

Ya'a't'eeh

Means "greetings" in the Navajo Language

Know your clans
Know yourself

Mud People Clan

Hasht'ishnii



Adoone'e



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)

Canyon DeChelly, Navajo Nation

Dedication

In Memory of Arlene Luther



Arlene Luther

March 5, 1948-2008





Chinle Wildcat Team 1970

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.

2004 Monument Valley, Utah

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



NAVAJO NATION LOCATION MAP

Naabeehó Bináhásdzo

Approximately 27,000
square miles

UTAH

COLORADO

Window Rock,
Navajo Nation
Capital

ARIZONA

NEW MEXICO



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



IN THE BEGINNING...jini

One who grew up in
the middle of the
universe

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--
Around 200 million years ago
(Jurassic Time) there existed
one large supercontinent called
Pangaea



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

The Navajo creation stories from our elders tell us emergence (Hajiinei) and progression through different worlds of different 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

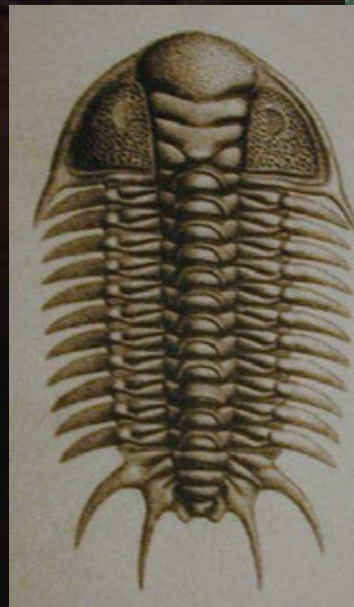
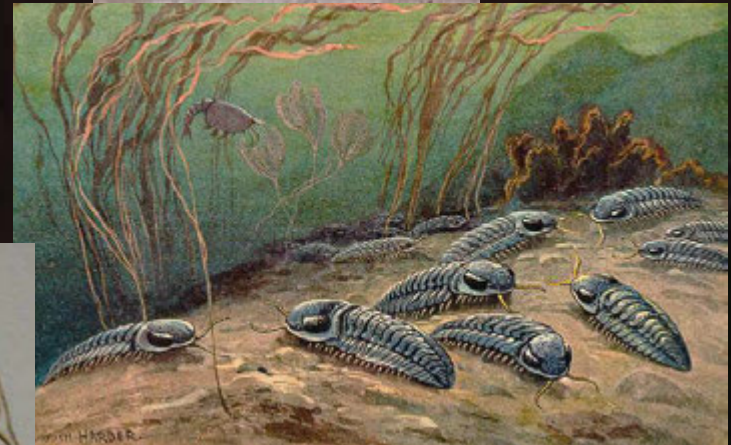
The first world was the “dark world” inhabited by insects.

SCIENCE---

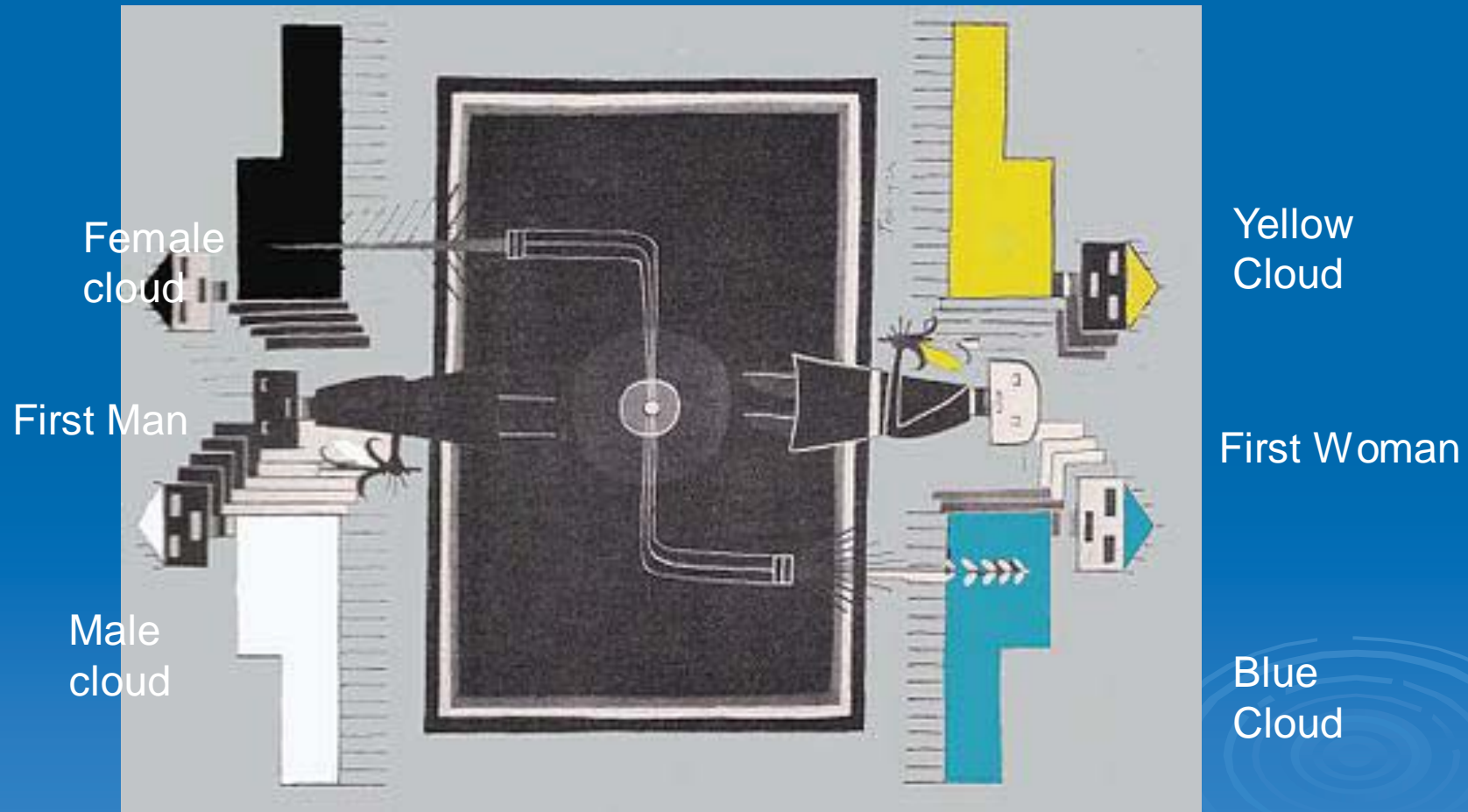
Trilobites – early Cambrian 526 million years ago roaming the oceans. Mass Extinction end of Permian period 250 million years ago



sect



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.

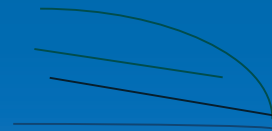
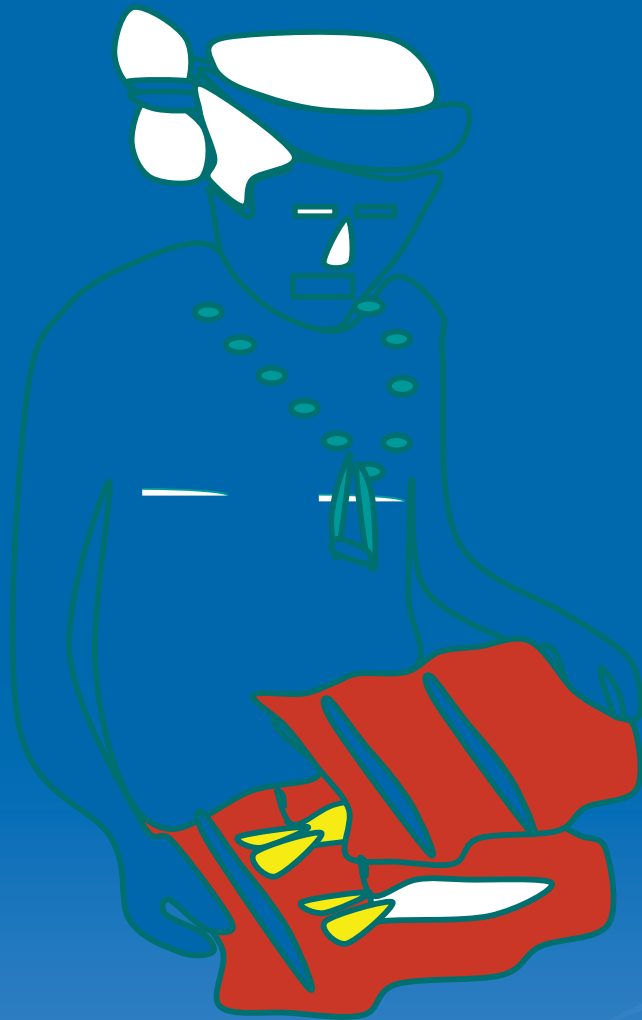


SCIENCE: Quartz crystals have piezoelectric properties, meaning that they are capable of changing a mechanical force into electricity, or an electric current into a mechanical force. A slice, or wafer, of quartz crystal will generate an electric current when it is subjected to pressure. Everyday uses 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.



East
Wind



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.

JUL 21 2004

Spider Rock



Some say the air
spirited people
destroyed the second
world by ICE.

In the **Third World**, Ni Haktsooi, “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 (Tééhoołtsódii) when Coyote stole her two babies. It rain and rain 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.

“Diyin Dine’e”
Holy earth
people.



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.

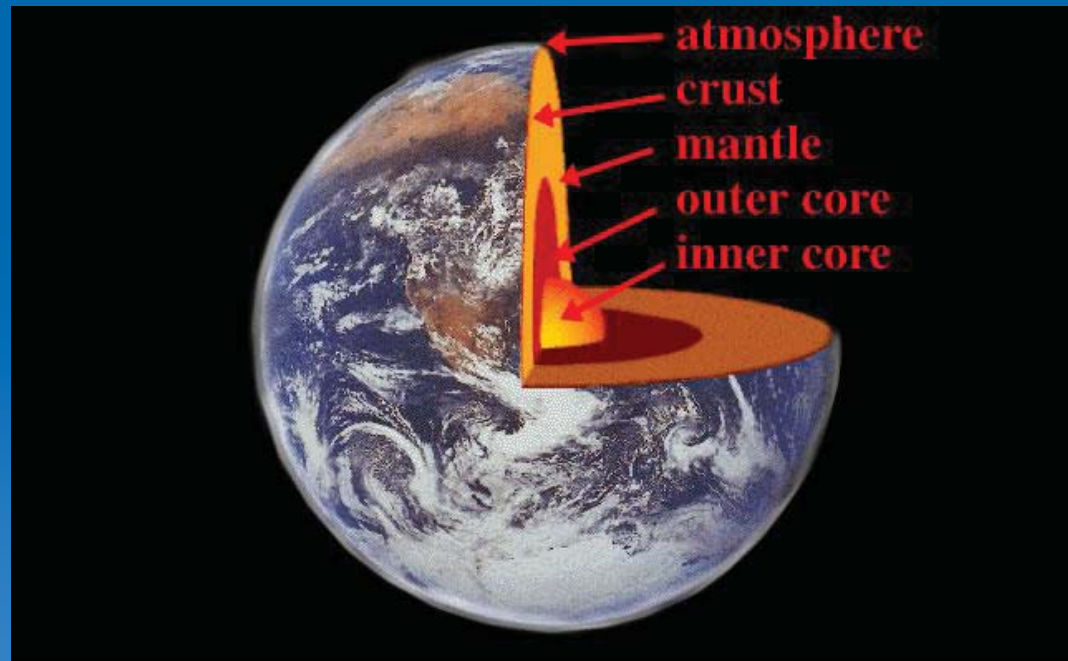
Pictures from NASA’s Cassini spacecraft



Structure of the Interior of Earth

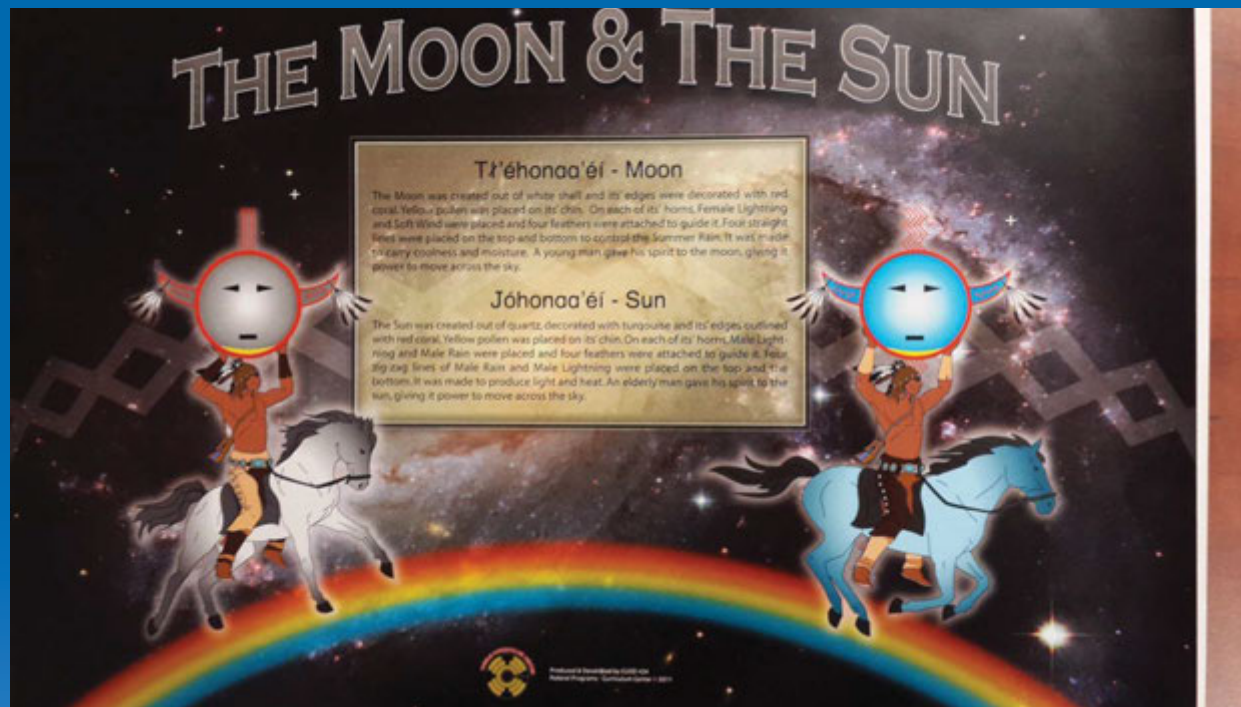
It is made up of four main layers:

- 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

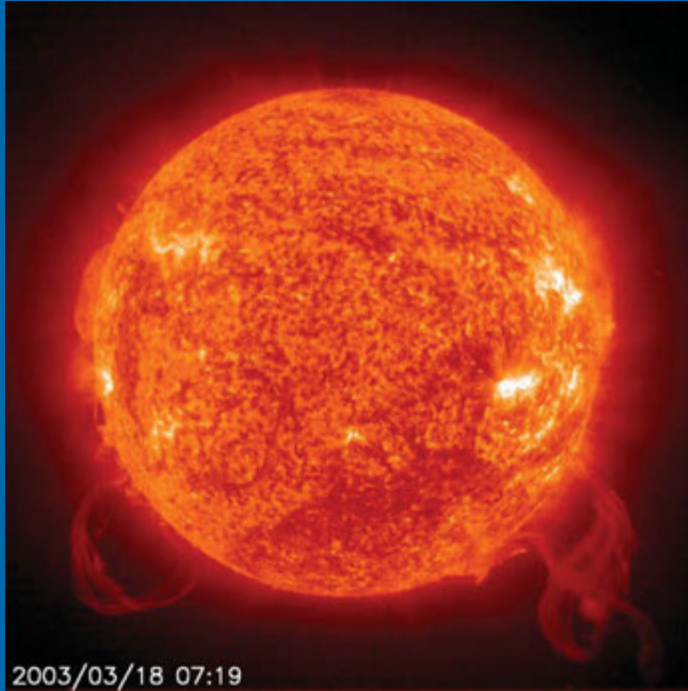


The sun and the moon were created in the fourth world. The moon was made of rock-star mica and mix with holy water from the spring, rain, snow water, and hail water.

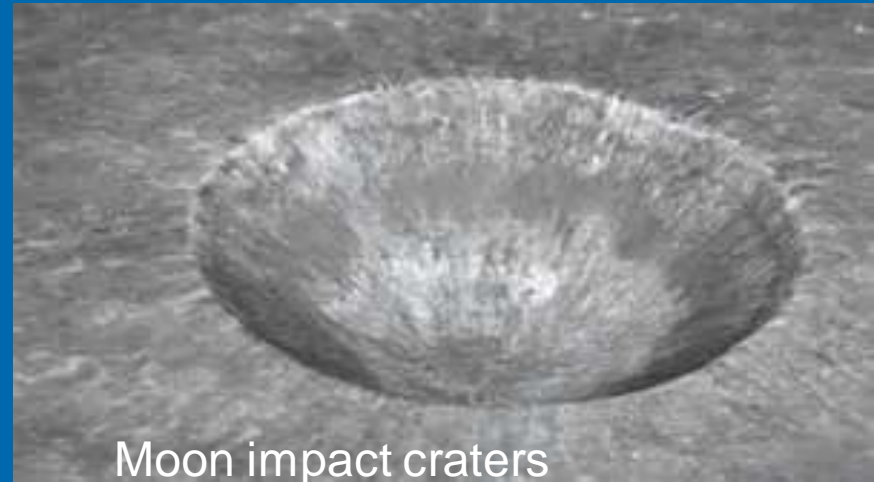
The sun was made of rock crystal, rays of red rain, bars of lightning with shimmering swirls. At first just as stars, the holy people were going to put four points on it, but decided to make the sun round.



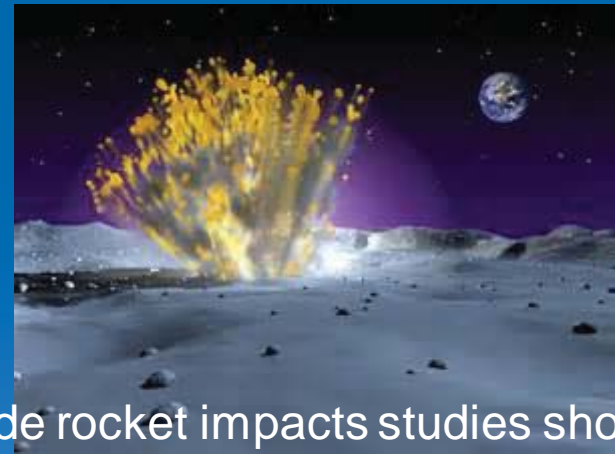
Science:



Images of swirling solar winds on the Sun. NASA photos

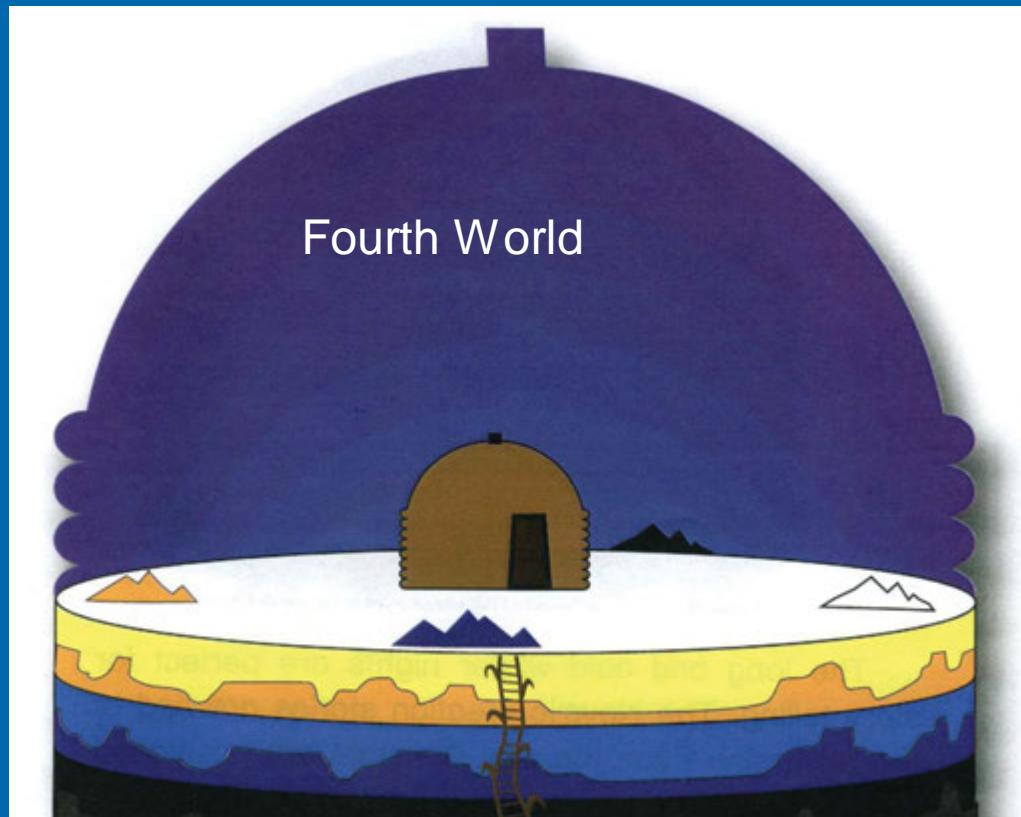


Moon impact craters



Recent man made rocket impacts studies show the dust contained billions of gallons of water
-KASA Channel 2 Exploration of Outer Space July 2015.

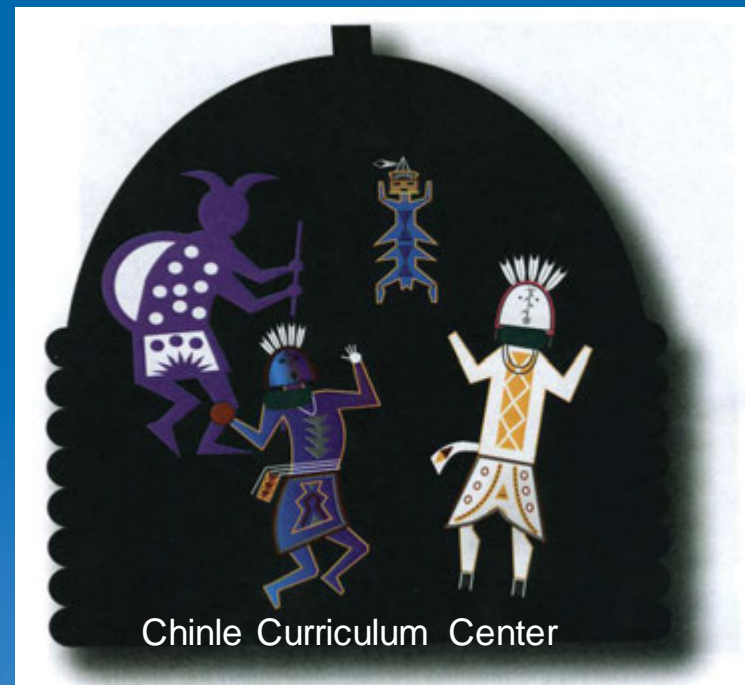
NAVAJO ASTRONOMY



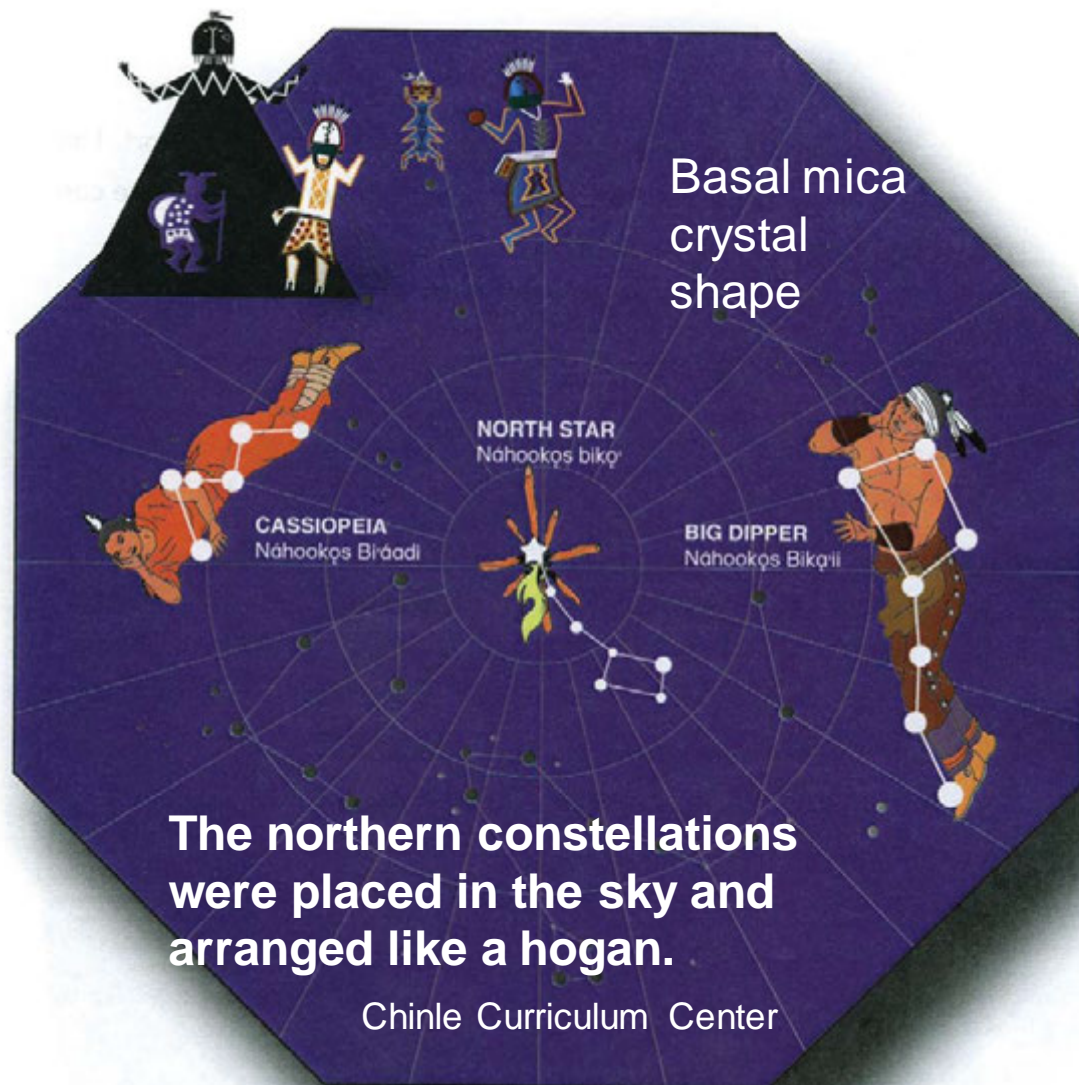
Chinle Curriculum Center

Science---Astronomy the study of the universe especially of motion and position

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.



Chinle Curriculum Center



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'éeshzhiin).

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

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

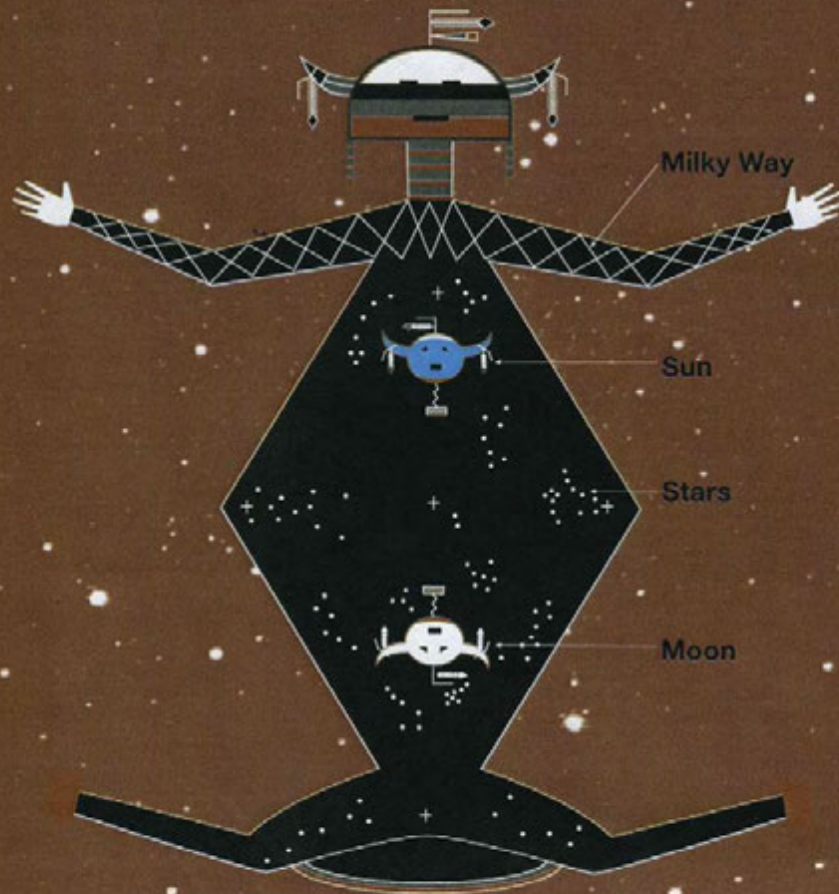
Science questions when time began. Big Bang Theory implies time came into existence at that moment when the universe was created.



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)

Chinle Curriculum Center

Father Sky The Living Universe



Chinle Curriculum Center

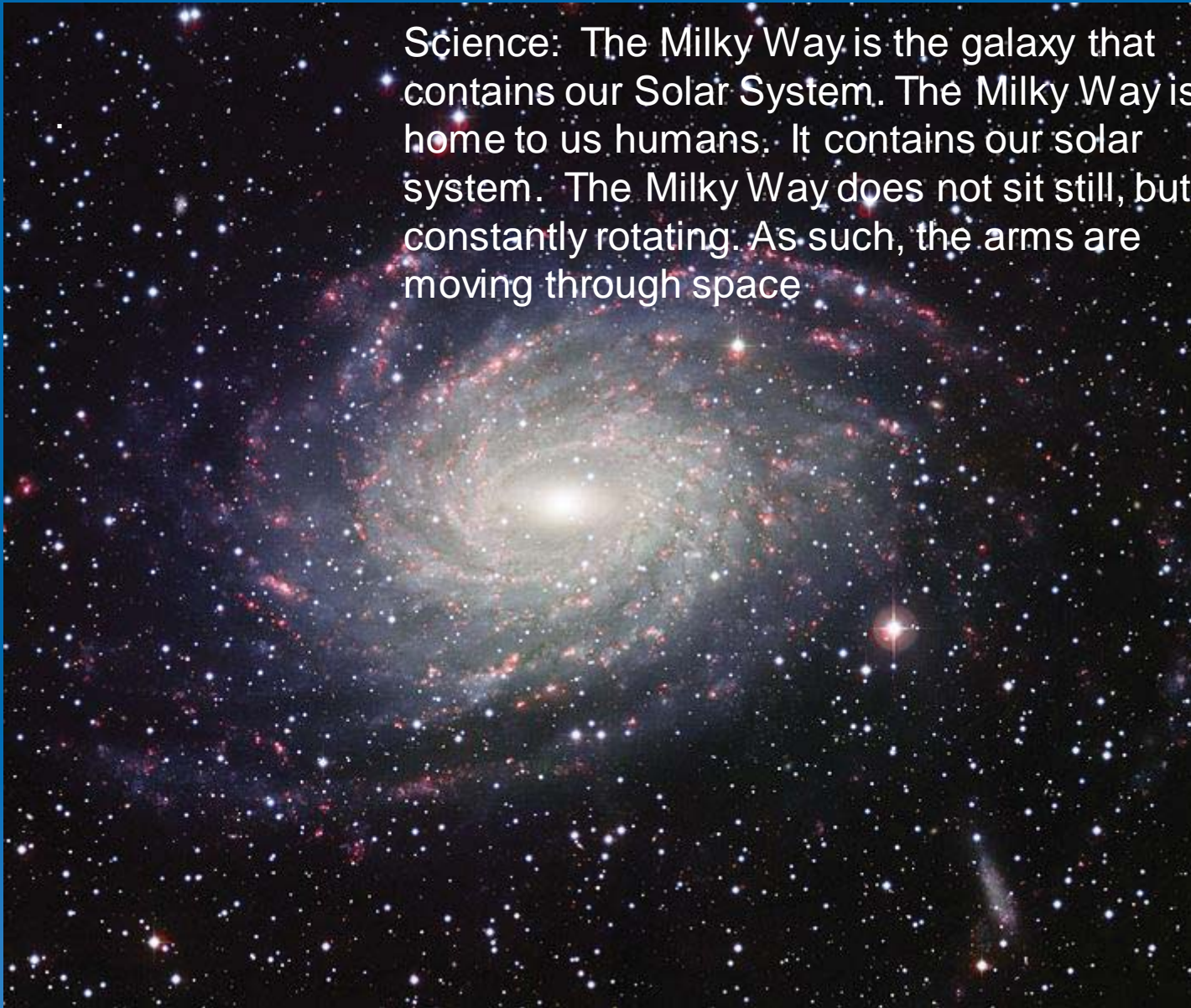
First Man and First Women first offered prayers by sprinkling cornmeal above the early dawn turning into milky way. The stars stretched and whirled around Mother earth becoming a protective shield.

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".



Painting ©2006 Victoria Begay. All rights reserved.



"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

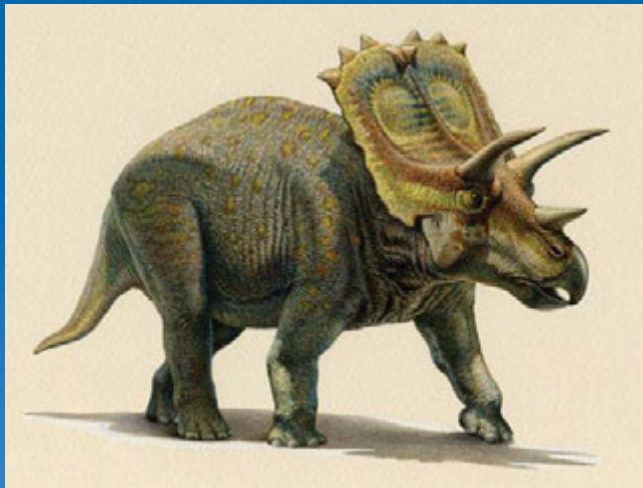
Hunger

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'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.



Tsetahotsittali

Monster who kick People
down the cliff.



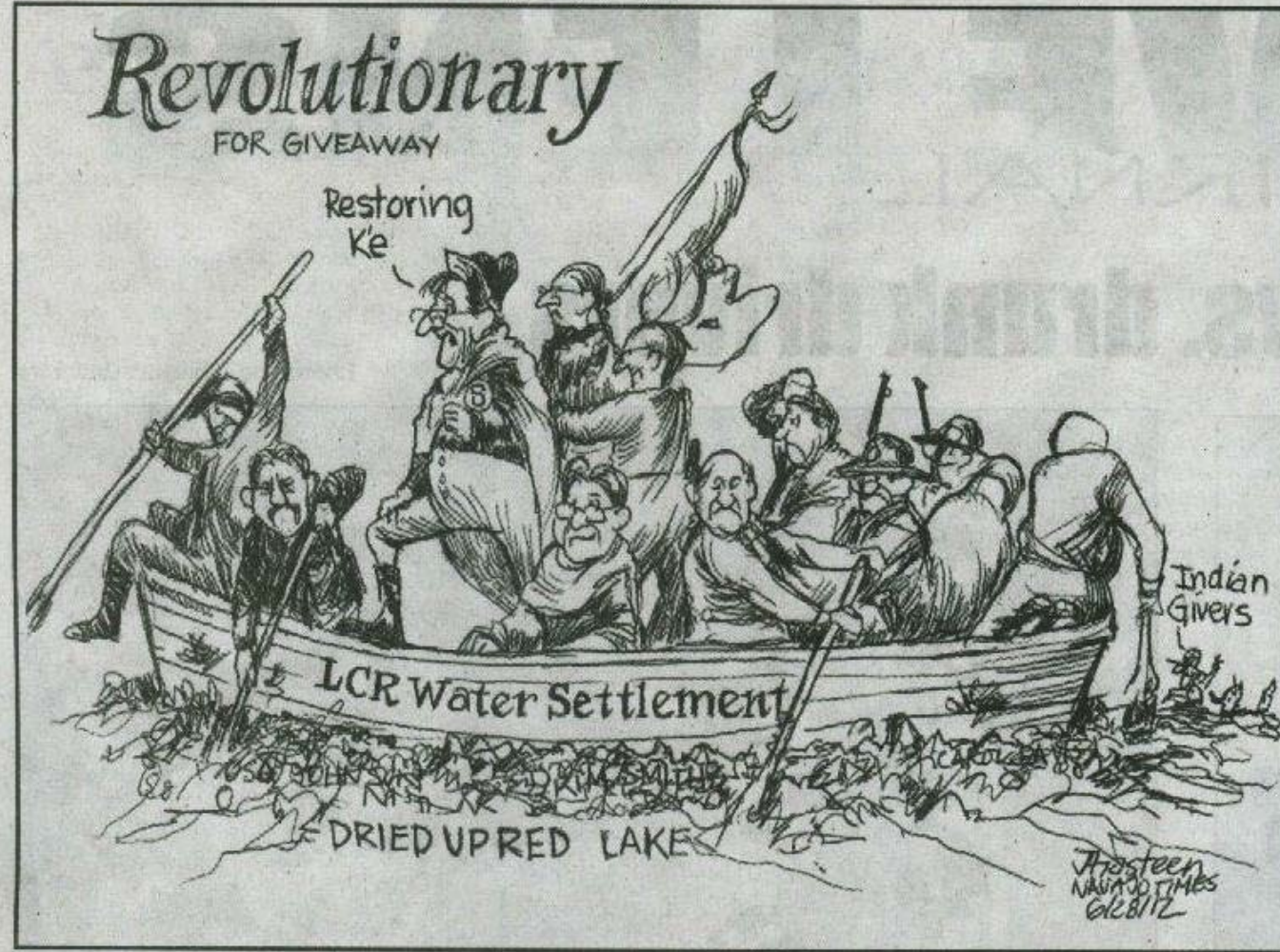
His people
are hungry
down
here.

ARIZONA WATER
STAKE HOLDERS

NN
WATER
LAWYERS

WATER
COMMISSIONERS

J. Hasteen
NAVAJO TIMES
12/5/12



Ke' - Restoring harmony and balance

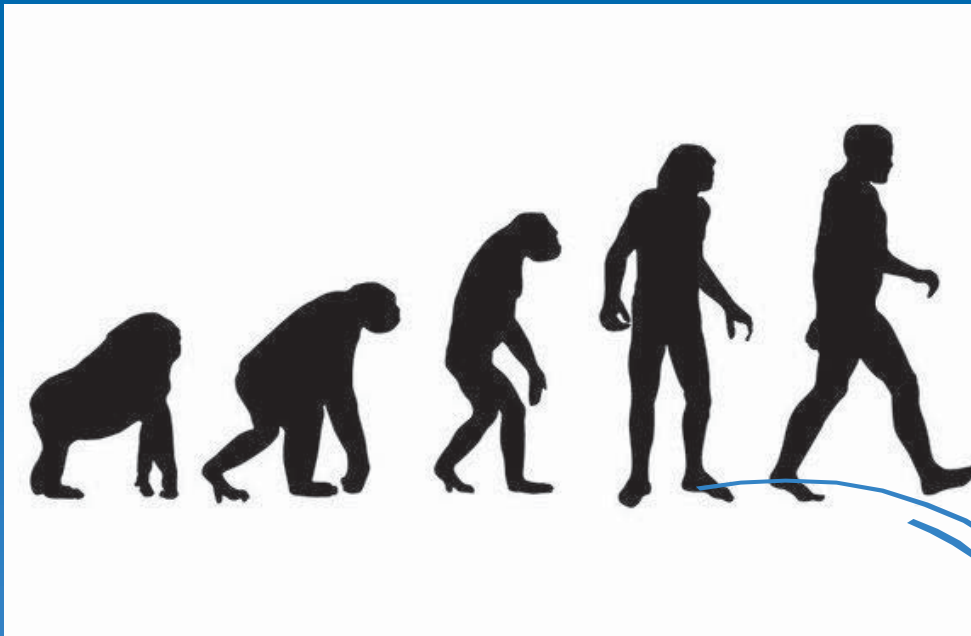


The emergence from the older First world to the fourth world.

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 aanii, 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								
Time Units of the Geologic Time Scale				Distinctive Plants and Animals				
Eon	Era	Period	Epoch					
Phanerozoic Eon (Phaneros = "evident"; Zoos = "life")	Cenozoic Era	Quaternary	Recent or Holocene	"Age of Mammals"	Humans			
			Pleistocene		Mammals develop and become dominant			
		Neogene	Pliocene					
			Miocene					
		Paleogene	Oligocene			24		
			Eocene					
		Paleocene	58			Extinction of dinosaurs and many other species		
		Mesozoic Era	Cretaceous			144	"Age of Reptiles"	First flowering plants, greatest development of dinosaurs
					Jurassic	208		First birds and mammals, abundant dinosaurs
	Triassic			245	First dinosaurs			
	Paleozoic Era		Permian	286	"Age of Amphibians"	Extinction of trilobites and many other marine animals		
				Carboniferous		Pennsylvanian	320	Great coal forests; abundant insects, first reptiles
			Mississippian			360	Large primitive trees	
			Devonian	408		"Age of Fishes"	First amphibians	
				Silurian			438	First land plant fossils
			Ordovician	505		"Age of Marine Invertebrates"	First fish	
				Cambrian			570	First organisms with shells, trilobites dominant
	Proterozoic	2500	Sometimes collectively called Precambrian			First multicelled organisms		
						Archean	3800	First one-celled organisms
								Hadean

Time is given in millions of years (for example, 1000 stands for 1000 million, 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.

SCIENCE EMERGENCE

Geologic Time Scale Four Time Periods

Cenozoic Era

65 mya to present

Mesozoic Era

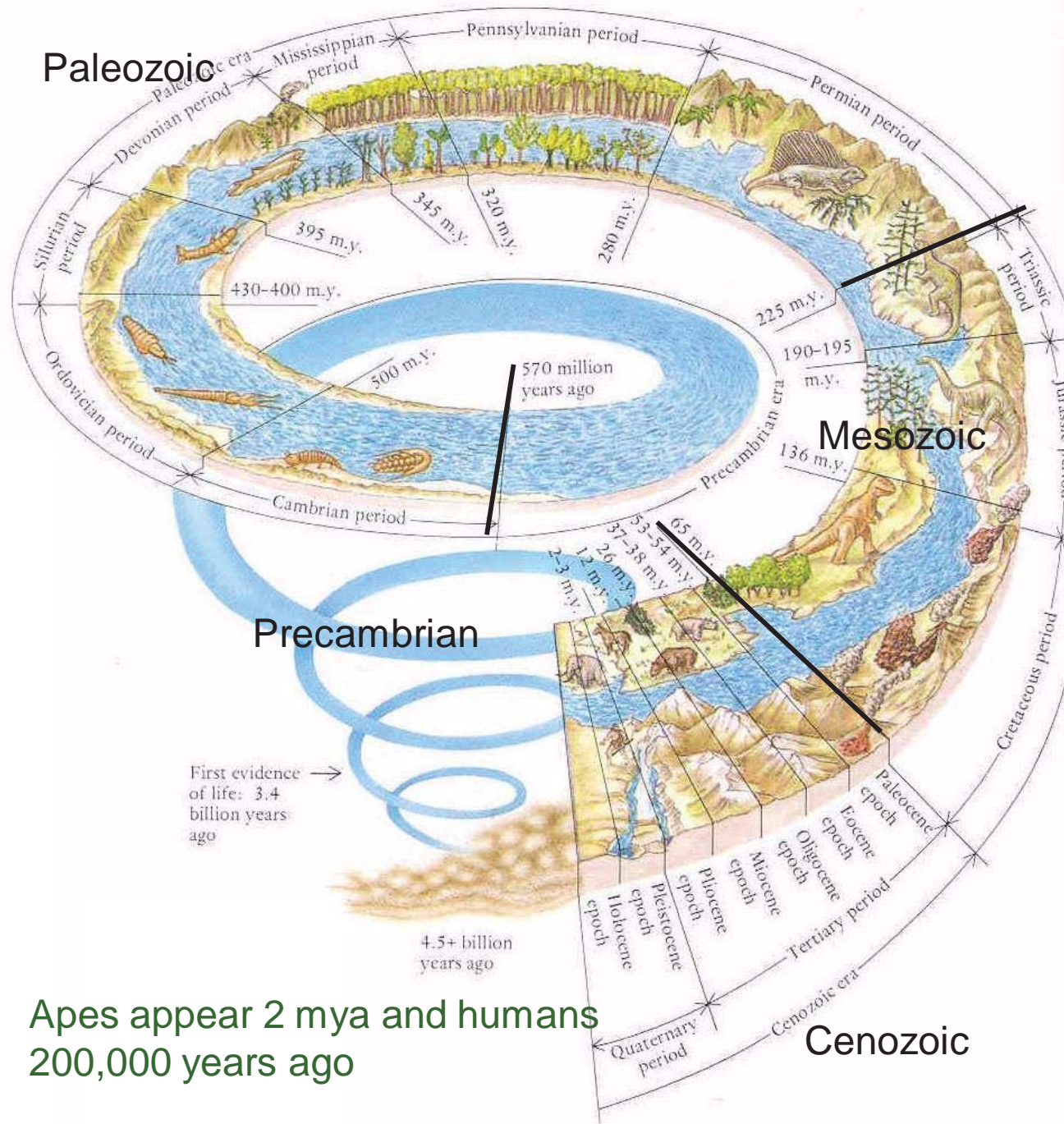
225 to 65 mya

Paleozoic Era

570 to 225 mya

Precambrian

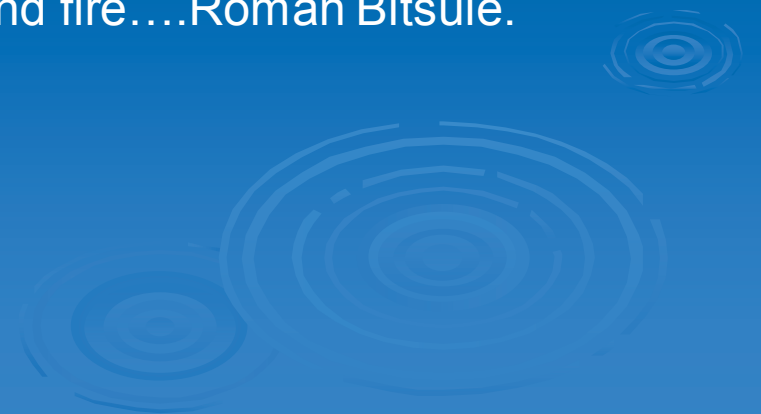
Era 4.5 billion to
570 million years
ago





""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

AUG 13 2004

East

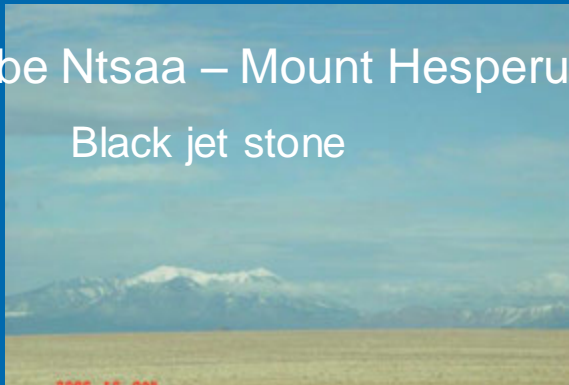
Tsisnajini – Blanco Peak

White shell stone



Dibe Ntsaa – Mount Hesperus

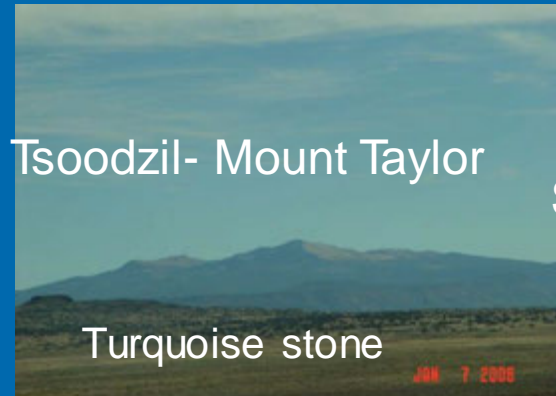
Black jet stone



North

Tsoodzil- Mount Taylor

Turquoise stone



South

Dook'o'osliid – San Francisco Peak

Abalone/coral
Shell



West

The four sacred elements

Earth - Nahasdzaan

Sacredness- Something that we hold in high regards, something very beautiful and untarnished and undistrubed.

Fire – Ko'

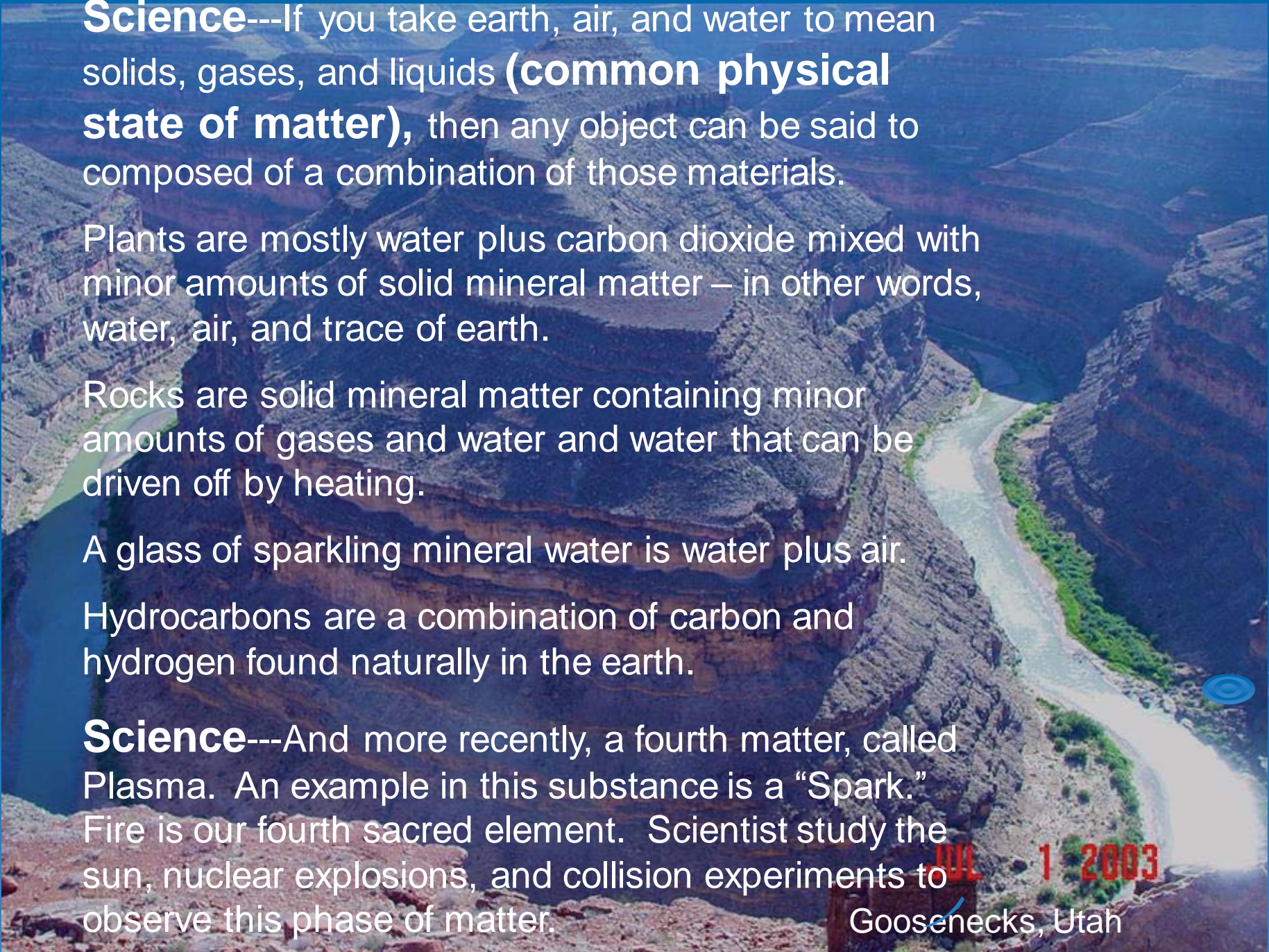
Air - Nilchi

Water – To'

The four sacred elements are the most important elements for growth and nourishment of all living things. All healing ceremonies use water.

JUL 27 2004

Monument Valley, Utah



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.

JUL 1 2003
Gooseheads, Utah

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'inigii (one that kills).

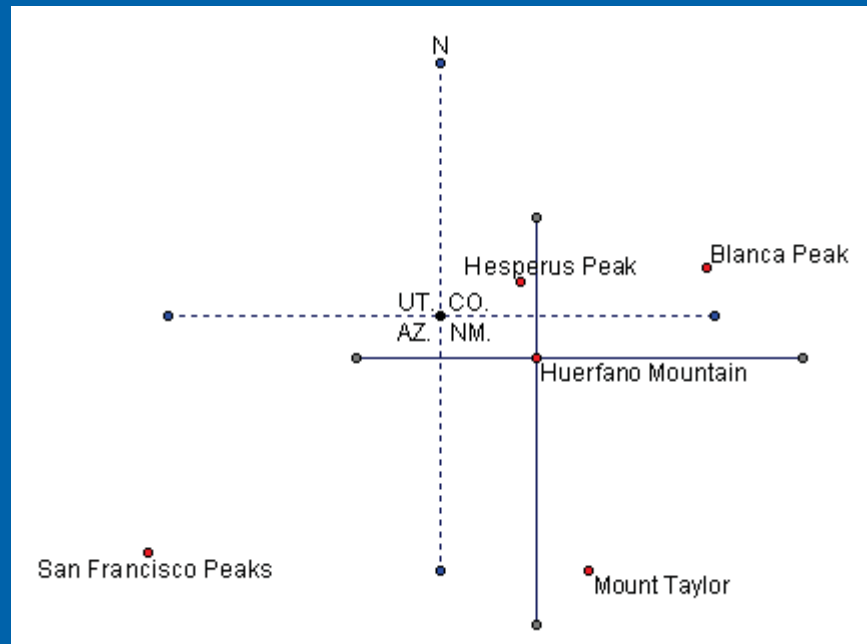
OCT 20 2004

Natural Pond in Tuba City, AZ

Navajos Four Sacred Directions

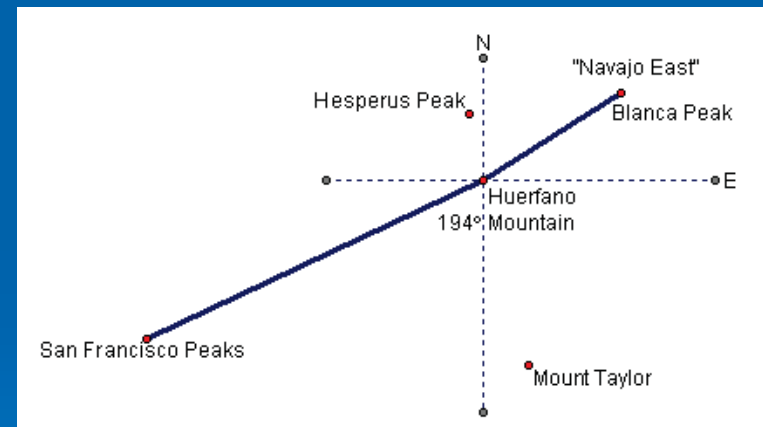
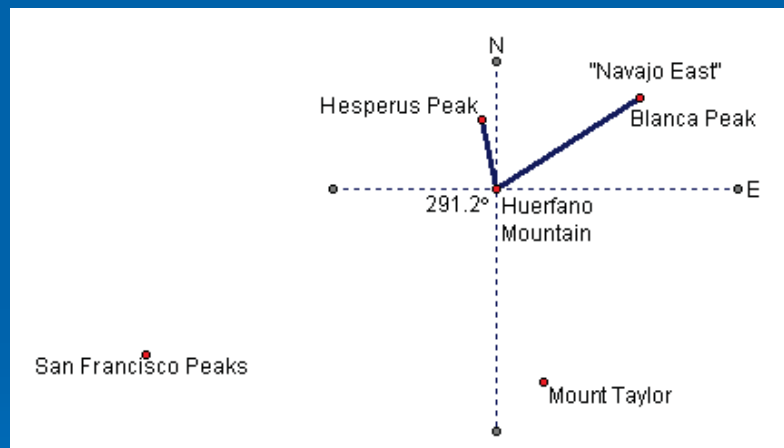
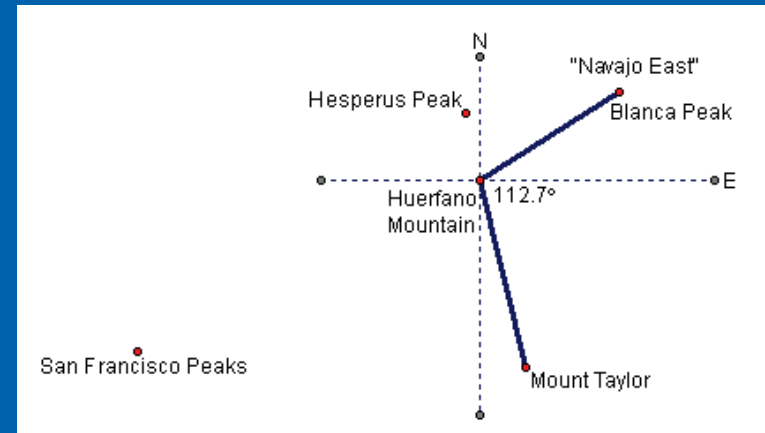
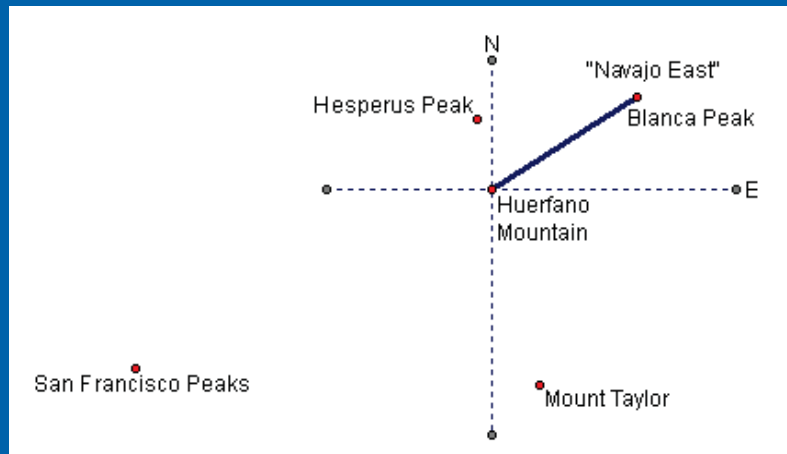
North is the European Culture's sacred direction and East is Navajo's sacred direction. When the sun comes up, we look to the East and offer prayers.

Angle Reading with a Navajo Influence (Navajo Trigonometry) on our Four sacred directions



Anonymous

"Navajo East" A standard position (positive x-axis)



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

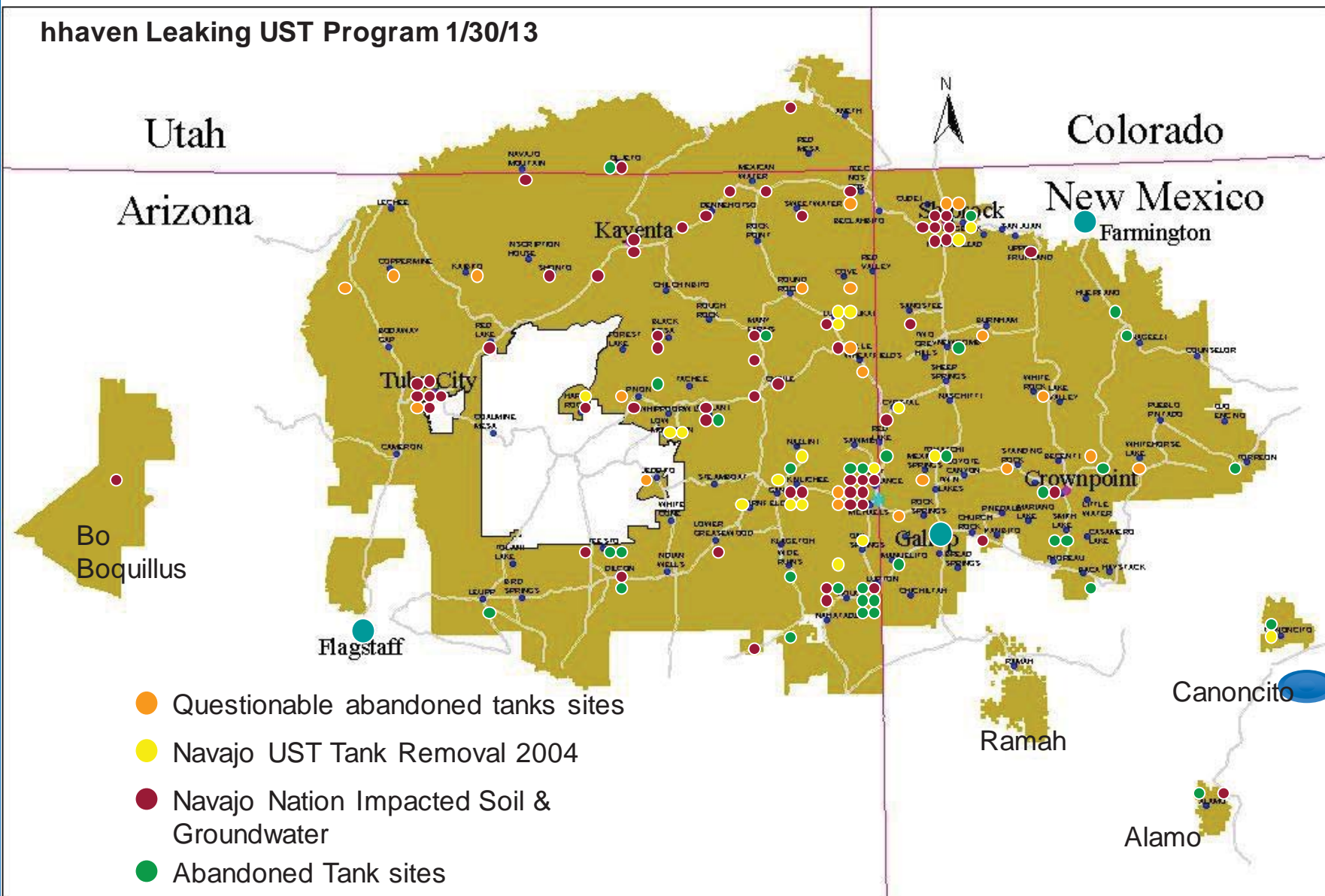
North - Siihasin – Symbolic of Spirituality, Hope, Strength, Regeneration. Associated with the natural order, sacred songs, prayers, ceremonies, and protection.

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



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.

A photograph of an oil pumpjack in a dry, cracked landscape. In the foreground, there is a large, shallow pool of water reflecting the sky and the pumpjack. The ground is parched and cracked. In the background, there are rolling hills and a cloudy sky. The pumpjack is a large, mechanical structure used for extracting oil from the ground.

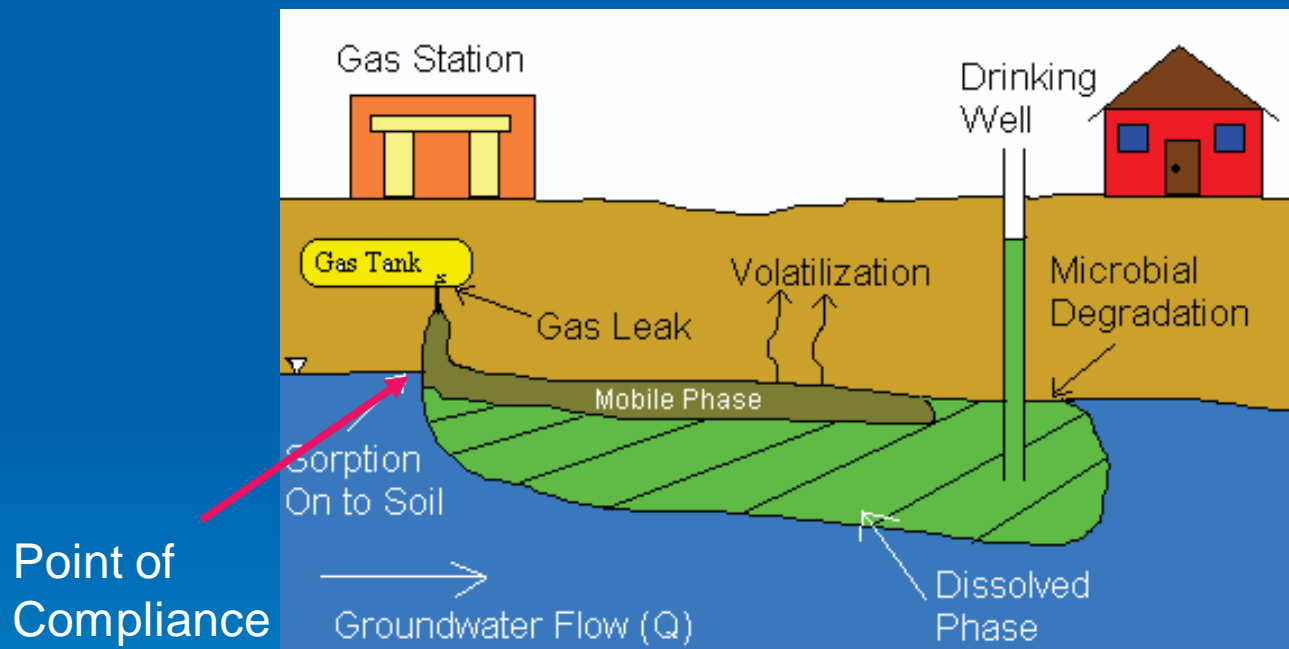
Cleanup Standards should incorporate the value of 'sacredness' for land, water and air to protect Groundwater. We believe it's appropriate to set the point of compliance at leaking sites at the source area and/or the point of highest Contaminant of concern (COC) concentrations as determined during site assessment activities.

DEC 13 2002

NAPI Farmington, NM

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.

Rough Rock,
Navajo Nation

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.

