

Here are a few tips for Roller Coasters.

1. You need about 45 minutes with this activity--10 minutes for the demonstration, 30 minutes to build the roller coasters, and 5 minutes for the cleanup.
2. There needs to be a lot of wall space that is flat. The roller coasters can't be put on walls that go around doors or wall that have things that protrude out from it.
3. Each roller coaster space needs as at least 10 feet of wall or they start running into each other.
4. No more that 4 per group--however, 3 per group are better.
5. Explain to the students what an engineer is--a person who uses science concepts to build things. Examples: bridges, buildings, amusement park rides, cars, airplanes, telephones, computers, lighting systems, etc.
6. Tell the students they are going to be engineers by building roller coasters.
7. Things never work the first time for an engineer. There will be setbacks. They will have setback and will need to tweak things to make it work. It may take 5 times to make things work.
8. When they tear off the tape, it needs to be between 9 inches and 12 inches long so that when it is put on the wall to hold the track the tape doesn't interfere with the groove the marble is rolling in.
9. Tape needs to be at every valley and every hill so the tubes don't wobble. If they wobble when the ball is going on the groove, the ball loses power and will slow down and won't make it up the hills.
10. Make sure everyone gets to participate by giving input. Explain that being an engineer need to be a team effort.
11. Give a demonstration at the first how to make a roller coaster with simple hills and valleys.
12. Tell that when the marble goes down the hill that it is collecting energy by storing it inside the ball for when it begins to go up the hill, the stored energy is now being used to go up the hill.
13. Show that if the marble doesn't make it up the hill, that the previous valley needs to be steeper to give the marble more power to make it up the hill.
14. Show that if the marble flies off the hill that less power is needed by making the previous valley not so steep.
15. They are to first build a simple roller coaster with hills and valleys. The ball has to make it to the end of the tube. They have to show you that it works.
16. Second, they build a roller coaster with one loop. There needs to be a lot of power to go around a loop so the slope has be pretty steep that goes into the loop.
17. When they begin a new roller coaster with a loop, don't have them tear the whole thing down. Just take the tape off of the last four feet of the first roller coaster and flip that part around to make a loop and continue by putting the tape down.
18. Third, they need to build a double loop and then a triple loop and so on for the groups that are doing well.
19. Some teams will do better than others, but that is all right. However, they should be successful in making a roller coaster with just hills and a loop within the half hour.
20. You can walk around and give them hints on what to do so it will work, but don't do it for them. They need to experience setbacks, recognize where the problems are and then rebuild where the problems are.
21. If they have a piece of tape that is not usable, have them roll it up into a ball in their hands and throw it away. Don't put it on the floor where it will be too hard to pull if off the floor.