



Science 7 Graphing Skills

Biome Basics

EQ: Why do East and West Texas look so different?

Targeted Skills

Information Literacy

- Collect Information
 - construct data tables
- Organize and Manipulate Information
 - data tables, graphs

Enduring Understandings

Balance within systems is regulated by the interactions between of biotic and abiotic factors.

Concepts Important to Know and Understand

Environmental responses, biodiversity

Broad Brush knowledge

Range of temperature, water, limiting factors, abiotic

Targets

1.3 Model and analyze the interactions that develop between biotic and abiotic factors.

Expert Information: Remember that a scale is a series of evenly spaced lines or points on a grid (graph paper) or measuring instrument (metric ruler, graduated cylinder). A scale includes the **range** of values on an axis and the **intervals** at which the values occur. Finding the right scale for numbering axes can be a challenge. Trial and error is the most common approach but can be frustrating and time-consuming. Use these steps to help determine the scale:

Determining a numerical scale:

1. Find the range of data: subtract the smallest value from the largest.
2. Divide the difference by the number of intervals you want to use.
3. Round the answer up (or down) for a manageable number.
4. Use the rounded number to mark off the intervals on the axis.

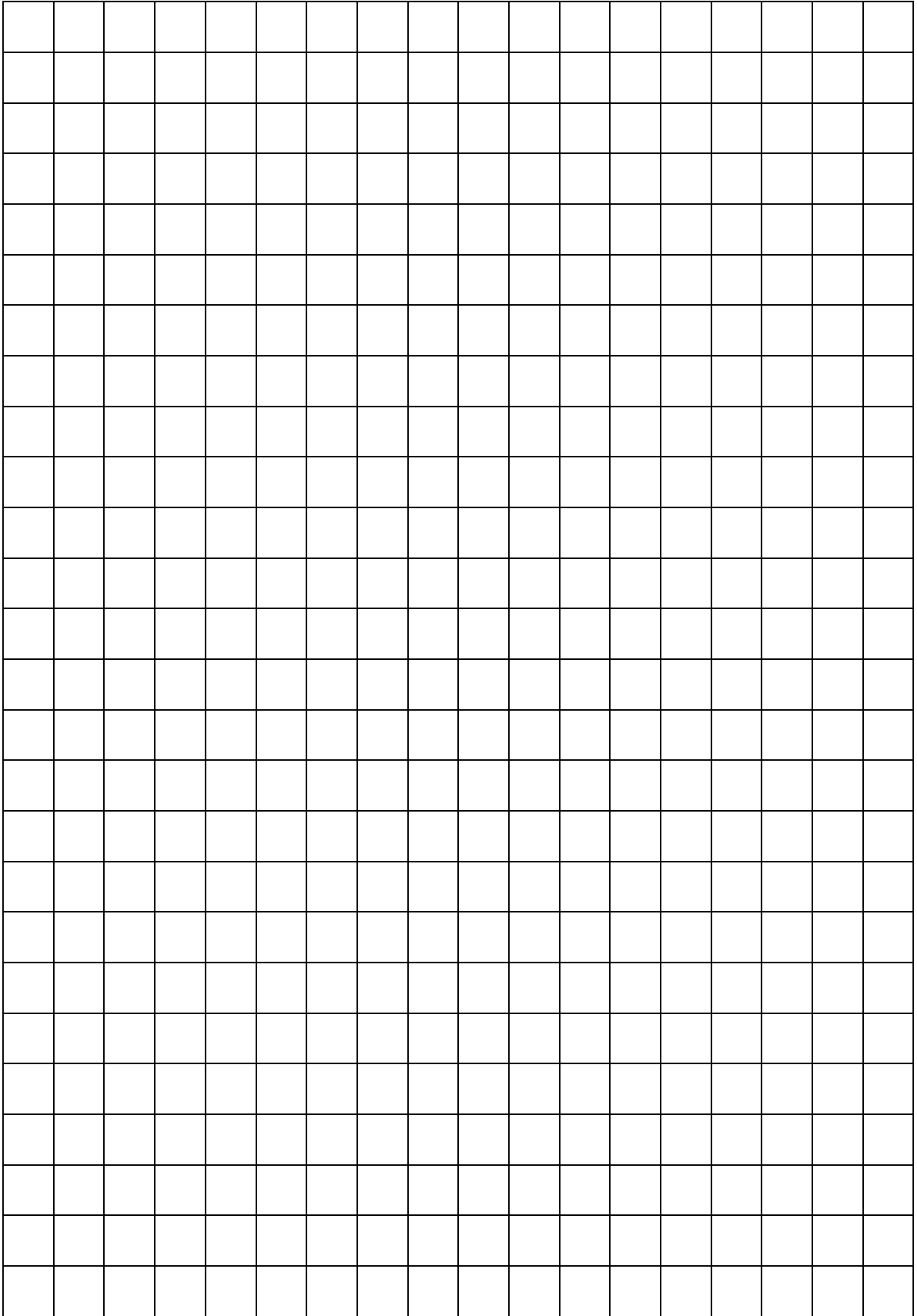
Use this checklist:

1. Does the graph take up as much of the plotting area as possible without going off the page?
2. Is the size of the intervals equal?

Once you've determined the best scale, this may not mean that you assign one number to one row on the graph paper. For example, the best interval for a Y-axis scale may be 5, but in order to fill up your paper, you may need to space out your graph by skipping lines/rows on the grid.

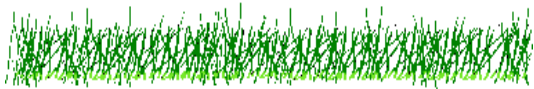
Procedure:

1. Read the information on the following page about the 6 major terrestrial biomes. Highlight all quantitative data.
2. Choose one type of quantitative data (temperature or rainfall, etc.) to graph. Make sure the data you choose to graph is given for all six biomes.
3. Make a data table to use for your graph. Organize the data table correctly. Use this check list for your data table:
 - ___ Descriptive title
 - ___ Columns labeled correctly with appropriate variables
 - ___ Units included in parentheses where appropriate
4. After your data table is complete and checked, choose an appropriate graph (line, bar, pie), and graph. Use the same title and column labels from your data table for your graph. Remember: if
5. your data table is correct, your graph will be correct.



Tundra comes from the Finnish word for barren or treeless land. It is considered the simplest biome in terms of biotic factors as there are so few plant and animal species. Trees do not grow in the tundra because their roots cannot penetrate the *permafrost* -the term used to describe the permanently frozen ground. There is no true soil. The long, cold, dark winters define the extremely short growing season, which is only 6-10 weeks long. The average precipitation in the tundra is less than 13 centimeters a year.

Graslands are semiarid biomes that typically have between 25.4 and 50.8 centimeters of precipitation a year. The dominant grasses and low shrubs grow in some of the richest soil in the world. Grasslands are known by different

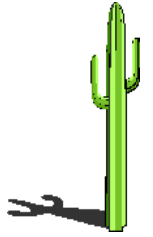


terms, depending on where they are located: North America, prairies; Russia, the steppes; South America, pampas; and Africa, the veld. The growing season begins in the spring and lasts through long, warm summers.

Abundant precipitation of over 203 centimeters a year and warm temperatures averaging over 21°C make the tropical rainforest the most complex biome in the world. More plant and animal species live here than in any other biome. The growing season is year round. Vegetation occurs in three *strata*: emergents, canopy, and understory. The canopy filters all but 3% of the light before it reaches the forest floor, making sunlight the major limiting factor for plants in the understory. Epiphytes, which include orchids, grow out of trunks and branches and absorb moisture and nutrients from the air.



Desert biomes are defined by the most arid conditions found in all biomes. Annual precipitation is less than 25 centimeters and temperatures can exceed more than 37°C in the summers but dip to -1° C at night. Plants may be evergreen or deciduous and commonly have spines or thorns to help reduce water loss. There are very few large mammals in deserts because of their intolerance to extreme abiotic factors of heat and water. Many animals are nocturnal, a behavioral adaptation that helps them avoid the heat of day.



Coniferous forests, also called by the Russian name *taiga*, form large belts across North America and Eurasia. Winters are long, severe, and last up to six months, and the short growing season is determined by the number of frost-free days, ranging from 50 to 100. Precipitation averages 38 to 51 centimeters annually. In Russia, temperature extremes range from -67 °C to 32 °C. The narrowness of the needle-like leaves of *conifers* (meaning cone-bearing) results in reduced surface area that prevents water loss during dry seasons.



Deciduous forest biomes are predominantly populated by trees with broad leaves that turn yellow, red, and orange in the fall. Leaves of deciduous trees are nutrient-rich and produce rich *humus* after they fall and decay. The average temperature in deciduous forests is 13 °C with an annual precipitation averaging 81 centimeters. The growing season lasts approximately 6 months. Most animals are nut and acorn feeders and have adaptations for *arboreal* (tree) habitats.

