**EVENT 3: SLOW DESCENT ROLLER COASTER**

*(Modified 2/6/2021)*

**OBJECTIVE:** To construct a slow descent roller coaster.

**RULES:**

1. The coaster must be designed and built by the team.
2. The coaster must be brought to the competition fully assembled.
3. The track is to be constructed from only standard size toothpicks (no larger than length 7.60 centimeters (3 inches) and width 1.80 millimeters) and white, clear drying, water soluble glue.
4. The coaster is to be designed so that a glass, unmodified marble, approximately 16 millimeters in diameter, will descent the coaster in the greatest amount of time.
5. It must be clear to the judge(s) that the marble is in continuous motion: the marble may not stop or be moving so slowly that it appears not to be moving. Slowly is defined as no discernible motion within a 5 second interval.
6. The marble must always be moving in a forward direction.
7. The energy to run the coaster is to come from only gravitational potential energy. No other form of energy may be used to increase, decrease, or maintain the speed of the marble.
8. Then marble must complete the descent within 30 minutes.
9. The coaster may not exceed the following dimensions: 1 foot wide by 1 foot long by 1 foot high.

**COMPETITION AND SCORING:**

1. The team will set up their coaster so that the judges and spectators can view and measure the descent time of the marble virtually using zoom meeting
2. The team will position their marble and signal the judge(s) to start virtual timing once the marble is released.
3. Only one team member may set-up the coaster, release the marble or modify the coaster during trials. No assistance from other team members other than verbal communication, either in-person or virtually, is allowed. Teams that meet in-person must socially distance and wear facemask.
4. Timing will cease when the marble completes the course, stops, rolls backwards or leaves the track.
5. If the marble stops, rolls backwards or leaves the track within 5 minutes after the release of the marble, the team will be allowed a second try.
6. The team will have five (5) minutes to alter the coaster if a second trial is needed.
7. The winning coaster will be the coaster designed with the slowest descent time for the marble and the greatest number of vertical loops.
8. For each vertical loop of at least 60 degrees to the vertical, 25% of the descent time for the marble will be added to the score.
9. For the loop to count towards the score, the marble must travel around it and stay in contact with the track.
10. For the team to be eligible to enter their coaster into the competition, the instructor of the team must verity that at least half the members of the team participated in some way in the building and designing process of the coaster.

**FINAL SCORE = { (your score) / (winning score) } X 100**

*Updates to the rules and frequently asked questions with answers will be posted on the NJAAPT Wild Apricot website. It is the team’s responsibility to keep team members updated about changes and clarifications to the rules.*