

2020 Jacob Wismer PTO Science Fun Competition

Activity/Event Rules

AERODYNAMICS

Description: Each team will build a paper airplane to be flown a distance of at least five meters, landing on a predetermined target. Airplanes must be of a folded aerodynamic design. Crumpled wads of paper do not qualify.

Number of Participants: Team consists of 3 students (JW students from 3rd-5th Grades)

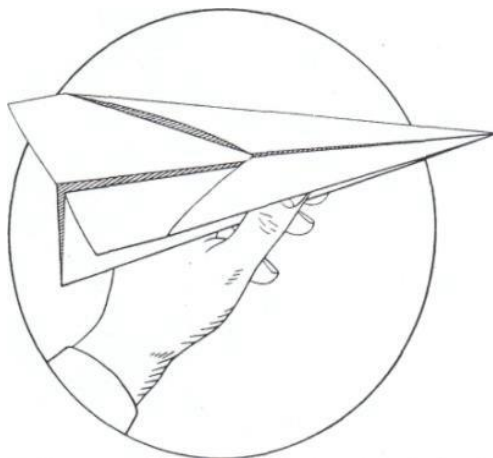
Time: 20 minutes

The Competition:

1. Three sheets of plain white paper will be supplied to each group along with approximately five centimeters of masking tape. Teams may bring a pair of scissors. The event supervisor may (or may not) also provide any of the following: straws, paperclips, or string. Three planes will be constructed.
2. Planes flown in competition must be made on site, during the allotted time, using only the materials provided.
3. Teams will have up to 12 minutes to make and test their three planes. Groups must choose which planes they will fly for their two official flights, with each flight made by a different member of the group. They may fly a plane more than once.
4. Planes will be hand launched from behind a line on the floor at a specified target more than 5 but less than 12 meters distant. The target may be on the floor or on a raised surface.

Scoring:

1. After each flight, the distance will be measured from the center of the target to the nose of the airplane where it comes to rest. The distance from the target will become the flight's score. The group score will be determined by adding the two flight scores together.
2. The lowest score, signifying the closest to the target, will be the winner. In case of a tie, the single best flight will break the tie.



BRIDGE BUILDING

Description: Using only the materials given, each team will build a bridge to span the longest distance possible and support a cup with as many small weights as possible.

Number of Participants: Team consists of 3 students (JW students from 3rd-5th Grades)

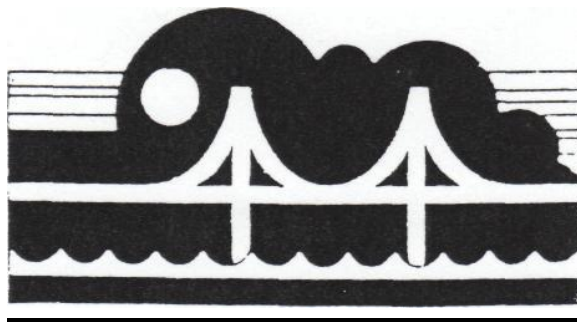
Time: 20 minutes

The Competition:

1. Each group will be given a set of materials selected by the event supervisor. Examples of possible materials include but are not limited to straws, bamboo skewers, toothpicks, spaghetti, clay, marshmallows, gumdrops, 5 ounce paper cup, pipe cleaners, paper clips and/or push pins. If straws are used, they may be crimped and slipped together. No string, tape or other materials may be used.
2. Students are to construct a bridge with a paper cup attached to it. The goal is to build a bridge that spans the greatest possible distance and is able to hold the weight of the cup.
3. The bridge will be suspended on two similar supporting structures, like two chairs, tables, or stacks of books.
4. The bridge must support the cup for 10 seconds.

Scoring:

1. The bridge spanning the greatest distance and supporting the cup for 10 seconds will be declared the winner.
2. In the event of a tie, additional weight will be added into the cup until the strongest bridge is determined.



CHOPPER CHALLENGE

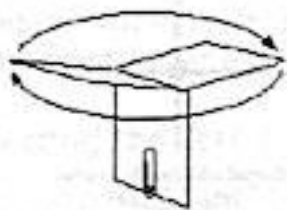
Description: Each team will build and test 2 choppers (rotary flying devices) using only materials they are given.

Number of Participants: Team consists of 3 students (JW students from 3rd-5th Grades)

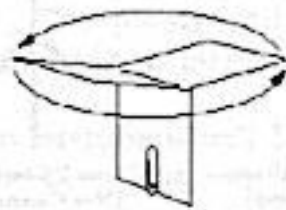
Time: 20 minutes

The Competition:

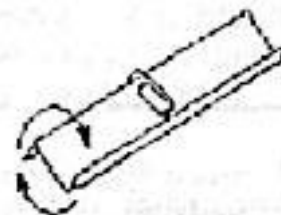
1. Each group will be given one sheet of 8 ½ by 11 inch 60-90 lb. card stock and 2 standard paper clips to construct 2 choppers that use rotation to slow their descent. Teams may bring a pencil, a straight edge (or small ruler) and one (1) pair of scissors to use chopper construction, but may not be part of the choppers.
2. Each chopper must be made using a single piece cut from the sheet of cardstock provided and one paper clip. The pieces for the two choppers need not be the same size and/or shape.
3. The event supervisor will identify at the event which two directions the choppers to be built for the competition are expected to rotate.
4. Each chopper must rotate in a different direction, as shown below, and they must be labeled with the direction they are intended to rotate. The drawings only illustrate the direction of the rotation. The choppers may be any design.



Clockwise Rotation



Counter-Clockwise Rotation



Vertical Rotation

5. Students may test their devices in the building area but will not be allowed to test them from the official drop location.
6. When it is their turn, groups will release their choppers, one at a time, from the height specified by the judges. All groups will release their choppers from the same height.

Scoring:

1. The judges will measure and record the time required for each chopper to reach the ground/floor. Time will continue if the chopper bounces off an object, but will stop if the chopper gets stuck and stops.
2. If a chopper does not rotate in the direction labeled, its flight time will be divided by 2.
3. The group's score will be the sum of the flight times for the two choppers.
4. The longest total time wins.
5. Ties will be broken by comparing each group's single longest flight time.

ECO EGG DROP

Description: Each team will make a package from recyclable paper products that will protect a raw egg when dropped from two different heights.

Number of Participants: Team consists of 3 students (JW students from 3rd-5th Grades)

Approximate Time: 20 minutes

The Competition:

1. Each team will bring building materials that are clean curbside recyclable paper products (see list on next page). They must all fit completely inside one small paper lunch bag which measures a maximum of 14 cm x 9 cm x 26 cm. The contents may not overflow the bag nor may they be pre-assembled. The event supervisor will not provide any of these building materials. In addition, each team may bring one (1) pair of scissors, but may not include it in the protective package.
2. Each team will be given these supplies with these restrictions:
 - a. One (1) plastic egg and one (1) zip-style plastic bag: to be used only during construction for sizing and must be left in the construction area. They must be readily retrievable (within 10 seconds) from the protective package or the team will be scored at the bottom of the Tier.
 - b. 20 cm of masking tape: May not be attached to the egg or plastic bag.
3. Each team will have a maximum of 10 minutes to construct a package to cushion the egg and prevent it from breaking when dropped from a given height. A broken egg is defined as a visible crack or one which leaves a wet spot on a paper towel.
4. Teams must also clean up their area within the 10 minute building time. They will be instructed where to put waste materials. Any team failing to clean up their area will be penalized.
5. When the team has completed building, they will take their package to a weighing station where its mass will be determined without an egg or plastic bag.
6. After the mass has been determined, the team will proceed to the drop site. They will seal one raw large Grade A or AA chicken egg in a zip-style plastic bag provided by the judges. They will then place the egg and plastic bag in their package.
7. Each team will be allowed one drop from the first height of approximately 1.5-2 meters. If the egg survives without breaking, they will then be allowed one drop from a second height of approximately 5 meters.

Scoring:

1. The team's score will be the mass of the package without the egg and plastic bag
2. Scores will be ranked using these tiers:
 - a. Tier 1: Eggs that survive both, the first and second drops
 - b. Tier 2: Eggs that survive first drop, but not the second
 - c. Tier 3: Eggs that break after the first drop
 - d. Tier 4: Eggs that break before the first drop. (Teams that break their egg before the first drop can still drop the package, but it will be scored as a broken egg)
 - e. Tier 5: Packages that use materials that are not allowed
3. The lowest score is the winner

(Continued on next page)

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(Eco Egg Drop continued)

These are the only allowed “clean curbside recyclable paper products”:

Writing & printing paper (printed or plain), card stock paper, construction paper

Paper envelopes, wrapping paper (without foil)

Newspapers, magazines, junk mail, shredded paper

Paper bags (including the bag used for transporting materials)

Flat pieces of cardboard, cereal boxes

Paper straws, paper plates (with no coating), empty toilet paper and paper towel rolls

Note: All building materials (except straws, toilet paper rolls and paper towel rolls) must be flat and less than 1cm in thickness.

Materials which will not be allowed (not an inclusive list):

Any preformed paper containers such as boxes (for example, shoe or gift boxes) or parts of egg cartons

Tissue paper, toilet paper, paper towels, napkins

Envelopes with metal clasps or transparent windows (unless removed)

Waxed paper products, milk cartons, drink boxes, soup boxes

Waxed or plastic food liner bags (such as for cereal or pet food)

Frozen or refrigerator food containers, juice concentrate containers

Wood products that aren't paper

Glass of any kind

Metal of any kind including foil, aluminum cans or tin cans

Plastics of any kind including milk cartons, yogurt containers, plastic straws, bubble wrap

Mylar, Styrofoam or packing peanuts

