

The Human Body: Marvels of Physics, Chemistry and Biology working together!

“The Human Body-The Western Science meets Native Science”

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Introduction

A human body is a wonder of the world. From a single cell, life is formed to function and survival begins as soon he or she is conceived in the mother's womb. As we live in our bodies day to day, it is amazing how we are unfamiliar with its function and its capabilities. We go through life on a daily basis by learning of our own bodies through professional health consultant or trial and errors. When something is not right, we seek experts to help us understand our own bodies such as doctors, health specialist, or even through Shamans. For many cultures, such as Native Americans, as an example, the people of Dine seek shamans to help them fix their bodies by performing a ceremony. Such as if one's body would be cramping up, one would be told it is due to exposure to lightening or twister or even to the extent of consumption of certain food. These finding affects the body and mind according to the medicine man. In order to heal, balance needs to be restored through a proper ceremony by a medicine man (Max,L., 2019). Could this be linked to spiritual or is it all mentally? Furthermore, how is this proven through scientific fact? Although, from the perspective of a Native American being, some key aspects about the function of our body is sacred and celebrated when changes happens or a new development occurs, such as a baby's first laugh and Kinaalda (Puberty). The condition of one's body in some culture is also based on the actions and with a positive mindset of the person. In the Dine way of life, a human body begins in the mother's womb. A prayer is said for the body by recognizing and blessing all the body parts and the journey of the baby as she goes through Si'a naagai bee ke hozhóón (Navajo term meaning to journey through life with beauty and positivity from birth through old age). In the western civilization, there is no celebration about a human body. People learn of their body simply by being aware and knowledgeable of their body functions from birth to death. In a more scientific perspective, a body is like a machine with its own interdependency. In learning about the body, one has to understand the biology, the chemistry and the physics of a human body. How biology, chemistry and physics intertwined and are interdependent of each other in order to function. It is astounding how a human body is like a machine and the brain is the central location of movements or compared to a CPU of a computer. As one goes through life, one has to learn of their own body and should begin at an early age. Therefore, this unit focuses on the physics of a human body. How one learns of physics through one's body by one's personal actions, reactions and movements verses reflexes. This unit addresses the western civilization perspective and the cultural perspective of the Dine Nation on the physics of human body. In addition, to learn the importance of the body's functions and understand where the main control is located and how it is connected with one's own choice and decisions.

Demographics

This unit has been developed for students at Tsaile Public School as a pilot. Tsaile Public School is located in a rural area of north eastern Arizona. Tsaile Public is one of the seven schools under the Chinle Unified School District. The school is small and located about 30 miles away from the other 6 schools. Tsaile Public School is an elementary school whose enrollment is from pre-school to eighth grade. The school's yearly enrollment ranges from 420 to 450 pupils. There are other charter schools as well as public schools outside the district where students can enroll. This is sometimes a concern for the school because students who hop between schools are not stable academically. They do not always acquire all standards and skills needed at each grade level as

they move. The ethnicity of the students is Native Americans, primarily Dine people or a descendant of another tribe. The school provides free meals for all students enrolled through a grant that it qualified for.

An estimated number of 1,200 people live in Tsaile. Tsaile is located at the base of Chuska Mountain. It is unique and beautiful area with wildlife existence. It is unique due to the fact that it is partially located in the forest where tall pine trees grow and partially located in the open rocky land towards Chinle. On the weekends, families often go fishing at a nearby lake or basically stay home. The nearest big town or city would be about 75 miles. There is only one convenient gas station, and a community college, known as Dine College, which is considered the main campus throughout the reservation. Majority of the Dine people that live in or around Tsaile area lives by the traditional values and beliefs of the Dine culture. Some of the children are engaged in learning about their own Dine language and practicing the culture tending to livestock, especially sheep, hunting, fishing, and family events. While others choose to live a modern life by staying home and basically watch movies and be on the internet or play video games. Older generation families practice ceremonies to maintain harmony in their household. They often gather for ceremonial purposes or casual get together, for trips or social activities and events in the community. The younger generation families are not home. Most young parents have to work or live off the reservation to provide for their families. Grandparents often take over the responsibility of caring of their grandchildren. Some live out in the cities or town and do not come home as often as they should. But the people in Tsaile seem to know each other very well. It is often true that it takes a village to raise a child. Extended families live nearby or in cluster by each other to support one another.

The community in or around the surrounding area of Tsaile rely on a grocery store, *Bashas*, to purchase their food. *Bashas* is located 25 miles west of Tsaile. *Bashas* is the main grocery store located throughout the reservation. If you browse through *Bashas*, variety of food groups are sold to the community. Unfortunately, *Bashas* is also stocked with unhealthy food such as chips, soda, sugary or fatty food. The prices of the foods are high due to the fact that it is located in rural areas on the reservation. These foods are considered a quick fix for families to consume as nutrients for the body. For some that have livestock or cattle as well as farming provides that as their food supply. As young as babies to teens as well as adults and teenagers are consuming food from *Bashas* to survive. In addition, a few fast food chains are within reach of families. The competition between businesses for customers to purchase is visible with advertisement or enticing of food exists. For students that attend school Tsaile Public School, a healthy meal approved by the FDA is provided, but students are often seen trashing their untouched food and settling for quick snacks which are also sold by the school. The type of food one takes has an effect on the human body. On the Dine Nation, one big health concern is the Diabetes

Rationale

In today's society, we seem to take advantage of our body. We use our body to do the simplest things in life such as pick up items, move or run with force, watch a movie, lay and read a book, have fun by playing on the playground, and fill it with food that makes us happy. What we don't know are the side effects of what we do to our body. Sometimes not getting enough energy or eating the right kinds of food take a toll on our bodies. In addition, we don't do enough physical

activities to support our bodies. We let go of ourselves and then we suffer from many injuries or diseases, such as diabetes. All the side effects affect our body and enables us to carry out jobs or be in activities. This also affects the mental state of being. Today's kids seem to be living in a very convenient type of life style. Children at an early age begin to learn and use electronics, all the video games, cell phones or tablets, as they sit to it with little physical movement and some negative involvement mentally with bad games. The body is not getting any physical activities that it needs to reinforce a healthy lifestyle. In addition, the food intake is another area that students need to become aware of. Many students eat the processed food because it is quick to warm up and easily assessable. Then they go lay around again having no energy to do anything physical. Furthermore, it effects the mood and behavior of each individual. The morality goes down to where they have negative attitude, dislike others, and their behavior changes by having bad attitudes to self and others. As I mentioned before that the Native philosophy of learning has changed to where it was once that daily activities, food intake and social activities involved mental, physical and emotional work together to bring out the best in a child.

In the classroom and in many homes today, students come to school unaware of their surrounding and cannot get the concept of how their body functions day to day. They also do not understand their surrounding as well as their environment. I have students that come to school with no energy and when asked to do things such as move a box, they struggle with how to pick it up and to move it. Basically no concept of the how, but they are quick to move when it involves hitting or hurting another child, that affects morality. In essence, because they cannot think it out, they first rely on someone to do the work, such as an adult or another student who is able to think it out in solving a problem. Furthermore, they seem to not grasp that a lot of their actions and energy comes from self-forces. When asked to move things, or when they play roughly, they don't understand the forces. I believe that one of the ways to start seeing differences in the student's behavior is to teach them about their own body. Along with the physical movement. How can students understand physics and how will it affect a positive outlook for each student? These activities and the resources from this curriculum will answer that question.

Tsaile Public School's data shows significant low scores for students in the area of informational text. According to the Arizona Merit Assessment, students are less knowledgeable and unable to apply skills when it comes to informational text. This is across the board for all schools on the Navajo Reservation. Students seem to have done better in the content of literary text. In an informational text, students have to be knowledgeable and apply skills such as comprehension, use of text features, diagram, cause and effect, context clues, and compare and contrast. Informational texts are non-fiction and basically the student's environment. According to the school's data, students are not able to comprehend information text and answer questions that apply to informational text. Several problems are identified. First is the amount of information shared at grade level and the vocabulary terms relating to the topic are difficult for the student's to grasp. The other problem is that majority of the students are not reading at grade level. So much of the topic and details seems to be modified or watered down so students can comprehend. This becomes a problem when the assessment is administered at grade level. The content of this unit is the important part so that the students will achieve the content standards or objective that is taught no matter on what the topic is.

Content Objective

The unit covers on the subject of physical science. Why physical science? I believe that students today struggle with their body from the perspective of health to physical activities, especially young children. It begins with the importance of teaching vocabulary words since this is an introduction to Physics. Students should be taught words such as energy, movement, forces, and the body parts of a human among other words. Learning the vocabulary is crucial because students must understand what the words mean as they say, hear and read it. Vocabulary development should take no more than 2 days. The next part of the activity is introduced what Physical science is in regards to our human body. Teacher will do some modeling physical activities as student watch. These activities are to brainstorm, make prediction to help the students understand physics is movement and motion by force. Such activities are standing and balancing, movement, pushing someone, jumping, and hopping. The Teacher and students will use the human body to teach physical science. Furthermore, my unit is aligned to the Arizona State Standard in Science and ELA (English Language Acquisition) using informational text. These standards are covered: cause and effect, compare and contrast, gather scientific data as well asking and answer questions. In addition, the students will learn to take science to a different level by analyzing the informational text when reading. This process will have students continually searching for answers and investigating, as well as making connection with their readings and the activities. This is so they will better comprehend the text they will be reading based on scientific reading. This unit will be composed of studying the human body and how it functions. How the body functions automatically, or reflexes vs. in our control. In addition, the unit will address the understanding the Diné teachings of our physical well being. Some of the Dine teaching will involve taking traditional food, to understanding the philosophy of learning, as well as learning the songs that were carried on from generation to generation. Furthermore, students will learn about cause and the effects of our intake from the outside to the inside. Students will be involved in experiments such as take sugary intake vs. healthy intake to provide energy. This is to show how energy works and how it affects our body to show motion and movement. Students will work with groups and pairs to do experiments. Technology will be used as well to provide instruction, and video to show students the physical science. Foremost importantly, students will learn and understand that they have control of their body verse the body control them. This is important so they will not be making excuses as to why they can't do certain physical things to what their action caused. In addition, students need to know and learn that their body is important and sacred.

History of the Native Science

“Living the earth and Facing the sun” (Cajete, G., 2000)

All is beautiful,
All is Beautiful,
All is beautiful, indeed,
Now the Mother Earth
And the Father Sky,
Meeting, joining one another
Helpmates ever, they.

All is beautiful,
All is beautiful,
All is beautiful, indeed.
-Navajo

This chant is considered a powerful prayer when it comes to one's intention to live in Hozhó. Although in the western civilization, science is defined differently from that of the Native Americans' aspect. In the western science, science is questioned and basically tested. As for the Native Americans, science is not a question, it is everyday living. It is the interaction with human vs. nature. In the western science, it has to be tested. On the other hand, Native American belief on science is not always tested. "Native science reflects the unfolding story of a creative universe in which human beings are active and creative participants. When viewed from this perspective, science is evolutionary-its expression unfolds through the general scheme of the creative process of first insight, immersion, creation, and reflection Native science is a reflection of the metaphoric mind and is embedded in creative participation with nature. It reflects the sensual capacities of humans, It is tied to spirit, and is both ecological and integrative (Cajete, G., 2000). It is basically by the stories passed on generation to generation as well as in the chants and prayers that are set in stones. All the teaching of the interaction with human and nature or matter is in the chants and prayers. As the Dine people believe that science is in our everyday lives. "Native science is in every sense an expression of the evolutionary interrelation of Native people with nature" (Cajete, G., 2000). As a result, how we live in this world and how we interact with other living or non-living things is sacred. In the Dine science, one is taught to respect every living thing or non-living thing on earth. Each time someone chooses to use or plant, one needs to make an offer. This is so because the people believe that the Holy people are the ones who bless with these richness. In return, they ask for offering out of respect. Everything on earth is supplied by Mother Earth. In the Dine Culture, most are taught to carry on that philosophy and respect. Respecting the environment goes beyond that, Dine are taught to respect one's own bodies as well as others. Therefore, special ceremonies are held for the individuals and special ceremony or prayer are held to take from earth such as a tree, or field. It is believed that every human is made of nature, that when one dies, they return back into nature.

Another important part of science with the Dine culture or other Native American culture is the physics of a human body or nature. It is believed that the interaction between physics, biology and chemistry are interdependence of each other. This is also true in the Western science. For Native science, mostly speaking for the Dine culture, is embraced with the knowledge and action to "seek life". Native American interact with the nature or natural sources of life to live a life, for survival and self-preservation. I grew up with my grandmother teaching me about identifying native plants and its uses. Furthermore, being physically fit is thought to be good for mental health. The Dine people early on believe that running every morning was a must. This is a time to be in touch with nature. It is believed that is also a force from the holy people to be blessed with good health. It is also believed that if you do not get up early in the morning and run to greet the holy people, then bad spirits live upon you, which affects the mind. To avoid bad behavior or negative mental health, one would be up early. Other important information with the Dine is the interaction with the environment. A lot of interaction is based on spirituality. Such as one's contact with lightning or twister can affect the physical well-being of a person. So, the Dine interaction with the environment is sacred and valued.

Understanding Physics through a Model

What is physics? Physics as defined in a dictionary is the study of matter, energy and how they interact which is mostly based on space and time. As students learn of their body, how they can move or work with their body, they will need to learn of what their body needs in order to work with their body. The ability to pick up or move things or objects are hard for some students. They don't understand that they are capable of moving objects through proper force. Basically, the ability to do work with one's body. At the same time, they need to make the connections with how much force and strength it will take to move an object. For example, when picking up a box, students tend to feel like they can't do it. Or simply because they don't examined the object and its surrounding. Another example is to do simple chores. I once saw a video on You Tube where a child was cooking for his younger sibling. The thought and the technique that went into mixing and stirring over a hot fire, reminded me of when I was young. As kids, we were told to work and to think through our steps and make sense of our surrounding while doing chores or hard work, such as chopping woods. It seems today, kids are not able to do work to strengthen their mind and body. Even when they are doing a writing activity, they get tired fast. The ability to push a pencil is not something that they'd think of when objects need to be moved with proper force. So I hope students begin to think of physics when doing work or activity.

In order to understand physics, one needs to understand Sir Issac Newton's theory, Law of Motion. In Newton Law one, it is said that when an object sits straight with balance on each end, it will stay in one place or what they called inertia. I understand that Law one pertains to an object sitting without movement. The object will remain unmoved, unless one decides to move it. The movement of it depends on the mass of the object. His second law takes effect if one decides to move the object. If the mass of the object is heavy, then the acceleration of the object depends on the mass and force. For an example, if a child decides to move a table, he or she might need more force to be able to move it. On the other hand, if it is a small toy or small object, it may not need as much force, but if it were pushed with the same force as a table, the acceleration would be much greater for the small object to move at a speed verses the moving the heavy object. This theory gets into the third law of Sir Issac's theory, he claims that in order for an object to move, the forces are equal. If one takes an action of moving an object, there will be a reaction from the force, which is sometimes gravity. Students need to learn that in order to move and object, they need to learn about forces. They also need to understand how they can use their body to function in the real world situation. In addition, when they play or interact with other students, such as hitting another student, which they consider "I barely pushed" incidents. The forces that come with mass can be greater. I believe that if students learn physics at a young age, it would encouraged them to think before doing anything, as well as taking care of their body to help them make better choices when eating and doing any kind of work.

In the science world, teaching science can be difficult because of how one can address it and how one can make it clear for students to understand. In general, teaching science is usually done through questioning, observing and experimenting. There is the science methods or science processes that is used to prove a thought or question. Most teachers use the process for students to use based on the following scientific process. This seems easier to follow and pretty simple. It

is similar to teachers who use it for science fair. I like the questioning because it leads students to be independent learners as well as accountable for their own learning. If students question they want to find out by developing their own questions. Here is a simple process most teachers resort to.

Step 1: Ask a question.

Step 2: Do background research.

Step 3: Construct a hypothesis.

Step 4: Test your hypothesis by doing an experiment.

Step 5: Analyze the data and draw a conclusion.

Step 6: Share your results.

It is good for students to be involved in experiments. At a younger age, students tend to be more motivated and curious to learn independently and build the love for science. As we think of STEM (Science, Technology, Engineering, and Math), we need more students involved in learning in the area of science. It is basically their environment that they need to learn and improve, from their own body out to their environment. This unit will be using inquiry and inquiry based learning strategies. Inquiry based learning is questioning and active engagement for students to learn. Inquiry is defined as a process to resolve uncertainty by analyzing an individual's ideas and beliefs. Inquiry requires a person to use reflective and critical thinking skills. There are skills that are used with inquiry, they are active, persistent, and based on a person's knowledge. It is an approach to learning which involves exploration, questioning, making discoveries, and testing discoveries to search for new understanding. Inquiry for elementary level is to involve students to get them to ask scientifically-based questions about objects, living things, and their natural world. The students make a connection between observations and collecting evidence. Through observations, the students to develop their own questions. It helps them to evaluate their responses and allows them to clearly communicate and support their answers with evidence (Spencer, T. L., & Walker, T. M., 2009).

One of the components of Inquiry-Based Instructional Strategies is the Five E instructional model. The model progresses through five phases that begin with the letter "E". This model helps students to be more motivated and to become independent learners. The 5E instructional model is: **engage, explore, explain, elaborate, and evaluate**. The first phase is to **engage**. The teacher's role is to motivate student's interest in the subject. How do you get students to engage? Students will use their prior knowledge and past experience to make a connection with what they will be learning about. In this phase, the teacher could ask an intriguing question and present a problem, show an event or photo. Students are encouraged to ask a variety of questions during this phase. Students will present questions to engage and to initiate his or her own learning as well as to seek more information. Example of questions that students could ask:

Why did this happen?

What can I find out about this?

How can this problem be solved?

How does this work? Why?

Spencer and Walker recommends for teachers to find activities that help students engage and stimulate their thinking (Spencer, T. L., & Walker, T. M., 2009). They recommend that teachers utilize some of these activities as students are learning. Activities for teachers include:

- Teacher Demonstration / Model
- Free Writing Brainstorming
- Using a KWL chart (Know already-Want to know-Want to learn)
- Analyzing a graphic organizer
- A short reading from a journal or piece of literature – Literature text using books from Random House book and *Racing the Sun*.
- Watching a short video – Youtube.com

After teachers have the students become engaged, they move to the **explore** phase. The recommendation is to have the teacher's role to facilitate or coach students by involving students in activities where students begin to think, problem solve, or investigate. The teacher asks questions, observes, and listens to student interactions. Explore phase will promote students to develop an understanding of a science concept, skill, or process. This phase can have students form hypotheses, test their predictions, record observations, and discuss in groups or with the teacher.

The activities to help student explore include:

- Performing an investigation- activities performed physically
- Reading resources to collect information – recording of cause and effects
- Problem solving - solution
- Constructing a model – Model of their body

The next phase is **explain** stage. The teacher is in the explain stage. She or he will present the scientific concept, process, or skill. The explanation is based on the activities presented in the engagement and exploration experiences. The students makes the connection based on their prior knowledge and their observations. Some of the student's question maybe answered during this phase. Examples of teacher explanation activities may include:

- Structured Questioning - hypothesis
- Reading and discussion – from the literary text or informational text.
- Student analysis and explanation – graphic organizer
- Supporting ideas with evidence
- Thinking skill activities: compare, classify, error analysis

In the **elaborate** phase, the students are now involved in activities that have them to apply, extend, or elaborate that they want to explore searching for answers. Students are interested and want to know more so they begin to questions their findings, such as: “What happens if...” “Can I find a way to ..?” During this phase, students should correctly use vocabulary, definitions, and explanations. At the phase, the activities planned by the teacher should help students elaborate and apply learning to real-world situations. Some of these activities should include:

- Problem solving

- Decision making
- Experimental inquiry
- Thinking skills activities: compare, classify, apply

The last phase of the 5E is **evaluate**. This phase involve students to work with each other. They check for understanding and expect each other to ask and/or answer questions. They need to prove their answers with evidence through what they observed or findings. The teacher then can evaluate students through activities that assess student performance and/or understandings of concepts, skills, and processes. The assessment activities include:

- Using a scoring tool or rubric
- Using a performance assessment – activity performance
- Producing a product – Body model

For this unit, student will need to know the process. How does one thing a person consumes effect another thing? Each step of the scientific process has a purpose. It begins with a question of what we want to know. What the learner wants to know? In this unit, the students would want to know how and what we eat affects our body. What are the types of food goes in our body. There are good and bad food. Students will use their own prior knowledge and come up with a list of what they eat at home. They will be involved in researching and learning through science academic vocabulary words in English and Navajo. Another question they will be experimenting with is the ability to move things, or the ability to be active. How does being active effect our bodies, mentally and physically? Through the scientific process or method, students learn to take steps to find an answer for their questions. Sometimes, the answer is surprising or it is not the outcome they expected. As a result, they would redo the experiment using a different approach of the 5E model. This process helps students to seek answers. It is a life learning skill to have because in our daily life, we tend to have choices. Each choices provides us with an outcome. The outcome may not be what we expected but in turn we would then take another route to see what that outcomes is.

Physics interacts with chemistry and biology. Our body is able to apply all three at the same time (Max, P. 2019). They rely on each other or they are interdependent on each other. Although physics is also used to describe the physical universe around us, it is also within our own body. Physics outside our body is characterized by how the universe and the objects behave through energy and force. This is true within our own body. How the energy from the food we consume is used as energy. The types of food one consumes has reaction within its own body. Physics is the science concerned with the discovery and characterization of the universal laws which govern matter, movement and forces, and space and time, and other features of the natural world. If one sees an object such as a huge heavy rock, a person may push it with as much force as he can, but it may not move due to not enough force to the rock. So one may question how to move the huge rock. He will then begin to test by experimenting ways to move it such as using several people, a tractor, pull it with a chain until it is able to move. Children often wonder how to do a job such as sweep, pick up an object. Some of the children stop at one try, then they wait for an adult to help. Students have to understand that force has to be applied in order to move an object.

Physics within our own body is just as important as the universal law outside our body. It deals with combination of matter and energy through experiments and tests to conclude to a final answer. We all heard that for a human to be happy or when one wants a blessing through our prayers, we think of being blessed physically, mentally and emotionally. As we think of physically, we think of being healthy. How is that obtained? What kind of activities are good for one to be physically well. An example of physically fit, one might go for a run or jog. The chemistry reaction of the run transforms to physics.

Teaching Strategies

This unit will require active participation through experiments and collaborations. The idea is for students to learn of their body through physics in the Native science by learning about the philosophy of education. How significant the “**Sa’ah Naaghai Bik’eh Hozhoo**” is thought to be a traditional living system that to give harmony and balance in the natural world and universe. Students will read a book titled, *Racing the Sun*, by Paul Bits. As students read the text, they will learn the importance of physically well-being as a part of traditional stories. In addition, students will be exposed to Dr. Suess books, *Oh the Things you can Do that Good for you!* that will also provide them to learn about the physical well-being of individuals. In an addition, another Dr. Suess book, *Inside your Outside!* will be used to implement lesson and activities to help students learn about the human body. There will be different approaches such as pairing students, whole group, use of graphic organizers, science experiment in relations to physics and video viewing.

Questioning and Experimenting

Students will use questioning skills in their assignments. They will be utilizing the scientific methods and process at times to develop questions. Student will use question starters such as who, what, how to ask questions about what they want to learn about or find out. Students will be experimenting through actions for motions and movements to understand physics.

Gradual Release Model (I do, We do, You do Model)

Some of the activities will involve the teacher to demonstrate certain action and movement. The students will also be involved in demonstrating through this model. This model is considered a gradual release from teacher modeling, joint responsibility from teacher and learner, to the responsibility of the learner. Student will then demonstrate independent practice. This strategy has been proven to be effective when delivering a lesson (Fisher, D. & Frey, N., 2013). The model helps student to feel less pressured and provided with modeling and demonstration, they are able to be more engaged.

I Do is a phase where the teacher tells and shows (model) what students need to do and how they do things. This phase is important especially for students who are visual learners. It is the effective and efficient learning process for students to grasp what they should do and be able to do.

We do is next phase of the learning process. This is also an important phase where the teacher is involved with the students by doing things together. The teacher is a support and guides with the students to ensure the learning of the objective is taking place.

You do is the last phase where the students will work independently and demonstrate the work they are assigned without the teacher's help. This phase helps the teacher check for understanding and see if there needs to be a re-teaching.

Graphic Organizer

Graphic organizer is a process for students to construct meaning so they better organize their understanding in visual and mental images. Student learn best by use of graphic organizers (Jiang, X., & Grabe, W. 2007). Graphic Organizer will be used to identify the behavior in a certain text. I will be reading literary text or short stories that will be based on Native science and western science on physics. Using the graphic organizer, students will be identifying the experiments they conduct and chart it. The graphic organizer can be simple that the students can draw picture. Students will be able to use the information from the text and share them with each other. Some of these behaviors can be used to compare and contrast with their findings or experiments as well with others. One of the graphic organizers that will be utilized is the KWL chart at the beginning of the lesson to assess student's prior knowledge on several topics: Food intake, Human Body, and behavior on physical actions. This will direct the teacher know exactly where to begin with learning about the human body.

Cooperative Learning

Students will be involved in group discussions of 4 to 5 students in a group. They will complete a given graphic organizer about their factual findings, or simply discussion. Students will also be involved in *think pair share model* after teacher has read scenario or situation. This strategy forces the students to be accountable and is supportive to their learning. Furthermore, students will learn in whole group settings at times when such as when the teacher will involve students in teaching moment of the character's trait, behavior model, or video viewing. Students will be involved in talking and sharing about a given scenario. They will also be sharing verbally and often use graphic organizer to share and gather their thoughts on paper. This will give the students visual aid to help the other participant to understand. Other activities where students will be involved collaboratively is when they read a passage from a text. Students will do jig-saw activity. Jig-saw activity is where students help each other comprehend a text by reading different parts together and then putting it back together to understand what the text is talking about. This activity elevates pressure on students who do not feel comfortable. It also makes everyone accountable.

Visualization

Students will be exposed to images through picture books and videos from you tube: What is friction? What is Force? What and how does the human body function? In addition, students will be viewing images from the text. Students will be engaged in reading picture books from Dr. Suess series. The book has lots of visual and information to show the students the parts of a body and its functions. Visual- aid helps students see the picture much more clearly so they can better understand what the topic is about. They can make the connection as teachers provide visual aid, especially students that are English Language learners. It has been researched that students learn best when provided with visual aids (Rasul, S., Bukhsh, Q., & Batool, S.,2011).

Technology in the classroom

Use of Eno board (like a smart board) will be used to show clips of behavior traits. An Eno board is an interactive board that allows students and teachers to engage in the lesson. Use of Eno board will make learning visual for students. The documentary camera will be additional tool to use when showing students how to complete graphic organizers. During the viewing of the clips or short videos, students will discuss the energy, force and movement. Students will also view an interactive activity for students to increase their knowledge about their body, and how physics is interacting with chemistry and biology. They will learn about what physics means through the use of technology. Use of technology provides motivation for students to learn, especially if they have to interact. It makes it more virtual reality as if they are really there.

Vocabulary

Teaching science is not that easy. It is not easy because there a lot of words to learn, especially when it comes to learning about the body. Name body parts and all other words such as force, energy, and matter will take time to learn. So in this unit, students will use a vocabulary book to keep track of all the academic words learned, as well as related words. In addition, there may be some songs played during some activities to reinforce vocabulary words. It is important that student learn the words in order to know what is being taught. Students can also act out certain words to help remember what the word means. As students learn the vocabulary or terminologies, introduction of the lesson should be implemented. For students that are English Language Learner, using TPR (Total Physical Response) is a way for them to gain and retain the words learned. TPR is an approach to have student physically involved to learn the meaning of words. The involvement helps with retention of the activities and words. Learning the science words for this unit will be difficult especially at the third grade level. Fortunately, with many visual aid, repetitious lessons, and activities will help student learn about the goal of the lesson.

Classroom Activities

This unit is designed to be implemented for 10 days of the activities. The unit will be taught for 3 days a week, except for the second week. Second week includes an assessment on the fourth day. Each day, a fifty-minute block will involve students learning about their body, its function and its processes.

Week 1 Day 1-Day 3

Teacher will start by administrating a pre-assessment survey about their human body. A KWL chart will be implemented as an assessment for students for three areas. The KWL can be administered in whole group or as individual assessment. Another assessment will be given that will assess the function of a body. Students will be asked this question: What do you know about your body? Students list the parts of a body, and its function such as; I have an arm to help me carry things. As student list their prior knowledge about their body, teacher will need to focus on how much a student knows about one's body. The assessment can be orally and written. The second part of assessing students is about food. Example questions are as follows: How does

food help my body? Teacher can have the option to send a survey home about how their parents teach about their child's body, the importance of ceremonies, and what time of food they eat at home. What teachings am I getting from home about my physical body? Or what belief do I have about my body? These activities help younger to share without feeling intimidated, such as a multiple choice question about getting the right answer. It provides a safe environment where students do not feel pressured but just to be able to answer what they know. To get a more out of students, a teacher might do this activity individually. There are some students who do shy away from personal questions, and then again, there are some who are willing to share. For older students such as 6th grade on up to high school, this may be better individually. For the first week, teacher is getting to know student's personal response about their body. These activities are at least 30 minutes each day.

Week 2 Day 4-5

The students will make a silhouette of their own body. Once the silhouette is completed, students will begin to label the body parts using their prior knowledge. Teachers need to watch closely for students that tend to mimic other students and copy off other students. This is an indicator to the teacher that the student does not really know a lot about human body. Teacher should be aware of their student so they can work closely with those students. Next, teacher will read a book written by Tish Rabe from the library of *The Cat in The Hat's Learning Library* to the students. The book offers insights about the human body with each part. Teacher will point out body parts in the English language and teach the Navajo names of the body that are labeled and described in the resourceful book from the Ft Defiance Hospital. The diabetes program had composed a helpful book for the Diné book that is resourceful for elders and families. As the teacher is reading the text, students can add more labels as they learn of their body. Teacher can write the body's function on a separate chart. The notes can be a part of the discussion. Both Text by Tish Rabe will be additional information that will be added each time students come across something new. Teacher will read the next book, *Oh the Things you Can Do that is Good for You!* During these reading of this text, teacher again will collect information from the reading. Students are learning of their body.

On the third day of week two, teacher will begin to inform students about the physics part of a human body. With the support of both texts, videos, teacher will now add what our body can do. The students need to understand how one's body functions. Students will conduct some tests to test their hypothesis that supports the movement of energy, forces and motions.

Activity One

Questions: What does our body need to make our body move? How does our body move? What kind of forces are there? Do we have control of our body?

Students will be involved in physical movements such as throwing a ball, walking to running, pushing, or any other physical activity. With each of these movements, notes or journals will be kept to document movements, energy and forces.

Activity Two

Questions: How does our body react to certain food when it comes to physical activities? What kinds of foods are good? What kinds of food are bad? How does food affect our body?

Students will take sample of certain food, such as sweets (cookies, chips, donuts vs healthy food, such as carrots, milk, fruits, and vegetables). As they eat food, a discussion on how much food, what kinds of food will support the body. After each eating, how does the body react, what does the body feel? Records or data will be kept on the hour. Other experiment is food from the cafeteria. Furthermore, some or all students can experiment with unhealthy food such as sweets, fatty food and compare to how they feel when they eat healthy food.

Week 3 Day 7-10

As students have collected data and records, group discussion on how our body works begin. On the first day of the third week, teacher will share information with students or from students from the cultural perspective. A discussion about the model “Navajo Philosophy of Learning” will be shared. Based on the four cardinal directions, the focus will mainly be about the physical perception of running. What does physics mean in the Dine way of life? Teacher will read “Racing the Sun.” The story is told through the Dine cultural perspective of life about being physically fit. Students will take notes discuss in a group share their perception of the book from “Racing the Sun”. Are students able to make connection about their own cultural values that are being instilled by their grandparents or parents?

As students begin to learn of the body and its function, they will be learning about the moral value of their body as well. The last week also involve students to learn about their action when they are in a social setting. They will analyze their reaction with other students, family members and teachers as they use their body to work, play, and survive. They will complete a graphic organizer about how much they have control over their own body to do movements, to work, to be able to do a small or big task. On the other hand, students well also learn that morality and cultural values need to be acknowledge when they live in their society.

Assessment

The assessment for the unit is based on the activities that students are involved in. Students will be involved in physical activities, discussion and conducting experiments with one’s own body. Assessment will be mainly through observation. As a pre-assessment, students will complete the silhouette of themselves and students labeling their body parts is an assessment. This gives the teacher prior knowledge and leads the teacher of how much students will be learning. The KWL charts, surveys and activities will also serve as an assessment for each category that involves students learning of their physical body in connection with the Dine cultural perspective. At the end of each lesson, graphic organizers, observation, and data are collected. In addition, teacher will observe students for the next couple of months to see if students have changed or grown more maturely about themselves. The outcome is for students to learn to be independent and capable of controlling their own body to life a positive lifestyle as well as be able to work without “I can’t do it” attitude.

Alignment with standards

The third grade standards are aligned with unit under the ELA standards, Social Studies Standards and Science Standards and the Dine Standards. The assignments and activities will help prepare students for science assessment in fourth grade as well.

ELA

3.R.RI.08 - The Highly Proficient student can describe complex connections within text, such as cause and effect, comparison, and sequence to help them understand expository texts.

Science

G3.1S.C1.PO2 -I can make a prediction about an investigation.

G3.1S.C2.PO2 - I can create a question, and plan an investigation around it.

G3.2S.C2.PO1 - I can tell how a system works (how components influence one another).

Social Studies

3.SS.H1.01ab - I can identify and explain the cultures, civilization, and innovations in Arizona's history.

Dine Standards

PO 1. I will take care of myself.

PO 1. I will listen and observe cultural teachings.

Student Resources

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