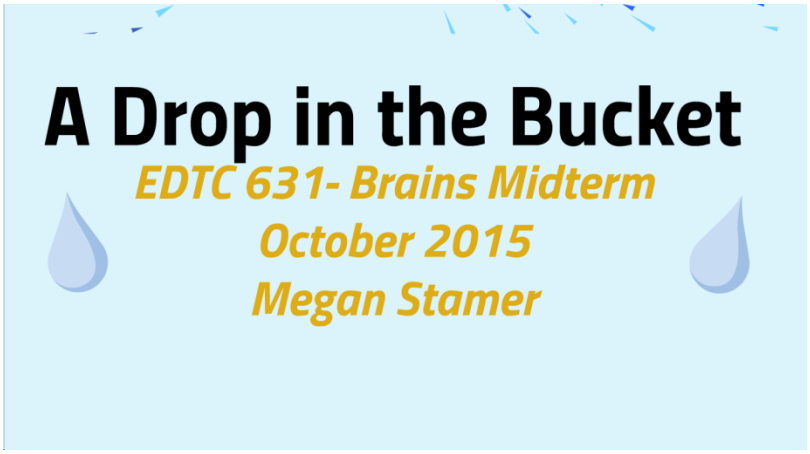
A Drop in the Bucket

EDTC 631- Midterm Project

Megan Stamer
10/16/2015



This upper elementary science lesson is designed to bring conservation ideas into the minds of students in an urban area.

Brains Midterm—Session 7, October 16, 2015
Elementary Science- "A Drop in the Bucket"
Megan Stamer

Rubric:

General Info:

- ✓ Target Audience
- ✓ Goals/Content Objectives
- ✓ Performance Objectives
- ✓ Evaluation/Assessment Techniques

Information/Teaching Strategies:

- ✓ Sense & Meaning
- ✓ Primacy/Recency
- ✓ Learning Styles
- ✓ Multiple Intelligences
- ✓ Why used and examples

Technologies:

- ✓ General Technology
- ✓ Specific Technology…using examples, stating why and how used in lesson
- ✓ Multiple Teaching Technologies…why used and examples

Information/Brain Research:

- ✓ Neurons
- ✓ Sensory Input
- ✓ Cerebral Lobes
- ✓ Limbic System

Presentation Techniques:

- ✓ Good Volume/Clarity
- ✓ Organized
- ✓ Engaging
- ✓ 10 MINUTES!

Prezi Overall:

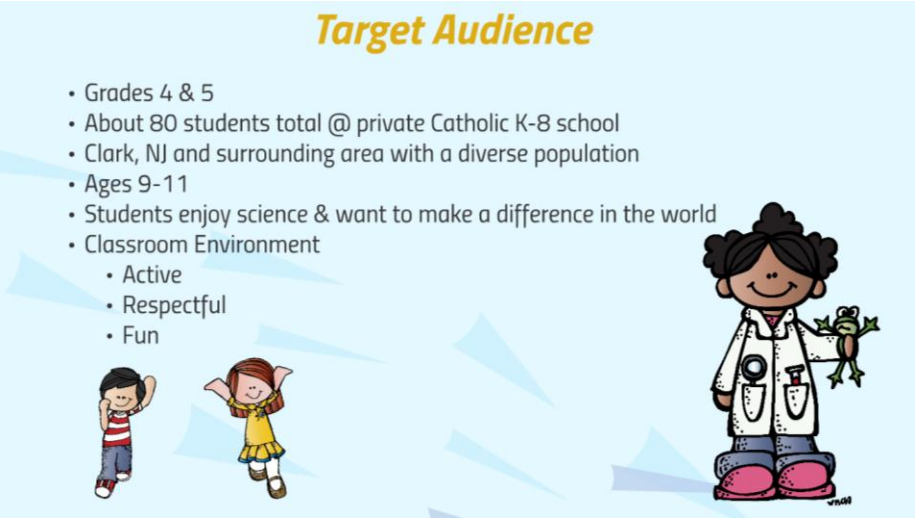
- ✓ Teaching Strategies
- ✓ Technology
- ✓ Brain Research
- ✓ Organization

- ✓ Eye-Friendly
- ✓ Engages Audience

Notes Relate To:

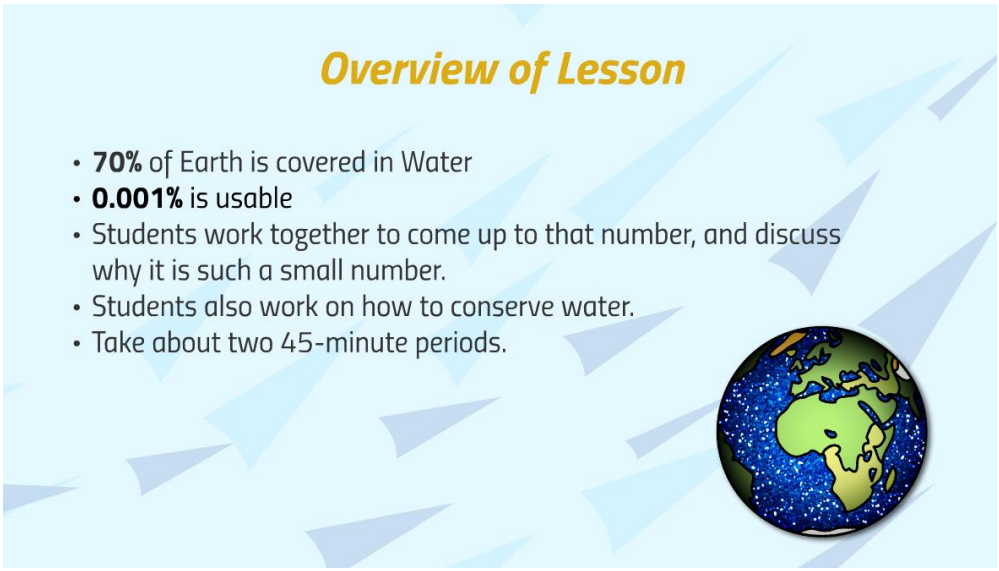
- ✓ Course Content
- ✓ Teaching Strategies
- ✓ Brains Research
- ✓ Contains Formal Citations-APA
- ✓ Examples from Lesson

General Information



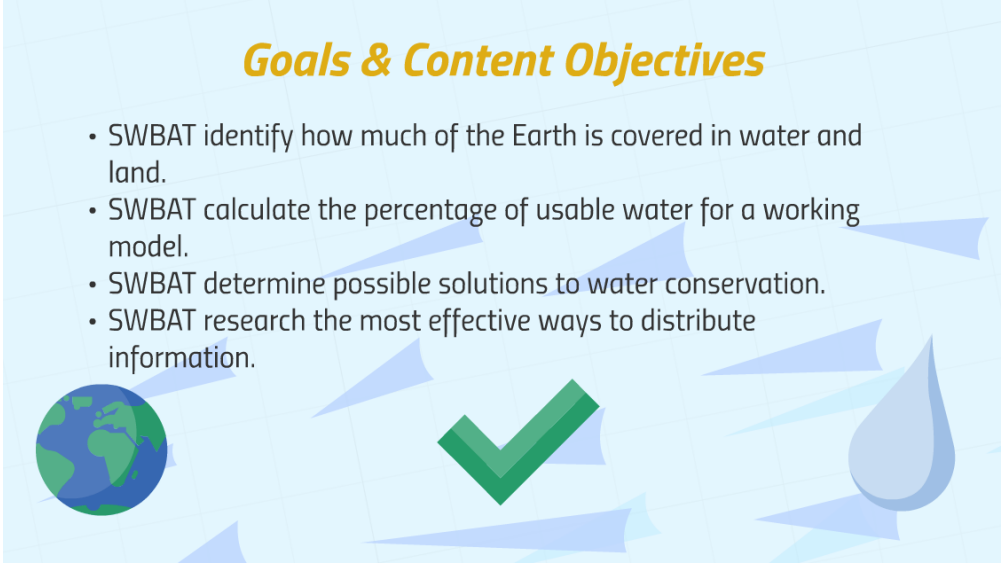
<u>Target Audience</u>:

I teach at St. John the Apostle School in Clark, NJ. I have two classes of fourth grade science and two classes of fifth grade science. These students range in age from 9 years old to 11 years old. Between the four classes, I teach about 80 diverse students. Even though the school is a private Catholic school, there are several students who attend on academic scholarship from lower income areas. All of my students enjoy science, or so they say, and want to make some sort of difference in the world. My classroom environment is active, respectful and fun. We have also spent time in the classroom on various procedures and rules that are used during the year. These are also the years where we learn to be more independent. This environment is conducive to learning because students are able to feel safe and wanted in my room.



Lesson Overview:

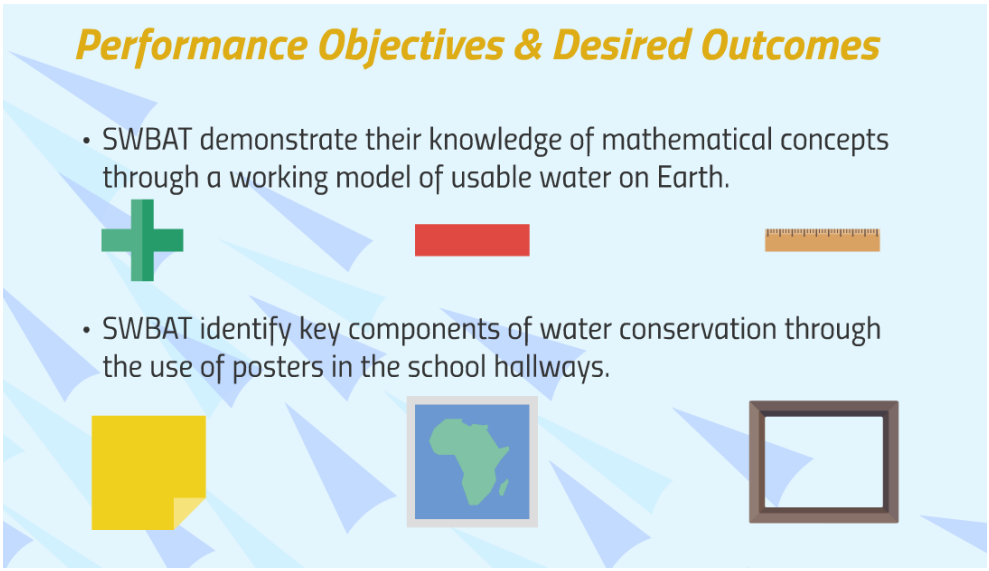
The lesson "A Drop in the Bucket" covers the topics of water conservation and the Earth's surface. Students use an activity called "Blue Planet", which allows students to determine if the Earth is covered more in water or land. Once they have decided that the Earth is covered 70% in water, and then they participate in an activity where they will determine what percentage of the water on Earth is actually usable. Students will use 1000 mL of water to determine their percentages, with guided help from the teacher. After determining that only 0.001% of Earth's water is usable, the students will work together to create small posters helping to promote water conservation techniques.



Goals & Content Objectives:

Upon completion of these lessons, students will be able to:

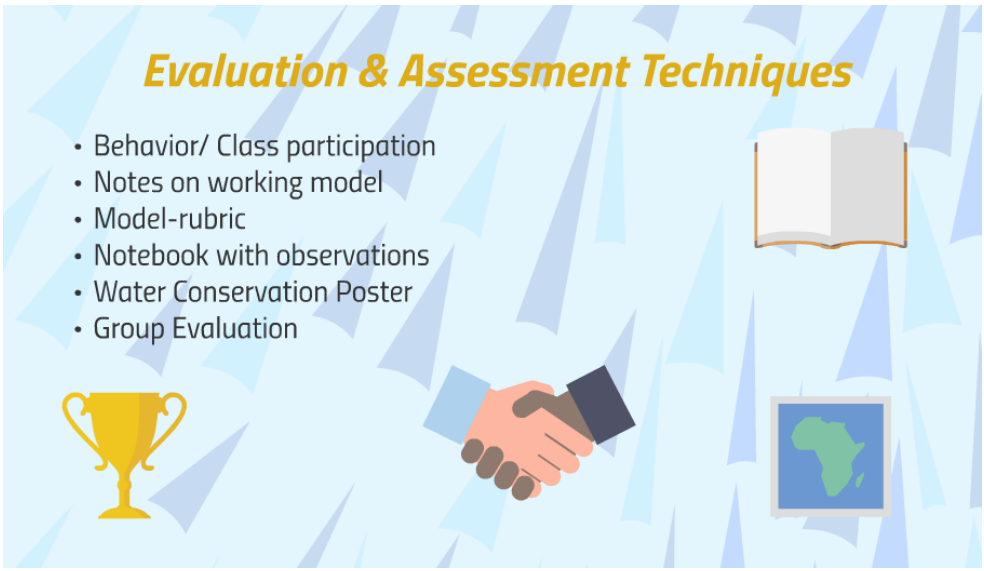
- ✓ Identify how much of the Earth is covered in water and land.
- ✓ Calculate the percentage of usable water for a working model.
- ✓ Determine possible solutions to water conservation.
- ✓ Research the most effective ways to distribute information.



Performance Objectives:

Upon completion of these lessons, students will have successfully:

- ✓ Demonstrated their knowledge of mathematical concepts through a working model of usable water on Earth.
- ✓ Identified key components of water conservation through the use of posters in the school hallways.

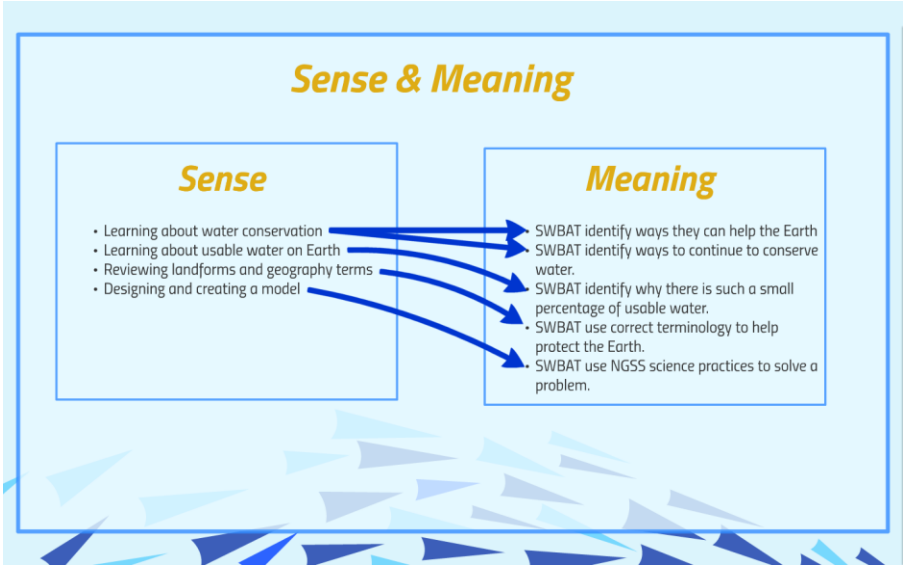


Evaluation & Assessment Techniques:

Students will be evaluated on the following criteria:

- ✓ Positive or negative behavior
- ✓ Ability and confidence to participate in class discussion and activities
- ✓ Student notes on working model and calculations to prove percentages
- ✓ Rubric on grading for working model of usable water
- ✓ Notebook with observations on activities and research on water conservation
- ✓ Rubric on grading for Water Conservation Poster
- ✓ Group Evaluation of activities to help determine participation in lesson

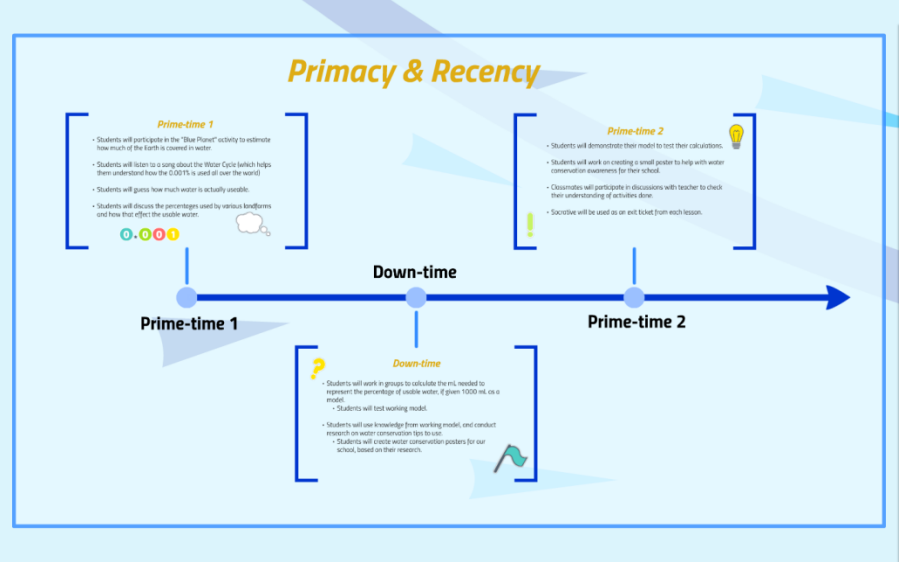
Information/ Teaching Strategies



Sense & Meaning:

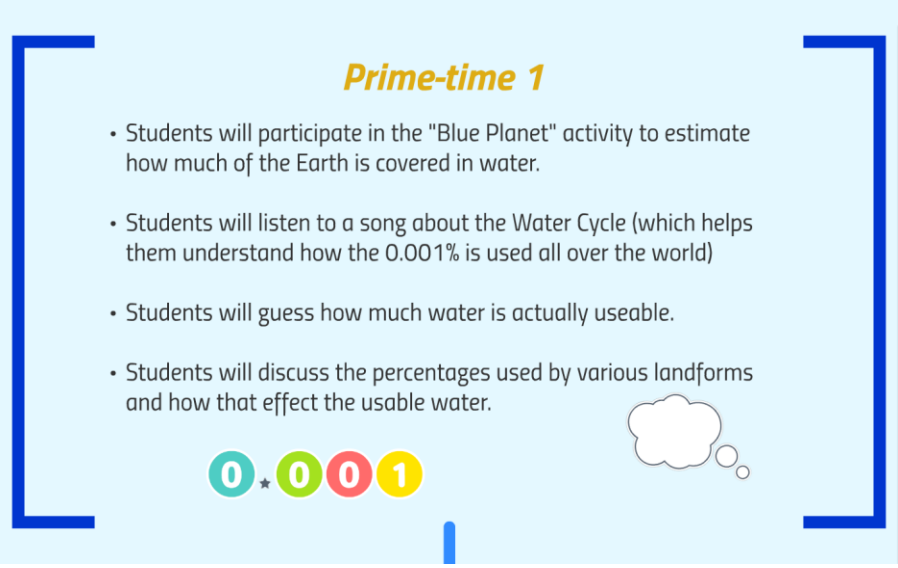
"Meaning is more significant. Of the two criteria, meaning has the greater impact on the probability that information will be stored" (Sousa, 2006). This has helped me place more meaning into what I teach my students during these lessons.

Sense	Meaning
✓ Learning about water conservation	✓ SWBAT identify ways they can help the Earth ✓ SWBAT identify ways to continue to conserve water. ❖ HOW will I make a difference?
✓ Learning about usable water on Earth	✓ SWBAT identify why there is such a small percentage of usable water. ❖ WHY is the usable percentage so long? ❖ HOW can that change?
✓ Reviewing landforms and geography terms	✓ SWBAT use correct terminology to help protect the Earth. ❖ AM I using the correct terminology to communicate effectively?
✓ Designing and creating a model	✓ SWBAT use NGSS science practices to solve a problem. ❖ HOW can I better solve this problem?



Primacy/Recency:

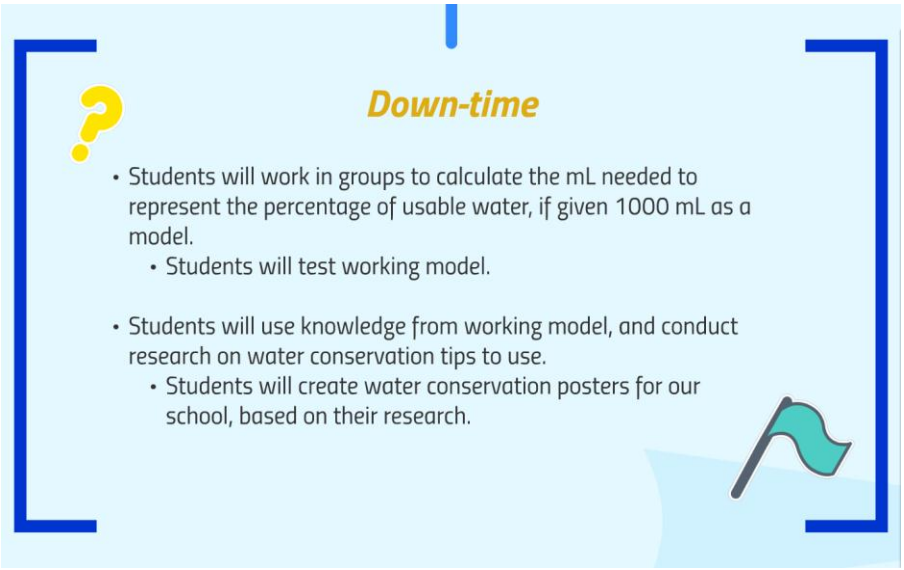
David Sousa says in his book that "during a learning episode, we remember best that which comes first, second best that which comes last, and least that which comes just past the middle" (Sousa, 2006). This is paramount in the planning of these lessons. I try to make all of my lessons engaging, but I understand that the prime times to teach my information are at the beginning and end of my lessons.



Prime-time 1

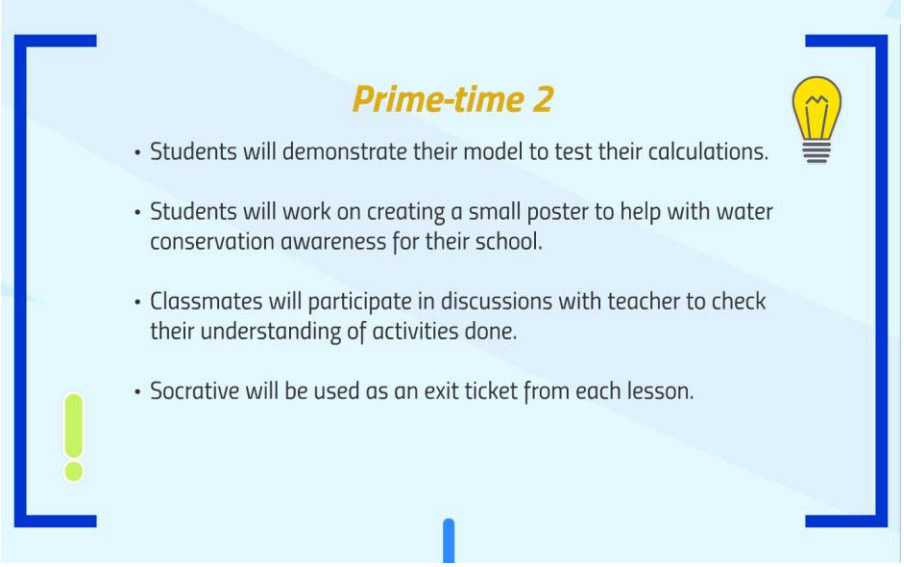
Students always enter the classroom, find their seat, and prepare for day. Since we are a Catholic school, classes are supposed to start with a prayer, and my students are always excited to volunteer to lead the prayer. Once we have begun class, I begin utilizing their

sensory input and neuron connections to help the content store in their long term memory. For these lessons during Prime-time 1, there are several different activities that are done during the first 20 minutes, or so, of class. ***One of the prime-time 1 activities is called Blue Planet.*** This includes all students to participate in determining how much of the Earth is actually covered in water. Students toss a blown up Earth "beach ball" to each other and record how many times their left thumb lands on water or land. After a set number of tosses, the students will determine the percentage of land "catches" versus the percentage of water "catches". Hopefully this will help show the students that there is more water than land on Earth. ***Another activity that occurs during prime-time 1 is listening to Mr. Parr's Water Cycle song.*** This can be done on each day of this "lesson". ***The third prime-time 1 activity is estimating how much water is actually usable***—how many squares out of 100. ***The final activity is determining, through the use of estimation, how many mL will represent a specific percentage of water used by landforms, people, etc. This also leads into a discussion on how this affects usable water.***



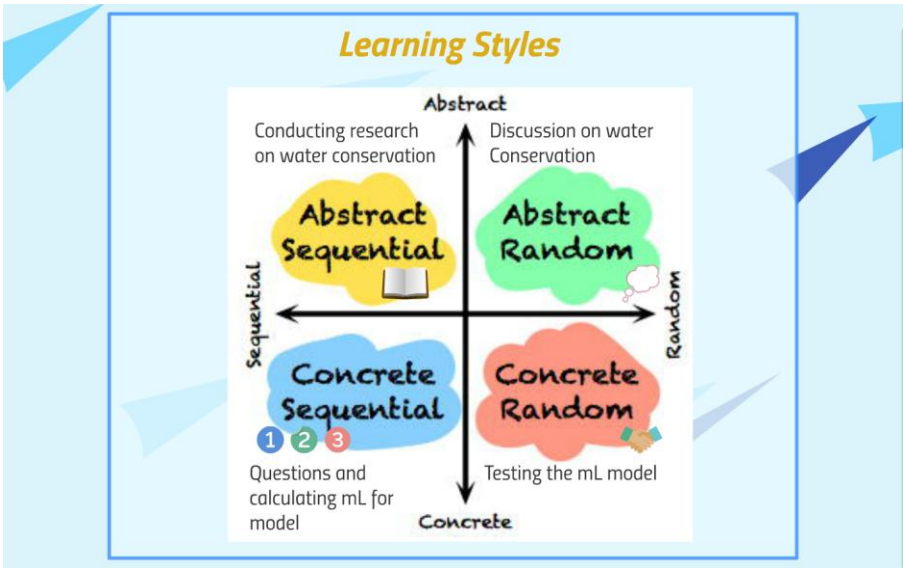
Down-Time

Sousa also says that "This (down-time) is not a time when no retention takes place, but a time when it is most difficult for retention to occur." During down-time, I try to make sure the students are practicing the information learned during prime-time 1, and applying the information to new situations. There are several activities that will occur during the down-time section, which will last about 15 minutes or so. ***One activity would be to calculate the exact mL needed to represent the given percentage of water divided into its various areas on Earth.*** Once the calculations have been created, students will then test out their calculations to create a working model. ***The second activity would be to use the knowledge from the working model, and conversations from class, to create water conservation posters.*** These posters will also include research conducted during the class.



Prime-time 2

During the last few minutes of class, anywhere between 5-10 minutes, prime-time 2 occurs. This is when I as the teacher will review the day's activities and objectives. ***Some activities done during this section would be demonstrating the working Earth's water model, presenting their water conservation posters, participating in a discussion about the activities***, and ***completing exit tickets***. This time is also a good time to discuss any upcoming classroom activities.



Learning Styles:

Teaching to various types of learners is very important when creating effective lessons and units. Using several models, such as Gregorc's Style Delineator, I am able to determine which activities will better reach the four types of learners that he has determined (Gregorc, 1985).

Concrete Sequential Learners:

- ✓ I demonstrate the process of calculating the mL for the working model, step by step for these students so that they can follow along.
- ✓ They will have a hard time thinking abstractly about the water conservation poster assignment and how we can all make a difference.

Abstract Sequential Learners:

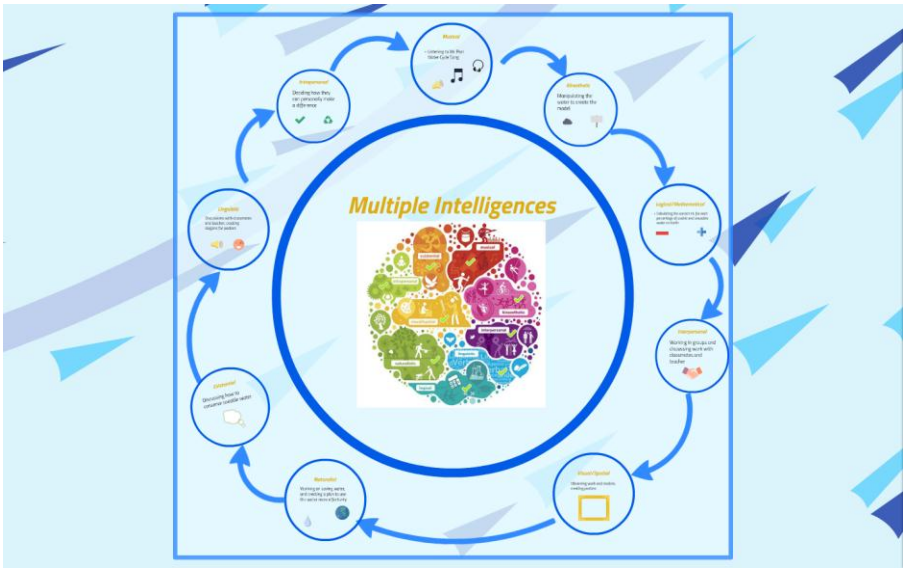
- ✓ Those who learn best by watching will have a good experience watching the demonstration of the working model, and by viewing examples.
- ✓ These students like to have ample time for working, and will get frustrated in the time is not enough.

Concrete Random Learners:

- ✓ Those who do better by having a flexible schedule will enjoy being able to move on to a task, as it gets completed. Students are allowed to complete the posters and research at home, as well as during recess time, if needed.
- ✓ These students are also those who will not want to re-do an assignment, or will have a hard time redoing it, once it is completed.

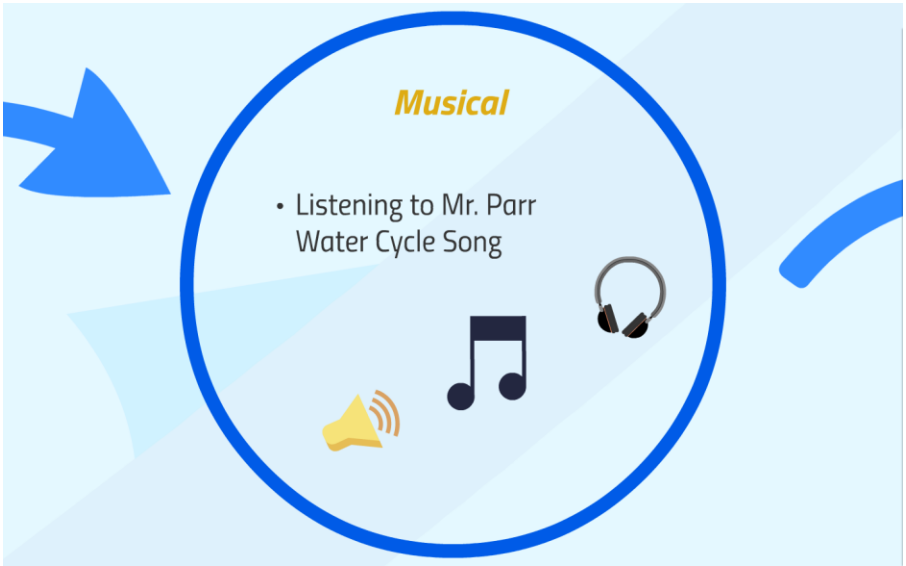
Abstract Random Learners:

- ✓ In my class, there are a lot of students who enjoy discussing and contributing to our conversations. Class participation is always factored into my grading so that students who are successful in this area can be rewarded.
- ✓ These students, however, do struggle with working alone and working within a specific time constraint.



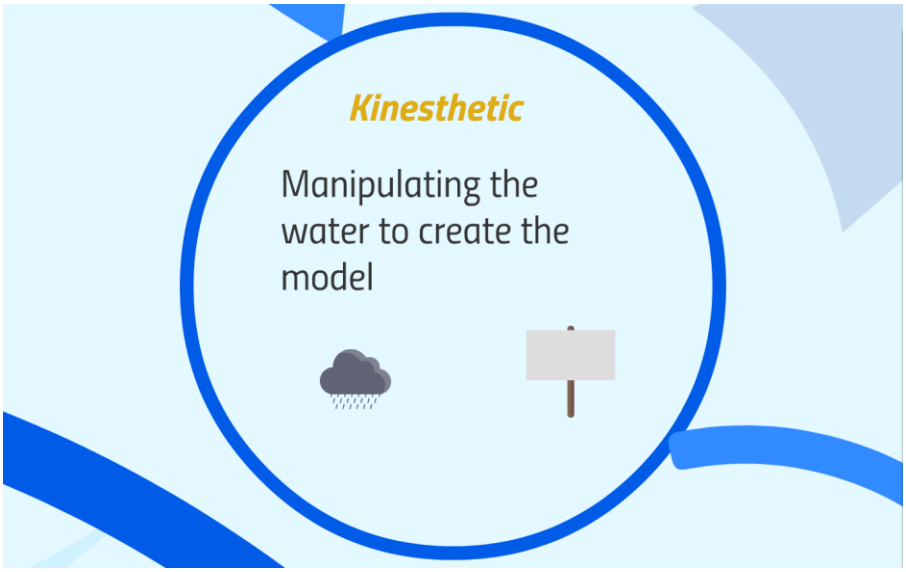
Multiple Intelligences:

Howard Gardner developed the idea of multiple intelligences back in 1983 (Gardner, 1983). I firmly believe that all educators can easily address many of these multiple intelligences within one lesson. These intelligences help students learn better. **These are how the intelligences are used during my lessons:**



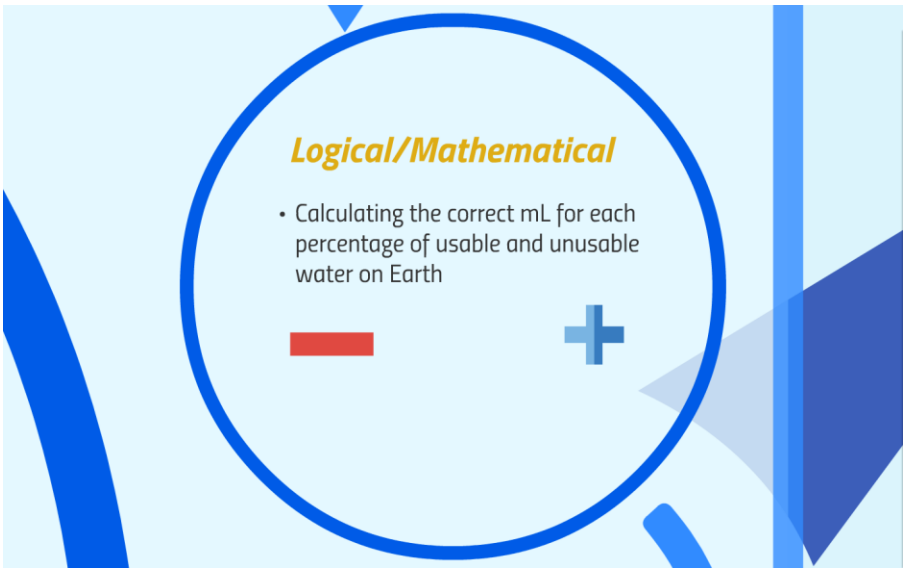
Musical Intelligence:

- ✓ Those that are "music smart" learn best through sounds, including listening and making sounds such as songs, rhythms, patterns and more.
- ✓ During these lessons, listening to music—like Mr. Parr's Water Cycle song—help the students to understand the importance of water.



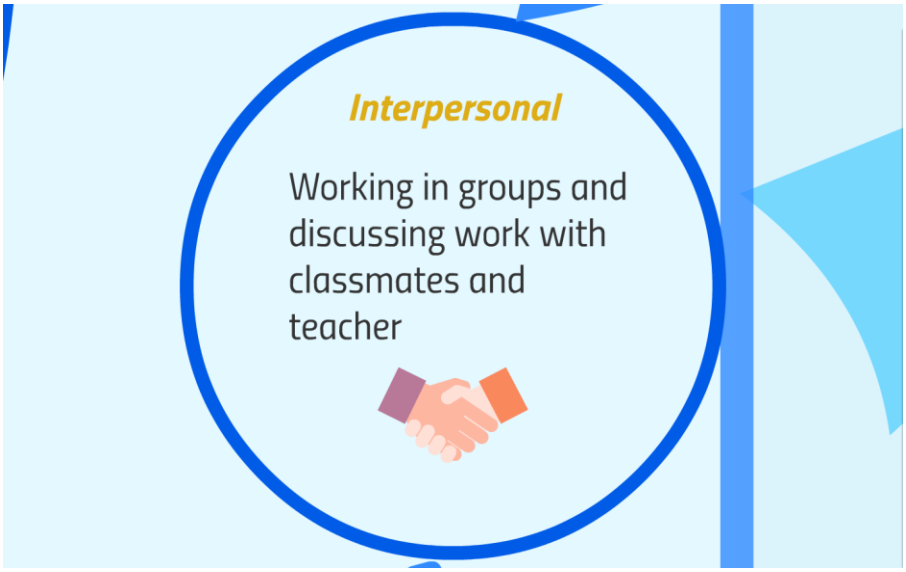
Kinesthetic Intelligence:

- ✓ Those that are "body smart" learn best through physical activity, such as dance, hands on tasks, constructing models and any kind of movement.
- ✓ Students will enjoy manipulating the water to create the model, and actively creating a poster for water conservation.



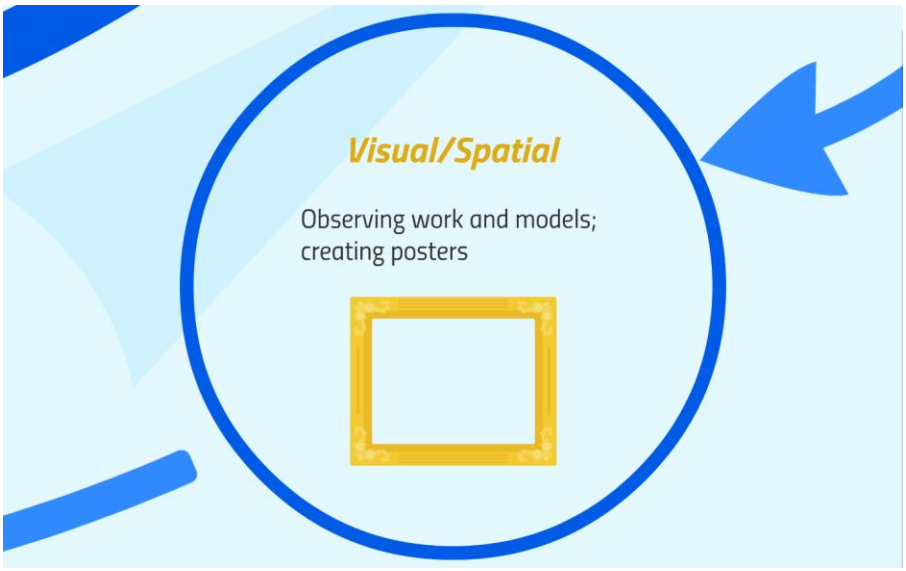
Logical/Mathematical Intelligence:

- ✓ Those that are "number smart" learn best through numbers, reasoning and problem solving.
- ✓ Students will enjoy calculating the correct mL for usable water on Earth.



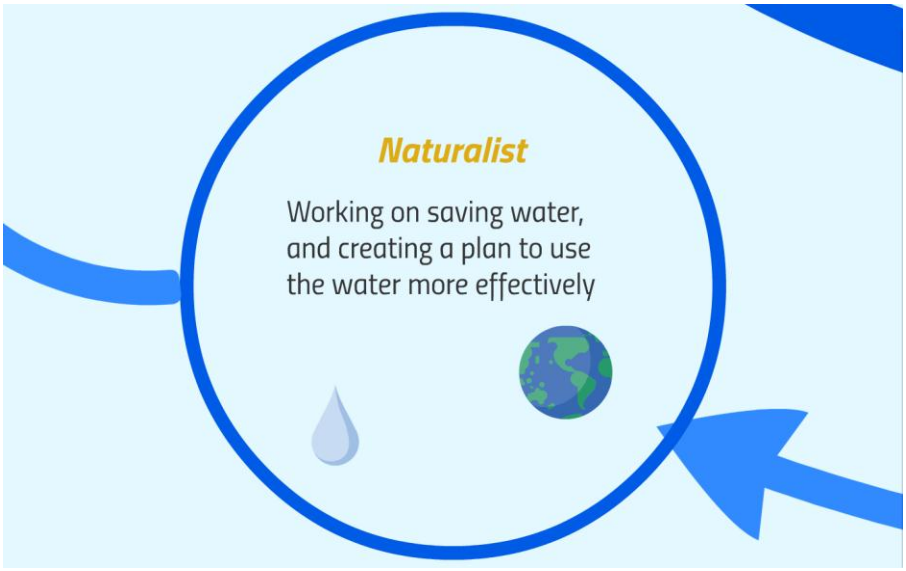
Interpersonal Intelligence:

- ✓ Those that are "social smart" learn best through interaction with other people through discussions, cooperative work, or social activities.
- ✓ These students will love to work in groups, and discuss their work with peers and the teacher.



Visual/Spatial Intelligence:

- ✓ These "picture smart" people learn best visually and ten to organize their thinking spatially.
- ✓ Students who prefer this intelligence will enjoy creating the posters for water conservation, and creating concept maps to help them organize their thoughts.



Naturalist Intelligence:

- ✓ The "nature smart" people learn best through interactions with the environment including outdoor activities, field trips and involvement with plants and animals.
- ✓ Students who identify with this intelligence will enjoy working with water, and creating a plan to help them conserve the little usable water on Earth.

Existential Intelligence:

- ✓ These "wondering smart" students learn best through seeing the big picture of life by asking questions about the world.
- ✓ They will enjoy discussing the conservation techniques with their peers and teacher.

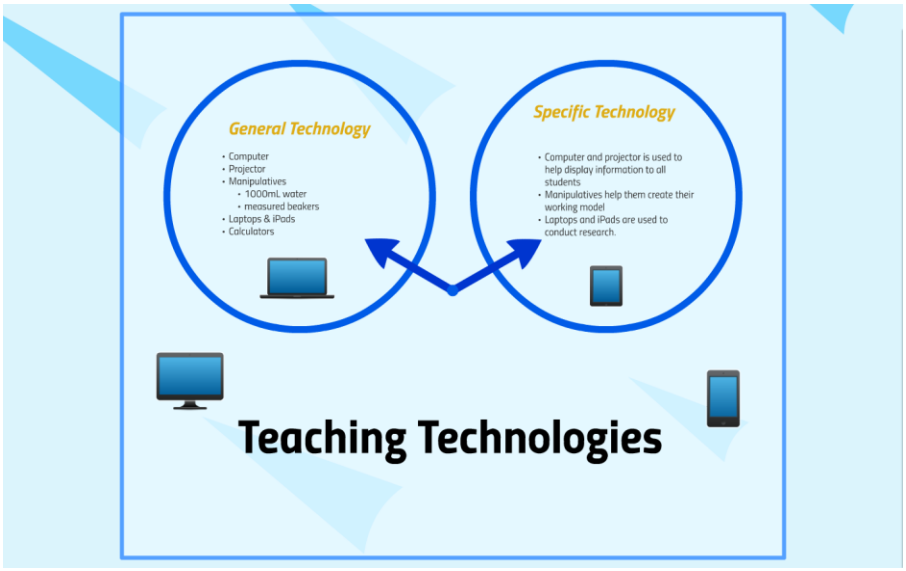
Linguistic Intelligence:

- ✓ Those who are "word smart" learn best by using language including speaking, writing, reading and listening.
- ✓ These students would enjoy all written work, listening to their peers and classmates and any discussions with their group.

Intrapersonal Intelligence:

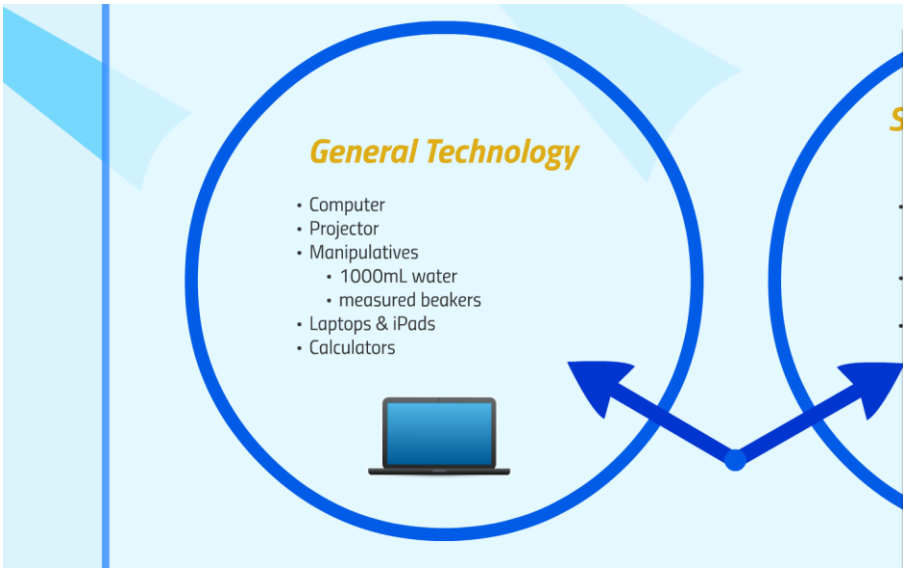
- ✓ These "self-smart" people learn best through metacognitive practices such as getting in touch with their feelings and self-motivation.
- ✓ They will especially enjoy deciding how THEY can help make the world a better place through water conservation.

Technologies



Multiple Teaching Technologies:

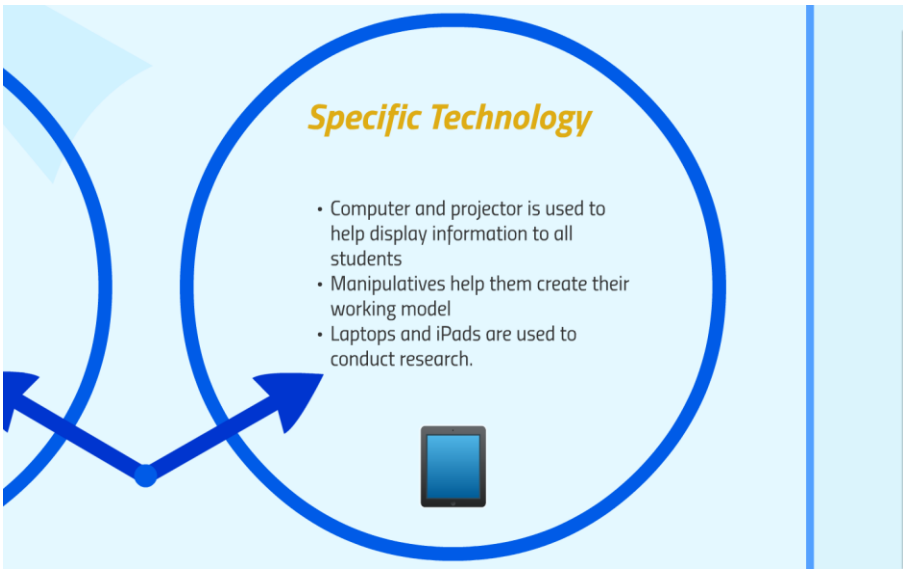
Technology has seemed to be a buzz word in education lately. I use specific and general technologies to help motivate and enhance my students' learning. I use multiple technologies to help accomplish this goal.



General Technology:

In general terms, I use a computer and projector as one of the main technology components. At times, I can and will use laptops and iPads for my students to use in small

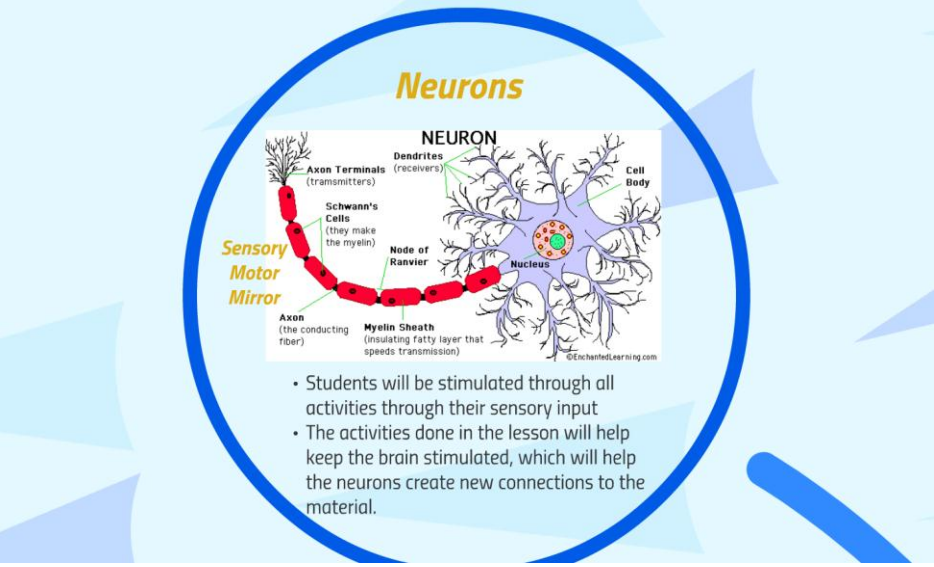
groups. We can also consider calculators, water and scientific tools like beakers a form of technology. These tools are essential in creating the working model of usable water.



Specific Technology:

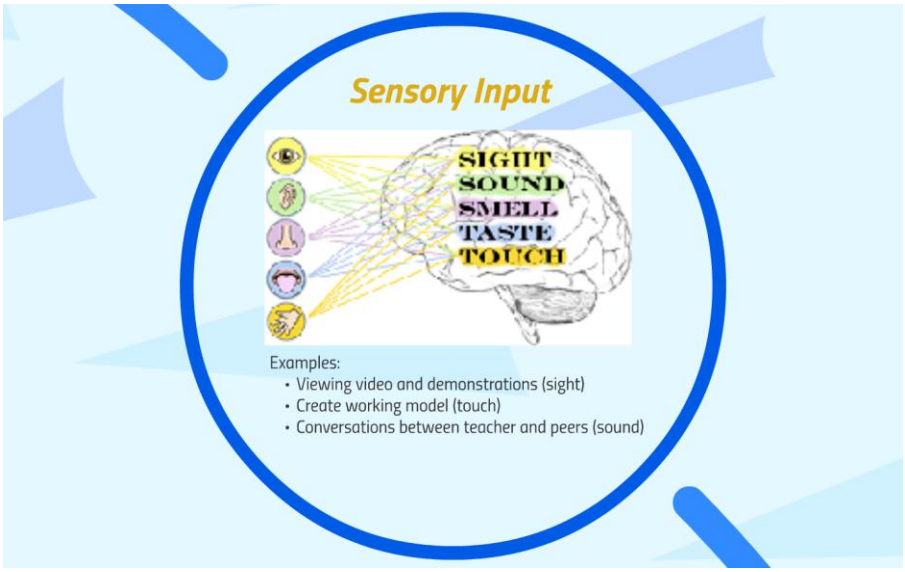
Specific teaching technology refers to how I will utilize the material at my disposal. The computer and projector are used to display information, notes, instructions and more. It is also used to show the Mr. Parr video. The laptops and iPads are used to create presentations and conduct research on water conservation. The manipulatives are used to create the working model of useable water.

Information on Brain Research



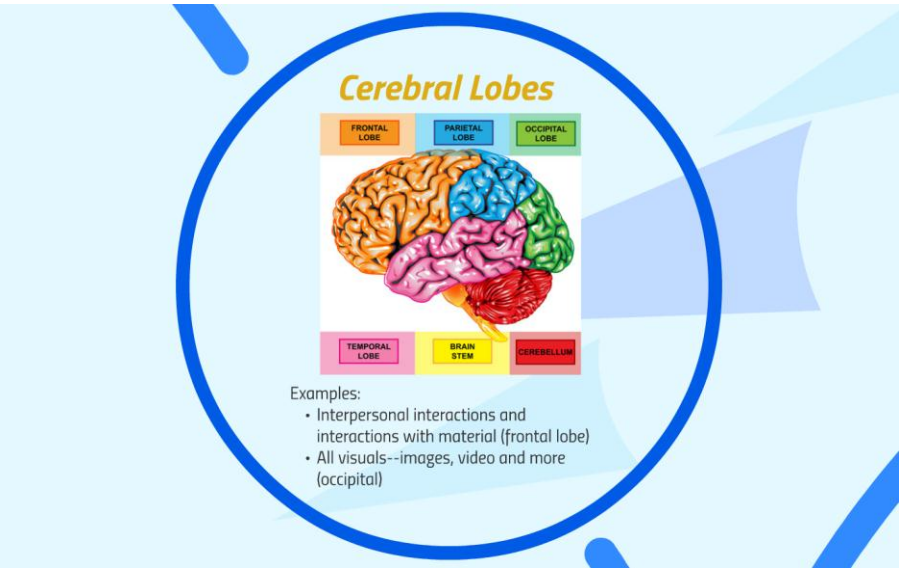
Neurons

- ✓ Working neurons will help students experience the lesson through listening, discussing, touching, writing, observing and creating throughout the periods.
- ✓ Neurons transmit signals to help students complete daily tasks.
- ✓ Sensory neurons help the students feel and see the water used for their working model.
- ✓ Motor neurons helps students draw, write, and manipulate the water for their working model.
- ✓ Mirror neurons will be used when I present the information to the students in a passionate and energetic way. Hopefully they will mirror this enthusiasm into their own work.



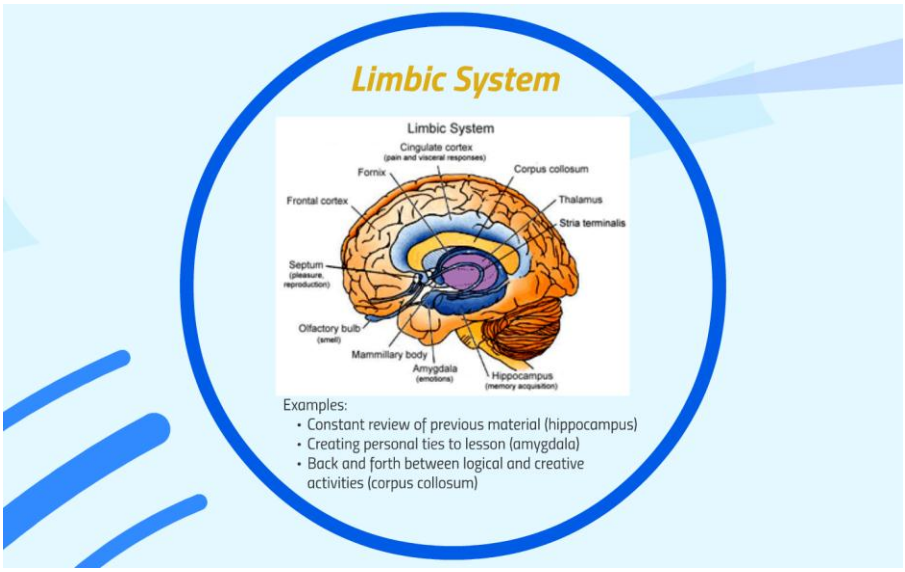
Sensory Input

- ✓ Students will use their sense of sight when they view all presentations, observe other groups' working models, and observe their own work.
- ✓ Students will use their sense of sound when listening to conversations, lectures, and music during the lesson.
- ✓ Students will use their sense of touch when manipulating the water for their model, materials for the posters, and in working with each other.



Cerebral Lobes

- ✓ Students will use their **Frontal Lobe** to plan, think, draw, and compose their posters on water conservation.
- ✓ Students will use their **Temporal Lobe** to speak during class discussions about water conservation. They will also use it listen to the Mr. Parr Water Cycle song.
- ✓ They will use their **Occipital Lobe** to visually process images, information and the model of useable water. This see the information on a smaller and more manageable scale.
- ✓ Students will use their **Parietal Lobe** to touch and feel the water and materials used for their working model and posters.



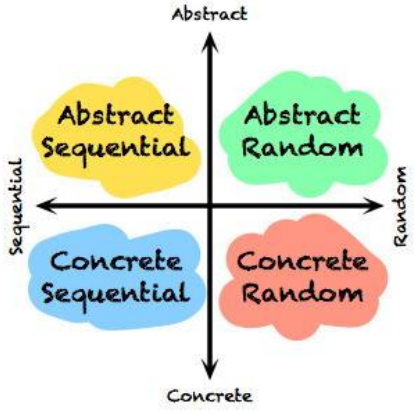
Limbic System

- ✓ **Amygdala-** Students will use the amygdala to store the percentages and other information regarding water conservation in their memory.
- ✓ **Cingulate Gyrus-** Students will use the Cingulate Gyrus when they see the excitement that the teacher shows in the lesson. They will feel challenged when they are asked to calculate percentages and mLs used to create the working model.
- ✓ **Hippocampus-** Students will use their hippocampus to retrieve memory of their previous activities when asked to recall the information.
- ✓ **Hypothalamus-** Students will use their hypothalamus when they display excitement for the lesson. This also is used when the students are proud of their work and projects.
- ✓ **Olfactory Cortex-** Students will use their olfactory cortex to view any presentations with information. This helps receive sensory information when they touch the materials for the working model.
- ✓ **Thalamus-** Students will use the thalamus to help give sensory signals to the brain when they manipulate the water for their working model.

Works Cited

Pictures:

1.



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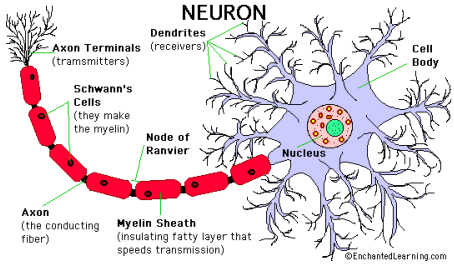

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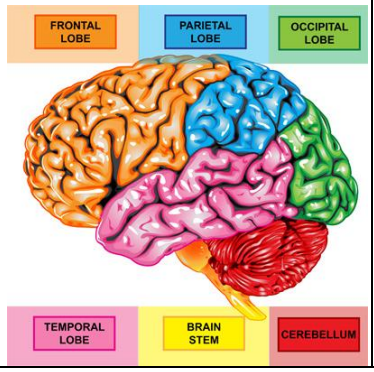

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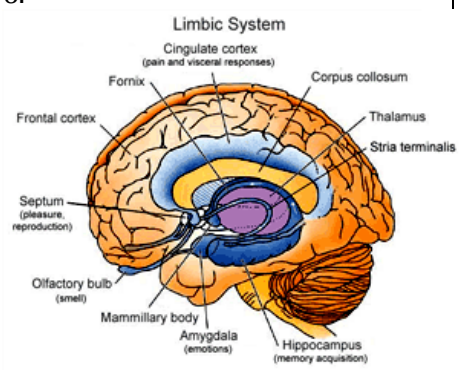

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