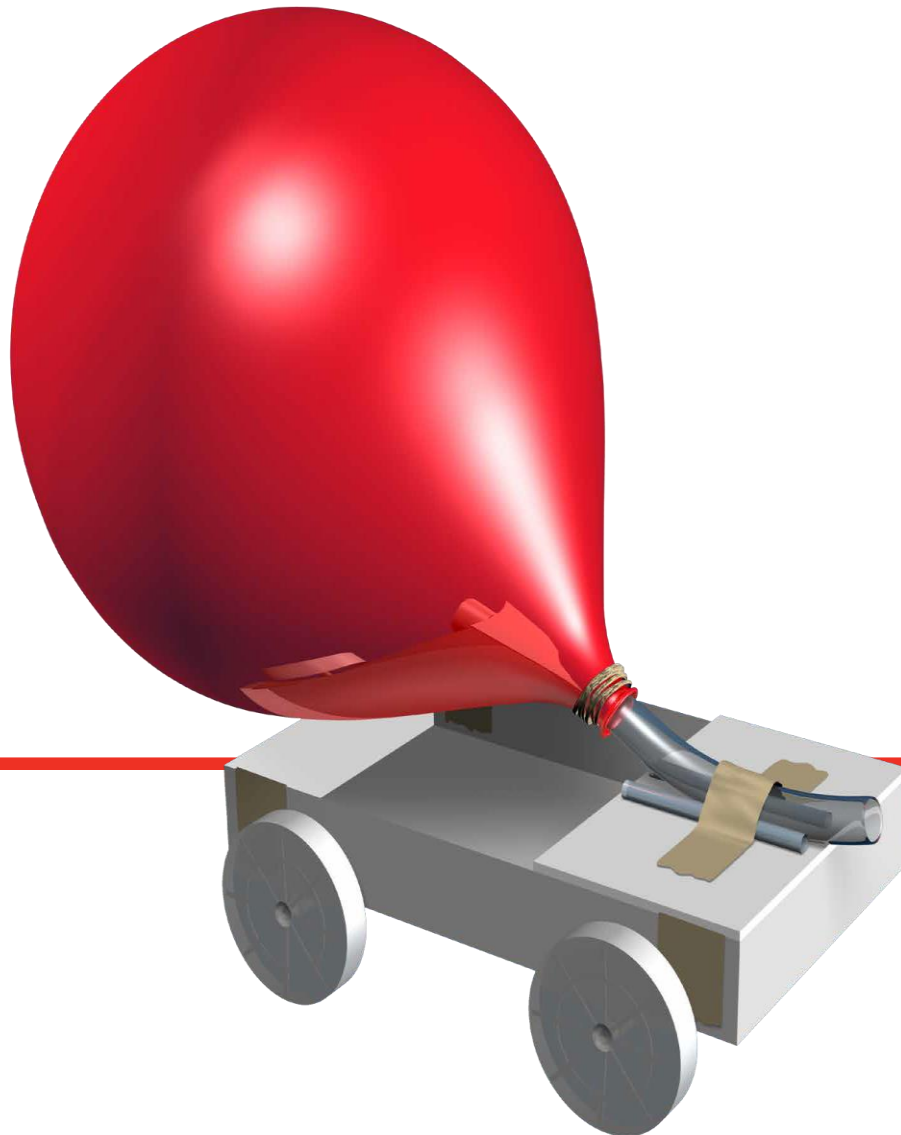


A World In Motion®

JetToy Challenge

Competition Guide



Building the JetToy Chassis

Materials

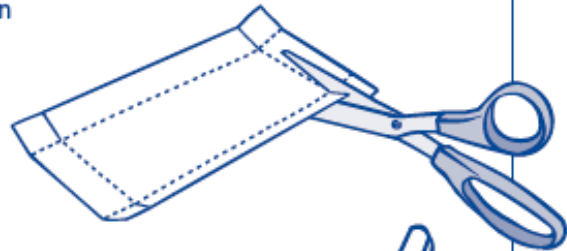
- JetToy Chassis Pattern
- scissors
- ballpoint pen
- masking tape

Procedure

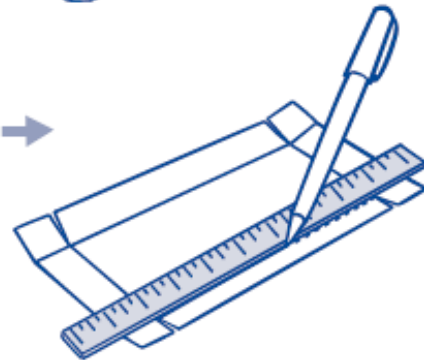
1. Every other team, get a JetToy Chassis Pattern. Cut the two chassis apart and give one to another team.

2. Each team, cut out the JetToy Chassis Pattern outline along the solid outer lines.

3. Cut the “cut lines” at the corners. Be careful that you don’t cut too far.

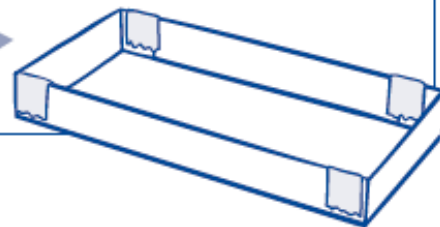


4. Use a ballpoint pen to draw a very heavy, deep line over each of the dotted fold lines. Press the pen hard back and forth to score the paper to make it easier to fold.



5. Fold down the four sidewalls on the scored lines. Make sure that the axle lines are showing on the outside of the chassis.

6. Use small pieces of masking tape to carefully attach all the flaps inside the chassis.

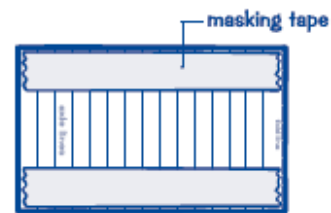


Assembling the Axles and Wheels

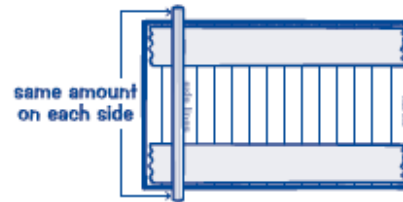
Procedure

1. Cut 2 axle bearings from a drinking straw. Each bearing should be exactly 7 centimeters long. Make sure that the cut edges are straight and not jagged.

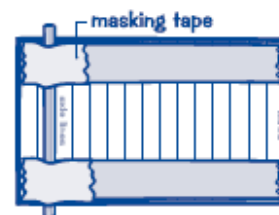
2. Put two strips of masking tape along the side of the chassis.



3. One team member can line up an axle-bearing with one of the axle lines. Center the bearing so the same amount extends on each side of the chassis.



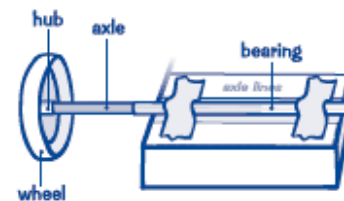
4. Another team member can tape the straw in place. Put the tape over the tape already on the chassis.



5. Repeat steps 3 and 4 to mount the other axle bearing.

6. Carefully push an axle stick into the hub of one wheel, then insert the stick into the axle bearing.

7. Carefully push a wheel onto the other end of the axle.



8. Repeat this procedure to make the other wheel assembly.



JetToy Distance Challenge


Objective: Student design teams will construct a JetToy car that can travel as far as possible.

- The track specs are 10m long X 3m wide.
- Teams must release their JetToy behind the 0m mark.
- The JetToy must stay on the track for the trial to be valid (if JetToy leaves the track, points are awarded at point of exit).
- JetToy balloon must be inflated to an 8-inch diameter or less. The track judge will check balloon diameter before JetToy is released.

Scoring:

- Design teams get three trials.
- Final score is based on the sum of the three trials. The track judge will determine the point total for each trial.
- The point total is determined by adding the meters traveled plus the distance (in cm) traveled beyond the meter mark. Please see example below.
- Measurements are taken from the furthest point of travel of the wheels.

Distance Track

| | | | | | | | | | | |
|----------|---------|----------|----------|----------|----------|----------|---|----------|----------|-----------|
| 0 points | 1 point | 2 points | 3 points | 4 points | 5 points | 6 points | 7 points  | 8 points | 9 points | 10 points |
| 0m | 1m | 2m | 3m | 4m | 5m | 6m | 7m | 8m | 9m | 10m |

The JetToy stopped 43 cm beyond the 7m line, so the point value for this trial is 7.43.

JetToy Weight Challenge


Objective: Student design teams will construct a JetToy car that carry a specific amount of weight.

- The track specs are 10m long X 3m wide.
- Teams must release their JetToy behind the 0m mark.
- The JetToy must stay on the track for the trial to be valid (if JetToy leaves the track, points are awarded at point of exit).
- JetToy balloon must be inflated to an 8-inch diameter or less. The track judge will check balloon diameter before JetToy is released.
- Teams must use weights provided by the judges at the starting line (1 weight = 9 pennies)

Scoring:

- Design teams get three trials.
- Final score is based on the sum of the three trials. The track judge will determine the point total for each trial.
- The point total is determined by adding the meters traveled plus the distance (in cm) traveled beyond the meter mark. Please see example below.
- Measurements are taken from the furthest point of travel of the wheels.

Distance Track

| | | | | | | | | | | |
|----------|---------|----------|---|----------|----------|----------|----------|----------|----------|-----------|
| 0 points | 1 point | 2 points |  3 points | 4 points | 5 points | 6 points | 7 points | 8 points | 9 points | 10 points |
| 0m | 1m | 2m | 3m | 4m | 5m | 6m | 7m | 8m | 9m | 10m |

The JetToy stopped 25 cm beyond the 3m line, so the point value for this trial is 3.25.

JetToy Accuracy Challenge

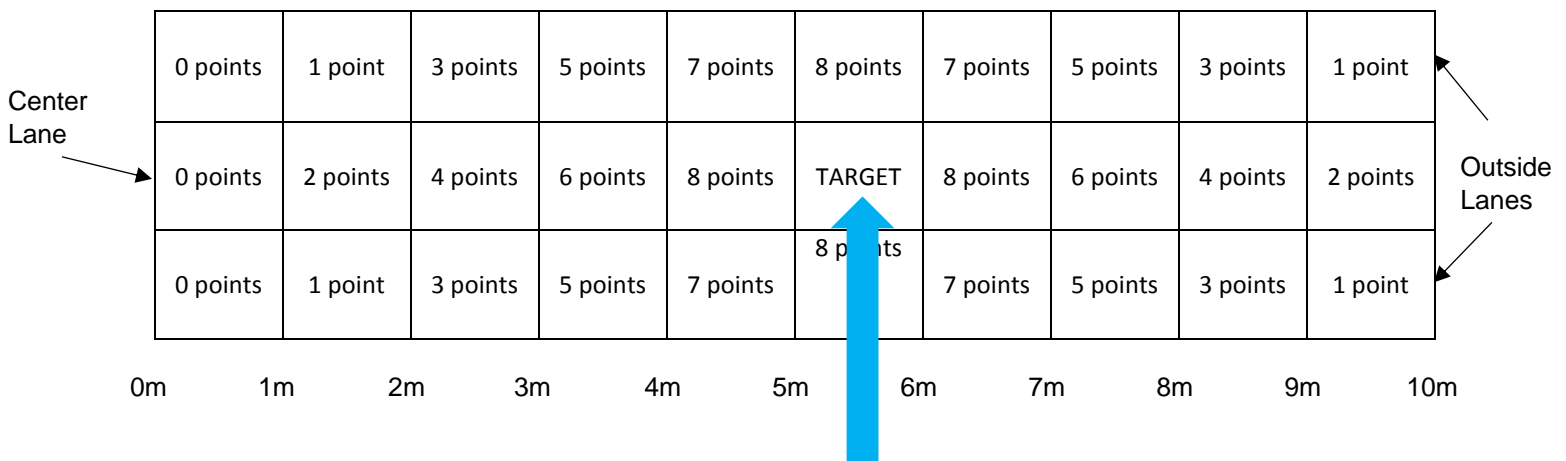
Objective: Student design teams will construct a JetToy car that can travel a specific distance.

- The track specs are 10m long X 3m wide.
- Teams must release their JetToy behind the 0m mark.
- The JetToy must stay on the track for the trial to be valid (if JetToy leaves the track, points are awarded at point of exit).
- The JetToy balloon can be inflated to **any** diameter determined by the design team.

Scoring:

- Design teams get three trials.
- Final score is based on the sum of the three trials. The track judge will determine the point total for each trial.
- The point total is determined by two components:
 - The point value of the box where the JetToy stops (50% or more of the JetToy must be in the box to receive that box's point value)
 - The distance (in cm) from line of the box furthest away from the center target to the wheel **closest** to the center target. The lane that it is in does not matter. Please see examples below.
- If the JetToy lands on the center target, the point value is determined by using the measurement that is closest to the center of the target.

Accuracy Track



JetToy Accuracy Challenge

Objective: Student design teams will construct a JetToy car that can travel a specific distance.

- The track specs are 10m long X 3m wide.
- Teams must release their JetToy behind the 0m mark.
- The JetToy must stay on the track for the trial to be valid (if JetToy leaves the track, points are awarded at point of exit).
- JetToy balloon can be inflated to any diameter determined by the design team.

Scoring:

- Design teams get three trials.
- Final score is based on the sum of the three trials. The track judge will determine the point total for each trial.
- The point total is determined by two components:
 - The point value of the box where the JetToy stops (50% or more of the JetToy must be in the box to receive that box's point value)
 - The distance (in cm) from the corner or line furthest away from the center target to the wheel closest to the center target. Please see examples below.
- If the JetToy lands on the center target, the point value is determined by using the placement of the wheel that is closest to the center of the target.

Accuracy Track

| | | | | | | | | | | | |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------|
| | 0 points | 1 point | 3 points | 5 points | 7 points | 8 points | 7 points | 5 points | 3 points | 1 point | |
| Center Lane → | 0 points | 2 points | 4 points | 6 points | 8 points | ★ ADIENT | 8 points | 6 points | 4 points | 2 points | ← Outside Lanes |
| | 0 points | 1 point | 3 points | 5 points | 7 points | 8 points | 7 points | 5 points | 3 points | 1 point | |
| | 0m | 1m | 2m | 3m | 4m | 5m | 6m | 7m | 8m | 9m | 10m |

Front, Back, Right, Left of Target (Starred below)

The wheel of the JetToy closest to the target is 47 cm beyond the 4m line, so the point value for this trial is 8.47.

| | | |
|----------|------------|------------|
| 7 points | 8 points ★ | 7 points |
| 8 pts ★ | ★ ADIENT | 8 points ★ |
| 7 points | 8 points ★ | 7 points |

47 cm

Corner Box (Starred below)

The wheel of the JetToy closest to the target is 77 cm from the outside corner of the box, so the score for this trial is 7.77. NOTE: No more than 7.99 points can be awarded for this box.

| | | |
|------------|----------|------------|
| 7 points ★ | 8 points | 7 points ★ |
| 8 points | ★ ADIENT | 8 points |
| 7 points | 8 points | 7 points ★ |

77 cm

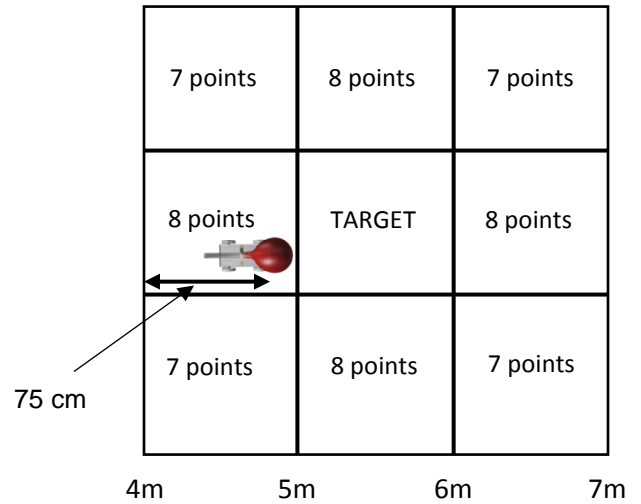
On Target

The wheel of the JetToy closest to the target is 9.6, so the score for this trial is 9.6.



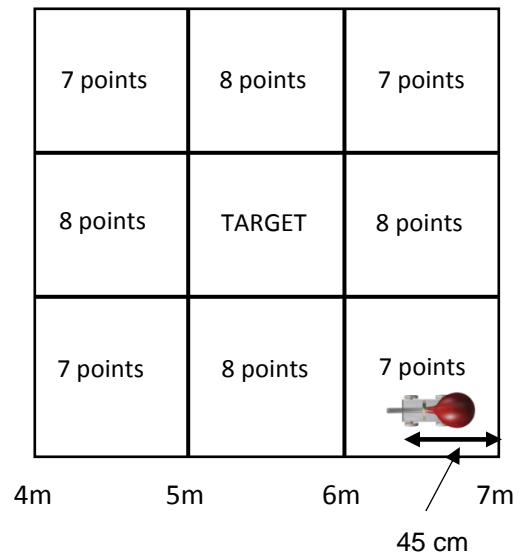
Scoring Example 1:

The front wheels of the JetToy stopped 75 cm beyond the 4m line in the center lane, so the point value for this trial is 8.75.



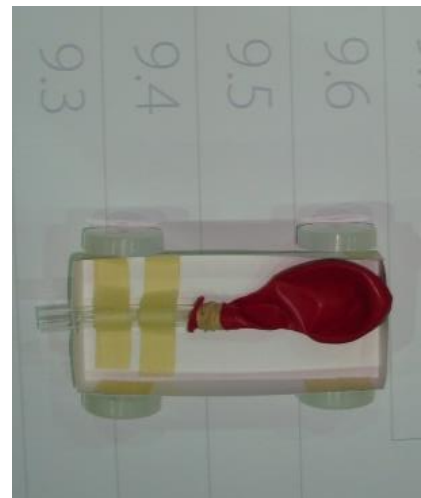
Scoring Example 2:

The back wheels of the JetToy stopped 45 cm beyond the 6m line in the outside lane, so the point value for this trial is 7.45.



Scoring Example 3:

Example #3: The JetToy landed on the center target. The front wheels are closest to the center of the target, and closest to the 9.6 line, so the point value for this trial is 9.6.



JetToy Time Challenge

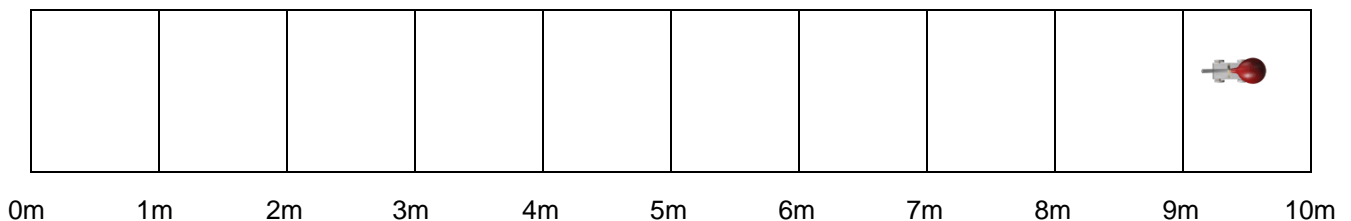
Objective: Student design teams will construct a JetToy car that can travel for an extended period of time.

- The track specs are 10m long X 3m wide.
- Teams must release their JetToy behind the 0m mark.
- The JetToy must stay on the track for the trial to be valid (or exit the track past the 10m mark).
- JetToy balloon must be inflated to an 8-inch diameter or less. The track judge will check balloon diameter before JetToy is released.

Scoring:

- Design teams get three trials.
- Final score is based on the longest elapsed time of the three trials.
- The track judge will time the teams' trials by using a stopwatch.
- Time starts when the nozzle is released.
- Time stops when the forward momentum of the JetToy stops (the JetToy cannot stop and start).

Time Track:



The JetToy stopped moving after 32.34 seconds. The point value for this trial is 32.34.