

GEORGIA AQUARIUM

STEAM FORWARD – EPISODE 6

Engineering [Teacher Version]

Welcome to STEAM FORWARD!

Engineering!

Career: Sr Director of Zoological Operations Life Support Systems/Water Quality, Curator of Fish and Invertebrates, and Director of Guest Programs
Episode: Engineering

Georgia Aquarium is an architectural marvel in downtown Atlanta that holds about 1.3 million cubic feet of water and tens of thousands of animals.

What did it take to build this place, and how do they go about improving on it?

To construct such a unique place, it took years of research and planning to maintain so many diverse habitats, keep the water clean, and the animals healthy.

During this episode, hosted by Dr. Meisa Salaita, we will dig deep into the structure that keeps the animals safe and healthy. Georgia Aquarium’s Eric Hall, Kim Stone and Jahmar Hannans will provide us with a window into the structural and mechanical engineering, the design process, and innovation.

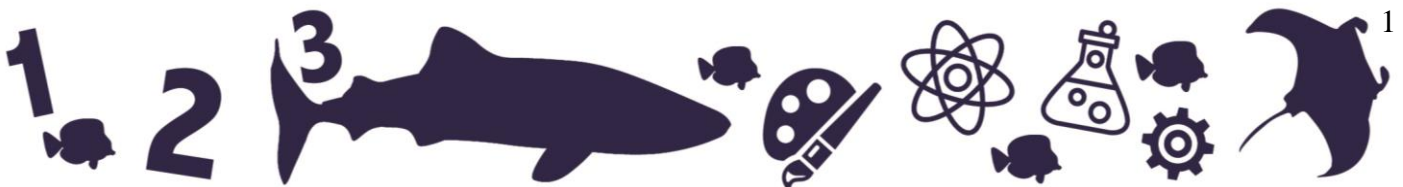
OBJECTIVES: Why am I learning this?


At the completion of this mini-unit, you will be able to:

- Understand what it takes to design an aquarium.
- Research and improve your design.
- Put your design into action!

THE ESSENTIALS: ASK & ANSWER

- 🐟 How did Georgia Aquarium create a one-of-a-kind animal collection?
- 🐟 How does engineering keep the Georgia Aquarium structure sound?
- 🐟 How does Georgia Aquarium constantly innovate?





GEORGIA AQUARIUM

STEAM FORWARD – EPISODE 6

Engineering [Teacher Version]

Activity 1

Video segment: 00:00–2:31

OBJECTIVES: Why am I learning this?

At the end of this lesson, you will be able to:


- Understand what it takes to design an aquarium

Imagine you have been given the job of designing the world’s next amazing aquarium. The first thing you need to do is design what the physical building will look like for the Aquarium’s board. Grab your pencil and ruler and start drawing plans for the outside of a building. Make sure the exterior plans are to scale and include views from above and the side. Be sure to include features that make this aquarium unique and/or help it be sustainable.

Students should work in teams of 3-4 people with each member having a role in the process. Final drawings will vary, however key elements to look for include:

- Is the drawing scaled? And did the team give you the scale? Is the scale realistic?
- Are the clear entrance and exits including loading dock?
- Did they include feature that were unique – this could be the architectural design, location, size, and look?





GEORGIA AQUARIUM

STEAM FORWARD – EPISODE 6

Engineering [Teacher Version]

Activity 2

Video segment: 2:36–4:53

OBJECTIVES: Why am I learning this?

At the end of this lesson, you will be able to:

- Research and improve your design.

Now that you have designed the look of the Aquarium, you have to decide what will go in the aquarium! Follow this steps to determine how much space you need.

1. Choose what major animals and habitats you want to display. List them here.

Answers will vary, encourage students to think outside of the box

2. Decide how big each habitat needs to be based on the animals you selected. Record them here.


Answers will vary, however some key elements to look for include:

- Does the habitat match the animal they selected? Is it big enough based on the size of the animal?
 - Students should be calculating the area of the whole exhibit. If they are not using standard shapes then encourage students break the exhibit into standard shapes and add them together to calculate the total area.
 - Did the students include a holding space behind the scenes for the filtration system?
3. Draw each habitat to scale on a separate piece of paper. Once done, cut out each habitat.
 4. Next, create a floorplan to scale for your aquarium inserting the habitats you have just drawn. Be sure to include areas that guest will need such graphics, food, restrooms, walking space and well as label the direction that people will walk in.

Answers will vary, however key elements to look for include:

- Does the floorplan match the drawings in activity 1?
- Is everything drawn to scale and the same scale?
- Did they include the guest component? Space to walk around, restrooms, food service and seating areas, maybe a theater or open space to gather people, stairs, and elevators if the Aquarium is more than one story.





GEORGIA AQUARIUM

STEAM FORWARD – EPISODE 6

Engineering [Teacher Version]

Activity 3

Video segment: 4:58–6:42

OBJECTIVES: Why am I learning this?

At the end of this lesson, you will be able to:

- Put your design into action!

Introduction

Time to finalize your design! Answer the following questions to figure out how to make it all work together!

1. Calculate the square footage of your exterior design.

Answers will vary based on their designs

2. Calculate the square footage of your design of the interior.

Answers will vary based on their designs

3. What do you need to do to make the two designs match? Are there any design aspects that need to be improved/updated?

Consider having the teams present their idea to another team for peer feedback. Sometimes new eyes can help a design team see a concept they missed or look at an existing idea differently.



STEAM FORWARD – EPISODE 10

Engineering [Student Version]

In The Field

What better way to bring STEAM FORWARD alive than to meet an expert at Georgia Aquarium? Here, you will learn more about the background and experience it takes to be a member of the STEAM TEAM. Let's get up close and personal

MEET AN EXPERT

Meet: Jahmar Hannans, Director of Guest Programs and Volunteer Services

Undergraduate school: Rhema Bible College and Mercer University

Majors: Biblical studies in youth ministry and Organizational Management

What is the most exciting part of your job at Georgia Aquarium?

Teaching and building programs that show our guests the aquatic world. Our work is never "done" – there's always a new and exciting way to share a story or an innovative way to improve the guest experience. No day is every the same!

What advice do you have for students interested in doing what you do?

Always stay a student and always read. Stay connected to the subject matter you are most interested in and it will lead you to success and fulfillment. I never imagined that my passion and heart for serving people would lead me to this incredible role, but I get to leverage things I learned in school every day leading my team.

What is something surprising or unexpected about your career path?

I never thought I would end up creating programs for children and adults. Always allow your passions to take you to new places.

What do you say to students who ask "Why am I learning this?"

Exploring the aquatic world always leads to new discoveries and how we are all connected to them. You will become more empowered once you learn of those connections.

