

Spinner

Some background info for you:

There is a bunch of physics to be learned from this toy. You will notice that when you **rotate** the crank, the container of water begins to spin just as well. This is because they are connected by the bands that you see – this is called a **pulley system**. The pulleys (the things that rotate) are connected to the bands, which rotate together thanks to you.

However, if you look closely, you will see that sometimes the container spins faster or slower than how fast you are spinning. Why does it do this? Look carefully. One end of the band is on a circle with a different **diameter** from the other end of the band. This makes one pulley spin **faster or slower** than the other one.

Try playing around with different combinations of **ratios** – in other words, try putting one end of the band on the biggest circle, the other end on the smallest circle, or even reverse it. **Your goal is to make the water in the container rise to the tapeline.**

For your memory:

1. What combination of diameters made the container spin the **fastest** (big/medium/small)?
 - Crank: _____
 - Container: _____
 2. Why does the smaller circle spin faster than the bigger circle?
 3. Why does the water rise?
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For your interest:

The distance around a circle is called a **circumference**. When the big circle and smaller circle spin together, the smaller circle has to cover the same circumference as the bigger circle, meaning it has to spin more in the same amount of time. This is why the smaller circle spins faster. Also, this is the answer to the second question.

When you are in a car that is turning, you should feel a push, also known as a **force**, to one direction. This is because things (and people like you) want to go in a straight line, but the turning car is keeping you from doing so. This is the same case in the **water level rising**. The water would love to go in a straight line, out of the container, but the container keeps them inside. And since there is already something below the every “piece” of water, they have nowhere to go but up.