

# Which Town Is Which?

## Focus

Reasoning about measurement relationships

## Summary

Students are presented with a simple map and measurement clues about the locations of towns on the map. They use the clues to identify the towns.

## Goal

- Reason deductively from measurement clues to identify locations on a map

## Connections

### *Measurement*

- Interpreting maps
- Comparing measurement units

### *Number*

- Adding (basic facts)
- Subtracting (basic facts)

## Prior Knowledge

- Identifying the longer and the shorter of two line segments
- Understanding terms for comparing distances (e.g., *farther*, *closer*)

## Materials

- Two poster boards
- A marker
- A copy of the blackline masters “Where Is It?” and “Where Is It? Challenge” for each student



## Investigation

### *Engage*

On a poster board, use a ruler to draw to scale the simple map in figure 4. Let two inches represent one mile. Label the distances and the towns as shown in the figure. Say, “This is a map. It shows towns.” Point out the dots that represent the towns, and name the towns. Say, “The map also shows roads.” Point to the roads. Explain that people must travel on the roads, and they measure the distance from one town to another on the roads.

Place your finger on Bolton, and ask the following questions:

- “Which town is twelve miles from Bolton?” (Kent) “How do you know?” (The road between the two cities is twelve miles long.)
- “Which town is five miles from Bolton?” (Hartford) “How do you know?” (The road between Bolton and Hartford is five miles long.)

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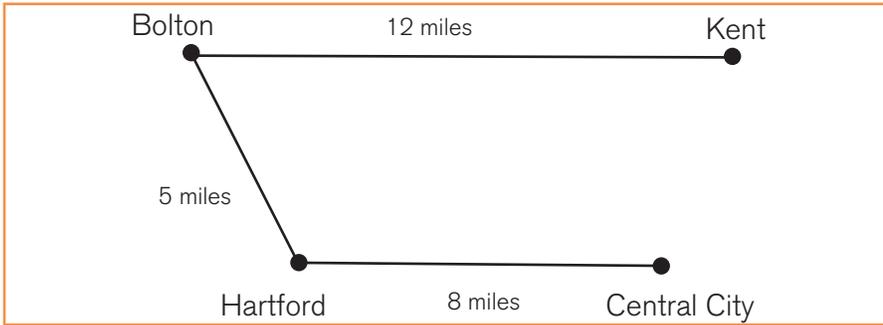


Fig. 4.  
Map 1

- “Which town is farther from Bolton—Hartford or Kent?” (Kent) “How do you know?” (Twelve miles is greater than five miles.)
- “Which town is closer to Hartford—Bolton or Central City?” (Bolton) “How do you know?” (Five miles is less than eight miles.)
- “If I leave Hartford and bicycle to Central City, how many miles will I bike?” (eight miles) “Show me on the map.”

Call on a student to point to Hartford and trace the road to Central City to show the eight-mile distance.

### Explore

Pose these problems about map 1:

- “I am thinking of a town. It is eight miles from Central City. Which town am I thinking of?” (Hartford)
- “I live in Kent. I drove twelve miles and then stopped. Which town did I stop in?” (Bolton)
- “I live in one of the towns on the map. My town is thirteen miles from Bolton. Where do I live?” (Central City) “How do you know?” (8 miles + 5 miles = 13 miles.)
- “I left home in the morning and drove to Bolton. In the evening, I left Bolton and drove home. Altogether, I drove ten miles. Where do I live?” (Hartford) “How do you know?” (One way is half of ten, or five, miles because 5 miles + 5 miles = 10 miles; Hartford is five miles from Bolton.)

Using the same scale as for map 1, draw map 2, in figure 5, on a second poster board. Next to each dot representing a town, draw a blank answer line, as shown. Identify only Lester on the map. Beside the map on the poster board, record the names of the other towns.

Once again, tell the students that the dots stand for towns and that the line segments that connect the towns represent the roads. Point out that only one town, Lester, is named. The job of the students is to listen to the clues that you will give them and figure out which town belongs with each dot. Read the clues below, one by one, and after each clue, ask the students if they can name any of the towns. Ask them to justify each answer that they give. Record the name of the town in the blank next to the dot. The solution is shown in the margin.

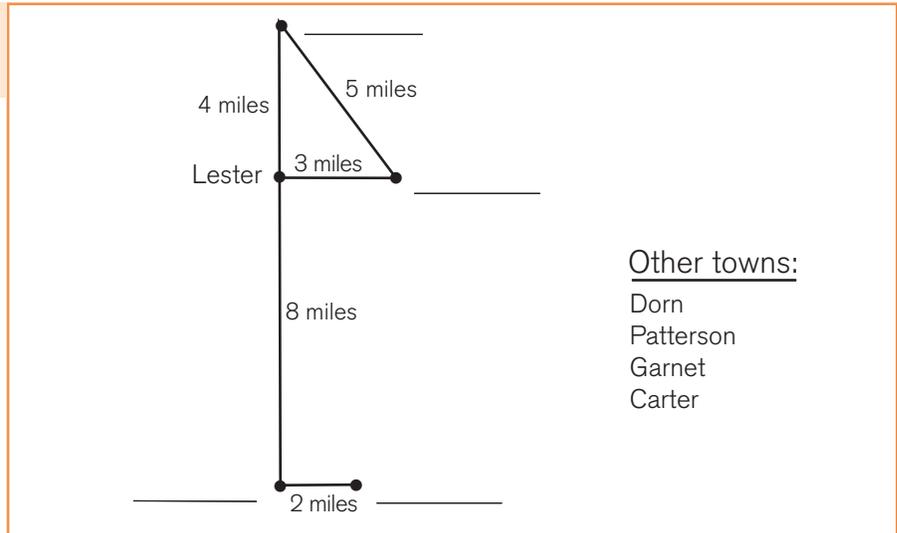
### Clues

1. From Dorn to Patterson and then back to Dorn is a total of four miles. (Dorn is two miles from Patterson.)
2. Garnet is the town closest to Lester. (Garnet is the closest. It is three miles away.)



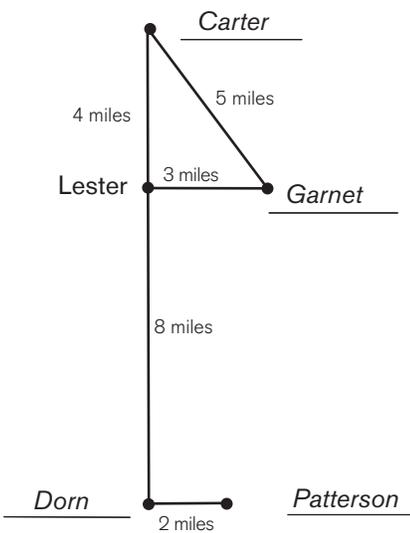
*“[The] development of reasoning is closely related to students’ language development and is dependent on their abilities to explain their reasoning rather than just give the answer.”*  
(NCTM 2000, pp. 125–26)

Fig. 5.  
Map 2



Other towns:

- Dorn
- Patterson
- Garnet
- Carter



3. Carter is four miles from Lester. Carter is five miles from Garnet.
4. Patterson is the farthest from Lester. (It is  $8 + 2$ , or ten, miles from Lester.)

Point out that the students may not be able to use the clues in order. For example, clue 1 is not entirely helpful until after clue 4 has been used to locate Patterson. Explain that some clues give information that can be used immediately, whereas others give information that can be used in calculations that can help the students identify a town. Clue 2, for instance, gives information that can be used directly. By contrast, clue 1 requires the students to understand that the round-trip total must be halved to yield the number of miles on the map.

Distribute the worksheet “Where Is It?” to each student. Have the students use the clues to identify the towns and then record the names on the answer lines. When the students have completed the worksheet, have them describe how they figured out the location of each town.

**Extend**

To give the students a greater challenge, you may wish to distribute “Where Is It? Challenge.” You could also give clues to use with a map of your state and identify towns that are, for example, closer to, or farther from, the town or city in which the students’ school is located.

**Discussion**

Which Town Is Which? allows students to interpret maps and focus on distances between points on a map. Students also learn to reason about relationships, as they do when they figure out the distance between two towns when the round-trip distance is given. Although the emphasis in this lesson is not on understanding map scales, the students may incidentally recognize that a longer “road” between towns corresponds to a greater number of miles and that a greater number of miles corresponds to a greater distance between towns on the map.