

# DO IT!

## Act and React!

The nervous system allows our bodies to react to different stimuli. This exercise investigates the time it takes us to react to a stimulus, and how changing variables may change reaction times by causing our brains to work harder.



### You'll Need

- 1) Plastic or Wooden Ruler (12 in or 30 cm)
- 2) Paper
- 3) Pencil
- 4) Calculator

### Smart Start:

Discuss reactions and reflexes. A reflex is an action that happens automatically, like shivering or blinking when a puff of air hits your eye. A reaction is voluntary, requiring a person to sense something, process the information, and then react to it.

- 1. Discussion.** What do you know about reactions? What could cause reaction times to be fast or slow?
- 2. Begin Experiment.** Work in groups of two or three. One person will drop the ruler ("dropper") while the other catches it ("catcher"), and another records the data ("recorder"). If working in groups of two, the dropper and data recorder can be the same person.
  - Drop the ruler: The dropper holds the ruler at its top, by inch 12 and/or centimeter 30, with the ruler hanging straight down.
  - The catcher places their thumb and index finger at the bottom, by inch and centimeter 0, but not touching the ruler.
  - The dropper will let go of the ruler, and the catcher will try to catch the ruler as fast as they can.
  - The recorder will record the distance dropped. Hint: repeat the test multiple times and averaging the time in order to get a better idea of your reaction times:
  - Add all your numbers together Divide by how many numbers you have
- 3. Repeat.** Have students Repeat the test, changing one variable at a time:
  - **Distraction Test:** Have the catcher say out loud every other letter of the alphabet while waiting for the ruler to drop.
  - **Auditory Test:** The catcher closes their eyes. The dropper will say 'drop' as the signal for the

catcher to catch the ruler.

- **Tactile Test:** The catcher closes their eyes. The dropper will touch the shoulder of the catcher as they let go of the ruler. The catcher will catch the ruler when they feel the shoulder touch.

**4. Alternate.** Switch roles, so that each member of the group has information about their reaction times.

**5. Review.** Have the young people display their data in a chart, graph, paragraph, sketch, or other way. Be creative!

- What did you learn?
- How did using different senses (touch, hearing, sight) affect your reaction time?
- What does this tell you about how your brain processes info?
- What other factors might affect reaction time (e.g. sleep deprivation, age, etc.)?
- Why is it important to learn about reaction times? [For example, multi-tasking like being on a cell phone while driving can slow reaction times, causing accidents.]