes or ones made of wood by the children</p>	<p>Observing weather department office and seeing maps and instruments</p>	<p>Visiting weather department office. Seeing instruments, maps, and map making. Listening to talk by operator.</p>
	<p>Drawing large picture map of an airport putting in pictures of all essential parts</p>	<p>Making a detailed map of a large airport. Studying maps of airline routes in this country and world routes.</p>

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued

II. EXCURSIONS AND OTHER ACTIVITIES—Continued

32

HOW TO BUILD A UNIT OF WORK

Younger Children	Middle-Grade Children	Older Boys and Girls
Dramatic play of airport activities	Helping younger children with some of the more difficult parts of their airport. Entering into the dramatic play occasionally	Writing for and collecting material from airline companies and other sources.
Making airplanes of scraps of wood and nails	Building model airplanes that are not too difficult to construct	Constructing airplane models and utilizing them as demonstration instruments.
Building large airplane of building blocks, or orange crates, old boards, and wrapping paper—large enough for children to get in and play	Experimenting with various shapes of wings, etc., for plane models	Forming "Model Airplane Club."*
Dramatic play of pilots, steward, mechanics, ground crew, and passengers		Holding tournament with neighboring schools.
Helping fly kites made by older children	Constructing and sailing kites Helping younger children with kite flying	Holding contests to better own records.
Making pin wheels to run with out of doors to note force of air on a propeller		Studying forces that act upon an airplane—lift, weight, thrust, and drag.
Folding paper gliders to sail on playground	Making model gliders and parachutes and experimenting with them Making a trip to airplane factory to see mass production or assembly of parts	Making model gliders and parachutes and experimenting with them. Making a more detailed study of production. Taking a trip to research laboratory to see wind tunnel tests.

* Free material on conduct of clubs and contests can be obtained from National Aeronautics Association of the U. S. A., 1085 Connecticut Avenue, N.W., Washington D. C.

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued
II. EXCURSIONS AND OTHER ACTIVITIES—Continued

Younger Children	Middle-Grade Children	Older Boys and Girls
Taking a trip to museum to see collections showing historical development of aircraft	Taking a trip to museum to see collections showing historical development of aircraft Making a more detailed study from books and visual aids	Taking a trip to museum to see collections showing historical development of aircraft Making a detailed historical study of craft, flights, aviators.
	Taking a trip to nearest weather station Setting up a weather station for detailed study of local weather for a month	Taking trip to a weather station.
		Helping middle group with school weather station.
		Studying pilot's use of weather information.

III. CONTENT AND INTEGRATIONS OF SUBJECTS
Social Studies

Gaining knowledge of how people: Travel Send mail Transport goods	Gaining some knowledge of aviation Gaining some knowledge of life in other countries	Studying routes to the world's capitals and other centers.
Aviation the fastest method	Realizing differences in time and distance by water, land, and air routes	Considering geographic problems of air bases for landing and refueling along the way.

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued III. CONTENT AND INTEGRATIONS OF SUBJECTS—Continued

Social Studies—Continued

Younger Children	Middle-Grade Children	Older Boys and Girls
<p>Gaining some knowledge of airplanes, airports, and some aviation workers</p>	<p>Realizing the need for understanding and working with other countries</p>	<p>Considering international problems involved in opening up new geographic areas and decreasing time and distance between places.</p> <p>Considering need for understanding of other people and their problems.</p> <p>Studying governmental problems of ownership of facilities, safety, traffic control, and health problems.</p>
<p>Gaining some concept of what a map is through representing a large space on a relatively small area</p>	<p>Making a picture map of an airport</p>	<p>Studying maps of air routes, in the United States.</p>
<p>Building a large airplane to play in</p> <p>Building an airport on the floor or large table for play with small airplanes</p> <p>Drawing and painting pictures as a step toward picture maps</p>	<p>Making a semi-abstract map of an airport and the region it serves</p> <p>Playing an airmail game using a map background on the board</p> <p>Learning to read a map of the United States showing airlines</p> <p>Learning to read simple graphs and charts with help in analyzing key. Maps, charts, and graphs made by older children could be used here</p>	<p>Studying maps of the world showing great circle routes.</p> <p>Comparing distances on land-water routes with airline distances.</p> <p>Making various types of graphs and charts to carry data collected.</p> <p>Making charts showing structure of the atmosphere, troposphere, stratosphere, ionosphere.</p>
<p>Making a picture history of aviation</p> <p>Learning that people have tried for a long time to learn to fly and that old planes differ from modern ones</p>	<p>Reading historical stories of early attempts at flight—balloons, gliders, early efforts by Wrights and others</p> <p>Studying pictures of early planes. Comparison of speeds, attitudes attained, size of plane, and uses</p>	<p>Making more detailed study of the history of aviation. Doing reference reading. Reading history stories and biographies, stories of efforts of early fliers, flights of Lindbergh, Byrd, and others.</p> <p>Giving reports of individual reading.</p>

ADAPTATIONS AND VARIATIONS IN UNITS OF WORK

Science

Developing interest in weather

Keeping a weather calendar showing sunny, cloudy, and rainy days
Determining kinds of clothes to wear from weather and thermometer reading
Watching a Cape Cod type barometer with colored fluid

Learning about the watercycle

Learning about wind, clouds, fog, and snow

Watching some of the experiments of the older children

Making pin wheels and running with them to see action and force of air on a propeller

Folding and sailing paper gliders

Helping to fly kites made by older group and watching them

Watching air-pressure experiments by older children

Continuing interest in weather

Setting up their own weather station, keeping detailed records of the weather for a month
Thermometer readings outdoors morning, noon, and close of school
Constructing a weather vane, an anemometer of tin cans, a rain gauge of a large can

Barometer reading, if possible

Learning to read weather maps

Studying weather elements—wind, fog, rain, snow, sleet, hail, dew, and forms of water—solid, liquid, gaseous

Making glider and simple model airplanes and flying them on the playground

Making kites and flying them

Setting up simple air-pressure experiments

Studying work that the air can do

Gaining some notions regarding stratosphere flying—that the air is colder and pilots need sealed cabins or oxygen supply and heated suits

Continuing interest in weather.

Studying weather and weather maps from the standpoint of the pilot and flying.
Studying the weather services at an airport and the pilot's use of these services.

Learning more about clouds and storms. Pilots can climb above most storms and can thread way between thunderheads of others. Storms occur in lower atmosphere only.

Learning more about weather elements, prevailing winds, and the aggregate of weather known as climate.

Testing airplane models on the playground.

Testing balance of planes.

Setting up and demonstrating air-pressure experiments.

Planning explanation for younger children.

Learning something of the strata of the atmosphere—stratosphere, ionosphere, troposphere (where man lives).

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued

III. CONTENT AND INTEGRATIONS OF SUBJECTS—Continued

Science—Continued

Younger Children	Middle-Grade Children	Older Boys and Girls
Learning that air is substance, occupies space and can do work		Adapting of planes and provision for pilots in stratosphere flying.
Studying the kinds of work that the wind can do		Studying adaptations of structure of birds permitting flight.
Observing flight of birds, soaring, flying, flapping	Noting structure of feathers and wings	Learning that soaring uses air that is rising: Air blows up a hill.
Studying animals that fly—flying squirrel, fish, etc. Spiders soaring on webs	Noting kinds of animals that can fly	Light reflected from light-colored land causes air to rise with high velocity.
Finding seeds that fly	Noting structure of seeds and spores that fly	
Playing with balloons	Experimenting with balloons	Helping middle-grade children with experiments with balloons.
Experimenting to learn that some things float and some sink	Learning that air expands when heated and that heated air is pushed up by colder air	Making and flying a model glider.
Learning that things that float are lighter for their size (the law of floating bodies)	Learning that: Balloons are blown about by the wind Glider were first used for flying	Learning about man's use of gliders—use of gliders to transport troops and equipment during war.

HOW TO BUILD A UNIT OF WORK

ADAPTATIONS AND VARIATIONS IN UNITS OF WORK

Learning that airplanes require motors in order to fly. The number of motors and the weight of the planes depend upon the work they must do

Learning that:

Function of an airplane motor is to turn the propeller

The propeller pushes on the air

The air pushes on the propeller and moves the plane forward

Airplanes must be tilted or banked to keep them from skidding

Learning about the following:

Three axes of balance of plane—lateral, longitudinal, vertical.

Four forces at work in flying—lift, weight, thrust, drag.

The purpose of airplane motors:

Single-motor planes

Multi-motor planes

Radial type

In line types

Air-cooled

Liquid-cooled.

The invention of gasoline made flying possible.
Mixture of gasoline and air causes explosion in cylinder that creates power.

The forces that keep an airplane wing lifting—speed, angle, shape of cross section.

The propeller and its thrust: two-blade fixed and variable pitch.

The control surfaces: elevator, rudder, ailerons, flaps.

The landing gear: two- or three-wheel, floats on sea hull.



Language Arts

Motivating the use of books and learning to read
Interest in picture books
Curiosity about captions under pictures

Furnishing high motivation for reading
Interest in books and stories on their reading level

Furnishing high motivation for wide reading following group and individual interests.

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued

III. CONTENT AND INTEGRATIONS OF SUBJECTS—Continued

Language Arts—Continued

		HOW TO BUILD A UNIT OF WORK	
Younger Children	Middle-Grade Children	Older Boys and Girls	
Developing interest in reading simple stories in books	Growing in independence in reading	Doing thorough, detailed reading of directions for making model airplanes, scientific material on weather, principles of flight.	
Dictating stories about their airplanes and dramatic play for charts and booklets	Beginning of wide reading following individual interests	Reading adventure stories of aviation—flights.	
	Learning to use a dictionary, children's encyclopedias, and other simple source materials	Reading history of the development of aviation. Learning to recognize central ideas of paragraphs and supporting details.	
	Learning to read charts, maps, and graphs	Increasing skill in using dictionaries, encyclopedias, and library sources.	
	Learning types of books to turn to for various purposes, geography and history books, atlas, etc.	Increasing skill in reading graphs, charts, and maps.	
Increasing skill in using visual and auditory aids	Increasing skill in using visual and auditory aids	Increasing skill in using visual and auditory aids.	
Growing in skill in discussion both in ability to contribute and to listen	Growing in skill in discussion both in ability to contribute and to listen	Growing in ability to conduct and to hold his own in discussion.	
Sharing of experiences	Giving oral reports of experiences and reading	Giving oral reports.	

ADAPTATIONS AND VARIATIONS IN UNITS OF WORK

Dictating or writing notes for permission to go on excursions	Writing notes for permission, for materials, and notes of thanks.	Writing notes for permission, for materials, and notes of thanks.
Dictating or writing accounts of trips for charts, booklets	Writing notes or a log or diary of trips or aviation study	Writing to Civil Aeronautics Authority, airlines etc., for materials for study.
Dictating original stories, poems, songs, and plays	Writing original stories, poems, reports, songs, plays, descriptions.	Writing original stories, poems, reports, songs, plays, descriptions.
Copying or writing as they are able		
Adding new words to vocabulary: Hydroplanes Hanger Stewardess, etc.	Building vocabulary—new words such as: Fuselage, ailerons, etc. Weather terms Common flight terms	Learning new scientific terms dealing with weather, principles of flight, airplane mechanism, composition of the atmosphere.
Utilizing content from books, pictures, stories, etc., in discussion and dramatic play	Growing in ability to apply facts and principles in thinking	Growing in ability to apply facts and principles to interpret data and solve problems.
Arithmetic		
Deepening understanding of common terms denoting size, quantity, time, speed, large, small, heavy, light, fast, slow, high, low, etc.	Continuing clarification of terms and concepts of time, distance, size, weight, and quantity	Solving many problems dealing with distances speeds, weights, quantities. These problems will arise in discussion, reading, construction, and experimentation.
Growing in concept of numbers—two motors, four motors	Measuring and calculating in construction of model planes, experiments, mapping	Making up original problems illustrating certain points in the arithmetic course of study: Economic problems of costs, comparisons by rail, air, water, truck, bus, etc. Geographic problems of space, distance-bases.
Estimating and measuring for construction	Solving problems of time, distance, speed, cost, weight, and quantity, using such problems for practice in the skills and processes required for these grade levels	
Numbering planes in play	Making up original problems	
		Figuring to scale utilizing fractions and relationship of parts.

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued
III. CONTENT AND INTEGRATIONS OF SUBJECTS—Continued

The Arts

		Younger Children	Older Boys and Girls
		Middle-Grade Children	
		Carrying on free expression with paint, crayons, and other graphic and plastic media	Carrying on free expression with paint, crayons, and other graphic and plastic media.
		Constructing with industrial arts materials	Constructing with industrial arts materials.
		Making scrap books, diaries, and picture books	Making scrap books, diaries, and picture books.
		Singing songs of airplanes and aviation	Interpreting instrumental music, flight, sound of motors, etc.
		Creating original songs and chants	
		Interpreting the rhythm of music	
		Carrying on dramatic play of airplanes and airport	Creating original plays.

HOW TO BUILD A UNIT OF WORK

POSSIBLE OBJECTIVES FOR A STUDY OF AVIATION—Continued

IV. EVALUATION

ADAPTATIONS AND VARIATIONS IN UNITS OF WORK		
Younger Children	Middle-Grade Children	Older Boys and Girls
Discussing what has been learned, answering questions, summarizing knowledge gained	Discussing and summarizing what has been learned	Discussing and summarizing what has been learned.
	Answering questions listed at beginning of study	Summarizing in small committees, individually, or as a total group.
	Summarizing additional knowledge gained	Evaluating all elements gained through study, including evaluation of study skills.
	Evaluating growth in study skills	
	Evaluating activities	Evaluating activities.
Summarizing through charts, booklets, murals	Summarizing through charts, booklets, murals	Summarizing through charts, booklets, murals.
Planning and giving a program for parents or a group from another school	Planning and giving a program for parents or a group from another school	Planning and giving a program for parents or a group from another school.
Showing the airport or airplane and put on brief dramatization	Dramatizing or portraying in some manner one of the following: Sketch of history of aviation Modern uses of planes A story about aviation An original group play	Demonstrating model planes and discussing them.
Sharing their pictures, poems, stories, charts, booklets, etc.		Demonstrating science experiments.
		Giving brief talks or panel discussion on: Recent development in aviation. Postwar problems growing out of aviation.

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ADAPTATIONS AND VARIATIONS IN UNITS OF WORK

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Short and Incidental Units of Work

The passing experiences of temporary nature which children encounter in their environment are often worthy of brief attention and interest. Many times they are high points of interest for the year even though they are of brief duration. The circus comes to a nearby place; the children can think of nothing else for a time and so they read, talk, and dramatize circus. If subject-matter values are less significant, that fact may be more than compensated for by the socializing experience of give and take in cooperative working and planning and by the language and reading values which grow out of the strong motivation of enthusiasm and keen interest.

A children's movie or concert, new toys at Christmas time, an unusual experience of a single child, the building of a new house in the neighborhood, or the work of road-building machines—any item of current interest in the life of the community or of even a single child may cause the group to lay aside its major unit of work for a brief period of enthusiastic experience or may cause the adding of another interest which is carried along parallel with or perhaps as a part of the major unit of work.

With older children, other types of interests may enter in. The eruption of a new volcano in Mexico probably caused many groups of children to spend time studying the causes and action of volcanoes in the world. Interest might lead them into wide reading of accounts of volcanic eruptions within historic time which have brought disaster to communities of people and changed the course of history. One interest often leads to another so that children delve into many areas in their individual reading.

Interest in the songs of World War II as compared with the popular songs of World War I; the music, art, and some of the literature of the nations that make up the United Nations; the handicrafts of the colonial period or a comparison of the handicrafts of the American Indians previous to the white man's coming and today might become short-term interests which existed by themselves or as an adjunct to a major unit of work.

Current events items brought in by children frequently call for a brief period of incidental study in order to understand the background and significance of the current happening. Taking time for background building as it is needed raises a current events period from the level of a less profitable routine period to one which has tremendous educative value for children, not only in the knowledge they gain of current world affairs, but in the motivation it furnishes for individual study and reading through the sharpening of intellectual curiosity.

Science interests will occupy a large place as well as interests which fall into the social studies category. Interest in a heavy fog or in mists rising

ADAPTATIONS AND VARIATIONS IN UNITS OF WORK

from a nearby valley may cause the group to stop for a simple experiment with water, or using a teakettle and a burner, so that children may learn the composition of fog, mist, and clouds. Weather phenomena of all sorts, may call forth brief interest. The announcement of an eclipse or a brilliant star may become the motivation for a short, intensive study. A list of these brief incidental studies at the end of a year may reveal values which add materially to those of the more extensive units of work.

Long-Term Studies Which Reappear Intermittently

An interest which is of general concern to individuals regardless of age and maturity and which has a large body of content may be developed in a variety of ways and may appear at many points in the curriculum program of a school. Each approach to the problem is different; each builds upon previous experience and enlarges that experience in some way. Few problems which are dealt with in the elementary school are covered so thoroughly at one grade level that there is nothing left to learn. Children enjoy an occasional experience of picking up the threads of a previous study, finding out how much they really do know, going more deeply into it, giving it a new slant, or bringing it up to date.

Certain types of interests can be managed best as long-term studies which are picked up for intensive work for a time then dropped until some new incident, bit of material, or need throws more light on them or stimulates renewed attention. Some of these studies may extend throughout the elementary school years.

Weather, seasonal change, and astronomy are science interests which might be studied in this manner. Other types of interests which lend themselves to long-term study are:

- New and significant developments in aviation.
- Developments in the control of disease, and medical and health care.
- Scientific developments which appear in the news.
- Community postwar problems.
- The progress of peace in Europe.

The subject of astronomy is treated briefly to show the way in which a long-term study might evolve.

Studying the Heavens

Five- and six-year-old children ask such questions as, "Where does the sun go at night?" "Where is it on a rainy day?" "Why does it go down in one place and come up in another?" "Why can't I see the stars and the moon in the daytime?" Their interests may lead to discussion, to the teacher's reading of stories and poems, and to the singing of songs about

HOW TO BUILD A UNIT OF WORK

the sun, moon, and stars. They will be interested in picture books and pictures on the bulletin board. The teacher may take the children into a dark room and demonstrate the rotation of the earth which causes day and night by using a flashlight and a globe with a marker pinned on it at the point at which the children live. This first exposure to difficult concepts cannot result in complete understanding. The same ideas and demonstration will need to be encountered many times as the children grow older before they are really learned and understood.

Eight- and nine-year-old children are delighted with a study of the heavens and can profitably carry on an extended unit of work on astronomy. They learn to distinguish between stars and planets, gain some concept of the vastness of space and some appreciation of size and distance. They are awed by the beauty, order, and rhythm of the universe and express their spiritual and emotional reactions in original poetry, prose, pictures, songs, and rhythmic interpretation. They can learn to identify the North Star, Venus as the evening star, the Great and Little Dippers, and Orion in the winter sky. There is a great deal in books which they can read, and a few films are simple enough for them.

Older boys and girls go on with the study, learn to identify more of the constellations, watch for star news, such as the appearance of a nova, and speculate about the knowledge man will attain when the new 200-inch telescope is ready for use on Mt. Palomar. They will be interested in the Greek legends about the constellations and the source of their names. They will demonstrate the rotation and revolution of the earth, explaining day and night and seasonal change with evidence of real understanding. They will be intrigued by the use made of the stars by airplane pilots and navigators though they will not go deeply into celestial navigation.

Astronomy will become a source of genuine interest for most young people through this intermittent treatment in the elementary school. Some of the children may carry on their interest as a hobby or vocation and become amateur astronomers or trained scientists in later years. For all children, it provides broadening of vision and some concept of the relationship of man to the universe.

Not only may studies be emphasized from time to time within the elementary school span, but studies may be picked up intermittently within the same year. A study of weather in fourth grade might be very detailed and extensive for a time, then a minimum of observation and recording might be agreed upon for the rest of the year so that at the end of the year conclusions might be drawn from a large mass of data. Or the subject of weather might be dropped except for passing interest as distinct seasonal changes were manifested.



A Concluding Comment

Units of work are of many kinds and involve many variations in details of content, organization, time span, and activities. The unit of work organization is a plan for organizing and integrating the learning experiences of children around a central interest. The goal sought through the organization is the best possible growth and development of all children collectively and of each individual child. Gifted children can grow in power through reaching out to new experiences which are challenging to them and which enable them to enrich the experience of the total group through their contributions. Retarded children can carry on activities which they find satisfying and which also fit into and enrich the total group experience.

Each teacher is a curriculum maker who provides the best curriculum she can produce for her children within the framework set up by the resources and requirements of her situation and the community needs and standards which exist there. Teachers differ in their interests and methods of thinking and working and each will do best those things which challenge and interest her as well as meet the needs of the children.

VI. REFERENCES TO HELP A TEACHER BUILD UNITS OF WORK

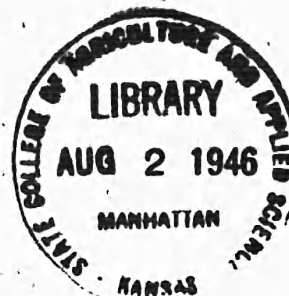
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