



Maryland Engineering Challenges™ 2009 Paper Airplane Guide



Challenge Sponsor:

AIAA: American Institute of Aeronautics and Astronautics
(Baltimore Section) www.aiaa.org

Level:

Elementary School: Grades: 1-5
Each grade will be judged separately

Important Dates:

Coaches' Information Workshop:

Thursday, November 20, 2008
4:00-7:00 p.m.

Hands-On Workshop:

January 2009
Date and time TBA

Registration Deadline:

Friday, February 20, 2009
4:00 p.m.

Written Report Due:

Friday, February 20, 2009
4:00 p.m.

Competition Date:

Saturday, March 7, 2009
9:00 a.m. – 2:00 p.m.

Snow Date:

Saturday, March 21, 2009
9:00 a.m. – 2:00 p.m.



All Paper Airplane workshops and competitions will be held at:
Baltimore Museum of Industry, 1415 Key Highway, Baltimore, MD 21230

For more information on registration or general questions, please contact Melinda Brantel Cané at mcane@thebmi.org or 410-727-4808 ext. 120.

The Challenge:

This challenge is based on design issues for a passenger airplane. Passengers want to go far, go fast, and remain safely in the airplane. Airplane operators want the planes to travel the shortest route (straight) in order to save fuel.

Each student will construct a paper airplane using only one piece of paper and a paperclip “passenger.” Students will launch the airplanes, trying to maximize the length and speed of flight and relative accuracy while keeping the passenger safely on-board. Each grade level will be judged and have prizes awarded separately.

For more information on engineering requirements, please contact Tom Milnes at thomas.milnes@jhuapl.edu.

Engineering Team Requirement:

Each team must consist of 4 students

Design & Construction Standards:

At the competition, each team must use the 8.5" x 11" piece of paper (“20 pound” or 75 grams/meter²) and jumbo paper clip (Acco Premium Silverette Paper Clips, Jumbo #72503) provided by the sponsors.

No coaching or other adult help fabricating the paper airplane will be allowed during the performance competition. No tools or construction materials other than the paper and paper clip provided. Three minutes will be given to construct four paper airplanes. All students must be involved in the manufacturing process. Only one piece of paper and one paper clip allowed per plane (unlimited number of scraps).

Required Construction Elements:

No tools may be used in the construction.

Performance Guidelines:

Each student must fly a plane. Individual score is Length x Speed x Accuracy.

- Length = Length of Flight
- Speed = Length of Flight/Time of Flight
- Accuracy = 1 - Distance from Reference Line/Length of Flight.

Paper clip must remain attached to or inside the airplane for flight to count. One re-throw allowed for lost passenger with 20% point deduction. Team score is sum of individual scores.

Evaluation Standards:

All elementary level competitions involve four main components: the design and construction of the project, a written report, an oral report, and the performance demonstration.

1. DESIGN & CONSTRUCTION *Competition value: 20 points.*
2. WRITTEN REPORT *Competition value: 30 points*
3. ORAL REPORT *Competition value: 20 points*
4. PERFORMANCE DEMONSTRATION *Competition value: 30 points*

An outline of what is required for each of these components, and guidance on preparing for the competition, is given in the "Elementary School Guide to Entry," which should be read in connection with this document.

What math skills were needed in this challenge?

What science skills were needed in this challenge?

List the safety rules you followed to make sure no one got hurt:

What did you learn by taking part in this project?

What did you enjoy most about taking part in this project?
