AN INTEGRATED AEROSPACE EDUCATION CURRICULUM
GUIDE TO BE USED IN GRADES FOUR, FIVE, AND SIX

A Field Report
Presented to
The Graduate Division
Drake University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science in Education

by
Gladys B. Downing
August 1960
AN INTEGRATED AEROSPACE EDUCATION CURRICULUM

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by

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Approved by Committee:

Chairman

Dean of the Graduate Division
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This has troubled some educators and individuals interested in education, who at the same time have little knowledge of aviation but a dawning realization of some of the consequences that aviation is imposing on our culture and thinking.

Educators have come to realize that with the progress that has been made in Aerospace Education, something has to be done to the present school curriculum to bring interesting, informative, and vital new material into the existing courses at all grade levels and curricular areas.¹

CHAPTER I

INTRODUCTION

The Aerospace Age is here and with it has come many responsibilities to accompany the privileges that it affords.

This has troubled some educators and individuals interested in education, who at the same time have little knowledge of aviation but a dawning realization of some of the consequences that aviation is imposing on our culture and thinking.

Educators have come to realize that with the progress that has been made in Aerospace Education, something has to be done to the present school curriculum to bring interesting, informative, and vital new material into the existing courses at all grade levels and curricular areas.¹

I. STATEMENT OF THE PROBLEM

It was the purpose of this study to devise a Curriculum Guide to assist the elementary teachers in integrating Aerospace Education with the curriculums of grades four, five, and six.

II. PROCEDURE

To gain a better understanding of the problem, the

investigator secured Elementary Curriculum Guides from the states of Florida, Ohio, Missouri, Minnesota, Kentucky, Texas, and Colorado, gaining information as to the necessary areas to include in each grade level. Also used were basic and parallel texts from the Indianola Community Schools as a guide for analysis of material in the investigator's integrated Aerospace Education Curriculum Guide.

To enable the writer to devise this Curriculum Guide, an integrated Aviation Education Curriculum Guide on Aerospace Education for the Public Schools, prepared by the Curriculum Committee at Miami University, Oxford, Ohio, and a Curriculum Guide for Aviation Education from the University of Tennessee were used to give information pertinent to the problem.

III. IMPORTANCE OF THE STUDY

At present, many school systems in Iowa have yet to recognize the importance of Aerospace Education, either as organized into an elective course or in its relationship to one of the well-defined curricular trends. Administrators and teachers are anxious to support Aerospace Education programs. A solution to this problem would appear to be the integration of Aerospace Education with the present curriculum to provide a Guide for the Elementary teacher.
IV. CHANGES TO MEET TODAY'S RESPONSIBILITIES

Educational Changes

In Iowa education there has been activity to meet the challenges which the airplane has presented. The Iowa Aerospace Education Council was formed by a group of educators and laymen in December, 1956, who met in the office of the State Department of Public Instruction, for the purpose of helping to bring about an educational program in Aerospace Education.

This Council has the full cooperation of the State Department of Public Instruction. Its members are representatives from universities, colleges, secondary, and elementary schools, service clubs, the Iowa State Education Association, Iowa Congress of Parents and Teachers, Iowa Aeronautics Commission and the State Department of Public Instruction, and is a part of the latter department.

New members are nominated for membership by the Council and are then appointed by the state superintendent of public instruction.

In 1957 the Aerospace Education Council and Drake University established the first Aerospace Education Workshop under the direction of Dr. Arthur Mullens, Professor of Education at Drake University. There were eighteen students, all teachers or prospective teachers, enrolled for the six
weeks' course. In 1958 there were twenty enrolled for the class, and in 1959 there were twenty, making a total of fifty-eight.

In 1958 and 1959, Iowa State Teachers College at Cedar Falls held two Aerospace Education workshops, with a total of twenty-eight teachers taking part; eleven high school teachers, five junior high teachers, and twelve elementary teachers with Dr. William H. Drier, the Director of the Aerospace Education Workshop.

With these two Iowa colleges offering Aerospace Education Workshops, only the small number of eighty-six teachers were reached in comparison with our present number of 32,328 teachers in Iowa Public Schools, as of September 15, 1959. This shows that there is a need for more educational opportunities for teachers in this important field of Aerospace Education.

The Iowa Aerospace Education Council hopes that other teacher-training institutions will find it possible to organize similar educational experiences for teachers. The Iowa Aeronautics Commission has added an Air-Age Education Director to its staff who is a member of the Council and is responsible for securing Aviation Education materials and distributing them to teachers throughout the state. Grants-in-aid have

\[1\] State Department of Public Instruction, *Iowa Educational Directory* (Des Moines, Iowa: State Department of Public Instruction, September 15, 1959).
also been established to assist teachers who want to further their educational growth by attending these workshops.

**Sociological Changes**

Because of aviation, one can never again be remote from other peoples of this world. There are no more "far-away" places. No spot on this earth is more than forty hours' flying time from your local airport. This fact can be verified quickly with a pencil and paper by using eight thousand miles as the diameter of the earth and 312 miles per hour as the average cruising speed of long distance flight.

These sociological problems arise which are equally important to school people who recognize in aviation a means of working for better understanding among peoples. This shrinking of the apparent size of the world, caused by fast air travel, had, however, expanded our opportunities to go places formerly inaccessible, to meet other peoples, and to broaden our understanding of world resources and conditions by firsthand experience. This has created a need for a modified curriculum program of most of the nations' school systems to meet the needs of "Aerospace Education."

The conquest of space is before us; so far our attempts are feeble. The state of the art is young. It is said that we are trying to run before we can walk. Perhaps this latter may be true. But this, the aircraft industry knows...the benefits of the
future in the field of flight will be hastened or
delayed in direct proportion to the knowledge and
acceptance by our citizens, and to the number of
young people who become technicians, engineers, and
scientists in the aeronautical industry.¹

Aviation, therefore, now affects the daily lives of
all of us. The impact of aviation has changed our social
situation and has opened up possibilities for social study
never before possible; it has made imperative the develop-
ment of social skills and understanding never before required.

Economic Changes

Today, the transportation industry has grown rapidly.
With the passing of Civil Aeronautics Act of 1938, airline
statistics show that great strides were made in the twenty
year period from 1938 to 1958.²

In 1958, the twenty-first year of operation under the
Acts, the airlines had reached new peaks of usefulness in
every category.

This growth had been possible because the airlines in
their efforts to serve the public had provided service in con-
tinuously greater abundance, while improving their dependa-
bility over the years.

¹National Aviation Education Council, United States Air-
craft Missiles and Space Craft (Washington: National Aviation
Education Council, 1959), foreword by Orval R. Cook, President
of Aircraft Industries Association.

²Air Transport Association of America, Air Transport
Facts and Figures (Washington: Air Transport Association,
In 1939 there were twenty-three airlines; in 1958 fifty-five. In 1939 there were 13,300 people employed by airlines, and in 1958 there were 146,000 employed. The airlines also serve 703 cities.\(^1\)

Safety in the air has been the number one concern of the airline industry. In the last seven years, the domestic scheduled airlines have had a safety rate of less than one fatality for every one hundred million passenger miles.\(^2\)

**Technological Changes**

Teachers must familiarize themselves with Industrial production methods.\(^3\) Standard designs of aircraft are no longer individually made by craftsmen, but are a product of mass production, part stampings, machinings, fitting, inspecting, subassembly and assembly, sometimes in jigs which insure a high degree of accuracy and interchangeability of competent parts. The development of modern aviation power plants is another important factor.

V. MEETING SPECIAL NEEDS AND INTERESTS

Within the social studies curriculum of the Indianola, Iowa, Community Schools are the following units pertaining to aviation:

\(^1\)Ibid.  \(^2\)Ibid., p. 9.

\(^3\)"They Blaze the Trail," *Boeing Magazine*, XXV, No. 4 (April, 1955). (A magazine published by the Boeing Airplane Company, Seattle, Washington.)
1. Stories about Flying
2. Airports and their Activities
3. Why and How Planes Fly
4. Community Aviation
5. How Man Learned to Fly
6. Current Aviation Developments
7. Air Transportation
8. Flight Control
9. Aviation For Fun
10. The Mathematics of Aviation
11. Science and Invention
12. Aircraft Manufacture
13. Aviation in Economic Life
14. Aviation Research
15. Weather
16. Agricultural Aviation
17. Business Flying ¹

In addition to these units the schools need to provide for special interests of individual pupils. These pupils may have the following desires concerning aviation:

1. Desire to specialize in flying as a life work.
2. Desire to specialize in aircraft mechanics.
3. Desire to continue education in aeronautical engineering.
4. Desire to have a military career in aviation.

¹ These units pertaining to aviation are presently included in the social studies curriculum, Indianola Community Schools, Indianola, Iowa.
5. Desire to use aviation as a hobby.
6. Desire to enter into related technological occupa-
tions such as meteorologists, technicians, navigators, and radar operators.

VI. TEACHER REQUIREMENTS

The Aviation Education Committee of the American Associa-
tion of Colleges for Teacher Education in its 1949 report pointed out that teachers should have:

1. An adequate reading and speaking vocabulary of aviation.
2. Knowledge of the importance of weather and climate to successful aviation.
3. A general knowledge and understanding of airplane structure.
4. A general knowledge and understanding of the simple scientific principles of flight.
5. An understanding of the place of aviation in peace and war.
6. An understanding of the effects of air transportation on various levels of international relationships.
7. An introduction to the social, economic and political implications of current and future aviation develop-
ment.
8. An appreciation of the services rendered by airports and their associated personnel.
9. Familiarity with existing and needed basic government services, regulations and relationships in service.
10. A knowledge of available aviation education resources in materials, personnel and equipment for instructional purposes.
11. The know-how for organizing units of aviation education and providing resulting learning experiences for chil-
dren through student or directed teaching.
12. A realization of the growing interdependence of people through aviation.

13. An understanding of problems—political, economic, international, and social—that aviation has created and the institutions society has established to solve these problems.

14. A realization of how the airplane has changed geographic relationships—particularly in terms of mankind's concepts of time, place and distance and mankind's attitude toward waterways, land masses and land and water barriers.¹

¹Civil Air Patrol, op. cit.
CHAPTER II

REVIEW OF THE LITERATURE

The writer secured Elementary Curriculum Guides from Missouri, Florida, Minnesota, Ohio, Texas, Colorado, and Kentucky to gain information as to the necessary areas to include in each grade level. Within this chapter, the writer will review the format of these guides.

I. LOUISVILLE, KENTUCKY, CURRICULUM GUIDE, 1958

The Louisville guide was organized in the following format:

Grade Six (Science)

Unit I. Story of the Earth
Unit II. Weather and Climate
Unit III. Living Things
Unit IV. Health and Nutrition

Development of unit -
State the name of Unit Outline. Example - (The Story of the Earth) Basic understandings to be developed and Pupil References, Materials and Activities followed.

II. DENVER, COLORADO, TEACHERS GUIDE, 1951

The Denver guide was organized in the following format:
Unit I. General Topic
  Time Spent
  Vocabulary Desired
  Activities
  Desired Outcomes

III. CINCINNATI, OHIO, TEACHERS GUIDE

The Cincinnati guide was organized in the following format:

Unit I. General Plan of Program
  Section Areas
  Summary of Outcomes in Each Grade
  Presentation of Outlines
    A. Purpose
    B. Scope of Program
    C. Approaches--Activities
    D. Evaluation
    E. Reference and Materials

IV. MINNESOTA CURRICULUM GUIDE, 1957

The Minnesota guide was organized in the following format:

Unit I. Introduction
  Desired Outcomes
  Content
  Teaching Procedures
Developmental Activities
Culminating Activities
Evaluation

V. TALLAHASSEE, FLORIDA, TEACHERS GUIDE, 1950

The Tallahassee guide was organized in the following format:

Part I
A. Introduction - Why the Guide Was Developed
B. Goals - Formulation of Good Habits and Skills
C. Selecting Problems and Experiences, by a Summary of:
   1. Characteristics
   2. Needs
   3. Problems Related to Needs
   4. Units Planned to Meet Needs

Part II. Resource Units consists of:
A. The Problem
B. Objectives
C. Preplanning

Form used
Problem and Content - Experiences of Students' Evaluations -
Bibliography

Part III. Sources of Material
A. References for Teachers
B. References for Students
VI. MISSOURI CURRICULUM GUIDE, 1955

The Missouri guide was organized in the following format:

Chapter I. Introduction
Chapter II. Foundations for Elementary Education
Chapter III. Unifying Experiences
Chapters IV-VI. Specific Subject Areas.

Form:

Unifying Experiences - Contents

Ideas to try:

Developing Unifying Experiences:
A. What we need to work on
B. What we know about
C. What we need to find out
D. Where can we find out?
E. How can we find out what we need to know?
F. How can we express what we have learned?
G. Evaluation
H. How can we use what we have learned?
I. What can we learn next?

VII. ORANGE, TEXAS, CURRICULUM GUIDE, 1947

The Orange guide was organized in the following format:

Chapter I. Statement of Philosophy
Chapter II. Concepts to be Developed in the Elementary Schools
Chapter III. Scope and Sequence

Chapter IV. Units of Learning Experiences

Chapter V. Six Units Outlined on Different Phases of Specific Area Program

Outlines Used:
A. Desired Outcomes
B. Teaching Activities
C. Bibliography
   1. Children's references
   2. Teachers' references
   3. Films

The writer secured curriculum guides for Aviation Education from Tennessee University, Knoxville, Tennessee, (1958)—and Miami University, Oxford, Ohio, (1957)—to use as guides for references and materials in organizing, and constructing the writer's Integrated Aerospace Education Curriculum Guide for Grades Four, Five, and Six.

VIII. TENNESSEE AVIATION EDUCATION GUIDE, 1958

The University of Tennessee with the cooperation of the staff, military representatives, consultants, Tennessee Aeronautics Commission, and Civil Air Patrol prepared the Aviation Curriculum Guide in Workshops under the direction of Clarence E. Kuhlman:

Part I. Purpose of Guide:
A. Gain general understandings of aspects of aviation.
B. Discuss implications of each of the aspects of aviation.

C. Develop ways of using aviation content and activity to motivate student learning in the different areas.

D. Prepare Guide for Teachers of Tennessee based upon the conclusions reached and causes of action defined by the concerted effort of workshop participants.

Part II. Grades 1-2-3. Integrating Aerospace Education with the General Education courses

Form:

A. Pupil learning needs

B. Suggested pupil activities

C. Suggested references and materials

D. Suggested evaluative helps

Part III. Grades 4-5-6. Integrating Aerospace Education with the General Education courses in the same form.

Part IV. Grades 7 to 12. Integrating Aerospace Education with the General Education courses in the same form.

Part V. Appendix

Bibliography

Free and Inexpensive Materials

IX. OXFORD, OHIO, AEROSPACE EDUCATION GUIDE, 1957

An Integrated Aviation Education Curriculum Guide for the Public Schools was prepared by a Curriculum Committee of the
National Education Workshop, Miami University, Oxford, Ohio, 1957.

This curriculum was developed in an attempt to provide an instructional sequence outline that contains information about aviation and its related fields.

Its best use was to serve as a gateway into a series of experiences, interesting, challenging, and educational to teacher and students.

Form:

1. Educational Objectives
2. Basic Learnings
3. Aviation Activities

The writer had the able assistance of Dr. Arthur Mullens, Director of the Drake Aerospace Education Workshop Course, of which she was a member of the summer 1959 class. He supplied information from his personal library with material such as pamphlets, latest bulletins on Aerospace Education, Current Aviation Magazines, and Curriculum texts as follows:


As a result of the study of the various curriculum guides, the writer decided upon the following format for presentation of the Aerospace Education Unit:

1. Introduction
2. Problems
3. References and Materials
4. Developmental Activities
5. Culminating Activities

The Aerospace Education Unit will be presented in Chapter III.
CHAPTER III

INTEGRATED AEROSPACE EDUCATION CURRICULUM GUIDE

Within this chapter, the writer will present an Integrated Aerospace Education Curriculum Guide to be used in grades four, five, and six.

Unit for Fourth Grade Mathematics

The branches of mathematics are concerned not so much with content as with skills essential to the treatment of content. The principles can be effectively illustrated in terms of their application to aviation. The basic textbooks have been used in reference to the goals that had to be achieved and the writer integrated Aerospace Education with these skills.

Unit outline on measuring time. Pupils need to develop the ability to tell and measure time. Following is the unit outline:

Reference and Materials

A. Text

"Reading Time Table" - p. 111
"Reading Thermometers" - pp. 157-158
"Time and Length" - p. 181
"The Gallon" - p. 218
"Distance" - pp. 234-235
"Trip to Airport" - p. 253
"We Travel by Plane" - p. 277

B. Materials
Large calendars
Construction paper
Paper plates

Children's Activities

1. Use clock in room, also large clock on board with movable hands.

2. Children make their own clocks out of paper plates. Play games, pretend you are all going on trips. Set the clocks at take-off time. Pretend to be in air. Set the clocks again at landing time. Consult the time table.

3. Learn to tell time by hours, half-hours, quarter-hours.

Evaluation

1. Did children make the clock face correctly?

2. Could they estimate time?

3. Did the children understand that clocks are different in different parts of the world and do not tell the same time at any time?
Children's Activities

What time the sun rises and sets, moon changes, degree in temperature, precipitation.

5. Check list on how many days we have rain, snow, wind, sunshine.

6. Keep record of holidays or special events in school.

Evaluation

4. Could the children make a time schedule?

Unit outline on the thermometer. Pupils need to understand how to read the thermometer and record temperature. A unit outline follows:

References and Materials

A. Materials
Inexpensive thermometer

B. Text
"Studying Thermometers" - p. 376

Children's Activities

Evaluation

1. Record the temperature on a chart made by the class.

1-2. Did children learn to read a thermometer?

Were they familiar with degrees?
Children's Activities

2. Place thermometers in different places in the room and outside the window, make comparisons, and find difference in temperatures in different places.

3. Make a thermometer.

4. Children find ways the temperature has influence on people and their work.

5. What do pilots need to know about the temperature of the air?

6. Pupils bring thermometers from home to observe.

Evaluation

1. Do children realize the great expense an airport is?

3-4. Did they understand temperature as a weather factor?

5. Did the pupils find ways that pilots use thermometers?

(No evaluation needed)

Unit outline on money. Pupils need to understand the value of money and the use of coins. A unit outline follows:

References and Materials

A. Materials

1. Toy money

2. Cash registers

3. Check book

4. Airmail stamps and regular stamps

5. Material for model planes

   a. cardboard
b. soft wood  
c. nails  
d. hammers and saws  

**Children's Activities**

1. Purchase tickets at the airport (pretend). Give cash or write a check.

2. Go to postoffice and purchase air mail stamps. Discuss cost of stamps and compare with other stamps.

3. Estimate cost of plane trip if you were going 1,000 miles at 6¢ per mile first class or 3¢ per mile air coach.

4. Construct model planes and estimate cost of this.

5. Plan a study on cost of activities in and around the airport such as salaries, maintenance of airport, equipment. List them and add them up.

**Evaluation**

1. Do children realize the great expense an airport is?

2. Did the children realize why the air mail and regular stamp had different prices and advantage the air mail had over the regular?

3. Could they figure out how much it would cost to take a trip by air?

4. Did they gain any knowledge of the value of money?

5. Did these activities help them to make change more easily and rapidly?
Unit outline on skills. Pupils need to attain the fundamental skills of: (1) addition, (2) multiplication, (3) division, (4) subtraction, and (5) fractional parts. A unit outline follows:

References and Materials
A. Materials
   1. Pair of scales
   2. Model planes as an exhibit to compare size and capacity of each. Also the use of each.
   3. Aerial maps (can be secured from airport)
   4. Road maps
   5. Train travel folders (for use in comparing train travel with air travel).

Children's Activities Evaluation
1. Weigh different articles and add to get the total weight. 1-2-3-4. Are they more skilled in addition, multiplication, division, and subtraction?

2. Learn distance to airport. What would be the round trip?

3. Purchase a ticket for Father and Mother. The two children will take half-fare. Adult tickets are $72.00. How much did Father pay for all four tickets?
Children's Activities

4. Find out how fast an airplane can fly (average). Then solve problem of how many miles the plane flew in so many hours.

5. Compare traveling on a plane with that of a train.

6. If four classes of twenty-five pupils went to the airport on Monday, how many went?

Evaluation

5. Is it easier for them to make comparisons?

6. Can they understand story problems?

7. Did they learn how to express relationships?

Example - Small plane carrying one passenger. Jet airliners carry sometimes 100, 25, 6, 7, 10, and airliners carry 21–60.

7. Did pupils see what a vast amount of subject matter is covered in the Aerospace Education program?

References and Materials

Weight of DC-6 plane

55,600 pounds

Weight of fuel

32,000 pounds

Passengers and crew

6,798 pounds
Children's Activities

Express  23,871 pounds
Mail      22,501 pounds
Baggage  4,801 pounds

Unit for Fourth Grade Art and Music

The Art and Music area is a part of General Education. The aim is the development of a well-rounded personality that will live a constructive and happy life in our society. The schools must provide a balanced program which will enable the child to meet and adjust himself in changing situations in the home, school, and community. Art and Music should not be isolated subjects but integrated with other subjects and life as well. It could also include Aerospace Education to meet the challenges that the world has today.

Unit outline on ways of art expression. Pupils acquire knowledge of: (1) painting, (2) drawing, and (3) modeling. A unit outline follows:

References and Materials

A. References

1. Addresses for free materials
   a. North American Aviation, Incorporated
      Los Angeles International Airport
      Los Angeles 45, California
   b. United Air Lines
      35 East Monroe Street
      Chicago 3, Illinois
c. United Aircraft Corporation
   John A. Cox, Public Relations
   East Hartford, Connecticut

d. Pan American World Airways System
   28-19 Bridge Plaza
   Long Island City, New York

e. McDonnell Aircraft Corporation
   Box 516, St. Louis 3, Missouri

f. Lockheed Air Terminal, Incorporated
   Burbank, California

g. Beech Aircraft Company
   Public Relations Department
   Wichita, Kansas

h. Republic Aviation Corporation
   Farmingdale, New York

i. Gruman Aircraft Engineering Corporation
   Mr. A. T. Wilder, Engineering Department C
   Bethpage, New York

j. Trans-World Airlines
   Air World Education
   380 Madison Avenue
   New York, New York

2. The following pictures are available from companies listed above:
   a. Weather man releasing balloon
   b. Gas boy filling an airplane
c. Porter carrying baggage
d. Ticket agent selling to customer
e. Radio repairman checking radio
f. Control tower operator issuing instructions
g. Hangar helper pushing planes in and out
h. Reservation clerk answering phone
i. Station manager signaling pilot that he is to start engines
j. "Follow me" truck leading planes to parking ramp
k. Hangar helper knotting tie-down ropes to airplane wings and tail

B. Materials for Plane
Soft wood suitable in size for fuselage, wings, and propeller. A pattern for each may be made of paper, then traced on the wood.

Children's Activities
1. Some topics that might be selected for painting or drawn after a trip to the airport are:
   The transportation one used to go to the airport.
   Airplanes one saw at the airport.
   An airplane taking off

Evaluation
1-2. Did drawings and paintings of airplanes and workers show evidence of improved color knowledge and how they vary?
4-6-9. Were these activities of value in evaluating the children's awareness of the weather?
Children's Activities

An airplane landing

The airport at night

A blimp seen overhead

A scene at the control tower

2. Observe activities of the people who work at the airport.

Discussion of the personnel will stimulate painting or clay modeling based on activities of the pilots, stewardesses, mechanics, porters, control tower operators.

3. Many paintings grow out of the study of air and weather.

Suggested topics such as the wind and its effect on trees, smokes, grass, the clouds, children flying kites, birds flying, seeds and leaves floating in the air.

4. Illustrations to stories they have written to stimulate creative drawing.

Evaluation

a. Creativeness:

b. Knowledge of color:

c. Initiative:

5. Did the children realize that the different airline companies use different colors for uniforms of workers?

6. Were the children aware that different weather conditions are indicated on charts by different colors? Did the children notice the colors at sunset or sunrise and how they vary?

7. Were these activities of value in evaluating to:
<table>
<thead>
<tr>
<th>Children's Activities</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. A roller easel machine showing in sequence pictures of the airport trip. Buying the ticket, getting on the plane, dispatcher giving clearance, taking off, over the water, above the clouds, the landing, greetings of friends and relatives.</td>
<td>5. Did the children realize that the different airline companies use different colors for uniforms of workers?</td>
</tr>
<tr>
<td>6. Prepare mural activities of airport.</td>
<td></td>
</tr>
<tr>
<td>7. Children cut out various buildings, planes, and figures, paste on brown paper background.</td>
<td></td>
</tr>
</tbody>
</table>

**Unit outline on design.** Pupils need to understand the problem of design. A unit outline follows:

<table>
<thead>
<tr>
<th>Children's Activities</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mounting and displaying pictures of planes, balloons, kites, birds.</td>
<td>1-2-3-4-5-6-7-8. In arranging an exhibit, did the children show interest in items made by others</td>
</tr>
</tbody>
</table>
Children's Activities

2. Arranging displays of toy airplanes, considering size relationships color, what is most important.

3. Improvising an airplane with chairs, blocks to use in imaginary trip.

4. Learning to repeat motifs.

5. Familiarizing oneself with geometric shapes.

6. Developing a feeling of linear rhythm.

7. Frieze of cut paper planes to use as a border.

Evaluation

and also selecting things that would go together, with some good ideas of arrangement?

Unit outline on construction. Pupils need to know the problem of construction. A unit outline follows:

References and Materials

A. Materials for construction of airport and workers

1. Nails and glue

2. Cut wheels or pontoons to attach to plane

3. Wood for hangar (soft is easier to work with.)

4. Material for wind cone or sock:
   a. stiff red or orange cloth or paper (funnel)
   b. wire ring
c. a small dowel  
d. wooden skewer  

5. Materials for runways  
Chalk to draw lines on floor or strips of paper to form runways  

6. Materials for people  
pipe cleaners  
rug yarn  

**Children’s Activities**  

1. Planning and making different kinds of planes.  
2. Planning and constructing hangars.  
3. Planning and constructing a landing field and its equipment; runways, windsocks, and other equipment.  
4. Making and dressing people at the airport.  
5. Use clay and soap to make planes.  
6. Construct a control tower, earphones, telephone, loud speaker, beacon, anemometer, weather vane.  

**Evaluation**  
1-2-3-4-5-6. Did the activities in construction give pupils an outlet to illustrate what they had been consuming in the aviation unit? Was size and proportion as it should be?
Unit outline on art appreciation. Pupils need to develop an appreciation of art (elementary). A unit outline follows:

<table>
<thead>
<tr>
<th>Children's Activities</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Study pictures to learn how artists show wind direction, weather conditions.</td>
<td>1-10. inclusive</td>
</tr>
<tr>
<td>2. Draw your concept of airplane of the future.</td>
<td></td>
</tr>
<tr>
<td>3. Make a mural on history of the airplane.</td>
<td></td>
</tr>
<tr>
<td>4. Watch a plane crop-dusting. See the different pattern made by the dust as it leaves the plane and rolls back, over, and under.</td>
<td></td>
</tr>
<tr>
<td>5. Children seeing the different shapes and forms such as triangles, squares, circles, ovals, rectangles, spheres, pyramids, cones, and variations in these shapes can be seen in wing shapes, parts of the plane, in airport buildings, runways, instruments.</td>
<td></td>
</tr>
<tr>
<td>6. Children should be familiar with the colors and hues, bright and dull, light and dark. Vocabulary should</td>
<td></td>
</tr>
</tbody>
</table>
Children's Activities

include adjectives such as a dingy gray, a clean blue, to describe color.

7. Children should also recognize texture such as shiny, dull, smooth, rough.

8. They should also see familiar things as patterns, such as the patterns of structural steel or rivets in an airplane, or row of airplanes in a picture. Study the pattern of veins in insect wings, feathers in bird wings, seeds in a dandelion tuft. Such appreciation experiences make excellent introductions to design problems. Also introduce fact that an object looks different at different points of view. Introduce birds-eye-view and aerial panorama.

9. Seeing dark and light (value contracts are basic in achieving dramatic pictorial effects.
Children's Activities

Notice dark and light relationships in pictures, discuss dark against light and light against dark in mounting pictures.

10. Encourage children to evaluate form in relation to function and to select expressive adjectives to describe their observations. Observe the formations of planes in the sky, also formation of birds flying.

Unit outline on skills of vocal expression through musical activities. Pupils need to attain skills in:

1. vocal expression
2. display musical initiative through
   A. creative expression
   B. creative writing
3. organize rhythmic expression

A unit outline follows:

References and Materials

A. Books

a. **New Horizons Book** - "Dandelion Parachutes"
   page 94

b. **New Horizons Book** - "At the Airport" - page 117
   "Travel" - page 23

c. **Music Hour Book 1 and 2** - "Airplanes" - page 79
   (New York: Silver Burdette, 1937)


   a. **Our Songs - Book 2**
      "The Big Sky" - page 121
      "Weather Vane" - page 59
      "Merry Music" - page 3
      "The Airplane" - page 73


   a. **Singing As We Play**
      "What's the Weather" - page 123
      "Airplanes" - page 180
      "The Wind" - page 121

   b. **Singing on Our Way**
      "The Wind" - page 97
      "Balloons" - page 25
      "Taking Off" - page 149

   c. **Singing and Rhyming**
      "The Airplanes" - page 162
      "Clouds" - page 106
Children's Activities

1. Make up songs about airplanes.
2. Make up verses about aviation to go with familiar tunes.
3. Choral readings.
4. Tap out rhythms.
5. Listen to good records.
6. Sing appropriate songs.

Evaluation

1. Did children associate the planes "up and down" with the musical pattern?
2. Was tone awareness developed?
3. Were these activities pure enjoyment? It should be.
4. Were the children able to show self expression?
5. Did the children show rhythmic expression?
6. Were the children interested in these activities?

Unit for Fourth Grade Language Arts

Conversation, listening, discussion, and writing constitute the most fundamental activities of life and should be of chief concern to the language program through the elementary school. They can best be taught when applied to matter of current interest. If schools are to fulfill their purposes, they must take into account whatever social changes occur over a period of time.
There can be no question of the effects of aviation upon the realities of today's world. If education is to meet the needs of an air age, the curriculum must change so that the influences of aviation can be accommodated.

**Unit outline on communication.** Pupils need to be able to communicate through: (1) listening, and (2) observing. A unit outline follows:

**References and Materials**

A. Text


B. Books

The following books have one or more stories on Aviation:


_____. *Wings Over the Woodshed*. Albert Whitman and Company, 1941.


**Children's Activities**

1. Information
   
a. Listen to understand directions: For visiting an airport For boarding a plane For making a model paper glider
   
b. Listen to understand information about things:

**Evaluation**

1-3. Did children follow through with directions and rules that were made in plans about visiting the airport? Were deviations from directions due to lack of attention or lack of understanding?
Children's Activities

The pilot describes how he flies a plane.
The guide tells about the use of the hangar.
The radio voice describes an air race.

Evaluation

Were the children able to translate verbal directions into physical actions?
Could they imitate sounds that they heard at airport?
Did the visit to the airport reflect on conversation or actions when they returned?

2-4. Did they enjoy the research through the newspapers, radio, and television and was it projected into other subjects?

2. Pleasure

a. Listen to sounds of things such as airplane engines.
b. Listen to experience of others.
c. Listen to poems and stories about adventures in the air.
d. Listen to songs about flying and weather.
e. Listen to radio programs about famous pilots and planes and fictional heroes.
Children's Activities

3. Listen in classroom for directions on constructing a large airplane.

4. Check radio and television programs in newspapers for programs on aviation.

5. Watch pilot start planes' engines. Look for signals given by ground crew.

6. Observe the shapes of clouds, planes, buildings, and landing field.

7. Observe movements of aircraft clouds, trees in wind, seeds and leaves floating, birds soaring and flying, vehicles moving through traffic.

8. Observe dress of pilots, stewardesses, and mechanics.

Unit outline on speaking. Pupils need to speak effectively and with a purpose. Following is the unit outline:

Evaluation

5. Could pupils interpret the signals given at the airport?

6-7. Were observations for the technical side of aviation, or for the beauty of the place and surroundings?

8. Could children describe fully the way the pilot, stewardesses, and other dressed?
References and Materials

A. Text


B. References


2. Poems and Rhymes


Children's Activities

1. Tell personal experiences with airplanes.

2. Talk to each other about an aviation experience such as heard over the radio, seen in pictures or heard at home.

3. Talk about pictures that have been collected by the group for observation.

Evaluation

1-2-3-4. Did related experiences show any misconceptions of aviation information?
Children's Activities

4. Give oral reports on the importance of the airport to the community.

5. Help to formulate rules of conduct to be followed by the group on an excursion to the airport such as:
   a. Keep with the group
   b. Observe safety rules in walking around the airport
   c. Ask questions courteously
   d. Thank guides and assistants for courtesies
   e. Observe safety rules in crossing streets

6. Discuss reasons for visiting the airport.

7. Formulate plans for a possible aviation activity which would require a division of labor and a coordination of small group activities. Assist in dictating a group plan to be followed.
   An illustration:

Evaluation

5-6. Were rules made by pupils more strict than ones the teacher would have made?
Children's Activities

We are going to build an airport.

We will need an administration building.

We will need runways, hangars, many trucks, and carts.
The largest building is the administration building so that will take more people to work on it. Another group will make a control tower.

Another will make the runways.

8. Make some riddles about airplanes.

9. Give directions to the airport.

10. Talk on telephone to airport for information about permission to visit it.

Evaluation

other to see if new words were used and were they used correctly?

8-14-16. Did the stories and choral readings that children composed have authentic information about aviation? Also the riddles?

9. Could you find the airport by following the child's directions?

10-11. In telephone conversation, did the children speak concisely, hold telephone correctly
Children's Activities

11. Call the weather station to inquire about the condition of weather in regard to flying.

12. Report on radio or television items that have to do with aviation.

13. After defining new words and phrases to be used, make a chart about the airplane, airport, workers or weather.

14. Compose and tell a story about pictures of airplanes or experience.

15. Choose a radio announcer in your room to give the weather report each morning.

16. Make up an airplane poem for choral reading.

Evaluation

and have conversation well organized?

12. Check on activities of radio and television.

13. Were charts an aid to students in checking on themselves?

15. Was there good cooperation in this activity? Perhaps it would stimulate someone to want to be an announcer in the future.

Unit outline on reading. Pupils need to read for:

(1) information and enjoyment, (2) problem solving,
(3) extending and enriching experiences, and (4) meaning.

References and Materials

A. Books

Hildreth, Gertrude, and others. *Lost on an Island.*


B. References


Children's Activities

1. Arrange a library corner for aviation books, pamphlets, and pictures, and all other reading material that have been collected by pupils or teacher.

2. Visit a public library. Talk with the librarian about books on aviation.

3. Read to enjoy, without believing, the whimsical charm in make-believe stories or poems about weather. Distinguish between fact and fancy.

Evaluation

1-2. Did children seem to want to read the books that were available and also want to find more if at all possible?

3. Did the children seem to understand what they had read and interpret it correctly?
Children's Activities

4. Read and carry out directions for constructions.

5. Plan to reread silently a story about aviation which is to be dramatized, and to select speaking parts.

6. Read to find specific information about weather.

7. Read aviation story and use dictionary for any words that are not familiar.

8. Find out what class is to do in carrying on an aviation activity by reading simple announcements, plans, or directions on a chart, bulletin board or blackboard.

9. Bring to school words that you have encountered outside of school. Add to your vocabulary list.

10. Keep a vocabulary list. Compare with others.

11. Think of words that have phonetic parts such as

Evaluation

4-5-6. Were more aviation books reported on?

7-8. Could you see that interest was stimulated with more reading material available?

9-10. Did their vocabulary enlarge?

11. Did this activity help in the phonics area?
Children's Activities

those in the following:
Ground, sound, found
Speed, feed, seed
Turning, churning, burning
Snow, slow, flow
Oil, soil, coil, foil
Rudder, shudder.

12. Think of unusual letter combinations such as: aviation
high microphone flight lights

13. Make check (✓) on words that have short vowel sounds such as:
wing glide
climb runway
loading jets
windsock take-off
spin radio
time mail
clock high
beacons
Unit outline on writing. Pupils need to write legibly and effectively. A unit outline follows:

References and Materials

A. Pamphlets

Mike and Nancy Learn About Jets

Helicopters
National Aviation Education Council,
1115 - 17th Street, N.W.,
Washington 6, D. C. 1954.

Jets - National Aviation Education Council

The Flying Clippers
Pan American Airways - Educational Service
28-19 Bridge Plaza North
Long Island City 1, New York. 1958.

Look to the Sky
National Aviation Education Council,
1025 Connecticut Avenue,
(Good for both teachers and students).

The Airport and You
United Air Lines, School and College Service

Tilly the Tiger
Children’s Activities

1. Make a scrapbook of pictures about anything that pertains to aviation and label each legibly so that reader can understand.

2. Write weather stories, original poems.

3. Write by copying or by dictation to give the different experiences.

4. Write original songs.

5. Write a play and then give it before another group.

6. Write the name and address of your airport.

7. Write notes or letters to pupils in other classrooms, parents, and friends asking them to come and visit your room to see an aviation exhibit or dramatization.

8. Write thank you notes to the airport after your visit.

Evaluation

1-2-3-4-5-6. Could you notice that vocabulary was increasing?

Did the interest in aviation quicken his habitual use of punctuation marks, capital letters, and correct form of writing?

7-8-9. Could you see that when writing the thank you notes, the children became more conscious of the proper courtesies to be shown others?
Children's Activities

9. Write thank you notes to anyone else that has assisted you in your aviation project.


11. Make different lists such as: kinds of airplanes, airplane books, observations to make in weather, words that describe aviation, terms that are used in aviation and the parts of the plane, helpers at the airport.

Evaluation

10. Were written records neat and of good form?

11. Did the children's list of things that fly include more than one type of aircraft, such as the glider, sailplane, jet, seaplane, balloon, blimp, dirigible?

Check to see if children know these:

Names of planes - Cessna, Cub, Luscombe, Mooney, Tri-Pacer, Apache, Beech, Beach Bonanza, Aironca, Swift, Navion, Stinson. Can they identify any of them?
Unit for Fourth Grade Science

This area in science should assist the pupils in continuing their explorations and discoveries of meaningful aspects of their enlarging environment. They should draw upon past experiences, what they have learned from these experiences, and what experiences will serve them in the future.

The airplane is a creature of science. There is no scientific principle nor procedure which cannot be illustrated in terms of its application to aviation or to a related field. Students learn best when they are involved with the realities of their lives and times. If education is to meet the needs of an air age, the curriculum must change so that aviation's influence can be accommodated.

Unit outline on weather. Pupils need to understand that there are different kinds of weather. A unit outline follows:

Resources and Materials

A. Materials

1. For rabbit forecaster
   gum arabic - ½ ounce
   cobalt chloride - 1 ounce
   calcium chloride - 75 grains
   sodium chloride - ½ ounce
   distilled water - ½ ounce

   This will make enough to treat white blotter paper for thirty-six ears. Ears will be blue in fair weather,
lavender in changing, and pink in rainy weather.

2. To make thermometer
   Use white and red ribbon or elastic or a zipper.
   Pull it up or down as temperature rises or falls.

3. To make weather vane
   Use soda straw pinned to the eraser end of a pencil.
   A feather or feather-shaped paper stuck in one end
   of the straw will catch the wind and cause the
   straw to turn.

4. Use a real thermometer.

B. Books

   1-33. Boston, Massachusetts: Heath and

2. Croxton. Science in Elementary Schools, pages

Children's Activities

1. Make "Bunny Rabbit" forecaster. Use white blotter
   paper for ears.

2. Keep daily weather calendars or charts.

3. Make cloud shapes out of cotton.

4. Describe clouds in sky.
   Watch for changing shapes.

Evaluation

1. Did they have comments about changes in the weather?

2. Were there any questions about weather changes?

3. Can they associate clouds with certain weather changes?

4. Did they understand the experiment to show that
Children's Activities

5. Talk about light air and heavier air.

6. Call weather station for a report on flying weather.

7. Children take turns in being weather man.

8. Build a weather station.

9. Listen to weather reports on radio.

10. Visit a weather station.

11. Observe smoke on windy and still days.

12. List useful effects of winds, such as sailing boats, drying clothes.

Evaluation

clouds are formed from evaporated water (water vapor) that has condensed?

5. How did pupils participate in the experiments and demonstrations?

6. Did the conversation reveal a knowledge of weather in relation to aviation?

7-10. Did they find out the weather stations help the pilots and other people?

8. Did they show interest in the instruments at weather station?

9. Could pupils use a thermometer correctly?

11. Did children ask how rain got into the air?

12. Did they realize how we depend upon wind?
Children's Activities

13. List how pilot can tell what direction wind is blowing—observations such as windsock, wind vanes, smoke, dust, flags flying, clothes drying.

Evaluation

13. Did they understand why pilots should know about weather?

Unit outline on air. Pupils need to understand that:
(1) Air is all around us; (2) What it is; (3) Air takes up space; (4) Air has weight; and (5) Hot air is lighter than cool air. A unit outline follows:

Resources and Materials

A. Books

Aviation Education Source Book. Stanford University
Random House. Pages 74-75.

Schneider, Nina and Herman. Science in Your Life.
Pages 90, 92, 100.

B. Motion Pictures

"What Makes Rain," University of Tennessee Film Library, Division of Extension, Knoxville, Tennessee.
Rental fee - $2.00.

C. Materials

Materials for wind sock and weather vane wire, cloth, string, wooden stick, needle and thread, blocks of wood, nail, dowels, brace and bit, wood strip.
Children's Activities

1. Perform simple experiments to show that air has weight and occupies space. Invert an empty tumbler or bottle in a pan of water. No water will rise into the tumbler because the air cannot get out. Tip the glass, note the bubbles of air escaping. Observe as the air escapes, the water takes its place and the tumbler fills with water. Punch a hole near bottom of tin can. Place it in water as indicated in above experiment. Note that air must bubble out before water can get in.

2. Move hand through air and feel pressure on hand.

3. Make simple parachute by tying strings to the four corners of a handkerchief and attaching small weight to the

Evaluation

1-2-3-12-14-15. Did all experiments prove what had been intended for them?

4. Did children observe independently that air "presses" against the surface of the earth and objects on the earth's surface?

5. Did children observe planes must land into the wind?

6. Were children able to construct the gliders and simple helicopter?

7. How many new terms were added to vocabulary of the pupils?

8. Did children realize that wind is only moving air?
Children's Activities

4. Make a paper pinwheel.

5. Collect pictures of birds in flight.

6. Watch birds in flight.

7. Start an aviation scrapbook.

8. Make a display of airplane models.

9. Make wooden gliders.

10. Visit the airport.

11. Construct a simple model helicopter.

12. Use toy balloon to illustrate "jet planes."

Evaluation

4. Did pupils understand that air "presses" against the surface of the earth and objects on the earth's surface?

5-8. Did children observe independently that planes must land into the wind?

6-9-11. Were children able to construct the gliders and simple helicopter?

7-10. How many new terms were added to vocabulary of the pupils?
Children's Activities

13. On cool days, open window at top or bottom. With light object, paper, or feather, observe movement of air in and out of room.

14. Place thermometers at different positions in room. Ask children why they vary.

15. Construct "milk bottle" barometer.

16. Go to gas station and see how compressed air is used.

17. Make a wind sock.

18. Make a weather vane.

Evaluation

13. Did children realize that by changing the positions of the control surfaces they changed the pattern in which the air flowed over the surface?

17-18. Did they note that the wind sock was a type of weather vane and told pilot how to land?

Unit outline on day and night sky. Pupils need to understand that: (1) stars are used by pilots and others to find their way; (2) magnetic compasses are used to find their way; and (3) sun is used to find directions and time of day. A unit outline follows:
Resources and Materials

A. Materials

1. Sundial
2. Telescope
3. Magnetic compass
4. Materials from which to construct compass.

B. Books


Schneider, Nina and Herman. Science Here and Now. Pages 68-70.

Aviation Education Source Book. Page 78.

C. Motion Pictures

"This Is the Moon"

University of Tennessee Film Library
Box 8540 - University Station,
Knoxville, Tennessee - $2.00.

Children's Activities

1. Observe night sky.
   Locate the Big and Little Dipper and North Star.

2. Discuss importance of these to pilots.

Evaluation

1. Find directions by means of stars and compasses.

2. In observing North Star, did they discover that it remained constant while the others moved?
Children's Activities

3. Attempt to point out some of the other constellations and tell the pupils some of the mythological stories connected with them.

4. Build a sundial.

5. Make a simple compass.

6. Compare home-made compass and a commercial one.

7. Discuss use of compass.

8. Look at pictures of instrument panel of a plane and find compass.

9. Observe position of sun at same time of day during different seasons.

Evaluation

3. Did the children learn that pilots can use the stars and sun to find their direction?

4. When making a compass, did children discover that it was a form of a magnet?

5-6. Could the children tell time and direction with sundial?

7-8-10. Did the visit to airport show them the light beacons? Green light for airport beacon and white light along airways? Did anyone suggest use of radio as a means of finding the direction?

9. Did they know how to use charts and maps?
Children's Activities

10. Visit to the airport to observe the light beacons.

Unit outline on simple machines. Pupils need to understand how simple machines help the people do their work. A unit outline follows:

Resources and Materials

A. Books

Any of the preceding books offer information on machines.

B. Note to Teacher

1. Not all aircraft land on wheels.
2. Land based planes land on wheels or skis.
3. Water based planes use the hull or fuselage bottom, floats and pontoons.
4. Amphibians can land on both land and water.
5. When wheels of an airplane are pulled up into the wings or fuselage they are "retracted." The two types of landing gear are "retractable" and "fixed."

Children's Activities

1. Make model airplane.
2. Bring toy airplanes to class.
3. Label toy planes with wheels as land based planes.

Evaluation

1-2-3. Did children learn that airplanes use wheels in different ways?
Children's Activities

4. Label toy planes with floats as seaplanes.

5. Draw or find pictures of amphibian airplanes.

6. Observe the wheels as planes fly overhead.

7. Look inside and find the control by which the pilot makes the plane bank, turn, climb, and glide, also observe landing gear.

8. Visit the repair shop to see planes repaired.

9. Watch airplane on take-off. Why are wheels retracted?

10. Demonstrate friction-rub hands together.

11. Make a teeter-totter. Show that it is a kind of lever.

Evaluation

4. Did they learn that the land and water based planes have different kinds of landing gear?

5. Familiarize use of word "amphibian."

6. Were pupils able to point out the different ways wheels are used in airplanes?

7-9. Did pupils understand the use of words: landing gear, retractable landing gear, and fixed landing gear to their vocabulary?

8. Did trip to repair shop show any interest and did pertinent questions arise?

10-11. Were experiments of value to students?
Unit outline on how airplane flies. Pupils need to understand that: (1) Wings are slanted; (2) Wings are shaped; (3) Wings are placed at an angle; (4) Fuselage (body)—what is in it; (5) Propeller pushes air back and pulls plane forward; (6) Tail helps plane travel in straight line; (7) Engine is power plant of plane; and (8) Landing gear supports weight of plane when landing.

Resources and Materials

A. Materials

1. Model planes
2. Heavy paper, balsa wood, rubber bands, airplane glue, or commercial plane kits (model planes)
3. Kite
4. Heavy paper, balsa wood, rubber bands, airplane or commercial plane kits (wing experiment)
5. Plywood about 12" square

Filmstrips: Encyclopedia Britannica Films
"Air Transportation"

6. Large carton, small broom handle, paint, brushes
7. All kinds of aircraft pictures
8. Roller skates
9. Wood screws, screw driver, small piece of soft wood
10. Paper for airplane
11. Aircraft pictures

B. References

World Book Encyclopedia. See "Airplanes" and "Aviation"
Chicago, 1949.

Nebraska Air Age Education Division
University of Nebraska, Resources for Enriching the Curriculum in the Elementary Grades with Air Age.

C. Resources
A package of useful materials, including several resource units.

United Air Lines DC-7-Mainliner - A folder which helps children learn the names, locations, and functions of the parts of a large plane. Illustrated with cut-away views and diagrams.

Aircraft Industries Association - U. S. Aviation Today
George - Look to the Sky
Hyde - Flight Today and Tomorrow
Junior Aviation for Beginners
(New York State Education Department)
National Aviation Education Council
Aviation Education Bibliography
(Elementary School) Pictures, Pamphlets, and Packets. Both free.

Children's Activities
1. Bring airplane models to school.
2. Examine and discuss likenesses.
3. Make model planes, and label

Evaluation
1-2-3. Could children see any important difference in model planes? Did they use the words such as fuselage,
Children's Activities

basic parts such as wings, fuselage, propeller, tail section, engine, and landing gear.

4. Fly a kite. How does one hold the kite to get it started? Slant the kite so the air can push the kite and lift it. Airplane wing is also slanted so the air pushes against underside of wing and ligts the plane.

5. Make thick-winged plane and thin-winged plane. Thicker wing produced more drag and more lift, also lift more weight, but travel faster.

6. Run with a piece of plywood holding it flat against breeze. Notice resistance. Repeat, holding plywood edgewise. Since

Evaluation

propeller, with ease and correct knowledge of each?

4-5. Did they understand lift and drag?

4. Did the shape of wings give them any idea of the resistance against breeze?

5. Is the vocabulary of the children broad enough to enable them to use words such as:
   a. altimeter
   b. speed indicator
   c. compass
d. pressure

6-7-8. Did the experiments carried on accomplish all that was intended?
Children's Activities

air offers resistance, wings are thin.

7. Using a kite, show that air pressure against the angle of the kite pushes it upward. This angle is used in wing shape to gain lift. The shape of the wing is the secret of why airplanes can fly.

8. Have children make a model fuselage. Use large carton for body, paint dials on instrument panel—fuel supply, fuel pressure, oil temperature, oil pressure, altimeter, air speed indicator, compass. Control stick is broom stick. Take turns as pilots.

9. Using stories, pictures and diagrams, inform children that fuselage houses the crew, passengers, controls, equipment, and cargo. It is a tube-like metal framework covered with

Evaluation

9. Could the children tell what the different parts an airplane has and the use and location of each?
Children's Activities

light, strong metal. Wings and tail are attached to fuselage.

10. Recall that when one rides a scooter, he pushes back with one foot to move the scooter forward. Also use one roller skate to demonstrate this.

11. Compare action of propeller to a wooden screw being turned by a screw driver. Examine ordinary wood screw. Threads go round and round in a spiral. When screw is driven into wood, the threads catch on the sides of the hole and pull the screw through.

Propeller works the same way.

Evaluation

10-11-12. Have children demonstrate how the different parts of the airplane work or function.

12. Make paper airplane, indicate tail section fin, rudder, elevator, stabilizer.

13. Observe from pictures or diagrams 13-14. Do the students have that plane can have single engine or multiple engines located at different places.

an extensive collection of airplane pictures? This is
Children's Activities
14. Observe model planes, pictures, or diagrams, and note this part of plane (landing gear).

Evaluation
very important, as some will experience seeing the plane only by pic-
tures.

Unit for Fourth Grade Social Studies
The social studies program for this grade is primarily focused upon man's relationship to his physical environment; upon the way in which science and invention have changed and are changing the way in which the people of the state, nation, and world live and carry on the basic social functions, and upon the interdependence of the communities of the world.

The children in this grade are interested in the physical characteristics of airplanes and airships, but unaware of the impact they have on the way they live and upon the course of the history of the world. It is the responsibility of the social studies teacher to awaken this awareness and help children to understand the changes the airplane has made. The writer has integrated general education skills with Aerospace Education to solve this problem.

Unit outline of man's basic needs. Pupils need to understand that man's basic needs are: (1) food, (2) clothing, and (3) shelter. A unit outline follows:

Resources and Materials
A. Teacher Information
Crop dusting is usually done in early morning or late afternoon when the wind is calm.

B. Motion Pictures

"The Air Age"
"Smoke Jumpers"

Audio-Visual Services
University of Illinois
Champaign, Illinois
"Utility Unlimited" - (free loan basis)
Film Librarian, Photographic Department,
Bell Aircraft Corporation, Post Office Box 1,
Buffalo, New York

Children's Activities

1. Observe airplane aiding the farmer by dusting or spraying his crop.

2. Find pictures illustrating the following:
   a. dusting crops
   b. spraying crops
   c. sowing seeds.

3. Identify the plants the airplane is dusting or spraying. Which of man's basic needs is being protected?

4. Tell how forest fire rangers use airplanes to protect the

Evaluation

1-2-3-7. Did children understand that the airplane is used to prevent crop diseases and to kill the bugs that damage crops?
Children's Activities

5. See motion picture "Smoke Jumpers."
6. Write to airlines and ask for copies of menus.
7. Write to Piper Aircraft Company for pictures of airplane equipped for spraying.
8. See motion picture "The Air Age" and "Utility Unlimited."

Evaluation

6. Were the children aware of the many uses of the airplane in helping to supply their basic needs?

Unit outline on community helpers.

Pupils learn to know that community workers help one another to supply their needs.

A unit outline follows:

Resources and Materials

A. Pamphlets from United Air Lines, Chicago 38, Illinois, 1958
1. Seeing the Airport
2. Mike and Nancy Visit the Airport
3. Some Day Soon
4. Going Home
5. **In the Air**

6. **All Over the Plane**

B. **Film**

"Our Singing World"

University of Tennessee Film Library

**Children's Activities**

1. Visit airport. Observe the many different workers.

2. Invite a community helper in to tell class of his duties.

3. Ask father or mother how aviation helps him in his or her profession, also how he helps aviation.

4. Plan a program around the workers at the airport.

5. Set up a play ticket office.

**Evaluation**

1-2-3-4-5. Did children identify all these workers at airport and how they helped the community:

- Weather man
- Ticket agents
- Cooks
- Cashiers
- Gas boys
- Field repairmen
- Plumber
- Teletypists
- Reservation clerks
- Airplane salesmen
- Pilots
- Stewardesses
- Control tower operators
- Radio communicators
- Porters
- Taxi drivers
Children's Activities

1. Count all the buildings at the airport and find out uses of each.
2. What materials were used to construct these buildings?

Evaluation

1-2-3. How many different kinds of building materials were used at the airport?

Unit outline on airport construction. Pupils need to know about the sources of materials used in the buildings of airports. A unit outline follows:

Resources and Materials

A. Books
   Glidden, Lewis and Cowles. *Airports*  
   Johnson, Gene. *Airplane Model Building*  

B. Films
   "The Airport" - University of Illinois Audio-Visual Service, Champaign, Illinois
Children's Activities

3. What were the sources of materials used in buildings?

4. Discuss the size of buildings.

5. Construct a small hangar for a toy plane.

Evaluation

4. Did the children realize that the size and shape of building influenced the kind of material used?

5. Did the children learn where the different materials came from?

Unit outline on aviation development. Pupils need to understand the development and the relation of aviation development to the present. A unit outline follows:

Resources and Materials

A. Text


B. Pictures

Free pictures

1. "Historic Planes"

United Airlines, School and College Services, 35 E. Monroe Street, Chicago, Illinois
2. "History of Aviation"
   University of Tennessee
   Film Library

C. Free Pamphlet

Wind Tunnel Development
Arnold Engineering Development Center
Tullahoma, Tennessee

D. Books

Cohen, Rose. The Men Who Gave Us Wings. New York:
   Macmillan Company, 1944.
   (Stories of same men who helped us fly.)

Children's Activities

1. Read the story of the Wright Brothers.
2. Make a list of all uses you can think of today for airplanes.
3. Who was Lilienthal? Find other stories of early development of the airplane.

Evaluation

1-2-6. Did the children realize what a contribution the Wright Brothers gave to society?
3. Did they find out that Lilienthal was a German, and that he tried to fly by jumping off roofs and cliffs with wings he had made? His wings were like those of a kite fastened to his body just like one steers a sled.
Children's Activities

4. Find pictures of aircraft, from the earliest to the present modern aircraft.

5. Investigate the history of your closest airport.

6. Dramatize the Wright Brothers' story.

7. Ask an experienced person such as a pilot, stewardess or employer of airport to come and talk to the class about his experiences and have a question-answer session.

8. Find local airport on the map and see how accessible it is to cities in the airport area.

Unit outline on transportation that serves community. Pupils need to understand the means of transportation which serve their community. A unit outline on transportation follows:

Resources and Materials

A. Suggestions

Contact local flying services for aeronautical charts. Civil Aeronautics Patrol is very cooperative in supplying interested persons with information, literature, and pictures.
B. Books


*Skylights.* Free monthly aviation fact sheet.


Children's Activities

1. Plan trip to airport.

2. Make a list of questions that you want to ask.

3. Make a list of things to see at airport.

4. Discuss safety precautions while at the airport and also courtesies that are to be extended to all concerned.

Evaluation

1-2-3-4. Did the children associate plane fuel with fuel one uses in automobiles? Did they check location of airport in relation to the city that is nearest to them?
Children's Activities

5. Secure airline maps and familiarize yourself with them.
6. Observe the loading of the planes, the passengers, the cargo.
7. Visit the loading ramps.
8. Observe the people who are helping to get the plane ready for the next flight.
9. Ask the names and types of airplanes that are at the airport.
10. Ask to visit the control tower. The observation point is a great experience and information is quite complete.
11. Plan an aviation corner in the school room.

Evaluation

5-6-7. Did the children learn main use of an airport to the community?
8. Did they consider the number of people it takes to carry on the work at the airport?
9-10. Did the children realize that air transportation works hand in hand with other kinds of transportation?
11. Does the room reflect a number of learning experiences on Aerospace Education?

Unit outline on different kinds of communication. Pupils need to know the importance of different kinds of communication in their community. A unit outline follows:
Resources and Materials
A. Films

1. Motion pictures (free loan basis)

"Postman of the Sky"

Film Librarian, Photographic Department,
Bell Aircraft Corporation, Post Office Box 1,
Buffalo 5, New York

"Of Men and Wings" and "History of Mail"

United Airlines School and College
Series, 35 East Monroe
Chicago, Illinois

B. Free pictures

"History of Mail"

United Airlines, Series,
35 East Monroe,
Chicago, Illinois

Children's Activities

1. Bring airmail stamps to class.

2. Make a study of history of airmail.

3. Send airmail letters to friends. Compare with regular postal service.

4. Find out how pilots talk from the airplane to the ground.

Evaluation

1-2-3. Did the children make comparison between air mail and regular postal service as to time?

4. Did the children understand two-way radio
Children's Activities

5. Plan conversation between control tower and pilot in the airplane.

6. Visit radio communications station at airport. Listen to pilot making position reports, asking for weather information, and filing flight plans.

7. Use telephones to make arrangements to visit the airport.

8. Write to United Airlines and ask for their packet of free pictures showing "History of Mail."

Evaluation

5-6. Did the children compare radio, telephone, and air communication and how they depended upon one another?

7. Was the telephone properly used?

8. Did pupils use the material that many of the companies request?

Unit for Fourth Grade Health and Safety

It is important that the schools provide health and safety education which will function effectively in the lives of boys and girls. The school working cooperatively with the home and the community should provide experiences which are
conducive to desirable health and safety behavior. Aviation can provide a stimulus for the establishment of good health and physical fitness practices by students.

Unit outline on contributing factors to good health.
Pupils need to understand that good health and regular growth depend upon: (1) food, (2) rest, (3) fresh air, and (4) sunshine. A unit outline follows:

References and Materials

A. Text


B. Materials

1. Health and physical standards for the pilots and other crew members.

2. Menus of meals served on airliner.

United Airlines, Mr. Ray O. Mertes, Director, School and College Service, Chicago 38, Illinois.

3. Address

United States Government - Bulletin on Basic Seven Food Groups, Washington, D. C.

4. National Dairy Council, Des Moines, Iowa. For pictures or illustrations of food. Also other valuable information on nutrition.

5. Plants for experiment on sunshine.
6. Chart paper.

7. Pictures and illustrations of food (from magazines and any other source available).

Children's Activities

1. Have pupils discuss the health needs of pilots and other airline personnel. (An airline pilot must have a physical examination every six months.)

2. Plan well-balanced meals.

3. Make menus that could be served on the plane.

4. Prepare a food chart, the "Basic Seven Food Groups," and check to see if you have included these necessary foods in your menus.

5. Prepare a twenty-four hour schedule of pupils' activities. It will help to check on amount of sleep and rest you need (13 hours' activity - 11 hours' sleep and rest).

6. Prepare reports on importance of plenty of fresh air, and

Evaluation

1-2-3. Did pupils learn why good health is essential to airmen? Did they learn why personnel must pass a physical examination at regular intervals to keep their jobs?

4. Could children list the necessary food requirements that are needed for balanced diet?

5-6. Could the pupils associate the other health factors such as fresh air, plenty of rest, as necessary things for people in air activities?
Children's Activities

collect pictures to illustrate reports.

7. Discuss with class why one needs sunshine, compare the human body with that of a plant. Experiment with a plant that gets plenty of sunshine and one that is in darkness.

8. Draw or paint a large aircraft. Name the craft "Good Health and Growth." Label the people getting on board milk, water, sleep, basic seven, sunshine.

Evaluation

7. Could pupils see by the use of the plants in experiments that sunshine is very important?

8. Did this activity stimulate interest within the classroom? (Children like competition and if they pretend they are also boarding the plane, it might promote good health habits.)

Unit outline on dressing properly. Pupils need to understand the importance of wearing suitable clothing for the:

(1) season, (2) climate, and (3) weather. A unit outline follows:

References and Materials

A. Booklet

Aviation Activities. Washington: National Aviation
Children's Activities

1. Discuss clothing of airline and airport workers.

2. Display pictures of uniform worn by different pilots.

3. Collect and display pictures of neat uniforms worn by aviation personnel. Note that good posture adds to the neat appearance. Also make sure that good posture is stressed for health's sake as well as for appearance.

4. Make pictures of different kinds of weather and illustrate clothing adaptable to each kind of weather.

5. Clothing can be secured from War Surplus Stores for display showing types of clothing for different kinds of climate and weather, and also the season.

Evaluation

1-2. Did children learn to distinguish between the different types of clothing and when each type was to be worn?

3. Could they see that posture helped in appearance as well as for the health standpoint in aiding correct breathing?

4-5. Were children aware of the relationship of weather to types of clothing worn? Did the children learn the "why" of good posture? Did they learn that good posture contributes to their comfort, strength, and good health?
**Children's Activities**

6. Make puppet show. Dress puppets as different people at the airport such as pilot, stewardess, mechanics, maintenance crews.

**Unit outline on signs of good health.** Pupils need to recognize some signs of good health such as: (1) eyesight, (2) hearing, (3) proper height, and (4) correct weight. A unit outline follows:

**References and Materials**

A. Materials

1. Secure aid from school nurse in carrying out the checking of ears and eyes. The nurse will also have weight and height charts to check on.

2. Packet containing height and weight charts may be obtained from:

   Department of Public Health
   State of Tennessee
   Nashville, Tennessee

**Evaluation**

6. Did the puppet show make a good concluding activity in this study?

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**Children's Activities**

1. Discuss heights and weights required for stewardesses.

**Evaluation**

1. Did children really find out some signs of good health, such as
Children's Activities

2. Pretend you are a pilot or a stewardess and plan a trip to your physician for a physical examination. Make a list of requirements for passing the examination.

3. Discuss the need for good eyesight for a pilot. Have eyes checked.

4. Discuss good hearing needs for pilot or stewardess and have ears checked.

5. Check weight and height of members of class and see how many are under or over weight and who is too short or too tall. Why is this phase of our health habits important?

Evaluation

2. Did children discover within the class any health problems such as
   a. need for glasses
   b. need for ear treatment
   c. overweight
   d. any other body defect?

3-4-5. Did discussions promote better health habits?
Unit outline on safety rules. Pupils need to develop the ability to see the importance of safety rules and to practice them. A unit outline follows:

References and Materials

A. Text

Jones, Maloney, Morgan and Landis. The Road to Health Health Trails, 4th Grade. Laidlaw Brothers, 1957.


B. Materials

1. Safety belt

2. Materials for safety posters, large paper, paints, crayons, and pictures for illustrations.

Children's Activities

1. Discuss the need to cooperate with our safety patrols. Compare with pilot who listens and obeys instructions before landing and taking off.

2. Discuss safety precautions a passenger in an airplane should take.

3. List some traffic rules that you should follow.

Evaluation

1-2. Did the children learn that safety rules and signs are of little use unless they use them?

3. Did the children realize that it is good citizenship to help keep other people safe? Were
Children's Activities

4. How would you treat the following if you were on a plane and had to give first aid? 
   a. a cut  
   b. a bruise  
   c. a burn  

5. Prepare a report to the class. Tell how you can prevent accidents at home as well as in traveling by land or in the air.


7. Have free play period when pupils select proper aviation games.

8. Bring a safety belt to school and discuss its uses.

Evaluation

4. Were children able to give first aid for the minor accidents such as cut, bruise, and burn?  

5. Did the pupils learn why a pilot practices safety-first?

6-7. Did pupils become more conscious of traffic rules and laws of safety after preparing their lists of them?  

8. Did seeing the safety belt make any impression on the children?
Unit for Fifth Grade Mathematics

Mathematics in the elementary grades has general outcomes to be accomplished such as: (1) an understanding of number concepts and process; (2) accuracy, reasonable speed, neatness in computation; (3) ability to apply mathematical knowledge of real situations in life; and (4) an understanding of the terms and symbols common to arithmetic.

The wide-awake instructor seizes every opportunity to utilize the in-school and out-of-school experiences of children to make arithmetic meaningful and provide experiences. Integrating Aerospace Education with the general mathematics program is an avenue by which the pupil and teacher can fulfill the goals and also enjoy the activities this unit affords.

Unit outline on quantities. Pupils need to develop concepts of quantity and relationships of quantities. A unit outline follows:

References and Materials

   Air Transport Association of America,
   1000 Connecticut Avenue, N.W.,

B. Text
   Brueckner, Merton, Grossnickle. The New Exploring
   Numbers, Grade 5, 1956. Winston Company, Chicago,
   Illinois.


d. "Telling Time (Fractional)," pages 132-302.

e. "Reading Timetables," page 140.


g. "Taking a Trip," page 183.


i. "How Much Do People Earn?" page 211.


C. Reading Text


Children's Activities

1. Plan visit to airport, "How many."

2. While at airport: How many different kinds of planes are on the field or in the hangar; how many passengers does each kind of plane carry; how many members are in the different

Evaluation

1-2-3-4. Did the children learn to think quantitatively in solving their problems of the airport and weather bureau visit and also in their own personal lives?
Children's Activities

3. Observe
How many are boarding planes, number of flights scheduled, number of north, south, and trans-oceanic.

4. Visit weather bureau. Find out how many weather reports are received each day, how many observation balloons are sent up, how many people employed in weather station.

5. Read following:
Statistics showing how many airplanes in United States. How many airports in United States.

Evaluation

5. Did pupils know how to find statistics? Could they understand how statistics were interpreted?

Unit outline on geometric forms. Pupils need to develop concept of geometric forms. A unit outline follows:

References and Materials

A. Materials
1. Road and Aerial maps
   Globe
   Railroad maps (for comparison).
2. **Boeing Airplane Picture Packet** - Free

Boeing Airplane Company,
Community Relations Manager,
Seattle 14, Washington

**Children's Activities**

1. Look at shapes of things -
   Structure of planes and other aircraft, buildings, airport, and the surrounding grounds.

2. Observe geometric forms, shapes and dimensions of the airport, length of runway, smoke towers, structure of beacon towers.

3. Examine exterior of buildings, the forms found in the designs of the buildings.

4. Observe the interior - walls, panels, windows, floors, stairways, banisters, ventilators.

5. Identify geometric forms - note shapes of wings and positional relationship, high, low, trailing, parallel, elliptical, tapered, square, sharp or rounded tips, angular rudders.

**Evaluation**

1-2-3-4-5-6. Did the children see the relationship between the forms and shapes of the parts of the buildings, inside and out? Why we have these different shaped things?
Children's Activities

6. Collect and exhibit: Commercial models, diagrams and pictures of planes (note use of geometric forms).

7. Construct for dramatization:
   Interior of control tower and trainer ships.

8. Make diagram of airport to scale.

Evaluation

7. In their dramatization, did they become more enthused when they were pretending to really do the things that they had been studying?

Unit outline on measuring. Pupils need to develop concept of meaning of: (1) space, (2) distance, (3) time, and (4) rate. A unit outline follows:

References and Materials

A. Text


2. Model clock to use in practice of telling time.

Children's Activities

1. Trip to airport: How
Children's Activities

far is it?
Best route to take.
Trace route from school to airport. Use scale on map.
Read car or bus speedometer.
Record mileage at both points.

2. At airport:
Look at airport. How large is it? Compare with something familiar, such as school grounds.
Length and width - Observe runway. How long does it take the plane to taxi to end? How long would it take to walk across airport?
Ask questions of personnel at airport. Try to obtain map of airport and figure distance by scale.

3. Find out:
Length, width, height, and speed of different planes.
Largest plane in world - size.
Smallest plane in world - size.

Evaluation

become aware of errors made when they are pointed out?

2. Are children becoming more familiar with the vocabulary that you have been striving to put before them?

3-4-5. Are the children realizing the time that is saved by using air travel? The necessity for saving time?
Children's Activities

4. Compare highway road maps and airline maps.

Compare mileage and time it takes to go by land and air.

5. Learn to use latitude and longitude to locate places.

Latitude expresses distance, north and south direction.
Longitude expresses distance east and west.

6. Use model of clock and practice using it to read the hours and minutes.

7. Find out ways in which time is important in aviation.

How accurately can time be measured?

Plan flight trips

Make timetables

Use in securing and broadcasting weather information.

Examine flight log.

Unit outline on volume. Pupils need to understand and use measurements of volume. A unit outline follows:

Evaluation

6-7. Did pupils see why time is so important in the aviation fields?
References and Materials

A. Material

Use Fahrenheit and Centigrade thermometers for comparison.

B. Book


Children's Activities

1. Observe an airplane being refueled. How much fuel to next refueling station, across continent, across oceans?

2. Think about storage of the gasoline—the vast amount that has to be used—such as cost.

3. Observe the cargo of the planes, the passengers, and the mail.

Unit outline on weather measuring. Pupils need to understand ways of measuring weather. A unit outline follows:

Children's Activities

1. Record classroom temperature on weather calendar.

Evaluation

1. Did children see the difference between the two kinds of thermometers?
Children's Activities

1. Acquire knowledge of variables and the use of each.

2. Figure average temperature for the whole week, each hour. Determine from your averages which hour of the day is warmest.

3. When visiting the airport note the following:
   a. Instruments measuring air pressure.
   b. Instruments measuring humidity.
   c. Instruments measuring wing speed.

Evaluation

The use of each.

2-3. Did they acquire skills in mathematics when they kept weather charts and averaged the temperatures?

Unit outline on money. Pupils need to understand and use measures of money. A unit outline follows:

References and Materials

A. Books
      "United States Money Table" - Page 351.

B. Materials
   Secure "Fare Table" from nearest airport for costs in air travel.
Children's Activities

1. Acquire knowledge of variation in money values in problems of exchange.
   a. Price lists
   b. Time tables
   c. Graphs (kinds)

2. Think about jobs that go with aviation, what they pay.

3. Make plans for a plane trip and the cost.

Unit outline on tabular forms. Pupils need to use tabular forms to communicate quantitative ideas. A unit outline follows:

References and Materials

A. Materials

Secure sample materials such as telephone directories, calendars, price lists, time tables from community sources.

Children's Activities

1. Acquaint children with the following tabular forms:
   a. Calendars
   b. Index

Evaluation

1. Did children realize that money had different values in different countries, and the importance of knowledge in regard to this?

2. Are any of the pupils thinking of going into aviation as a career?

1. Did children realize the abundance of materials available for instructional purposes
Children's Activities

c. Table of contents
d. Telephone directory
e. Statements and bills
f. Price lists
g. Time tables
h. Graphs (kinds)

Evaluation

outside of text that can be very valuable
in the learning process?

Unit for Fifth Grade Music and Art

The music and art program of the country have drawn rich content from aviation. This unit has suggested activities that will stimulate interest and develop an appreciation of the Arts.

Unit outline on different medias of art. Pupils need the experiences of using different materials, such as pencils, crayons, paints, model plane kits, and cotton materials. A unit outline follows:

References and Materials

A. Miscellaneous materials for art work
   1. Crayons
   2. Drawing pencils
   3. Paints
   4. Paper

B. Collection of art pictures - "Masterpieces."

C. Magazines such as:
   1. Life
2. Look

3. Holiday

D. Secure pictures of different kinds of planes.

E. Films

"The Airplane Changes Our World Map"
(Encyclopedia Britannica Films, Incorporated),
University of Tennessee, Division of Extension,
16 mm. black and white, sound, 11 minutes
$2.00 cost.

Children's Activities

1. Draw aviation maps, including weather, airmail routes and commercial airlines.

2. Make a roller screen movie:
   a. Sequence of scenes
   b. Cross country trip
   c. Famous flights
   d. Trips around the world
   e. Scenes from history of flight
   f. Evolution of modern plane.

3. Make aviation guessing game
   a. Identification of planes
   b. Plane parts to be named
   c. Airport accessories to be named.

Evaluation

1. Did children show appreciation for design and color?

2. Did the medium that the children used reflect their knowledge of the subject?

3. Did game show knowledge gained and consumed?
Children's Activities

4. Individual painting in this grade without dictation, but guidance.

5. Making model airplanes.

6. Making a parachute out of light cotton material, and decorating in bright colors.

Unit outline on design. Pupils need to have experience in design. A unit outline follows:

References and Materials

A. Materials

1. Paper - (construction)

2. Linoleum blocks or scraps

3. Blueprint paper

4. Pictures.

Children's Activities

1. Construct a scrapbook for aeronautical content:
   a. The cover - "all over pattern"
   b. The end - papers
   c. Title-page
   d. The page layouts.

2. Make display backgrounds.

Evaluation

4. Did painting show individuality?

5-6. Did construction show artistic ability?

1. Did children have a sense of rhythm in their design?

2. Did they have a good choice of color in their work?
Children's Activities

3. Make insignias
4. Make settings and costumes for dramatization activities.
5. Linoleum block printing
6. Use blueprint paper to make patterns or designs, using leaves, small model planes, or cutout pictures of planes to make borders

Unit outline on art appreciation. Pupils need to have an appreciation of the Arts. A unit outline follows:

References and Materials

A. Magazine advertisements, illustrated brochures—good sources of photographs and paintings on aviation secured from manufacturers of aircraft.

Children's Activities

1. Let children help in securing and arranging good paintings, photographs, models, charts, maps, pictographs, and diagrams of aviation subjects in the schoolroom.

2. An opportunity for discussion of displays in the school room. An appreciation, rather
Children's Activities

than analytical point of view should take place, encouraging children to express their feelings and personal preferences.

Unit outline on appreciation of beauty. Pupils need to learn to appreciate beauty in its natural environment. A unit outline follows:

References and Materials

A. Book


B. Periodicals

1. Air Trails
2. American Aviation
3. Skyways Magazine
4. Flying

C. Films

1. "Essential Parts of the Plane"
2. "History of Aviation"
   Bell and Howell Film Sound Library
   30 Rockefeller Plaza, New York 20, New York
3. "Youth Takes To Wings"
   Bray Pictures, Incorporated
   New York, New York
Children's Activities

1. Draw pictures of birds in flight.

2. Make kites.

3. Construct models of historic aircraft.

4. Make a frieze--using birds and planes--how alike and different also.

5. Make scrapbooks.

Evaluation

1. Did children make good comparisons between birds and planes?

2. From the references and materials did the children gain more knowledge than they had experienced before?

3. Did films keep in their appreciation of aviation?

Unit outline on expression through music. Pupils' understanding of the use of music in expressing oneself and for enjoyment is covered in this area. A unit outline follows:

References and Materials

A. Texts


Children's Activities

1. Write some original songs.
2. Make tape recordings of group and individuals and play back.
3. Listen to musical records.
4. Dramatize songs
5. Write own words to familiar tunes, using aviation as the theme.

Unit outline on singing. Pupils must understand melody, form, and harmony. A unit outline follows:

References and Materials
A. Materials
   1. Find many music books for children to select songs from.
   2. Tape recorder
   3. Lined paper to write music notes on

Children's Activities

1. Sing songs—give children opportunity to sing songs of their own choice.
2. Make tape recordings of group and individuals and play back.

Evaluation

1. Did they enjoy new songs, or did they want to sing familiar songs?
2. Did children understand what harmonizing meant?
3-4-5. Did these activities provide interest in the class?

1. Could children harmonize?
2. Did children enjoy singing or was it a duty rather than a happy
Children's Activities

Evaluation
time of the day?

Unit outline on music integration. Pupils need to relate music to other activities in and out of school. A unit outline follows:

References and Materials
A. Musical Poems
   1. Magee, John Gillispie. "High Flight"
      New York: Gray Company.
   2. Recordings of Navy Cadet's Choir, Public Relations Officer, United States Navy, Pensacola, Florida.

Children's Activities
1. Have a musical program.
   Try to get everyone to participate in something.

2. Correlate music and poetry.

3. Choral readings can be used with a group.

Evaluation
1. Did children feel it a pleasure to take part in these activities or was it just a task that was required of them?

Unit for Fifth Grade Language Arts

The language arts are all the processes through which meanings are communicated by the use of spoken or written words. By supplying examples of aviation content that are interesting and challenging to children, the investigator has planned a curriculum that will aid the teacher in this area.
Unit outline on communication. Pupils need to communicate through listening and speaking. A unit outline follows:

References and Materials

A. Pamphlet


B. Outside speakers

Talks from resource people, radio or television programs.

C. Materials

Use index cards for notes when speaking to groups.

D. Books

1. Science books - Read


2. Reading Textbooks - (Parallel)

Children's Activities

1. Listen to a general talk, television or radio program on aviation.

2. Make plans carefully as to the observation to be made in a trip to the airport. Things to look and listen to: wind sock, radio messages, and various types of work.

3. Listen carefully to information given by guide and follow directions that are given by them. Obey the safety rules. Be sure and take notes so that report you give will be more authentic.

4. Listen to reports given by other pupils.

Evaluation

1. Did children seem interested and were they good listeners to the resource material people read, also the radio and television programs?

2. Was trip to airport successful? Could you have improved it by more planning or stimulating more interest before going?

3. Did children gain information at airport?

4-7. Did children listen well to others as they gave their reports on returning from airport? Were they courteous and interested?
Children's Activities

5. Listen to radio for reports about airplanes, the weather, current aviation events. Be certain that you know how to interpret what you have heard.

6. Observe the clouds and sky at sunset and sunrise. How would they look if you were a pilot and looking down, instead of up, when we are on the ground?

7. Listen to the members of the class read the aviation stories and perhaps some have composed poems. Were they interesting?

Evaluation

5. Were they good listeners when gaining information from radio?

6. Did the students have previous experience with clouds or was this the first activity regarding them?

Unit outline on speaking. Pupils need to feel the importance of speaking clearly and effectively. A unit outline follows:

References and Materials

A. Books


**Children's Activities**

1. Converse informally with small group of classmates on personal experience with aviation on:

   a. Observations of planes and airport activities

**Evaluation**

1-2. Did children learn to speak effectively and clearly? Did children gain some knowledge of the history of the airplane?
Children's Activities

b. Exchange ideas on types of planes seen and ways of identifying planes.

c. Tell about movies on aviation, also radio talks and television programs.

2. Prepare a question and answer session with classmates.

3. Practice appropriate ways of carrying on telephone conversation.

   a. Correct way in placing and terminating calls.

   b. Voice, normal and articulate with precision, phrase sentences clearly, hold mouthpiece close to lips.

   c. Transact business first.

   d. Chat only if both persons have the time.

4. Make individual reports on some particular phase of aviation.

Evaluation

5. Did their readings and discussions seem to influence them to the extent of making some phase of aviation a career?

6. Did they acquire more general knowledge with their readings in regard to aviation?

3. Did telephone conversation improve with practice?

4. Did their readings influence their thinking on aviation and its possibilities?
Children's Activities

5. Carry on a demonstration with model planes or other subject that you are interested in.


7. Dramatize play, Wright Brothers, or other interesting stories.

8. Memorize aviation poems.

9. Have oral reading periods.

Evaluation

5. Did their readings and discussions seem to influence them to the extent of making some phase of aviation a career?

6. Did they acquire more general knowledge with their readings in regard to aviation?

7. Was interest stimulated to the point that the children wanted to give public assemblies?

Unit outline on writing. Pupils need experiences in writing for a special purpose. A unit outline follows:

References and Materials

A. Reading Texts


"Candles in the Sky" - page 56

"Johnny's Balloon Adventure" - page 204

"The Magic Rain Cloud" - page 211.

The New Days and Deeds. 1955
"On With the Show" - page 172

"S. O. S." - page 210

B. Necessary materials:
   a. Writing paper
   b. Ink
   c. Pen
   d. Materials for writing letters

C. Writing textbooks suitable for child's level of ability

D. Magazines on aviation

E. Spelling textbooks

F. Language textbooks

"Writing Letters" - page 72

**Children's Activities**

1. Write sentences on aviation facts.

2. Incorporate as many aviation words as possible.

**Evaluation**

1. Did children appreciate all the pioneers of aviation have done for us? Did they learn how to write meaningful sentences?

2-3. Were the vocabulary lists complete?
Children's Activities

3. Build an aviation vocabulary.

4. Write descriptive paragraphs about airplanes or other aviation subjects.

5. Write questions and answers that you feel are important in the field of aviation.

6. Write letters to airline companies for free materials to use in your research.

7. Prepare an aviation bibliography.

8. Write skits or plays for entertaining a group.


10. Write thank you notes to all who have contributed to your aviation study.

Evaluation

4-5. Could the children use the aviation vocabulary with complete ease, or were they somewhat unfamiliar with it?

6. Were their letters of requests for material correct and clear and were their notes of thanks well written?

7. Did students find much material for the bibliography?

8. Were the plays or skits true to life and did the children have a lot of imagination?

9. Was the aviation dictionary of use to the students?
Children's Activities

11. Write personal notes or letters to friends telling of all the interesting activities that you have carried on in the aviation study.

Evaluation

10-11. Was their writing in good form and style, as well as meaningful?

Unit outline on reading. Pupils need to learn to read for: (1) use, (2) understanding facts and ideas, (3) pleasure, (4) thinking critically, and (5) spelling words. A unit outline follows:

References and Materials

A. Books


B. Films


2. "Air Transportation" - Tennessee Film Library, Knoxville, Tennessee.


5. "An Airplane Trip" - Encyclopedia Britannica Film, Incorporated, University of Tennessee, Division of University Extension, Knoxville, Tennessee.

**Children's Activities**

1. Read to find specific answers to personal questions such as:

   a. What is largest plane in world?

   b. What materials are planes made of?

   c. How much does the heaviest plane weigh?

   d. How long does it take to build a plane?

**Evaluation**

1. Did the children find their specific questions?
Children's Activities

e. What is the tail of a plane for?
f. How long or large is the wing span?
g. What is speed of a helicopter?
h. Who invented the airplane?

2. Read to find out what changes the position of the wind sock and what does the pilot find out by these changes.

3. Read to find out what a test pilot does.

4. Read to follow directions:
a. Methods of constructing model planes.
b. Drawings to scale.
c. How to mix paints.
d. Directions for science experiments.

5. Read to acquire information for oral and written reports.

Evaluation

2. Did they learn about the weather and how it affects flying?

3. Could they read weather maps, weather reports, and weather charts?

4. Did they find enjoyment in their reading?

5. Did they build a better vocabulary than they had had in the past and was it of use to them?
Children's Activities

6. Read aviation stories to appreciate acts of bravery and heroism.

7. Read to detect accuracy or inaccuracy of facts.

8. Read to enjoy aviation cartoons in humorous short stories and articles relating to aviation. Develop discrimination between the good and the poor.

9. Read to gather specific data about weather:
   Weather reports, weather maps, weather charts.

10. Read for vocabulary building in aviation.

11. Read for improvement of knowledge of words and their correct spelling.

12. Read for improvement of reading skills.

Evaluation

6. Did they share reading experiences with others?

7. Did they learn to respect the rights of others?
   Respect opinions and thoughts of others?

8. Were their readings more extensive after this enthusiasm was aroused?

9. In their readings, could they pick out important parts of material?
Unit for Fifth Grade Science

Integrating aviation information into the curriculum of our schools assists the pupils in continuing their explorations and discovery of meaningful aspects of their enlarging environment. At this age, the child needs to initiate, plan, reason things out, and verify facts.

Unit outline on the sun's family. Pupils need an understanding of the planets, earth, and its stratosphere. A unit outline follows:

References and Materials

A. Text


B. Materials

For shadow post - 3' x 2' plywood, dowel stick, protractor.
Children’s Activities

1. Children will profit from making a clay or paper cut-out model of the planets, their positions and correct proportions of their size and relative distances from one another. They can obtain the figures that tell distance and diameters of various planets and decide on a scale that they can use in order to get all the members of the solar system into their display and in order to have the sun (largest body) and Mercury (smallest body) included.

2. Give pupils opportunity to look at the night sky through a telescope. If they can actually see a planet, their enthusiasm will be much greater.

3. Read Nature Magazine, published monthly from October to May; bimonthly from June

Evaluation

1. Did the children realize that we had these planets? Did the children realize their size and position in comparison with the Earth?

2. Could the student recognize the planets by their position or any research that they had made before the observation?

3. Were readings a help to the student?
Children's Activities

5. When the pupils read their stories or legends, could they answer questions such as "Do people today tell time by it?"

4. Construct a shadow post.

Mount dowel peg for plywood. Carefully locate a true North with help of surveyors plot of the school ground.

With a protractor, determine the angle that the sun is from the Zenith. If this is done on September 21 or March 21, the angle should equal the observer's latitude. Observe how this angle changes with the months.

Also you can check the point that the shadow crosses the month line each hour on the hour, on the 15th of each month. See if these marks can be devised to tell time.
Children's Activities

5. Read stories from mythology. Discuss ancient and present day beliefs. Some interesting questions can come from these discussions.

Evaluation

5. When the pupils read their stories or legends, could they answer questions such as "Do people today believe any of these stories?" Give reasons.

Unit outline on weather. Pupils need an understanding on effects of weather on aviation. Consider: (1) temperature, (2) humidity, (3) pressure, (4) thunderstorms, and (5) air masses. A unit outline follows:

References and Materials

A. Books


B. Films

"Winds and their Causes" - 16 mm., motion picture, sound, black and white, 10 minutes, Coronet Instructional Films, 1948.

"Aerology-Thunderstorms," - 16 mm., motion picture, sound, black and white, 41 minutes, United States Navy, Federal Aviation Agency, 1943.

Children's Activities

1. Secure an experienced pilot to tell the class about weather as it is related to flight.

2. Make charts and diagrams for purposes of illustration, show how the uneven heating and cooling of the Earth's surface produces atmospheric instability and hence turbulence, clouds, rainfall, and thunderstorms. Also point out that varying terrain, that is water, forests, and plowed fields, can cause a change.

3. Students give reports on temperature and flight.

Evaluation

1. Did the pupils become more weather conscious by listening to reports on radio and television?

2. Did they read the newspapers and bring to class these articles that would pertain to weather?

3. Were the reports that were given accurate and did their scientific learning carry through into other fields of science?
**Children's Activities**

4. Pupils and teacher compose questions for study and discussion such as:
   
a. How does uneven heating atmosphere affect flying?
   
b. Describe a "bumpy" airplane ride (some child may have experienced this).
   
c. What is effect of turbulent air on man during flight?
   
d. Why is it important for pilot to know the kind of terrain over which he is flying?
   
e. Why is it more dangerous to fly over mountains than it is in the Middle West?
   
f. Why is flying at high altitudes (stratosphere) comparatively safe and smooth?
   
g. What is temperature inversion?
   
h. How does moisture in the air affect temperature?

**Evaluation**

4. Did the questions that were asked cause the children to do a great deal of outside reading and research to find the answers?
Children's Activities

1. What is difference between surface winds and winds aloft? How do they relate to flight?

5. Visit a weather station.

Evaluation

5. Was the trip to the weather station profitable? Did you plan with them on this field trip, or was it an "on the spur of the moment" activity?

Unit outline on performance of airplane in the air. Pupils need to understand: (1) the forces controlling and keeping the plane aloft, and (2) the meaning of words such as lift, thrust, drag, and gravity. A unit outline follows:

References and Materials

A. References

1. Pamphlets


Potter, Norman and William Konicek. Fundamentals of Aviation. University of Illinois, Staff of the
Institute of Aviation, September, 1955.
Reprint 1957 (Glossary of aeronautical terms).
General Motors Corporation. Power Goes to Work.
Detroit, Michigan: 1945.
McNamara and Mehrens. Tilly the Tiger. Washington:
DeVore, Robert. "Higher and Faster," Colliers Magazine,
April 22, 1944. (Tells about the test flights and achievements in the United States.)
Civil Air Patrol. Demonstration Aids for Aviation Education. Washington: Bolling Air Force Base,
Aviation Education Source Book. New York: Hastings

B. Materials
Balloon, soft wood for propeller (balsa), dowel sticks or skewers, plastic straws.

Children's Activities
1. Blow over top edge of paper shaped as airfoil. Sheet of paper held between thumb and forefinger.

Evaluation
1-7. Did they explore other scientific fields which relate to aerodynamics? (Aerodynamics - study of motion of the air and of the forces acting on solids in motion relative to air.)
Children's Activities

2. Shape airfoil from piece of balsa wood. Balance on end of meter stick. Allow air from fan to blow over it.

3. Use different shapes of airfoils.

4. Use a fly spray to illustrate the venturi effect on foil.

5. Place tabs on wings and stabilizer of planes to represent ailerons, with tabs in various positions.

6. Drop maple seed to illustrate action of helicopter.

7. Ask children to ride with hand out of car window. Hold it first flat, and gradually rotate it to a vertical position. Note lift and drag.

8. Construct model planes and gliders. Change shape of wing and positions and

Evaluation

2-3-4. Could they see the various aspects of the venturi effect? (determining the point of least pressure)

5. Could they identify the parts on a plane at the airport?

6-12. Did the construction of the propeller give the student the knowledge of action of helicopter?

8. Did the children make working model planes and gliders?
weight of various parts
of glider and note effect
on flight.

9. Observe the operation of
forces which sends the
rocket ship forward. In-
flate a balloon, hold the
neck closed and hold it
upward. Release the balloon
and it will be shot forward
by the escaping air being
expelled backward.

10. Compare the action of the
balloon in the above case
and the action of jet pro-
pulsion and rocket plane
with the recoil of a gun
when it is shot. As the
bullet bounds forward, the
gun kicks back against the
shoulder.

11. One must realize that the
force of gravity must be
overcome before a rocket
plane can leave the earth

---

9. Did the pupils realize
that jet propulsion and
rocket engines operate
upon principles entirely
different from the con-
ventional airplane?

10. Through their research
materials did pupils
discover that this is an
unexhaustible subject and
that scientists and
engineers are constantly
working upon new ideas
which bring about changes
in our modern airplane?

11. Did the students know
that there is "pull"
between any two bodies?
Children's Activities

so pupils observe

a. That all things
   eventually fall to
   the ground, and that
   gravity holds most of
   the atmosphere very
   near the earth's sur-
   face.

b. The fact that the means
   by which lift is accom-
   plished in planes and
   balloons are merely
   devices to counteract
   gravity.

c. That an object must
   travel at a speed of
   about 26 miles per
   second in order to
   overcome the effects
   of gravity.

12. Construct and operate a pro-
    peller by using an "all day
    sucker" stick or wooden skewer.
    Use soft wood for propeller.
    Bore hole in center to fit
    skewer or stick. Whittle
Children's Activities

blades so that they
are slightly convex on
upper surface.

Unit outline on clouds. Pupils need to recognize
different cloud types and their significance. A unit outline
follows:

References and Materials

A. Books

United States Weather Bureau (Bulletin 42). Weather
Reporting and Forecasting. Washington: Govern-
ment Printing Office, 1951. Chief of United States
Weather Bureau.

United States Weather Bureau "Cloud Code Chart" from
United States Department of Commerce, Washington,
1938.

Civil Air Patrol. Aviation Study Manual, Unit VI.


How and Why Experiments, "Grade Clouds" - Pages 189-195.


Gallant, Roy. Exploring the Weather. New York: Garden
City Books, 1947.

George, Frances and others. Look to the Sky. Washington:
National Aviation Education Council, 1953.
B. Filmstrips


Children's Activities

1. Collect cloud pictures.
   Take photographs of different cloud formations.

2. Learn the names and characteristics of key cloud types such as:
   a. Cirrus—high and composed of tiny ice crystals and usually flat bases.
   b. Cumulus—white and fluffy.
   c. Stratus—without definite form and often cover whole sky (winter clouds).
   d. Nimbus—also will likely

Evaluation

1. Did the children answer questions such as:
   a. What were clouds made of?
   b. What happened when they disappeared?
   c. How high were the clouds?
   d. What kinds of weather did they bring?

2. Did the children see the beauty in clouds as well as the scientific reality?
Children's Activities

cover the sky, thick,
and gray, usually
darker than stratus
and will perhaps bring
rainy or snowy weather.

3. Learn to associate different types of clouds with weather changes.

4. Draw weather charts including weather elements, humidity, precipitation, wind direction, wind velocity, temperature, types of clouds, and amount of clouds.

5. Discuss and relate experiences in flying through clouds, above clouds, and under clouds.

6. Interview a pilot to see what he can use to estimate weather situations such as:
   a. temperature gauge
   b. bumps
   c. clouds

(Clouds are the best indication.)

Evaluation

3. Did they make the associations between names and effects?

4. Did they discover a sequence in cloud formation during a frontal disturbance?

5. Did pupils see the need for knowledge of clouds in relation to the airplane?

6. Was interview of pilot well received by pupils? Do you think interviews are worthwhile? Give reasons.
Unit for Fifth Grade Social Studies

The social studies teacher should be fully aware of her responsibility in developing the future citizens of tomorrow. The teacher should take this opportunity to bring about a better understanding of various social and economic problems confronting the world. Aviation is one of these problems and if teachers take this opportunity to integrate Aerospace Education, the educational program will stay abreast of the world today.

Unit outline on changes in living. Pupils need to understand how aviation has changed living: (1) socially, (2) economically, and (3) politically. A unit outline follows:

References and Materials

A. Text


B. Materials

1. The Director, Coast and Geodetic Survey, Washington. Rand McNally Company
Post Office Box 7600 Chicago 80, Illinois
Sales Manager, Educational Department.

2. Aviation in the Elementary Grades 1-6
Trans World Airlines, Incorporated
380 Madison Avenue
Children's Activities

1. Secure maps of all kinds and compare types to show relationships.

2. Use these maps to make a bulletin board.

3. Study symbols and legends of maps.

4. Plan a vacation to other countries and use the air as your mode of transportation. Plan your route and try to discover something of the habits, customs, industries, dress, and language of the people you will visit.

Evaluation

1-2. Through their research, did the children gain an understanding of the habits, customs, industries, dress, and language of the people they come in contact with on their imaginary trip to other countries? Did the children see how we and everyone else depend on one another?

3-4. Was the map study of any value? How extensive did they use them? Could the children see that aviation was a great help in understanding our neighbors?
Children's Activities

5. Discuss how aircraft has changed the defense policies of nations.

6. Discuss how countries may interchange produce more easily by air.

7. Discuss how physical barriers such as mountains, oceans, are no longer trade barriers.

8. Learn that all countries cooperate with one another in giving weather reports.

9. Display pictures of types of planes—fighters, bombers, pursuit, patrol, commercial.

Evaluation

5-7-8. Did pupils make any great study of our defense programs? Here is a great field for reports, news gatherings, and interviews to be carried out. The children should have been stimulated to the point where they would go ahead.

6. Could they outline ways that the airplane was used in our trading program? Did they think it was advantageous or would bring us disaster?
Unit outline on cultures and languages. Pupils need to understand how aviation aids us in sharing culture and language of other people in the world. A unit outline follows:

References and Materials

A. Books


Children's Activities

1. Collect news items and display film and book reviews of other countries.

2. Write a list of the best known artists, conductors, scientists and composers and discuss how air travel makes it possible for them to appear in different countries from one day to another.

Evaluation

1. Did the children seem to get the idea that the airplane has made all nations our near neighbors?

2. Did children gain any knowledge from the experiences in reference to the artists, scientists, conductors?
Children's Activities

3. Study and make oral and written reports of the early history of the world and how culture was handed down and compare the early history with that of today.

4. See films of other countries.

5. Learn common words and phrases in other languages.

6. Write letters to children in other countries and discuss use of air mail stamps.

7. Examine school song books for music from different lands.

8. Invite exchange students to talk and visit the classroom.

Evaluation

3. Did they understand how our maps have changed and how aviation has helped us to get a truer picture of our world?

4. Did they understand that children of other lands have the same problems and desires and happiness that we do?

5. Did they appreciate the contributions made by the people in the field of aviation?

6. Did the children work and play democratically together?

7. Was there an opportunity to note if there were improved attitudes toward other cultures or races?

8. Did the exchange students provide any food for thought in regard to aviation?
Unit outline on past and present. Pupils need to apply knowledge of the past to an understanding of the past. A unit outline follows:

References and Materials

A. Books


Wright, Orville and Wilbur. Miracle at Kitty Hawk. Farrar and Straus, 1951.

B. Films

"History of Aviation." Walt Disney Production, District of Tennessee, Bureau of Aeronautics, Berry Field, Nashville, Tennessee Color, sound, 18 minutes.

Children's Activities

1. Study the development of aircraft and flying, and acquaint children with man's earliest desire to fly.

Evaluation

1. Did the children gain knowledge of early history of the airplane and of man's desire to fly?
Children's Activities

2. Children make research on the heavier-than-aircraft prior to Kitty Hawk.

3. Students learn about famous flyers and flights.

4. Children must be able to identify the main parts of the plane and their uses.

5. Take field trips to airport to observe the interdependence of nations and industries throughout the world.

6. Make a list of products flown into Hawaii from other countries. Group under food, clothing, medicine, and others. Discuss advantage of transportation of these products in comparison with other means of transportation.

Evaluation

2. Could the children trace the history of the present air transportation system?

3-7-8. Did the children gain a better understanding of how aviation has improved world trade?

4. Are the children becoming more familiar with the parts of the plane and their uses?

5. Are trips to airport bringing more extensive meaning to the children and understanding than when first taking this field trip?

Can children appreciate our dependence on rest of world for products, ideas, and all around good neighborliness to all, and how the airplane has aided in this?
Children's Activities

7. Have children become aware that aviation has developed world trade and promoted friendly relations with other nations.

8. Have children become aware that airplane factories are dependent upon many different parts of the world for the materials which are necessary in building planes.

Unit outline on use of airplanes. Pupils need to understand the importance of using the airplane for: (1) mail, and (2) express. A unit outline follows:

References and Materials

A. Books


B. Films and Slides

"Air Mail Pick Up." American Aviation Incorporated, 200 West 9th Street, Wilmington, Delaware. 35 mm., sound.
Children’s Activities

1. Children may go on excursion to airport to observe several things such as:
   a. What airlines are served by airport.
   b. Passenger services offered by the airline
   c. Preparation of passenger and plane for flight
   d. Airport post office
   e. Loading and unloading of mail.

2. Go on excursion to post office to gain information about airmail and the operations involved.

3. Go to express office to gain information about ground and air operations involved in air express.

Evaluation

1-2-3-4. Did the excursion seem a profitable and educational experience to the children?
4. Go to downtown air passenger terminal to gain information concerning air travel.

5. Interview personnel who are connected with passenger travel, airmail, and air express.

6. Look at motion pictures and slides about airports.

7. Look through books, magazines, newspapers, and pamphlets for pictures concerning various activities of the airlines.

8. Arrange collection of airmail stamps, air travel folders, rate and time schedules, air express folders, airline menus, airmail letters, and airline advertisements.

5. Were interviews of interest to students?

6. Evaluate the motion pictures and slides in class.

7-8-9-10-11-12-13-14-15. Did the activities prepared such as scrapbooks, dramatizations, written experiences contribute to enthusiasm and enrichment of the children's learning needs?
Children's Activities  Evaluation

9. Construct an air pick-up device in miniature.

10. Construct a movie device for showing original movies concerning air travel, mail, and express.

11. Make a scrapbook of magazine pictures, airline advertisements, airline menus, et cetera.

12. Prepare a radio program which tells about air trips being made today by well known people.

13. List commodities that can or cannot be carried by air.

14. List slogans of different airlines.

15. Dramatize a "Trip by Air," or "Carrying the Mail," or "The Mail Must Go Through."

Unit for Fifth Grade Health and Safety. Health and safety are not ends in themselves but rather means to a happy, successful, and productive life. The home and school must become partners if program of health and safety is to be
successful. Integrating Aerospace Education in the program will result in many interesting and worthwhile activities. Satisfying experiences will promote social-emotional adjustments.

Unit outline on the five senses. Pupils need to appreciate the five senses. The five senses are: (1) seeing, (2) hearing, (3) smelling, (4) tasting, and (5) touching. A unit outline follows:

References and Materials

A. Textbook


B. Materials

Stamp pad
White paper

Children's Activities

1. Make a list of all the beautiful things one sees in a day.

Evaluation

1-3-4-5-6-7. Did the children seem to see the importance of caring for our:

a. eyes
b. ears
c. clean mouth and teeth
2. Establish good reading habits. Children discuss rules for reading and the proper lighting that is needed.

3. Think of the pleasure one has in carrying on a conversation with friends. The beautiful sounds of the great outdoors, the sounds in the sky, the whir of bird wings and airplane engines.

4. a. Pretend you are walking in a flower garden. What are names of flowers that you smelled?

b. Review the trip to the airport. Think of all the different odors that were present, such as 1. gasoline

2. asphalt (runways or drives)
<table>
<thead>
<tr>
<th>Children's Activities</th>
<th>Evaluation</th>
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<tbody>
<tr>
<td>3. Oil</td>
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<td>4. Cleaning fluids</td>
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<td>5. Food odors as in restaurants</td>
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<td>6. Unpleasant odors.</td>
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5. Tasting - Pleasant and unpleasant tastes. Care of mouth for good health and appearance. Discuss the importance of a clean mouth pertaining to airplane stewardesses, pilots and other personnel at airport.

6. Discuss with children what organ contains the sense of touch - "The Skin." (Its importance to good health)

7. Take a stamp pad, such as comes with a printing press, and make your fingerprints on a clean white piece of paper. This is for true identification with aviation.

Unit outline on source and distribution of basic foods. Pupils need to develop understanding of source and distribution
of basic food and contribution to: (1) health, (2) growth, and (3) welfare. A unit outline follows:

References and Materials

A. Textbooks


B. Films

1. "Controlling Germs"

2. "Care of Minor Wounds"

3. "First Aid on the Spot"

4. "Keeping Ourselves Healthy"

5. "Vegetables"

6. "Consumption of Food"

   The University of Tennessee Film Library, Knoxville, Tennessee.

7. "Clouds" - Bell and Howell Film, Sound Library 30 Rockefeller Plaza, New York 20, New York. 10 minutes.

8. "Mainline Meals" - United Airlines, Chicago, Illinois, (16 mm. color)

C. Material

1. "The Wheel of Good Eating" - American Institute of
Children's Activities

1. Make a collection of stories for boys and girls on proper food for them.
2. Plan meals.
3. Write to airline companies for menus and discuss them.
4. Make a poster showing how foods travel.
5. Discuss the effects of aviation on the foods that we eat.
6. Discuss effect of plane in supplying food to the armed forces.
7. Discuss effect of plane in supplying food to the disaster areas in time of flood, drought,

Evaluation

1-2. Did the children enlarge their vocabulary by using such words as vitamins, carbohydrates, proteins, fats, and minerals?
3. Do they know the foods that contain the above named?
4. Are the children listening as well as contributing to class and group activities?
5. Did the children take an interest in improving themselves healthwise after studying the proper foods to eat?
6. Do the children share willingly their ideas as well as materials?
7. Do children realize the importance of preservation of foods and how the
Children's Activities

blizzard, or any other extreme weather conditions.

8. Explain how foreign travel by way of air may have brought new ideas of food and cooking to our own area.

9. Review the seven basic foods.

10. Discuss cloud seeding as a means of reclaiming land for food production.

Unit outline on disease. Pupils need to understand how communicable diseases spread and how they may be controlled or prevented. A unit outline follows:

References and Materials

A. Film

"Insects as Carriers"

B. Textbook


"Purification of Water" - pages 310-311.

Evaluation

airplane has helped?

8. Did students volunteer information regarding foreign foods? Some personal experience that they had?

9. Can they give examples of the "basic seven?"

10. Did students understand the process of cloud seeding?

1. Discuss diseases that you have had.

1. Can pupils distinguish between disease carrying insects and others?
**Children's Activities**

2. Secure assistance from school nurse or your doctor for materials, or perhaps an assembly program with them as moderators in a discussion or panel.

3. Make a list of all communicable diseases. Make posters to illustrate ways of preventing or spreading of disease.

4. Discuss spread and control of disease by aircraft.

5. Perform experiments to illustrate how water can be purified—by boiling, filtering, and by chemical means.

6. Contact airline company for information regarding means of controlling disease-carrying insects.

**Evaluation**

2. Since using outside speakers for discussion groups in class has been stressed, have the pupils gained a more extensive knowledge of topics at hand?

3. Were the lists complete?

4-6-7. Do the children cooperate in the sanitary projects around the home, school, and community?

5. Were experiments realistic and were pupils able to gain a more complete picture of problem involved?
Children's Activities

Perhaps a representative will come to visit your school.

7. Plan a field trip to your local water works, local sewage disposal plant and a dairy farm. Observe the sanitary measures taken by these enterprises.

8. Promote a "litterbug campaign." Place containers in convenient places for litter.

Unit outline on safety. Pupils need to be safety conscious. A unit outline follows:

References and Materials

A. Films

1. "Accident Behavior"
2. "Airplane Changes the World Map"
3. "First Aid on the Spot"
4. "Wounds and Fractures"

University of Tennessee Film Library, Knoxville, Tennessee.

B. Maps
1. County
2. State
3. Highway
4. Airway

Children's Activities
1. Discuss accidents children have had themselves.
2. Have children bring to school stories that illustrate some preventive phases of safety and read them to the group.
3. Bring up actual situations where there is specific need.

Evaluation
1. Do the children know how the radio and other signals are used summoning help in emergencies?
2. Do the children realize what a help the airplane has been to mankind in times of distress such as flood times, drought, snowstorms, to give relief to the people by distributing food, clothing, medicine, and fuel?
3. Do children grasp the idea of the importance
4. Correlate safety with all other subjects.

5. Organize extracurricular activities, school patrols, safety clubs, traffic courts.


7. Investigate the different safety agencies.

8. Make safety posters—stressing air travel.

9. Keep scrapbook of news reports and pictures of air travel and compare disasters on land and in the air.

10. Make up a first aid kit.

11. Discuss the use of the airplane in aiding in forest fire control.

12. Discuss the aids the airplane
Children's Activities

can give our highway
patrolmen in regard to
the traffic problem and
helping to enforce the
laws of our highway to
save lives.

Unit for Sixth Grade Mathematics

The mathematics program in the sixth grade had pro-
visions made for a systematic organization and treatment of
some of the topics of concern and included a program of mater-
ials that has given the pupils an understanding of the field
of aviation and the implications it has on modern life.

Unit outline on improvement of number skills. This
unit includes the following: (1) whole numbers, (2) common
fractions, (3) decimals, and (4) percentage. A unit outline
follows:

References and Materials

A. Textbook

Brueckner, Merton, Grossnickle. The New Understanding
Numbers, Grade 6. Chicago, Illinois: John C.
Winston Company, 1956. Page 1 -- Problems to stimu-
late interest at start of year.

Page 47 -- Distances by air (Tables showing airline
miles).
B. Materials

1. Maps—air and highway
2. Sample travel folders
3. Poster paper

C. Textbook (above)

(Problem 6), page 181

Centigrade thermometer is used by scientists and European people.

D. Books


Children's Activities

1. Find the parts of the airplane that are circles.
2. What geometric figure (or

Evaluation

1-2. Was interest stimulated to the point that other problems were brought to class,
Children's Activities

part of a figure) is
represented by each of
the following:
a. The spoke of the
tControl wheel or stick
of an airplane.
b. The apex of the folded
parachute.
c. The shapes of differ-
ent types of aircraft
wings.
d. The propeller.
e. The aileron.

3. Using maps, find distances
from a given point. Plan a
trip and find distance by
land and air.

4. Find the amount of time
saved in traveling by air.

5. Use problems figuring time,
rate, distance and fuel con-
sumption.

6. Use problems to show the
arithmetic of Fahrenheit
and Centigrade scales.
Have class construct

Evaluation

other than just the
assignment?

7. In the percentage prob-
lems, did it give the
students a better under-
standing of why we have
to collect taxes, and
why as good citizens,
we should not try to
avoid paying taxes?

8. Did graphs seem to have
meaning?

3-4. Was there a carry-
over from other subject
areas?

5-6. Did the skills improve
as the enthusiasm gained
momentum?
Children's Activities

original problem concerning these thermometers.

7. In working percentages, take taxes, duties, change in air speed, profits and losses in the aviation subjects. Also visit your county court house and get information on tax rate. Figure the tax on gasoline that will be used in aircraft.

8. Make graphs showing weather conditions, fuel consumption, passenger miles flown by commercial and passenger planes.

Evaluation

7. In the percentage problems, did it give the students a better understanding of why we have to collect taxes, and why as good citizens, we should not try to avoid paying taxes?

8. Did graphs seem to have meaning?

Unit outline on gaining information on time zones, longitude and latitude.

References and Materials

A. References

1. Tourist Bureau in your community (research material showing how much money is actually spent by tourists visiting different vacation spots).

B. Film
"Latitude and Longitude" - University of Tennessee Film Library, 16mm, black and white, sound, 9 minutes.

C. Textbooks (parallel)

D. Useful Aids
Northwest Airlines Flight Maps. Northwest Airlines, 1885 University Avenue, St. Paul 1, Minnesota. Free.

Children's Activities
1. Make a study of the equator and its position on the globe.
2. Observe the latitudinal lines and longitudinal lines that:
   a. minute of latitude equals nautical mile anywhere.
   b. minute of longitude equals nautical mile

Evaluation
1. Do the students have a complete knowledge of latitude and longitude?
2. Does the vocabulary of students contain such as: barometer, meridian, altitude, anemometer, atmosphere, climate, degree, geographic poles, gravity, Greenwich meridian, horizon, knot
Children's Activities

4. Learn the characteristics of the meridians on different type maps.
   c. only at the equator.

3. Make a study of the time zone: 3.
   a. that the world is divided into 24 zones of 15 degrees or 1 hour.
   b. that zones in west longitude are prefixed "plus" and zones in east longitude are prefixed "minus."
   c. that the time zones in the United States and Canada are named Atlantic, Eastern, Central, Mountain, and Pacific.
   d. that when approaching 180 degrees meridian from the east one day is lost.
   e. that the meaning of navigation, its importance and the part played by arithmetic in navigation problems.

Evaluation

(measure of speed), magnetic north, mid meridian, nautical mile, parallel, perpendicular?

Did the students understand the different time zones and where they are located?
Children's Activities

4. Learn what the fuel capacity is of some of the light planes in general use.

5. Find maximum flying distances of the planes with fuel tanks filled.

6. How many miles can be flown per gallon of fuel?

7. Learn how to change nautical miles to statute miles.

8. Show how aviation aids the tourist industry.

Unit outline on spending and budgeting.

References and Materials

A. Textbook


a. "How to Measure Things We Buy," page 146

b. "The Faster We Go, the More Gasoline We Use," page 118

c. "Good Way to Save Money," page 115

Evaluation

4-5-6. Did students "extend" themselves in the study of fuel and its use? Many problems could be made concerning these activities.

7. Could they explain differences between nautical and statute miles?

e. "3 Pay Plan," page 109

f. "Turkeys for Thanksgivings," page 86

g. "Worries of the Grocer," page 49

h. "How Much Should We Pay," page 35

i. "Arithmetic at the Grocery Store," page 30

Children's Activities

1. Plan picnic lunch to take on trip to the airport. Have committees in charge. Budget money, time and space. Figure everything that you use, food, and other supplies.

2. Figure cost of trip and average cost per person. Also figure cost with different ways of transportation such as by car, bus, or train.

3. Compare air travel with other ways of transportation.

4. Everyone in class prepare their own individual budget.

5. Organize an Airplane Club and estimate the cost per person.

Evaluation

1-2. Did the pupils learn the values of thrift and planning?

3-4. Did the children learn something of the amount it takes to meet the family needs?

5-6. Did the students get full cooperation from home on this project?
Children's Activities

6. Make out a budget for your whole family and try to get cooperation of family to help make it and carry it out.

Unit for Sixth Grade Music and Art

The art activities in this grade can be of a more mature level and emerge into adult life as students are interested in adult problems, professions, and vocations. Individuals who have special talents should be stimulated. A large degree of integration can be attained if the instructor and pupils are on the alert and interested in the Arts.

Unit outline on design. Pupils need to apply design to everyday living in the "Aerospace Age." A unit outline follows:

References and Materials

A. Materials

2. Tempera Paints  4. Wrapping paper (plain)

B. Books

1. Encyclopedia for information of famous paintings
Children's Activities  Evaluation
1. Design wall covering suitable for recreation room at air terminal.
2. Potato printing - cut out designs pertaining to planes for designing.
3. Use tempera or other paints to make drapery designs suitable for recreation room or boys' room.
4. Plan and design a room using the "Aerospace Age" theme.
5. Discuss how plane designing has influenced the automobile industry design "Swept wing Dodge."
6. List advertisements that use "Aerospace Age" terms to stimulate business, such as "jets" in cereal, "jets" in tennis shoes, "air foam" mattresses.

1-2. Could students associate many of our modern designs with the "Aerospace Age" influence?
3-4. Did the students question this phase in designing as just being a "fad" or was it a permanent part of the present culture?
5-6. Did students think this type of advertising was good business? Why?
Unit outline on the "fine arts." Pupils understand how man can satisfy his desires, express emotions and thoughts through the arts. These are: (1) architecture, (2) painting, (3) poetry, (4) sculpture, and (5) music. A unit outline follows:

References and Materials
A. Materials
  1. Famous paintings
  2. Recordings of great composers
  3. Recordings of Air Force or Navy Cadet Choir

Children's Activities

2. Have students view jet paths, sunsets, cloud backgrounds for the color that is present.

3. Make a study of pictures of aircraft for design, balance, symmetry, and simplicity.

4. If at all possible, take a plane trip above the clouds and see the beauty of the clouds.

Evaluation
1. Could students trace the evolution from ancient to modern aviation?

2. Did students appreciate the colors that nature has given us?

3-4. Are the students developing a desire for the arts through aviation projects?

5. Were experiments done with art, music and color to ascertain their psychological value?
Unit outline on importance of streamlining in aviation. Pupils need to understand the effect of streamlining on the efficiency of flight.

References and Materials

A. Materials

Scale model charts of different types of planes with sectional drawings - North American Aviation, Incorporated, International Airport, Los Angeles 45, California.

Children's Activities

1. Make scale drawings of each of the five major parts of a plane.
   a. wings
   b. fuselage
   c. power-plant
   d. landing gear
   e. control surfaces

Evaluation

1. Were students proficient in their scale drawings?

Unit outline on culture of all nations. Pupils understand how aviation can bring all nations together as one culture through music. A unit outline follows:

References and Materials

A. Materials to refer to:
   1. Prince Igor: "Palovetzion Dances by Bordin"
   2. The Trepam Dance from the "Nutcracker Suite"
   4. "Blue Danube Waltz," "Emperor Waltz"
Children's Activities

1. Make a study of folk music and folk dance of Russia, Germany, Scotland, United States, Latin America, and Ireland.

2. Learn music and dances such as:
   b. Ireland - "The Irish Jig, The Irish Washerwoman."
   c. Scotland - "The Highland Fling."
   d. Germany - "Dei Lorelei."

3. Make use of this study with assembly programs.

Evaluation

1. Did the students prepare their assembly program? Did the songs and dances show that in reality we are "one nation"—but have different kinds of music and dance?

2. Were they able to produce plays and other entertainment from this music study?

3. Can we note any influence of different countries in our modern music today?

Unit for Sixth Grade Language Arts

The content and experience of this unit have been selected to assist pupils in using language as a personally satisfying
means of communicating facts, ideas, and feelings in speaking, reading, writing, listening, and observing. The writer has supplied illustrations of significant content from aviation that will satisfy their questions and stimulate new interests in this new area of Aerospace Education.

Unit outline on listening and observing for information. Pupils need the ability to: (1) use the library as a source of material, (2) use of the dictionaries and encyclopedias, (3) use of contents, index, glossary, (4) read for meaning, (5) read for fun, and (6) listen and observe. A unit outline follows:

References and Materials

A. References


B. Periodicals and Magazines


Children's Activities

1. Collect all the books that are accessible and catalogue and number them. Use the library for source

Evaluation

1. Did your study at the library show any increase in material on aviation used?
Children's Activities

and prepare a bibliography of books and materials on topics such as:

a. Kinds and Uses of Aircraft
b. How and Why Aircraft Fly
c. Jet Aircraft
d. Rockets, Missiles, and Space Travel
e. Airports
f. Aviation Careers
g. History of Aviation
h. Reference Books
i. Dictionaries

2. Use the Reader's Guide for periodic literature pertaining to the above topics.

3. Contact librarian to lecture or discuss books and their uses that are available on Aerospace Education.

4. Prepare an aviation glossary, alphabetical order and secure proper pronunciation for such

Evaluation

2. Were students "at home" in the library, or did they need assistance from librarian?

3. Could you see an improvement in the language skills after this study?

4. Could the students show an improvement in the amount of time it took
Children's Activities

words as acceleration, acrobatics, aerodynamics, aeronautics, aileron, airfoil, airspeed, altimeter, altitude, alto-cumulus.

5. Discuss between the use of index and the table of contents.

6. Read articles for meaning, make an outline, select the most important parts.

7. Select books and periodicals that would be used for pure enjoyment.

Evaluation

to locate material at the library?

5. When the students were reading for meaning, were their condensed articles given the same meaning as the original article?

6. Make a check on books and articles that were checked out of the library. Were they of good choice and do they pertain to the subject involved?

7. When checking on good listening, did you find that the student had acquired better listening habits, not repeating the question so many times?
Children's Activities

8. Make a report to the class after listening to an aviation talk. Be sure and take notes. (da Vinci to Wright Brothers)

9. Have an interview with a specialist in the Aerospace Education Field and report to class on the interview.

10. Observe the effects of posture on listening.

11. Compare listening ability at different times of the day. Are you more alert, do noises detract?

12. Read articles that contain facts and figures. Can you accurately recount the data, when you have not been asked beforehand to remember them?

Unit outline on communication. Pupils need to develop the ability to communicate through speaking by: (1) building a broad vocabulary, and (2) expressing oneself creatively and purposely. A unit outline follows:
References and Materials

A. Books


Children's Activities

1. Converse informally with small group of classmates on aviation activities, topics, and problems of personal concern.

2. Talk over observations made by the class during an excursion, or science experiment on aviation, or assembly.
   a. bring out significant points.
   b. add significant observations not brought out by others.
   c. ask questions of genuine concern, if clarification of ideas or information is needed.

3. Present an interview between two students, one of whom knows more about aviation than the other. The interviewer should define his

Evaluation

1. Were the students "free" in their informal discussion?

2. Did they gain more confidence as they progressed in their work?

3. Did the students use originality and creativity or was it "canned?"
Children's Activities

purpose for the interview, consider carefully the questions he will ask, and plan how to begin and end an interview.

4. Present a current event report on a recent aviation activity.
   a. a new flight record, a new airplane design, a distinguished pilot, a new discovery.

5. Discuss in open forum a current aviation problem, such as the Federal Aviation Agency regulation concerning pilot training.

6. Conduct a committee meeting to make plans for a visit to the airport. (Select a chairman to conduct the meeting.)


8. Dramatize scenes such as "The Wright Brothers," "Lindbergh,"

Evaluation

4. Did students seem more alert on current events and interested in what was going on around them?
Children's Activities

Amelia Earhart, and other interesting contributors to aviation.

Evaluation

8. In the dramatic plays, did it show a lot of originality or did they stick strictly to material in the books that they had read?

Unit outline on writing. Pupils need to develop the ability to write for a purpose and to express thoughts and feelings effectively. A unit outline follows:

References and Materials

None.

Children's Activities

1. Report by writing such activities as:

   a. a scientific observation or experiment

   b. an event, incident, or activity observed by the entire class, as the landing of an air transport.

   c. Bring to class and examine official reports, as the airport manager's report to the city on airport
Children's Activities

activities, receipts, and expenditures.

d. Make an official report on aviation books and materials received during the study of aviation.

e. A personal experience as a passenger on a plane, a witness of the take-off of a new plane, a visitor in the weather bureau, communication division, or maintenance division at the airport.

2. Give directions in writing

a. clear directions on how to make a glider, a tile design with aviation motif, a scale drawing for an instrument panel, a scientific experiment.

3. Explain in writing

a. contact flying, parachuting, flying, taking off, dead reckoning, weather

Evaluation

Did words used take on a new meaning?

3. In determining the way students can follow directions as well as give them, have them give
Children's Activities

forecasting, receiving clearance, and instrument flying.

4. Writing announcements and advertisements
   a. Write announcements for an aviation assembly.
   b. Make posters announcing the coming of aviation speakers and the topics they will speak about.
   c. Prepare announcements for new aviation books for the school paper which will attract readers.
   d. Compose blackboard advertisements for other classrooms to announce the showing of an aviation film sponsored by your class.

5. Write reviews
   a. Review an aviation book on forms prepared by the class

Evaluation

directions to each other in class exchanging back and forth. Were the directions clear and understandable?

4. Were the writings of the letters in good form, well-chosen words and was courtesy shown at all times?

5. Were the book reviews well received by other members of the class as
Children's Activities

in such a way that the annotations can be used to guide the reading of others.

6. Write summaries:
   a. Summarize main things the group learned on an excursion to the airport, or to the air express office.
   b. Summarize class findings on significant aviation problems.

7. Writing letters:
   a. Write letters to library requesting permission to interview the librarian about aviation books available locally and through the State Library.
   b. Write a letter requesting a speaker on aviation for a school assembly.
   c. Write an order for some

Evaluation

they were read?

6. Did the summaries give them any assistance in remembering the materials that they had covered?
Children's Activities

Evaluation

3. How big a piece of model-making equipment or material.

d. Write an informal note of thanks.

e. Write invitations to an aviation program for parents and friends.

8. Record notes for personal use. 8. Was the recording well done, were notes taken so that they could be used and were plans checked over to see whether they had been carried out?

d. Outline--information read, carried out?

heard or observed.

Unit outline on appreciation of language arts. Pupils need to develop and understand the practical and vocational aspects of the language arts. A unit outline follows:

References and Materials

A. Books on Aviation Careers


2. Colby, C. B. Airdrops: Men, Weapons, and Cargo by Parachutes. New York: Coward-McMann,
Incorporated, 1953.


**Children's Activities**

1. Ask for an interview of an airline company for a position or information about the vocational opportunities by letter or by telephone.

**Evaluation**

1. Did students see the need for making a good impression?
Children's Activities

2. Assume that you have made your appointment for the interview, and will need to prepare your interview or get it well in mind, what you will say in your introductory remarks and have answers prepared on questions that they might ask you in an interview. Also get your qualifications well in mind and show how you would state them clearly and to the point. Always remember to make an interview at their convenience and do not consume more time than they want to give. Show every courtesy possible. Be businesslike but courteous.

Evaluation

2. Did students correlate the language arts with vocational aspects of life?

3. Did students seem to gain confidence in meeting their prospective employers?
Unit for Sixth Grade Science

Science in sixth grade stressed the basic principles and varied the levels of activities to illustrate these principles. Activities have been selected which can be carried on with a minimum amount of equipment to use. This study has been prepared to aid the student in assuming his responsibility as a citizen to understand technical problems.

Unit outline on weather elements. Pupils need to understand the interaction of weather elements and how they affect flying conditions. A unit outline follows:

References and Materials

A. Books


about what makes the weather directions for
reading weather maps and suggestions for fore-
casting weather.

B. Materials

1. Wet and dry thermometers
2. Materials for barometer
   a. glass tube 30" long and sealed at one end, mercury to fill tube yardstick to fasten filled mercury tube on
   b. milk bottle barometer
      milk bottle rubber balloon drinking straw glue
3. Material for a windsock
4. Collection of weather maps

C. Films

1. "Winds and Their Causes" - (sound, 10 minutes) Coronet Film Company, 65 East South Water Street, Chicago, Illinois.
2. "Weather Forecasting" - Chief of United States Weather Bureau, 24th and 17 Streets, N.W., Washington 25, D. C.
3. "What Makes Rain?" Young America Film, University of Tennessee Film Library, 16 mm., black and white, sound - 10 minutes, $2.00.
Children's Activities

1. Questions to ask to provoke thought and get interest stimulated
   a. What makes weather?
   b. What is atmosphere?
   c. How do we know that air is real?

2. Provide broad and varied opportunities for the individual child to experiment with air, handle it, control it, feel impact of its forces. Learn that air can be measured by what it does. Learn that as air is compressed, its pressure increases; as it expands its pressure decreases.

3. Experiments showing
   a. Air has weight.
   b. Air is compressible.
   c. Air exerts pressure.

4. Construct and learn to use a barometer.

Evaluation

1. Could the children establish a daily temperature pattern?

2. Could they associate temperature changes in anticipating weather changes?

3. Could the children realize the magnitude of air pressure?

4. Did they understand that air presses in all directions?
Children's Activities

5. Compare an aneroid barometer and altimeter. (Note that they differ only in the matter of recording readings.)

6. Use charts, drawings, or graphs to show the decrease in temperature, air pressure, density, and amount of moisture with the increase in altitude.

7. Teacher asks what causes winds - Pupils seek information regarding winds. (Unequal heating of air masses is basic reason for winds of all types.)

8. Try an experiment in order to learn how wind direction and velocity are determined.

Evaluation

5. Did their experiments make projects more understandable?

Were they worthwhile or were they just a way to consume valuable time? (Experiments should always have a purpose and try to prove something through them.)

6. Were charts of help to pupils in keeping records of weather changes?

7. Were pupils anxious to extend their knowledge of winds?
Children's Activities

12. (Wind direction and velocity are shown on weather maps.) (Arrow is shown flying with the wind, with the station circle representing the head of the arrow.) (The number of barbs on the end of the arrow indicate the velocity according to the Beaufort Scale.)

9. Question--What causes fogs, clouds, and precipitation?
What causes dew, frost, fog, ice formation on aircraft?
Experiment with these problems.

10. Construct a convection box--to show how wind is caused by the unequal heating of air.

11. Be sure that children understand the "water cycle."
Watch for words condense and evaporate.
Children's Activities

12. Make weather maps, check weather forecasts, and visit a weather station. The windsock is always of interest to children.

13. Set up a weather station.

Unit outline on services of weather bureau. Pupils need to understand what services are provided to aviation by the weather bureau.

References and Materials

A. Magazines for youth to subscribe to:

1. **Air Trails: the Model Builders' Guide.**
   Street and Smith, 122 East 42nd Street, New York, New York. Monthly $2.50


3. **Model Aviation** (including Air Youth Horizons).
   Air Youth Division, National Aeronautics Association, 1025 Connecticut Avenue, N.W., Washington, D. C. Monthly $1.00.

Children's Activities

1. Children list various services that the meteorologists are giving pilots and aviation as a whole.
   a. Observation of clouds

Evaluation

1. Did the children realize the vast amount of information and services that the weather bureau gives us?
Children's Activities

1. (use telescope)
2. Determine visibility
3. Obstructions to visibility
4. Ceiling (cloud ceiling refers to altitude of the base of cloud formations which are below 10,000 feet and which cover more than one-half the sky.
5. Wind direction and velocity
6. Upper air data (pressure, temperature, and relative humidity in upper levels of atmosphere are determined by airplane observations and use of radiosonde)
7. Radiosondes--weather instruments and radio transmitters weighing less than two pounds and carried aloft by free balloons.
8. Relative humidity--determined by psychrometers (wet and dry thermometers).
Children's Activities

1. Temperature—obtained by accurate thermometers.

j. Pressure—determined by mercurial barometers.

k. Recording devices.

l. Precipitation.

2. Learn to identify clouds.

Evaluation

2. Is the vocabulary of the children increasing with all of the new terms that we are encountering now?

3. Are the children doing more and more outside reading?

4. Did they learn to recognize clouds?

Unit outline on atmospheric conditions. Pupils need to know what influence atmospheric conditions have on aviation.

References and Materials

A. Films

2. "Landing and Starting"

3. "Taxiing" - University of Tennessee Film Library, 16mm., black and white, Knoxville, Tennessee.

B. References


C. Books

Jaffo and Black. Big Book of Real Airplanes. New York: Crossett and Dunlap, 1951. Pages 9-10. (Twenty-one important parts listed, illustrated and described.) Aeronautical terms also listed and defined.

Children's Activities

1. Demonstrate the effects of lift by the use of a small wind tunnel constructed by the pupils.


3. Watch for "dust devils" or "whirl winds."

4. Study the action of gliders and kites.

Evaluation

1. Did the pupils discover the reason for longer take-off runs during periods of high humidity?

2. Do the children understand the cause of air movements?

3-4. Did children recognize air movements as being both vertical and horizontal?
Children's Activities

5. Model plane with controlable rudders may be flown to demonstrate rudder action.

6. Name the parts of the airplane.

Unit outline on gravitation and inertia. Pupils need to understand that gravity is a force and present throughout the universe. A unit outline follows:

References and Materials

A. Films

1. "Aircraft in Flight" - Aviation Education Division, Civil Aeronautics Patrol, Bolling Air Force Base, Washington, D. C.


B. Text


Children's Activities

1. Drop two different size and weight balls an equal distance and observe that both strike the floor at the same time.

Evaluation

1. Did the children understand that there is "pull" between any two bodies?
Children's Activities

2. Drop one steel ball and at the same time project a second in a horizontal plane. Observe that both strike the floor at the same time (Explain).

3. Make a study of gravity through the pendulum.

4. Stack several blocks on a small cart and then start and stop the cart quickly. Pull the cart in a straight line and then suddenly change its direction.

5. Discuss the effects of gravity and inertia on the members of a plane as it suddenly changes direction.

6. Place a small amount of water in a bucket, and swing it rapidly in a vertical circle. Explain why the water remains in the bucket.

Evaluation

2. Did they understand that weight decreases at extremely high altitudes?

3. Did they understand that gravity is independent of shape or dimension?

4. Did they understand that a lifting force must be present to overcome weight while in flight?

5. Did the student understand that all forces are equal on a plane in straight and level flight at a constant speed?

6. Did the students realize the tremendous forces placed upon the body and the plane structure during a sudden change
Children's Activities

7. Discuss the action of freely falling bodies. Discuss the action of air resistance on these bodies.

Evaluation

7. Did the student understand the relationship between force and acceleration?

Unit for Sixth Grade Social Studies

The Social Studies viewpoint brings about the necessity of understanding how far aviation has progressed in the few short years. Nationally and internationally, it affects our political relationships in a social, economical and cultural way.

Unit outline on the social, economic and political situation. Pupils need to understand how the airport has affected our world today. A unit outline follows:

References and Materials

A. Film

"Children's Airport Excursion" (Silent) 12 minutes, 16 mm., Teaching Films Custodians, Incorporated, 25 West 43rd Street, New York, New York.

"Sky Harbor" - (Sound) 12 minutes, 16 mm., R. B. Innis Company, 1101 North Delaware, Indianapolis, Indiana.

"The Airport" - Audio-Visual Aids Service, University of Illinois, Champaign, Illinois. 16 mm., black and
Children's Activities

**Airport**

1. Interview the manager of the local airport to find out who owns the airport and how it is managed. Also how it is classified, how it will meet the standards set by the Federal Aviation Agency (F.A.A.).

2. Write letters to nearest airport to find out how it is managed and operated. Write to regional office of Civil Aeronautics Administration to

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**Evaluation**

1. Could the students identify different airports and how they are classified?

2. Does their letter writing show marked improvement since first starting with Aerospace Education?
Children's Activities

find out number of airports in state, where they are, and how they are classified (municipal, commercial, private, Army, Navy, and intermediate fields).


4. Discuss how airports are financed or get financial assistance. (Subsidy). (Beginning in 1933, the federal government gave financial aid to airport construction as part of the federal relief program.)

1933 - Civil Works Administration spent $11,500,000 on airport construction (in small

Evaluation

3. Did the students get a better all-over picture of the progress of aviation over the period 1920 to 1960? Could they write or give orally a history of aviation?

4. Did the films give them a better understanding of the airports, their construction, and activity around them?
**Children's Activities**

communities building 585 new airports).

1934 - Federal Emergency Relief Administration carried on work of Civil Works Administration. Airport projects - 943. Federal Emergency Relief Administration constructed 55 new airports.

1935 - Works Progress Administration (W.P.A.) replaced Federal Emergency Relief Administration and gave federal aid to airports.

1938 - Civil Aeronautics Act repealed provision of the Air Commerce Act of 1926 forbidding government to establish airports and gave Civil Aeronautics Administration authority to plan location and development of airports. (Now Federal Aviation Agency)

1940 - Congress appropriated $40,000,000 for airport construction and improvement projects.

**Evaluation**

5. Did the students understand what the word "subsidy" meant and did they think that aviation needed it?
Children's Activities

1944 - To date Congress has appropriated $400,000,000 to Civil Aeronautics Administration for national defense airport development programs.

5. Appoint a bulletin board committee to arrange a display of planes, old and new and also of airports (modern).

Evaluation

5. Did the students understand what the word "subsidy" meant and did they think that aviation needed it?

Unit outline on the social, economic, and political situation. Pupils need to understand how airways have affected our world today. A unit outline follows:

References and Materials

A. Films

"Aerial Navigation Airways Flying" - United States Army Signal Corps. (Explains Federal Aviation Agency safety regulations and how they operated.)

Children's Activities

Airways:

1. A map of the United States, have pupils show the airways of the nation. Use different colors to

Evaluation

1-2. Did the students see the need for international flight control and regulation?
Children's Activities

show different kinds of airways.

2. A radio skit can be written by pupils to tie in their information that they have thus far come in contact with.

3. Written themes concerning airways.

4. Cartoons can be used to illustrate the "right-of-way of the highways," "east and westbound traffic," safety regulations, hearing range signals on our airway.

Evaluation

3-4. Is there evidence that students are showing a greater appreciation for foreign culture?

Unit outline on the social, economic, and political situation. Pupils need to understand what effect airlines have on the world today. A unit outline follows:

References and Materials
None

Children's Activities

Airlines

1. Take an imaginary air trip.

Evaluation

1. Were plans complete in every detail?
Children's Activities

Make arrangements for the trip, length of trip, dates, time of arrival, and departure from each place visited. Plot the route on the globe and also use map. Figure the cost of trip and miles traveled. Plan baggage, clothes, and other things to be on the trip.

2. Write letters to Pan American Airways, Incorporated, New York City, and to American Export Airlines, Incorporated, New York City, for free materials advertising travel over international airways. These could be used on bulletin board.

3. Follow up the plans of the imaginary trip by air with the trip itself. Keep a diary of the trip telling about the countries and cities visited and the things done.

Evaluation

2. Did students see the need for the extensive plans made?

3. Was the diary of more interest to girls than boys? An attempt to reach all should be made if possible.
Children's Activities

4. Diary might consist of cities that were visited, strange food, customs, dress, language, and homes; unusual experiences.

5. Name the different airlines:
United Airlines, Overseas,
Pan American World Airways,
Routes to South America,
Pacific Routes, Trans-
Atlantic routes, Pan
Africa, Cut-off to Rio,
American Airlines, Braniff
Airways.

Unit outline on the social, economic, and political situation. Pupils need to understand what effect Government Control and Regulation have on our world today. A unit outline follows:

References and Materials

A. Use encyclopedias


B. Books


Children's Activities

Government Control and Regulation


Evaluation

1. Did the students understand the need for regulation of aircraft operations?

2-3. Did they get any cooperation from the Federal Aviation Agency for their projects? (They are more than willing to aid.)

4-5. Were requests by letter well written and courteous?
Children's Activities

the local airport.

5. Write to the Superinten-
dent of Documents, Govern-
ment Printing Office,
Washington 25, D. C., for
copies of the Civil Air
Regulation.

6. Pupils make a balance sheet
of the advantages and dis-
advantages which they can
see in adopting a policy
of freedom of the air.

Evaluation

6. Were the balance sheets
well prepared and useful
in making their sum-
maries?

Unit outline on the social, economic, and political
situation. Pupils should feel the importance of World Trade
as it affects our world. A unit outline follows:

References and Materials

Films

1. "Wings for Victory" - Official Films, Incorporated,
   425 Fourth Avenue, New York, New York

2. "Our Empire of the Air"

3. "Bermuda by Air" - Pan American Airways, Long Island
   City, New York
Children's Activities

World Trade

1. Reading activities in magazines are good sources for material on world trade.

2. Discuss the advantages of "Air Freight"—also kinds of air freight.

3. Write letters to Federal Aviation Agency Board to secure latest data on international air transportation including number of miles of international airways in operation, number of passengers flown, pounds of mail carried, pounds of freight carried, and total miles flown.

4. Letters to Division of Air Mail Service, United States Post Office Department, Washington, D. C. for maps showing international air-mail routes.

Evaluation

1-2-3-4-5. Did the students see how our world had shrunk with the use of the airplane in world trade?
Children's Activities

5. Using maps, show the areas in which each of the essential materials needed in producing an airplane is found.

Unit outline on the social, economic, and political situation. Pupils need to understand what effect World Peace has on our world. A unit outline follows:

References and Materials

Who's Who in America - for General H. H. (Hap) Arnold

Major General Ira C. Baker
Lieutenant General Carl (Tooe) Spaatz
Sir Arthur T. Harris
Major General Claire Lee Chennault

Books


Children's Activities

World Peace

1. Discuss the problem of inadequacy of natural boundaries in the air age?

2. Make a study of the biographies of air commanders.

Evaluation

1. Did students see the parallel between aviation and world peace?

2. Did they see how necessary it was for us to promote world peace
Children's Activities

3. Make a survey. A poll of students' opinion and a poll of adult opinion made up questions such as:
   a. Should the United Nations disarm?
   b. Should the United States participate in a world police force?

4. Discuss the problem of "Building International Unity."
   a. Good will trips
   b. Is freedom of the air desirable?

5. Make special reports on topics such as:
   b. Henry Wallace's Trip to Russia.
   c. Eddie Rickenbacker's Flight to France.

Evaluation

3. Was survey of any value to students?

if at all possible due to our "shrinking" world today?
Unit outline on the social, economic, and political situation. Pupils need to understand the vocational opportunities. A unit outline follows:

References and Materials

A. Books on Aviation Careers


5. Floherty, John J. *Aviation from the Ground Up*.

B. Careers - Vocations

Films

1. "Air Transportation" - (10 minutes) film library, University of Tennessee, Knoxville, Tennessee.


Books


Children's Activities

Vocation

1. Students make a list of the vocations that aviation offers:
   a. Pilot and co-pilot
   b. Navigation
   c. Flight engineer
   d. Radio engineer
   e. Meteorologist
   f. Flying instructor
   g. Steward - stewardess
   h. Stunt pilot - test pilot
   i. Parachutist
   j. Chef
   k. Electricians
   l. Airport managers
   m. Aeronautical engineers
   n. Advertiser
   o. Office workers, clerks
   p. Pilot
   q. Navigator
   r. Draftsman
   Many others

2. Make graphs showing expansion of job opportunities in aviation.

Evaluation

1. Did the students visualize the vocational fields opened by aviation?
Children's Activities

3. Organize "Pen Pal Clubs" for the purpose of gaining better understanding of the impact of air transportation on world relationships.

4. Set up demonstrations to illustrate the theory of flight.

5. During field trips to airport, observe the operation of instruments and skills used in operating airports and air traffic.

Unit outline on the social, economic, and political situation. Pupils need to understand the impact aircraft and industry have on the world. A unit outline follows:

References and Materials
None

Children's Activities

1. What influence did World War II have on the airplane industry? Make a thorough

Evaluation

3. Did they realize the broad technological scope of the field?

4. Were the skills shown by the students in their constructive activities indicative of satisfactory growth?

5. Did the students evidence understandings of the nature of aviation jobs?

Evaluation

1. Did they desire further knowledge about aircraft and aviation occupations?
Children's Activities

study of how the airplane industry has expanded and the problems that developed with this expansion such as:

a. Thousands of jobs that were made available to workers in aircraft factories.

b. Housing shortage for workers.

c. Public utilities insufficient.

d. Inadequate transportation facilities to carry workers to and from work.

e. Larger school enrollments.

2. Write to an aircraft factory for information regarding output, number of employees. Report to class on findings.

Evaluation

Unit for Sixth Grade Health and Safety

American health and physical condition determine the success of our nation in maintaining its ways of life in the
period of tension. In the field of aviation, tremendous advances have been made. Need for persons capable of meeting the standards necessary for participation has been intensified. In this "Aerospace Age" the "Air Condition" of American youth must not be under-emphasized.

**Unit outline on recreation.** Pupils need to understand how aviation may be used as a means of recreation. A unit outline follows:

**References and Materials**

A. Text


B. Book


C. Films

"An Airplane Trip" - "Chimp, The Aviator", University of Tennessee, Division of Extension, Knoxville, Tennessee.

**Children's Activities**

1. Promote a model plane contest in charge of a special committee.

2. Contact businessmen who combine business with flying.

**Evaluation**

1. Were the contests worthwhile? If so, why?

2. Did they develop good sportsmanship?
Children's Activities

pleasure in the use of
the airplane.

3. Secure an outside speaker
to discuss flying clubs,
how they are organized,
supported and operated.

4. Contact local flying club
to see if they would be
interested in carrying out
a local sight-seeing tour.
The class might help in
selling tickets, taking
care of advertising and
some of the general
arrangements.

5. Encourage boys and girls out
of school to become inter-
ested in aviation by invit-
ing them to participate in
some of your recreational
activities.

6. Participate in games and
dances other countries
brought to us by the air-
plane.

Evaluation

3. Plan question and
answer discussion to
evaluate guest speakers.

4. Did any take a sight-
seeing tour? Did any
of the learnings carry
over into subject matter
areas?

5-6. Were the boys and
girls out of school
couraged to learn
more about the airplane?

Do the activities seem
to stimulate interest
in the community?
Unit outline on physical conditions of youth. Pupils need to understand the need of good physical condition. A unit outline follows:

References and Materials

A. Books


B. Films


Children's Activities

1. Discuss the physical fitness necessary for military preparedness; required by Air Force personnel.

2. Participate in physical conditioning exercises required of air personnel.

3. Plan an airline meal and discuss the sanitary practices taken place on the plane.

Evaluation

1. Did students understand why pilots are required to pass such rigid physical requirements?

2. Did students think it necessary to take exercises?

3. Did students gain knowledge as to the sanitation problem on the airlines?
Children's Activities

1. Prepare a bulletin board and include pictures and written references promoting physical activities.

2. Make a study of the effects of aviation upon public health.

3. Set up a health contest establishing rules for the entire class to follow.

4. Conduct classroom demonstrations on how personal health problems may be solved through the study of aviation. A pilot or other air personnel might visit the class and give the demonstrations.

Evaluation

4. Did the bulletin board cause comment other than in the room? This project should cause interest to spread within the whole school if enough enthusiasm is shown by group participating.

5. Did the students understand the role of the airplane in promoting good public health?

6. Could you see improved health conditions among students after contest?

7. After demonstrations were given, did any students show a desire to become a pilot or other air personnel?

Unit outline on health problems. Pupils need to know how aircraft influences health problems. A unit outline follows:
References and Materials

Films
1. "Controlling Germs"
2. "Consumption of Food"

Tennessee Film Library, Knoxville, Tennessee.

Children's Activities
1. Read materials how the various types of aircraft used in controlling disease, spraying, ambulance service, and missions of mercy.

2. Contact county health authorities for information regarding the local problems of controlling health.

3. Use pictures and maps to show where the people need help in time of need. How does airplane help with this problem?

Evaluation
1. Was there marked improvement on knowledge of how aviation has helped to:
   a. control disease
   b. control weeds
   c. protection of crops
   d. search and rescue
   e. emergencies
   f. disasters

2. Were these health agencies contacted and were they cooperative? Did this activity show any results?

3. Did these pictures and map study give the pupils an idea how important a role the airplane played in a time of need?
Children's Activities

4. Study the sanitation problem as to how the airplane has aided it.
   a. Controlling insects

5. Contact local concern that is in the crop dusting and spraying business for information.

Evaluation

4. Did students realize that insects could carry germs long distance and that the airplane is a very necessary way of destroying these insects by spraying?

5. Did students make a survey relative to insect breeding places and suggest aircraft as a possible solution?

Unit outline on the use of aircraft in emergencies.

Pupils need to understand how the airplanes aid in emergencies.

A unit outline follows:

Children's Activities

1. Go to library for material referring to:
   a. Isolation in floods
   b. Evacuation of ill or injured
   c. Cyclones
   d. Delivery of food to injured
   e. Delivery of critical medical supplies

Evaluation

1. Did students realize that our way of life in society would be in jeopardy if it were not for the emergency role of aircraft?
Children's Activities

f. Search for missing or lost

g. Delivery of perishable goods

2. Discuss these problems of emergencies also in how the Civil Air Patrol has aided us, (citing forest fires, coast patrol).

Evaluation

2. Were the students able to cite local situations where emergencies had been taken care of by aircraft?

Unit outline on safety. Pupils need to understand the safety measure taken in flight. A unit outline follows:

References and Materials

A. Books


Children's Activities

1. Why should the pilot and stewardess have a need for first aid knowledge?

2. Secure a first aid handbook from library or the school nurse. Determine which learning would be necessary to know.

Evaluation

1. Did students recognize first aid as a safety measure?

2. Did students seem familiar with contents of first aid handbook and did they carry out the practices?
Children's Activities

3. Contact a stewardess to lead a discussion in the classroom on the comforts that she might give the passengers, both in normal and emergency flights.

4. Ask a student to prepare a report on the safety measures that the passenger can observe for the comfort of himself as well as others.
   a. no smoking
   b. safety belts
   c. no alcoholic beverages

5. Discuss radar, radio knowledge of flying as to flight safety. Did the students consider the extensive knowledge and training of the flight personnel a safety factor?

Evaluation

3-4. Was there any pronounced fear expressed for personal safety in flight?

Unit outline on first aid. Pupils need to understand the necessity of first aid. A unit outline follows:

References and Materials

A. Free Materials
   1. American National Red Cross, Atlanta 3, Georgia
   2. John Hancock Mutual Life Insurance Company, Boston, Massachusetts
3. Superintendent of Documents,
United States Government Printing Office,
Washington 25, D. C.

B. Books

C. Films
1. "Artificial Respiration"
2. "Accident Behavior"
3. "Care of Minor Wounds"
4. "Control of Bleeding"
5. "Wounds and Fractures"
6. "First Aid on the Spot"

Tennessee Film Library, Knoxville, Tennessee

**Children's Activities**
1. List situations relative to flight which might require first aid such as treatment of:
   a. nosebleed
   b. nausea or airsickness
   c. fear or panic
   d. loss of sense of

**Evaluation**
1. Did these discussions lead to any desire to organize a first aid class?
Children's Activities

balance

f. Ear or eye discomfort

2. What are some treatments and measures to take in case of aircraft emergencies:
   a. bandages and dressings
   b. stoppage of bleeding
   c. crowd control
   d. temporary splints
   e. treatment of shock
   f. panic

3. Invite local representatives of the Civil Air Patrol, Red Cross Chapter, Emergency Squads and any others to tell how the airplane aids in the work of their organizations.

4. Invite local Fire Department representatives to demonstrate techniques in emergency activities.

5. Using part of the class as victims, let the rest of the class administer first aid to the wounded.

Evaluation

2. Were there comments from students on actual treatment that they had performed in an emergency?

3-4. Analyze the results of visits from representatives. Were the students more impressed with the work that these people were doing for our community?
Children's Activities

Include lifts, carries, and other first aid measures.

Evaluation

It was the purpose of this study to devise a Curriculum Guide to assist the Elementary teachers in integrating Aerospace Education with the curriculum of grades four, five, and six.

To gain a better understanding of the problem, the writer secured Elementary Curriculum Guides from states as Florida, Ohio, Missouri, Minnesota, Kentucky, Texas, and Colorado, gaining information as to the necessary areas to include in each grade level. Basic and parallel texts from the Indianapolis Community Schools were used as a guide for analysis of material in the writer's Integrated Aerospace Education Curriculum Guide.

To enable the writer to devise this Curriculum Guide, an Integrated Aviation Education Curriculum Guide on Aerospace Education for the Public Schools, prepared by the Curriculum Committee of Miami University, Oxford, Ohio, and a Curriculum Guide for Aviation Education from the University of Tennessee were used to give information pertinent to the problem.

Having summarized the General Education Guides in Curriculum planning the writer found that the guides all include similar organization such as:
CHAPTER IV

SUMMARY

It was the purpose of this study to devise a Curriculum Guide to assist the Elementary teachers in integrating Aerospace Education with the curriculum of grades four, five, and six.

To gain a better understanding of the problem, the writer secured Elementary Curriculum Guides from states as Florida, Ohio, Missouri, Minnesota, Kentucky, Texas, and Colorado, gaining information as to the necessary areas to include in each grade level. Basic and parallel texts from the Indianola Community Schools were used as a guide for analysis of material in the writer's integrated Aerospace Education Curriculum Guide.

To enable the writer to devise this Curriculum Guide, an integrated Aviation Education Curriculum Guide on Aerospace Education for the Public Schools, prepared by the Curriculum Committee of Miami University, Oxford, Ohio, and a Curriculum Guide for Aviation Education from the University of Tennessee were used to give information pertinent to the problem.

Having summarized the General Education Guides in Curriculum planning the writer found that the guides all include similar organization such as:
1. Introduction
2. Problems
3. References and materials
4. Developmental activities
5. Culminating activities
6. Evaluation

The contents of the writer's Aviation Education Guide combine General Education with Aerospace Education. The form used covered the same areas that were in the General Guides.
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