**Saturday Science Teaching – Fall 2018 Lesson Plan**

**Touch on Learning**

**Lesson 1**

**Grade:** K

**A) LEARNING OBJECTIVES and CRITERIA FOR DETERMINING IF OBJECTIVES ARE MET**

**Objectives:**

* Students will be able to use descriptive words to talk about touch.
* Students will be able to use touch to distinguish what objects are.

**Criteria:**

We will be able to tell students have met these objectives when:

* Students share their ideas of what they think is in the mystery box
* Students use descriptive words in charades activity
* Student circle the descriptive words on their worksheets
* When students explain how we used touch in our activities

**B) TEACHER CONTENT KNOWLEDGE (Describe what your teams needs to know**

**regarding the science concepts you’ve identified for each learning objective above)**

All pre-service teachers should have knowledge of the sense of touch beforehand. We will ask the students essential questions throughout the lesson in order to understand their thinking. The student’s answers will act as a guideline to help us determine what to add to or take away from our next lesson.

**KNOWLEDGE BEYOND STUDENTS KNOWLEDGE:**

Understand that:

* Skin is a protective barrier that is composed of multiple layers
	+ Top layer: Epidermis
	+ Second layer: Dermis
	+ Bottom layer: Subcutaneous Tissue
* **Somatosensory System**: Huge network of nerve endings and touch receptors that controls our sense of touch
	+ Responsible for all the sensations we feel such as cold, hot, smooth, bumpy, etc…

**C) MATERIALS (asterisk (\*) = any materials that may be a safety concern)**

- Construction paper

- Markers

- 7 empty tissues boxes

- 1 stuffed animal

- Pencil

- Cooked spaghetti noodles

- 4 jello cups (any flavor)

- Bowl

- 1 bag of pinto beans

- 1 bag of white rice

- Spider man mini action figure

- 1 small bag poms poms

- 4 glass beakers

- 4 thermometers

- Beach ball

**D) REFERENCES (list ALL references that you borrowed ideas from to develop this**

**lesson – including any handouts you may distribute)**

None- all original ideas

**E) TENTATIVE TIMELINE**

|  |
| --- |
| 9:30-9:35- Intro of who we are  |
| 9:35-9:45 Ice breaker (Pass ball, say name and favorite animal) to get to know students and names  |
| 9:45-10:00- Creating cover page for the students 5 senses workbook |
| 10:00-10:20- Activity 1: Charades- have them using touch words, describe object to other group and that group will try and guess their object (objects being used: stuffed animal, pencil) |
| 10:20-10:50-snack and bathroom break  |
| 10:50-11:00- mystery box example with the class  |
| 11:00-11:20- Activity 2 Mystery box stations students will be drawing what they think is inside the box (worksheet)  |
| 11:20-11:30- class discussion on what they drew/ thought was in each box-- then reveal objects to them |
| 11:30-11:45- activity 3: glass temperatures  |
| 11:45-11:55- Question students: How did we use touch in our activities, How can touch help us describe objects?  |
| 11:55-12:00- Elaborate: writing letters on partners back seeing if they can guess what they are drawing  |
| 12:00-12:05- Goodbyes! |

**F) DESCRIPTION OF YOUR LESSON:**

**Following a learning cycle approach explain how:**

**· You will ENGAGE the students into the activities for the day**

We will be ENGAGING students through our charades activity. This will get students excited and into the lesson. The students will be Engaging with objects and using descriptive words to describe them to the other group. The other group will not be allowed to look at the object but instead will have to listen to the group's words and try and guess the object they are describing.

**· The students will EXPLORE the concept through gathering data/investigating/experimenting etc**

Students will EXPLORE the content through the mystery box activity where they will investigate different objects and make predictions. Students will be put into groups and placed at a station with a mystery box. Here, they will have the chance to feel what is inside each box and predict what they feel by drawing a picture.

Students will EXPLORE during the glass temperature activity through experimenting the different temperatures in each glass. From this activity they will be able to see that 3 glasses of water look the same, smell the same, ect. However, when they touch the outside of the glasses and put thermometers in they will be able to see a difference.

**· You will support students in making sense of the concepts through forming EXPLANATIONS**

Students will EXPLAIN when we are talking about the mystery box. After all of the students have had the chance to feel what is in each box there will be a class discussion where we will talk about what lead them to think what is in that box and why they think that, compare their predictions to other students, and then reveal to the class what each object actually is.

Students will come up with EXPLANATIONS when they are allowed to touch the glasses. They will see that only through touch can we tell the difference between 3 things that look the same to the eye and get an explanation for how touch helps us discover things in the world.

**· Students will have an opportunity to ELABORATE on what they’ve learned this week**

Students will ELABORATE on what they learned this week by a fun activity to end the day. We will have the students partner up and take turns drawing letters on each others backs. This will help them elaborate on the fact that touch feels different on different parts of our body.

**G) How will you determine if your students achieve the objectives for this week?**

We will determine if our students are understanding our objectives by asking questions and checking for understanding throughout the day. We have set aside time for discussion to elaborate on what the students have learned throughout the activities. How did we use touch in our activities today?” From students answers they will have to think back on all the activities done for the day and think how the sense of touch helped them/ just how they used touch and elaborate on this when telling us.

**H) PEDAGOGICAL FOCUS: -State the focus for the week (Productive discussions, Science for all etc), -Explain how you are trying to incorporate this into your practice in this week’s lesson**

Productive Discussion:

Throughout the lesson we will have the students partake in multiple discussions. The students will be able to talk about their thoughts and findings in each activity. They will also participate in a whole-class discussion at the end of the lesson by answering our essential questions.

1. **Anticipating**: We are anticipating that the students might have the most difficult time with the temperature glasses so we will be very explicit with this activity to make sure students are understanding what we are having them focus with.
2. **Monitoring**: The students will be doing multiple activities that revolve around the five senses, more specifically the sense of touch.
3. **Selecting**: We will select certain students to share their ideas to the class
4. **Sequencing**: We will observe the groups throughout the activities and select the groups to share their ideas in a certain order.
5. **Connecting**: We will connect the students’ answers and discussions to key ideas from the lesson.

**(Insert any handouts here)**

[*https://docs.google.com/document/d/1zF11ySvPEfd0-qjfTHRKPMkRPu7dOMIflG4-seGS3UA/edit*](https://docs.google.com/document/d/1zF11ySvPEfd0-qjfTHRKPMkRPu7dOMIflG4-seGS3UA/edit)

**Focus Question:** How can we use touch to help us describe objects?

 **Saturday Science Teaching – Fall 2018**

**Sight**

**LESSON #2**

**Grade:** K

1. **LEARNING OBJECTIVES and CRITERIA FOR DETERMINING IF OBJECTIVES ARE MET (minimum of 2/ lesson)**

 **Objectives:**

* Students will be able to define what sinking and floating means.
* Students will be able to determine whether an item is sinking or floating by using their senses, specifically sight.

**Criteria:**

We will be able to tell students have met these objectives when:

* We will know students have met this when they identify where they think the object will be in the water on the worksheet.
* Students explain how we used sight in our activities.
* Students build their boat and see when their boat sinks.

 **B) TEACHER CONTENT KNOWLEDGE**

**On Sinking and Floating:**

* Floating or sinking of an object does not depend on its weight, it depends upon its density. Things denser than water sink in water whereas things having less mass than water float over it.
* An object floats when the weight force on the object is balanced by the upward push of the water on the object. The upwards push of the water increases with the volume of the object that is under water; it is not affected by the depth of the water or the amount of water.
* If the weight force down is larger than the upward push of the water on the object then the object will sink. If the reverse is true then the object will rise – rising is the opposite of sinking.
* Different objects float at different levels in the water because as most regular objects are lowered into the surface of water, the upward push of the water steadily increases until it is in balance with the weight force of the object, and the object then continues floating at this level with the two forces in balance.
* Many objects that are hollow (and so generally contain air) float because the hollow sections increase the volume of the object (and so the upwards push) for very little increase in weight force down. However, it is not necessary for an object to contain air in order to float.
* No object can float without some part of it being below the surface of the water.

**On Vision and Sight:**

* The amount of light that enters the eye is controlled by the circular and radial muscles in the iris, which contract and relax to alter the size of the pupil. The light first passes through a tough protective sheet called the cornea, and then moves into the lens. This adjustable structure bends the light, focusing it down to a point on the retina, at the back of the eye.

 **C) MATERIALS (asterisk (\*) = any materials that may be a safety concern)**

* *Things That Float and Things That Don’t* by David A. Adler

- 1 big bucket (for sinking and floating objects) **MUST BE CLEAR!!!!!**

- 1 Ping pong ball

-1 Golf ball

- 1 Wiffle ball

-1 Feather

- 1 Styrofoam- one for activity, 15 more for students to build with

- 7 Rocks

- 40 Straws

- 40 Pipe Cleaners

- 3 rolls Tape

- 1 roll of Foil

- 40 sheets Construction paper

- 60 Popsicle sticks

- 7 sticks Clay

- A lot of Packing peanuts

- 1 roll Saran-wrap

- 15 Scissors \*\*\*\*

- 400 Pennies (allott)

- A lot of markers

- A lot of crayons

- 15 pencils

- Vegetable oil

- 1 Two liter of Coke

- 2 more large clear containers

**D) REFERENCES (list ALL references that you borrowed ideas from to develop this lesson – including any handouts you may distribute)**

None- all original ideas

**E) TENTATIVE TIMELINE:**

|  |
| --- |
| 9:00-9:30 Color pages  |
| 9:30-9:45 Icebreaker (Say name and something you like. People around the circle trade spots) to remind everyone of names. (Sydney)  |
| 9:45-10:00 Go over rules and expectations, make a list on the board. (Alexis) |
| 10:00-10:20 Look at different objects that are placed at the front of the classroom and have the students decide if they think they will sink or float. Record yes/no answers on the whiteboard. (Alison) |
| 10:20-10:50 Snack and bathroom breakDuring snack break play: Magic School Bus: Season 2 Ep.13 on sinking and floating: <https://www.netflix.com/watch/70286648?trackId=13752289&tctx=0%2C12%2Cfff98d2a-04f6-408c-943c-dde08d6152d0-988503%2C%2C> |
| 10:50-11:20 Activity 1: Build Boats- Students will use different objects such as styrofoam, straws, tape, or foil to create boats. They will then place their boats in a tub of water to see how many pennies their boats will hold before sinking.(Alexis & Alison)Write how many pennies each person's boat held next to their name on the board (alexis) |
| 11:20-11:25 Go noodle break (Sydney):  |
| 11:25-11:40 Activity 2: Rebuild- allow students time to make their boats better/ what will make it hold more pennies before sinking, then test to see if they are correct (Sydney & Molly)Write new number of pennies held by the rebuilding of their boats next to how many their first boat held to compare and contrast. (Alexis) |
| 11:40-11:50 Read aloud and discussion of the book (Alison) |
| 11:50-12:00 Activity 3: Place the same objects in oil and soda and have the students predict if each object will sink or float. (Molly) |

Time fillers: -Gonoodle -I spy game -Eyeball coloring page

**F) DESCRIPTION OF YOUR LESSON:**

**Following a learning cycle approach explain how:**

**You will ENGAGE the students into the activities for the day**

At the beginning of the Engage phase I will write the focus question on the board and read it to the students. By introducing the focus question it will also introduce the topic of the week “sight”. The focus question to be written is “Focus Question: How does our sight help us determine whether an object will sink or float? “ The Engage portion of our lesson also is when we will be showing objects in a circle, giving each student a chance to only see it before guessing if it will sink or float. Their guesses/ predictions of whether each object will sink or float will be recorded on a worksheet, they will just have to put an “X” next to if they think it will sink or float. We will then ask then “Would using any other sense help us determine if they would sink or float?” This activity will also get each student excited about the lesson to come.

**The students will EXPLORE the concept through gathering data/investigating/experimenting etc**

The explore portion of our lesson is when students will be building and rebuilding their boats. This is the explore because students are able to look and experiment with the different material provided and decide what they think will make their boats float compared to other objects. Students will be building a boat independently but will be talking with the other students at their tables to gather ideas on how to construct their boats. Here, the students will be able to build their boats and use their sight to predict and then see how many pennies their boat will hold before sinking to the bottom of the tub of water. To build the boats, students will be able to use foil, styrofoam, straws, tape, and pipe cleaners to build their boats. During this section of the lesson, the teachers will walk around from table to table and ask the students “Why did you choose the materials you did to build your boat?” “Why do you think the material you used are better than other materials?” and “How does the materials you’re using help your boat float?”.

**You will support students in making sense of the concepts through forming EXPLANATIONS**

We will read “Things That Float and Things That Don’t” by David A. Adler. This will help students and explain the concept of sinking and floating and what things sink and what things float. After the book, we will ask students “why they think some things float whereas others sink?” We are hoping they can draw back to the activity and the book to come up with their own explanations.

**Students will have an opportunity to ELABORATE on what they’ve learned this week**

In order to further elaborate our lesson topic we will have the students participate in another activity that highlights using sight to determine whether an object will sink or float**.** In this activity the students will see if the same objects from the previous activity will sink or float in different liquids (other than water). We will put these objects in oil and coke and have the students predict whether they think the objects will have the same results that they did in water. We will explain to the students the differences between water, oil, and coke at the beginning of the activity to see if these differences change their predictions.

**G) How will you determine if your students achieve the objectives for this week?**

We will determine if our students are understanding our objectives by asking questions and checking for understanding throughout the day.We have set aside time for discussion to elaborate on what the students have learned throughout the activities. This set aside time will be after the book we read and also after we pass around objects and talk about if students think they will float or sink and then watch it together and see if they were right or wrong.

 **H) PEDAGOGICAL FOCUS:**

**Explain how you are trying to incorporate this into your practice in this week’s lesson**

**Assessing for Learning:** In order to assess the students for learning we will ask them questions throughout the lesson. For example, during the activity where we have the students decide whether an object will sink or float we will observe how students answer and ask them, “What makes you think that?” “Why will that object sink?” Another way we will assess the students for learning is in the form of a worksheet. During the first activity the students will look at multiple objects and determine whether an object will sink or float. They will fill out their worksheet by checking the sink or float box for each object.

1. **Clarity**: We will make these ideas clear to the class by using everyday language that is clear to them and that they understand. We will also make students who speak quietly speak up and say stuff again so other students in the class can understand their ideas as well, like good scientists do!
2. **Coherence**: We will be able to determine whether students are coherent by asking them questions such as, “Why do you think this object will float?” The students’ answers will help us know if the students are understanding the lesson topic and whether or not we need to be more explicit in our instruction.
3. **Causality**: We will ask the students during the rebuild questions like, “Why do you think your second boat held more pennies?” The students’ ideas creates a link between a cause and an effect.

**(Insert any handouts here):** Worksheet we will email you\* , Coloring pages

**Saturday Science Teaching – Fall 2018**

**Lesson Plan TEMPLATE**

Smell

LESSON # 3

Grade:K

1. **LEARNING OBJECTIVES and CRITERIA FOR DETERMINING IF OBJECTIVES ARE MET (minimum of 2/ lesson)**

**Objectives:**

* Students will be able to be able to know the correct ways to smell
* Students will be able to identify different smells using their nose

 **Criteria:**

* We will know the objective is met when students are using the correct process of walfting the different smells.
* We will know the objective is met by listening to how students describe different smells.

**B) TEACHER CONTENT KNOWLEDGE (Describe what your teams needs to know regarding the science concepts you’ve identified for each learning objective above):**

The sense of smell, just like the sense of taste, is a chemical sense. They are called chemical senses because they detect chemicals in the environment, with the difference being that smell works at dramatically larger distances than that of taste. The process of smelling goes more or less like this:

1. Vaporized odor molecules (chemicals) floating in the air reach the nostrils and dissolve in the mucus (which is on the roof of each nostril).
2. Underneath the mucus, in the olfactory epithelium, specialized receptor cells called olfactory receptor neurons detect the odor. These neurons are capable of detecting thousands of different odors.
3. The olfactory receptor neurons transmit the information to the olfactory bulbs, which are located at the back of the nose.
4. The olfactory bulbs has sensory receptors that are actually part of the brain which send messages directly to:
	* The most primitive brain centers where they influence emotions and memories (limbic system structures), and
	* “Higher” centers where they modify conscious thought (neo-cortex).
5. These brain centers perceive odors and access memories to remind us about people, places, or events associated with these olfactory sensations.
	* The nose allows you to make scents of what's going on in the world around you.
	* Just as your eyes give you information by seeing and your ears help you out by hearing, the nose lets you figure out what's happening by smelling.
	* It does this with help from many parts hidden deep inside your nasal cavity and head.
	* Up on the roof of the nasal cavity (the space behind your nose) is the olfactory epithelium.
	* Olfactory is a fancy word that has to do with smelling.
	* The olfactory epithelium contains special receptors that are sensitive to odor molecules that travel through the air.
	* These receptors are very small — there are about 10 million of them in your nose!
	* There are hundreds of different odor receptors, each with the ability to sense certain odor molecules.
	* Research has shown that an odor can stimulate several different kinds of receptors.
	* The brain interprets the combination of receptors to recognize any one of about 10,000 different smells.

**C) MATERIALS (asterisk (\*) = any materials that may be a safety concern)**

- 30 white pieces of paper

- 20 paint brushes

- 40 sheets thick white construction paper

- 1 bottle cinnamon spice

- 1 bottle brown liquid paint

- 1 bottle vanilla extract

- 1 bottle red liquid paint

- Lavender oil

- 1 bottle purple liquid paint

 - Pepper

- 1 bottle black liquid paint

- Lemon oil or lemon juice

 - 1 bottle yellow liquid paint

- Mint oil

- 1 bottle green liquid paint

- Sunscreen

- 1 bottle white liquid paint

- Cotton candy oil

- 1 bottle blue liquid paint

- Orange scented oil or real orange we can squeeze

-1 bottle orange liquid paint

- 5 glass jars

- 1 can of club soda

- Vinegar

- Bottle of peroxide

- 1 can of sprite

- 20 fun size bags of M&Ms

- Markers

-Crayons

**D) REFERENCES (list ALL references that you borrowed ideas from to develop this lesson – including any handouts you may distribute)**

None- all original ideas

Paints and their scents:

Red- Orange

Orange-Mint

Yellow- Lavender

Brown- Cotton Candy

Green-Lemon

Black- Pepper

Blue- Cinnamon

Purple- Vanilla

White-Sunscreen

**E) TENTATIVE TIMELINE (Keep brief—tables work well for this!)**

|  |
| --- |
| 9:00-9:30 Color pages |
| 9:30-9:45 Ice Breaker with m&m’s- Students will pick a M&M from their bag and have to answer a question about themselves based on the particular color of the M&M they picked.(Alexis) |
| 9:45-10:00 Activity 1: Picture Drawing- Students will draw a picture of the worst smell they have ever smelled and the best smell they have ever smelled. After the students are done drawing their pictures they will have the choice to share the different experiences they drew about. (Sydney) |
| 10:00-10:30 Snack and bathroom breakDuring snack break play: Magic School Bus: Season 4 Ep. 10 <https://www.netflix.com/watch/70286673?trackId=14277283&tctx=0%2C9%2C338ecb59-4c2d-42d9-838c-e92eecd95eee-571775211%2C%2C>  |
| 10:30-11:00 Activity 2: Painting with Smell- Students will paint pictures using the scented colored paints. While they are painting, they will smell the different colors and make predictions on a worksheet about what each scent is. (Molly) |
| 11:00-11:10 Gonoodle Break [**https://app.gonoodle.com/activities/think-like-a-scientist?s=category&t=Science**](https://app.gonoodle.com/activities/think-like-a-scientist?s=category&t=Science) |
| 11:10-11:30 Discussion and change predictions: Teachers will hold a discussion to see what the students predicted the scent was for each color and write predictions on the board. Here, they will be given time to go back and change their predictions on their worksheet. (Alexis) |
| 11:30-11:55 Activity 3: Five Jars- Students will smell five different jars that are each filled with either water, club soda, peroxide, vinegar, and sprite. They will make verbal predictions on what they think is in each jar and the teachers will discuss how your nose helps you smell different scenes. (Allison) |
| 11:55-12:00 Coloring pages while waiting on parents.  |

**F) DESCRIPTION OF YOUR LESSON:**

**Following a learning cycle approach explain how:**

**· You will ENGAGE the students into the activities for the day**

For the first part of our engage, we are going to have a discussion about how we smell, and what objects might have stronger smells than others. This is where we will discuss our focus question which is, “How does smell help us determine what things are?” Then we are going to have the students draw a picture of the worst and best smells that they can remember. We will give them time to think about different smells, and then once they are finished with their pictures we will have them share their responses.

**· The students will EXPLORE the concept through gathering data/investigating/experimenting etc**

The explore portion of our lesson is when the students are painting pictures with different scented colored paints. This is the explore because students are investigating and smelling the different scents of each color and making predictions as to what they think each scent is. All of the colors will have the same scent but each student will be painting their own picture and making their own predictions. Here, the students will use their sense of smell to identify different scents within the paint and explain why they think each scent is what it is. During this section of the lesson, the teachers will walk around from table to table and ask the students “Why do you think that specific color has that scent?” and “How does your nose help you decide the scent of each color?”

**· You will support students in making sense of the concepts through forming EXPLANATIONS**

The explain portion of our lesson will be a class prediction about the different smells from our explore portion of the lesson. We will have each color on the board and let the students talk about what they think the smell is. We will have them come to one prediction and then write it on the board. They will be able to change their prediction on their worksheet if they change their thinking. We will then reveal the smells of each color and have a discussion about what was easier and more difficult to distinguish.

**· Students will have an opportunity to ELABORATE on what they’ve learned this week**

In order to further elaborate our lesson topic we will have the students participate in another activity that highlights using smell to determine what five unknown liquids are. In this activity, the students will have the opportunity to make verbal predictions about what each liquid might be in five different jars. After everyone’s prediction is recorded we will place the five liquid’s bottles out and have the students use their sense of smell in order to match the bottles to the liquids. After we reveal what the correct pairings are, we will have a class discussion on how they used their sense of smell. Lastly, we will have a discussion about using the sense of smell in order to detect danger. For example, if you smell smoke in a building it could be an indication that there is a fire.

**G) How will you determine if your students achieve the objectives for this week?**

We will determine if our students are understanding our objectives by asking questions and checking for understanding throughout the day. We have set aside time for discussion to elaborate on what the students have learned throughout the activities which is after they are done painting with different scents and guessing what they though each one was on the worksheet. We will hold a discussion for them to see what they thought each scent was and why. There will then be time for the reveal of what the actual scent is and if they were right or not if not they will have time to correct their answers.

**H) PEDAGOGICAL FOCUS:**

**-State the focus for the week (Productive discussions, Science for all etc),**

**-Explain how you are trying to incorporate this into your practice in this week’s lesson**

This week we will be focus on three aspects of STEAM; Science, Art, and Math.

**Science**: The students will draw on science aspects of STEAM throughout the entire lesson. They will learn about their sense of smell, as well as using it to identify certain scents. At the beginning of the lesson we will ask the students questions like, “What does our nose help us do?” and “What certain scents smell stronger than others?” in order to gage where the students are at with their understanding of smell.

**Art**: The students will participate in a painting activity where each paint color is a different scent. The students will make predictions on what each color will smell like before they begin and we will record their answers on the board. During the activity the students will smell each color and create a painting.

**Math**:The students will use their math skills to count how many different colors of paint they used in order to complete their painting. Then, as a class, we will go over each scent and have a discussion about how we use our noses to smell.

**(Insert any handouts here)**

Emailed to you!

 **Saturday Science Teaching – Fall 2018**

**Lesson Plan TEMPLATE**

Hearing

Lesson #4

Grade: K

1. **LEARNING OBJECTIVES and CRITERIA FOR DETERMINING IF OBJECTIVES ARE MET (minimum of 2/ lesson)**

 **Objectives:**

* Students will be able to understand why hearing is important but not necessary to our daily lives
* Students will be able to identify different sounds in nature using their ears

**Criteria**

* We will know the objective is met by knowing how people that aren't able to hear live/ notice things
* We will know the objective is met by what the students write on draw on their paper after going outside.

 **B) TEACHER CONTENT KNOWLEDGE (Describe what your teams needs to know regarding the science concepts you’ve identified for each learning objective above)**

**How We Hear:**

* Sound waves travel into the ear canal until they reach the eardrum.
* The eardrum passes the vibrations through the middle ear bones or ossicles into the inner ear.
* The inner ear is shaped like a snail and is also called the cochlea.
* Inside the cochlea, there are thousands of tiny hair cells.
* Hair cells change the vibrations into electrical signals that are sent to the brain through the hearing nerve.
* The brain tells you that you are hearing a sound and what that sound is.
* Each hair cell has a small patch of stereocilia sticking up out of the top it.
* Sound makes the stereocilia rock back and forth.
* If the sound is too loud, the stereocilia can be bent or broken.
* This will cause the hair cell to die and it can no longer send sound signals to the brain.
* In people, once a hair cell dies, it will never grow back.
* The high frequency hair cells are most easily damaged so people with hearing loss from loud sounds often have problems hearing high pitched things like crickets or birds chirping.

**Parts of the ear:**

* Pinna—the outer portion of the external ear: sound travels through the outer ear to the ear canal.
* Auditory Canal—the open passage through which sound waves travel to the middle ear.
* Eardrum—a taut, circular piece of skin that vibrates when hit by sound waves.
* Malleus (Hammer), Incus (Anvil), Stapes (Stirrup)—tiny bones that vibrate to amplify sound waves. These are the smallest bones in the body.
* Eustachian Tube—the passageway that connects the ear to the back of the nose to maintain equal air pressure on both sides of the eardrum.
* Cochlea—coiled, fluid-filled structure of the inner ear that contains hair cells called cilia. Cilia sway in response to sound waves, transmitting signals toward the brain.
* Semicircular Canals—fluid-filled structures in the inner ear that detect movement and function as balance organs.
* Auditory Nerve—bundle of nerve cells that carry signals from the sensory fibers to the brain.

**C) MATERIALS (asterisk (\*) = any materials that may be a safety concern)**

-crayons

-paper

-pencils

-15 Scissors

-2 rolls tape (clear)

-metal cans (8)

-30 pennies

- 50 paper clips

-rice

-1 ping pong ball

**D) REFERENCES (list ALL references that you borrowed ideas from to develop this lesson – including any handouts you may distribute)**

* <https://team-cartwright.com/sound-science-activities/>
* <http://www.scholastic.com/listencarefully/pdf/starkey_68_imallears.pdf>

**E) TENTATIVE TIMELINE (Keep brief—tables work well for this!)**

|  |
| --- |
| 9:00-9:30 Color pages  |
| 9:45-9:55 Ice Breaker- Students will walk around and ask their peers different questions about what they like and fill out their playing cards. (Sydney) |
| 9:55-10:05 Intro to hearing and why it's important to our everyday lives and what sounds we hear that warn of us things. (Alison) |
| 10:05-10:15 Activity 1: Go outside and listen for different sounds. Fill out the recording sheet of what they heard.(Molly) |
| 10:15:10:20- Come back to class and hold a discussion about what they heard when they were outside, see what was the same and what was different (Molly) |
| 10:20-10:50 Snack and bathroom breakDuring snack break play: Magic School Bus: Season 1 Ep. 8 |
| 10:50-11:30 Activity 2: Shake containers in stations (2 at each station/ 4 stations) (7 minutes per station) Reval after all students have been to each station (Alexis) |
| 11:30-11:45 - Ear diagram worksheet and how the ear works and how we hear(Sydney) |
| 11:45-12:00 Play the game: Telephone. (Alison) |
| 12:00 Coloring pages while waiting on parents  |

**F) DESCRIPTION OF YOUR LESSON:**

**You will ENGAGE the students into the activities for the day**

The engage portion of our lesson will start by us writing and saying the focus question of the week. “**Focus Question:** How does sound help us live on earth?” We will then be telling them that we will be going outside to explore the sound we hear with our ears outside. Each teacher will take a group outside, we will all split up and go in different directions, so hopefully each group will hear different sounds unique to that area. Once outside students will be asked to draw or write 4 sounds they hear outside. If students are hearing nothing or can't notice sounds this is when the teacher will point out or direct them to hear certain things that they hear. We will then come back inside and share with the other groups what their group heard outside and see if we heard the same or different things. We will then ask the focus question again to see if after going outside they have further ideas to the answer to the question.

**The students will EXPLORE the concept through gathering data/investigating/experimenting etc**

4 station with 2 cans at each. Each teacher will be at 1 station and have 2 mystery cans at each for students to listen to and explore what might be inside based off the sound. At Molly's station there will be cans of: ripped up pieces of paper in one can and a can of rice. At Alexis station there will be a can of water and a can of markers. At Sydney's station there will be a can of pennies and a can of just 1 penny. At Alison's station there will be a can of crayons and a can of 1 ping pong ball. The students will be exploring with their ears at these stations and thinking about the sound the can/bucket makes when they shake it/ roll it, etc. From the sounds they hear they will make predictions of what the object(s) inside might be. They will be exploring with different sounds that the different cans make. During this section of the lesson, the teachers will ask the students “Why do you think that is what is inside?” and “How does what you hear when you shake it give you clues about what is inside?

**You will support students in making sense of the concepts through forming EXPLANATIONS**

The explain portion of our lesson will be when the students complete the cut and paste of the mini model of the ear. We will have an example of the mini ear model displayed on the whiteboard for the students to use as a guide. Students will use scissors and glue to create and learn the basic anatomy of an ear. Students will learn about the eardrum, ear canal, and nerves that are within an ear. After the students are done with their cut and paste, we will also have a brief discussion where we talk about how our ears help us to hear in our daily lives.

**Students will have an opportunity to ELABORATE on what they’ve learned this week**

In order to further elaborate our lesson topic we will have the students play the game telephone. The students will be instructed to get into a circle on the carpet sitting close enough where they are able tell each other a secret. In this activity, one student will start a saying or quote and they will tell the person next to them. From here the quote will go around the circle until it gets back to the original student and we will see if the quote has changed or stayed the same. This activity will allow the students to further understand why hearing is so important and what could happen when our hearing is impaired.

**G) How will you determine if your students achieve the objectives for this week?**

We will be able to determine if students have achieved the objectives by asking them questions throughout the lesson in order to check for understanding and also through the response on their worksheet after going outside. We will set aside time for discussions to elaborate on what they have learned which will allow to see if they are engaged and listening. We can also see if they have achieved the lesson by looking at their drawings for the listening in nature activity to understand if their thinking is on track.

**H) PEDAGOGICAL FOCUS:**

This week our pedagogical focus is science for all (ELL & Special Ed focus). In regards to special education, we will focus on three different ways students are able to express their knowledge. First, expressing knowledge through language and gesture.If a student struggles to express their knowledge through writings and drawings we can have multiple textiles and/or objects for the students to explore with. Instead of having them write down or draw what they think they could verbally communicate to us their thought process and answers. Second, expressing knowledge through visual image. If a student struggles to express their knowledge through written text we can allow the student to draw pictures in order to express their thoughts. After the student has finished their drawing we can have a discussion with the student in order to gauge the student’s understanding of the topic. Third, expressing knowledge through action and process. If a student struggles to express their knowledge through verbal skills we can allow the student to have hands-on experiences in order to answer a certain questions. In regards to ELL students, we will have multiple forms of visuals and models in order for the students to succeed. These tools will help limit confusion and serve as examples for the students to reference back too. The students will also be placed in groups throughout the multiple activities. This allows the students who don’t feel comfortable speaking during whole-class discussion to participate in a smaller, less judgemental environment.

**(Insert any handouts here)**





**Saturday Science Teaching – Fall 2018**

**Lesson Plan TEMPLATE**

 Taste

 LESSON #5

 Grade: K

**A) LEARNING OBJECTIVES and CRITERIA FOR DETERMINING IF OBJECTIVES ARE MET (minimum of 2/ lesson)**

 **Objectives:**

* Students will be able to understand that we taste through taste buds on your tongue.
* Students will be able to identify how your nose helps you taste.

 **Criteria:**

* We will know the objective was met by what the students write on draw on their paper after trying the miracle berries.
* We will know the objective was met when the students are able to distinguish how the taste of food is different when your able to smell and when your are not able to smell.

**B) TEACHER CONTENT KNOWLEDGE (Describe what your teams needs to know regarding the science concepts you’ve identified for each learning objective above)**

**About the Miracle Berry:**

-The miracle berry (Synsepalum dulcificum) is a small red fruit that contains a glycoprotein (Miraculin) that coats the taste buds and temporarily alters their shape. This causes your taste receptors to interpret certain flavors (mostly sour ones) far sweeter.

- Miraculin sits on your sweet receptors for an hour or so. For most of that time, it silences the receptors, which is why the fruit itself tastes of very little. Whenever you take a bite or swig of something acidic, miraculin gains a few extra protons and changes shape. In doing so, it also changes the shape of the sweet receptors it has stuck to, sending them into a signalling frenzy.

 **How we taste:**

-And in those bumps are taste buds. When you put something in your mouth, they send a message to your brain to give you information about whether the food is salty, sweet, sour, bitter or umami (a meaty, savoury taste).

**C) MATERIALS (asterisk (\*) = any materials that may be a safety concern)**

-2 huge bags assorted jelly beans

-4 packs of miracle berries (10 count)

 -2 package of plastic spoons (24 counts)

- 8 Lemons

-2 large bags of sour patch kids

-8 limes

-1 package of cream cheese

-3 containers of strawberries

-3 bags of salt and vinegar potato chips

-3 bags of sharp cheddar cheese (cheese cubes)

-30 paper plates

-2 yards String

-3 Hole Puncher

-15 bandanas

-40 dixie cups

-1 orange

-paperclips

-1 box of goldfish

-Mini paw patrol figurines

**D) REFERENCES (list ALL references that you borrowed ideas from to develop this lesson – including any handouts you may distribute)**

* NA

**E) TENTATIVE TIMELINE (Keep brief—tables work well for this!)**

|  |
| --- |
| 9:15-9:20 Color pages (Keiden and Oliver need to make cover page) |
| 9:20-9:30 Icebreaker- Name Bingo: Students will cover the letters of their name as they are called on their Bingo sheet (Molly) |
| 9:30-10:00 Activity 1: Jelly Beans- Students will predict what jelly beans will taste like while plugging nose. They will then plug their nose and taste jelly beans and talk about how plugging your nose blocks your taste buds (Sydney) |
| 10:00-10:15 Snack and bathroom breakDuring snack break play: Magic School Bus: Season Ep.  |
| 10:15-10:30 Activity 2: Students will be giving plate of food they will be eating and we will will try each one and they will record what it actually tasted like on a worksheet then we will make this chart on the board, then they will be given the miracle berry and watch Magic School Bus as it dissolves (Alexis)  |
| 10:30-10:45 Taste same food with miracle berry, record on worksheet, then record results on the board (Molly) |
| 10:45-11:00 T chart class discussion about how things taste with and without the miracle berry(Alison) |
| 11:00-11:30 Senses guessing game (Alexis) |
| 11:30-12:00 Create take home packet of all their worksheets (Sydney)  |

**F) DESCRIPTION OF YOUR LESSON:**

**Following a learning cycle approach explain how:**

**You will ENGAGE the students into the activities for the day**

The engage portion of the lesson will be the Jelly bean activity. Students will be plugging their nose to see if that changes the flavors of the jelly beans. We will also be asking and writing the focus question on the board for students to think about.. “**Focus Question:** Why do we like some taste and not others?” This activity will get them excited for the lessons to come.

**The students will EXPLORE the concept through gathering data/investigating/experimenting etc**

The explore portion of our lesson is when the students eat the miracle berries. This is the explore because students are investigating and experimenting how the miracle berries change their taste buds to make all foods taste sweet. To start this activity, students will be given a plate of all the different food that they will be trying and they will eat, predict, and record what the food actually tastes like before they eat the miracle berries on a worksheet. Next the students will eat the miracle berries and eat the same foods again and write on their worksheet what the miracle berries made their food taste like. During this section of the lesson, the teachers will walk around from table to table and ask the students “What do you think the miracle berries will do to the way you taste the different food?”, “What does the different food taste like after eating the miracle berry?”, and “Why do you think the miracle berry changed the way you taste food?”.

**You will support students in making sense of the concepts through forming EXPLANATIONS**

After the students have finished tasting all the food with the miracle berries we will bring everyone back together for a class discussion. I will ask them questions like “What do you think made the food taste differently?” “Did it change all the food to one flavor, if so what?” I will be hearing what they say and by putting the T chart of before and after on the board, hopefully they will be able to see the trend that the miracle berry changes things to Sweet. I will then go into why it changes things to sweet and what the miracle berry actually does to their tough.

**Students will have an opportunity to ELABORATE on what they’ve learned this week**

In order to wrap up our unit we will finish this week’s lesson with an activity that will incorporate all five senses. The students will be blindfolded and asked to smell, touch, shake, and taste certain items that are placed in a dixie cup. They will incorporate the final sense of sight when they take off their bandanas in order to see what the mystery objects are.

**G) How will you determine if your students achieve the objectives for this week?**

We will determine if our students are understanding our objectives by asking questions and checking for understanding throughout the entire day. Within our lesson, we have set aside time for whole class discussion to elaborate on what the students have learned while completing the activities which is after the jelly bean activity and also after the miracle berry activity. Along with the class discussions, we will determine if the students achieve the objectives through the answers they put the two worksheets. Here the students will be making predictions about what each object of food will taste like and then record what it actually taste like after trying the food with the effect of the miracle berry. Their responses will allow us to see if they understand and have achieved our learning goals.

**H) PEDAGOGICAL FOCUS:**

Our pedagogical focus this week is Nature of Science. The two tenets we will be focusing on are observations and inferences and subjectivity.

**Observations and Inferences** - For this part of the Nature of Science students will be observing the jelly beans, they will be looking at the color of it and trying to infer what the taste of the jelly bean will be. Then they will have the chance to see if what they inferred was correct. This is also seen again during the miracle berry exploration because students are inferring what the miracle berry will do to the taste of each of the food items.

**Empirical Evidence** - This is seen in the lesson when students are recording their evidence. Students are writing down or recording what they think the miracle berry will make things taste like, and then record what it actually made it taste like. They are also recording what they think the jelly beans will taste like and what it actually taste like.

**Subjectivity** - This is present in the lesson because students will come in with a knowledge of what they think things will taste like based off of what they previously know.

**(Insert any handouts here)**



Also emailed more worksheets to you!