

Mapping the Woods: Maps and Cartography

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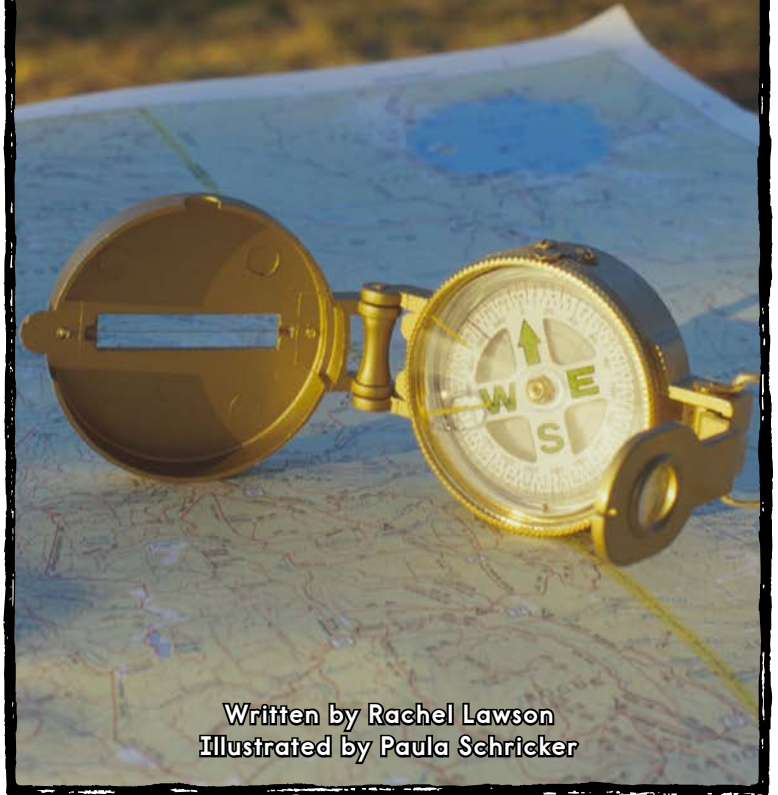


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Written by Rachel Lawson
Illustrated by Paula Schricker

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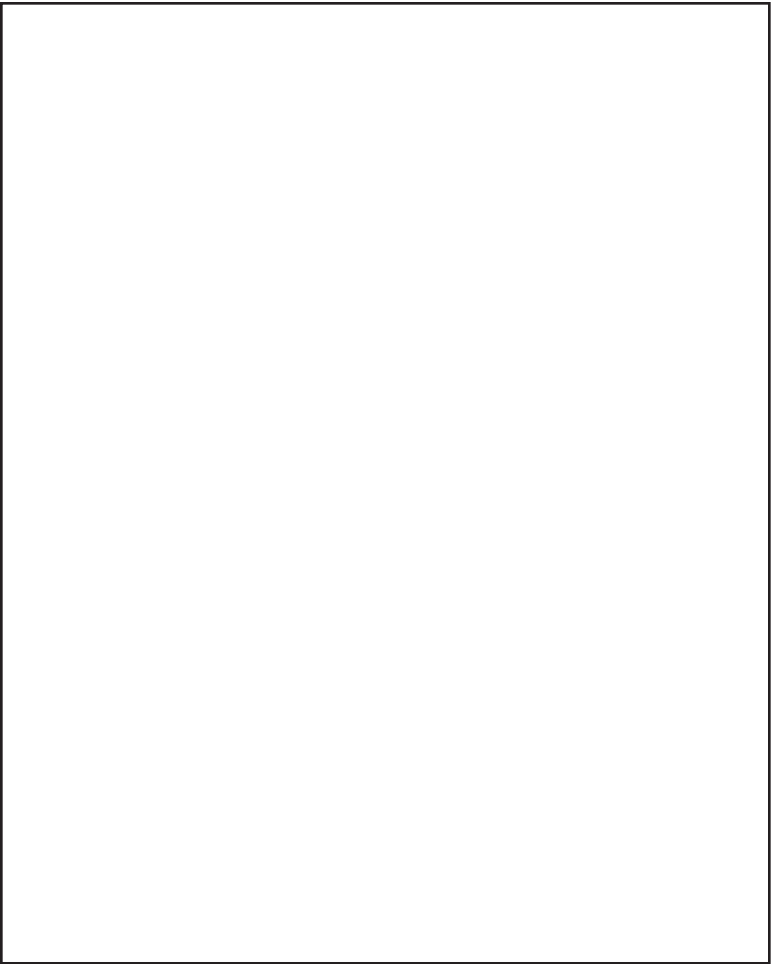
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Level W Leveled Book
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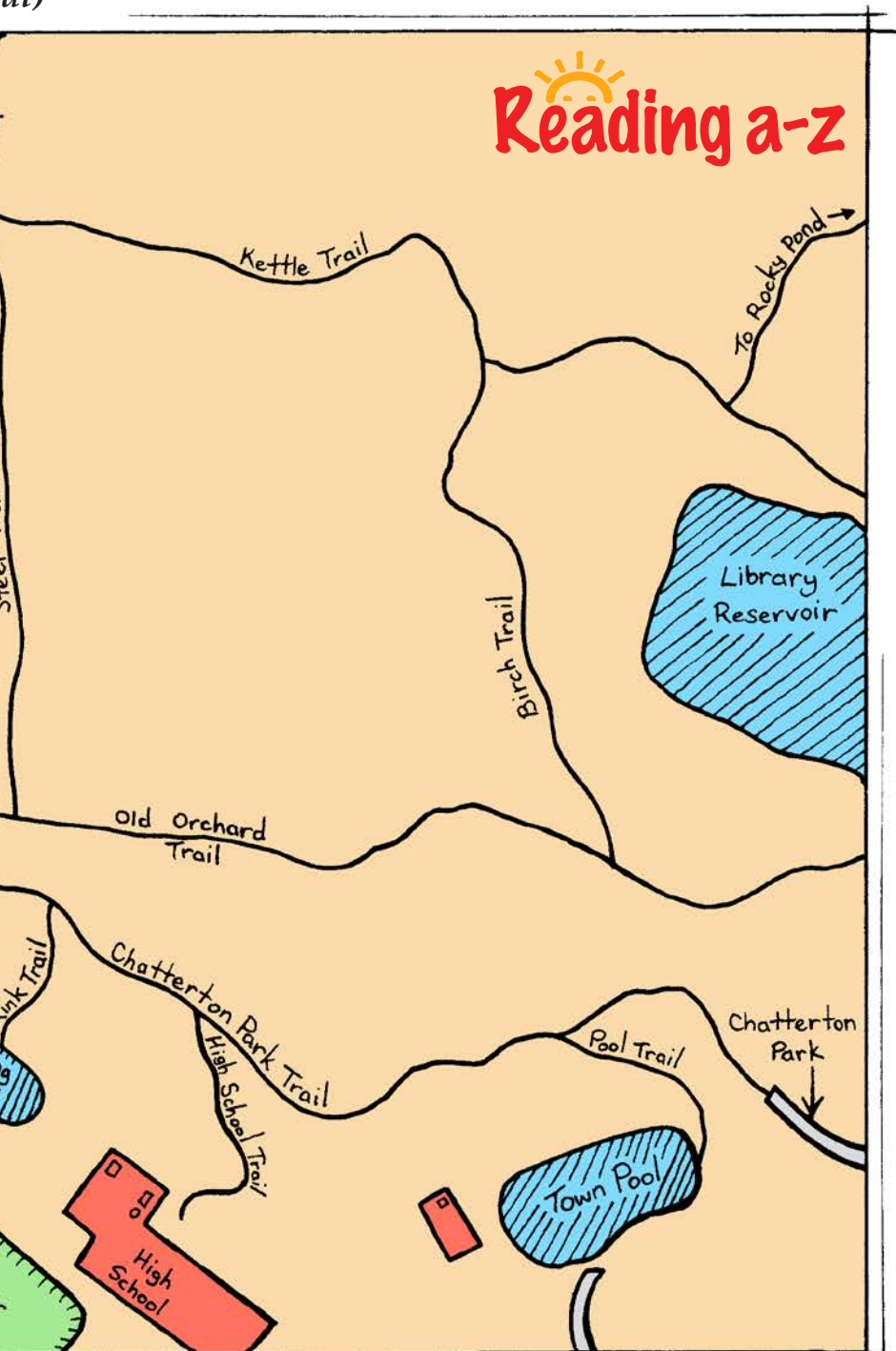
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Correlation

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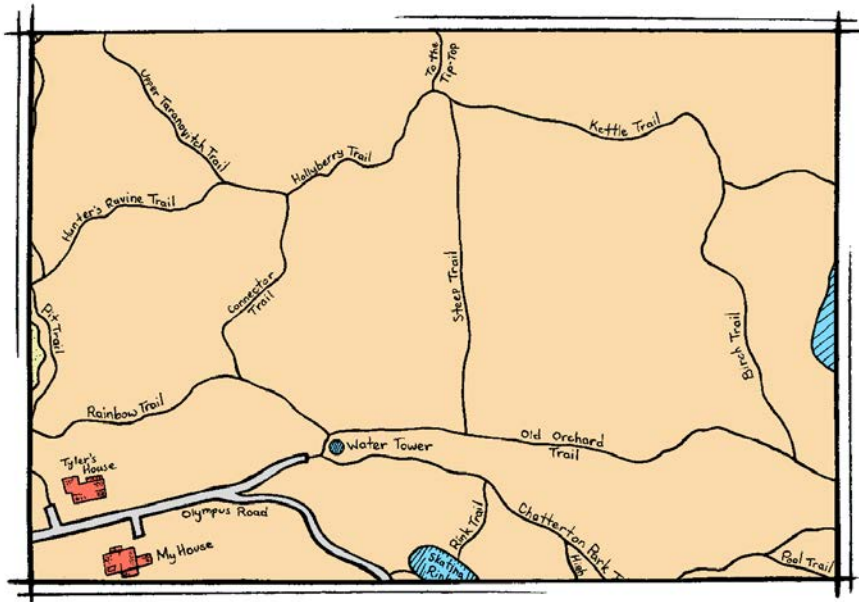


Map is not to be assembled with book.



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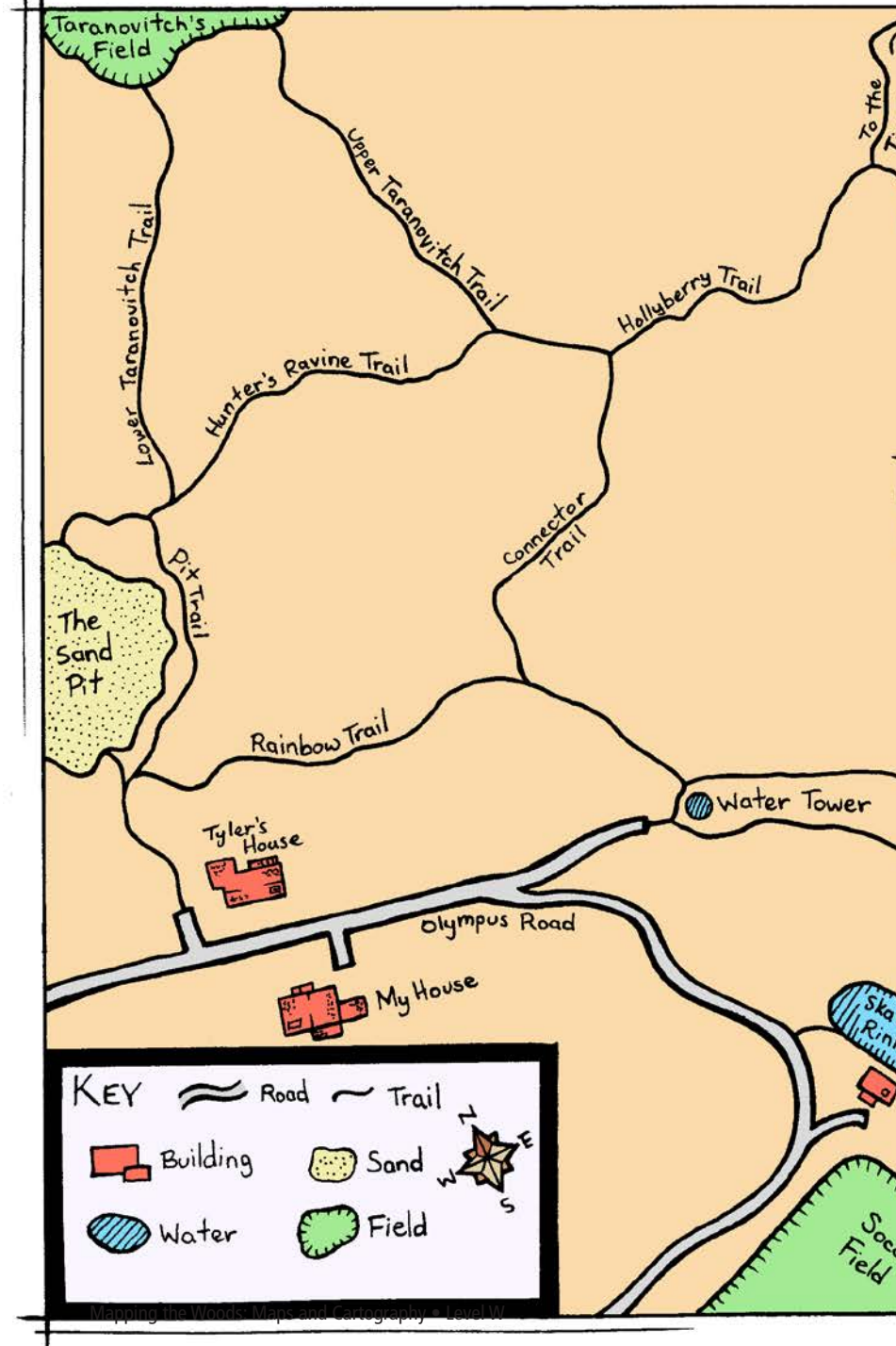
Maps and What They Do

This is a map I drew of the woods that are by my house. The map shows the trails, roads, and buildings near my house. Be sure you have a copy of my map to follow along as you read this book.

A map is a drawing of an area. It shows where things are in relation to each other. Most maps show an area from above, as though you were looking down from an airplane. In fact, that's how most maps are drawn today. Someone takes a photograph from an airplane or satellite, and then a mapmaker, or **cartographer** (car-TOG-ra-fer), uses that photograph to draw a map.

My Map by Rachel Lawson

(supplement)



Glossary

cartographer	a mapmaker (p. 4)
compass rose	a pointed symbol that shows where the directions are on a map (p. 7)
elevation	height of the land (p. 14)
key	the part of the map that explains what the symbols and colors mean (p. 6)
landmark	an object that help you find your way (p. 11)
pictorial map	map with pictures rather than symbols (p. 12)
relief maps	maps that use colors or shades to show elevation (p. 15)
scale	the size of one thing compared to the size of another; on a map, how big the area is compared to the map (p. 8)
surveying	mathematically measuring the distance and angle between objects (p. 5)
topographic map	a map that uses lines to show elevation (p. 14)

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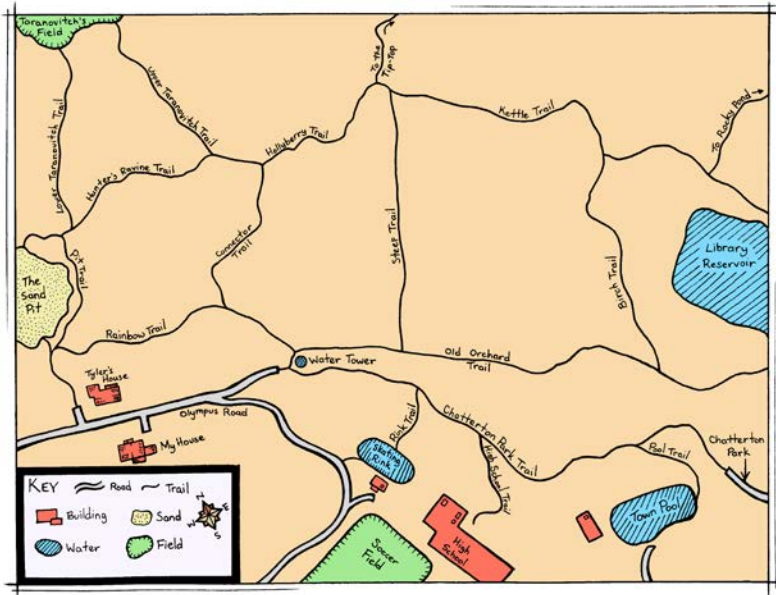
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Before there were planes or spaceships, people drew maps by carefully remembering where things were, how far away they were from each other, and which direction they were from each other. Maps were also made by **surveying**, or taking mathematical measurements of how far and in which direction things were from each other. Many small maps are still made by surveying. Surveying creates an accurate map, though it takes a long time to survey a large area.

I drew my map by remembering and guessing where everything was—it was very hard to do. Some things still might be the wrong size. But if you were lost on the trails by my house, you could use this map to find your way out.



This surveyor is using his equipment to take measurements.



What Is on a Map?

The Key

Most maps aren't an exact drawing of the way an area looks. For instance, I didn't draw the trees, grass, or buildings as they would look in a photo or painting. Cartographers use symbols so that their maps are easy to draw and read. Most maps have a box in the corner, called the **key**, that tells you what each symbol means.

The key on my map tells you the symbols I used to draw the woods and my neighborhood. The double lines are roads where cars drive. The single lines are walking trails. The boxes are buildings, and the slanted lines show water areas.



- 4 Notice the kinds of corners you turn. Draw a line that makes the same kind of corner in the same direction.
- 5 Write the name of each street on your line as you walk down it. Draw landmarks, such as a church, a special tree, or a familiar store.
- 6 Draw your important place when you reach it.
- 7 Use markers and crayons to color your map and add more details.

Try giving your map to a friend or a family member. Challenge that person to find his or her way to your important place.

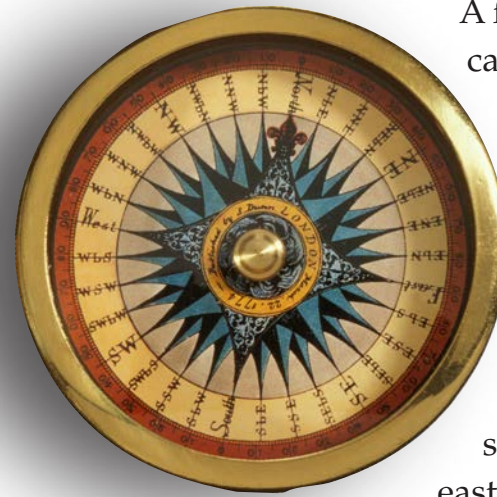
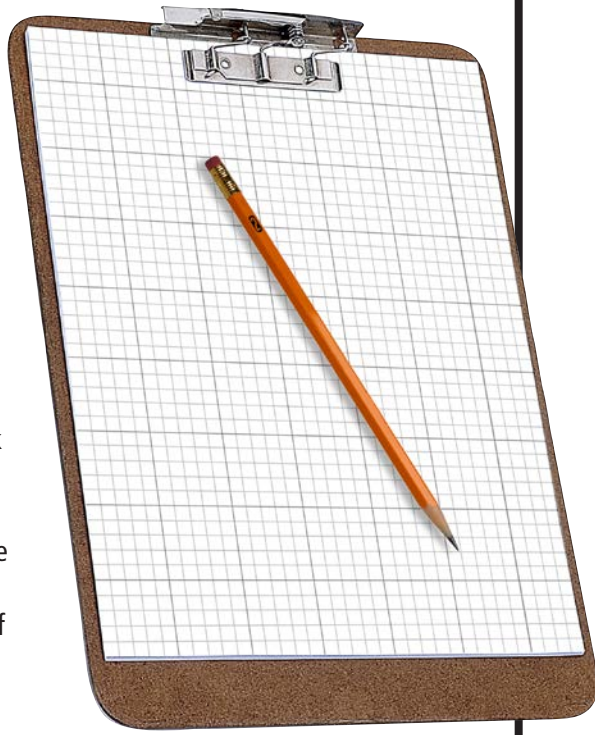
Try This

Make a Map

Try to draw a map that shows the route you take from your home to an important place, such as your school, the snack bar, or a friend's home.

What you need: graph paper, a pencil with an eraser, and something to write on.

- 1 Draw your home. Use a symbol, such as a square, or a picture of your home.
- 2 Begin walking toward your important place. Draw a line away from the picture of your home, going in the same direction you walk.
- 3 Try to estimate distance by counting how many steps or minutes it takes to go down the first street. If it takes twice as many steps or minutes to walk down another street, draw a line that is twice as long. Use another piece of paper if you need to.



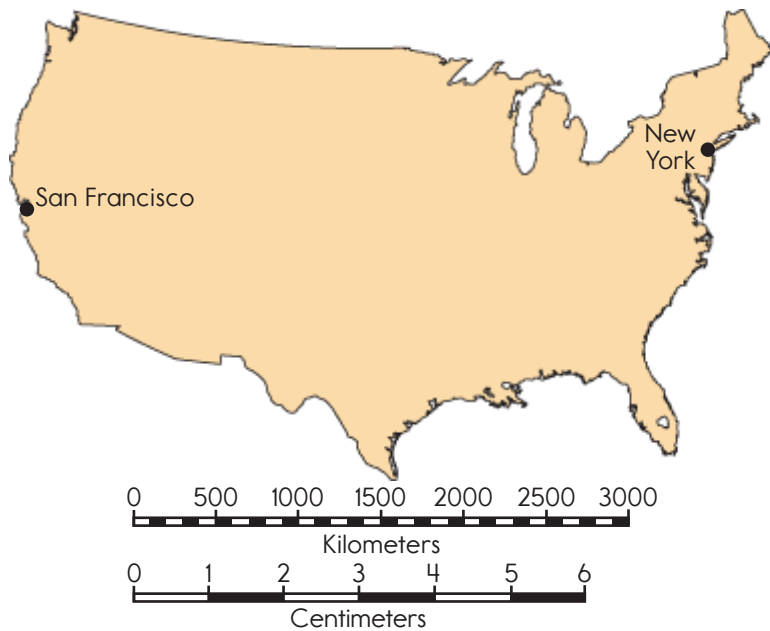
A four-pointed star called the **compass rose** inside the key tells you where north, south, east, and west are on the map. Most maps put north at the top, south at the bottom, east on the right, and west on the left. As you can

see from my compass rose, my map is drawn with northeast at the top. I did this because my house faces northeast, so that is how I think of my neighborhood.

Most maps show the names of cities, roads, trails, and other geographical features such as rivers and oceans so that you can quickly tell where things are. I put the name of each trail, road, and building on my map. Look at my map and see if you can find the Hunter's Ravine Trail and the high school.

Some planes have GPS tracking devices in them so you can see where you are during the flight.





Scale

The **scale** of a map tells you how big the map is compared to the actual area. Most maps show the scale by comparing two units.

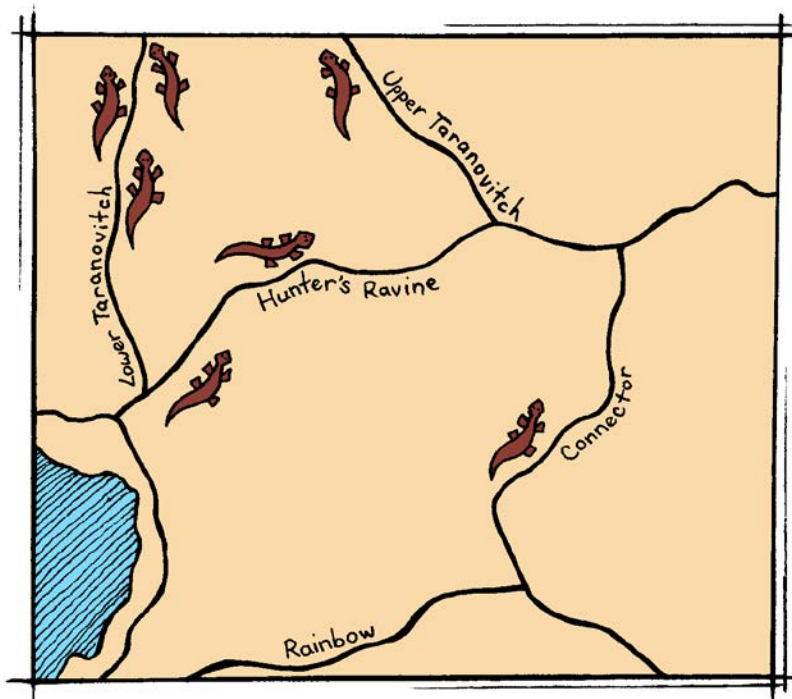
On this map of the United States, the scale units are shown on a bar with marks and numbers on it. The top scale tells you the distance in the actual area. The bottom scale shows the distance on the map; this map is measured in centimeters. For example, on this map one centimeter is equal to almost 500 kilometers of actual distance.



This backpacker uses a map to find his way around.

Bon Voyage!

Maps can tell you many things about a place without your ever having to visit it. Some maps help you find your way around, while others tell you what you might see. There are as many kinds of maps as there are places on Earth and things to see. Check out some maps around you. You can plan a wonderful journey, whether it is a real trip or just an adventure in your mind.

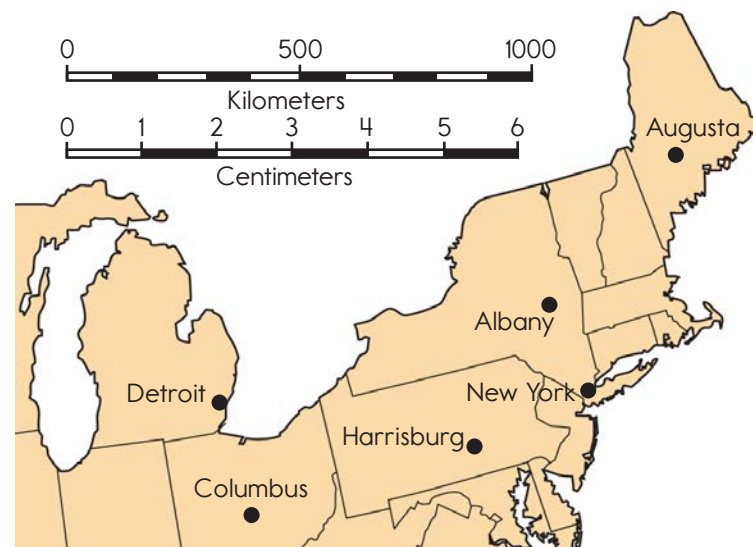


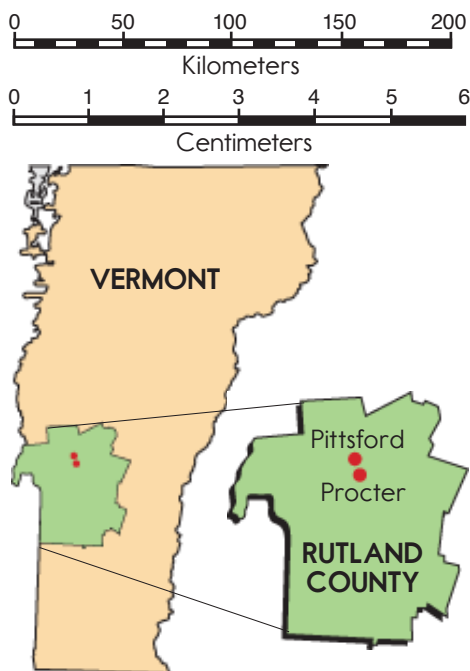
On this version of the map, I used a drawing of a newt to show how many red newts I see in different areas. Each drawing represents five red newts. You could use this map to see if the population of red newts is rising or falling. You could also use it to pick walking trails where you could see many red newts.

Data maps can represent almost any kind of information. Look in newspapers, magazines, and on the Internet to find different kinds of data maps. Remember to look at the key to see what each color or symbol means.

Can you imagine if a map of the entire United States were drawn in the scale of my map of the woods? The map would have to show every single building in the United States, plus all of the spaces in between. It would be hundreds of kilometers wide—certainly too big to fold up and put in your pocket. If a cartographer draws a big area, he or she makes the map in a smaller scale. This map of the United States is in a very small scale.

If a map zooms in on a smaller area, the scale gets bigger and bigger. This map shows the northeastern part of the United States, where my woods are. The area is about four times smaller than the United States, so the scale is four times bigger.





This is the state of Vermont. And here is a map of the county, or part of the state, where I live. Notice how the top numbers on the scale get smaller and smaller as the area shown on the map gets smaller and smaller.

Distance and Area

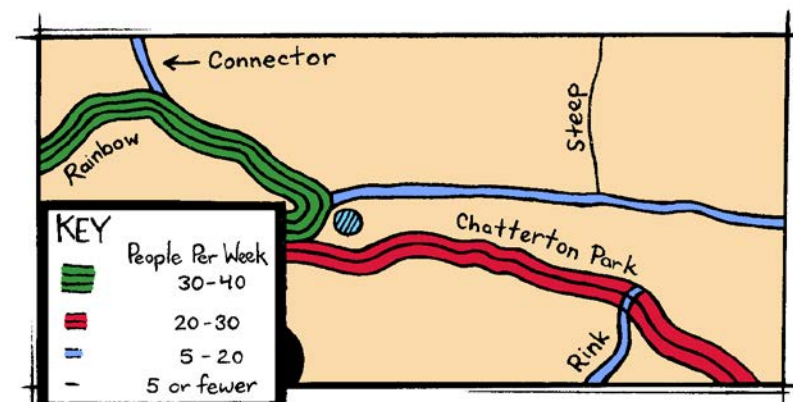
Try This

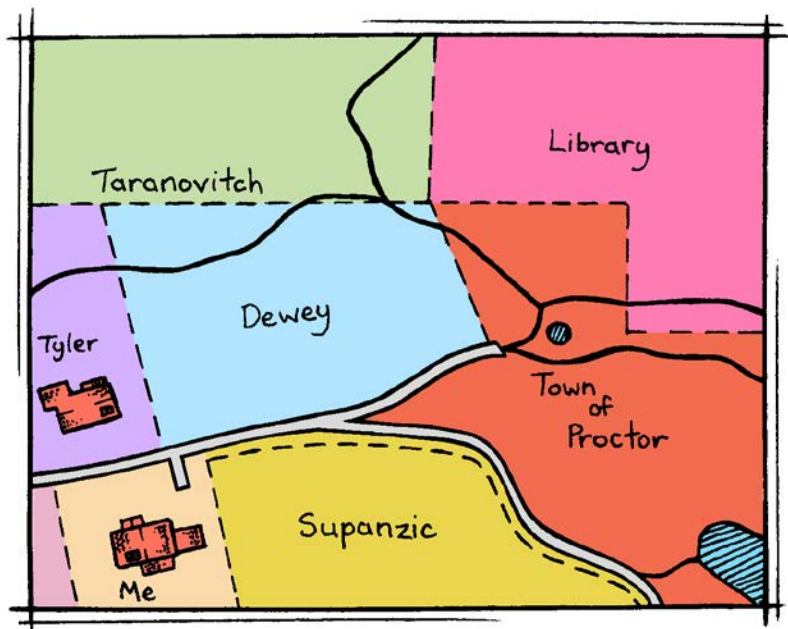
- 1 Measure the number of centimeters between New York and San Francisco using the map on page 8.
- 2 How many kilometers does each centimeter represent? Multiply your measurement by that number.
- 3 How far is it from New York to San Francisco?
- 4 Measure the length of the state of Vermont in centimeters on this page. Using the scale on the map, figure out how many kilometers Vermont is long.
- 5 Measure the width of the state. Since the width changes from top to bottom, measure in the middle to get an average width. Use the scale to figure out how wide Vermont is.
- 6 Multiply the length times the width. About how big is Vermont in square kilometers?

Data Maps

A data map is any kind of map that shows information in the form of numbers. You may have seen a data map on the news that showed how people voted in different areas. You may also have seen a data map on the weather report that showed how many centimeters of rain fell in different areas. Data maps can show natural or human information.

On this version of my map, I changed the way I drew the trails to show how many people use each path. Four lines mark trails where 30 to 40 people go each week. One line marks trails where 5 or fewer people go each week. Use the key to see how the other trails are drawn. You could use this data map to estimate which trails have the most erosion, or to plan a walking trip on which you wouldn't run into many other people.





Boundary Map

A boundary map shows who controls the land or whom it belongs to. A boundary map of the world shows the countries. A boundary map of the United States shows the individual states or counties. On this page, I made my map into a boundary map. Now it shows who owns the land.

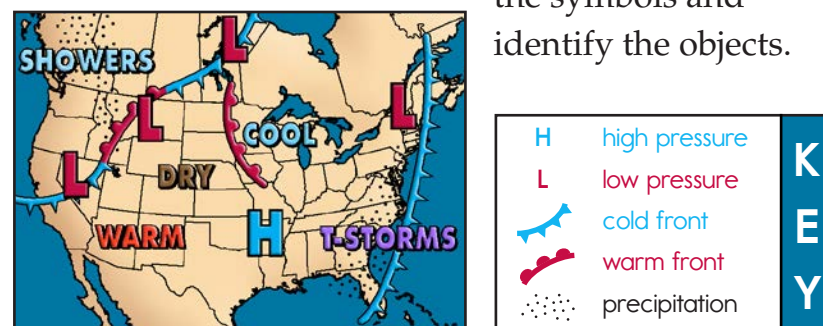
A boundary map helps people know how they can use the land and who might be there. Parts of the woods belong to Mr. Taranovitch, who doesn't like people to go hunting on his land. Hunters could use this boundary map to know where they are not allowed to hunt.

Landmarks and Symbols

Maps often show where important objects or things are. A **landmark** is an object that is special, important, or helps people find their way. It can also be something you might want to find if you were using the map. One landmark on my map is the water tower. When I see the water tower, I know I am close to my road. On many city maps, landmarks are important buildings, such as schools, hospitals, and courthouses.

Most important objects are shown using symbols. For instance, my water tower is drawn as a circle with slanted lines across it. On a city map, a hospital might be a blue or red cross. Symbols can also show important areas, events, or things that you can't see. On a historical map, a drawing of an explosion or gun might show where a battle took place. On a weather map, a blue line with triangles represents colder weather moving in. Use the key to help you understand

the symbols and identify the objects.

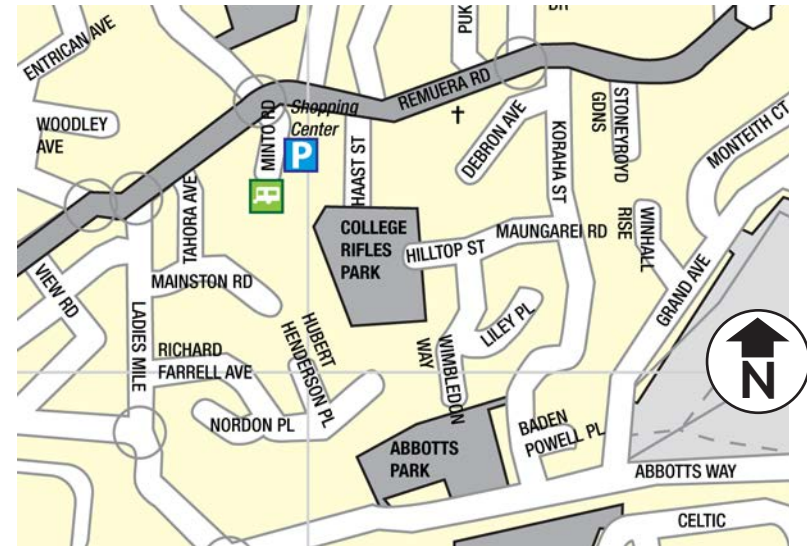


Types of Maps

The information on a map depends on what the map is used for. If you are using a map on a boat trip, then the map needs to show rivers, lakes, and oceans, but it doesn't need to show things on land. If you are using a map on a car trip, then the map needs to show roads, towns, and cities, but it doesn't need to show farms, forests, or hiking trails.

There are three basic kinds of maps: physical, political, and data. Physical maps show natural things, such as rivers, mountains, plants, and weather. Political maps have to do with people. They show roads, cities, buildings, countries, and other human-made things. Some maps show a mix of the two. For example, the **pictorial map**, or map made with pictures instead of symbols, on the next page shows a ski area at the top of a small mountain. The map shows buildings, such as ski lodges, and areas of woods where it is not safe to ski. Both kinds of information, political and physical, are important to skiers.

The third kind of map, a data map, is used for showing information, especially information given in numbers, which is called statistics.



Political Maps

Road Map

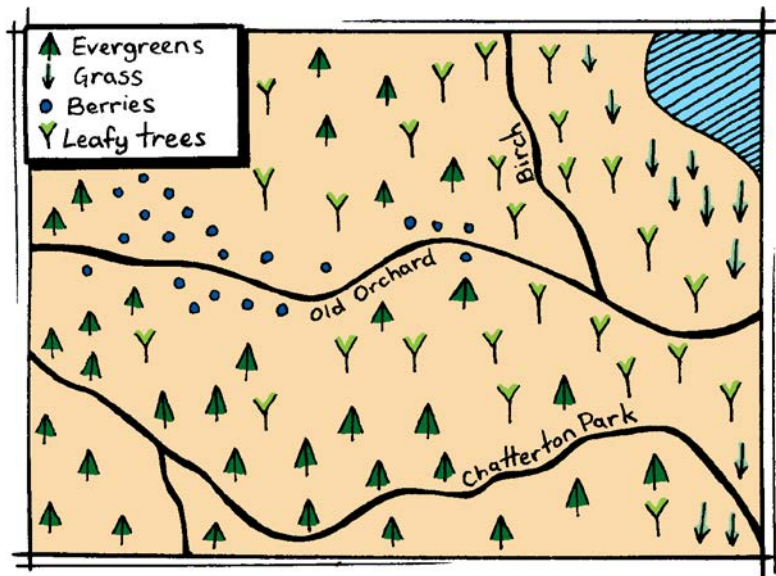
A road map shows roads and where they go, and it is best for finding your way from one place to another. Here is a road map of part of the city of Auckland, New Zealand. How might you walk from the College Rifles Park to the Abbotts Park? How many times would you turn, and in which direction? You could use this map to help you find your way around if you ever went to Auckland.

My map of the woods is a kind of road map. It shows paths where you can go from one place to another. Use my map to figure out how to get from the water tower to Mr. Taranovitch's field.

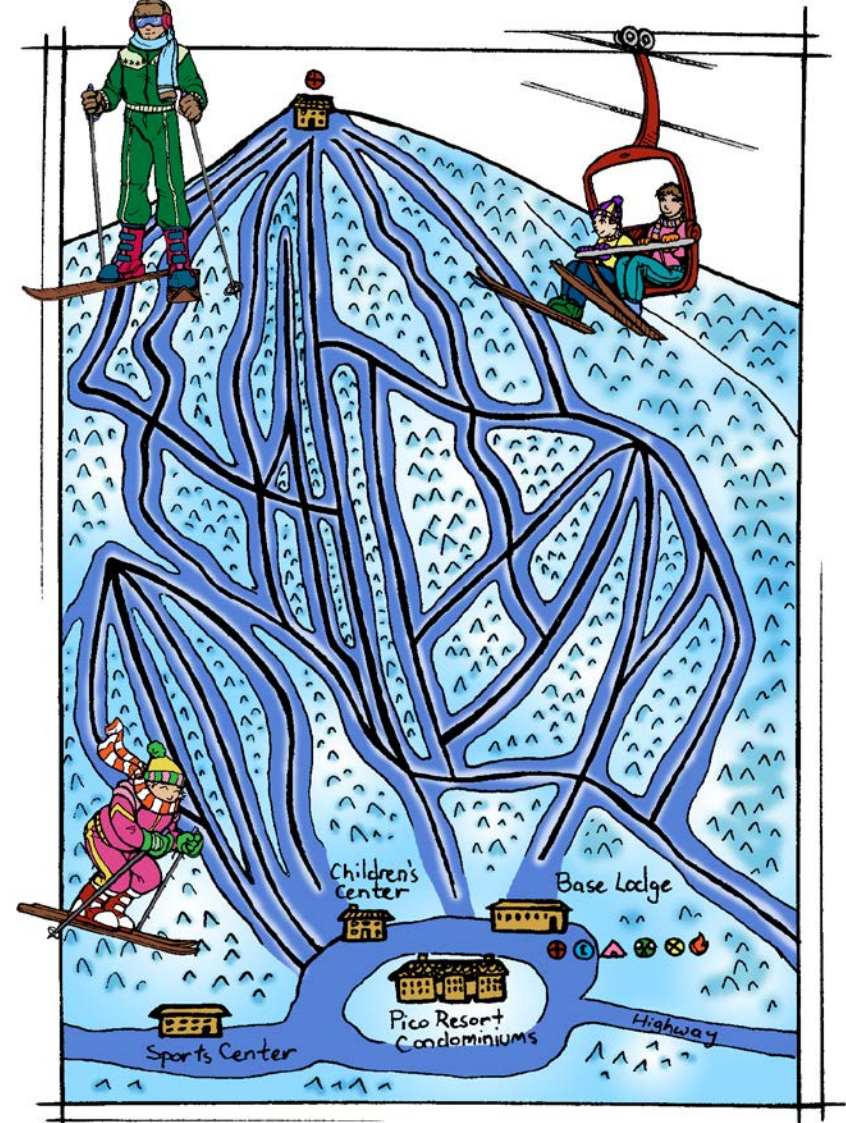
Vegetation Map

A vegetation map shows what kinds of plants grow where. It uses different colors or patterns to represent different kinds of plants. I colored my map so that it shows you where there are grass, shrubs and bushes, evergreen trees, blackberries, or trees that lose their leaves, such as maples and birches. You can use the key to tell which pattern is which. Can you use the map below to find the spots along Old Orchard Trail where there are berries?

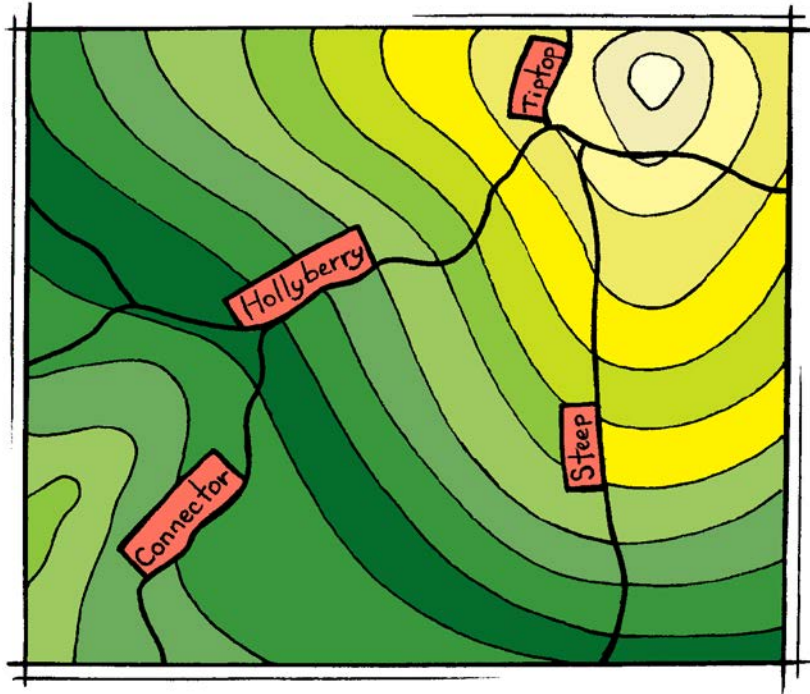
Other vegetation maps show where crops grow, such as corn or apples. What kind of trees line both sides of Birch Trail?



On the next few pages, I will use my map to show you different kinds of maps and how to use them.



Killington/Pico Ski map



Physical Maps

Topographic Map

One common physical map is a **topographic map**. It shows **elevation**, or how high or low the land is. Each line is one unit, such as one meter, higher or lower than the one next to it. When the lines are close together, the land is rising or falling steeply. When they are far apart, the land is flat. I turned part of my map into a topographic map that shows you where the land rises and falls, giving you a sense of the shape of the small mountain where my woods are.

Topographic maps are good for going out into the wilderness, where there are no roads or signs. Let's say you got lost in the woods near Hunter's Ravine Trail. Using my map, how could you find your way back to Pit Trail? Without a compass or compass rose to tell which way was north, it would be very hard to know where to go with just a trail map. But with a topographic map, you could match the shape of the land to the shape on the map, to get an idea of where you are depending on the direction you are walking.

Relief Map

Other kinds of maps show elevation. **Relief maps** use colors to show how high or low things are. They usually use light colors to show high areas and dark colors to show low areas. Here, I shaded part of my map to make it a relief map. You probably have seen a relief map of the world that shows major mountain chains. Other relief maps show imaginary shadows made by mountains and valley walls.

