

**Answer on Question#40097 – Physics – Mechanics**

When a high diver wants to execute a flip in midair, she draws her legs up against her chest. Why does this make her rotate faster? What should she do when she wants to come out of her flip?

**Solution:**

Once off the board, the high diver has no torques on her so her angular momentum remains constant. Her angular momentum is the product of her moment of inertia and her angular speed. When she pulls herself into a "tuck" position, this makes her moment of inertia -- her "rotational mass" -- small. To keep the angular momentum constant the angular speed increases.

When she comes out of the "tuck" position and extends her body, this makes her moment of inertia large and her angular speed decreases to keep her angular momentum constant.

It is more fun to watch this executed by a high diver or a figure skater. But you can demonstrate the same ideas yourself on a rotating chair with a couple of heavy books in your hands. Or, we have also demonstrated this in class with a nice turntable and weights,

