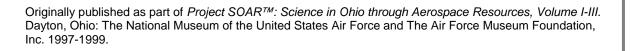


Grade Level:	5
Subject Area:	Science & Math
Time Required:	<i>Preparation:</i> 1 hour <i>Activity:</i> 1 hour
National Standards Correlation:	 Science (grades 5-8) Science and Technology Standard: Understanding about science and technology Standard. Physical Science Standard: Motions and forces. Math (grades 3- 5) Geometry Standard: Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships. Measurement Standard: Apply appropriate techniques, tools, and formulas to determine measurements. Choose an appropriate unit and measure lengths and widths to a specified degree of precision in customary measurement
Summary:	Students will construct a paper airplane and a similar one half scale in size. The distance each airplane will fly will be compared.
Objectives:	 Students will: Build a paper airplane following written and verbal instructions. Build a similar airplane, half-scale in size. Reach a conclusion about how size affects the distance flown.
Background:	See the "Paper Dart Airplane" lesson (<u>http://www.nationalmuseum.af.mil/shared/media/document/AFD-090709-089.pdf</u>)
Materials:	You will need: • Paper airplane pattern • Paper (8 ¹ / ₂ " x 11") • Scissors • Ruler • Colored pencils • Pencil
Safety Instructions:	Do not fly paper airplanes directly at another person. Use caution when flying the paper airplanes. Create a single direction flight zone. Be sure that students stop flying their airplanes when other students are retrieving airplanes that have already landed.
Procedure:	 A. Warm-up 1. Discuss symmetry. Explain that it is important to keep the wings symmetrical.





- 2. Discuss similarity. Explain that it is important to measure carefully.
- 3. Review the four forces of flight (lift, drag, thrust, gravity).

B. Activity I

- 1. Using the paper airplane pattern as a guide, students will measure the dimensions, divide in half and cut out the resulting rectangle.
- 2. Using the paper airplane pattern as a guide, students will measure, double and determine placement of all fold lines and cut lines. When complete they should have a similar paper airplane pattern, half-scale in size.
- 3. Decorate with colored pencils if desired.

C. Activity II

Students will construct each paper airplane. (See the "Paper Dart Airplane" lesson at <u>http://www.nationalmuseum.af.mil/shared/media/document/AFD-090709-089.pdf</u>).

D. Activity III

Students will fly each plane, recording which flies the longer distance a total of 5 times.

E. Wrap-up

Students will compare their results with their classmates. Discuss the results.

Assessment/ Evaluation:

ation: Students' airplanes will be checked for similarity. Students can be evaluated by teacher observation of student's participation in the activity.

Extensions: Using the original paper airplane pattern, students could make a double size airplane and conduct the same experiment.

