**Senses and Perception in Nature**

**(From Perception to Understanding to Empathy)**

**NATURE Sunday Academy 2019-2020**

**Project Description:**

A sense is a physiological capacity organisms use to acquire data for perception. The senses and their operation, classification, and theory are overlapping topics studied by a variety of fields. The stimuli perceived by senses are controlled by a specific sensory nervous system, and a sense organ, or sensor, dedicated to each sense. Humans have a multitude of sensors but Sight (vision), Hearing (audition), Taste (gustation), Smell (olfaction), and Touch (somatosensation), are the five traditionally recognized senses. The ability to detect other stimuli beyond those governed by these broadly recognized senses also exist. These include: Temperature (thermoception), Kinesthetic sense (proprioception), Pain (nociception), Balance (equilibrioception), Vibration (mechanoreception), and various internal stimuli (e.g. the different chemoreceptors for detecting salt and carbon dioxide concentrations in the blood, or sense of hunger and sense of thirst).

Non-human animals may possess senses that are absent in humans and some of these are more advanced. Plants also have a whole set of senses that closely mirror what animals have. These senses help them interact with the environment around them.

Some senses also originate from a complex interaction of two or more sensors to provide a unique perception to our brains. From a sociological angle, the literal use of concepts associated with perception have had a great impact on our ability to communicate, understand, and empathize with other people. In other words, perception leads to understanding, which should eventually create empathy. This flow in the process of information is central to how we interact with our environment, and other people around us.

Today we will be doing some activities tied to the senses and we will demonstrate some of the concepts mentioned.

**Project Objectives:**

**After this lesson, students should be able to:**

* Discuss the 5 traditional senses most living things possess.
* Discuss the nontraditional senses most living things possess.
* Explain how senses work.
* Demonstrate some senses and how it is used by some animals to survive in nature.
* Perform activities to stimulate thought and answer critical thinking questions.

**Session Organization:**

* *11:00-11:15 Cultural connection*
* *11:15-11:25 Introduction to the Senses and Perception*
* *11:25-12:30 S****imple human perception (Rotation through stations)***
  + - *Activity 1A: Touch of Genius*
    - *Activity 1B: I see the light*
    - *Activity 1C: Tasty treats*
    - *Activity 1D: Bells and Whistles*
    - *Activity 1E: Fee-fi-fo-fum, I smell…*
* *12:30-12:50 Lunch*
* *12:50-01:50* ***Complex human perception*** 
  + - *Activity 2A: Flavor test*
    - *Activity 2B: Coke or Pepsi*
    - *Activity 2C: Balance and Direction*
* *01:50-02:50 A****pplied aspects of the senses in our daily lives*** 
  + - *Activity 3A: How the senses have shaped our languages*
    - *Activity 3B: Senses and understanding*
    - *Activity 3C: Empathy (online emotional IQ quiz)*
* *02:55-03:00 Wrap up*

**ND State Science Standards:**

8.2.2. Use evidence to generate descriptions, explanations, predictions, and models

8.2.4. Design and conduct a scientific investigation (e.g., making systematic observations, making accurate measurements, identifying and controlling variables)

9-10.2.6. Design and conduct a guided investigation

9-10.2.8. Analyze data found in tables, charts, and graphs to formulate conclusions

11-12.2.4. Formulate and revise explanations based upon scientific knowledge and experimental data.

**Materials and Equipment:**

* Blindfold (one per group)
* Earplugs (one set per student)
* Respiratory mask (one per student)
* Dark room
* Light sources (such as 4 or 5 flashlights)
* Treats
* Bowls
* Bells and whistles
* Natural and man-made fragrances and scents
* Nose pincers or clamps
* Red Solo cups
* Original Coca Cola and Pepsi Cola products

**The Senses: Traditional, Extrasensory,** **and Non-human**

A sense is "A system that consists of a group of sensory cell types that responds to a specific physical phenomenon, and that corresponds to a particular group of regions within the brain where the signals are received and interpreted." There is no firm agreement as to the number of senses because of differing definitions of what constitutes a sense.

The senses are frequently divided into **exteroceptive** and **interoceptive**:

* Exteroceptive senses are senses that perceive the body's own position, motion, and state, known as proprioceptive senses. External senses include the traditional five: sight, hearing, touch, smell and taste, as well as thermoception (temperature differences) and possibly an additional weak magnetoception (direction). Proprioceptive senses include nociception (pain); equilibrioception (balance); proprioception (a sense of the position and movement of the parts of one's own body).
* Interoceptive senses are senses that perceive sensations in internal organs.

Other senses considered include: Balance and acceleration (equilibrioception), temperature (thermoception), relative positioning or kinesthetic (proprioception), pain (nociception), time, agency, familiarity and many others.

There are other perceived senses which are usually not traditional and involve either a combination of 2 senses (Example: Flavor which is a combination of the taste and smell senses), or those that are generated by the brain and memory (Examples: senses of depth, fullness, hunger and intuition or déjà vu). These are typically not considered senses per se.

Non-human animals may possess senses that are absent in humans, such as electroreception and detection of polarized light. Most animals have advanced senses of smell, taste, sight, touch, echolocation, balance, magnetic alignment, and many other senses they use in nature.

Plants also have a whole set of senses that closely mirror what animals have. Plants sense light, gravity, temperature, humidity, chemical substances, chemical gradients, reorientation, magnetic fields, infections, tissue damage and mechanical pressure. These senses help them interact with the environment around them.

It is possible to lose a sense due to disease, an accident, or deterioration over time. It is also possible to be born without the capacity to use a sense. Some people have the ability to have one sense that is highly developed; some people without the ability to use a sense can compensate by highly developing another sense.

***Simple human perception (Rotation through stations)***

**Activity 1A**

**Touch of genius!**

**Materials needed:**

* Blindfold (one per group)
* Earplugs (one set per student)
* Respiratory mask (one per student)

**Introduction:**

The sense of touch is very important for how living things interact with the outside world. Touch or somatosensation (also called tactition), is a perception resulting from activation of neural receptors, generally in the skin including hair follicles, tongue, throat, and internal skin linings. A variety of pressure receptors respond to variations in pressure (firm, brushing, sustained, etc.). The touch sense of itching caused by insect bites or allergies involves special itch-specific receptors in the skin and spinal cord.

The loss or impairment of the ability to feel anything touched is called ***tactile anesthesia***. Paresthesia is a sensation of tingling, pricking, or numbness of the skin that may result from nerve damage and may be permanent or temporary.

In this experiment students will demonstrate how the tactile sense works and how it helps us familiarize ourselves with our surroundings and objects.

**Procedure:**

1. Students stand in the center of an empty or cleared room, wearing the blindfold, ear plugs and a mask. This eliminates the senses of sight, hearing, and smell.
2. The students will be led into a blocked off room and randomly placed in front of a table with objects spread out.
3. No other movement or sounds should be made by others to give an indication of which objects are found in the room. The room must remain quiet.
4. The student should use their hands to feel the object and eventually determine what it is exactly.
5. The student will be timed and is expected within 30 second to identify as many objects as possible by touch.
6. After the session, they will be led out of the secluded room still blindfolded, plugged and masked.
7. Each student will write down the identity of the objects touched.
8. The students will take turns doing this activity to avoid crowding the room.

**Questions:**

* 1. Was this an easy process?
  2. Do you feel you can use only the sense of touch to navigate in life?

**Activity 1B**

**I See the Light**

**Materials needed:**

* Blindfold
* Dark room
* Light sources (such as 4 or 5 flashlights)

**Introduction:**

Sight or vision is the capability of the eye(s) to focus and detect images of visible light on photoreceptors in the retina of each eye that generates electrical nerve impulses for varying colors, hues, and brightness. There are two types of photoreceptors: rods and cones. Rods are very sensitive to light but do not distinguish colors. Cones distinguish colors but are less sensitive to dim light.

The inability to see is called ***blindness***. Blindness may result from damage to the eyeball, especially to the retina, damage to the optic nerve that connects each eye to the brain, and/or from stroke. Temporary or permanent blindness can be caused by poisons or medications.

People who are blind from degradation or damage to the visual cortex, but still have functional eyes, are actually capable of some level of vision and reaction to visual stimuli but not a conscious perception; this is known as blindsight.

In this activity we will be exploring our ability to detect light waves. Can you detect light even when you are blindfolded or close your eyes? What sensory processes are involved in your ability to see light waves?

**Procedure:**

1. Students stand in the center of an empty or cleared room, wearing the blindfold. This eliminates the senses of sight. The idea is to see how many can detect light waves and what direction it is coming from while blindfolded.
2. The students will be led into the middle of a dark room
3. A number of other students will be randomly placed in this room with light sources prior to the student entering the room. No other movement or sounds should be made by others to give an indication of where the students are found in the room. The room must remain quiet.
4. The students with the light sources will systematically flash their lights for about 10 seconds towards the blindfolded students.
5. The student will be is expected to identify the direction of the flash and if there is light by turning towards the source. The aim is to identify as many sources as possible.
6. After the session, they will be led out of the dark room still blindfolded.
7. They will then record the number of sources and what direction the light came from.

**Questions:**

* 1. Where you able to perceive light through the blindfold?
  2. What does that tell you about the human ability to see?
  3. Do you know of any animals who do not need this sense or have a limited capacity to use it?

**Activity 1C**

**Tasty treats**

**Materials needed:**

* Treats
* Bowls
* Blindfolds

**Introduction:**

The sense of taste is very important for how living things survive. It relies mainly on chemical interaction and is strongly correlated with our perception of like or dislike. Taste or gustation is one of the traditional five senses. It refers to the capability to detect the taste of substances such as food, certain minerals, and poisons, etc.

The sense of taste is often confused with the "sense" of flavor, which is a combination of taste and smell perception.

Flavor depends on odor, texture, and temperature as well as on taste. Humans receive tastes through sensory organs called taste buds, or gustatory calyculi, concentrated on the upper surface of the tongue.

There are five basic tastes: ***sweet, bitter, sour, salty and umami***. There are other tastes but these have yet to receive widespread acceptance. The inability to taste is called ***ageusia***.

In this experiment students will demonstrate how the taste sense works and how it helps us familiarize ourselves with objects we consume.

**Procedure:**

1. Students stand in the center of an empty or cleared room, wearing the blindfold,. This eliminates the senses of sight.
2. The students will be led into a blocked off room and randomly placed in front of a table with several treats spread out.
3. The student should determine the taste of each treat provided to them. Tastes can only be described as sweet, sour, bitter, salty, or umami.
4. If need be, the student will be provided with water to rinse their mouths after every treat eaten.
5. After the session, they will be led out of the secluded room still blindfolded.
6. Each student will write down the possible identity and taste of the treat eaten.
7. Also, students will be asked to make an educated guess of the treat tasted and its color.
8. The students will take turns doing this activity to avoid crowding the room.

**Questions:**

* 1. Was this an easy process?
  2. Do you feel you can use only the sense of taste to determine what is appropriate to eat in life?

**Activity 1D**

**Bells and Whistles**

**Materials needed:**

* Blindfold (one per group)
* Bells and whistles

**Introduction:**

Hearing, or auditory perception, is the ability to perceive sounds by detecting vibrations and changes in the pressure of a medium through time. The ear is the main sensory organ for audition. Sound may be heard through all 3 forms of matter. It is one of the traditional five senses; In humans and other vertebrates, hearing is performed primarily by the auditory system and involves the detection of: mechanical waves which are transduced into nerve impulses that are perceived by the brain’s temporal lobe. Hearing and touch essential have similar mechanisms.

The swimming pool game, Marco Polo, demonstrates our ability to localize sound. With eyes closed we hear “Marco” then swim towards its direction. This ability is only possible with two ears. Although we can hear with just one ear we can’t distinguish the location of its source. A single ear can process the amplitude (loudness) and frequency (pitch) of a sound wave. But, together, both ears detect sound location through minute differences in timing.

Partial or total inability to hear is called ***hearing loss***. There are several different types of hearing loss based on severity: Conductive hearing loss, sensorineural hearing loss and mixed types.

In this experiment students will demonstrate how ears help us move through an obstacle using sounds.

**Procedure:**

1. Students will be put into groups of 3 for this activity. One student will be the blindfolded subject and the other 2 will have to lead the student through a maze course using hand claps, bells and whistles.
2. Each group should strategize on how to achieve this the fastest possible way. It may help to develop a signaling system of when to use the bell, the whistle, or the clap sounds.
3. With the blindfold placed over the eyes prior to entering the course station, the student must navigate through this course with the help of their team mates.
4. Leader placements will vary by team, but the leader should not stand directly in front of the subject.
5. The blindfolded student should follow the direction they think the sound is coming from. Continue this sequence until the student successfully moves through the course.
6. Record the time it takes for each team to complete the course.

**Questions:**

1. Was this an easy process?

2. Do you feel you can use only the sense of hearing to navigate the world around you?

* 1. What do you think are some options for people who cannot hear that are available to them today?

**Activity 1E**

**Fee-fi-fo-fum, I smell…**

**Materials needed:**

* Blindfold (one per group)
* Various natural and man-made fragrances and scents (or objects with distinct fragrances)

**Introduction:**

The sense of smell is also known as olfaction. It has many purposes and plays a major role in our ability to perceive and detect hazards, pheromones, and food. It is one of the senses involved in our perception of flavor. It occurs when odorants bind to specific sites on olfactory receptors located in the nasal cavity. The signals from these receptors are transmitted to the olfactory bulb, where the sensory input interacts with portions of the brain responsible for smell identification, memory, and emotion. Thus emotions are closely tied to our abilities to smell. Some organisms rely on this sense more than others. Pets such as dogs and cats use their sense of smell to create emotional attachments to their owners, In the wild, social structures and belonging to a group is dependent on this sense for many animals.

The inability to smell is known as ***Anosmia***. There are several other olfactory such as: hyperosmia (abnormally acute sense of smell), hyposmia (decreased ability to smell), presbyosmia (decline in the sense of smell with aging), dysosmia (distortion in the sense of smell), parosmia (distortion in the perception of an odor), phantosmia (hallucinated smell), and heterosmia (inability to distinguish odors)

Terminology used to describe smells vary but usually are associated with emotional interpretation of the stimuli. Words such as: soft, strong, weak, hard, gross, putrid, bitter, noxious, sweet, euphoric, etc., are typically used. In this experiment we will test your ability to identify different fragrances and scents from natural and man-made sources.

**Procedure:**

1. This activity needs to be conducted in a well aerated space or room. If possible the use of fans to quickly disperse the scent is encouraged.
2. Students stand in the center of an aerated room, wearing the blindfold to eliminate sight.
3. The students will be led into a blocked off room and randomly placed in front of a table with labelled or numbered fragrances and scents laid out in a patterm.
4. The student should determine and describe the smell of each provided to them using some emotional connection to the smell.
5. If need be, the student will be provided with a fan to clear their nostrils after every whiff.
6. It is important that the fragrance and scents not be sprayed directly or towards the individual. Please use fragrance tester etiquette for this experiment
7. After the session, they will be led out of the room still blindfolded.
8. Each student will write down the possible identity and smell.
9. The students will take turns doing this activity to avoid crowding the room.

**Questions:**

1. Was this an easy process?
2. Do you feel you can use only the sense of smell to navigate the world around you?
3. What do you think are some options for people who cannot hear that are available to them today?

***Complex human perception***

These set of activities look at sensory perceptions that require more than one sense for the brain to form an idea of what it is we are interacting with. More often than not, we confuse these with the simple and traditional senses. Examples of complex perceptions involving a combination of multiple senses include: flavor, balance, hunger, homeostasis, pain, and many others.

**Activity 2A**

**Flavor test**

**Materials needed:**

* Treats and natural food products
* Bowls
* Nose pincers or nose clamps or other forms of clamps to secure the nasal passages.

**Introduction:**

The perception of flavor involves 3 senses. It is an attribute of a substance produced by the senses of smell, taste, and touch and is perceived within the mouth. Flavor depends on odor, texture, and temperature as well as on taste. Odors are detected only when the material is in gaseous disorders of smell greatly affect the ability to detect flavors. The touch sensations relating to flavor are based on the chemical properties of the substance. Reactions induced by chemical properties include coolness (peppermint), bite (mustard and pepper), and the warmth (cloves).When we consume food, the simultaneous stimulation of these senses creates an immediate impression that causes us to accept or reject the food. This has implications on our decision to continue eating it or to reject it. Many foods such as fruits, nuts, milk, and some vegetables have highly acceptable flavors in their natural, uncooked state. Other foods need to derive flavor through cooking, seasoning, flavoring or combinations of these. Preference or avoidance of a particular flavor is a learned behavior. In this experiment students will demonstrate how the limiting one sense can impact our ability to determine flavor.

**Procedure:**

1. This activity will be performed in 2 rounds. It may be helpful to split the class into 2 general groups; one group starting the experiment with clamped noses, and the other with unclamped noses.
2. Students are provided each with a nose clamp. This eliminates the senses of smell.
3. First, the students will be provided with several foods spread out. The student is expected to eat them without clamped noses.
4. The student should determine the flavor of each food provided to them.
5. If need be, the student will be provided with water to rinse their mouths after every food eaten.
6. Then the activity will be repeated, but this time with their noses clamped.
7. Each student will write down the possible differences in the flavor when their noses are clamped and unclamped.

**Questions:**

* 1. Was there any difference between the two trials in your opinion?
  2. Was there a food eaten you did not like? Did your perception of the food change with your nose clamped?
  3. Was there a food eaten you liked? Did your perception of the food change with your nose clamped?

**Activity 2B**

**Coke or Pepsi**

**Materials needed:**

* Blindfold
* Red Solo cups
* Original Coca Cola and Pepsi Cola products

**Introduction:**

The debate is real! There is abundant cognitive research out there trying to determine which product, coca cola or pepsi cola, is better. The market and campaign rivalry between these two beverage products defines the American way in so many contexts. An interesting issue raised is whether the “average” person can actually differentiate between the 2 products if put within a rigorous scientific testing process. It has been suggested that our abilities to distinguish one from the other, is essentially a visual process.

In this activity we will be exploring this possibility. Can you distinguish between the two products? If your visual sense is take away, can you differentiate between these products?

**Procedure:**

1. Students will be expected to wear blindfolds. This eliminates the senses of sight.
2. The students will be handed two nondescript cups labelled A and B, containing either the Coca cola or the Pepsi cola product.
3. Instructors assisting with the experiment should be encouraged to vary which product gets poured into cup A and B.
4. The student will be is expected in 3 drawdowns max from each cup, to identify which cup contains the Pepsi cola and which contains the Coca cola. Water will be provided to rinse between drinks from the cups.
5. They will then record what cup they think contains which product.

**Questions:**

1. Where you able to make a distinction?
2. What distinguishing information were you able to use from the products?
3. Is this an easy process?
4. Which product is better, Coca cola or Pepsi cola?

**Activity 2C**

**Balance and Direction**

**Materials needed:**

* Earplugs
* Blindfolds

**Introduction:**

The perception of balance is very important for how living things survive. It determines to a greater extent our abilities to move and navigate the world around us. It helps prevent humans and animals from falling over when standing or moving. As humans, our evolution to *Homo erectus* is greatly tied to this ability. Balance and direction are typically achieved through a combination of multiple sensory organs, skeletal system, and senses: the eyes, ears, and the body's sense of where it is in space all play an important role. Visual signals sent to the brain about the body's position in relation to its surroundings are processed by the brain and compared to information from the vestibular and skeletal systems.

When the sense of balance is interrupted it causes dizziness, disorientation and nausea. Balance can be upset by many diseases, inner ear infections, by a bad common cold affecting the head, and vertigo. The disturbance can be temporary such as quick or prolonged acceleration, turning in circles like riding on a merry-go-round and being weightless in space. Blows the side of the head or directly to the ear can affect balance as well.

In this experiment students will demonstrate how the sense of balance and direction is affected by movement when we inhibit a sense or two. We will play the popular toddler game of merry-go-round, or turning in circles while blindfolded and/or ear plugged.

**Procedure:**

1. Students stand in the center of an empty or cleared room, wearing a blindfold or ear plugs. This is to eliminate the senses of sight and hearing.
2. The students will be asked to initially spin in around for 45 seconds without the blindfold or ear plug. Then the instructor will ask them to move into a specific cardinal direction.
3. After some recovery time, the same process will be repeated with either a blindfold or an ear plug.
4. **CAUTION: Dizziness and motion sickness is possible and care should be taken not to continue if the student feels sick.**
5. After the session, each student will write down their experiences.
6. The students will take turns doing this activity to avoid crowding the room.

**Questions:**

* 1. Was this an easy process?
  2. What does this tell you about our abilities to move around?

***Applied aspects of the senses in our daily lives***

Beyond the generic and direct use of the concepts of senses to define our perception of the world around us so we can navigate it, there are several applied and colloquial meanings and that can be assigned to these terminologies. Of interest is defining these terms within the framework of understanding different levels of information and cues we get from our surroundings. In this section we will do some activities related to how the concepts of perception and understanding are applied in language structure, degree of comprehension, and as a tool for empathy.

**Activity 3A**

**How the senses have shaped our languages**

**Introduction:**

The use of terminology and phrases related to the implied meaning of the senses is a common theme across languages in the world. Sentences such as:

* *I see what you mean.*
* *You are not listening to me.*
* *I hear you loud and clear*
* *I feel for you in this time of despair.*
* *This business does not smell right.*
* *His words were so touching.*
* *He got a taste of the affluent lifestyle.*
* *You need to establish some balance in your life.*

… Are all instances when we use sensory terminology to communicate specific information to other people. Concepts of the senses are also used to define levels of understanding when presented with specific situations.

The process of understanding is a spectrum. This means we have different levels of understanding. In language application the following is usually true:

|  |  |  |
| --- | --- | --- |
| **Levels of Understanding** | **Sensory association** | **Explanation** |
| **The beginning of understanding** | Taste  Smell | The early stages of information processing or gathering |
| **The middle of understanding** | Touch/feel  Hear/listen | Intermediate. Typically works with situational context |
| **Complete and total understanding** | See/look | Getting the clear picture |

In this activity we will use these sensory associations to define our level of understanding of various scenarios, riddles, and mathematical equations.

**Procedure:**

1. Watch the YouTube video on the use of senses in language.
2. Respond to the following scenarios in column 1 by providing an answer in column 2,
3. Then indicate your level of understanding of the scenario by drawing a picture of the sensory organ associated with your level of understanding.

|  |  |  |
| --- | --- | --- |
| **Scenario** | **Answer** | **Your Level of Understanding (Sensory Association)** |
| *What property is:*  *A + B = B + A* |  |  |
| *I am an odd number. Take away one letter and I become even. What number am I?* |  |  |
| *How many gallons of water does it take to fill up an 800 gallon tank?* |  |  |
| *The names of your mother’s children are Tommy, Timmy, and Tammy. What is the name of the fourth child?* |  |  |
| *How long will it take a car going 80m/h to reach a town 80 miles away?* |  |  |
| *What are the factors of 24? Which of these factors are prime numbers?* |  |  |
| *In the morning I walk on four legs, in the afternoon I walk on two legs, and in the evening I walk on three legs. What am I?* |  |  |
| *In a family of 10 individuals, how many relatives does the seventh kid have?* |  |  |
| *If: A + 5 = C*  *A + B = 15*  *What is A if the above is true for all real numbers?* |  |  |
| *Two fathers and two sons sat down to eat eggs for breakfast. They ate exactly three eggs, each person had an egg. How is this possible?* |  |  |
| *5 + 5 + 5 + 5 = 555; where can you draw one straight line to make this true?* |  |  |
| *3 men go into a hotel. The man behind the desk says a room is $30 so each man pays $10 and goes to the room. A while later the man behind the desk realized the room was only $25 so he sent the bellboy to the 3 guys' room with $5. On the way the bellboy couldn't figure out how to split $5 evenly between 3 men, so he gave each man a $1 and kept the other $2 for himself. This meant that the 3 men each paid $9 for the room, which is a total of $27 add the $2 that the bellboy kept = $29. Where is the other dollar?* |  |  |

**Activity 3B**

**Senses and understanding**

**Introduction:**

The use of sensory terminology to define levels of understanding is a common trait shared by many languages and cultures. Understanding refers to the ability to grasp or be perceptive of our surrounding. Complete understanding is the end goal of perception. There are several ways in which a complete understanding can be expressed. One of these ways is to be able to communicate what we grasp in multiple ways, with clarity, across diverse platforms, to different audiences and people.

In this activity we will test our complete grasp of understanding by identifying in how many ways we can express information we grasp so that multiple audiences can understand what we mean,

**Procedure:**

1. Identify 5 ways you can express the following information.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Expression** | **Expression 1** | **Expression 2** | **Expression 3** | **Expression 4** | **Expression 5** |
| **Three-fourths** |  |  |  |  |  |
| **United States of America** |  |  |  |  |  |
| **Water** |  |  |  |  |  |
| **Native American** |  |  |  |  |  |
| **Mitakuye Oyasin** |  |  |  |  |  |
| **Hello** |  |  |  |  |  |
| **Meegwich** |  |  |  |  |  |

**Activity 3C**

**Empathy (Emotional IQ)**

**Introduction:**

Empathy is the experience of understanding another person's thoughts, feelings, and condition from his or her point of view, rather than from one's own. It is the capacity to understand or feel what another person is experiencing from within their frame of reference, or to place oneself in another's position. Empathy facilitates prosocial or helping behaviors that come from within, rather than being forced, so that people behave in a more compassionate manner. It therefore encompasses a number of emotional states. Compassion and sympathy are terms associated with empathy. Compassion refers to an emotion we feel when others are in need, and it motivates us to help them. Sympathy is a feeling of care and understanding for someone in need.

The absence of empathy is known as ***Alexithymia***. It describes a deficiency in understanding, processing or describing emotions in oneself, as opposed to others.

Several psychological tests have been developed to measure emotional IQ which essentially give the subject an idea of how to be more empathic with others around them. Some of these test rely on facial cues, while others rely on your behavior towards defined scenarios. In this activity, we are going to do one such tests and determine how empathic each of us can be to others.

Follow the link below to take the Emotional IQ quiz:

<https://greatergood.berkeley.edu/quizzes/ei_quiz>

This test was developed by the Greater Good Science Center at the University of California at Berkeley.

If you have some more time, you can also try the Emotional IQ test from the following link:

<https://www.arealme.com/eq/en/>

It is a quick 10 question Emotional Intelligence test that gives a numerical score as a result:

**Wrap-Up & Discussion**

*1. How were the concepts of STEM used in today’s activity?*

*2. What was the most successful idea you used in the activity?*

*3. What did you try in the activity that did not work?*

*4. Why do think it did not work?*