

Name: \_\_\_\_\_

Class: \_\_\_\_\_

## Structures and Forces

### End of Unit Project

Thrill rides have become extremely popular and the quest for the greatest thrill continues. These rides must be engineered to provide a safe experience for the thrill-seeker. Your challenge in this end of Unit Project is to design and construct a thrill ride that will safely carry 2 marbles through the course of the ride. The safety test will be your evaluation along with the diagrams you provide illustrating the stresses and forces that are involved.

#### **Specifications:**

- The Thrill Ride (structure) must be free standing
- It must be no larger than 50 cm x 50 cm x 50 cm
- It must carry 2 marbles
- Lightweight materials should be used
- The load must be suspended at least 30 cm above the table
- The marbles must be secured in the passenger compartment throughout the ride
- The marbles must not come into contact with the structure at any time
- Choice of materials is open, but you should consider using what you already have
- The ride must operate three times during the test

#### **Components of this project:**

- Labeling the stresses and forces acting on all parts of the structure, throughout the operation of the ride. (Arrows should be drawn, showing the points within the structure where the stresses are forces are acting).
- The center of gravity of your structure
- A description of your static and dynamic loads
- The types of fasteners and joints used to make your structure strong

### Scoring Guide

Criteria	Comments	Score (circle only one)
Working model		Not done 1 2 3 4 5 Excellent
Mass of the structure		Not done 1 2 3 4 5 Excellent
Successful Operation of thrill ride (safety test)		Not done 1 2 3 4 5 Excellent
General appearance (Aesthetic appeal)		Not done 1 2 3 4 5 Excellent
Specification diagrams complete		Not done 1 2 3 4 5 Excellent
	Total	/25

## Examples

<https://www.youtube.com/watch?v=ASkhLcTLgF4>

