

# E3 Interpreting Motion Graphs

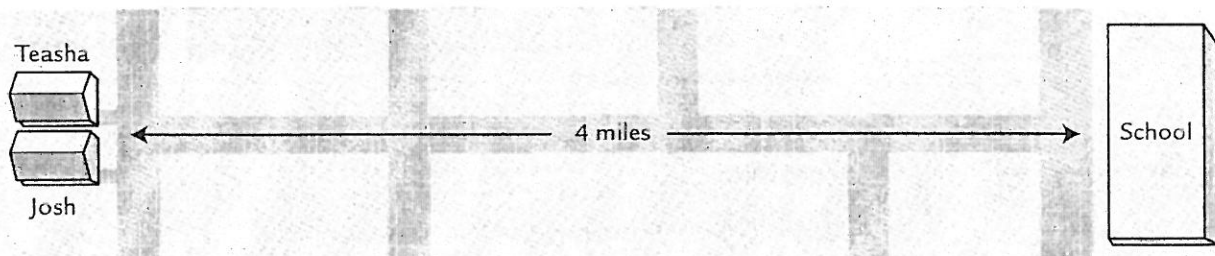


In the previous activity, you calculated the speed of a cart during its trip on a track. Sometimes, however, the speed of an object changes during a trip. For example, the driver of a car often changes the speed of the car because of traffic or road conditions. When the speed of an object changes over the course of a trip, a motion graph is useful because it shows the speed during all parts of the trip.

*Teasha and Josh live next door to each other at the end of a long straight road that goes directly to their school. They live four miles from the school, and their parents drive them there in the mornings.*

## CHALLENGE

How can you use a graph to describe motion?



### MATERIALS

*For each pair students*

- 1 set of 8 strips cut from Student Sheet E3.1, "Trip Strips"
- 1 Student Sheet E3.2, "Teasha's and Josh's Trips to School"
- 1 pair of scissors
- tape or glue

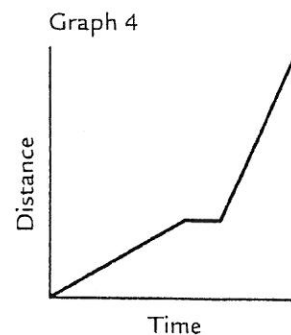
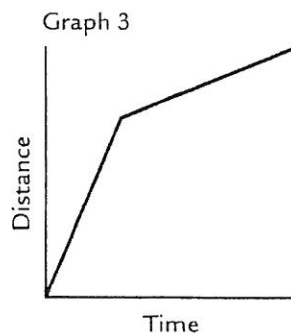
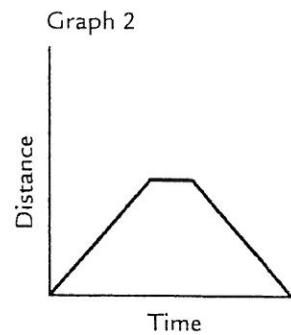
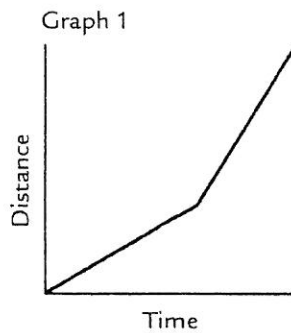
### PROCEDURE

1. Cut apart the 8 trip strips along the dotted lines.
2. Read the trip strips. Each strip represents a story or one or more pieces of a story for two stories mixed together. Some of the strips describe Teasha's trip to school. The others describe Josh's trip.
3. With your partner, identify the strip that matches each segment of the two motion graphs shown on Student Sheet E3.2, "Teasha's and Josh's Trips to School."
4. Glue or tape each strip onto the segment of the graph that it describes.
5. Explain your choices in your science notebook.

## ANALYSIS

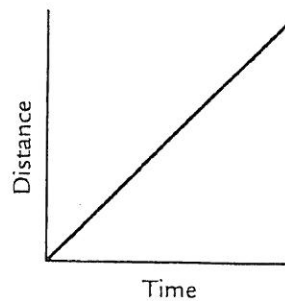
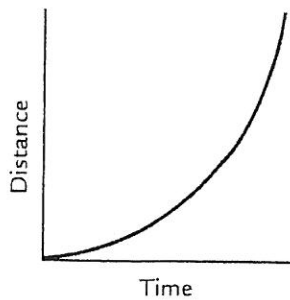


1. Identify a place on each graph where the slope of the line changes. What does a change in the slope of a motion graph indicate?
2. Which student—Teasha or Josh—started out faster? Explain how you know this.
3. How far into the trip did Josh turn around? Describe what the graph looks like at this point in the trip.
4. Look at the motion graphs shown below. Match the descriptions here to the correct graphs:
  - a. A car moving at a constant speed stops and then moves in the opposite direction at the same speed.
  - b. A car moving at a constant speed stops and then moves faster in the same direction.
  - c. A car moving at a constant speed changes to a higher constant speed.
  - d. A car moving at a constant speed changes to a lower constant speed.





5. A car that **accelerates** (ak-SELL-ur-ates) is one that changes speed or direction. Which graph below shows a car continually accelerating? Explain how the shape of the graph shows this.



### EXTENSION

Create one or more new character(s) also riding in cars for the scenario of this activity. For each character, make up another set of trip strips and a motion graph to go with them.