THE CHALLENGE
Understand and experience waves as they exist in traffic through marble modeling.

GRADE LEVEL
Pre-K and Younger Elementary School

ACTIVITY DURATION
Total 30 minutes. About 10 minutes to setup. Another 10 minutes to perform the two parts of this activity. Additional 5-10 minutes, depending on the length of the discussion and the amount of observations done.

MATERIALS PER GROUP
- 1 piece of cardboard about 11” x 17”
- A textbook
- Drinking straws
- Scotch or masking tape
- 40 marbles
- Marker
- Two erasers
- A matchbox car
- Lego about the size of a marble
- Yard stick, ruler, or other straight edge

SET UP
Divide students into groups of 3-5 children per group.

For Part I - Tape two straws on the cardboard to create one “lane” (see Figure 1) wide enough for one marble. Place two erasers or textbook underneath the cardboard to create a slight incline so the marbles will roll.

Figure 1: One Lane Set-Up
For Part II – Retape one side of the straws on the cardboard to create a second “lane,” (see Figure 2). Use a marker and the ruler to draw the lane striping in between the lanes. Place two erasers or textbook underneath the cardboard to create a slight incline for the marbles to roll.

Figure 2: Two Lane Set-Up

ACTIVITY

Part I
Demonstrate how vehicles bunch up when one slows down abruptly.

See “Set Up” for instructions (See Figure 1).
1) Release marbles at the top of the track at a consistent rate.
2) Let participants stop one marble at the bottom of the track.
3) Ask participants what they observe happening to the rest of the marbles.
4) Ask participants if they have experienced this in real life before when riding in a vehicle on the road. What kinds of things might cause a situation like this to occur?

Part II
See “Set Up” for instructions (See Figure 2).
1) Release marbles at the top of the track, on both lanes, at a consistent rate.
2) Tape down a Lego (acting as a roadblock) to one lane.
3) Ask participants what they observe happening to the rest of the marbles.
4) Ask participants if they have experienced this in real life before when riding in a vehicle on the road. What kinds of things might cause a situation like this to occur?

Note: This activity can be setup with a group of 3-5 students. Each can take turn to release the marble.

FOR DISCUSSION

Potential questions for discussion.
1) How wide are travel lane?
2) What was their experience when they were stuck in traffic?
3) What are some activities that could cause lane closure?
4) What happens when an accident is cleared? Does traffic resume to normal immediately?
5) What happens when traffic needs to merge?
6) Which lane should slow vehicles use?