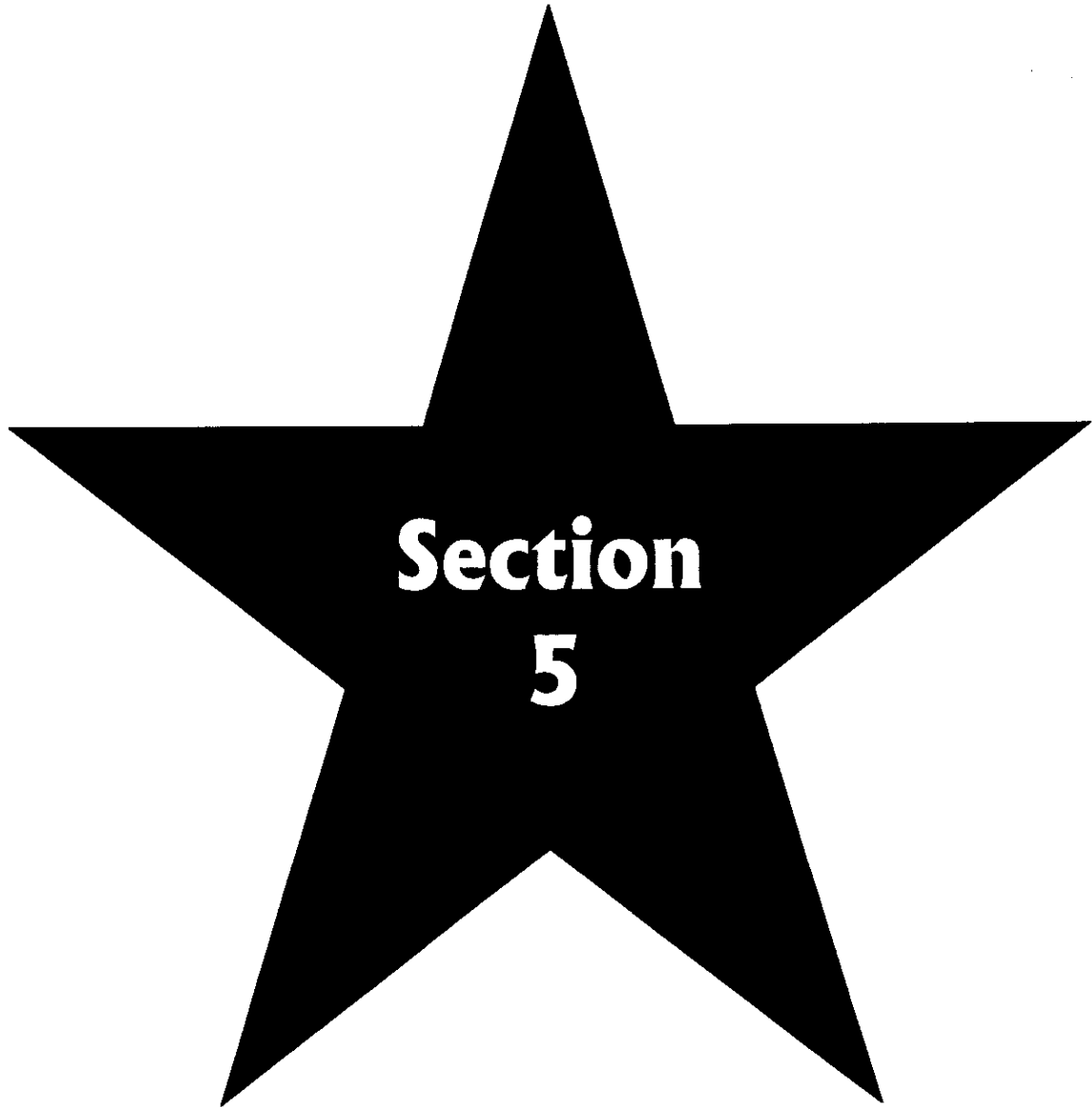


Extending the Challenge



Resources

NASA Core Catalog - <http://core.nasa.gov> or 1-866-776-CORE

-Distributor of audiovisual materials for the National Aeronautics and Space Administration

Civil Air Patrol – www.capnhq.gov

-Resources for educators, grants, awards, links and more

-Become an education member and receive free or low-cost teaching materials

Contact: Great Lakes Liaison Region Alice.Noble@wpafb.af.mil

Det 3 CAP-USAF GLLR Phone: 937-257-6836

5440 Skeel Avenue Fax: 937-257-8260

Wright-Patterson AFB, Ohio 45433

Eisenhower National Clearinghouse – <http://www.enc.org/focus>

-For teachers interested in doing more to integrate web technology into your classroom, but don't have time to sort through the number of sites most search engines kick up; ENC's online feature [Classroom Calendar](#) is a great resource. Classroom Calendar's user-friendly format allows you to search month-by-month and quickly peruse numerous date-appropriate topics that include biographies, inventions, mathematics, and science.

K to 8 Aeronautics Internet Textbook – <http://wings.ucdavis.edu/>

-This web site, developed for grades K to 8, presents a multimedia course in aeronautics that features an online textbook of aeronautics principles, lesson plans and activities, and information about careers in aeronautics. Each lesson plan includes an overview, a series of related activities, vocabulary words, time and materials requirements, and assessment rubrics. In sample activities, students design, build, and fly their own kites; recreate the inside of a commercial airplane by rearranging the chairs in the classroom and take on the roles of the different airline crew and ground crew members. This site and related links provide a ton of great information for educators!

-For specific information on the principles of flight (thrust, drag, lift, weight) and how they affect gliders and powered flyers, go to:

<http://wings.ucdavis.edu/Book/beginner.html/> You may also select beginning, Intermediate, and Advanced for K-8 activities and curriculum “Bridges” for math, language arts, social studies, performing arts, and literature links.

Flying Ace Activities – <http://www.faa.gov/education/documents/curriculum>

-Aviation education for grades 4-6; the purpose of this guide is to assist teachers who have little or no aviation education to present interesting and informative lessons.

Plane Math – <http://www.planemath.com/>

-A fun interactive site to learn cool things about math and aeronautics.

Science Fun With Airplanes – <http://www.ag.ohio-state.edu/~flight/>

-An excellent interactive site for students to learn about the principles of flight and why planes fly the way they do. The “Science of Flight 4-H Project Book” that provides 20 hands-on experiments to help young people learn about this fascinating subject is also available through the website for \$1.00 + \$3.50 S&H.

STARDUST – <http://stardust.jpl.nasa.gov>

-A very informative site about the NASA’s STARDUST Mission that left the earth in 1999 and is due to rendezvous with comet Wild 2 in January 2004. NASA updates the site each week with STARDUST news and updates.

Thursday’s Classroom – <http://www.thursdaysclassroom.com/>

-The aim of Thursday’s Classroom is to provide a connection between NASA and the classroom. The weekly lessons and activities are prepared by professional educators and scientists. One of our favorite sites!

Other wonderful sites for teachers, parents and students to explore that are great resources for information regarding space related topics:

<http://www.space.com>

<http://science.nasa.gov>

<http://spacelink.nasa.gov>

<http://teachspacescience.stsci.edu/>

Books

Connecting Science, Fiction, and Real Life – Works of fiction draw adolescent readers to further adventures in science. When you're planning a unit on space, it's easy to check out every nonfiction book about the subject on the library shelves. It's not so easy to identify novels that feature a space-related theme in the context of real or imagined lives. The following novels can be used to introduce or expand a science unit and allows students to experience science from a completely different perspective.

In *The Green Book* by Jill Paton Walsh, a young girl and her family are among the last people to evacuate Earth to colonize another planet. Because the book involves interplanetary travel, it can be used in conjunction with a unit on astronomy. After studying the planets, students could write their own stories about planets they would travel to and why.

Some other titles on the topic of interplanetary travel are:

A Wrinkle in Time by Madeleine L'Engle

My Teacher is an Alien by Bruce Coville

The Hitchhiker's Guide to the Galaxy by Douglas Adams.

Other suggestions:

Maps and Globes, by Jack Knowlton, Harriett Barton. Maps and globes can take you anywhere – to the top of the tallest mountain on earth or the bottom of the deepest ocean. Maps tell you about the world: where various countries are located, where the jungles and deserts are, even how to find your way around your own hometown.

The Magic School Bus Taking Flight: A Book About Flight. Created by Joanna Cole and Bruce Degen.

Taking Flight – The Story of the Wright Brothers, by Stephen Krensky.

The Third Planet: Exploring the Earth from Space, by Tam O'Shaughnessy and Sally K. Ride. This book looks at Earth from an outsider's point of view: astronaut Sally Ride.

Classroom Activities

The following are a few ideas of fun activities you may wish to consider for the classroom as a way in which to extend the curriculum contained within this guide. Additional ideas will be added periodically to the Challenger Learning Center's -Teacher's Resource Center (TRC).

National Kite Month – guide your class in celebrating this fun event during the month of April. Information on National Kite Month can be found at:

<http://www.albanyhill.net/NationalKiteMonth/> - the site contains information on utilizing kites as educational tools and is a great extension activity to the four forces of flight.

Consider an entire grade level or whole school event that includes kite making classes, classroom guest lectures, sport kite competition, kite art displays, Cub Scout programs, kite demonstrations (contacts through the website), a string untangling contest, poetry or short story writing about what you would see if you were a kite flying high above the ground.

<http://www.molokai.com/kites/20kidskites.html> - For over 15 years the Big Wind Kite Factory has been giving kite-making classes for the children on the island of Moloka'i in Hawaii. The site provides the complete time tested instructions to get 20 kids making their own kites and flying them in 20 minutes.

Fly Day Friday – Utilizing the many ideas presented in the Extending the Challenge section of this guide and your own terrific ideas, consider incorporating a flight related activity into your lesson plan each Friday during the school year. We guarantee the children will eagerly look forward to Fridays to see what fun new activity you have planned for them!

“2101...Life in Space” Art Contest – Imagine that in 100 years, mankind is living in space. Students could be challenged to show examples of what they think “Life in Space” would be – what would your school or home look like, would cars or food be different, what would vacations be like, what kind of pets would you have? Challenge students to use their imagination. Consider introducing the activity by showing students examples of space art (there are many resource books at the library and running an internet search with the key words “space art” brings up many examples) or show a space related movie that depicts futuristic life in space.

Thematic Units

FIRST FLIGHT CENTENNIAL (1903-2003) – when you see a jet streaming through the sky, or marvel at the Space Shuttle’s ability to fly, it’s hard to believe that it all started with the Wright flyer just 100 years ago.

On a cold windswept beach near Kitty Hawk, North Carolina, on December 17, 1903, two brothers changed the world. Wilbur and Orville Wright made the first controlled, powered flight on that day ushering in a century of flight that has transformed our world and proved that the airplane has become indispensable worldwide.

The centennial of powered flight presents a unique opportunity to focus on the historical significance of the aviation-related events leading up to, and following, December 17, 1903. More importantly, the 100th anniversary of flight will inspire a new generation of inventors, innovators, and dreamers. Consider utilizing the numerous resources designed for educators to incorporate the Centennial Celebration into your classroom.

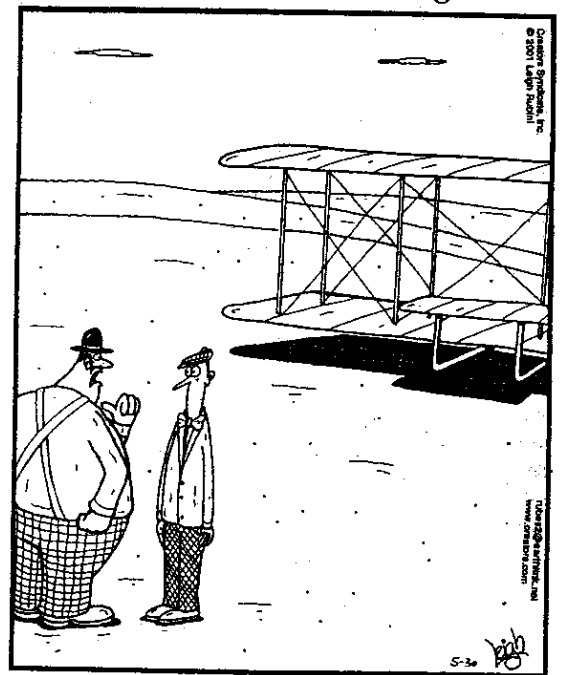
In honor of the 100th anniversary of flight, the U.S. Congress established the U.S. Centennial of Flight Commission. The Commission will encourage, enable, and amplify the efforts of all the organizations and individuals planning to celebrate the achievements of the Wright brothers and a century of powered flight. The Commission is encouraging and promoting national and international participation in the commemoration of the centennial by the public; educators and students; Federal, state, and local government; members of civic organizations; and members of the aviation and aerospace industry. Visit the U.S. Centennial of Flight Commission’s Web site at www.centennialofflight.gov - the site has been designed to be used by educators and their students, as well as others planning to participate in the celebration.

Other terrific sights designed for the Centennial Celebration:

- <http://www.firstflightncc.com/>
- <http://www.firstflightcentennial.org>
- <http://www.aerospace.nasa.gov/centuryofflight/>
- <http://www.fi.edu/flights/first/>
- http://www.countdowntokittyhawk.org/first_flight.html
- www.first-to-fly.com

Rubes

Leigh Rubin



"It's not fair, Orville. How come I never get to be the pilot?!"

Thematic Units

Aviation! Our Planes Will Deliver

A Webquest

(Created by Sandy Colquhoun)

INTRODUCTION

The time is pre-1940 and there is a great need for a delivery system for small packages from coast to coast and all points in between. You are going to form a company that will provide the fastest form of small package delivery to the nation. In the recent past, there have been several important people who have been using a new method of transportation, the airplane. Among the people who have begun to use this form of transportation are the Wright Brothers, Charles Lindbergh, and Amelia Earhart. Your company has determined that using this new method of transportation might provide the fastest method of package delivery. The problem is that each of these famous aviators used a different type of airplane. You will be deciding which plane the company should buy to make the delivery system profitable.

THE TASK

You will perform the following tasks in determining which form of air transportation will best suit your company for small package delivery to the nation.



Write a short biography on one of the following people: the Wright Brothers, Charles Lindbergh, or Amelia Earhart.



Define parts of the airplane and describe how the airplane flies.



Make a chart showing the speed and endurance of the plane used by the Wright Brothers', Charles Lindbergh, or Amelia Earhart.



Create a flight plan from Los Angeles to Indianapolis and a flight plan from Los Angeles to New York.



Using the chart and other gathered information, determine which plane should be purchased for your delivery company.

RESOURCES

Atlas
Encarta Electronic Encyclopedia
Grolier's Electronic Encyclopedia
World Almanac
World Book Encyclopedia
Various Books in Media Center on Aviation and/or Flight

The following Internet sites via <http://www.plainfield.k12.in.us/hschool/webq/webq85/>

Wright Brothers:

[Biography](#)
[Pictures of plane](#)
[Military Flyer](#)
[Wright Brothers at the Smithsonian](#)

Charles Lindbergh:

[Biography](#)
[Picture of plane](#)
[Information on plane](#)

Amelia Earhart:

[Biography](#)
[Airplane](#)
[Aviation history](#)

Airplanes:

[How they work](#)
[How planes fly](#)
[Flight plans](#)

More info on:

[Charles Lindbergh and Amelia Earhart](#)
[Electra 10e and other information on Amelia Earhart](#)

THE PROCESS

1. You will be assigned to one of three groups: The Wright Brothers, Charles Lindbergh or Amelia Earhart. The information you gather will be based on the aviator your group is named for. The Wright Brothers group will locate information only on the Wright Brothers, the Lindbergh group will locate information only on Charles Lindbergh and the Amelia Earhart group will locate information on Earhart.
2. Using the sources listed, write a short biography on the aviator you are assigned to. This biography should contain information such as where and when they were born and when they died. List the education and any jobs they might have held. Information should also be given about what they did in the aviation field to become famous. This biography should be about a page in length.
3. Draw a picture of a simple airplane (remember this is pre-1940) and label the parts of the plane. Under this picture describe what each part of the plane does. Write another paragraph on how an airplane flies using terms such as force, lift, thrust and drag. A good source for information on this project is the Internet site [Off to a Flying Start](#).
4. Investigate the airplane most closely associated with the person you are assigned to. You need to locate information about the speed of the airplane and how far it can travel at one

time. The class will create a chart showing each plane and how fast it can travel and the maximum distance it can fly.

5. Using an atlas, determine flight paths from Los Angeles to Indianapolis and from Los Angeles to New York based on the airplane associated with your aviator. List states, cities, mountain ranges, major rivers and other major geographical areas you will be flying over. Remember you will need to fly into and out of major airports, if possible, because you will need to refuel. Using a map of the United States, draw your flight path on the map indicating your refueling stops. Determine how many miles you fly on each segment of your trip and the total miles for your trip.
6. The class will come together for discussion and sharing information. Since you are creating a company for small package delivery, the company needs a name. The class will brainstorm and vote on a name for the company. Each group will share the biographical information they gathered about their aviator. Using the class-created chart, information gathered about the flight paths to Indianapolis and to New York, and other information gathered during the project, determine which plane would be the best to use for your new company. List the reasons for choosing that particular plane.

EVALUATION

Since this is a group project, each group can be graded rather than individual grades. The group can be evaluated on the completion of each task. Each task can be worth a percentage of the whole grade; the following is a sample grading scale that can be used:

Biography	25%
Parts of the plane picture	30%
Chart of speed & endurance	10%
Flight paths	35%

CONCLUSION

You have started a company, which will solve the problem of delivering small packages from coast to coast. In doing the research for this company, you have learned about airplanes and how they work. You have learned about the pioneers in aviation and what they have done to help this new form of transportation to succeed. You have learned about the geography of the United States. You have also learned to work in groups to compile information and work as a large group to determine the best form of transportation for your new company.