

**We Have Art Down To A Science**  
Post Lab Activity – Teacher Guide  
Grades K-3

**Overview:**

The students will work in teams to progress through three different stations which reinforce the concepts provided in the We Have Art Down To A Science e-Lab. The classroom teacher may choose any number of the activities to provide for each station from one to all of them, whichever best meets the abilities of the students.

**If your students are K-1 and cannot read, you may want to ask for some parent volunteers to come into the classroom to help guide the students through each station.**

**STATION ONE: Music – Sound Waves:**

The music station activities focus on the science of sound waves. The activities are: Make A Gong, Make A Plastic Straw Kazoo, and Make A Tissue Dance.

**STATION TWO: Pottery – Sculpting and Chemical Change:**

The pottery station activities focus on sculpting. A recipe for making your own playdoh is provided. This activity **does require a heat source**. Also provided is a recipe for making salt dough, **which does not require a heat source**. Both of these activities incorporate the science concept of chemical changes. You may also search for a link about the invention of playdoh to share with your students. The video is 2 minutes and 51 seconds in length. It can be found on YouTube and is from the Travel Channel.

**STATION THREE: Painting – Mixing Colors and Optical Illusion:**

The painting station activities include yarn painting and creating an optical illusion called a thaumatrope. By providing only red, blue and yellow paints for the yarn painting, the students will need to mix the colors of paint to have more than just the three choices available. The thaumatrope is a toy from earlier days before animation became so popular.

**Materials will be listed with each activity.**

**Procedures:**

Explain to the students that today they will be working with partners to complete 3 stations that will allow them to practice the science concepts they learned about in the We Have Art Down To A Science e-Lab. Make sure the partners/teams understand to read the directions at each station so they will know what they should do to complete the activity. If you are using

parent volunteers, make sure students understand to listen to the parent volunteer and follow his/her directions.

You may also want to set a time limit to complete each activity. Share with the students the sound (ex: buzzer, clapping hands twice, bell, etc.) you will be using when it is time for them to rotate to the next station.

Send the students to each station and keep track of time so you can signal when it is time for the partners/teams to rotate. You will need to determine the time limit based upon the amount of time you have for the students to complete all three stations.

Each activity has written directions for the students/parent volunteers to follow to complete the activity. Make sure you have the directions for each activity at each station printed and placed, clearly visible, where the activity is to take place.

After all of the students have completed all three stations, get the class back together to have a final discussion of what they discovered at each station.

**The yarn painting activity will take more than one day to complete because the glue-soaked yarn needs to dry once the student creates their pattern/design. The students can then paint their pattern/design, once the yarn has dried in place. You may want to have the students (as a whole class) create their design with the glue-soaked yarn the day before doing the stations. Then on the day the students rotate through the stations, they can paint their design at that time.**

***Explanations for the science behind the station concept will be listed with each activity.***

***Assessment:***

As the students are participating in the activities at each station, walk around the classroom to monitor their progress. Once students have completed each station, get the class back together for a post station discussion. Ask the following questions:

**STATION ONE: Music – Sound Waves:**

Make Your Own Gong and Make a Straw Kazoo:

- What did you hear at this station? (a high sound like a bell or a low sound like a gong)
- Why do you think the sounds were different for each spoon? (answers will vary)

- How did you change your kazoo to make different sounds? (made it shorter, added holes)
- What made the sounds you heard from the spoons or the kazoo? (vibrations changing into sound waves)

### STATION TWO: Pottery – Sculpting / Chemical Change:

Make Your Own Playdoh and/or Make Your Own Salt Dough and/or History of Playdoh Video:

- What ingredients did we start with to make our playdoh or salt dough? (flour, water, salt, cream of tartar, food coloring, vegetable oil / flour, salt, water, food coloring)
- Who can give me an example of a physical change? (answers will vary)
- Who can give me an example of a chemical change? (answers will vary)
- Did making our playdoh and/or salt dough bring about a physical change or a chemical change? (chemical change)

### STATION THREE: Painting – Mixing Colors and Optical Illusion:

Yarn Art Painting and/or Make a Thaumatrope:

- Ask for any volunteers to share their yarn art painting and notice if they mixed colors.
- Ask specific students who mixed colors, how did they get certain colors if only red, blue and yellow paints were at the station. (red + yellow = orange / red + blue = purple / yellow + blue = green / all colors mixed together = black)
- Ask for volunteers to share their thaumatrope. If a student chose to draw his/her own design and not use the copy provided, ask him/her to demonstrate their thaumatrope.
- Ask if anyone can explain why they see their image on both sides.  
(The human eye can retain an image for about 1/20 of a second after the object has disappeared. They may see something like the eyes can still see what was there after it is gone.)

**A list of materials for each activity at each station is provided. You will only need to acquire the materials for the stations you decide to provide for the students. The materials listed are enough for one team of 2 students at each station, unless noted otherwise. If you have multiple teams at each station at one time, you will need to increase the number of materials provided.**

## **Station Activity Information:**

### **STATION ONE: Music – Sound Waves:**

#### **Make Your Own Gong:**

##### **Materials:**

A wooden or heavy plastic ruler  
Two different size metal spoons (teaspoon and serving spoon)  
2 pieces of yarn / each 4 feet long (can be cut shorter if the students are younger and not very tall)  
Printed directions for completing the activity

##### **Getting Ready:**

Collect the necessary materials for this station.  
Cut the yarn to desired lengths  
Tie the yarn around the handle of each spoon.  
Make sure the printed directions are visible for students to read or parent volunteers to follow.

##### **Explanation:**

Before participating in the We Have Art Down To A Science, the students may not have realized that sound is heard because of sound waves being produced and traveling to their ears. A person cannot see sound waves because they are invisible. Sound waves occur as a result of vibrations. In this activity, the students will hear the vibrations created when the ruler hits the spoon. The vibrations travel up the yarn to their ears instead of spreading out into the air inside the classroom. The students will hear different sounds based upon what type of spoon is used and the length of the yarn used. The students may hear a higher sound like a church bell or a deeper sound like a gong. Only the student holding the yarn to their ears will hear the sound. The other student hitting the spoon with the ruler will hear a slight “tink” sound.

**A WORD OF CAUTION: Sometimes the student hitting the spoon with the ruler will think that hitting the spoon really hard will produce a louder sound. This is not the case.**

## **Directions: Make Your Own Gong:**

Today you will test how sound travels. When a sound is made, sound waves are created but you can't see them because sound waves are invisible. The sound waves travel through the air to reach your ears. This activity helps you to see how the sound waves travel to your ears.

- 1) Create a loop in the middle of the string/yarn and place the loop around the handle of the spoon.
- 2) Pull the yarn/string tightly so that the spoon hangs in the center of the yarn/string and you have two long pieces of the yarn/string, about the same length.
- 3) Take the ends of the longer pieces of yarn/string and wrap them around your pointer (index) finger of each hand.
- 4) Gently push the string against each ear. DO NOT PUT THE STRING INSIDE YOUR EARS.
- 5) The spoon needs to hang just below your waist.
- 6) The student not holding the yarn/string needs to GENTLY hit the ruler against the rounded part of the spoon.
- 7) Try making the yarn/string shorter or try using a different sized spoon and compare the sounds.
- 8) The students should trade places and repeat the process all over again.

## **Make a Straw Kazoo:**

### **Materials:**

Plastic drinking straw (**one per student**)

Scissors

Printed directions for completing the activity

A push pin (optional)

### **Getting Ready:**

Collect the necessary materials for this station.

Make sure the printed directions are visible for students to read or parent volunteers to follow.

### **Explanation:**

Before participating in the We Have Art Down To A Science e-Lab, the students may not have realized that sound is heard because of sound waves being produced and traveling to their ears. A person cannot see sound waves because they are invisible. Sound waves occur as a result of vibrations. When an object vibrates, moves back and forth, the air around that object will vibrate as well. When the air vibrates fast enough, a person may hear this movement as sound. By cutting the straw and making it shorter, the student changes the amount of air inside the straw. When there is less air to vibrate, it will make a different sound.

## **Directions: Make A Straw Kazoo:**

Sounds are made by vibrations. When an object vibrates or moves back and forth, it makes the air around the object vibrate. When the air vibrates fast enough, it may produce sound.

Blowing air through your straw kazoo, will cause vibrations that produce sound waves for you to hear.

- 1) Bite down on one end of the plastic straw to make it flat.
- 2) Cut the flattened end to make a V shape.
- 3) Open the flattened end of the straw a little.
- 4) Place the V shaped end of the plastic straw into your mouth and blow.

Experiment to make other sounds:

- 5) Use a push pin to poke holes in your kazoo. Then blow air through it. Compare the sounds it makes now to the previous sounds. Cover some of the holes with your fingers while you blow. Does that change the sounds again?
- 6) Use scissors to cut your kazoo into a shorter length. Blow through it. Compare the sounds it makes now to the previous sounds.

## **Make a Dancing Tissue:**

### **Materials:**

A 12 inch piece of thread  
A piece of tissue paper  
A working speaker that allows changes in volume  
Printed directions for completing the activity

### **Getting Ready:**

Collect the necessary materials for this station.  
Make sure the speaker works and the volume can be adjusted from low to high and high to low.  
Cut the string into 12 inch pieces or you may choose to have the students do this part of the preparation.  
Make sure the printed directions are visible for students to read or parent volunteers to follow.

### **Explanation:**

Before participating in the We Have Art Down To A Science e-Lab, the students may not have realized that sound is heard because of sound waves being produced and traveling to their ears. A person cannot see sound waves because they are invisible. Sound waves occur as a result of vibrations. When an object vibrates, moves back and forth, the air around that object will vibrate as well. The tissue will move when the music is played because the sound waves coming from the speaker are hitting it. It will move faster if the beat is faster (higher frequency) and move slower if the beat is slower (lower frequency).



## **Directions: Make A Dancing Tissue:**

With this activity, you will see the tissue dance in front of a speaker. The music you hear is producing sound waves. These sound waves are causing the air around the speakers to vibrate. The tissue will dance differently when the music volume is loud or low.

- 1) Take your 12 inch piece of thread and tie it around the tissue paper.
- 2) Turn the volume of the speaker up and hold the tissue paper in front of the speaker. Notice what happens to the tissue paper.
- 3) Turn the volume of the speaker down and hold the tissue paper in front of the speaker again. Notice what happens to the tissue paper.
- 4) Discuss what you observed with your partner. Did changing the volume change the way the tissue paper danced?

Experiment further:

- 5) Change the location of where you tied the string around your tissue paper and place it in front of the speaker once again. Play the volume low and change it to loud. Did the tissue paper's dance change?

## STATION TWO: Pottery – Sculpting / Chemical Change:

### Make Your Own Playdoh:

#### Materials:

#### COOKING REQUIRED

1 cup flour  
1 cup water  
2 teaspoons cream of tartar  
1/3 cup salt  
1 tablespoon oil (vegetable or canola)  
Food coloring  
2 quart saucepan  
Heating element  
Printed directions for completing the activity  
Newspaper to cover table or desks (**optional**)

#### Getting Ready:

Collect all necessary materials for this station.

Since it involves cooking, you may want to prepare the playdoh at home and bring it in to the classroom for the students

If preparing the playdoh in the classroom, make sure the heating element works and the electrical cord is out of the way so someone does not trip over it.

Make sure the printed directions are visible for students to read or parent volunteers to follow.

Cover table or desks with newspaper, if desired.

#### Explanation:

Students were introduced to two new types of changes materials can go through: physical changes and chemical changes. A physical change occurs when the appearance of something is changed but you still have that same material. Examples would be a piece of paper being torn or ice melting into water. A chemical change occurs when the material you start with is completely different than the material you end up with. Most (**but not all**) chemical changes occur because heat is added in some way. Examples would be baking cookies or burning a piece of paper. You no longer have eggs, butter, flour, or sugar separately but they have combined with the heat to produce the cookie. In burning the paper, you no longer have paper but ashes. When

playdoh is created, a chemical change occurs as a result of heat being added to the ingredients by cooking on a stovetop or heating element. If the playdoh is baked, heat added once again by an oven, the dough would become hard and brittle instead of soft and squishy. The first chemical change occurred during the We Have Art Down To A Science e-Lab, when the piece of pottery was baked in the kiln and second chemical change occurred when the glaze was added to the piece of pottery and fired in the kiln once more.

## **Directions: Make Your Own Playdoh:**

Playing with playdoh can be lots of fun. It is soft and squishy. You can shape it into almost anything you want. The first playdoh was actually invented by accident because a teacher wanted something new and different for her students to use in art class.

**THIS ACTIVITY DOES CALL FOR A HEAT SOURCE.**

**You may want to make the playdough at home and bring in the finished product for the activity.**

- 1) In a 2 quart saucepan, add 1 cup flour, 2 teaspoons of cream of tartar and 1/3 cup salt.
- 2) Add 1 cup water and 1 tablespoon of vegetable oil. Turn your burner on medium/low setting and stir. It will be a little lumpy and that's okay.
- 3) Keep stirring it until it starts to get a little solid. There may still be a few lumps, don't worry about that, you can work them out later.
- 4) Once it starts to solidify, add the food coloring right away. Stir to combine everything. The dough will start to get thicker and maybe a little lumpy. Just keep stirring everything together.
- 5) Once the dough starts to gather around the spoon, you know it is done. This whole process may take 20 seconds or up to 2 minutes, depending on how hot your heat source is.
- 6) Remove the homemade dough from the saucepan and put it on some waxed paper to cool.
- 7) After it is cooled, knead it for a few minutes to get out any remaining lumps and get a better consistency. The homemade play dough can be stored in a Ziploc bag.
- 8) The cooled play dough is now ready for the students to use and create things at this station. You may predetermine what you want them to create or allow them to decide what their creation will be.

## **Make Your Own Salt Dough:**

### **Materials:**

**NO COOKING REQUIRED**

1 cup flour

¼ cup salt

½ cup water

3 to 5 drops of food coloring

Printed directions for completing the activity

Newspaper to cover table or desks (**optional**)

### **Getting Ready:**

Collect all necessary materials for this station.

**Since it DOES NOT involve cooking, you may want to have students measure the ingredients and mix together as a class.**

Make sure the printed directions are visible for students to read or parent volunteers to follow.

Cover table or desks with newspaper, if desired.

### **Explanation:**

It is the same as the playdoh explanation. See the information on page 7.

## **Directions: Make Your Own Salt Dough:**

Playing with salt dough can be lots of fun. It is soft and squishy. You can shape it into almost anything you want. The salt dough can be used in the same manner as play dough.

**THIS ACTIVITY DOES NOT NEED A HEAT SOURCE.**

- 1) Mix together 1 cup flour and  $\frac{1}{4}$  cup salt.
- 2) Mix together  $\frac{1}{2}$  cup warm water with a few drops of food coloring.
- 3) Slowly pour the water into the flour mixture, stirring as you pour. Stir until everything is combined.
- 4) Knead with your hands until the flour is completely absorbed. If the dough is too sticky, add more flour until it doesn't stick to your hands.
- 5) The salt dough is now ready for the students to use and create things at this station. You may predetermine what you want them to create or allow them to decide what their creation will be.
- 6) The homemade play dough can be stored in a Ziploc bag.

## **History of Playdoh Video:**

**Materials:** Computer with monitor  
Internet

**Getting Ready:** Do a search for the invention of playdoh. The video from the Travel Channel is 2 minutes and 51 seconds in length. Set up the computer and monitor so the whole class can see the video. Check the speakers for volume to make sure students can hear the audio portion of the video. Make sure the internet is working in the building and have the link opened so you can start the video once the students are ready to give it their attention.

**You may choose to show this to the whole class instead of at a station in the classroom.**

**Explanation:** Playdoh was created by accident. Sharing this video with your students will provide them with some background knowledge of how playdoh was created and show them how little it has changed and over the last 6 decades.

## **Directions: History of the Invention of Playdoh:**

If you choose to share this video with your students, follow the getting ready guidelines above. Once you have completed those requirements, you are all set to share video with the students. This may be better suited for a whole class activity instead of a station activity. The video is only 2 minutes and 51 seconds in length. Since all students will complete either the playdough or salt dough activity, this may be best shown at the beginning of the class before having the students break off into their teams.

## STATION THREE: Painting – Mixing Colors and Optical Illusion:

### Yarn Art Painting:

#### Materials:

Yarn string or embroidery floss (various lengths)  
White glue  
Small amount of water  
Bowl or container to hold the glue and strings of yarn or floss  
Cardboard or cardstock **(one sheet per student)**  
Various forms of paints (tempera, poster paints, acrylics) in **red, blue and yellow only**  
Paintbrushes  
Water in cups  
Printed directions for completing activity  
Tweezers or chopsticks **(optional for students to use to get the yarn out of the glue)**  
Newspaper to cover desks or table **(optional)**  
Moist and dry paper towels **(optional)**

#### Getting Ready:

Collect all necessary materials for this station.  
In the bowl, add a little water to the white glue and stir it to combine and make it less thick.  
Cut your yarn or embroidery floss to different lengths. The shorter lengths are easier to handle but the longer lengths allow for some abstract designs. Make sure to provide many various lengths of yarn or embroidery floss for your students.  
Place the various lengths of yarn or embroidery floss into the glue and make sure they are submerged into the glue.  
Cover the table or desks with newspaper, if desired.  
Make sure the printed directions are visible for students to read or parent volunteers to follow.

**The yarn painting activity will take more than one day to complete because the glue-soaked yarn needs to dry once the student creates their pattern/design. The students can then paint their pattern/design, once the yarn has dried in place. You may want to have the students (as a whole class) create their design with the glue-soaked yarn the day before doing the stations. Then on the day the students rotate through the stations, they can paint their design at that time.**



**Explanation:**

Mixing colors to create new colors may be a new concept for younger students. In the pre-lab lesson, the students got to see red and yellow mix to make orange. Red and blue mixed to make purple. Yellow and blue mixed to make green. With the yarn painting the students can mix colors directly on their piece of art. The students will choose the lengths of yarn and lay them out on the cardstock to create a design. The longer lengths can be used to create an abstract design or the shorter lengths can be used to create a concrete image like a heart, leaf, ball, etc. The yarn needs to be allowed to dry in place, usually overnight. The next day, the students can use watercolors, tempera paints, or acrylic paints to paint the design they created the day before. If you provide only red, yellow and blue paints, it will force the students to mix the colors of paint together to get the green, orange and purple. They may mix more red with less yellow to get a reddish orange or more yellow with less blue to get a yellowish green. They could mix all the colors together if they needed black. The key to this activity is to just let them create and discover what colors they can make (if they choose to mix them). Allow paintings to dry before displaying or sending home with the students.

### **Directions: Making A Yarn Art Painting:**

You will create a 3-D design on your paper/cardstock/ matboard / canvas by using yarn that has been soaked in glue. The yarn will dry in the design you create. Then you can paint it. There are only 3 colors of paint provided: RED, BLUE, and YELLOW. If you remember from the pre-lab activity for We Have Art Down To A Science, we were able to create orange, green, and purple by using only the three colors of red, blue and yellow. During the We Have Art Down To A Science e-Lab, the lab director showed us an interesting fact about the color black. Feel free to experiment and see what beautiful colors you can make for your yarn art painting by mixing the colors of paint.

- 1) In a bowl, add a little water to some white glue and stir to combine.
- 2) Take the cut strands of yarn and place them in the watered down glue substance.
- 3) Take one strand of yarn at a time out of the glue. Run your fingers down the length of the glue-covered yarn, if you want to remove the excess glue.
- 4) Arrange the yarn onto your paper in the design of your choice. The longer lengths are fun to arrange in one continuous line but the shorter lengths are easier to manage.
- 5) Let the yarn dry, usually overnight. Laying it on a flat surface is best to keep the yarn from slipping and changing the pattern or design.
- 6) Once the yarn has dried, paint in the sections as desired.
- 7) Allow paint to dry before sending the works of art home or displaying in the classroom.

## **Make a Thaumatrope:**

### **Materials:**

A copy of the provided pattern **or** paper for students to draw their own design (**one copy or sheet of paper per student- cardstock recommended**)

Plastic straws (**one per student**)

Glue or double-sided tape

Scissors

Crayons or colored pencils

A circular pattern, if students are making their own design

Printed directions for completing the activity

### **Getting Ready:**

Collect the necessary materials for this activity.

Make sure the printed directions are visible for students to read or parent volunteers to follow.

### **Explanation:**

A thaumatrope is a toy from a long time ago. It helps to create the illusion of motion and was a toy children played with before the flood of animated cartoons or movies available today. The human eye can retain an image for about 1/20 of a second after the object has disappeared. The thaumatrope consists of 2 images that go together like a fish and a bowl, a bird and a cage, an astronaut and a spaceship, etc. The images are drawn on identical sized pieces of paper cut into a circle and glued together with a straw in the middle. When the student turns the straw between their hands, the image on one side will appear briefly on the other side. The fish will appear inside the bowl, the bird will appear inside the cage, etc.

## **Directions: Making A Thaumatrope:**

When you watch cartoons on television, you are watching something called animation. This type of entertainment hasn't always been around. Today you are going to make a toy that was very popular **BEFORE** cartoons were on television. It is an optical illusion called a thaumatrope. This toy will trick your mind and make you think you see something that you really don't see.

- 1) Trace and cut two identical circles. If your teacher has provided an image, simply cut out the circles provided.
- 2) Draw two images that go together like a bird and a cage, a fish and bowl, etc. Your imagination is the only limitation. **OR** if your teacher has provided the image already, then you can color each part.
- 3) Turn the circles over on the blank sides and place 2 strips of double-sided tape or glue on each circle.
- 4) On the side where the tape or glue is located, carefully place the plastic straw in the center of the circle. Make sure the tape is sticking to the straw or that there is glue on the straw as well.
- 5) Now carefully place the glue or tape side of the second circle on top of the other circle, making sure the straw in the center as well.
- 6) Press both sides of the circles together. If using glue allow time for the glue to dry.
- 7) Twirl between your hands. The image on one side will also appear on the other side. It will look like the bird is in the cage or the fish is in the bowl.