Egg Crash Cars-basics

1) EGG WILL BE INSERTED INTO A ZIP LOCK BAG BEFORE IT GOES INTO THE SEAT. PLAN ACCORDINGLY.

2) TEACHERS PLEASE COME WITH THE RUBRIC FILLED OUT AND EVALUATED BY YOU FOR THE CRITERIA. THIS WILL ALLOW US TO SPEED UP THE TESTING PROCESS.

3) THE EGG MUST BE VISIBLE FROM THE OUTSIDE OF THE VEHICLE USING A WINDOW.

4) VEHICLES WILL HAVE FOUR SYSTEMS

   1) CRUSH ZONE (BUMPER)
   2) ROLL CAGE
   3) CAR BODY
   4) SEAT AND RESTRAINT SYSTEM.

5) 2) Attach 2” Velcrow to the bottom of your base. Use the hook part of the velcrow. (prickly side)

6) I SUGGEST STUDENTS READ ALL THE RULES AND INSTRUCTIONS BEFORE BEGINNING.
Egg-cellent Crash Test

Problem: Eggs everywhere are dying in horrible automobile accidents. It seems that all the egg car designers do not believe in building safe cars. Your job is to design and build a prototype car that has safety as a priority. A team of one person protects one egg. A team of two must protect two eggs. Please note that the eggs will be launched with a thick elastic band down a track and smash into a wall. The impact is violent and will cause the car to most likely roll. There will be a protective case over the crash area to avoid injury to onlookers. Also, the car will only last one test. Any adhesive may be used for the building of the car.

One person team-- one egg.
Two person team---two eggs.
Use any adhesive you like.
Provide sketches for all parts of the car.
Car will not be reusable.
Optional to use the car body in the crash. It fits over the chassis just like a real racecar body does.
If a students does not have velcrow on the base we will duct tape the car to the testing block.
No Metal parts in the car.
THERE ARE FOUR DESIGN ELEMENTS THAT WILL BE JUDGED.

1) THE CAR BODY
   1. Your vehicle length must not exceed 10 1/2 inches, including the bumper and crush zone.
   2. This part of your car will fit over the top of the roll cage and chassis.
   3. It must look like a sedan not a truck or van.
   4. We must be able to see the egg through the windows.
   5. It can be made out of any of the materials listed below.
   6. You may choose to test your car with or without the car body cover.
   7. The cover could be so designed to help protect the egg.
   8. Provide a sketch of the car body

2) THE ROLL CAGE
   1) Cut out and fold your base for the car structure to be attached to. (use base template provided)
   2) Attach 2" Velcrow to the bottom of your base. Use the hook part of the velcrow. (prickly side)
   3) Provide a design using the sheet provided or provide your own design sheet for the roll cage.
   4) The roll cage will be attached to the base.
   5) We must be able to see the egg inside the car.
   6) You may use any type of adhesive material you wish.
   7) It is recommended that you use popsicle sticks for the roll cage.
   8) Remember no metal.

3) THE SEAT AND RESTRAINT SYSTEM
   1) This system can also be considered the ergonomic system so the seat should be comfortable.
   2) You may use a piece of egg carton but you will get more points if you design your own seat.
   3) The seat will be attached to the base.
   4) The egg must be visible in the seat even with restraints.
   5) The restraint system can be attached either to the base or the seat or both.

4) THE CRUSH ZONE
   1) This would be the bumper and space between the front of the car and the seat
   2) It will be attached to the front of the base.
3) Use any materials from the materials list to absorb impact.

**SUGGESTED PROCEDURE FOR MAKING THE VEHICLE**

Procedure:

1. **Read all directions.**

2. Select the size of your group.
   a. A group of one will make a one
   b. A group of two will make a two passenger vehicle.

3. Each group member should design a car using the handouts provided. It is up to the individual designer to decide whether or not they want to design the body to fit the safety features or the safety features to fit the body. Either way one has to be done first. Doors are optional, front rear and side windows are mandatory.

4. Select a design.

5. Make changes as your group, thinks are necessary, come up with a final plan if one of yours is good enough fine remember your final product should look like your plan.

6. Divide your work. Each partner should have a job if they finish early they should help others or start a new job. ***These jobs don't need to be completed in this order this is just suggested***

7. **Chassis Cover**
   a. Make a template using tag board or other material.
   b. Use a glue to attach the chassis cover template to a piece of tag board.
   c. Cut out the template on the solid lines fold it per the instructions on the template.
   d. Glue the tabs of your cover to the sides of your cover.

8. **Roll cage**:
   a. Cut parts to the sizes indicated on your plans.
   b. Following your plans, glue the sides of your roll cage parts to the chassis cover. Make sure the wheels of the chassis will still turn freely *** You might want to glue this together separately then attach it to the chassis after the sub system is complete. ***
   c. Attach all cross pieces,

9. **Bumpers**:
   a. Following your plans construct and attach your bumper systems to the chassis cover.
10. **Seats:**
   a. Construct your seat
   b. Install your seat.

11. **Seat belts:**
    a. Make your seat belt
    b. Install your seat belt

12. **Body**
    a. Carefully layout your side body panels.
    b. Add decorations as time allows. ***This can wait until you are done with everything prototypes are often unpainted***
    c. Cut the bottom of your body first to make sure your bottom lines up with your wheels
    d. Cut out the rest of your body make sure you don’t make the side panels to small or they will not fit on the roll cage. Doors are optional, front rear and side windows are mandatory.
    e. Make an exact copy for the other side of your car.
    f. Cut a piece out that is the correct length for a top, make cut it about 1 inch wider than your car should be and cut \( \frac{1}{4} \) inch tabs, \( \frac{1}{2} \) in deep to fasten to your top to the sides. Beginning with one side
    g. Be sure your body fits over or leaves holes for your bumpers to attach to the chassis cover.

13. **Ideas to keep in mind**
    a. Your body and bumpers should be energy absorbing to try to slow your car down more slowly
    b. It’s ok if your car gets dented or broken as long as your egg lives.
    c. Hold on to all your scraps you never know what you might need later.
    d. Cardboard is harder to work with but, it is stronger.
    e. The “Measure twice cut once.”
    f. Remember eggs feel pain and have feelings too so be considerate of them. 😊
Acceptable Materials list

Chassis cover template
Tag board
Paper
Card board
Plastic canvas
Construction paper
Paper towel roll
Plastic
Popsicle stick
Wood
Mini sticks
Fabric
String

Rubber band
Elastic
Hot Glue stick (used as a part)
Hot Glue stick (used in gun)
Hard foam
Soft foam
Bubble wrap
Stuffing
Egg carton holders

Unacceptable Materials List

NO METAL
This template is a side view of the testing block with wheels. The popsicle sticks and eggs are the actual size. You may cut them out to design a side view of your vehicle by gluing them onto this template.
This is a sample roll cage design and the dashed lines are a sample shape of the car body to fit over the roll cage.

POPSICLE STICK
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POPSICLE STICK
POPSICLE STICK

Egg

Egg

POPSICLE STICK
This is the **base template** you will paste onto your tagboard or cardboard so your can cut it out and fold it.

| Cut the outside lines. Then cut the short lines in the corners to create tabs. Fold the inside lines and use the tabs to connect the base. This is the bottom of your car. It will fit over a testing block 3.25 inches by 6.25 inches. Please attach a piece of two inch Velcro on the bottom of this base. Use the hook side of the Velcro. Place and attach your seat restraint system, crush zone and roll cage to this base. |
Event Coordinator----Ted Hoca    e-mail me with any questions.  

<table>
<thead>
<tr>
<th>Design Elements</th>
<th>Zero Points</th>
<th>One 0r Two Points</th>
<th>Three or Four Points</th>
<th>Five Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car Body</td>
<td>Meets no criteria</td>
<td>Meets one criteria</td>
<td>Meets at least 3 to 5 criteria</td>
<td>10 ½ inches long or less fits over roll cage looks like sedan see the egg / windows sketch</td>
</tr>
<tr>
<td>Crush Zone</td>
<td>No Crushable bumper</td>
<td>Has a bumper.</td>
<td>Has a bumper and a sketch of the crush zone.</td>
<td>Attached to the base. Looks like materials will absorb impact. Sketch provided of the crush zone.</td>
</tr>
<tr>
<td>Roll Cage</td>
<td>Roll cage poorly adhered and designed.</td>
<td>Meets two of the criteria</td>
<td>Meets three to five criteria</td>
<td>Velcrow attached Sketch provided Crafted well Can see the egg Roll cage well adhered Attached to the base.</td>
</tr>
<tr>
<td>Seat and Restraint System</td>
<td>No Seat or restraint system or can t see the egg</td>
<td>Has a restraint system and seat but cannot see the egg. Or system poorly conceived.</td>
<td>Meets three or four of the criteria listed in five.</td>
<td>Designed own seat Attached to the base Has a restraint system Can see the egg Has a sketch</td>
</tr>
</tbody>
</table>

Egg Survival Points 0-5-10-15

<table>
<thead>
<tr>
<th>Egg demolished</th>
<th>Egg decapitated</th>
<th>Egg cracked</th>
<th>EGG SURVIVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>liquid in bottom part of egg</td>
<td>but still in tact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Just liquid in seat no points</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name of Student ____________________________ Grade Level ________  
Rubric_______+Egg Crash_______=

Name of School District____________________ Name of School ________  
Total Points________
Event Coordinator----Ted Hoca e-mail me with any questions. 99thoca@jamestown.wnyric.org School Phone- 716-483-4411