

VIRGINIA MUSEUM OF NATURAL HISTORY – WAYNESBORO
INTERPRETIVE MASTER PLAN

FEBRUARY 2015

submitted by:

 **Quatrefoil Associates**

29 C Street Laurel, MD 20707



LETTER FROM THE EXECUTIVE DIRECTOR

We are a *Museum Without Walls*. That is a call to mission, ambition, relevance, and responsibility. There are over 7 million Virginians we must reach. Martinsville, the Board of Trustees, and the VMNH Foundation took a brave step forward when the doors to our Starling Avenue facility opened in March of 2007. We now contemplate a bold new move to triple our attendance to exceed 100,000 visitors annually, and capture an audience composed of state-wide and nation-wide tourists. We will achieve this while interpreting one of the truly amazing ecological regions of Virginia, with the Shenandoah Valley and Blue Ridge supporting flora and fauna found nowhere else on earth.

Waynesboro is an unconventional next step in the growth of VMNH, just as opening the museum's original building on Douglas Avenue in Martinsville was three decades ago. I have worked closely with numerous constituents in Waynesboro over the past three years and have seen an economic recovery fueled by support from the City and local business leaders.

Waynesboro is centrally located between Harrisonburg and Charlottesville, is adjacent to Interstate 64 and 10 minutes from Interstate 81, has 300,000 people traversing Mile Post 0 on the Blue Ridge Parkway annually, and the south entrance to the Shenandoah National Park is situated only 10 minutes from the Downtown. These travelers represent a ready-made audience of people from throughout Virginia and other parts of the country who would be keenly interested in an interpretive natural history experience in this biologically and geologically rich area of the Commonwealth.

This master plan outlines steps we may take together to engage more visitors and operate a sustainable science interpretive facility that will match our *Museum Without Walls* ambitions. I thank the Board of Trustees, VMNH-Foundation Board of Directors, the VMNH staff, the City of Waynesboro, and everyone else who has worked to bring us to this exciting point.

Joe B. Keiper, Ph.D.
Executive Director
February 2015



DESIGN & CONTENT OVERVIEW

The new center in Waynesboro is a vibrant place of learning and discovery that will explore the connections among water, geology, life and the passage of time at the intersection of the Blue Ridge Mountains and the Shenandoah Valley. Through participatory and specimen-based experiences, visitors will gain a deeper understanding and appreciation of Virginia's natural heritage.



This Master Plan for the new Waynesboro Center explores the biodiversity and natural conditions of the Blue Ridge Mountains and Shenandoah Valley region. This multifaceted story spans millions of years, from the geological and hydrological forces that created the unique landscape to the regional habitats where plants, animals and people flourish today. This is the foundation of the exhibition – the stories of nature over time – stories that provide a deepened sense of appreciation for the local surroundings.

On the main level, the design approach emphasizes the grandeur and diversity of life through dense, yet considered, displays of specimens and artifacts from the region. The juxtaposition of collections and content reinforces the idea of nature as a network. Specimens and scientific disciplines link to each other to demonstrate this holistic connection. For example, a geological specimen might tell the story of its own formation, but it also might reveal clues to the life forms that existed millions of years ago, or how humans have used it as a resource throughout time. Stories are the matrix that unites the collections with visitor's emotions. Stories are the hook that makes the inanimate collections come to life.

Through participatory and specimen-based experiences, visitors gain a deeper understanding and appreciation of Virginia's natural heritage. Activities help wrap their minds around the processes of scientific discovery and analysis. Visitors learn first-hand how archaeologists put together puzzles to reveal the past, or how biologists decipher the intimately woven “web of life.” There are also “playscapes” designed for children, and enthusiastic adults, to explore scientific discovery through fun, physical play.

This exhibition attracts a variety of visitors, from tourists to the local community, from families to trail hikers, from school groups to senior citizens. The space itself accommodates special events, such as lectures and classes, and provides open lab space for university students and researchers to conduct their work in zoology, botany, archaeology and geology, all visible to the public. It also provides a community center and venue for special events. Exterior spaces are imagined as a place for programming and social gatherings amongst indigenous gardens and natural waterscapes, providing a connection between community and the natural environment.





1st Floor (Main Level) View



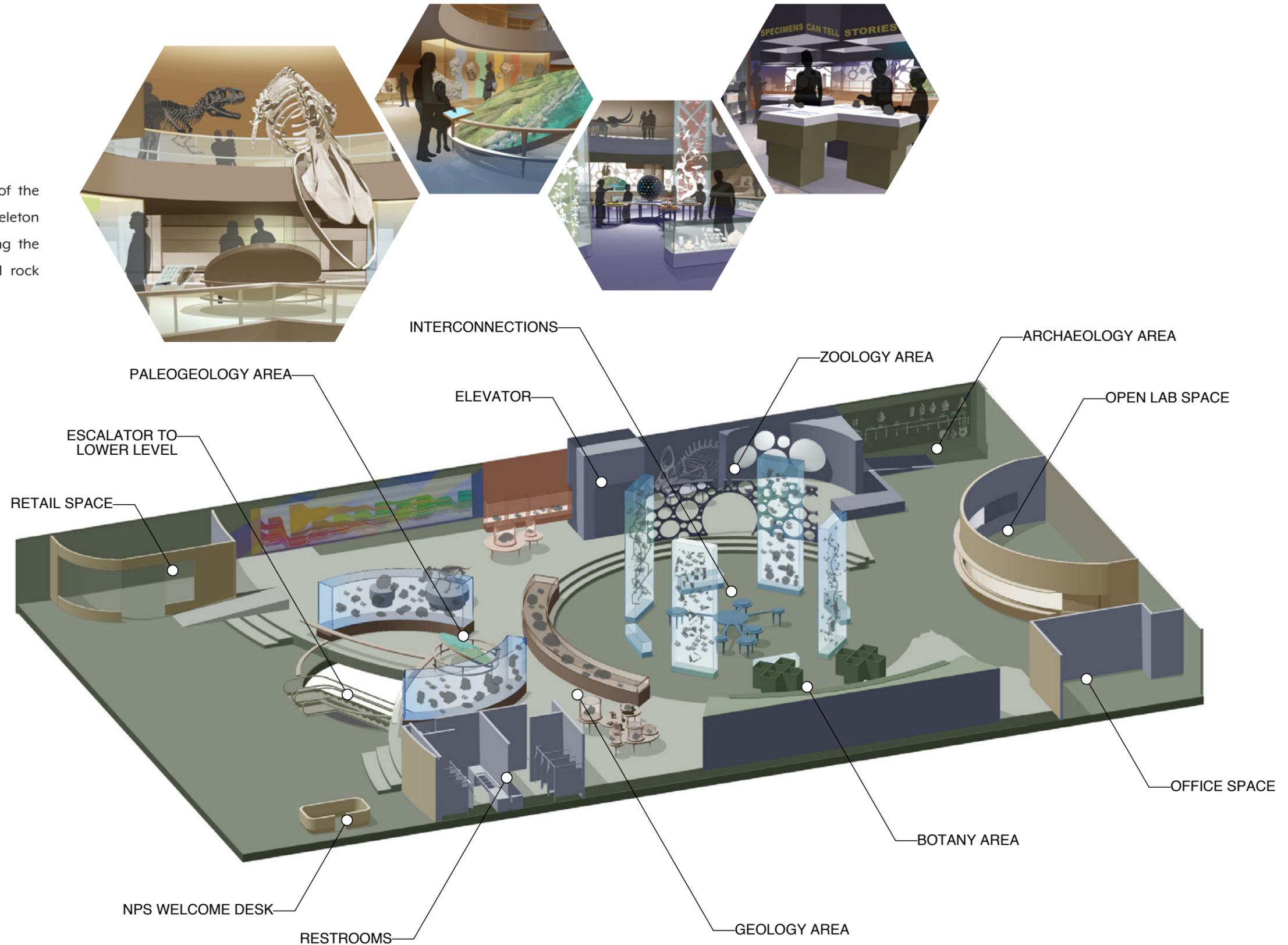
MASTER PLAN EXPERIENCE OVERVIEW

MAIN LEVEL

The visitor experience begins with a stunning overview of the exhibits just beyond the entry. We see an ancient whale skeleton arcing high above the glass display cases. Upon entering the Paleogeology exhibit, we realize that some of the local rock specimens on display are actually deposits from an ancient ocean. And the soaring whale skeleton belongs to an animal that once swam in Virginia.

In the first area, a large disk displays a projected image of the Shenandoah Valley region as seen today. By moving a slider along a timeline on a small touch screen, we change the projected image. Moving the slider back in time, we see tectonic plates collide, mountains lift and erode, and the formation of a shallow inland sea. This portal into the past shows the geologic history of the region through a visual journey that is beyond imagination.

We move on to discover fossils flanking the portal. One fossil path focuses on animals, while the other focuses on plants. As we follow the path of animals, the fossils evolve from marine creatures to land dwellers. From fossils embedded in stone, the ancient animals progressively become articulated skeletons. If we take the botany path, the plant fossils become preserved specimens.



PALEOGEOLOGY

The regional topography we see today is just a brief snapshot in a vast geologic timeline. In this exhibit, visitors are encouraged to step into the shoes of a geologist to discover the origins of the Blue Ridge Mountains and limestone valley. Using visual, tactile and microscopic evaluation, visitors find the clues hidden in local rock samples and use critical-thinking to determine how limestone, sandstone and Catoclin basalts (greenstone) were formed millions of years ago. Other open-ended activities teach the interpretation of stratigraphy and the origins of local rock formations.

An interactive trip back through time offers a fascinating visual recreation of the region's geologic history. Visitors learn that the modern landscape was formed through a series of collisions, uplifts, eruptions, deposits and eons of erosion. Virginia didn't always look like it does today – it wasn't even in the same place as it is today. And people may be surprised to learn that this region was once a shallow marine environment, or that the original Appalachian Mountains were once as high as the Himalayan range is today.

Sometimes paleontologists find the skeletal remains of ancient organisms. They also find rocks containing the imprints of prehistoric plants or animals, or perhaps their footprints from long ago.



The Mystery of the Missing Dinosaurs...

Visitors learn about the Mesozoic fauna of the region through dinosaur footprints excavated from the Culpepper Stone Quarry and discover why scientists rarely find a bone or tooth at

the site. The Triassic rift and Culpepper basin are another backdrop for regional fossil exploration, as is a collection of Ordovician fauna and prehistoric plants, such as ferns and scale trees.

As we move deeper into the Zoology exhibit, skeletons become the taxidermied specimens of modern animals. Mammals, reptiles, fish, birds and insects surround us in a vast display of biodiversity that encourages us to wonder and inquire: Why is this region so diverse in animal life, and why are there species here that don't exist anywhere else?





Paleogeology



ZOOLOGY

Visitors now step into the shoes of a zoologist to uncover the answers. As they learn to think like a scientist, visitors see why the Blue Ridge Mountains environment is similar to an island environment and learn that isolationism can result in unique species, such as the Big Levels salamander, and threatened species, such as the bog turtle.

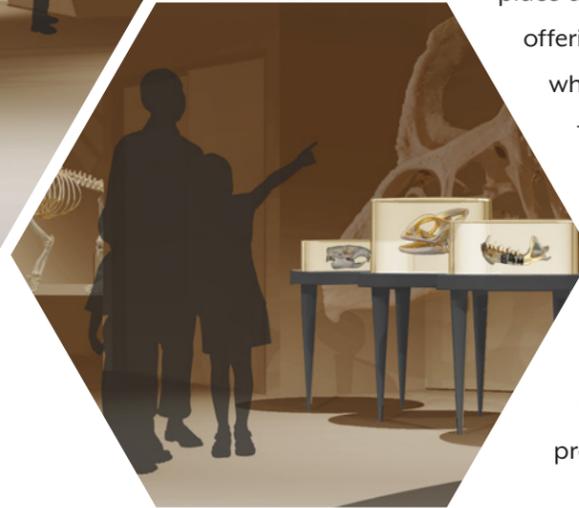
Visitors also learn how an abundant species becomes extinct in the geological blink of the eye. The plight of the passenger pigeon (now extinct), the Indiana bat and the little brown bat (now endangered) are explored. What happened to these animals and how can visitors help to keep this from happening again? Which animals are being reintroduced to this region? Elk, beavers and bald eagles are just a few of the species making a successful comeback with help from zoologists and environmentalists.

Visitors will learn the difference between an “introduced” species and an “invasive” species. Can an animal that is introduced for the benefit of humans become an invasive species? The native brook trout of the South River and the introduced brown and rainbow trout are used as examples.



The relationship between trout and indigenous insects is explored in a fly-fishing display that shows the beautiful artistry of lures in comparison to the indigenous insects they are designed to mimic.

The EnviroCam viewing station provides live video feeds from different locations within the surrounding National Parks. This seated area is both a resting place and a portal into the regional ecosystems, offering a wilderness experience to individuals who may never have the opportunity to visit these ecosystems in person.



Our journey through nature continues on the opposite side of the exhibit space, where plants move through time from fossilized specimens in Paleogeology to their contemporary, preserved successors in Botany.





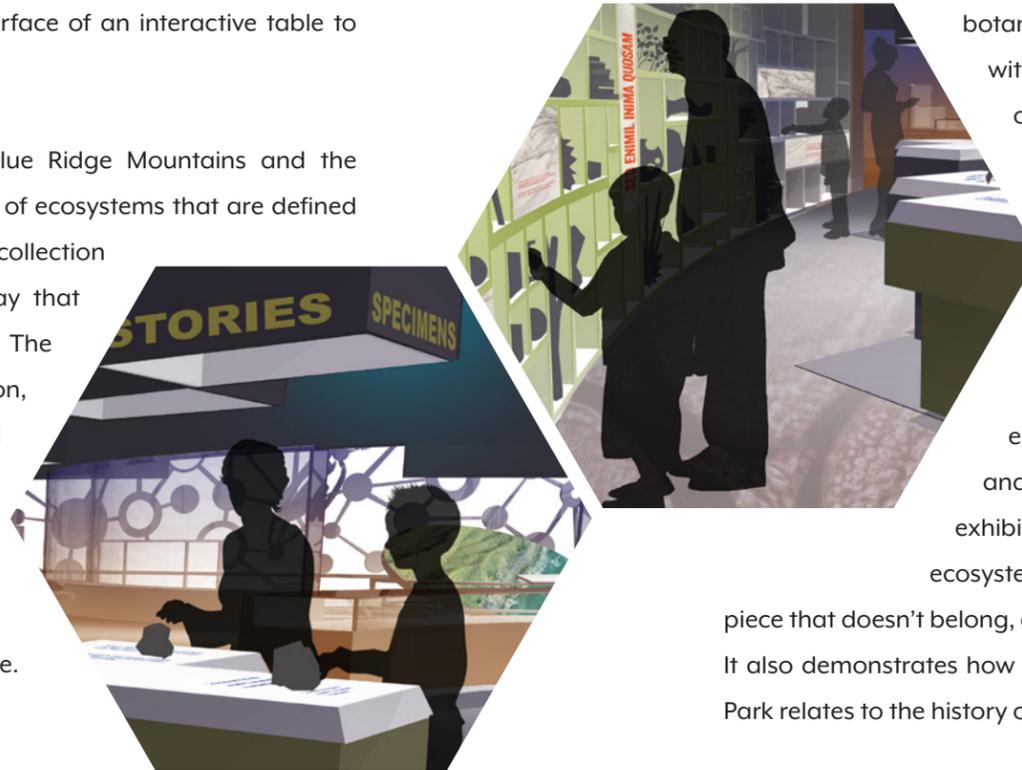
Zoology



BOTANY

This section displays a tremendous variety of plant specimens, each holding an incredible story that can be accessed in different ways. Visitors might use their personal devices to reveal content through a specially designed application, or checkout a digital tablet from the museum. Or they might place a specimen on the surface of an interactive table to unveil the story.

Plant life at the intersection of the Blue Ridge Mountains and the Shenandoah Valley is found in a variety of ecosystems that are defined by elevation and climate. Visitors view a collection of plant specimens in a vertical display that depicts several unique ecosystems. The spruce fir forest is at the highest elevation, maple/beech and oak/hickory at mid elevations, and bottomland forest and/or grasslands at the lowest elevation. Wildflowers typically found in each ecosystem are featured, as are some of the animals that live in each zone.



Visitors now have the opportunity to think like a botanist by exploring the interactions of plants with other organisms and the environment, or by learning how early humans in this region used the native plants for survival. Visitors can also step into the shoes of a field botanist to identify plants and search for new species, or to see the damage caused by invasive insects, such as the emerald ash borer, hemlock wooly adelgid and brown marmorated stinkbug. This exhibit shows the importance of a balanced ecosystem and how one missing piece, or a new piece that doesn't belong, can crumble the environmental structure. It also demonstrates how the distribution of plants in the National Park relates to the history of climate change.

Now, the Zoology path and Botany path lead us to the rear of the main floor where we find an open laboratory filled with scientific discovery in action.





Botany

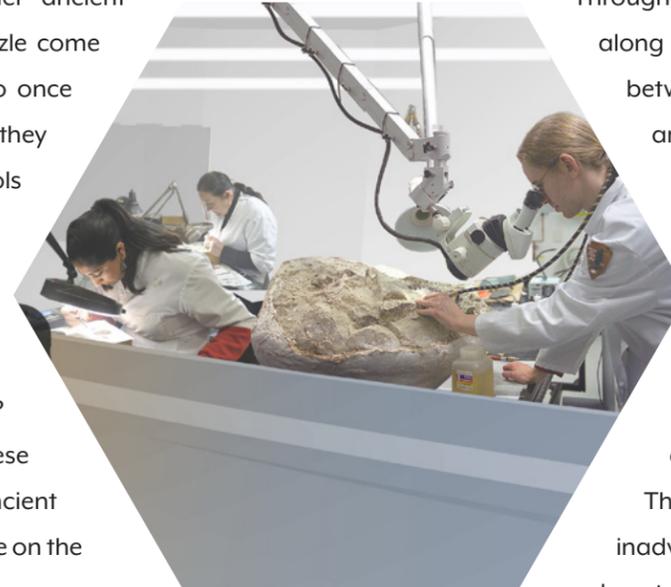


LAB SPACE

Behind the glass wall of the Lab Space, we see university students and researchers conducting scientific work, perhaps while an educator talks to a group of school children. This is where scientists reconstruct the past by piecing together ancient artifacts. As the pieces of the history puzzle come together, we learn about the people who once lived in this area — the plants and animals they ate, the shelters they made, and what tools they used in daily life.

Who were the humans who lived in this area before us? How were they using the natural resources? Where did they settle? Visitors discover their own answers to these questions by analyzing the evidence that ancient people left behind. This is where visitors take on the role of an archaeologist through hands-on, open-ended activities. They view ancient objects, analyze them and come to a conclusion using the same analytical techniques used by scientists. A display of flint tools is now seen through the eyes of a critical-thinker.

Visitors also discover the wonderful world of garbage. What was once considered a discard by historic peoples is now a treasure trove of information for modern archaeologists. Visitors sort through a small pile of unearthed trash to decipher the hidden clues. In the process, they will learn how to identify animal bones, determine the period in time and make a hypothesis about the people's culture.



Throughout history, ancient peoples have migrated along waterways. In this region, they migrated between mountains and valleys. How do archaeologists know this? Why did humans settle in certain areas during different periods in time? Why did they leave?

How have geology, zoology and botany influenced the lives of humans...and how have humans, the greatest invasive species of them all, influenced the environment?

This section highlights past actions that had inadvertent impacts in the area, and what is being done to rectify the damage.

Our journey through the main floor culminates in the center space — the core of the exhibition — where the four scientific disciplines come together. This is where nature is explored as an interconnected system.





Lab Space

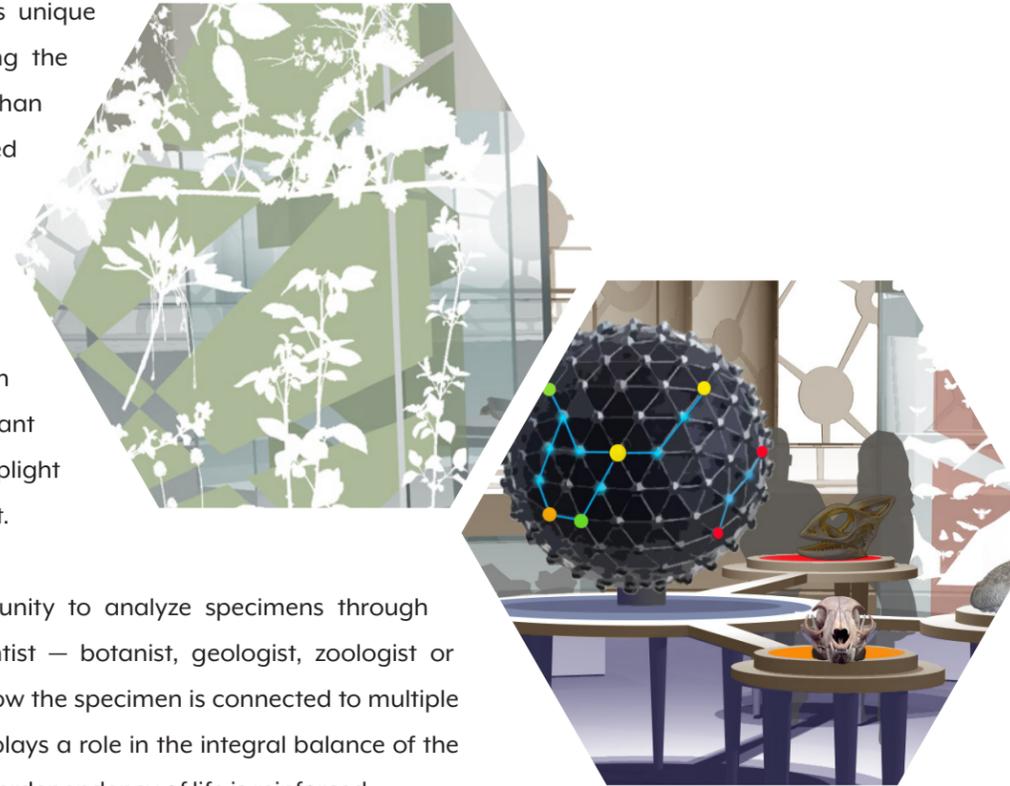


CONNECTIONS

A centralized multimedia activity allows visitors to explore the region's unique tapestry of life by emphasizing the relationships in nature. Rather than treating specimens as isolated elements, they operate like hyperlinks to connect with other specimens and/or stories in the collection. For example, an insect specimen might have a connection to a plant that triggers a story about the plight of an historic human settlement.

Visitors also have the opportunity to analyze specimens through the eyes of a particular scientist — botanist, geologist, zoologist or archaeologist. They discover how the specimen is connected to multiple scientific disciplines, or how it plays a role in the integral balance of the ecosystem. This is where the interdependency of life is reinforced.

Surrounding this core of “connections” are towering cases filled with specimens. As our eye is drawn upward, we see megafauna populating the second level of the building. Let's get a closer look.





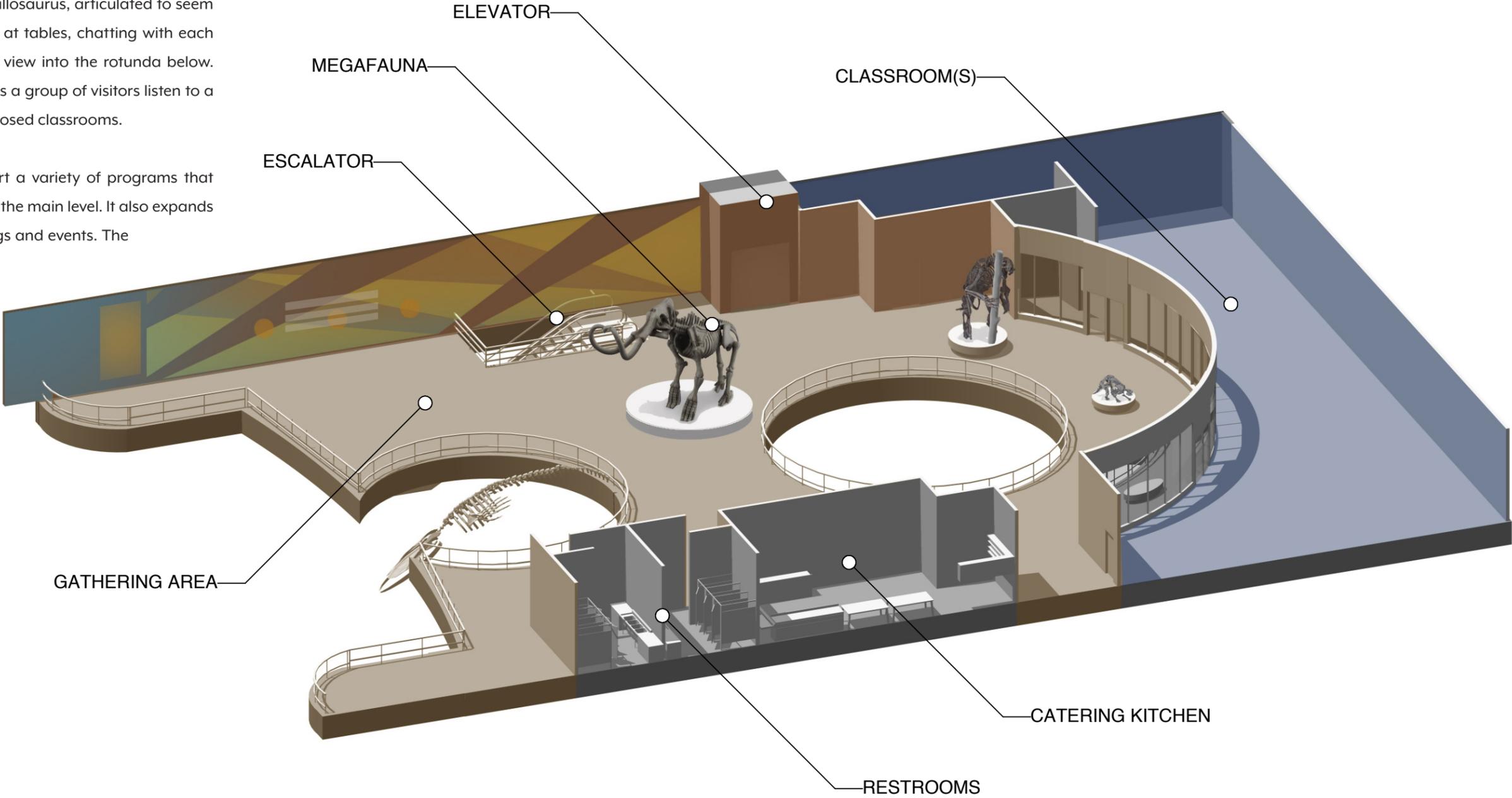
Connections



SECOND LEVEL

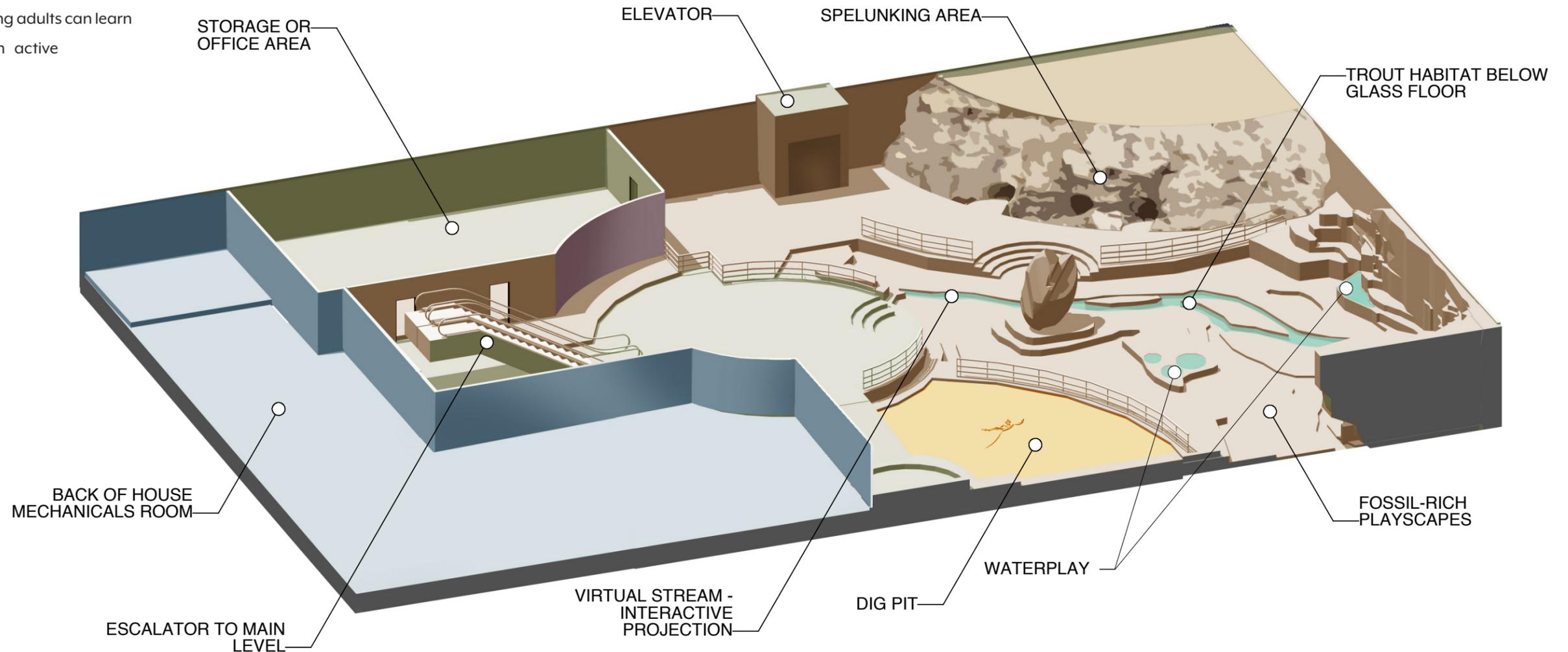
As we step off the escalator we see amazing beasts from days gone by: A giant sloth, a mammoth, and an allosaurus, articulated to seem as though it's coming for us! People sit at tables, chatting with each other amongst the megafauna, with a view into the rotunda below. Caterers prepare for an evening event as a group of visitors listen to a presentation inside one of the glass-enclosed classrooms.

The second level is designed to support a variety of programs that extend the messaging of the exhibits on the main level. It also expands the capacity to support social gatherings and events. The classroom space is multipurpose. It can be divided into several small spaces and used for meetings, lectures and rentals. This floor ensures an adequate amount of space for addressing current topics, as well as adding functionality and flexibility to fulfill the Center's needs.



LOWER LEVEL

This is a place where children and fun-loving adults can learn about exploration and science through active play. Each of these fun “playscapes” is designed to replicate how scientists and adventurers explore the real world of the Blue Ridge Mountains and the Shenandoah Valley. A ramp winds around the space to allow for handicapped access. We see children and adults crawling in and out of channels of replicated caves. Spelunking is underway! Kids crawl into caverns with stalagmites and traverse hidden passages. As they explore, they might encounter bats roosting in the darkness. We follow the sound of dripping water to discover the source. A trickle falls from a wall of stratified rock to form small pools where children play and observe water in its liquid, solid and gas forms, while learning about the fundamental role water plays in the land’s formation.



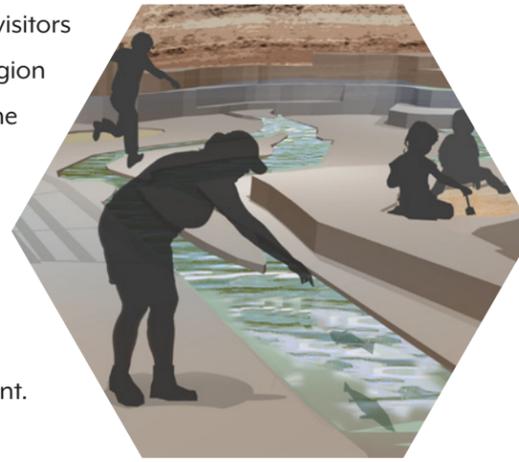
The pools lead to a stream. Stepping closer we see that part of the stream is a projection where children interact with virtual fish. Another part of the stream is stocked with real trout swimming in water below a glass floor.

Both the rock strata and ground below our feet are sprinkled with replicated fossils and a paleological treasure hunt is taking place. As we move up to a higher level we notice a dig pit with children uncovering a mammoth skeleton buried in the sand. Other children and adults play hide and seek among giant replicated rock formations.



PLAYSCAPES

From the trickling inside a cave to trout-filled streams, visitors discover why water is such an integral part of this region and how the topography has been shaped by water. The land has gone through processes of building-up and eroding-down since earth's atmosphere first formed. Oceans have come and gone, rivers have changed their courses, and rain has fallen in a perpetual process of erosion. The combination of hydrology and geology has created a very unique regional environment. Several activities and exhibits convey this principle.



- An interactive tilt table demonstrates how water interacts with geology.
- A hands-on activity shows the interesting properties of water in its liquid, solid and gas forms.
- A working model offers an underground view of spring water. Where do springs come from? Why does this part of Virginia have so many? What is the connection between hydrology, the South River and the karst topography?
- A large graphic panel shows the connection between the Shenandoah Valley, Potomac River and the Chesapeake Bay.
- Another graphic panel shares the importance of the South River to this area, its history and its ongoing recovery. A sidebar teaches us ways to care for all of our rivers and streams.
- A video projection on the floor creates a virtual stream with virtual trout that children can interact with.

- An artificial stream, meandering through the floor, is actually a trout habitat covered by glass. Visitors can walk upon the glass and observe the fish swimming below.
- A spelunking experience explains how water forms caves and stalagmites, and why there is such an abundance of caverns in this region. This specially-designed cave is also an activity space, and a fun place to explore. Kids might even find surprises, like a bat.

Paleontology and Archaeology are also featured in the playscapes.

- A fossil hunt is scattered throughout the space. Children use a map to find the hidden fossil treasures.
- A dig site allows junior paleontologists to unearth mammoth bones in a sand pit. Children can then determine which part of the mammoth they've uncovered by matching the bone to a routed-out section of a skeleton graphic on the wall. Similar "matching" activities can be used for ancient stone tools found in the dig site, as well.

An escalator positioned in the center of the space carries us up and down, to and from, the main level. But before we leave the building, we have one last place to visit — the outdoor garden.





Playscape



OUTDOOR GARDEN AND EVENT SPACE

Stepping outside, we enter the garden, a collection of indigenous plants and a vernal pool, all designed to attract local insects or amphibians. This area is a more contemplative, relaxing space, very different than the active energy of the lower level or the interactive spectacle of the main floor. It is designed as a tranquil setting for museum members to have lunch or host special events. Open areas accommodate temporary structures for programming or social gatherings.

Whether this outdoor space is built on the roof (if a pre-existing building is selected as the site) or as part of the grounds adjacent to the building (as may be the case if the building is new construction) its main purpose is to offer visitors a way to connect with the landscape through a real, living reference. Augmented with minimal interpretation, the garden is designed to address the change of seasons. Here and there we see mechanical viewers as one might find at a scenic overlook. The viewers are directed towards different aspects of the landscape. We step up to one that is pointed toward the mountains. As we look through its lenses we see an exact digital model of the same mountain. Simple instructions tell us to turn a dial. As we do, the mountains in the viewer reshape themselves, rising high until they are capped with snow.

Again, we are reminded of the deep history of the mountains and valley, and all the things that have come and gone over the millennia. We are reminded of the critical role that water plays as the life-blood of the region. And we remember how the first people who lived here were in balance with nature, an achievement that scientists and activists are striving for today. Below the mountains we see the South River that represents this effort.

As we sit and contemplate our time spent at the Waynesboro Center, we think of how much we missed during our visit. We must come back. And next time we will bring friends.

We can learn from yesterday and prepare for tomorrow by using what we've learned today to shape the future of Virginia.

