Geobat

Lesson 9

Lesson Reference: www.geobat.com and a CAP ACE academic lesson

Objectives:

- Students will construct a model of Geobat.
- Students will experiment with flight.
- Students will discuss future aircraft and spacecraft.

National Standards:

Source: www.geobat.com

Science

- Content Standard A: Science as Inquiry
- Content Standard B: Physical Science
  - Motion and forces
  - Transfer of energy
- Content Standard E: Science and Technology
  - Abilities of technological design
  - Understandings about science and technology
- Content Standard G: History and Nature of Science
  - Science as a Human Endeavor

ISTE NETS Technology Standards

- Creativity and Innovation
  - Use models and simulations to explore complex systems and issues
  - Develop an understanding of the core concepts of technology
- Communication and Collaboration
  - Develop an understanding of engineering design
- Critical Thinking, Problem Solving, and Decision Making
- Technology Operations and Concepts
  - Understand and use technology systems

Source: www.geobat.com

Background Information:

The idea of circular aircraft, better known today as UFO's (unidentified flying objects) or flying saucers, has been around for a long time. Swedish inventor Emanuel Swedenborg is known for the earliest design of a "flying saucer" as his idea was documented in an article entitled "Sketch of a Machine for Flying in the Air" in 1716. Since then, many people have continued to dream and work on developing a circular flying machine. During World War II, it is reported that the German scientists developed and built some circular flying aircraft. Even the U.S. military has developed and flown circular aircraft, but details about the designs, flights, and performance are vague. Today, aerospace enthusiasts still work on designs, such as Paul Moller, who is working to make a "flying saucer" a "car" of the future.

Geobat is one of several current flying saucer designs. It was designed by an artist, Jack Jones. He derived the name Geobat from its geometric design (geo) and a bat he remembered from childhood (bat). Geobat may look futuristic, but in reality, it is a flying machine. One distinct difference in its design compared to other flying saucer designs is that part of its center area has been removed. This helps reduce unnecessary weight.

Geobat can be made as a flying remote control aircraft, and the military is experimenting with its possible uses and effectiveness as a military aircraft. Could it someday be used to carry passengers, like a jet liner? Could it be used to explore other planets? Are "flying saucers" already being used by beings from other solar systems?

Materials:

- Geobat pattern for each student printed on *cardstock* (pattern is included, but can also be obtained from http://www.geobat.com/Paper.html)
- Scissors
- Tape
- 2 pennies per student
- computer with Internet (optional)

Lesson Presentation:

1. Show students the flying disk and ask them if they know what it is. If students suggest it is a flying saucer, ask them what characteristics/properties of the object lead them to believe it is a flying saucer.

2. Ask students if they believe flying saucers are real. Provide some background information (see "background information") as time allows.

3. Show the 5-minute Geobat video available at www.geobat.com. Some of the terminology and explanations may be a bit advanced, but the visual images will be helpful.

4. Tell the students that they will make a paper airplane model of Geobat and experiment with the flight of the glider.

5. Distribute the Geobat pattern and guide students through the process of cutting out the pattern and assembling the fuselage to the disc according to the directions printed in the cut-out portion of the disk. Tape can be used to attach the pennies to the disk.

6. Before allowing the students to experiment with the flight of the Geobat model, provide the following information:
    - Ask students to record, on their own paper, the flight performance of the Geobat. Tell them to include descriptions of the angle at which they tossed the model, the amount of force (thrust) used to launch the model forward, position of the surface controls, flight path, and distance.
    - Instruct the students to test the flight of the model *without* first adjusting the surface controls . After they have recorded and evaluated the performance of the Geobat with no adjustment of the surface controls, then ask them to begin experimenting by manipulating the surface controls.
    - Remind students to be courteous of others who are test flying their models. Ask them to make sure they have a clear path before tossing the model forward. Remind the students to be aware of others who may be flying their model as they make their way to retrieve their Geobat after a test flight.
7. Ask students to return to their seats to write what they like and dislike about the model, as well as what (if any) surprises they encountered while flying their model.

Summarization:
Ask students to share what they wrote about the Geobat and its performance. Ask the students why they do or do not think Geobat will be a reality for aviation and/or space travel some day. Share with students the quote from Robert Goddard: "Every vision is a joke until the first man accomplishes it; once realized, it becomes commonplace." Robert Goddard was an early rocket scientist in the early 1900's. In 1929, he became the first person to launch a rocket using liquid fuel. He was ridiculed because of his belief and expression of the idea that traveling to places beyond Earth, such as the moon, was possible. This was not a popular or realistic idea in his time. Ask the students what they think his quote means. Ensure that students understand that an idea that is perceived as unrealistic doesn't mean that the idea is impossible. People tend to make fun of something or discount someone's idea until someone actually accomplishes it, and once people get used to the new invention, it becomes normal. Remind students that dreaming and trying to invent new things is a great adventure.

Career Connection: (from http://stemcareer.com/topcareers/ and http://www.onetonline.org/)

Aerospace Engineer – engineering duties to include designing, constructing and testing aircraft, missiles, and spacecraft. Sample job titles include Aerospace Engineer, Flight Test Engineer, Design Engineer, Systems Engineer, Structures Engineer, Test Engineer, Aeronautical Engineer, Aerospace Stress Engineer, Avionics Engineer, and Flight Systems Test Engineer.

Air Traffic Controller – control air traffic on and within a vicinity of an airport according to established procedures and policies to expedite and ensure flight safety. Sample job titles include Air Traffic Control Specialist (ATCS), Air Traffic Controller, Certified

Professional Controller (CPC), Air Traffic Controller (Enroute Option), and Air Traffic Controller (Tower Option).

Scientist – plan, direct, or coordinate activities in such fields as life sciences, physical sciences, research and development in these fields. Sample job titles include Natural Science Manager, Water Team Leader, Fisheries Director, Health Sciences Manager, Laboratory Manager, Natural Resources Planner, Research and Development Director, Coastal Management Planner, Environmental Manager, and Mineral and Aggregate Resources Planner.

Pilot – pilot and navigate the flight of fixed-wing, multi-engine aircraft usually for the transport of passengers and cargo. Must have pilot certificate and rating for aircraft type used. Sample job titles include Airline Captain, First Officer, Pilot, Airline Pilot, Check Airman, Co-Pilot, Airline Transport Pilot, and Commuter Pilot.

Assessment:

- Student construction of Geobat
- Student answers to class discussion questions
- Student flight performance documentations

Lesson Enrichment/Extension:

- Ask students to design an airplane or spacecraft that might be used in the future. Ask them to label the parts and explain how the craft would operate.
- Allow students to construct the Geobat using cardboard or a foam plate and to compare and contrast flight performance.
- Allow the students to make 20-inch Geobats using the instructions provided at the end of this lesson plan.

Associated Websites:

- www.geobat.com
- Learn more about the history of UFO's http://science.howstuffworks.com/ufo-history.htm.
- Read about military UFO's as early as 1942 and related science http://www.unmuseum.org/realsauc.htm.
- Article about flying saucers posted on November 2008 http://www.popsci.com/cars/article/2008-10/flying-saucers-come-home.
- Video of the Moller M200x http://www.youtube.com/watch?v=3MwxVAZuFOs&feature=related.
- Read about and see pictures of 7 real-world adventures in flight http://www.msnbc.msn.com/id/30967909/
- Historical versions of circular wing aircraft http://discaircraft.greyfalcon.us/World%20Disc%20Development.htm.
- Flying saucer design that has NASA and military interested (as of June 2008) http://www.sciencedaily.com/releases/2008/06/080611135049.htm

CONCEPT TO REALITY

Penny Penny

Copy onto cardstock (sturdy) paper!

GEOBAT

Like No Other Aircraft In the History Of Aviation!

C.G.

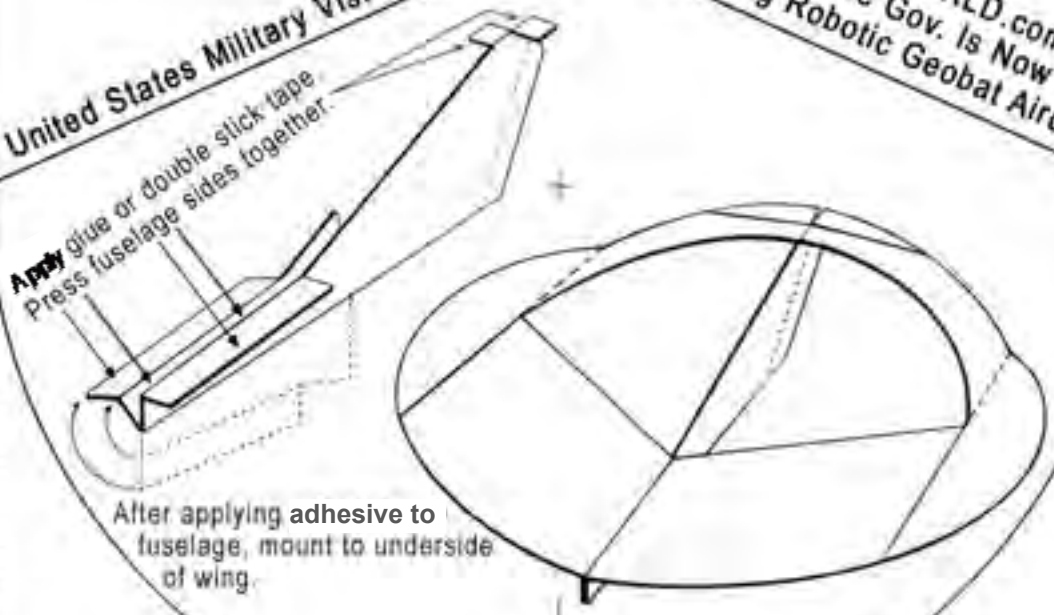
www.geobat.com

United States Military Visits Inventor!

www.C60WORLD.com
Japanese Gov. Is Now
Developing Robotic Geobat Aircraft!

AirshowUnlimited.com

SouthWind-Aviation.com
The Future Of Personal Aircraft Utility



Fold

Fold

Fold

Geobat Flying Saucer Aviation

Elevator Hinge Line

Cut

Cut

Fold On Dotted Lines

Rudder Hinge Line

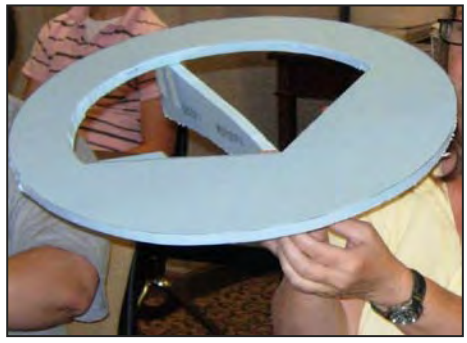
Full-Scale Flying Saucers Are Coming To America!

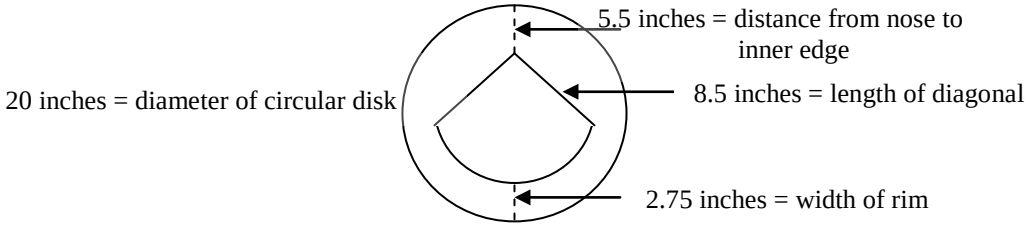
Inventor: Jack M. Jones

Vertical Stabilizer

http://www.geobat.com/Paper.html

Geobat 20-inch Foam Glider Instructions





Picture not to scale.

You can make 4 Geobats from a 4' x 4' piece of Dow blue foam (or similar foam insulation board).

1.) Cut the 4' x 4' foam sheet into 4 equal parts.

2.) Trace the outline of the Geobat onto the blue foam, leaving enough room on one edge to use for the boom (horizontal, rectangular piece that attaches underneath the Geobat disk).

3.) Draw an outline of a boom on the smooth, blunt outer edge of the blue foam.

4.) Cut out the Geobat disk shape.

5.) Carve rounded leading edges and taper trailing edges.

6.) Sand to a smoother shape.

7.) Cut the boom from the blue foam.

8.) Center the boom underneath the Geobat disk and use tape or epoxy to attach it.

9.) Add ballast (heavy material applied to the front of the aircraft to provide stability) to the nose (front) of the Geobat model. (Add clay, coins, or other materials to add weight. Eleven pennies or 5nickels equals 1 once of ballast weight.)

10.) Add more weight if balance point is not at 5 1/2 inches from the nose.

11.) Test fly your Geobat inside a building first. Try to trim it to glide at least 30 feet. Customize your model with plastic fins or winglets.