

Clocca Concepts Bead Lines: The Cosmic Story Curriculum Guide

The Cosmic Story is sold in sets. Each set includes the materials necessary to create 1 bead line (necklace).

Items Included:

- Cosmic Command Cards (sold separately)
- 23 Symbol Beads (i.e., sun, mammal, raindrop)
- Scale Beads (red, silver, clear, yellow, black)
- 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, lightning, 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 Cosmic Story - the understanding of the universe and of the developing natural world. Bead Lines allow students to use mnemonic devices (beads as symbols of events) to tell a story. The Cosmic Story was inspired by Jennifer Morgan's book *Born with a Bang: The Universe Tells Our Cosmic Story*. The Cosmic Story begins with the "Big Bang" (or the "Great Radiance") and ends with the infinite possibilities of the future of the story teller (student). Bead lines can incorporate both generic and specific events. They can be short or extremely long. For the Cosmic 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 (dinosaur bead represents the age of the dinosaurs; glow in the dark bead represents the moon).

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., Earth came into being

approximately 4.6 BYA and the Earth's Moon came into being 4.5 BYA- both of these are scaled within the 4 Billion Years ago era. 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.

- Black Seed Bead = 1 Billion Years
- Yellow Seed Bead = 1 Hundred Million Years
- Clear Seed Bead = 10 Million Years
- Silver Seed Bead = 1 Million Years
- Red Seed Bead = 1 Hundred Thousand Years

Directions for Use:

1. Place Cosmic Command Cards in order from oldest event (13 billion 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 = 1 Billion Years
 - b. Yellow Seed Bead = 1 Hundred Million Years
 - c. Clear Seed Bead = 10 Million Years
 - d. Silver Seed Bead = 1 Million Years
 - e. Red Seed Bead = 1 Hundred Thousand Years
4. Beginning with the Great Radiance or The Big Bang, follow instructions presented on Cosmic Command Cards.
5. When the Cosmic story is complete, tie ends of jewelry cord together into a knot.
6. Have student recite their story to another student(s).

Event Date	Time Scale	Scale Color Bead	Event	Bead Description
13 BYA	1 Billion	Black	Big Bang – Great Radiance	Black and white starburst bead
11 BYA	1 Billion	Black	Galaxies & Stars Created	Black round bead with white stars
9 BYA	1 Billion	Black	Milkyway Galaxy was Created	Silver with swirly pattern bead
5 BYA	1 Billion	Black	Our Sun was created	Round orange/yellow bead
4.6 BYA	1 Billion	Black	Earth was created	Blue/green swirly bead
4.5 BYA	1 Billion	Black	Earth's Moon was created	Glow-in-dark bead
4 BYA	1 Billion	Black	Rain Fell and Oceans formed	Aqua tear-drop shaped bead
3 BYA	1 Billion	Black	Bacteria- first form of life develops	Green atom bead
540 MYA	1 Hundred Million	Yellow	First true animal develops- sponges, jellyfish	Sponge
500 MYA	1 Hundred Million	Yellow	First plant life develops- algae and fungus	Green moss
500 MYA	1 Hundred Million	Yellow	Jawed Fish appear	Fish bead
440 MYA	1 Hundred Million	Yellow	First plant life appears on land when vascular plants evolve	Leaf bead
400 MYA	1 Hundred Million	Yellow	Insects & Seeds	Lady bug bead
370 MYA	1 Hundred Million	Yellow	Amphibians & Reptiles	Frog bead
360 MYA	1 Hundred Million	Yellow	Trees flourish and form forests	Long wood bead
200 MYA	1 Hundred Million	Yellow	Dinosaurs roam the Earth	Dinosaur bead
150 MYA	1 Hundred Million	Yellow	Birds take flight	Red bird bead
65 MYA	10 Million	Clear	Asteroid hits Earth	Gray stone bead
54 MYA	10 Million	Clear	Primates Evolve	Monkey bead
40 MYA	10 Million	Clear	Mammals Flourish	Mammal bead (varies)
2 MYA	1 Million	Silver	Earliest and closest ancestors to modern day humans evolve	Hand bead
2 MYA	1 Million	Silver	Ice Age (most current)	Clear crystal bead
Current	1 Hundred Thousand	Red	You are born	Blue star bead

The Cosmic Story: TIMELINE

13 billion years ago...

In a great flash, the Universe flares forth into being. This is known as the **Big Bang**, or the **Great Radiance** (black and white starburst bead). All the energy that will ever exist erupts from a point smaller than a grain of sand. Space-time itself unfurls and expands.

11 billion years ago...

One hundred billion galaxies take shape, each with tens of billions of stars (black bead with white stars).

9 billion years ago...

The **Milky Way** (swirly silver bead), a galaxy that encompasses our solar system, a celestial sphere that contains a host of various stars and other solar matter is formed.

5 billion years ago...

Our **Sun** (yellow round bead) ignites within a swirl of gas and particles from a supernova explosion.

4.6 billion years ago...

The swirling particles form planets, asteroids and comets; **Earth** (blue and green swirl bead) is born.

4.5 billion years ago...

A large asteroid strikes our Earth, the **Moon** is born (clear glow in dark bead).

4 billion years ago...

As Earth cools, **rain** (teardrop shaped blue bead) falls, and oceans form.

3 billion years ago...

Blue-green bacteria (green atom looking bead) capture the energy of sunlight with photosynthesis, which releases oxygen. Over time oxygen makes the sky and sea turn blue and microscopic life flourishes in all waters of the planet.

540 million years ago...

Multi-cellular Life evolves. Predatory behavior became a part of Earth's cycle. The first true life develops- **Sponges** (sponge) and jellyfish. Creatures develop shell-like forms to protect themselves.

500 million years ago...

Small creatures learn to capture the sun and store the energy chemically. These early blue green **algae** (green moss) take hydrogen for photosynthesis directly from the seas.

The first **fish** (fish bead) moved through the oceans, inventing the backbone to protect the nervous system.

440 million years ago...

First plant life appears on land when **vascular plants** (leaf bead) evolve from algae and fungi.

400 million years ago...

Small creatures venture from the water, and the first **insect(s)** make home on land and fly into the sky (red ladybug bead). Insects carry seeds, spreading plants across the fertile land.

370 million years ago...

Amphibians (frog charm) and **Reptiles** lay land worthy eggs, as internal fertilization provides protection for developing embryos. Seed plants evolve, and life flourishes on land.

360 million years ago...

Trees (long wood bead) begin to flourish and forests form (wooden bead). 70% of marine species die.

200 million years ago...

Dinosaurs (dinosaur bead), the largest land animal of all time, roamed the earth's surface.

Pangaea is forms and later splits into separate continents.

150 million years ago...

Birds emerge (red Glass bird), a direct descendant of the dinosaur as leg bones evolve into wing bones, jawbones into beaks and scales into feathers.

65 million years ago

An **asteroid** (black rock bead) slams into the Gulf of Mexico. North America erupts in flames. Sulfuric acid rain falls; dust clouds cause Earth to grow cold. Many animals and plants go extinct, including the dinosaurs.

54 million years ago...

Human's **primate** (monkey bead) ancestors emerge from the African forests and began to stand upright and walk the plains.

40 million years ago...

Mammals (mammal bead) re-emerge after the mass extinction, evolving into amazing new forms that fill the empty ecological roles left by the dinosaurs.

2.5 million years ago...

The most recent **Ice Age** (crystal glass bead) begins, requiring humans, plants, and animals to adapt to new environmental conditions.

1.9 million years ago...

Earliest and closest ancestors to modern day **humans** (hand bead) are using tools and making fire.

Modern Humans emerge. Language, shamanic and goddess religions, and art become integral with human life.

11,000 years ago, agriculture begins after the glaciers begin retreating. Humans begin to shape the environment.

3,000 years ago classical religions emerge. Judaism, Buddhism, Hinduism, Christianity, Islam

250 years ago scientists calculate the age of the Earth. Humans try to understand how old the Earth is through empirical observations.

Current Time...

You are born! Happy Birthday and welcome to the Universe!