Make a Roller Coaster

Test your knowledge of physics by making your own roller coaster. You can make a roller coaster out of just about anything, but below you'll find a list of materials to use as cars, to make tracks, to support your tracks, and to make hills. You may find some materials work better together than other materials, especially depending on the size of your track and cars.

Materials: This table gives you a list of suggested materials to use as cars, tracks, adhesives, and supports to make your roller coaster. You will not use all of these items, but hopefully this can help you make your roller coaster with items you already have and/or can easily obtain.

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| --- | --- | --- | --- |
| CARS | TRACKS | ADHESIVES | SUPPORT |
| Marbles | Vinyl tubing | Tape | Staircase |
| Ball bearings | Poster board | Glue | Books |
| Metal B-Bs | Cereal boxes | Clay | Chairs |
|  | Cups | Staples | Bed |
|  | Foam insulation tubes |  | Wood blocks |
|  | Cardboard tubes |  |  |

What to Do:

Spherical objects such as marbles and ball bearings tend to make the best "cars" for your roller coaster. The size of the marbles/balls needed depends on the type of material you use for your tracks. For instance, while vinyl tubing works well to make tracks that bend and curve, only small objects like B-Bs and ball bearings can actually fit in most vinyl tubing. However, vinyl tubing is probably the easiest material to make tracks with, so we recommend using it for your first attempt at making a roller coaster. Most hardware stores carry vinyl tubing in a variety of sizes, so test your cars to make sure they can move through it before you purchase it.

If you use poster board or cereal boxes, cut out long strips to make your track. You may have to build walls or sides to keep your car from falling off.

Whatever material you use, build your track so that the cars can run smoothly on it - no cracks or seams that will trip up the cars.

Use the adhesives to connect track pieces together as well as connect the track to your support system.

Remember the laws and forces of motion when building your roller coaster track. Your first hill must be the tallest to build up enough potential energy to get your car through the track. Adjust hills and loops so that the car will have enough velocity to make it through the course without having so much speed that it flies off.

You may want to try several different cars with different sizes and weights to see which car moves through your track the best.

What's Happening?

You may find it very tricky to build the track just right so that the car can make it all the way through without falling off. Ride makers of roller coasters face these same challenges: how to make a fun, thrilling ride that is also safe. But by following the laws of physics, ride creators can make rides both fun and safe without a lot of trial and error, which is a good thing for the riders!

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