

# Amaze Your Brain *at Home!*

EXPERIMENTS

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## SPIN CLASS

Angular momentum is a measure of how much, how fast, and in which direction something is spinning. If no friction or other pushes or pulls interfere with a spinning object, this angular momentum does not change. Use your knowledge of this fact to spin faster!

### MATERIALS

- 2 heavy objects (the heaviest objects you can hold at arm's length, such as full jugs of milk or soda)
- A helper



### INSTRUCTIONS

1. Position the chair in an open spot where you will not bump anything when spinning.
2. Sit in the chair with one heavy object in each hand and your arms stretched out from your sides. Your arms should make a letter 'T' with your body.
3. Ask a helper to start spinning you slowly. Then ask them to let go and step away while you spin.
4. Quickly pull the heavy objects in toward your body. Did your spin get faster?



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## SPIN CLASS

### TRY IT ANOTHER WAY!

You can experience a similar concept by standing and spinning in a circle with your arms out and making a 'T'. Without changing how fast you are spinning, pull your arms in so your elbows are at your waist and your hands are at your collarbones. Was it easier to spin with arms out or in?

### WHAT'S HAPPENING?

The **momentum** of a spinning object relates to its shape and how fast it is spinning. If it is left by itself, the momentum of a spinning object does not change. If the shape changes, so does how fast it spins.

That is why when you changed shape by moving your arms closer to your body, you spun faster. The heavy objects in your hands made this effect more obvious, because you made a bigger change to your shape. We can see this same effect when a dancer or figure skater begins to spin faster when they pull their arms and legs toward their body. Scientists use the term **moment of inertia** to talk about the shape of a spinning object in relation to its momentum.

If no person interfered by stopping your spin, why did you stop? There was something else interfering with your spin: friction. The friction of your chair slowed and eventually stopped your spin. Think of ways you could reduce friction to spin even longer!



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