

# The Geography of the Rio Grande

## Analyzing the Geography of the Rio Grande

**OVERVIEW:** This lesson introduces the geography of the Rio Grande System. Using a series of five maps and a worksheet, students are led through tasks that acquaint them with the geography of the region and the demographics of the Rio Grande Basin of New Mexico.

**OBJECTIVES:**

- To familiarize students with the geography of the Rio Grande system
- To identify the location and importance of the State of New Mexico in the Rio Grande System
- To analyze demographic trends in the Rio Grande Basin

**Procedures—Part I**

1. Distribute a copy of **Map 1 (The Rio Grande System)** and **Map 2 (State Boundaries)** to each student or group. Locate the region on a map of the United States or North America. Inform students that the two maps are drawn to the same scale. Map 1 is a map of the Rio Grande System flowing into the Gulf of Mexico. Map 2 is a political map of the Southwestern United States and a section of Mexico.
2. Instruct students to place Map 1 on top of Map 2. Hold the two maps up to a light and match the outline of the coast of the Gulf of Mexico. Next, on Map 1 draw the borders of Colorado, New Mexico, and Texas with a light colored pencil or crayon. With a different color, trace the international boundary that follows the Rio Grande from El Paso to the Gulf of Mexico. Finally, on Map 1, have students make dots where the cities on Map 2 are located and then label the names of the cities.
3. Tell students you are going to read a description of an imaginary trip down the Rio Grande. They should follow your narration on Map 1 and, when they are told to do so, draw or label

**Materials:**

1. Map 1 (The Rio Grande system)
2. Map 2 (State Boundaries)
3. Narration: A Journey Down the Rio Grande
4. Colored pencils or crayons

**Time:**

One Class Period

**Suggestions:**

This lesson could be in pairs or in small groups. This would conserve paper.



<p>certain items on their maps. (The narration follows this section on procedures.)</p> <p>4 . Finish the first class period by asking questions about the narration to test for comprehension and retention.</p>	
<p><b>Procedures—Part II</b></p> <ol style="list-style-type: none"> <li>1. Distribute a copy of <b>Map 3 (The Rio Grande Basin of New Mexico)</b> and <b>Map 4 (Population Centers of New Mexico)</b> to each student or group. Again, put the river map (Map 3) on top of the political map of New Mexico (Map 4) and hold it up to a light source. Lightly draw on Map 3 the location of the cities with populations over 5,000. The Rio Grande Basin is located inside the dotted boundary on Map 3.</li> <li>2. Hand out <b>Worksheet: Geography and Demography of the Rio Grande Basin</b>. Students will be making a population map of the Rio Grande Basin on Map 3. Using the population figures from the 1990 census given on the worksheet, students should create symbols to show the relative size of population centers in the basin. (Example: use dots for places with a population of 5,000 to 10,000, stars for populations between 10,000 and 20,000,etc.) Next to the symbols, students should identify the place names.</li> <li>3 . Have students study the second chart on the worksheet on demographic trends. Answer the questions in the section "Questions for Thought." When each student or group has finished, discuss the</li> </ol>	<p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• Map 3 (The Rio Grande Basin of New Mexico)</li> <li>• Map 4 (Population Centers of New Mexico)</li> <li>• Map 5 (Watersheds and Tributaries of the Rio Grande Basin)</li> <li>• Worksheet: Geography and Demography of the Rio Grande Basin</li> </ul> <p><b>Time:</b> One Class Period</p> <p><b>Suggestions:</b> For the purposes of this lesson, we have defined the Rio Grande Basin as the land drained by the mainstem of the Rio Grande and the tributaries that flow into it in the State of New Mexico. Since the Pecos River is a tributary of the Rio Grande, one could say that it should also be a part of the Rio Grande Basin. However, since it joins the Rio Grande in Texas, the State of New Mexico for administrative reasons considers it to be a separate basin. This lesson also omits several closed basins that the state administratively includes in the Rio Grande Basin (Tularosa, Estancia, and Mimbres Basins).</p>

<p>answers as a class; emphasizing that not only is the population of the state of New Mexico growing, but it is becoming more concentrated in the Rio Grande Basin. This growing population will put more pressure on the river system in the future.</p> <p>4 . Distribute Map 5 (Watershed and Tributaries of the Rio Grande Basin). Have students locate the community in which they live on the river system. They should refer to Map 3 and Map 4 to help them. If this lesson is to be used as a part of "The River" curriculum, tell them to refer to this map to locate tributaries of the Rio Grande in New Mexico.</p>	
---	--



## **NARRATION FOR A JOURNEY DOWN THE RIO GRANDE**

*Note to the teacher:* After students have drawn in the political boundaries and the location of the major cities using Maps 1 and 2, read the narration, allowing sufficient time for students to draw on their maps (Map 1). To save time, you may wish to have a list of the names to be labeled on the board before you begin.

### **NARRATION**

#### **Part 1**

Locate the mainstem or the main river course of the Rio Grande on Map 1. Follow the river up to the northernmost point. This is the beginning, called the **headwaters**, of the Rio Grande. If you were to visit this area you would be standing near the top of the San Juan Mountains some two and a half miles above the level of the sea. There would be tall mountain peaks all around you. There would be almost no trees growing at this elevation, and in most months of the year, there would be snow covering the ground. During the winter, the snow could be way over your head. Back in the year 1953, there was 55 feet of snow in the area, enough to cover a five-story building! Even in July you would find patches of snow and by August, the chill of the coming winter would be in the air. As the snow melts, small streams join others and thus begins the journey down the Rio Grande. From here it travels almost 1900 miles until it meets the sea at the Gulf of Mexico.

**Map activity:** Draw on your map some mountains where the Rio Grande begins. They should be about 1” in length running north to south. Label them “San Juan Mountains.”

## **Part 2**

The Rio Grande drops out of the tall mountains quickly. In only 12 miles, the river has dropped more than 3000 feet, losing about a quarter of its original elevation. On its way toward the New Mexico border, many smaller tributaries or streams join the mainstem. The land around the river here in Colorado is a large flat valley that is some 8000 feet above the level of the sea. Here are large and small farms where potatoes, grains, hay and lettuce are grown using irrigation water from the Rio Grande and its tributaries. Water is used over and over as wet fields are drained and water is returned to the river to be used again. The valley is bordered on both sides by high mountains. The summer is short and warm. The winter is long and cold.

**Map activity:** Mark on your map just above the border of Colorado and New Mexico the San Luis Valley. Draw in some small fields of grain.

## **Part 3**

By the time the Rio Grande leaves Colorado, it has lost much of its stream flow. Only during the melting of the snow in the spring does a lot of water reach New Mexico. It has picked up some wastes or contaminants from agriculture in the San Luis Valley and mining in the nearby mountains. But it is soon replenished with the water from the many small rivers and springs in northern New Mexico. The river enters a stretch known as the Rio Grande Gorge, a wild and scenic part of the river with deep canyons and rapids. The river has cut through volcanic rock and ash and is often 1000 feet below the level of the surrounding land. When there is access to the river, some hardy sportsmen catch trophy-size fish in pools between the rapids. In some stretches, boaters in kayaks or rafts navigate through some of the most challenging river runs in North America. Little of the water is used for agriculture since the level of the river is so far below the rest of the land.

**Map activity:** On your map, just below the Colorado state line, mark the Rio Grande Gorge and draw in a small river raft and a fish.

## **Part 4**

North of Española (where the Chama River meets the Rio Grande), the river again begins a dramatic change. The series of valleys through which the river flows are much wider than the Rio Grande Gorge. The climate is milder than the San Luis Valley. Here people have lived for thousands of years using the water of the river for life-giving agriculture. Many settlements along the river were home to Pueblo Indians hundreds of years before the arrival of the Spaniards in the early 1500s. The Chama River is the last major

tributary of the Rio Grande until the Conchos River in Mexico. However, many other small streams and arroyos join the river along its journey and after summer thunderstorms add water to the river. Along this section of the river is the large Cochiti Dam, built to control flooding north of the city of Albuquerque, New Mexico's largest population center. Near the river is an area of large trees and plants that are able to live because of the water. In some areas, there are wildlife preserves where many types of animals and birds live. In New Mexico, this section of the river from the Chama to Elephant Butte Reservoir is known as the Middle Rio Grande Valley.

**Map activity:** Mark the Middle Rio Grande Valley on your map. Also draw in a Pueblo and some buildings around Albuquerque. Label Cochiti Reservoir.

### Part 5

Elephant Butte and Caballo Reservoirs store water for the rich agricultural areas downstream in the Mesilla Valley around Las Cruces and near El Paso and Ciudad Juarez. The climate is now hotter and drier in the lower elevations. The plants and animals have adapted to the desert where there is often little rainfall. Near the Rio Grande are large farms that use the river's water to grow warm weather crops like *chile*, pecans, and cotton. Mountains, now browner and more barren, still are seen on both sides of the river.

**Map activity:** Draw on your map, between Elephant Butte Dam and El Paso, some farms of cotton, pecan trees, or *chile*.

### Part 6

At El Paso, the Rio Grande or Rio Bravo del Norte, as it is known in Mexico, begins its role as an international boundary. By the time it separates the industrial cities of El Paso and Ciudad Juarez, the river has lost most of its water and what remains in its concrete riverbed is often muddy and contaminated. By the end of the El Paso Juarez Valley, The Rio Grande has traveled 700 miles and has irrigated almost a million acres of cropland. Here the river is only 3400 feet about sea level, but still has 1200 miles to go before it ends in the Gulf of Mexico. The land past El Paso is a rocky desert. The animals and plants that live in this desert have adapted to harsh conditions. At times the Rio Grande is without surface water, running again after summer rains for brief periods.

**Map activity:** On your map, between El Paso and the Rio Conchos, draw what you think this desert might look like.

## Part 7

The Rio Grande gains a new life when the clear, cold waters of the Rio Conchos of Mexico join it. Again becoming a major Southwestern river, it flows through the Big Bend region of Texas and Mexico past spectacular gorges, canyons and valleys.

**Map activity:** Mark Big Bend on your maps just below where the Rio Conchos joins the Rio Grande and draw in some hills or gorges.

## Part 8

Past the Big Bend country, the river again flows through flat desert of cactus and mesquite. The Pecos River, which begins in the mountains near Santa Fe and irrigates thousands of acres of farmland in New Mexico and Texas, joins the Rio Grande just above a large lake named Amistad (Friendship) Reservoir. Downstream the river enters another large agricultural area. By the time it reaches the city of Laredo, the elevation is only 440 feet above the level of the sea. The climate is now once again different. One can feel the humidity or moisture in the air. The river cycles have also changed. The high level of river flow is during the summer and fall rainy seasons instead of the springtime snow melt in Colorado and northern New Mexico. The largest reservoir on the river is Falcon Lake. It provides irrigation water for the richest agricultural delta in North America. There are almost a million acres of citrus groves and cropland on both sides of the border. The land is flat and green. Palm trees line the river bed in some areas. One begins to see birds from the sea. The smell of the air is one of tropical coastal land.

**Map activity:** Draw on your map some citrus trees or palm trees below Falcon Lake.

## Part 9

Past the border cities of Brownsville and Matamores, the Rio Grande ends its journey in the Gulf of Mexico. It has flowed 1900 miles through tall mountains, deep gorges, and flat plains. It has traveled under banks of snow and through alpine meadows. It has been the only stretch of green in dry, hot deserts. People have used its water to drink, to grow food and for recreation in many forms. Thousands of varieties of fish, animals and birds have depended on its life-giving water for survival. At times it has been almost dry, and at other times it has been a raging torrent of water. This is the Rio Grande or the Rio Bravo del Norte, an international river.

