

AN INTRODUCTION TO STEAM

PRE-VISIT

OBJECTIVES:

- Students will be able to communicate how Science, Technology, Engineering, Arts, and Math have been used to improve and advance human life.
- Students will be able to identify accomplishments of Mississippi makers.

INTRODUCTION TO STUDENTS:

STEAM is an acronym that stands for Science, Technology, Engineering, Arts, and Math. Throughout history, people have used these five areas of study to advance and improve our world. Mississippians have a history of being able to use STEAM well. For example, Henry Merrill of Iuka, MS was the first person to make a round trip transatlantic flight! Today, we are going to practice using STEAM!

PRE-VISIT ACTIVITIES (choose one or more):

ACTIVITY: CREATE A PUPPET

- STEAM Focus: Arts, Engineering
- Mississippi Maker: Jim Henson
 - Jim Henson became the world's most famous puppeteer by inventing new ways to make puppets move and creating The Muppets
- Supplies:
 - Paper Bags
 - Crayons, Markers, Pencils, etc.
 - Tape*
 - Popsicle Sticks*
 - Yarn/String*
- The Lesson
 - Jim Henson became the world's most famous puppeteer and a master storyteller by using engineering and artful creativity. When he wanted to improve the ways puppets show emotion, he used new materials. He called his new creations "Muppets" which combined the words "Marionette" and "Puppet." Henson used his Muppets to tell stories. Today, we will make our own puppets and give them stories!
- How
 1. Give students paper bags and art supplies so they can design their puppets
 2. Have students give their puppet a personality and story
- STEAM Team Huddle
 - What was it like to design your own puppet? Was it fun? Were you a little nervous?
 - Henson's creations were used in shows like Sesame Street. If your puppet was in a show, what would its theme be?
 - "Muppet" is a combination of two words. If you had to call your puppet a different name, what two words would you combine? What would the new word be?
 - When we go to WonderBox in the Mississippi Children's Museum, there will be a display case with one of Jim Henson's creations- a Fraggle! What do you think something called a "Fraggle" will look like?



•Age-it-up Inspirations

- Have students use tape, popsicle sticks, string, and other supplies to make marionettes, puppets suspended and controlled by strings from above.
- Have students team up and put on shows for the class with their puppets
- Have each student tell a short story to the class using their puppet

✿ ACTIVITY: BUILD A PLANE

•STEAM Focus: Math & Engineering

•Mississippi Maker: Henry Merrill

- Henry Merrill of Iuka, MS was the first person to make a round-trip trans-Atlantic flight. He filled the wings of his plane with ping-pong balls!

•Supplies:

- Paper
- Paper clips
- An elevated location like a stage
- Scissors*
- Ping-pong balls*
- Tape*
- Tape Measure(s*)



•The Lesson

- Air travel used to be a dream for humanity. In ancient times, people thought that the sky was a place humans could never go. Now, we travel all over the world in planes filled with people! Henry Merrill was a pioneer in plane flight. Today, we will see just how difficult it can be to fly with even a small amount of weight!

•How:

1. Give students paper and have them fold their best paper airplane
2. Have each student throw their paper airplane from the same elevated spot
3. Measure the distance from the elevated location to the plane which flew the furthest
4. Have students retrieve their planes and clip a paperclip onto a part of their planes
5. Throw the planes again
6. Measure the distance to the furthest plane again and compare

•STEAM Team Huddle

- Whose airplane went the farthest? Why do you think it flew so far?
- What happened when we put paper clips onto our airplanes?
- Who was the Mississippian that made the first transatlantic round trip in a plane? With what did he fill the wings of his plane? Why do you think he did that?
- When we go to WonderBox in the Mississippi Children's Museum, there will be a display case about Henry Merrill and an opportunity to Create your own Really Amazing Flying Thing at The CRAFT! What do you want your spacecraft or aircraft to look like?

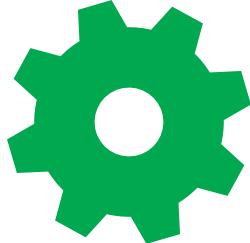
•Age-It-Up Inspirations

- Have students use scissors to modify their planes. Ask in the huddle why they thought certain modifications would work.
- Rather than a paperclip, have students tape or glue a ping-pong ball to their paper airplane.
- Have students each measure the distance between the platform and their plane and compare the two results.



*** ACTIVITY: COKE & MENTOS SPACE ROCKET**

- **STEAM Focus:** Science, Technology, Engineering, Arts
- **Mississippi Maker:** Dr. Henry T. Sampson Jr.
 - Dr. Sampson, from Jackson, MS, used science, technology, engineering, and math to help rockets launch safely into space.
- **Supplies:**
 - 2 Liter bottle of Diet Coke
 - Scotch Tape
 - 3-5 Mentos
 - Blank Index Cards
 - Crayons, Markers, and/or colored pencils
 - Clothes you don't mind getting messy
 - An outdoor space with at least 10 yards between rocket and students



• The Lesson:

- When Mentos and Coke touch each other, they begin a chemical reaction! This reaction builds up pressure in our "rocket" which causes a small explosion. Since the explosion can only escape through one spot in the rocket, the explosion pushes the rocket away from the escape hole. This effect is similar to the purpose of a patent designed by Dr. Sampson! Since rockets normally go to space with the flag of the country they represent, we will blast off our rocket with our own flags. Take 5 minutes to draw what you would want your country's flag to look like and we'll attach it to our rocket.



• How:

1. Give each student one half of an index card to draw their flag. Allow students 5-10 minutes to design their flags.
2. Tape each card to the 2-liter bottle of Coke
3. Place 3-5 Mentos in a row between two pieces of tape. Make sure the tape is short enough that it would not touch the soda if suspended from the lid. (If needed, pour out a small amount of soda, keeping in mind that the rocket will be stronger with more soda in the bottle.)
4. Tape the mentos to the inside of the lid of the coke bottle
5. Put the lid on tight enough to block liquid from escaping easily, but loosely enough to be blasted off
6. Shake the bottle lightly until you feel the pressure building. (Make sure to always aim the lid away from yourself and students)
7. SLAM the lid onto the ground and back up quickly to see the rocket "take off!"

• STEAM Team Huddle:

- What did you learn from our Coke and Mentos rocket?
- Why did we put flags on our rocket?
- What kind of reaction happened when the Coke and Mentos interacted?
- When the pressure built up and exploded out of the bottom, it was like a rocket blasting off. What Mississippian's inventions helped rocket explosions do this same thing?
- When we go to WonderBox at the Mississippi Children's Museum, there will be a display case about Dr. Sampson and opportunities for you to build your own flying devices at an exhibit called The CRAFT. What do you think your aircraft or spacecraft will look like?

