

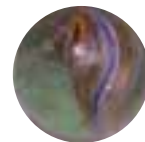
MARBLE



by Rich Massey



MANNA



ere's an exciting roller coaster project and the best part is, no one will become ill. Using very simple and inexpensive supplies, the middle school students design and build a roller coaster with a special twist. The challenge is to make the marble roll SLOWLY! Their grade is based on creativity and the elapsed time in which the marble stays in motion. The clock is stopped when the marble comes to a stop.



To choose teams, I take the number of students in the class, divide by two, and then write the names of popular roller coasters on slips of paper. The name of each roller coaster is written twice so each student will find his/her match. The slips of paper are placed face down and each student draws one to find out who his/her partner will be. If the class has an odd number of students, that person is assigned to what I perceive to be the weakest team.

Project requirements and sketching then follows the project. The students may use some or all of the materials on the supply list, but no extra items. As stated earlier, their task is to construct a SLOW moving roller coaster. As the teams determine the best track designs, thinking skills are utilized from day one. Baffles, bumps and ridges may be used to slow down the marble; however, the students are not told how to slow it down. At the end of the run, the marble must end up in the box, even though the track may extend beyond its perimeter.

By day five, the students are begging to borrow my stopwatch so they can time their devices. By day seven, they are whispering creative ideas to teammates so other groups can't hear them. Day ten is finals. Each team gets three attempts at the slowest roller coaster. The students' longest time is recorded. Grades are based on elapsed time and creativity.

The objectives include: design concepts, teamwork, simple engineering skills, and construction techniques. The instructor may choose to take this project to a higher level by discussing today's high-speed roller coasters. This discussion would include: energy, friction, inertia, history, safety, comfort, braking, etc. A homework assignment could be to draw and describe the roller coasters of the future. Students could vote on the best roller coaster in the area and discuss why they chose it and why they believe it's the best.

The students love this exciting educational activity. Before class, they pull the project out of the storage closet before roll call! An important consideration is that the projects are delicate and require adequate storage facilities – some of them are up to two feet high.



The following is a list of supplies needed to complete this project:

SUPPLY LIST

- 1 empty soda box 11 x 16 (24 cans)
- 40 index cards
- 20 drinking straws
- 30 spaghetti sticks
- 1 pair of scissors
- 3 ft. string
- 10 craft sticks
- 12" of masking tape per day
- hot glue or white glue
- stopwatch

PLAN OF PROCEDURE

- Day 1** Sketching and design
- Day 2-9** Construction
- Day 10** Final competition

If you have any questions, you can contact Rich Massey at Rmassey@pgs.K12.va.us