

**Module 10: Resources and Virginia Geology**  
**Topic 4 Content: Virginia Geology Notes**



Virginia is composed of a very diverse landscape that extends from the beaches and barrier islands all of the way to the highly elevated Appalachian Plateau. Geologists have discovered ancient shallow seas, swamps, the collision of continents, and the existence of karst topography in the different physiographic provinces of Virginia. Explore each of these regions by clicking the different highlighted areas. Make sure to visit each physiographic province.

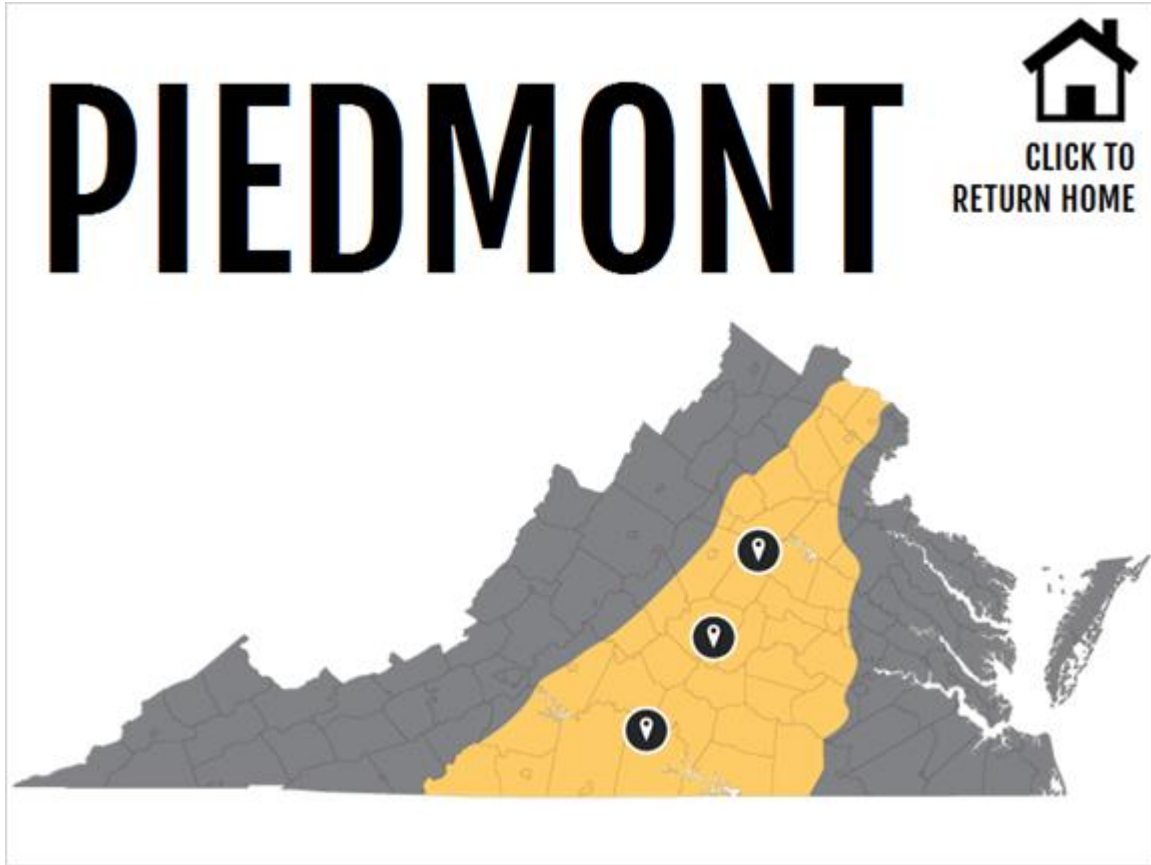
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The Coastal Plain province is located in the eastern-most part of Virginia and is known for its wetlands and natural harbors. It begins near Richmond, Virginia at the Fall Line and continues eastward to the ocean. Click on each of the icons to learn more about this area.

- The Coastal Plain is covered in a thick layer of sediment, including sand, silt, clay, and gravel. The sand, silt, gravel are mined for use in road construction. These sediments accumulated in the Coastal Plain after being weathered, eroded, transported, and deposited by eastward flowing rivers and streams. Underneath the sediment is sedimentary rock, formed from sediments that gathered here over time and were slowly pressurized and compacted into rock over millions of years.
- The elevation of the Coastal Plain province is low, from just a few feet above sea level to about 200 [to hundred] feet above sea level at its highest point. The low elevation and the exposure to water change the landscape frequently in the Coastal Plain. As the water rises and falls with regular tides and occasional storm events, sediments move and change the shape of the coastline over time.
- Oil and natural gas deposits exist off of the coast of Virginia. The Commonwealth of Virginia may decide to allow companies to invest, build rigs, and harvest these reserves.
- The beaches and barrier islands of Virginia attract many tourists for swimming, surfing, and other watersports. These areas also provide a habitat for a wide variety of wildlife, and recreational fishing is also prevalent.

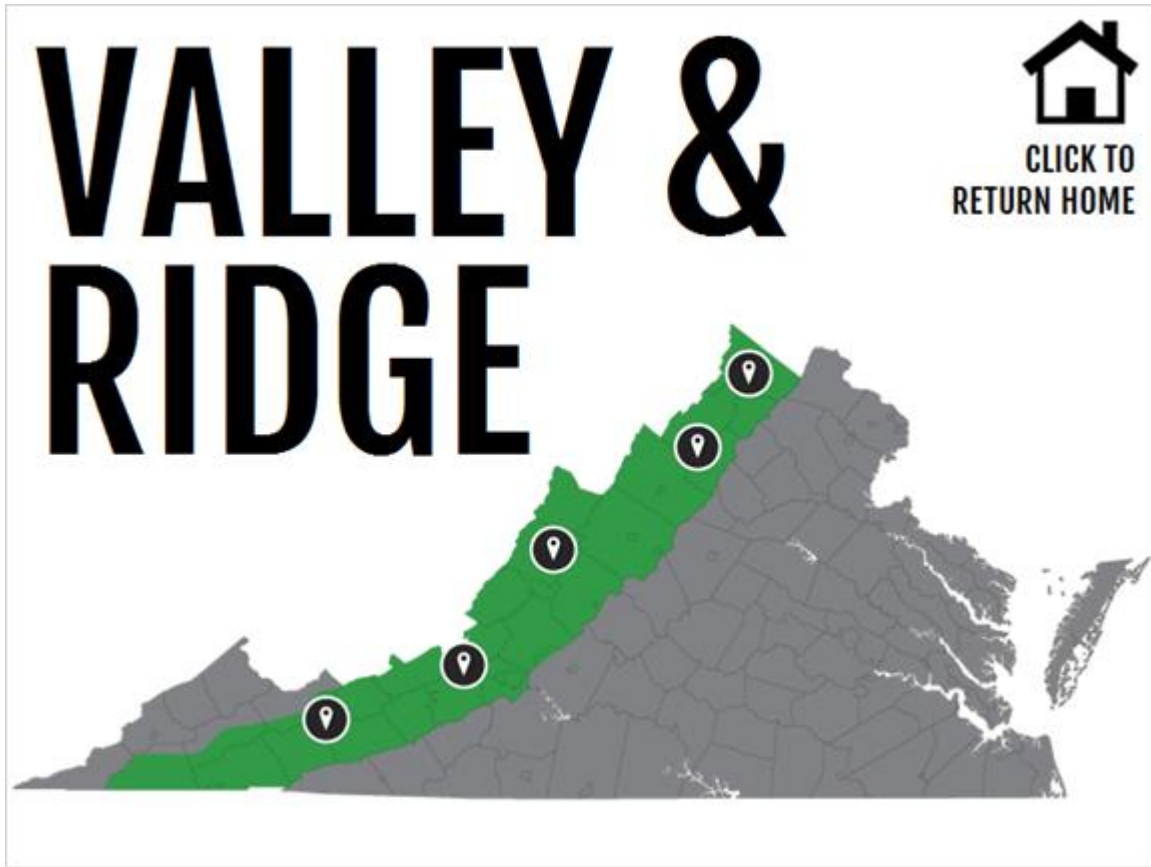
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The Piedmont province begins at the western edge of the Coastal Plain, at the Fall Line. The Fall Line is the boundary where softer sedimentary rocks end and harder igneous and metamorphic rocks begin. Click on each of the icons to learn more about this area.

- Silica is mined in this region for use in electronics. The heavy metals of zirconium and titanium are mined in this province. These metals are used to strengthen steel. The Piedmont province has a unique geology of rolling hills and folded rocks. Key rock resources include slate, kyanite, vermiculite, granite, gabbro, and feldspar.
- The folding and faulting in the metamorphic rocks underneath this province indicate that it was geologically active in the past. These rock formations were created as the North American tectonic plate and the African plate collided. These plates were originally made of granite and volcanic basalt, but the heat and pressure from the collisions caused these igneous rocks to change into metamorphic rocks. The oldest rocks in this area are around 1100 million years old.
- The metamorphic rocks here are more resistant to weathering and erosion, so many of the rivers have interesting features, such as rapids and waterfalls, which are not present in the Coastal Plain region. The James River is a prime Piedmont site for recreation such as kayaking and tubing due to the faster moving water near the Fall Line.

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West of the Blue Ridge is the Valley and Ridge Province. This province is made up of a series of valleys that are separated by ridges, created from the pressure of colliding tectonic plates. Click on each of the icons to learn more about this area.

- The Valley and Ridge Province is home to the Allegheny Mountains. This is a long folded mountain range with elevations between 3,000 and 4,000 feet.
- The bedrock in this province is made of thick folded sedimentary rocks such as sandstone, shale, and limestone. The limestone rock is mined and used to make concrete. Silica is mined in this region for use in electronics. The Valley and Ridge province contains the heavy metals zirconium and titanium. Virginia is one of three states that mine these important heavy metals.
- The Valley and Ridge is known for karst topography. Over time, slightly acidic rain and groundwater erodes the limestone bedrock to form unique underground features such as sinkholes, caves, and caverns. Luray Caverns is a very popular tourist destination in this province.
- Fossils found in the rock are evidence that this province was once a shallow sea.
- The rivers in this province will empty on two different locations. Some of the rivers and streams in this province empty into the Chesapeake Bay. Other rivers will flow south and west and drain into the Gulf of Mexico.



The smallest and western-most province is the Appalachian Plateau. Click on each of the icons to learn more about this area.

- Although this area is called a plateau, extensive erosion has caused the area to contain very rugged topography. This region is composed mostly of sedimentary rocks. The Appalachian Plateau is known for its deposits of bituminous coal. This means that when the coal formed here hundreds of millions of years ago, the land was a swamp filled with large plants.

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Just west of the Piedmont is the long and narrow Blue Ridge province. Click on each of the icons to learn more about this area.

- The Blue Ridge Mountains are old, rounded mountains that start in Georgia, run through several states, including Virginia, and end in Pennsylvania. This Blue Ridge province is the area of the highest topography and is also home to the very highest elevation in the state of Virginia, Mount Rogers. Mount Rogers has an elevation of 5,729 feet above sea level.
- Metamorphic and igneous rocks create the solid bedrock of the Blue Ridge. Some of the rocks in this area are dated to over 1.1 billion years old. This province contains the oldest known rocks in the state. The Blue Ridge Mountains are made of igneous rocks, indicating that this region was once volcanically active. Important resources include quartzite, crushed stone, copper, and iron.
- The Blue Ridge is an important recreational resource for Virginia. There are ski resorts, hiking in Shenandoah National Park, and mountain roads, like the famous Skyline Drive, that attract thousands of visitors looking to enjoy all the mountains have to offer.