Adoone’e

Ya'at'eh

Means "greetings" in the Navajo Language

Know your clans
Know yourself
Mud People Clan
Hashtl’ishnii
I am Hona’gha’ahnii (One that walks around you - mother’s side)
Born for To’dich’i’i’nii (Bitter Water - father’s side)
Ta’chii’nii (Red Water - maternal grandfather)
Ma’ii Deeshgiizhnii (Coyote Pass - Paternal side Nali)
Dedication

In Memory of Arlene Luther

Arlene Luther
March 5, 1948-2008
My Old School House, Chinle, Arizona circa 1958
1977 Superior Oil
Drilling along the Gulf Coast in Texas.
Dr. Small USEPA Region IX Science Liaison
The Fundamental Laws of the Dine’

Dine’ Bi Beehhaz’ aanii Bitse Silei

The creation of our life.
Our way of life is like an act of prayer.

Henry Haven, Geologist
Navajo EPA
March 25, 2015
Current economic conditions
Mineral Resources
Creation story with Geologic Concepts
Sacred elements
Sacred mountains and directions
Cleanup standards
Window Rock, Navajo Nation Capital

Naabehó Bináhásdzo

Approximately 27,000 square miles
Current Situation

- Population: 332,000
- Youth comprise more than 50% of the population. Median age of overall population was only 24 years old in 2000
- 40% of Navajo people lack running water and electricity.
- 43% of Navajo people live below the poverty level in 2000

- Lack of economic development.
- Navajo Unemployment rate 52.19% in 2001
- The worst unemployment rate in the US was 7.4%
Navajo Nation WWII Codetalkers
The Navajo Creation Story

Voices of memories…from the beginning of time
Our creator (Ya’alnii’ nee’yani) blew air into the earth and added layers of clay to make it bigger for us.

The first world was small, a floating island in mist and water in the middle of four seas.

Our creator (Ya’alnii’ nee’yani) blew air into the earth and added layers of clay to make it bigger for us.

Science - The most abundant element in the earth’s crust is oxygen. Oxygen makes up 46.8% of the earth’s crust.

Science -- Around 200 million years ago (Jurassic Time) there existed one large supercontinent called Pangaea.
The Navajo creation stories from our elders tell us of emergence (Hajiinei) and progression through different worlds as insect people.

Navajo origin stories begin with a First World of darkness (Nihodilhil). From this Dark World the Dine began a journey of emergence into the world of the present.

The first world was the “dark world” inhabited by insects.

SCIENCE---

Trilobites – early Cambrian 526 million years ago roaming the oceans. Mass Extinction end of Permian period 250 million years ago.
The inhabitants of the first world were Diyin Dine é, Coyote, mist beings and various insect people. The supernatural beings First Woman and First Man came into existence here and met for the first time after seeing each other's fire. First Man burned a quartz crystal for a fire and the First woman burned a turquoise crystal.
SCIENCE: Quartz crystals have piezoelectric properties, meaning that they are capable of changing a mechanical force into electricity, or an electric current into a mechanical force. A slice, or wafer, of quartz crystal will generate an electric current when it is subjected to pressure. Everyday uses such as acting as the ignition source for cigarette lighters and push-start propane barbecues.
First Man and First Women were created from ears of white and yellow corn by the holy people.

The east wind blew between the two buckskins and gave them life. This is how life began.
Did Life First Develop in a Mica Sandwich at the Bottom of a Primordial Sea?

News story originally written on December 4, 2007

Earth’s first life form may have developed between the layers of a chunk of mica sitting like a multilayered sandwich in primordial waters, according to a new hypothesis.

The mica hypothesis, which was developed by Helen Hansma of the National Science Foundation (NSF), proposes that the compartments between layers of mica -- a common mineral that cleaves into smooth sheets -- could have provided the shelter and protection needed for molecules to organize into cells.
The four sacred elements were created in the first world or the natural laws.

Earth, fire, wind, and water
The first world was small and got crowded, the people quarreled, and made living very unhappy. Some say the first world was destroyed by FIRE.
They journeyed to the Second World, Ni’ Hodootł izh (Blue World), which was inhabited by various mammals and various birds, including blue swallows.

A swallow welcomed them and they lived in harmony together for 23 days until one of the Air-Spirit People tried to sleep with the swallow chief’s wife. The swallow chief found out and banished the newcomers who traveled to the third world.
Some say the air spirited people destroyed the second world by ICE.
In the **Third World**, Ni Hałtsooí, “yellow world,” there were two rivers that formed a cross and the six Sacred Mountains, but there was still no sun. More animal spirit beings lived here too.
The third world was destroyed by a flood. This time a great flood was caused by the Big Water Creature (Tééhooltsódii) when Coyote stole her two babies. It rained and rained and flooded the third world.

It is said that coyote gave the male baby back and kept the female baby. She became the female rain.
Dine’ emerged from three previous underworlds into the **fourth world** called the "Glittering World or the white world.” Ni’hodisos in Navajo.

The locust was the first to arrive. He was the first to explore the land in the first world. He went into the ground to explore and never came back until the fourth world. He is the defender of all lands.

**SCIENCE**

Pictures from space of the earth and a view from Saturn showing the moon and the earth.
Structure of the Interior of Earth

It is made up of four main layers:
1) the inner core: a solid metal core made up of nickel and iron (2440 km diameter)
2) the outer core: a liquid molten core of nickel and iron
3) the mantle: dense and mostly solid silicate rock
4) the crust: thin silicate rock material
The sun and the moon were created in the fourth world. The moon was made of rock-star mica and mix with holy water from the spring, rain, snow water, and hail water.

The sun was made of rock crystal, rays of red rain, bars of lightning with shimmering swirls. At first just as stars, the holy people were going to put four points on it, but decided to make the sun round.
Science:

Images of swirling solar winds on the Sun. NASA photos

Recent man made rocket impacts studies show the dust contained billions of gallons of water.
-KASA Channel 2 Exploration of Outer Space July 2015.
After emergence to the fourth world, the holy people built the first sacred hogan. They held a meeting to plan a design for the universal sky.

Science---Astronomy the study of the universe especially of motion and position.
The northern constellations were placed in the sky and arranged like a hogan.

The motion of the earth helps us see the stars move.

Time and space is defined by the stars and the four cardinal light.

North star (Nahookos Biko’ or So Doohaaghaaha) is the central fire. Cassiopeia (Nahookos Bi’aadii) is the grandmother and Big Dipper (Nahookos Bika’ii) is the grandfather.

Pleiades (Dilyehe) a cluster of stars represents the whole universe and is also indicator of time. It will help the people measure time, said the Black God (Haasch’éeéshzhiiin).

Science questions when time began. Big Bang Theory implies time came into existence at that moment when the universe was created.
First man and First Woman looked at the beautiful stars in the night sky and blessed the stars by sprinkling corn meal across the sky, creating the Milky Way (Yikaisdahi- one who waits for the dawn).
First Man and First Women first offered prayers by sprinkling cornmeal above the early dawn turning into milky way. The stars stretched and whirled around Mother earth becoming a protective shield.

Today Navajo people sprinkle corn pollen toward the early dawn. In Navajo Sand paintings, the Milky way stretches across Father Sky’s body to help, heal and restore harmony and balance in people’s lives.

Father sky is the home to all the stars, moons, and planets.

To the Diné, Yikaisdahi, the Milky Way, is our home.
Science: The Milky Way is the galaxy that contains our Solar System. The Milky Way is home to us humans. It contains our solar system. The Milky Way does not sit still, but is constantly rotating. As such, the arms are moving through space.
The Navajo deities, or "Holy People", set the mountains down where they should go, put the sun and the moon into the sky and were in the process of carefully placing the stars in an orderly way.

But the Coyote, known as the trickster, grew impatient from the long deliberations being held, and seized the corner of the blanket where it lay and flung the remaining stars into the sky and still moving away from us.

Science- The Big Bang Theory. Recently scientists concluded that the stars are moving away from us.
The Holy People continued to make the necessities of life, like clouds, trees and rain. Everything was as it should be when the evil monsters (Ye’ii Tso) appeared and began to kill the new Earth People.

But a miracle happened to save them, Changing woman (Asdzaa Nadleehe) married the Sun and bore two son, twins, and heroes to the Navajo people. They were known as "Monster Slayer" and "Child-Born-of-Water".
"The Warrior Twins"

The picture depicts the warrior twins going to see spider women and their father sun. They journeyed on the rainbow to see their father. They were given lightning arrows and special medicine to defeat the giants... Naayee Neizghani and Tobajishchini.
Monsters (Naayéé)

- Big Water Creature
- Horned monster
- Monster Eagle
- Monster who kicks People Down the Cliff
- Others that were left to survive
- Hunger
- Thirst
- Poverty
- Death

It is believed that the bodies of the monsters slain turned to stone and became part of the rock formations. Uranium was a monster (Ye’ii Tso). Today anything that causes sickness or imbalance is called ate’el’l inigii (one that kills).

Science—Age of Dinosaurs. The Mesozoic Era, the great dinosaur extinction 66 million years ago. The human family 4 million years ago. The formation of the present continents.
Tsetahotsiltali
Monster who kick people
down the cliff.

His people are hungry.
Down here.

Arizona Water Stake Holders

Water Commissioners

Navajo Times
12/6/12
Ke’ - Restoring harmony and balance
The emergence from the older First world to the fourth world.

Science Geologic laws. The law of superposition and Horizontality. Sedimentary layers deposited in horizontal layers and Oldest layer on the bottom and the youngest layer on top (time sequence).
With all of the monsters dead, the Navajo deities, or "Holy People", turned their attention to the making of the four original clans. Kiiyaa aani, or Tall House People, was the first clan.

The first people from the other three worlds were not like the people of today. They were animals, insects or masked spirits as depicted in Navajo ceremonies.

Science--Theory of Evolution
Humankind evolves from the ape-like creatures. All life is related and has descended from a common ancestor: the birds, fishes, and the flowers --- all related.
Evolution of Life—Geologic Time

Table 1-1: The Geologic Time Scale

<table>
<thead>
<tr>
<th>Eon</th>
<th>Era</th>
<th>Period</th>
<th>Epoch</th>
<th>Distinctive Plants and Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proterozoic</td>
<td>Ediacaran</td>
<td>570-510 Mya</td>
<td></td>
<td>First multicelled organisms</td>
</tr>
<tr>
<td>Proterozoic</td>
<td>Pre-Ediacaran/Pre cambrian</td>
<td>540-570 Mya</td>
<td></td>
<td>First one-celled organisms</td>
</tr>
<tr>
<td>Hadean</td>
<td>Pre-Plantagenic</td>
<td>4.6-5.4 Ga</td>
<td></td>
<td>Approximate age of oldest rocks</td>
</tr>
<tr>
<td>Hadean</td>
<td>Archean</td>
<td>3.5-4.6 Ga</td>
<td></td>
<td>Origin of the Earth</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Cambrian</td>
<td>530-570 Mya</td>
<td></td>
<td>First fish</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Ordovician</td>
<td>485-498 Mya</td>
<td></td>
<td>First land plant fossils</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Silurian</td>
<td>443-485 Mya</td>
<td></td>
<td>First amphibians</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Devonian</td>
<td>408-443 Mya</td>
<td></td>
<td>Great coal forests; abundant insects, first reptiles</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Carboniferous</td>
<td>320-408 Mya</td>
<td></td>
<td>Extinction of insects and many other marine animals</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Pennsylvanian</td>
<td>286-320 Mya</td>
<td></td>
<td>First dinosaurs</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Permian</td>
<td>245-286 Mya</td>
<td></td>
<td>First flowering plants, greatest development of dinosaurs</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Triassic</td>
<td>208-245 Mya</td>
<td></td>
<td>First birds and mammals, abundant dinosaurs</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Jurassic</td>
<td>144-208 Mya</td>
<td></td>
<td>Extinction of trilobites and many other marine animals</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>Cretaceous</td>
<td>66-144 Mya</td>
<td></td>
<td>Humans</td>
</tr>
<tr>
<td>Cenozoic</td>
<td>Paleogene</td>
<td>61-66 Mya</td>
<td></td>
<td>Mammals develop and become dominant</td>
</tr>
<tr>
<td>Cenozoic</td>
<td>Neogene</td>
<td>66-64 Mya</td>
<td></td>
<td>Extinction of dinosaurs and many other species</td>
</tr>
<tr>
<td>Cenozoic</td>
<td>Quaternary</td>
<td>64-66 Mya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cenozoic</td>
<td>Recent or Holocene</td>
<td>0-64 Mya</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Time is given in millions of years (for example, 1000 stands for 1,000,000,000 years, which is one billion). The table is not drawn to scale. We know relatively little about events that occurred during the early part of the Earth's history. Therefore, the first four billion years are given relatively little space on this chart, while the more recent Phanerozoic Eon, which only spans 570 million years, receives proportionally more space.
Paleozoic Era
570 to 225 mya

Mesozoic Era
225 to 65 mya

Cenozoic Era
65 mya to present

Apes appear 2 mya and humans 200,000 years ago
"'The fifth world,'" as an old Navajo said, "would not come for thousands of years. Man does not know of its coming. As long as the plants and animals continue to live and grow, we are in the 'fourth world.' When they are gone, we will be somewhere else."

All life and geological formations are animated and connected by means of life giving holy winds, sacred water, and fire....Roman Bitsuie.
My world will end.....when there is no more MacDonalds
Our lands – Nihi keyah (under our feet) is a sacred element

According to our history, the Holy people, we were placed in the midst of the four sacred Mountains. We were given ceremonies to keep healthy, maintain balance with the living world and prosper.

Traditional Homeland of the Navajo People

Tsisnajini – Blanco Peak
Tsoodzil- Mount Taylor
Dook’o’osliid – San Francisco Peak
Dibe Ntsaa – Mount Hesperus
- **East**: Tsoodzil - Mount Taylor
- **South**: Tsisnajini - Blanco Peak
- **North**: Dibe Ntsaa - Mount Hesperus
- **West**: Dook'o'osliid - San Francisco Peak

- White shell stone
- Turquoise stone
- Black jet stone
- Abalone/coral Shell
The four sacred elements are most important elements for growth and nourishment of all living things. All healing ceremonies use water.
Science---If you take earth, air, and water to mean solids, gases, and liquids (common physical state of matter), then any object can be said to composed of a combination of those materials.

Plants are mostly water plus carbon dioxide mixed with minor amounts of solid mineral matter – in other words, water, air, and trace of earth.

Rocks are solid mineral matter containing minor amounts of gases and water and water that can be driven off by heating.

A glass of sparkling mineral water is water plus air.

Hydrocarbons are a combination of carbon and hydrogen found naturally in the earth.

Science---And more recently, a fourth matter, called Plasma. An example in this substance is a “Spark.” Fire is our fourth sacred element. Scientist study the sun, nuclear explosions, and collision experiments to observe this phase of matter.
Navajo Traditions & Culture

Navajo Fundamental laws declares that all humans and other life forms need clean air and clean water and that human care and protection of the land is consistent with K’e or a duty of maintaining respect and reverence for fire, water, air, and mother earth.

Protect our environment and care for Mother Earth for our children’s grandchildren so they enjoy a place on this earth.

We appreciate all living things (life) and the following sacred elements land, air, water, and light.

K’e is how to live in balance with nature and all of Mother Earth’s inhabitants and surroundings. All life forms, including humans, are connected to each other.

Attain balance between hozho (condition of a perfect state) and nayee or ate’el’I inigii (one that kills).
North is the European Culture’s sacred direction and East is Navajo’s sacred direction. When the sun comes up, we look to the East and offer prayers.
Angle Reading with a Navajo Influence (Navajo Trigonometry) on our Four sacred directions

Anonymous
In the Navajo culture, it is taught that the journey through life is circular. And the concept of "positive-ness" corresponds with a "clockwise" motion. For example, when one enters a Hogan (a Navajo dwelling), it is considered respectful to go around the Hogan in the "clockwise" (positive) direction. When recognizing the four sacred mountains, the recognition is in a "clockwise" fashion; begin in the East, and then the South, followed by the West, concluded in the North and returned back to the East.
A method to construct a Solution by the direction of the four sacred directions. Former Chief Justice Yazzie.

East – Nitsahakees. Symbolic of Positive thinking. Associated with the development of concentration and the senses.

South- Nahata. Symbolic of Planning. Associated with organization, communication, comprehension, and the planting of seeds.

West – Iina. Symbolic of Life. Associated with clan system, kinship, social development, and life cycles.

North - Siihasin – Symbolic of Spirituality, Hope, Strength, Regeneration. Associated with the natural order, sacred songs, prayers, ceremonies, and protection.

Policy makers must THINK about everyday life for those living with contamination. They must PLAN out how to disseminate an effective message warning residents about dangers. We must inform people that they LIVE with the contamination daily. We must REGENERATE the contaminated sites.

Science: Scientific Method. Question, Hypothesize, Experiment, observe & record, analyze, and Share Results
Navajo Nation Impacted Soil and Groundwater
hhaven Leaking UST Program 1/30/13

Questionable abandoned tanks sites
Navajo UST Tank Removal 2004
Navajo Nation Impacted Soil & Groundwater
Abandoned Tank sites
Navajo Nation Council Resolution
CAP-47-95

In the Navajo Way, the Earth is our Mother, the mountains part of her sacred body, the water courses her veins and arteries. When the Earth is injured, the resultant instability, imbalance and disharmony bring illness to life on Earth including human kind.”
“So people (Navajo) haul water, as many as 80 percent of people in some communities.” Shaun McKinnon -The Arizona Republic
Aug. 26, 2007
Pump and Treat
It is imperative that contaminated groundwater be restored to pristine conditions because of the importance of the environment to religious ceremonies and the essential life giving precious water to all land, plants, animals, and people.

A Navajo medicine man cannot store the materials needed for ceremonies and thus must have access to uncontaminated soil, plants, and water when a ceremony is to take place.
Cleanup Standards should incorporate the value of ‘sacredness’ for land, water and air to protect Groundwater. We believe it’s appropriate to set the point of compliance at leaking sites at the source area and/or the point of highest Contaminant of concern (COC) concentrations as determined during site assessment activities.
Why is Point of Compliance Important?

We must address contamination at the source and address impacted groundwater resources at the point where contamination meets the groundwater not downgradient.

WATER IS SACRED
In view of cultural and traditional values - Navajo EPA cleanup standards:

does not endorse a tiered approach to remediation.

believes that promulgating a single value for each contaminant for each medium best serves the Navajo cultural and traditional values.

recognizes the nature of the relationship between the Navajo people and the natural resources they live on, it is appropriate to set a point of compliance at leaking source area and/or the point of highest contaminant of concern concentrations.

will not consider Monitored Natural Attenuation as an acceptable cleanup method unless contamination levels are within 10% of the values of the relevant cleanup standards.

shall not use risk assessment analysis unless it is convincingly proven and agreed upon that there is no other reasonable alternative.

the ultimate goal of environmental cleanup on the Navajo Nation is to reduce contaminants to undetectable or background levels.
Albert Einstein once claimed that the only thing that interfered with his learning was his education. Your teachers don’t know everything. Trust the instinctual information that comes to you, too.

Thank you