

Fabulous Flight

Subject: Science

Intended Grade Level(s): Grade 6



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Description:

Students apply their knowledge of aerodynamics to design, build and test a variety of flying devices. In constructing models, students develop a basic design, build it, test it, and solve the problems that inevitably arise. Through teamwork they learn that planning, communication, cooperation and flexibility are important to the overall result, even though parts of the task can be worked on individually. In the process, students learn about the parts of an aircraft, their role in controlled flight, famous aviators who contributed to the evolution of flight and a basic knowledge of flight's history. Students will also use and expand their knowledge of technology to explore, create, illustrate, describe, explain, research, design, and manipulate information gathered throughout this flight unit.

Faith Integration:

The students will be encouraged to recognize the hand of the Creator in flight, both natural and the technological applications of God's natural laws of flight. Students will choose a famous aviator and consider/journal what it would have been like if they had been that person as a Seventh-day Adventist Christian. Students will also make comparisons to the four major forces of flight and the spiritual forces that work in their daily life.

Curriculum Benchmarks:

The student will be able to:

P2 2.2 display data electronically through graphs and charts

2.2 vary font style and size, and placement of text and graphics, in order to create a certain visual effect

P5 2.3 navigate the Internet with appropriate software

Materials/Hardware/Software: List all materials, hardware needed, software (including publishers information)

- Materials needed for constructing a basic parachute: Corks, medium weight plastic bags, scissors, tape, thread, small paper clips, metre sticks and timers.
- Coloured/plain paper for constructing paper airplanes
- Large sheets of cardboard, markers, scissors, paint - for designing a model aircraft.
- Computers with Internet access and Microsoft Office.
- <http://rubistar.4teachers.org>
- Flight - Edmonton Public Schools, 1996.
- Classroom and School Library.
- Art and craft supplies for Flight History Timeline Bulletin Board.
- Journals - for online discovery

Teacher Preparation:

- Create a comprehensive website on flight - Fabulous Flight <http://www.kn.att.com/wired/fil/pages/listflightlg.html>
- Design rubrics for poster and timeline
- Gather listed materials for activities

Student Preparation:

- Students will need to have a general understanding of air and aerodynamics. (This is a previous unit of study in grade six)
- Students will require a basic knowledge of how to find a website and use search engines to find appropriate and relevant information on the Internet.
- Students will require a basic knowledge of Microsoft Word and PowerPoint.

Activities/Procedures:

Students create a web to classify things that fly

1. Using PPT, create a web and download pictures from online clip art to illustrate
2. Create a graph in Microsoft Word to categorize your web into three columns using the following headings: Floaters, Gliders and Powered Flyers.

Students construct a basic parachute

Materials: Corks, medium weight plastic bags, scissors, tape, thread, small paper clips, metre sticks and timers.

Procedure:

1. Cut plastic - 30cm X 30cm square
2. Cut four 30cm lengths of thread
3. Tie one piece of thread to each corner of plastic square
4. Create a basket by taping two paper clips opposite each other on the cork
5. Gather all four strings and thread through both paper clips and tie with a reef knot
6. Students grasp top center of plastic to lift parachute - stand on a chair to drop your parachute
7. With a partner, measure height and time of decent
8. Using Microsoft Word, describe your procedure, record your findings, and discuss what variables you could change to make your parachute more efficient. Print and submit.

Students Explore Parts and Functions of a Plane

1. Go to Fabulous Flight website created by your teacher and click on the link [Airplane Parts and Functions](#) - Explore and manipulate the parts and functions of an airplane.

<http://www.kn.att.com/wired/fil/pages/listflightlg.html>

2. After exploring [Airplane Parts and Functions](#) click on the following link to find a worksheet for you to print off and complete.

http://www.grc.nasa.gov/WWW/K-12/BGA/Dan/airplane_parts_wks.htm

Design and Label an Airplane

In groups of three or four students, design and label a three-dimensional model of an aircraft.

Create a paper airplane

1. Students will create a minimum of six paper airplanes using the designs from the Fabulous Flight website. **Required:** Build the Best Paper Airplane in the World

<http://www.kn.att.com/wired/fil/pages/listflightlg.html>

2. With a partner, test your paper airplanes and manipulate parts to perfect flight.
3. Test each airplane at least five times, making adjustments as necessary.
4. Create a chart to display success of various designs and flight tests.

Students will create an illustrated children's book to portray how the four forces of flight can be compared to the spiritual forces at work in their daily lives.

1. Minimum of 8 pages - two pages for each force (one for flight application and one for spiritual application)
2. Illustrations should be detailed and colourful
3. Spiritual applications should include a Bible text as a reference.
4. Students may work independently or with a partner
5. Format should be approved by your teacher

Spiritual Flight - Examples

- The force of lift: hope in God that gives life and lifts you up.
- The force of thrust: faith and obedience that moves you on ahead.
- The force of weight: sin and a negative outlook that pulls you down.

- The force of drag: discouragement and doubt that holds you back and slows you down.

Research a Famous Aviator and Create a Poster Illustrating Significant Contributions to the History of Flight

Choose a famous aviator from the list below and go to the Fabulous Flight Website to find the corresponding link. You may choose a different famous aviator but require approval from your teacher.

<http://www.kn.att.com/wired/fil/pages/listflightlg.html>

- Amelia Earhart - The most celebrated of all women aviators
- Charles Lindbergh - While growing up on a farm near the small midwestern town of Twin Falls, Minnesota, Charles Lindbergh was fascinated by speed.
- Chuck Yeager - Yeager had no real interest in learning to fly when he first joined the Air Forces. He simply wanted to be a mechanic.
- Learn About the Wright Brothers - Discover information and play games to learn more about the famous Wright Brothers.
- Louis Bleriot - Louis Bleriot's Record-setting Flight Across the English Channel

See Rubric below to guide you through the poster creating process.

Making A Poster : Famous Aviators

Teacher Name: **Mrs. Wilton**

Student Name: _____

| CATEGORY | 4 | 3 | 2 | 1 |
|--------------------------|--|---|---|--|
| Use of Class Time | Used time well during each class period. Focused on getting the project done. Never distracted others. | Used time well during each class period. Usually focused on getting the project done and never distracted others. | Used some of the time well during each class period. There was some focus on getting the project done but occasionally distracted others. | Did not use class time to focus on the project OR often distracted others. |

| | | | | |
|---------------------------|---|---|--|---|
| Labels | All items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away. | Almost all items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away. | Several items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away. | Labels are too small to view OR no important items were labeled. |
| Knowledge Gained | Student can accurately answer all questions related to facts in the poster and processes used to create the poster. | Student can accurately answer most questions related to facts in the poster and processes used to create the poster. | Student can accurately answer about 75% of questions related to facts in the poster and processes used to create the poster. | Student appears to have insufficient knowledge about the facts or processes used in the poster. |
| Content - Accuracy | At least 7 accurate facts are displayed on the poster. | 5-6 accurate facts are displayed on the poster. | 3-4 accurate facts are displayed on the poster. | Less than 3 accurate facts are displayed on the poster. |
| Attractiveness | The poster is exceptionally attractive in terms of design, layout, and neatness. | The poster is attractive in terms of design, layout and neatness. | The poster is acceptably attractive though it may be a bit messy. | The poster is distractingly messy or very poorly designed. It is not attractive. |
| Title | Title can be read from 6 ft. away and is quite creative. | Title can be read from 6 ft. away and describes content well. | Title can be read from 4 ft. away and describes the content well. | The title is too small and/or does not describe the content of the poster well. |
| Mechanics | Capitalization and punctuation are correct throughout the poster. | There is 1 error in capitalization or punctuation. | There are 2 errors in capitalization or punctuation. | There are more than 2 errors in capitalization or punctuation. |
| Grammar | There are no grammatical mistakes on the poster. | There is 1 grammatical mistake on the poster. | There are 2 grammatical mistakes on the poster. | There are more than 2 grammatical mistakes on the poster. |

Create a Timeline Bulletin Board of Flight History

1. In small, assigned groups, create a bulletin board display timeline of the history of flight. Gather information from classroom library books, school library books, Fabulous Flight website, and search the Internet using a search engine of your choice - example: Google.
2. Use the following Rubric as a guideline to create your bulletin board timeline.
3. Each group will be assigned a specific bulletin board.

Timeline : Flight History

Teacher Name: **Mrs. Wilton**

Student Name: _____

| CATEGORY | 4 | 3 | 2 | 1 |
|------------------------------------|--|---|--|--|
| Spelling and Capitalization | Spelling and capitalization were checked by another student and are correct throughout. | Spelling and capitalization were checked by another student and were mostly correct . | Spelling and capitalization were mostly correct, but were not checked by another student. | There were many spelling and capitalization errors. |
| Content/Facts | Facts were accurate for all events reported on the timeline. | Facts were accurate for almost all events reported on the timeline. | Facts were accurate for most (~75%) of the events reported on the timeline. | Facts were often inaccurate for events reported on the timeline. |
| Fonts and Colors | The use of font styles and colors is consistent and shows a logical pattern. It helps organize the material. | The use of font styles and colors is consistent and shows a logical pattern for the most part. It helps organize the material somewhat. | The use of font styles and colors is consistent , but is not used effectively to organize. | The use of font styles and colors is not consistent OR detracts from the organization. |
| Graphics | All graphics are effective and balanced with text use. | All graphics are effective, but there appear to be too few or too many. | Some graphics are effective and their use is balanced with text use. | Several graphics are not effective. |

| | | | | |
|----------------------------|---|---|---|---|
| Readability | The overall appearance of the timeline is pleasing and easy to read. | The overall appearance of the timeline is somewhat pleasing and easy to read. | The timeline is relatively readable. | The timeline is difficult to read. |
| Title | The timeline has a creative title that accurately describes the material and is easy to locate. | The timeline has an effective title that accurately describes the material and is easy to locate. | The timeline has a title that is easy to locate. | The title is missing or difficult to locate. |
| Dates | An accurate, complete date has been included for each event. | An accurate, complete date has been included for almost every event. | An accurate date has been included for almost every event. | Dates are inaccurate and/or missing for several events. |
| Learning of Content | The student can accurately describe 75% (or more) of the events on the timeline without referring to it and can quickly determine which of two events occurred first. | The student can accurately describe 50% of the events on the timeline without referring to it and can quickly determine which of two events occurred first. | The student can describe any event on the timeline if allowed to refer to it and can determine which of two events occurred first. | The student cannot use the timeline effectively to describe events nor to compare events. |
| Preparation | The student had notes about all the events and dates s/he wished to include on the timeline before beginning to design the timeline. | The student had notes about almost all the events and dates s/he wished to include on the timeline before beginning to design the timeline. | The student had notes about most (~75%) of the events and dates s/he wished to include on the timeline before beginning to design the timeline. | The student had not prepared adequate notes before beginning to design the timeline. |
| Time Use | Classroom time was used to work on the project. Conversations were not disruptive and focused on the work. | Classroom time was used to work on the project the majority of the time. Conversations were not disruptive and focused on the work. | Classroom time was used to work on the project the majority of the time, but conversations often were disruptive or did not focus on the work. | Student did not use classroom time to work on the project and/or was highly disruptive. |
| Resources | The timeline contained at least 8-10 events related to the topic being studied. | The timeline contained at least 6-7 events related to the topic being studied. | The timeline contained at least 5 events related to the topic being studied. | The timeline contained fewer than 5 events. |

Explore all sections of website - Fabulous Flight

Devote two class periods to exploring and journaling about information you have discovered.

Journal entries should include, but not limited to, answers to the following questions.

1. What did I already know?
2. What have I learned?
3. What questions do I still have?
4. How has this website affected my learning?
5. If I could change or alter any part of this website, what changes would I make?

<http://www.kn.att.com/wired/fil/pages/listflightlg.html>

Reflection Journal

Reflect on the famous aviator you researched and journal about how it may or may not have been different if you were that famous aviator as a Seventh-day Adventist Christian.

Evaluation

- The Plane Game - Play this game to test your knowledge of flight
- Teacher will record your score upon completion - raise your hand when you have completed the game.

<http://www.kn.att.com/wired/fil/pages/listflightlg.html>

Management Plan

- Students will be provided with ample class time to work in the computer lab and on the classroom computer.
- Choose two computer monitors who have been guided through the present activity, prior to lab time, to assist with troubleshooting and guidance for other classmates.

Computer Lab:

- Students have assigned seating and log onto the network using their own personal username.
- Volume in the lab should be the same as in the library - respect others who are working.
- Leave computer on when finished - log off and turn off monitor.
- Visiting sites not relevant to project will result in suspension from the lab.

Classroom Computer:

- Sign up for classroom computer time - students/groups may trade times if initialled by both students/groups
- Leave computer on when finished - log off and turn off monitor.
- Visiting sites not relevant to project will result in suspension from the classroom computer.

Ethics Plan

Students will review what they have previously learned about plagiarism and how to responsibly cite information taken from the Internet.

Plagiarism will result in redoing the project in the presence of the teacher and receiving a grade no higher than a D.

Follow-up Activities

Upon completion of this unit, students will take part in a being there experience at the Reynolds Museum - Aviation department where they will take a guided tour through the history of flight and view real planes, reviewing flight history and famous aviators. Students will also sit in a functional model of a plane and experience first-hand how flight is affected by yaw, roll and pitch through the manipulation of the corresponding parts of the plane. This being there experience also includes a guided study, which provides the students with the opportunity to design, build and launch a model rocket.