Route 79

Caroline Elementary

3

1

5

4

2

6

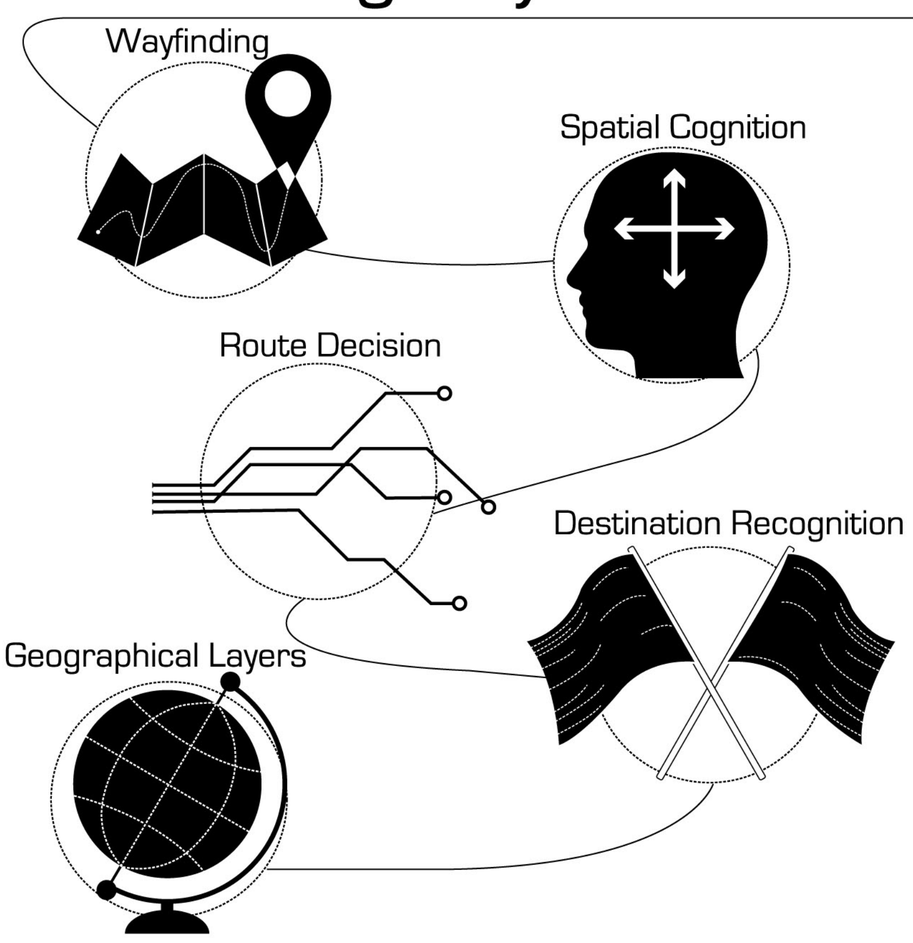
Six Mile Creek

N

10' 20' 40' 80'

Caroline Elementary:

Teaching Layers of the Living World Through Space and Direction



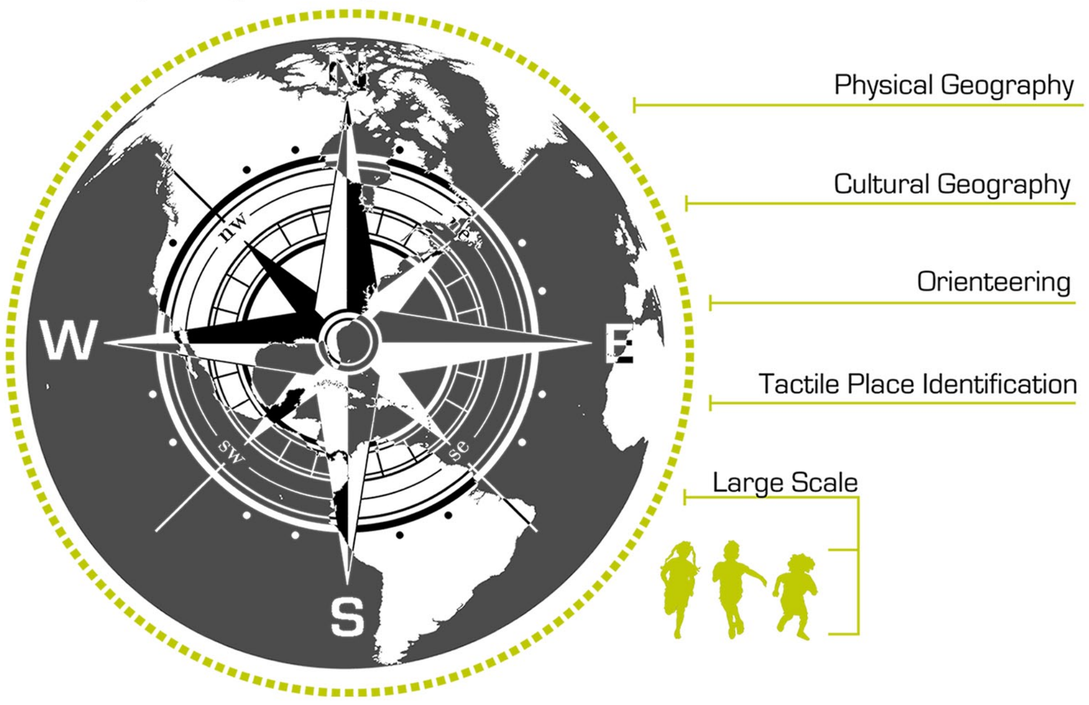
This design solution is based on teaching students the ability to navigate from one point to another and recognize landmarks and changes to their environment along the way. Teachers and students have the ability to translate what they learn in the classroom on a broad range of subjects from physical geography to shapes and sizes of continents, locations of places, plant species and how they move about the globe, general soil types and what can grow there and cultural geographical features based on abstract forms. Understanding why species like Japanese Knotweed grow so abundantly, its harmful effects on the ecosystem, as well as what it can be used for and how it can be treated to minimize harmful impacts is also a very important teaching instrument within the development of this design. This layering of the living world presents unique learning opportunities for the children of Caroline elementary to cultivate a sense of spatial scales and wayfinding.

Developing Spatial Cognition

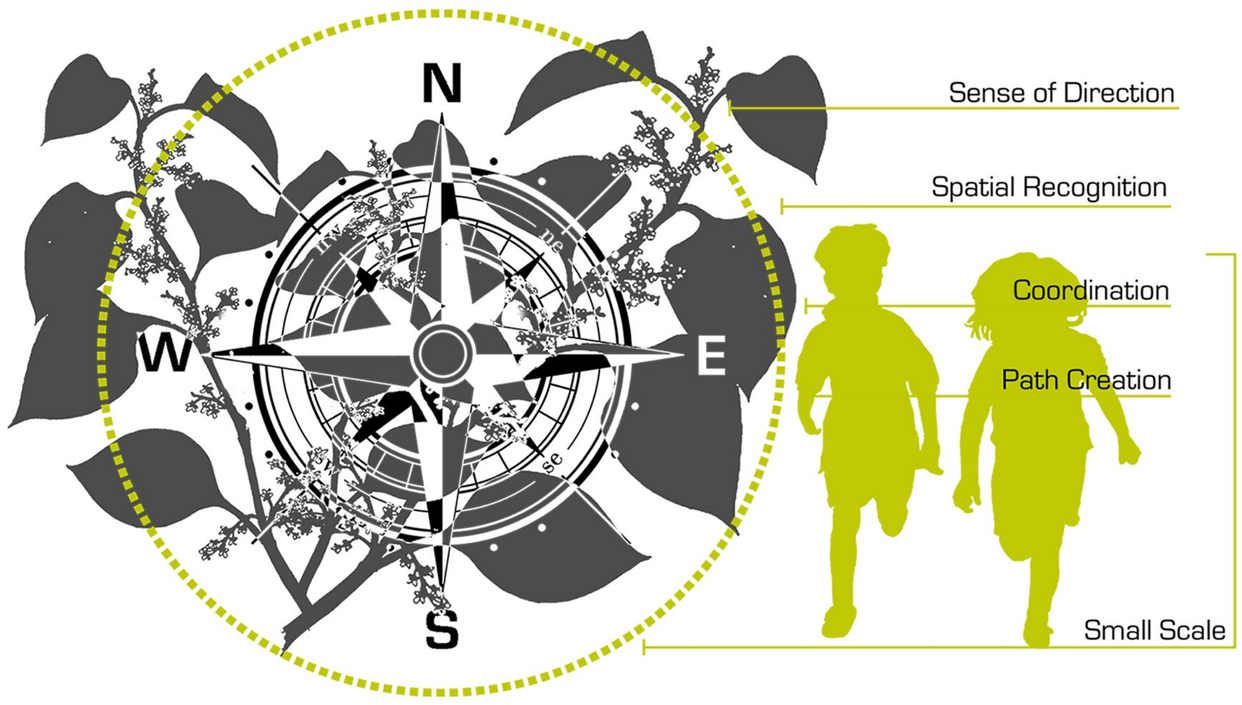
Spatial cognition is the study of knowledge and beliefs about spatial properties of objects and events in the world. Spatial properties include location, size, distance, direction, separation and connection, shape, pattern, and movement. Cognition is knowledge, its acquisition, storage and retrieval, manipulation and use. Our design, which features a scale model of the globe allows students to interact with the world as opposed to simply looking at it on the map. Designed into our world is a clear delineation of each continent, different substrates for growing and planting, and world topography in a dymaxion and untraditional projection.

Spatial Scales

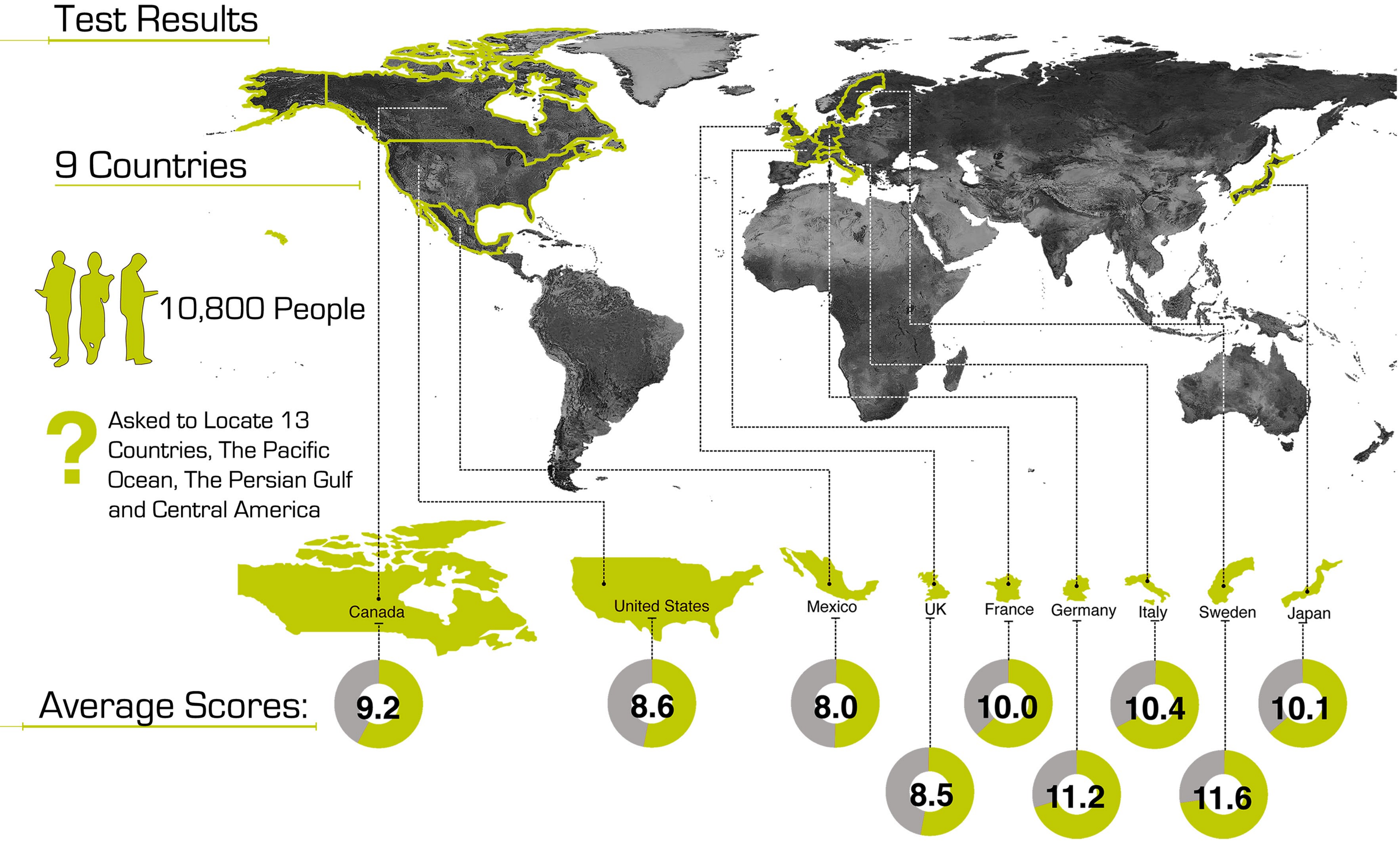
World Map Way Finding



Invasion Zone Way Finding



Test Results



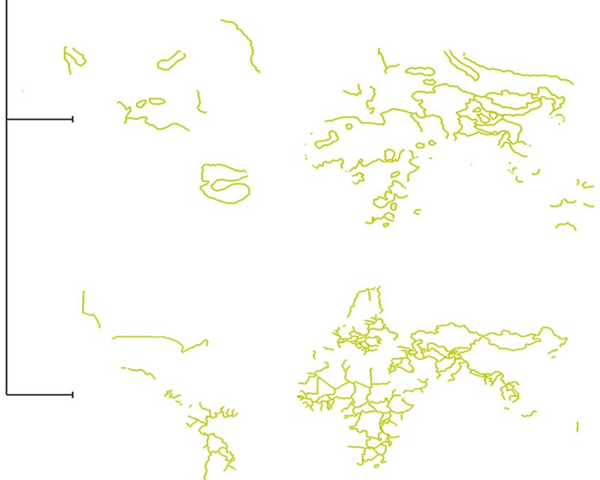
Layering Geographical Education and Play | Opening Eyes to New Projections

World Map

Cultural Geography

Population Density

Historical Trade Routes



Religous Boundaries

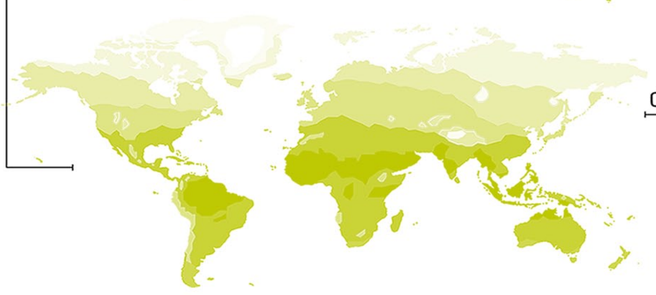
Physical Geography

National Borders

Elevations

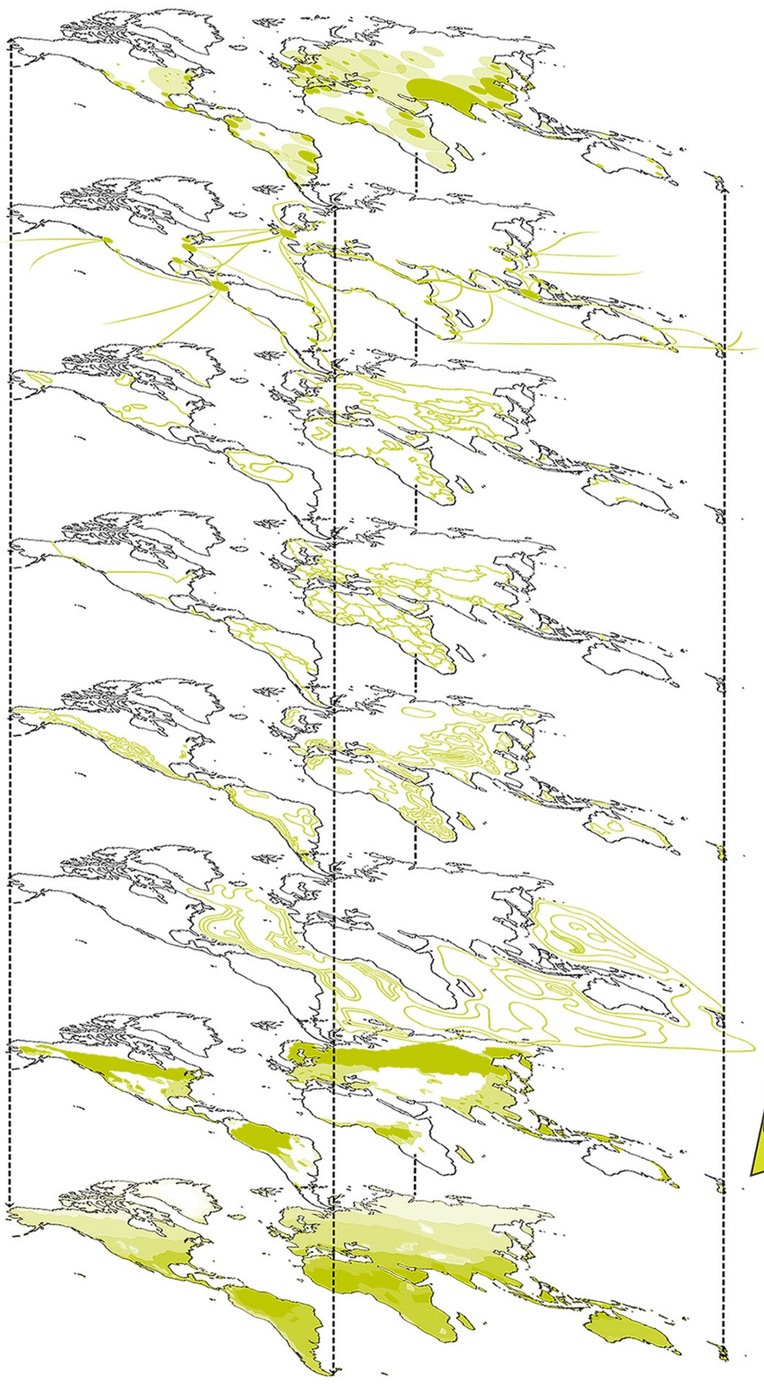
Sea Elevations

Forested Land

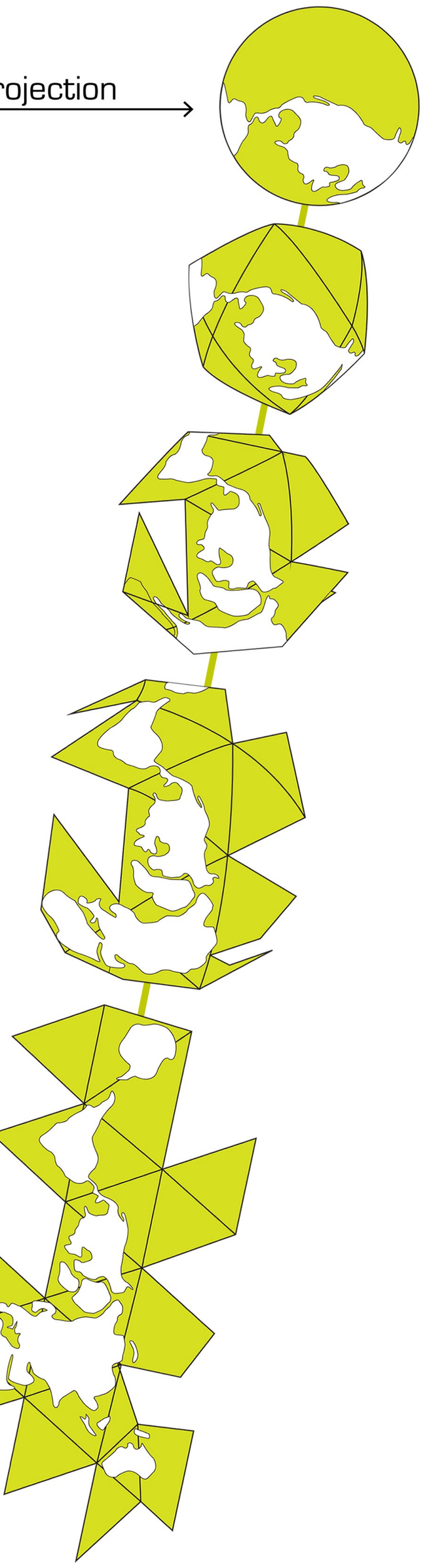


Climatology

Caroline Continental Playscape



Dymaxion World Projection



As the continental playscape begins to feed into the nature trail and knotweed areas, this overlapping of zone types coupled with the dymaxion world projection creates a very different perspective of interpreting space and world geography. This creates a perfect opportunity to create orienteering games and classes that utilize Caroline's outdoor space for map making and reading skills in order to locate certain areas on site.

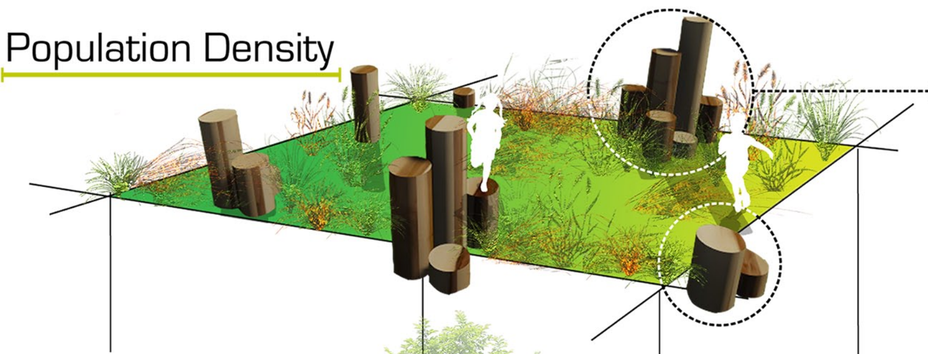
Orienteering Classes

This overlapping of continents and new vegetation into the densely invaded Japanese Knotweed nature trail also begins to create a barrier for the knotweed and disallows it from spreading any further towards the school. This establishes multiple functions for the continental playscape outside of geographical education.

Knotweed Containment

Introducing Geography and Wayfinding Through Abstract Forms

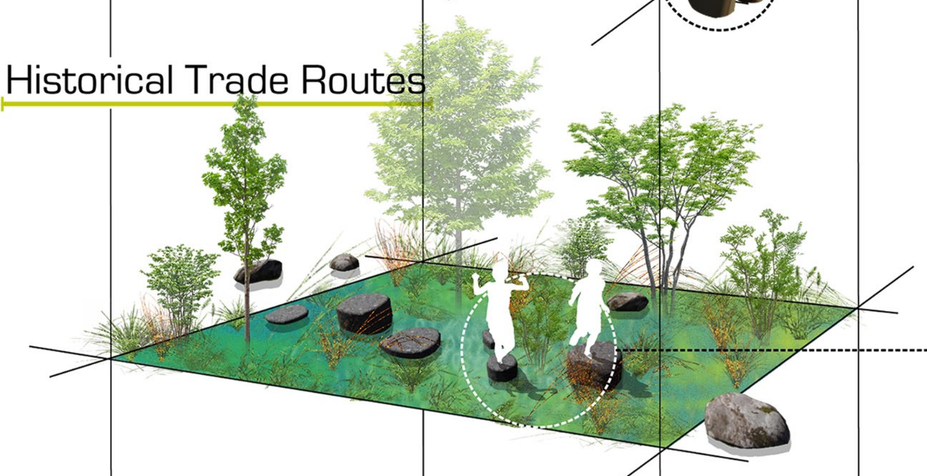
Population Density



The worlds most population dense regions and cities will be represented through clusters of climbing structures which denote population based on size and height.

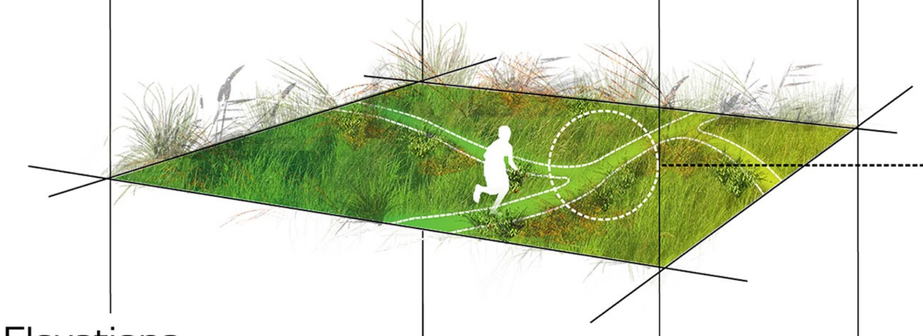
Africa
Sahara Desert
Savannah

Historical Trade Routes



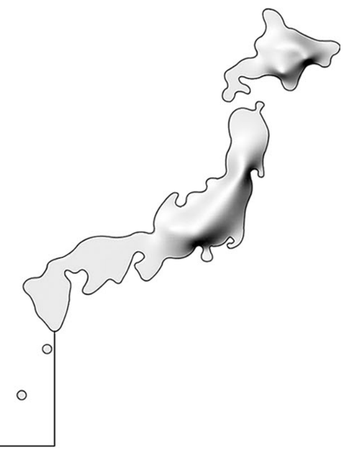
Historical trade routes will become stone paths within the site's world oceans and will be routes of travel through the school's newly formed rain gardens.

National / Religious Boundaries

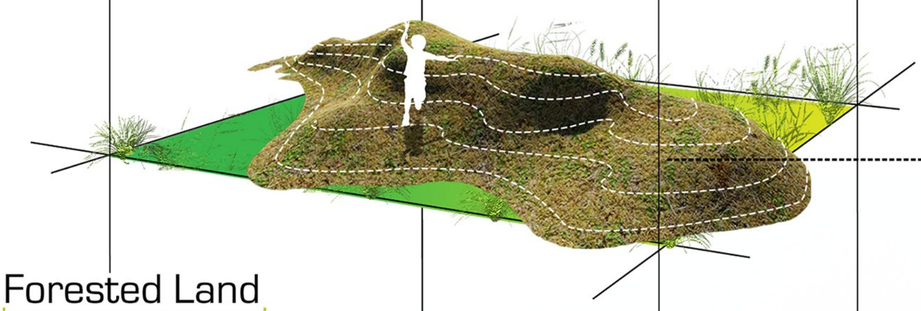


National and religious boundaries around the world will be represented through maze-like paths carved into the landscape.

Zen Gardens
Japan

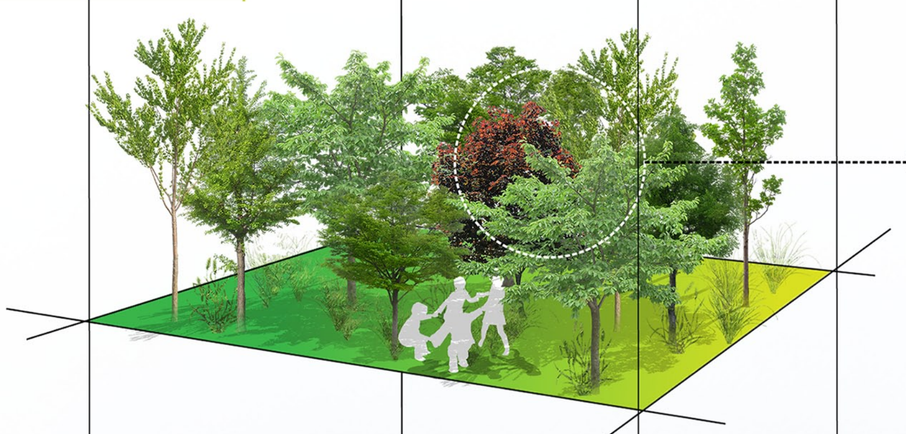


Elevations

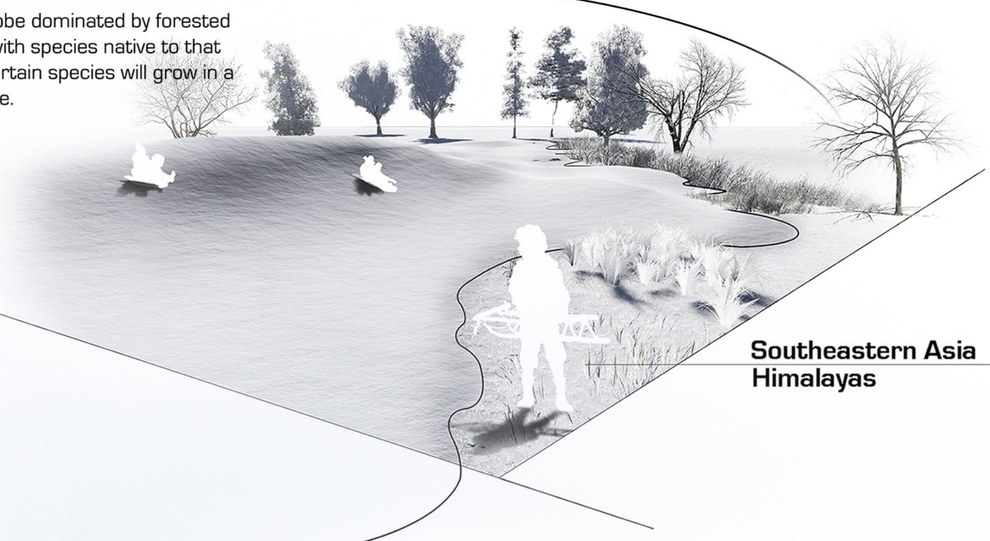


The World's various mountain ranges will be recreated and exaggerated through topographical manipulation.

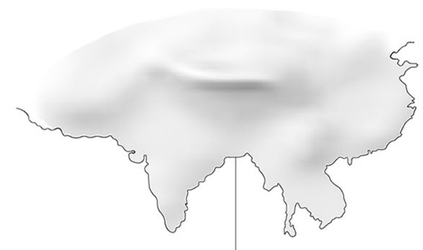
Forested Land



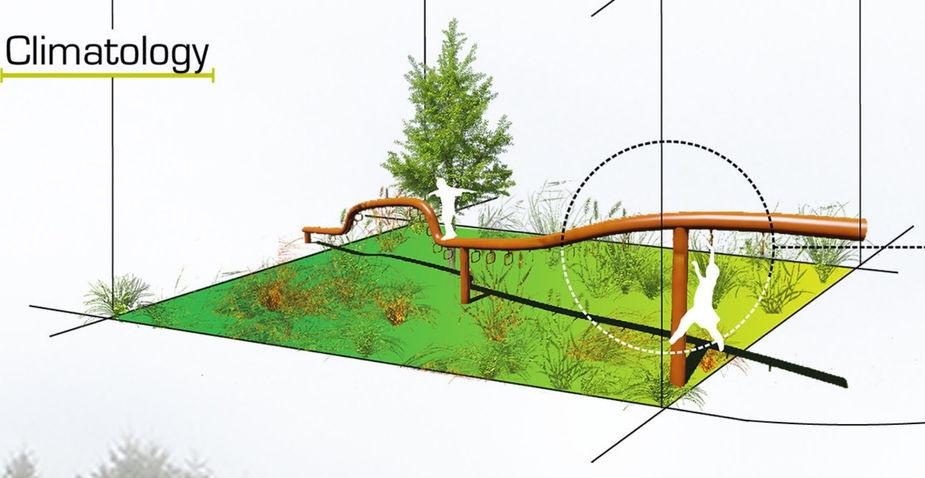
Areas around the globe dominated by forested land will be planted with species native to that region, permitting certain species will grow in a north eastern climate.



Southeastern Asia
Himalayas



Climatology



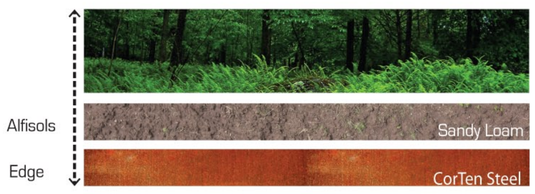
Elevated play structure mimicking the average annual tempurature of different locations around the globe based on varying rising and falling heights.

Just outside of the Japanese knotweed infested nature trail, proposed viewing strucutres will be incorporated to act as play elements for the children in which they can climb on and navigate their way through as a more formalized maze system. These will also serve as seating and viewing for the very popular community youth soccer programs that utilize the Caroline Elementary facilities during the summer months.

Soccer Seating

Keys to World Plantings and Soil Variations

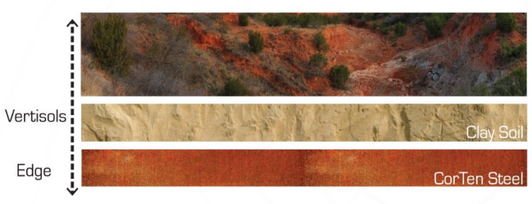
Soil and Plant Layering



Found In: Temperate Forests
Northern Europe

Found In: Grasslands
Central U.S.
Central Europe/Asia
Southern South America

Found In: Deserts
Middle East/Western Asia
Southern U.S.



Found In:
Central America
Eastern Africa
India
Australia

Found In: Tundra
Arctic
Antarctic

Found In: Tropics
Northern South America
Equatorial Africa

Atlantic Rain Garden

Edges

Trees

	Botanical Name	Symbol	Quantity
River Birch	Betula nigra	Bn	6
Sweet Gum	Liquidamber styraciflua	Ls	2
Swamp White Oak	Quercus bicolor	Qb	2

Shrubs

Foamflower	Tiarella cordifolia	Tc	26
Cinnamon Fern	Osmundastrum cinnamoneum	Oc	34
Spicebush	Lindera benzoin	Lb	26
Rough Horsetail	Equisetum hyemale	Eh	63
Purple Coneflower	Echinacea purpurea	Ep	138

Interior

Shrubs

Winterberry Holly	Ilex verticillata	Iv	60
Ninebark	Physocarpus monogynus	Pm	38
Switchgrass	Panicum virgatum	Pv	117
Red Twig Dogwood	Cornus sericea	Cs	22

Canadian Boreal Forest

Trees

Canadian Hemlock	Tsuga canendensis	Tc	1
Grand Fir	Abies grandis	Ag	1
Pin Oak	Quercus ellipsoidalis	Qe	1

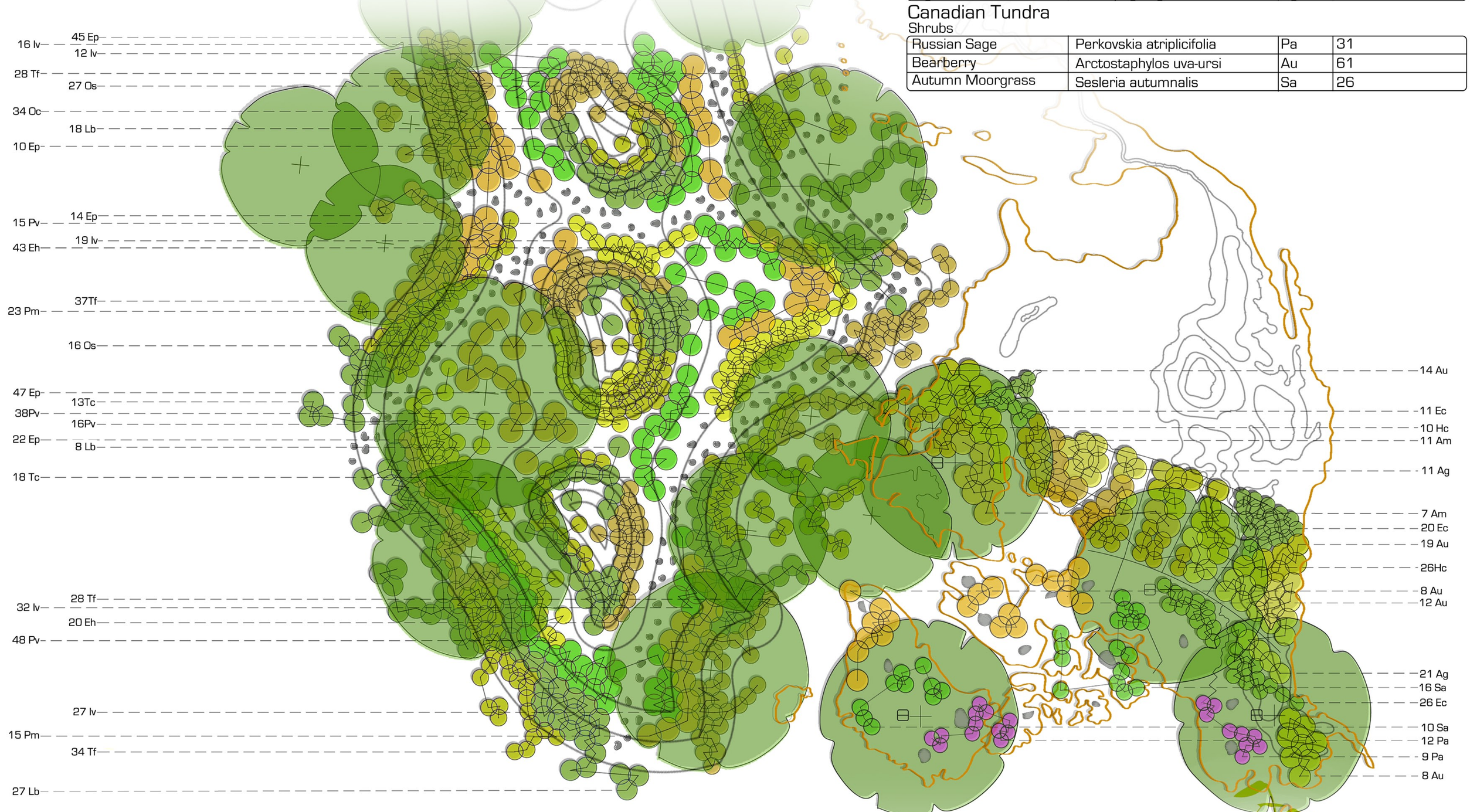
Shrubs

Common Yarrow	Achillea millefolium	Am	18
Scarlet Mallow	Hibiscus coccineus	Hc	36
Canadian Wild Rye	Elymus canendensis	Ec	57
Big Bluestem	Andropogon gerardi	Ag	37

Canadian Tundra

Shrubs

Russian Sage	Perkovskia atriplicifolia	Pa	31
Bearberry	Arctostaphylos uva-ursi	Au	61
Autumn Moorgrass	Sesleria autumnalis	Sa	26



The Atlantic Ocean Rain Garden will detain much of the sites water, especially water that runs off of the topography developed for the continents. A main feature within this space will consist of stepping stone paths which take the route of historical trade routes throughout the Atlantic. Like the rest of the World layout on site, the routes will be warped into the dymaxion projection in order to create a new perspective of how these routes can be viewed.

Planting Forms

Analyzing Existing Site Vegetation and Properties

Creek Edge

Under 10% | 10% | 20% | 30% | 40% | 50% | 60%

Cinnamon Fern
Osmundastrum cinnamomeum

Sycamore
Platanus Occidentalis

Cottonwood
Populus Deltoides

Black Willow
Salix Nigra

Japanese Knotweed
Polygonum Cuspidatum

Myrtle
Vinca minor

American Basswood
Tilia americana

Virginia Creeper
Parthenosisus Quinquefolia

Nature Walk

Under 10% | 10% | 20% | 30% | 40% | 50% | 60%

Box Elder
Acer Negundo

Honeysuckle
Lonicera Tatarica

Sycamore
Platanus Occidentalis

Cottonwood
Populus Deltoides

Black Willow
Salix Nigra

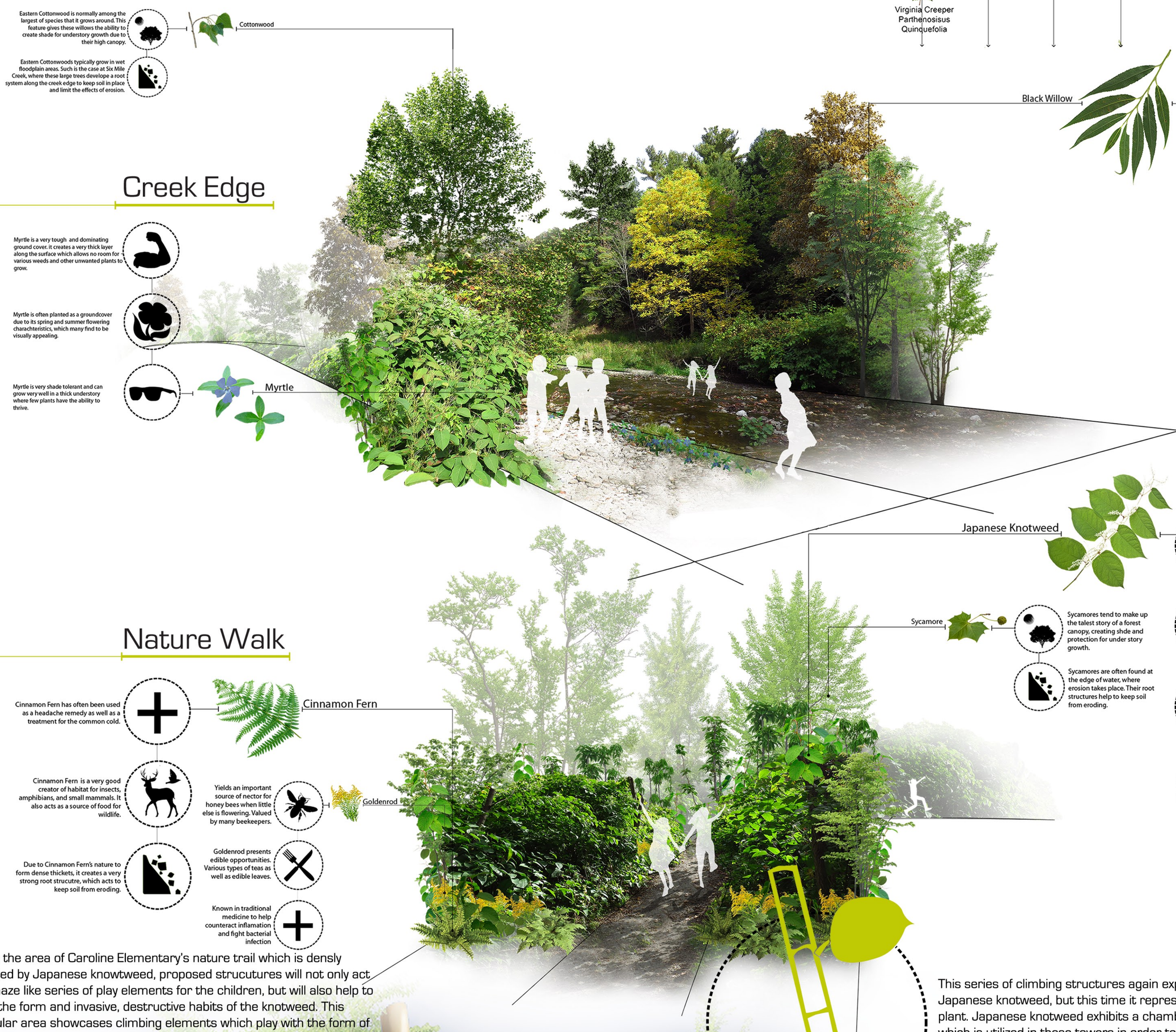
Goldenrod
Solidago spp.

American Basswood
Tilia americana

Virginia Creeper
Parthenosisus Quinquefolia

Cinnamon Fern
Osmundastrum cinnamomeum

Japanese Knotweed
Polygonum Cuspidatum



Cottonwood

Eastern Cottonwood is normally among the largest of species that it grows around. This feature gives these willows the ability to create shade for understory growth due to their high canopy.

Eastern Cottonwoods typically grow in wet floodplain areas. Such is the case at Six Mile Creek, where these large trees develope a root system along the creek edge to keep soil in place and limit the effects of erosion.

Black Willow

Black Willow is normally among the largest of species that it grows around. This feature gives these willows the ability to create shade for understory growth due to their high canopy.

Black Willows typically grow in wet floodplain areas. Such is the case at Six Mile Creek, where these large trees develope a root system along the creek edge to keep soil in place and limit the effects of erosion.

Black Willows bark contains salicylic acid, a compound very similair to asperin. This compound has been used to treat headaches, fever and coughs.

Creek Edge

Myrtle is a very tough and dominating ground cover. it creates a very thick layer along the surface which allows no room for various weeds and other unwanted plants to grow.

Myrtle is often planted as a groundcover due to its spring and summer flowering charachteristics, which many find to be visually appealing.

Myrtle is very shade tolerant and can grow very well in a thick understory where few plants have the ability to thrive.

Myrtle

Japanese Knotweed

Yields an important source of nector for honey bees when little else is flowering. Valued by many beekeepers

Young knotweed stems are edible as a spring vegatable. Oftern compared to the taste of rubarb, many jams and sauces are made from knot-weed.

In Japanese culture, knotweed is oftern used as a pain remedy through the process of creating ointment like topical treatments

Due to knotweed's nature to form dense thickets, it creates a very strong root strucutre, which acts to keep soil from eroding.

Sycamore

Sycamores tend to make up the talest story of a forest canopy, creating shde and protection for under story growth.

Sycamores are often found at the edge of water, where erosion takes place. Their root structures help to keep soil from eroding.

Nature Walk

Cinnamon Fern has often been used as a headache remedy as well as a treatment for the common cold.

Cinnamon Fern

Cinnamon Fern is a very good creator of habitat for insects, amphibians, and small mammals. It also acts as a source of food for wildlife.

Yields an important source of nector for honey bees when little else is flowering. Valued by many beekeepers.

Goldenrod

Goldenrod presents edible opportunities. Various types of teas as well as edible leaves.

Due to Cinnamon Fern's nature to form dense thickets, it creates a very strong root strucutre, which acts to keep soil from eroding.

Known in traditional medicine to help counteract inflamation and fight bacterial infection

Within the area of Caroline Elementary's nature trail which is densly inhabited by Japanese knowtweed, proposed strucutures will not only act as a maze like series of play elements for the children, but will also help to teach the form and invasive, destructive habits of the knotweed. This particular area showcases climbing elements which play with the form of the plant and also demonstrate its power to crack and grow through hardscape surfatces.

Knotweed Habits Play

This series of climbing structures again expresses the form of the Japanese knotweed, but this time it represents the interior of the plant. Japanese knotweed exhibits a chambered interior form which is utilized in these towers in order to allow children to climb from one level to the next.

Knotweed Form Play

Locating Regions

Comparing Climate Zones

Japanese Invasive Species in New York

New York

Japan

Average Annual Extreme
Minimum Temperature
-18° to -12°

6,500 Miles

Average Annual Extreme
Minimum Temperature
-18° to -12°

Japanese Knotweed
Fallopia japonica

Japanese Stiltgrass
Microstegium vimineum

Japanese Barberry
Berberis thunbergii

Japanese Honeysuckle
Lonicera japonica

Burning Bush
Euonymus alatus

Japanese Knotweed Food Opportunities

Various jams and jellys can be created from the stems of Japanese Knotweed due to the semi-sweet rhubarb flavor that it naturally possesses.

Many beekeepers prize Japanese Knotweed as a source of monofloral honey production because bees can access Knotweed at a time when not much else is flowering.

Knotweed shoots can be prepared and eaten raw as a spring vegatable. They are also quite often baked into various pastries and used to complement other flavors.

Elementary schoolers are the perfect age and size to be able to feel fully enclosed and engulfed by the knotweed within these trail systems. It creates a sense of adventure and mystery for the children to explore.

During the months of the year that the knotweed is fully grown, children will be urged to create various invasion trails that traverse new routes through the knotweed each year. This will begin to develope a sense of direction in the children.

Japanese knotweed is a highly invasive species that often times requires pesticides and excavation in order to defeat. Rather than initiate this type of disturbance, the knotweed will be controlled in a different way.

Children will be urged to take out their energy in a destructive yet productive manner by being able to rip out and destroy as much knotweed as they would like.

Once knotweed has been knocked down and ripped from the ground, children will have the ability to grow their tactile abilities by building with the downed knotweed

This is not only a way of controlling knotweed and growing tactile skills, but also as a way to develope teamwork skills through building

Japanese Knotweed Invasion Zone

Spring: Harvest Shoots and Prepare Food

Summer: Invasion Trails and Structures

Fall: Perimeter Knotweed Destruction and Die Back

Winter: Collect and Construct

The next array of strucutres within the nature trail capitalizes on the ability to host birding areas for classes during thir bird units. These elements allow the children to experience a superior view over the knotweed and gives them the opportunity to view bird species from different heights. This area also maintains the maze like qualities of these hidden relics within the knotweed that the children must find new paths to and from each and every year.

Birding Unit Structures