

# CHART YOUR COURSE

*Students use real-world scenarios to chart and explain time and distance.*

## TEACHER NOTES FOR DISCUSSION

Students will explore change represented in graphs comparing distance and time. It is important for students to exchange and share their graphs. This shows them how vital it is for data to be accurate. These real-world examples help students to see the relationship between the x-axis and y-axis.

The first exploration asks students to create a graph. The second exploration has students create a graph and a scenario to explain the graph. It is important to note that the graph represents the distance from home; therefore, points that fall on the timeline are closest to home.

## Objective

By the end of this activity, students should be able to interpret and create distance versus time line-graphs; and, write stories based on these graphs.

## RELATED STANDARDS AND BENCHMARKS

National Council of Teachers of Mathematics. *Curriculum and Evaluation Standards for School Mathematics*. <[http://standards-e.nctm.org/1.0/normal/standards/intr\\_MAIN.html](http://standards-e.nctm.org/1.0/normal/standards/intr_MAIN.html)>, March 16, 2000.

### Standard 2: Patterns, Functions and Algebra

- use symbolic forms to represent and analyze mathematical situations and structures
- use mathematical models and analyze change in both real and abstract contexts

### Standard 7: Reasoning and Proof

- make and investigate mathematical conjectures
- develop and evaluate mathematical arguments and proofs

### Standard 8: Communication

- organize and consolidate their mathematical thinking to communicate with others
- express mathematical ideas coherently and clearly to peers, teachers, and others

## Time Considerations

Instructor preparation:  
30 minutes

Student activity:  
two classes

# CHART YOUR COURSE

## UNDERSTAND YOUR MISSION

You will interpret a story of a boat trip along the Mississippi River and represent it on a graph, using your excellent reasoning and communication skills. Then you will make a story from a graph of a day's events of your boat trip. You will need to know what the x-axis and the y-axis represent.

### LEARN THE LINGO

horizontal	parallel to a plane following the horizon; represented as lines running right to left on a graph
vertical	perpendicular to a plane following the horizon; represented as lines running up and down on a graph
x-axis	a line on a graph that runs horizontally
y-axis	a line on a graph that runs vertically



### Gather Your Supplies

- graph paper
- paper
- pencil

## CHART A COURSE FOR EXPLORATION

### Exploration One

Rebecca left her house this morning at 7:30. She walked two blocks to Sally's house, arriving at 7:40. The girls ate breakfast and left the house at 8:00. One block from Sally's house, Sally realized she forgot her homework. Both girls hustled back to Sally's house getting there at 8:11. The girls then ran the three blocks to school, arriving just in time for the 8:30 bell.

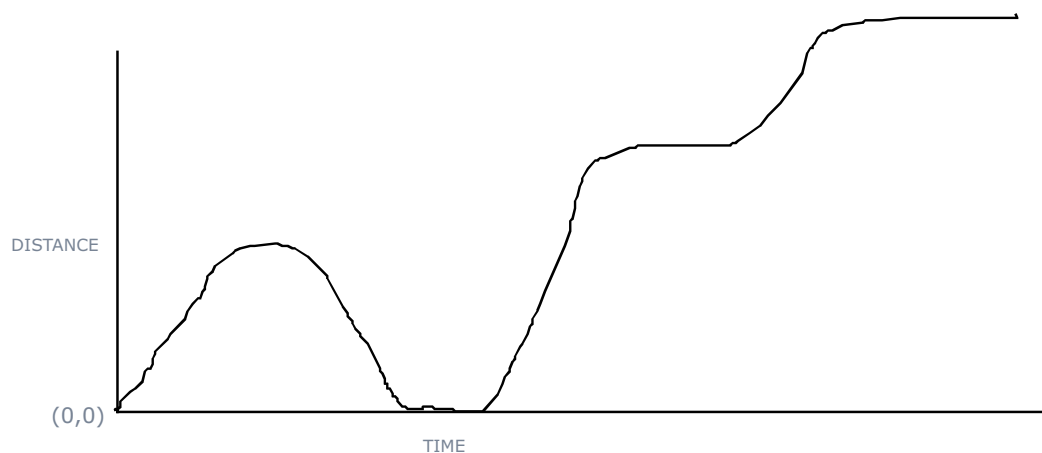
Use graph paper to draw a graph that shows the distance and time Rebecca traveled to school.

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## Exploration Two

As you travel down the Mississippi River in your houseboat, many events might occur. These events could cause your boat to pick up speed, lose distance, or stay at a constant rate. The following graph represents Day One on the river. The graph shows time on the x-axis (horizontal lines) and distance on the y-axis (vertical lines). Brainstorm some possible things that might happen as you travel down the Mississippi River. Study the graph. Write a story about what happened on this day. The story should be reasonable and associated with the graph.

Note: The origin of the graph,  $(0,0)$ , is the starting point for the day's trip.



## Go Beyond

Make a distance/time graph that represents your Mississippi River trip from the time you left home to when you returned home.

Describe a recent vacation, trip to the mall, or fantasy trip. From this description, make a distance/time graph.

Design a map to go with the story.

# CHART YOUR COURSE

## Peer Assessment

Exchange your graph and story with a partner. Answer the following questions.

1. Does the story's timing match the graph?
2. Are the axes on the graph properly labeled?
3. Are the axes on the graph properly scaled?

## Rubric Scoring Scale

Labeling and Scaling	
0	Most labels and scaling axes are incorrect.
1	Some labels and scaling axes are correct.
2	Labels and scaling axes are shown.
3	Labels, scaling axes, and plotting curves are shown.

Converting	
0	None of the needed information is kept while converting between the stories and graphs.
1	Some of the needed information is kept while converting between the stories and graphs.
2	Most of the needed information is kept while converting between the stories and graphs.
3	Can convert between the stories and graphs.

## REFERENCES

- . *Mathematics of Motion, Distance, Speed, and Time. (Teacher's Edition)*. Creative Publications, 1998.