

Rotating Stool

Apparatus

a stool which rotates smoothly,
small hand held weights,
enough floor space for other students to stand well back.

Action

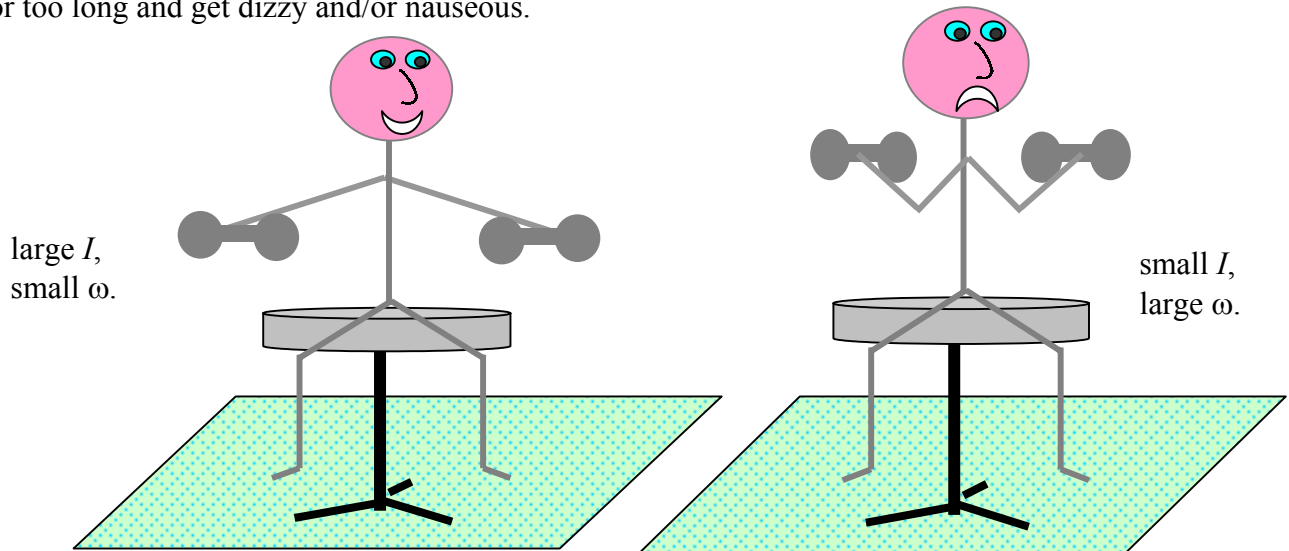
The students take turns sitting on the stool and being spun SLOWLY by each other. They should start off with their arms drawn in, so that they can brake by extending their arms. If they start with arms out they can spin very quickly and fall off when they draw their arms in.

The Physics

When the hands are stretched the system has a larger rotational inertia and a smaller angular velocity. When the hands are pulled inward towards the body the rotational inertia decreases and hence the angular velocity increases. Angular momentum of the system (person and weights) is conserved.

Notes:

It is important that other students stay well clear of the chair to avoid mishaps, and students do not rotate for too long and get dizzy and/or nauseous.



Accompanying sheet

Rotating Stool

Sit on the stool with equal weights in your hands.

Start rotating with the hands stretched out
and slowly bring your hands towards your chest.
What happens? Why?

What happens when you stretch your arms out again?

**Warning: Stand well back from the chair when it is in use!!
Do Not Rotate Too Quickly!!!**