

Reaction Time and Distracted Driving

INTRODUCTION:

Objective/Learning Targets:

Understand the influence of distractions on reaction times under various conditions.

RESOURCES

Materials:

- Stopwatch (optional)
- Rulers
- Reaction time charts
- Pens/pencils
- Tape measure
- Chalk or cones (to mark distances outside)

Amount of Time: 45 minutes

Age Range: 4th grade and up

ACTIVITY/PROCESS

1. Ask the students to divide into pairs. Give each pair a ruler, charts, and pencils.
2. Explain that our goal is to test how quickly we can react under various conditions.
3. One student will hold the ruler over the other student's hand and drop it. The catching student should have their hand poised to catch the ruler, but should not actually touch it until the ruler is dropped.
4. Have the students drop and catch the ruler, giving each student a chance to fill both roles a few times. Each time, have the students record how many centimeters of the ruler fell through their hand before catching in.
5. Tell the students that now we are going to test our different senses. Ask them to name all five senses, and then decide which of the five senses we've been using so far to know when the ruler is dropped.
6. Invite the students to test different ways to experiment on the senses. For instance, the catching

student could close their eyes and use sound (a cue from the dropping student) or touch (being tapped on the arm by the dropping student). Test and record the dropping distance under these different scenarios. Which senses allowed for the fastest and slowest reaction times?

7. *Older students* may be asked to calculate the average of their different drops or the mean and median drop distance of the entire group.
8. Explain the concept of reaction time and how the human brain processes the need to react to something:

Reaction time is the length of time it takes to respond to a stimulus. Reaction time depends on nerve connections and signal pathways from the skin (touch), eyes (sight), ears (sound), tongue (taste), and nose (smell) to the brain. Some reaction times occur naturally such as blinking to cleanse the eyes. Other reaction times are the result of a choice and can be improved with practice such as learning to swing a baseball bat. Reaction time is important when driving, when playing sports, in emergency situations, and in many day-to-day activities.
9. Ask students to share times in their life that reaction time is important. Ask them what might slow down their reaction time in those situations (fatigue, distractions, etc.).
10. Test reaction time while adding distractions. Have the students break into groups of three and return to their original setup (having their eyes open to see the ruler being dropped). One student will drop the ruler into the second student's hand. The third student will be trying to distract the catching student—noise, funny faces, asking questions, etc. Record the reaction time.
11. After students tried all three roles, ask them to share: did distractions make you catch the ruler more slowly? What distractions were harder to overcome?
12. Discuss how driving (car, ATV, snowmobile, bike) is a really important activity in which to avoid distractions. Emphasize that part of the danger is that these vehicles move quickly in very short amounts of time. Explain how even pedestrians can put themselves in danger, by texting and walking, for example because safety requires every traveler to be alert and ready to react.
13. Go outside to the pre-set course. Show how far a car at 30 mph moves in five seconds (220 feet). What happens if a driver is distracted while moving this quickly? How far will they travel before they can stop? Ask the students to name distractions that drivers might encounter.
14. Ask the students to run down the course. Yell “stop” and see how much further students move after hearing the command to stop. You might want to make the sprints five seconds to correspond to the car travel time discussed above. Repeat the demonstration with a visual cue to

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stop (like a hand signal) rather than an audial one. Repeat the demonstration with distractions—have half of the students run the course while the other half distracts them, and then switch.

15. Have the students discuss how they can help encourage drivers to not be distracted. Ask students to suggest, then practice, phrases that students can use to ask a driver to put down their phone or stop other distractions.
16. Discuss how vehicle passengers can also do other things to keep themselves safe, such as wearing seatbelts in case a crash does occur. Practice asking fellow passengers to buckle up.

CONCLUSION

Conclusion: Describe the objective for the lesson and point students forward by connecting your objective to their own writing.

- Ask students to recall the scenarios in which they said reaction time is important.
- Discuss what distractions students face in their typical day and what the dangers would be of reacting too slowly