

# Topsy Turvy Toss

October 2023

Columbia University Neuroscience Outreach

## Objectives:

- Learn about neuroplasticity and sensory adaptation

## Materials:

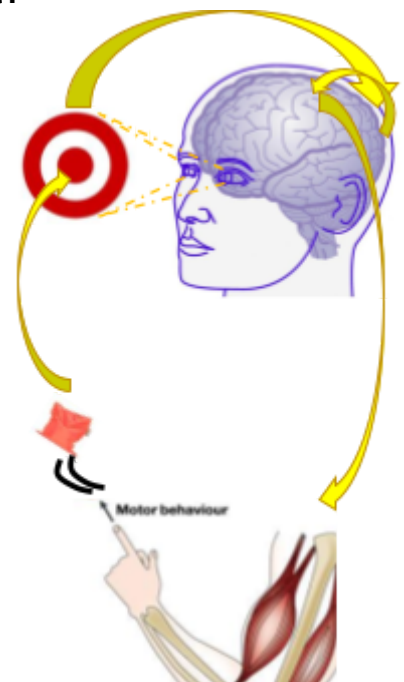
- Vision shifting goggles
- Cornhole boards
- Bean bags

## Possible Introductory Questions/Comments:

- **Q: Do you know what it means to adapt to something?** What do you think it would mean for one of your senses to adapt? *Give example of adapting to an odor (i.e. not smelling it after a few minutes)*
- **Q: How easy do you think it is for our brains to adapt?**

## Activity:

- **The experiment:** How does our brain adapt to a shift in vision?
- Have a student throw the bean bag at the target (cornhole board) several times
- Now, have them put on the vision shifting goggles and throw the bean bag to the target again 3~5 times.
  - Be careful not to let the kids walk around with the goggles, since they might fall/bump into things.
- Tell the student to remove the goggles and quickly throw the bean bag again. They will probably miss! Because they have adapted to the vision shift, they will have trouble even with their normal vision.



## Possible wrap-up/follow-up:

- **Q: Why was it hard to hit the target once they put the goggles on?**
- **Q: How did your brain adapt?**
- **Q: Why would it be important for our brains to adapt in this way?**
- If students are curious, you can talk about the brain regions involved in this task. Our visual system and motor system work together



to make coordinated movements, and with the help of our cerebellum, we can correct movements pretty quickly when our visual fields are shifted!