



Project of the Week:

The Amazing Recycled Roller Coaster

Hello to My Thinker Tank Friends,

This week you will learn about friction, speed and centripetal force just by having fun making a cool trick and fun-tastic rollercoaster out of stuff you have around the house.

Here is a fun and exciting project to work on this week.

Thinker Tank Quick Activity: The Upside Down Cup of Water Trick

Materials needed (always ask for permission to use):

- String or Yarn
- A Plastic Cup
- Something to make a hole in a plastic cup.

Read the instructions:

1. Carefully poke (or have an adult poke) two holes opposite each other near the top rim of the cup.
2. Cut a piece of string about as long as you are tall.
3. Tightly tie one end of the string to each hole in the cup to form a long handle.
4. Fill the cup about halfway with water.
5. Go outside to an area where it's okay if you spill a little water and where you will not hit any nearby people or objects while twirling the cup.
6. Start twirling the cup to the side with the cup going over your head in a *horizontal* circle (so the cup moves parallel to the ground). *How fast do you need to spin it to keep the water in the cup?*
7. Gradually transition to twirling the cup in a *vertical* circle. *Does the water stay in the cup, even at the top of the loop?*
8. If the water spills out of your cup, refill it and try again. Make sure you twirl the cup faster this time. You can also fill it with less water if you continue having trouble.

Watch the video: [paste link to video]

Try 2: Try the activity with solid objects instead of liquid. What happens if you put a toy in the cup?

Try 3: Try changing the length of the string. Does making the string longer (or shorter) make it easier or harder to keep the water in the cup?

Try 4: Try changing the amount of water in the cup. Does adding more water to the cup make it easier or harder to prevent the water from spilling?



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Observe and record your results

As long as you only fill the cup about halfway, you should be able to twirl the cup in a horizontal circle and then transition to a vertical one without spilling any water. It can be difficult to go directly to a vertical circle because the cup might not be going fast enough on the first loop to prevent water from spilling out. If you fill the cup with too much water, it can also be difficult to prevent some spillage.

Thinker Tank Main Activity: **The Recycled Roller Coaster**

Materials needed (always ask for permission to use):

- Something that rolls (a marble, ping pong ball or any kind of small ball you have.
- Tape (masking tape is best but clear tape will work too)
- Toilet Paper or Paper towel rolls
- Paper- any kind
- Paper cup and Plates and Bowls if you have them.
- Any kind of cardboard use recycled cereal boxes or any kind of box.
- Anything that is okay for you to use will work making a roller coaster.



Just gather your materials and find a place where it is okay to make your roller coaster. Try putting pieces together however you see them fit together. Create a plan. Try it out (If it doesn't work, don't worry, just try it again). That's it.

Remember to start out high to give your marble the momentum it needs to make it to the end.

Here are some videos to get you thinking.

1. [Intro Video](#)
2. [Example one](#)
3. [Example two](#)
4. [Example three](#)

Fun Roller Coaster Facts:

- One of the first high-speed coasters was *Drop-The-Dip*, at Coney Island, Brooklyn, NY (1907). At this time lap restraints started to be used.
- The first tubular steel coaster was the *Matterhorn Bobsleds* at Disneyland, Anaheim, CA (1959).
- Knott's Berry Farm, Buena Park, CA, introduced the *Corkscrew* (1975), the first coaster to completely invert passengers.
- *King Cobra*, Kings Island, Cincinnati, OH (1984) was the first roller coaster that allowed people to stand up.

Now go make the greatest recycled roller coaster ever!

