

2000

## Literature-based language arts extended to the science area : flight and space

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### Recommended Citation

Ryan, Thomas F., "Literature-based language arts extended to the science area : flight and space" (2000). *Graduate Research Papers*. 1422.

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## Literature-based language arts extended to the science area : flight and space

### Abstract

This instructional project is an integration of the language arts and science areas. A fertile learning environment was established with a literature base that included different genres and related expressive activities. This extensive literature base provided an in-depth study of flight and space, a unit that is part of the third-fourth grade science curriculum.

The goal of this project was to present quality literature, representative of many genres, to integrate study across the curriculum. As the learners progressed through the activities that were student-initiated as well as teacher-directed, they displayed an increased appreciation of literature as well as a working knowledge of aviation.

**Literature-Based Language Arts Extended to the  
Science Area: Flight and Space**

**A Graduate Project**

**Submitted to the  
Department of Curriculum and Instruction**

**In Partial Fulfillment  
of the Requirements for the Degree**

**Master of Arts in Education**

**UNIVERSITY OF NORTHERN IOWA**

**by**

**Thomas F. Ryan**

**November 2000**

This Graduate Project by: Thomas F. Ryan

Entitled: Literature-Based Language Arts Extended to the

Science Area: Flight and Space

has been approved as meeting the research article requirement for the  
Degree of Master of Arts in Education.

11/15/2000  
Date Approved

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## Abstract

This instructional project is an integration of the language arts and science areas. A fertile learning environment was established with a literature base that included different genres and related expressive activities. This extensive literature base provided an in-depth study of flight and space, a unit that is part of the third-fourth grade science curriculum.

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Instruction in the elementary schools has changed little over the past few decades. Each subject is frequently isolated in its presentation to the students. Textbooks are often the source of information. Their content appears to be in a logical progression; each bit of information is supposed to be a building block, providing the foundation for the layers of instruction that are to follow. The elements of language instruction tend to be kept in their own domain as well. Almost all teachers' manuals and students' materials are prepared by publishing companies and presented in packages that enable teachers to set their credentials aside and put their rooms on auto-pilot (Silva & Delgado-Larocco, 1993).

To individuals that have received their formal education in this assembly-line manner, the entire instructional program makes perfect sense, until they stop to consider how illogical it is from the perspective of the learners. Up until the time they enter school, children have learned language because it is part of the world around them, and they see other people using it to create meaning. Language learning is easy when it is whole, real, and relevant and makes sense as it is encountered within its functions (Goodman, 1986). When children enter school, learning is often taken out of context, and much decision-making is taken out of the students' and teachers' hands; therefore, it becomes irrelevant and is difficult (Smith, 1994).

## Value of Literature-Based Language Arts

Literature-based language arts emphasizes creating meaning while engaged in the process of language, not learning fragments in meaningless sequences. Literature-based language arts extended across the curriculum allows children to experience the functions of language, thus extending their thinking-language abilities and their knowledge of the content areas (Huck, 1996; Routman, 1991; Langer, 1995).

An important component of a literature-based program is the provision of the different genres and related experience activity. It includes not only trade books but also newspapers, magazines, menus, travel pamphlets, and other written materials from the real world (Palardy, 1997). Such a print-rich environment can provide in-depth learning (Bosma & Guth, 1995).

Exposure to fine literature challenges students to use higher-order thinking abilities. As a result, this level of literature offers children reasons to return to the works -- to ponder, to savor, to question, and to share with others. Quality literature serves as models of language and provides content that can be used in speaking, writing, and other expressive meaning (Harms & Lettow, 1998).

It is time for teachers to take charge of their classrooms, and mold the curriculum around the needs of the individual students. No longer should the pace of instruction be dictated by scope and sequence charts or basal

readers. Classroom teachers who have flexibility in making decisions regarding the needs of their students are the most valid source for determining future instruction (Fuhler, 1990; Smith, 1983).

### Literature-Based Language Arts Extended to the Science Area

The study of science centers on inquiry and discovery and focuses on the use of the scientific method for problem solving. Implementing children's literature into the science curriculum creates a natural partnership that is manageable for the teacher and makes sense to the learner (Bosma & Guth, 1995). With quality children's science trade books, specific questions can be answered and enhanced through interaction with the literature (Routman, 2000). Bringing in the different genres of literature can add dimensions to the study (Langer, 1995).

### Implementation of Literature-Based Language Arts in the Science Area: Flight and Space

This study of flight and space for third and fourth graders employed several genres of quality literature to connect the language arts to this science unit. The literature - - works, videos, and CD-ROMS - - were found through a search of the school, public, and A.E.A. libraries. Much information was found through the internet. The science concepts were developed through teacher-directed activities and student-initiated experiences offered in learning centers.



### Teacher-Directed Activities

The unit was begun by showing a Bill Nye video titled "FLIGHT" as an overview of the unit to the students. After discussing the video, I read the poetry volume UP IN THE AIR, by Myra Cohn Livingston (New York: Holiday House, 1989) aloud to the class. This book is a cycle of triplet poems that take the reader from take off to landing. The images presented in this book recreate the sensations experienced in an actual airplane flight.

The poems in UP IN THE AIR have many metaphors and similes that connect readers' prior knowledge with the images portrayed in the poems. Examples of the figurative language are given below:

Far off, the peaks of a mountain range

Hold giant faces, purple and strange.

and

Lakes finger out like a giant hand.

Stepping-stones leapfrog across the land.

(unpaged)

This read aloud experience generated interest among the students carrying them into the rest of the unit.

Another read aloud experience was focused on the lyrical volume Catching The Wind, by Joanne Ryder (New York: Morrow, 1989). After the teacher read the piece aloud to the students, the class was asked to write about what

it would be like to fly. These questions were presented to support discussion and eventual composition:

1. What would you see while you were flying?
2. How would you feel while flying?
3. What sounds would you hear?
4. If you could fly, where would you go?

As Amelia's Fantastic Flight (New York: Holt, 1992) was read aloud, her travel was traced on a map. Then, the students wrote about a flight they might take and their experiences in each country they visited. The students' stories were compiled into a class book.

### Student-Initiated Activities

These literature-based activities were available for students in learning centers. These centers' functions were to extend the content of the flight and space study. They provided options for the children to take part in the processes and functions of language. Sustaining centers as well as centers specific to the unit were available.

### Sustaining Centers

Sustaining centers were maintained throughout the school year with their contents coinciding with the unit being studied. These centers helped maintain the security and predictability of the learning environment. These centers were included: listening/reading, author/illustrator, and bookmaking.

- Listening/Reading Center

This center provided many books with accompanying teacher-made cassette tapes. (see the appendix)

- Author/Illustrator Center

The author who was featured in this unit was Myra Cohn Livingston. Her poems range from the fanciful to those that bring forth images of realism. Several of her poems deal with various aspects of flight and are reflected in their titles as in "BIRD WATCHING" and "SEAT BELTS OVER KANSAS" from the book Flights of Fancy. These poems demonstrate the poet's ability to write with feeling and imagination. Examples of her work from Space Songs (New York: Scholastic, 1988), Flights of Fancy (New York: Macmillan, 1994), and Sky Songs (New York: Holiday House, 1984) as well as a brief biography were also available in this center.

- Bookmaking Center

This center contained the directions and materials needed for the students to construct books. The children wrote mini-reports about aircraft and aviators in the books they had constructed.

Children's Response: This center was in constant use. Children worked as individuals and in pairs writing and illustrating their reports.

### Centers Specific to the Unit

These centers were developed specifically for this unit on space and aviation. The centers that dealt solely with the principles of flight will not be presented in this paper, but they were designed to conform to the science standards “Understands motion and principles that explain it” and “Understands the nature of scientific inquiry.” The centers that related specifically to language arts conformed to the standard “Demonstrates competence in the stylistic and theoretical aspects of writing.” These standards for grades three and four were presented in Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education (Kendall & Marzano, 1997).

- Amelia Earhart Center

Language Arts Standards: Grades Three and Four – Exposed to the genre of biography, writes biographical sketches (e.g., illustrates the subject’s character using narrative and descriptive strategies, such as relevant dialogue, specific action, physical description, background description, and comparison or contrast to other people; reveals the significance of the subject to the writer; presents details in a logical manner).

**Science Standard: Grades Three and Four – Knows that people of all ages, backgrounds, and groups have made contributions to science and technology throughout history.**

**Literature Experience:**

Read or listen to the book Amelia Earhart, Adventure in the Sky (Troll, 1983), by Francene Sabin.

**Expressive Activity:**

1. List important ideas about her life to add to a list developed by the class.
2. Contribute to a class mural showing aspects of Amelia Earhart's life.

**Children's Response:** The children visited several Amelia Earhart sites to gather information for their mural drawings. This center was the most popular of all the centers.

- **Out in Space With Poetry Center**

**Language Arts Standard: Grades Three and Four – Understands the elements and some forms of poetry.**

**Science Standard: Grades Three and Four – Understands essential ideas about the composition and structure of the universe and the Earth's place in it.**

### 1. Literature Experience:

With a partner read aloud the poems "METEORITES" and "COMETS," by Myra Cohn Livingston, from Space Songs (New York: Scholastic, 1988). Have your partner guess the object your poem describes.

### Expressive Activity:

Write a poem about a space element on a piece of paper. On the other side, name and illustrate it. Add your poem to the class book. You can transpose your poems into the shape of the images, thus creating concrete poems.

Children's Response: Instead of writing about natural objects, most of the children chose to do concrete poems about man-made satellites after doing some research about their various forms and functions.

### 2. Literature Experience:

With a partner read aloud the poems "Clouds" and "Storm," by Myra Cohn Livingston, from Sky Songs (New York: Holiday House, 1984). Discuss the words that make this poem come to life for you.

### Expressive Activity:

Write a cinquain about a sky object on a piece of paper. You can illustrate your poem and add it to the class book.

Children's Response: The children were eager to try this type of poetry and proudly showed the class book to visitors.

### 3. Literature Experience:

Read the poems "Face In The Clouds" and "Seat Belts Over Kansas," by Myra Cohn Livingston, from Flights of Fancy (New York: McElderry, 1994).

#### Expressive Activity:

Write a concrete poem about how an object on the earth would appear if you were viewing it from above.

Children's Response: This was a challenge for many students, and it led to a discussion of how things would appear from the air.

### 4. Literature Experience:

Read/listen to the poem "Satellites", by Myra Cohn Livingston, from Space Songs (New York: Scholastic, 1991).

#### Expressive Activity:

With the materials provided at the center, create a satellite and write the directions for making it. Think of a name for it and tell about its function(s).

Children's Response: The children enjoyed putting their satellites together and had fun naming them.

- Paper Airplane Center

Science Standard: Grades Three and Four – Understands motion and the principles to explain it.

Language Arts Standard: Grades Three and Four – Writes stories or essays that convey an intended purpose (e.g., to record ideas, to describe, to explain).

### 1. Integrated Science and Language Arts Goal Standards:

Read about various types of airplanes and the benefits they bring us.

Researches and writes short reports about various airplanes of the past and present.

Literature Experience: Read *Super Paper Airplanes* by Norman Schmidt.

Scan Super Paper Airplanes (New York: Sterling/Tamos, 1995), by

Norman Schmidt, to find a paper airplane that is of interest to you and read the directions for building it.

Expressive Activity: Make a paper airplane and use the historical information provided in the book to write a short report on your model.

With the materials provided at the center, make a paper airplane and use the historical information provided in the book to write a short report on your model.

Children's Response: The children took their paper airplanes out during recess and enjoyed seeing how well the various types flew. The students shared the historical facts about the airplanes with their classmates.

### 2. Integrated Science and Language Arts Standards: Grades Three and Four – Read about the basic fundamentals of flight and applies them to make a paper airplane fly. Writes a concrete poem in the shape of the airplane they have build.



1. Literature Experience:

Scan Championship Paper Planes (Reisterstown, MD: Flying Frog, 1999), by Paul Jackson.

Expressive Activity:

With the materials provided at the center, make a paper airplane with the flight characteristics that most interest you. Then, write a concrete poem in the shape of the paper airplane that you built.

Children's Response: The children added their concrete poems to the bulletin board for display.

2. Literature Experience:

Look through The Ultimate Paper Plane Book (Reisterstown, MD: Flying Frog, 2000), by Paul Jackson, and build the airplane of your choice.

Expressive Activity:

With the materials provided at the center, make a paper airplane. Then write an acrostic poem that describes it.

Children's Response: The children were enthused about acrostic poems. I observed them writing acrostic poems about other topics during writing time.

- Space Trivia Center

Science Standard: Grades Three and Four – Understands essential ideas about the composition and structure of the universe and the Earth's place in it.

Language Arts Standard: Grades Three and Four – Writes in response to literature (e.g., advances judgments, supports judgments with references to the text, other works, nonprint media, and personal knowledge).

Literature Experience:

Listen to/read information from the book Investigations Space (New York: Lorenz, 1999), by Ian Graham.

Expressive Activity:

Write interesting trivia on 3”X5” cards from the book and choose your favorite items to add to the class trivia book.

Children’s Response: The children enjoyed quizzing each other on information from this book.

## Conclusion

Integrating the language arts with the science area provided my students with a rich learning environment that allowed them to take ownership of their learning. The quality literature enhanced both curricular areas and enabled the students to combine them to make meaning.

While teaching this unit, I observed frequent student interaction and was pleased with the enthusiasm displayed. Because of the success of this unit, I look forward to developing other literature-based science units in the third-fourth grade curriculum.

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## Appendix

## Listening/Reading Center

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