**Structures and Forces
End of Unit Project**

**Reference:** **Reverse Bungee Drop of Doom** (Textbook pgs. 344 - 345)

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 the 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 safely 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
· No commercial construction kits are allowed (Some kit components can be used)
· The ride must operate three times during the test

**The components of this project**, to be evaluated, include:

· The actual working scale model 'thrill ride'
· A Scientific Drawing of the ride

* labelling 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 and forces are acting).
* the center of gravity and thrust line of your structure
* a description of the live and dead loads the structure must carry
* the types of fasteners and joints used to make your structure strong

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| **Scoring Guide**  |
| **Criteria** | **Comments** | **Score (Circle only one)**  |
| Working model |   | Not Done 1 2 3 4 5 Excellent  |
| Mass of structure compared to other successful entries |   | 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**  |