



Clocca Concepts Bead Lines:

The North America Story Curriculum Guide

The North America Story Beadline is sold in single sets (Command Cards included). Each set includes the materials necessary to create 1 bead line (necklace).

Items Included:

- North America Story Command Cards (included)
- 26 Symbol Beads (i.e., asteroid, Golden Age of Mammals, Great Lakes)
- Scale Beads (black, blue, purple, green, orange, yellow, white & gold (time scale change))
- Jewelry cord

Anthropologists, psychologists, and historians believe that storytelling has been with us since the beginning of our existence - in fact, they argue that storytelling is that which *defines our humanity*. For thousands of years, as people struggled to survive, they passed through stories what wisdom and knowledge they accumulated. In early times, storytelling was used to explain significant and often confusing events such as storms, tidal waves, lightening, and fire. Special types of stories about heroes and Gods were used to bind individuals to common belief systems. Moral tales conveyed the first codes or laws that ensured the harmony, cooperation, and ultimately the success of early human populations. Story telling has been the main way in which human cultures and civilizations have transferred knowledge of past events, chronicled present events, and inspired hope for future events.

Clocca Concept's Bead Lines introduces students to the North America Story - the understanding of the history of the North American continent and of the developing natural world therein. Bead Lines allow students to use mnemonic devices (beads as symbols of events) to tell a story. The North America Story begins with the extinction event of the asteroid impact in the gulf and ends with the infinite possibilities of the future of nature, the land, and the human inhabitants of North America. Bead lines can incorporate both generic and specific events. They can be short or extremely long. For the North America Story, we decided to keep it simple but with enough specific details to make an interesting story and keepsake necklace. Please feel free to incorporate other elements (religion, technology, etc...) as well as personal elements (students can personalize these bead lines). Some beads were chosen as literal representations of events and others are suggestive by color (green represents the grasslands).

While this story is certainly an impressionistic lesson, it also incorporates a time scale into the bead line. As such, the dates used are approximations and are included with other dates within the same bead scale (i.e., 94 TYA would be scaled as 90 TYA). It is also important to note that as science and technology progress, these dates can change based on new finding and data. Dates are also disputed according to science, different religions, and cultures. This would definitely have an



impact on the scale of any timeline or bead line. The easiest way to read the bead line is from the present to the past as dates are based on – years ago- and not actual dates - 1409 B.C.

On the North America Story beadline, we scaled both according to years ago (ten thousands, hundred thousands, and millions) and according to era (Paleocene, Oligocene, etc...). As such, we had to be creative to account for both timescales. The color of the bead represents the era (listed below and incorporated onto the Command Card) and a single bead indicates time (which changes 3 times- indicated with a gold bead- from Ten Thousands, Hundred Thousands, and Millions)

- Black Seed Bead = Paleocene Era
- Blue Seed Bead = Eocene Era
- Green Seed Bead = Oligocene Era
- Purple Seed Bead = Miocene Era
- Orange Seed Bead = Pliocene Era
- Yellow Seed Bead = Pleistocene Era
- White Seed Bead = Holocene Era
- Gold Seed Bead = Scale Change (beginning with Ten Thousand Years ago, change to Hundred Thousand Years Ago, change to One Million Years ago)



Directions for Use:

1. Place North America Story Command Cards in order from oldest event (65 Million Years Ago) to the most current event (Current time).
2. Lay out the jewelry cord and the beads.
3. Note to students the use of scale beads:
 - a. Black Seed Bead = Paleocene Era
 - b. Blue Seed Bead = Eocene Era
 - c. Green Seed Bead = Oligocene Era
 - d. Purple Seed Bead = Miocene Era
 - e. Orange Seed Bead = Pliocene Era
 - f. Yellow Seed Bead = Pleistocene Era
 - g. White Seed Bead = Holocene Era
 - h. Gold Seed Bead = Scale Change (beginning with Ten Thousand Years ago, change to Hundred Thousand Years Ago, change to One Million Years ago)
4. Beginning with the Asteriod/Extinction Event, follow instructions presented on the Command Cards.
5. When the story is complete, tie ends of jewelry cord together into a knot.
6. Have student recite their story to another student(s).



Paleocene Era

65-57 million years ago

(The Paleocene, the "early recent", is a geologic epoch that lasted from about 65 to 57 million years ago. It is the first epoch of the Palaeogene Period in the modern Cenozoic Era. The Paleocene Epoch immediately followed the mass extinction event at the end of the Cretaceous, which marks the demise of non-avian dinosaurs, the giant marine reptiles and much other fauna and flora. The die-off of the dinosaurs left unfilled ecological niches worldwide, and the name "Paleocene" comes from Greek and refers to the "old(er)"- "new" fauna that arose during the epoch, before modern mammalian orders emerged in the Eocene.)

65 MYA- The Dinosaurs Go Extinct

At the end of the Mesozoic Era, there was a great extinction. An asteroid slammed into the Gulf of Mexico and an enormous amount of debris was thrown into the atmosphere, making earth very cold and dark. This extinction wiped out the dinosaurs and the great sea reptiles. The earth began to change as forests died away and grasslands spread across the land. New fauna and flora emerged, and Earth took a new form.

63 MYA- The Golden Age of Turtles

Turtles and other small mammals survived the meteor impact by burrowing in the mud. Later the Native Americans named this land "Turtle Island". Turtles became abundant in North America. Turtles have remained relatively unchanged for at least 150 million years.

62 MYA- The Bearpaw Seaway

Found in the North Western hemisphere of North America, The Bearpaw Seaway is the last major expansion of the Western Interior Seaway, which was a huge inland sea that split the continent of North America in two halves. This expansion covered the mid-section between the Arctic and the Gulf. During this time The Bearpaw Seaway began to recede and the Rocky Mountains began to rise for the first time. Land now connected both -east and west- forming the North American Continent.

Other Events

- Ferns, redwoods and ginkgo trees expand their range to N.A.
- Diatryma birds fly into N.A. growing and reaching 9 feet tall.
- Warm seas circulated throughout the world, including the poles. The earliest Paleocene featured a low diversity and abundance of marine life, but this trend reversed later in the epoch. Tropical conditions gave rise to abundant marine life, including coral reefs. With the demise of marine reptiles at the end of the Cretaceous, sharks became the top predators.



Eocene Era

57-34 million years ago

*(The **Eocene** Epoch, lasting from about 56 to 34 million years ago, is a major division of the geologic timescale and the second epoch of the Paleocene Period in the Cenozoic Era. The Eocene spans the time from the end of the Paleocene Epoch to the beginning of the Oligocene Epoch. The start of the Eocene is marked by the emergence of the first modern mammals.)*

55 MYA- Bering Land Bridge

Known as Beringia, the land bridge was nearly 1,000 miles wide north to south at its greatest extent, which joined present-day Alaska and eastern Siberia. The Bering Land Bridge was the only way to travel from Asia to North America. Many animals such as Rhinoceroses, lions, elephants and later, humans, used this path to migrate and to discover new land. If this bridge did not exist at this time the flora (variety of plant life) and the fauna (variety of animal life) of the world would be very different.

54 MYA- The Camel and Horse Originate in North America

The first camel and horse family originated in North America. These grazers evolved specialized teeth for processing the stiff and coarse grass that was at that time becoming very plentiful on the Great Plains of North America. At some point, some of them crossed into the Old World across the Bering Land Bridge. Then, suddenly about 10,000 years ago, the horse and camel disappeared from both North and South America. The submergence of the Bering Land Bridge prevented any return migration from the Old World or Asia, and the horse was not seen again on its native continent until the Spanish explorers brought horses by ship in the sixteenth century.

37 MYA- Nimravids

Around 37 million years ago, a species of cats, the Nimravids, appeared in North America and Asia. These animals survived in the warm wet climate, but as cooler drier conditions prevailed, the Nimravids moved on. These cat-like animals resembled saber tooth cats, but were not closely related. They came in a variety of sizes and had huge saber teeth. Their bodies were muscular and slung low to the ground. They had short legs, long tails and walked flat-footed.

35 MYA- The Rattlesnake is born

Several species of snake, including the garter snake, crossed over into North America from the Bering Land Bridge. The garter snake mated with another species of snake and created what we know today as the rattlesnake. Rattlesnakes are a venomous snake with fangs and a rattle at the tip of its tail.



Oligocene

34-23 million years ago

*(The **Oligocene** is a geologic epoch of the Paleocene Period and extends from about 34 million to 23 million years before the present. The name Oligocene comes from the Greek and refers to the scarcity of additional modern mammalian faunas after a burst of evolution during the Eocene. The Oligocene is the third and final epoch of the Paleocene Period. The start of the Oligocene is marked by a major extinction event, a faunal replacement of European with Asian fauna except for the endemic rodent and marsupial families called the Grande Coupure.)*

34 MYA- Antarctic Circumpolar Current

During this time a cooling occurred, which was caused by the shift in ocean currents that flowed from west to east around Antarctica. Known as the Antarctic Circumpolar Current, this westerly current and cooling temperature promoted seasonal changes to occur in North America. As part of these seasonal changes, trees drop their leaves in the autumn, and new growth of leaves occurs in the spring. Antarctica and Australia break away.

30 MYA- The Rocky Mountains Rise

The Rocky Mountains were originally formed around 55 MYA after a series of pulses, caused from the shifting of the Earth's crust, shaped the new land. After the erosion of the Rocky Mountains and the recession of the Bearpaw Seaway, a new uplift of the mountains occurred, causing the Rocky Mountains to rise again. Today, the Rocky Mountains stretch more than 3000 miles, from British Columbia, Canada to New Mexico.

25 MYA- Tornadoes

The rising peaks of the Rocky Mountains created a border north to south, which left a vast open plain in the central region of North America. As cold air began to move, unobstructed, across the Central Plains, warm air from the gulf rose up, producing severe storms and tornadoes. Tornadoes are violent, dangerous, rotating columns of air. These funnel clouds can produce winds 110+ mph. 90% of all tornadoes in the world occur in North America.

Other Events

-Squirrels originate in North America which prompted the co-evolution of nut trees like oak, beech and hickory



Miocene

23 - 5 million years ago

*(The **Miocene** is a geological epoch of the Neocene Period and extends from about 23 to 5 million years ago. The Miocene was named by Sir Charles Lyell. Its name comes from the Greek and means "less recent" because it has 18% fewer modern sea invertebrates than the Pliocene. The Miocene is the first epoch of the Neocene Period. The earth went from the Oligocene Epoch through the Miocene and into the Pliocene as it cooled into a series of Ice Ages. The plants and animals of the Miocene were fairly modern. Mammals and birds were well-established. Whales, seals, and kelp spread. At the end of this epoch, the Himalayas started to rise.)*

23 MYA- The Cactus appears

The rising peaks of the Rocky Mountains have transformed the western landscape, as it did the Central Plains. Harsher climates and drought prevailed in North America. Plants and animals had to adapt to changing climates and ecosystems, or perish. A new plant emerged in the dry western desert of North America, the cactus. These plants remained isolated until modern day humans and livestock expanded their range into other ecosystems.

22 MYA- Grasslands

Dry conditions prompted a new form of land ecosystem east of the Rocky Mountains, the Grasslands biome. Rolling terrains of grasses, flowers and herbs grew there. These plants supported a vast variety of mammals, reptiles, birds and insects. Most of these plants still exist in modern times.

20 MYA- The Golden Age of Mammals

The formation of grasslands was a critical factor in mammals' ability to grow and thrive in North America. Most mammals had now reached almost all corners of the earth, with many species inhabiting the land, sea, and even the air. Most mammals had evolved into modern designs, with huge diversity and numbers. Species such as apes, dogs, whales, beavers, bears, and horses roamed the grasslands, mountains, and waterways.

15 MYA- The Pronghorn and Cheetah

The pronghorn a true descendant of the antelope, originated in North America. These animals were adapted for the open plains of the grasslands. The Cheetah is the only genus of felid cats ever to originate in North America. Cheetahs would later emigrate to Asia and Africa, never to see the Americas again. The Pronghorn developed their speed in order to escape the cheetah, the fastest land animal in the world.

Other Events

-Mastodons

-Felid Cats which include all lions, tigers and other cats originate in old world and cross over Bering Strait and arrive in North America



- Nimravids go extinct
- Cool coastal waters prompt kelp forest and seaweed
- Sheep size grazing mammals evolve, they provide food for carnivores



Pliocene

5 - 2 million years ago

*(The **Pliocene** Epoch is the period in the geologic timescale that extends from 5 million to 2 million years ago. It is the second and youngest epoch of the Neocene Period in the Cenozoic Era.)*

5 MYA- The Grand Canyon

After the rise of the Rocky Mountains, the Colorado Plateau began to rise. Water began to drain through the basins, slowly forcing its way from the northeast to the gulf. This drainage formed the Colorado River and the Grand Canyon.

5 MYA- The Columbian Flood Basalts

The largest flood basalt to ever appear on earth takes place in North America. The Columbian Flood Basalt engulfed 63,000 square miles of the Pacific Northwest. This was the result of a giant volcanic eruption and coated this stretch of land with basalt lava. The crust produced a large plateau, altering the course of the ancient Columbia.

3 MYA- Woolly Mammoths Evolve

Woolly Mammoths roamed into the Americas across the Bering Land Bridge. Larger than elephants, the mammoth thrived best in cold climates. As the climate warmed and new ecosystems emerged, the mammoth became extinct.

3 MYA- Isthmus of Panama and The Great American Interchange

The Isthmus of Panama is a narrow strip of land that formed between the Caribbean Sea and the Pacific Ocean, linking North and South America. The creation of the Isthmus of Panama is one of the most important geologic events to occur in 60 million years. This had an enormous impact on Earth's climate and environment. The separation of the Atlantic and Pacific resulted in the creation of the Gulf Stream. This also allowed animals, plants, and humans to migrate between the North and South American continents. This event is known as The Great American Interchange.

Other Events

- Rhino go extinct in North America
- Humans are evolving in Africa



Pleistocene

2 million - 13 thousand years ago

*(The **Pleistocene** is the epoch from 2 million to 11 thousand years ago that spans the world's recent period of repeated glaciations. The Pleistocene is the first epoch of the Quaternary Period or 6th epoch of the Cenozoic Era. The end of the Pleistocene corresponds with the end of the last glacial period. It also corresponds with the end of the Paleolithic age used in archaeology.)*

2 MYA- Ice Age

During the last glacial period, a huge ice sheet, the Laurentide Ice Sheet, covered much of Northern America. Severe glacial advances caused plants and animals to retreat southward because of reduced living space from the ice sheets. A major extinction of large mammals, such as mammoths, saber-tooth cats and ground sloths began during this time and continued for many years. Neanderthals also became extinct, and modern humans began to rise. All that remains today of the continental ice sheets are Greenland and Antarctica.

640,000 YA- Yellowstone Super volcano

One of the largest ever eruptions, the Yellowstone Super volcano erupted. This eruption formed the Yellowstone Caldera and the Lava Creek Tuff. Once a mountainous region, super eruptions have created the eastern part of the Snake Plain River. The Lava Creek Tuff, formed from volcanic rock and ash, is distributed in a radial pattern around the Yellowstone Caldera. The entire Yellowstone area covers 18 million acres of land. This is the last intact contiguous temperate ecosystem in the world.

95,000 YA- The Great Lakes (Laurentide Ice Sheet)

The Laurentide Ice Sheet was a massive sheet of ice that covered most of Canada and the northern to mid part of North America. As the Laurentide melted, the Great Lakes were formed: Lake Erie, Lake Huron, Lake Michigan, Lake Ontario and Lake Superior. The five lakes reside in separate basins, but form a single, naturally interconnected body of freshwater. These lakes hold 21% of the world's surface freshwater.

13,000 YA- The Clovis Culture

The Clovis Culture is known to be one of the first human inhabitants of the Americas. This group of people crossed over The Bering Land Bridge, during a period of lowered sea levels and then continues across the Rocky Mountains. The Clovis Culture were big time game hunters of mega fauna such as mammoths, bison, horse and camel. As these large mammals disappeared (whether by extinction or emigration) from the North American continent, so did the Clovis Culture.

Other Events

- Polar Bears evolved from grizzly bears in Asia
- A much larger breed of bison cross over The Bering Land Bridge
- Smaller bison, elk, grizzly bears and moose appear



Holocene

13,000 - Present

*(The **Holocene** is a geological epoch which began at the end of the Pleistocene around 10,000 years ago and continues to the present. The Holocene is part of the Quaternary period. It has been identified with the current warm period, and can be considered an interglacial in the current ice age. The Holocene also encompasses within it the growth and impacts of the human species world-wide, including all its written history and overall significant transition toward urban living in the present.)*

12,000 YA- Native People of the Americas

The migration of humans from Eurasia to North America was traveled along The Bering Land Bridge. These early Paleo-Indians spread throughout the Americas, diversifying into many hundreds of culturally distinct tribes. Over the course of thousands of years, the native people domesticated, bred and cultivated a large array of plants and animals. Communities began to form and people began to take their place in those communities as skilled craftsmen, hunters, farmers, etc. In some regions the native people created monumental architecture, large scale cities, states and empires. A few civilizations (in Central and South America) such as the Maya, Aztecs, Mixtec and Nahua people had created a written text. Music, art, language and religions were developing amongst the different tribes.

Present- Welcome to North America!

Prior to 1492 A.D., there was limited contact between the inhabitants of North America and the outside world (Europe, Asia, Africa, etc...). Eventually Europeans began to explore and establish settlements on the North American east coast. The Spanish, Dutch, French and British empires fought for land and resources for many years. For the inhabitants of Europe, this was a New World and a great discovery for future possibilities. For the native inhabitants of North America, this was the end to their way of life.

Other Events

- Horses return with the early Spaniards
- United States is formed
- The Bering Land Bridge disappeared.