

Geography Skills Workbook

Maps, Data & Regions

Grades 6 – 9

A Skills-Based Geography Resource

Map Reading • Data Analysis • Regional Studies

5 Map Analysis Activities • Skills Assessment • Answer Key

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This workbook develops essential geography skills through clear instruction, guided practice, and real-world application. Work through each unit in order, completing all activities and practice problems.

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Map Analysis Activities Included:

- Activity 1: Reading a Choropleth Map (Unit 3)
- Activity 2: Interpreting a Dot Density Map (Unit 3)
- Activity 3: Analyzing Population Data (Unit 4)
- Activity 4: Climate Zone Comparison (Unit 5)
- Activity 5: Regional Data Analysis (Unit 6)

Skills Covered in This Workbook:

- Identifying map types and their purposes
- Using map scale to calculate real-world distances
- Reading latitude and longitude coordinates
- Interpreting thematic maps (choropleth, dot density, flow)
- Analyzing population data and demographic indicators
- Understanding climate zones and their characteristics
- Comparing regions using multiple data sources
- Applying geographic vocabulary and concepts

Unit 1: Map Types & Basics

What Is a Map?

A **map** is a two-dimensional representation of a three-dimensional surface. Maps show selected features of an area, simplifying the real world to communicate specific information. **Cartographers** (mapmakers) make choices about what to include and what to leave out, depending on the map's purpose.

Five Essential Map Elements

Almost every useful map includes five key elements that help the reader understand the information presented:

- **Title** – Tells what the map shows and often the area it covers.

Example: Population Density of South America

- **Compass Rose** – Shows direction (North, South, East, West).

Example: The arrow always points North.

- **Scale** – Shows the relationship between distance on the map and real distance on Earth.

Example: 1 cm = 100 km

- **Legend (Key)** – Explains the symbols, colors, and patterns used on the map.

Example: A dot might represent a capital city.

- **Labels** – Words that identify features such as countries, rivers, or mountain ranges.

Example: Amazon Rainforest

Quick Check

1. Which map element tells you the relationship between distance on the map and real distance on Earth?

2. Why is a legend important when reading a map?

Unit 1: Map Types & Basics

Types of Maps

Types of Maps

Maps can be grouped into three main categories based on their purpose: **general-purpose maps** and **thematic maps**.

1. Political Maps

Political maps show human-created features such as boundaries between countries, states, or cities. They often label capital cities and major population centers. Colors are typically used to distinguish between different countries or states, but these colors do not represent physical terrain.

2. Physical Maps

Physical maps show natural features of the landscape such as mountains, plains, rivers, and lakes. They use color and shading to indicate changes in elevation (relief). Lower elevations are typically green, while higher elevations are brown or gray.

3. Thematic Maps

Thematic maps focus on a specific topic or theme. Instead of showing a variety of features, they present a single type of data, such as population density, climate zones, or election results. We will explore thematic maps in depth in Unit 3.

Map Type Comparison

Feature	Political Map	Physical Map	Thematic Map
Main Focus	Boundaries & cities	Natural landscape	Specific data/theme
Color Use	Differentiate regions	Show elevation	Represent data values
Key Features	Borders, capitals	Mountains, rivers	Data patterns

Practice

3. Which type of map would you use to find the border between France and Spain?

4. If you wanted to see the height of the Himalayas, which map type would be most useful?

5. A map showing average rainfall across Africa is an example of which type of map?

Unit 1: Map Types & Basics

Understanding Map Scale

Understanding Map Scale

Because a map is much smaller than the area it represents, cartographers use **scale** to show the relationship between distances on the map and actual distances on Earth. There are three ways scale is expressed on a map:

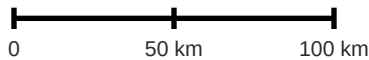
1. Verbal Scale

A sentence that states the map distance equals a real-world distance.

Example: "1 centimeter equals 10 kilometers"

2. Graphic Scale (Bar Scale)

A line or bar divided into segments that represent distances on the map.



3. Fractional Scale (Representative Fraction)

A ratio that compares map distance to ground distance using the same units.

Example: 1:1,000,000 — One unit on the map equals 1,000,000 units on Earth.

★ TIP: Converting Fractional Scale

If a map scale is 1:500,000, then 1 cm on the map = 500,000 cm on Earth. To convert centimeters to kilometers, divide by 100,000. So, $500,000 \text{ cm} \div 100,000 = 5 \text{ km}$. Therefore, 1 cm = 5 km.

Scale Conversion Practice

6. A map has a scale of 1:250,000. How many kilometers does 1 cm on the map represent? (Hint: Divide by 100,000)

7. On a map with a scale of 1 cm = 20 km, two cities are 4.5 cm apart. What is the actual distance between them?

8. A map has a scale of 1:2,000,000. Two towns are 3 cm apart on the map. What is the real-world distance in kilometers?

Unit 1: Map Types & Basics

Using Map Scale

Using Map Scale: Distance Problems

When measuring distances on a map, you can use a ruler and the map's scale to calculate the actual distance. Remember the formula:

$$\text{Actual Distance} = \text{Map Distance} \times \text{Scale Factor}$$

Guided Example

On a map with a scale of 1 cm = 50 km, the distance from Town A to Town B measures 6.2 cm. What is the actual distance?

Step 1: Identify the map distance = 6.2 cm

Step 2: Identify the scale factor = 50 km per cm

Step 3: Multiply map distance by the scale factor: $6.2 \times 50 = 310$ km

Answer: The actual distance is 310 km.

Independent Practice

9. The distance between two landmarks on a map (scale 1 cm = 25 km) is 8 cm. What is the actual distance?

10. A river measures 12 cm on a map with a scale of 1:1,500,000. What is the actual length of the river in kilometers?

11. If two cities are 450 km apart in real life, how far apart would they appear on a map with a scale of 1 cm = 50 km?

12. A highway is 3.5 inches long on a map with a scale of 1 inch = 10 miles. What is the actual length of the highway?

★ TIP: Large Scale vs. Small Scale

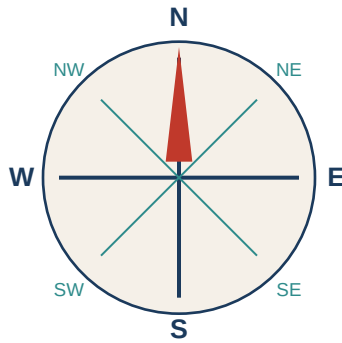
It can be confusing! A **large-scale map** (e.g., 1:25,000) shows a smaller area with more detail (like a city map). A **small-scale map** (e.g., 1:50,000,000) shows a larger area with less detail (like a world map). Think of it this way: a large fraction (1/25,000) shows more detail than a small fraction (1/50,000,000).

Unit 1: Map Types & Basics

Compass Rose & Directions

Compass Rose & Directions

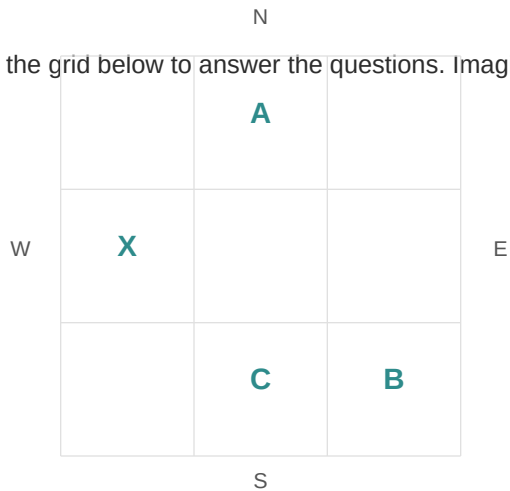
A **compass rose** is a figure on a map that shows the orientation of the cardinal directions (North, East, South, West) and often the intermediate (intercardinal) directions (NE, SE, SW, NW).



Understanding Direction

When we say a place is "north" of another, we mean it lies in that general direction. **Absolute direction** never changes: North is always North. **Relative direction** describes where something is compared to something else (e.g., "Canada is north of the United States").

Direction Practice



Use the grid below to answer the questions. Imagine you are standing at point X.

13. In which direction is point A from point X?

14. In which direction is point B from point X?

15. If you walk South from point X, which point do you reach?

Unit 3: Reading Thematic Maps

What are Thematic Maps?

What are Thematic Maps?

Unlike general-purpose maps that show a variety of features, **thematic maps** focus on a specific subject or theme. They are designed to show the spatial distribution of data, such as population density, climate, or election results. Thematic maps use symbols, colors, and patterns to represent statistical data.

Types of Thematic Maps

There are several common types of thematic maps. Each presents data in a unique way:

- **Choropleth Maps** – Use different colors or shading patterns to represent statistical data for specific areas (like countries or states). Darker shades usually mean higher values; lighter shades mean lower values.
- **Dot Density Maps** – Use dots to represent the presence or quantity of a phenomenon. Each dot represents a specific quantity. The closer the dots are together, the higher the concentration of the data.
- **Flow Maps** – Show the movement of goods, people, or ideas between places. The thickness of the lines often indicates the volume or amount of movement.
- **Isoline Maps** – Use continuous lines to connect points of equal value. Topographic maps that show elevation with contour lines are a common type of isoline map.

Quick Check

1. Which type of thematic map uses color shading to represent data in defined areas?

2. If you wanted to show the movement of refugees from one country to another, which type of map would be most appropriate?

Unit 3: Reading Thematic Maps

Choropleth Maps

Reading a Choropleth Map

Choropleth maps are excellent for comparing data across regions. When reading a choropleth map, the first thing you must do is read the **legend**. The legend explains what the colors mean by dividing the data into ranges or classes.

Example Legend: Population per Square Mile

Color Shading	Population Density
Dark Purple	500 or more
Medium Purple	250 – 499
Light Purple	100 – 249
Light Lavender	50 – 99
White	Less than 50

When looking at a choropleth map, look for spatial patterns. Are the darkest colors clustered together? Are the lightest colors on the edges? These patterns tell a geographic story.

★ **TIP: Beware of Large Areas!**

On a choropleth map, a very large region (like a state or province) might be shaded dark, making it look like the whole area is densely populated. However, the data is often an **average**. A large state could have a high total population but a low population density if most of the land is empty desert or forest.

3. According to the example legend above, if a region is shaded Light Purple, what is its population density range?

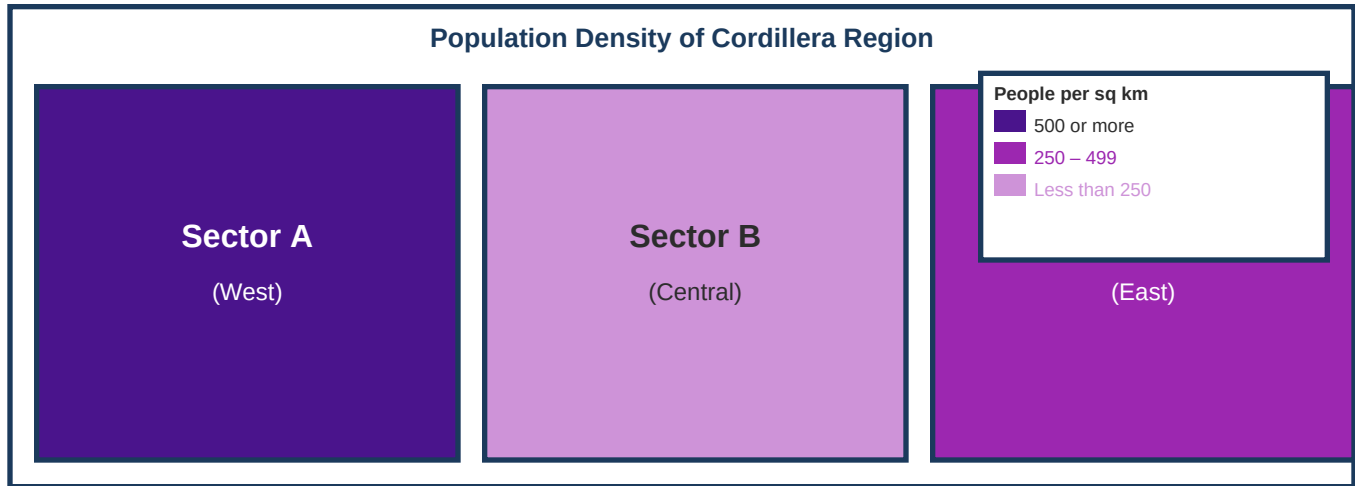
4. Why is it important to always check the legend before making assumptions about a choropleth map?

Unit 3: Reading Thematic Maps

Activity 1

Map Analysis Activity 1: Choropleth Map

Examine the schematic choropleth map and legend below to answer the questions.



5. Which sector has the highest population density?

6. What is the population density range for Sector B?

7. Sector A has the highest population density, but it is the smallest in land area. Why could its density be so high? Give one possible geographic reason.

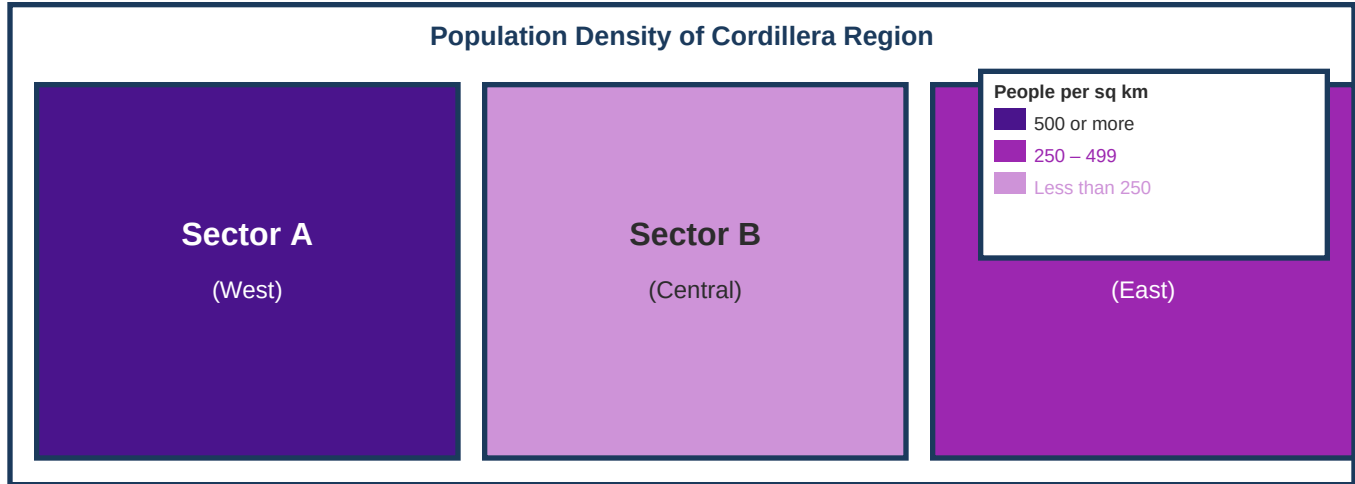
8. If Sector C has a total population of 3,600,000 and an area of 12,000 sq km, calculate its population density. Does your calculation match the map's color shading? Show your work.

Unit 3: Reading Thematic Maps

Activity 1

Map Analysis Activity 1: Choropleth Map

Examine the schematic choropleth map and legend below to answer the questions.



5. Which sector has the highest population density?

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Unit 3: Reading Thematic Maps

Dot Density Maps

Reading a Dot Density Map

Dot density maps use dots to show the spatial distribution of a phenomenon. On these maps, **each dot represents a specific quantity** of the item being mapped. For example, one dot might represent 1,000 people, 500 acres of wheat, or 10,000 cattle.

The key to reading a dot density map is observing the **spacing** of the dots:

- **Clustered dots** indicate a high concentration of the phenomenon.
- **Scattered dots** indicate a low concentration or even distribution.
- **Areas with no dots** indicate the phenomenon is completely absent in that region.

★ TIP: Do Not Count the Dots!

Unless a map only has a few dots, you should never try to count the individual dots to find a total number. Instead, use the legend to find the value of one dot, and look at the overall patterns and clusters. Dot density maps are best for showing **relative distribution**, not precise totals.

9. If a dot density map legend states "1 dot = 500 sheep," and you count 12 dots in a specific valley, how many sheep are in that valley?

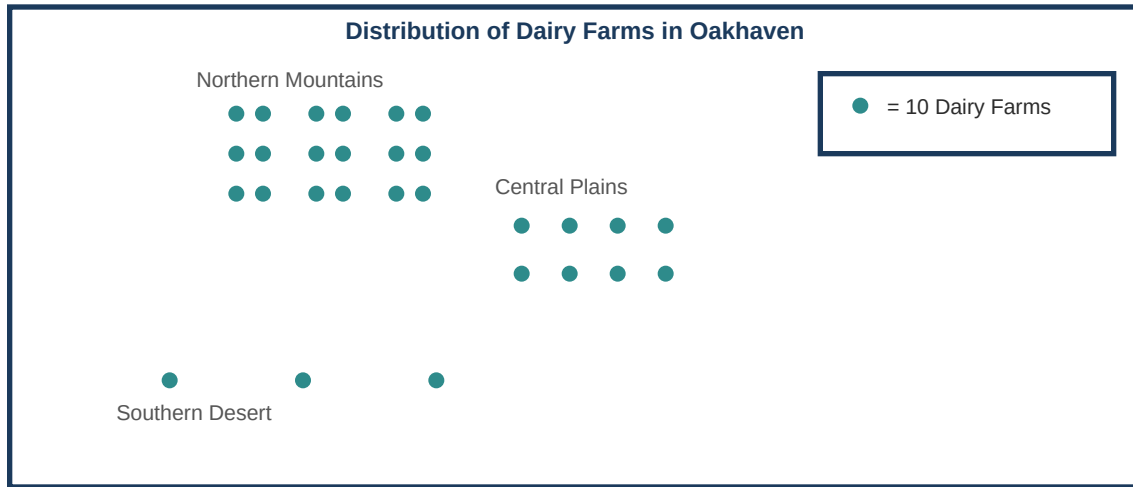
10. Why are dot density maps particularly useful for showing where people live within a country, rather than just the total population?

Unit 3: Reading Thematic Maps

Activity 2

Map Analysis Activity 2: Dot Density Map

Examine the schematic dot density map below showing the distribution of dairy farms in the fictional country of Oakhaven.



11. Which region of Oakhaven has the highest concentration of dairy farms?

12. Approximately how many dairy farms are located in the Central Plains region? (Show your calculation).

13. Why are there almost no dairy farms in the Southern Desert?

14. Based on the map, what geographic feature do you think dairy farms require to thrive?

Glossary

(Continued)

Isoline Map: A map that uses continuous lines to connect points of equal value.

Lapse Rate: The rate at which temperature decreases as altitude increases.

Latitude: The angular distance of a place north or south of the Earth's equator.

Legend (Key): A map element that explains the symbols, colors, and patterns used on the map.

Longitude: The angular distance of a place east or west of the Prime Meridian.

Meridian: Another name for a line of longitude.

Microclimate: A small area where the climate differs from the surrounding region.

Natural Increase: The difference between the birth rate and the death rate.

Parallel: Another name for a line of latitude.

Perceptual Region: An area defined by people's feelings, attitudes, and cultural identity.

Physiological Density: The number of people per unit area of arable (farmable) land.

Polar Climate: A climate zone that is extremely cold year-round.

Political Map: A map showing human-created boundaries, borders, and cities.

Population Density: The average number of people living in a given area.

Population Pyramid: A graphical representation of the age and sex distribution of a population.

Prime Meridian: The line of longitude at 0°, running through Greenwich, England.

Rain Shadow: The dry side of a mountain range, caused by the mountains blocking precipitation.

Region: An area of the Earth's surface with one or more shared characteristics.

Scale: The relationship between distance on a map and actual distance on Earth.

Thematic Map: A map that focuses on a specific subject or theme.

Weather: The short-term conditions of the atmosphere in a specific place and time.

Unit 1: Map Types & Basics

Page 3: Quick Check

1. Scale 2. A legend is important because it explains what the symbols, colors, and patterns on the map represent.

Page 4: Practice

3. Political map 4. Physical map 5. Thematic map

Page 5: Scale Conversion Practice

6. 2.5 km ($250,000 / 100,000$) 7. 90 km (4.5×20) 8. 60 km ($2,000,000 / 100,000 = 20 \text{ km/cm}$; $3 \times 20 = 60 \text{ km}$)

Page 6: Independent Practice

9. 200 km (8×25) 10. 180 km ($1,500,000 / 100,000 = 15 \text{ km/cm}$; $12 \times 15 = 180 \text{ km}$) 11. 9 cm ($450 / 50$) 12. 35 miles (3.5×10)

Page 7: Direction Practice

13. Northeast 14. Southeast 15. Point C

Page 8: Unit 1 Review

1. Title, compass rose, scale, legend, labels 2. Political maps show boundaries/cities; physical maps show natural features/elevation 3. Physical map 4. Large-scale shows more detail/smaller area; small-scale shows less detail/larger area 5. 7 km ($100,000 / 100,000 = 1 \text{ km/cm}$; $7 \times 1 = 7 \text{ km}$) 6. 16 miles (3.2×5) 7. East 8. To simplify the real world and communicate specific information

Unit 2: Latitude & Longitude

Page 10: Quick Check

1. The Prime Meridian 2. No, they converge at the poles and are farthest apart at the Equator.

Page 11: Understanding Hemispheres

3. Southern and Western 4. Southern and Eastern 5. No, because it lies at 0° latitude, it is the dividing line between the Northern and Southern Hemispheres.

Page 12: Finding Coordinates

6. 40°N , 80°W 7. 30°N , 60°W 8. 10°N , 70°W 9. 20°N , 50°W 10. 40°N , 60°W 11. 20°N , 70°W

Page 13: Locating Points

12. Point F 13. Northeast 14. Southeast 15. 60 minutes 16. 45.5° ($30 / 60 = 0.5$; $45 + 0.5 = 45.5^\circ$)

Page 14: Unit 2 Review

1. Parallels run east-west; meridians run north-south. 2. The Equator 3. The Prime Meridian, located in Greenwich, England. 4. Southern and Eastern 5. Meridians connect at the North and South Poles because they arc from pole to pole; parallels are circles that get smaller toward the poles. 6. It is later. Earth rotates eastward, so locations east of the Prime Meridian experience time ahead of Greenwich. 7. 0°N , 0°E (or 0°W)

Skills Assessment

Part 1: Multiple Choice

1. C (Legend) 2. A (0°) 3. B (Dot Density) 4. B (12) 5. C (Mountains)

Part 2: Map Scale Calculations

6. 225 km (4.5×50) 7. 30 km ($500,000 / 100,000 = 5 \text{ km/cm}$; $6 \times 5 = 30 \text{ km}$)

Part 3: Coordinates and Hemispheres

8. Southern and Eastern 9. The Prime Meridian 10. Absolute is exact (coordinates); relative is in relation to somewhere else (north of the park).

Part 4: Population Data

11. 50 people per sq km ($15,000,000 / 300,000$) 12. 25 per 1,000; 2.5% 13. Expansive; high birth rate (35) creates a wide base.

Part 5: Climate and Regions

14. Weather is short-term; climate is long-term. 15. Elevation, ocean currents, topography. 16. A region defined by feelings/culture (e.g., The South). 17. It includes uninhabitable land, skewing the average. 18. Region A likely has trade/fishing/agriculture; Region B likely has mining/limited agriculture.

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