

# Sea Turtle Augmented Reality



VIRGINIA  
**AQUARIUM**  
& MARINE SCIENCE CENTER

Augmented Reality (AR) is the addition of computer-generated images to real world environments. In this activity, scouts will explore sea turtle anatomy and use a dichotomous key to identify the species of an AR sea turtle.

## Duration

Activity: 30-45 minutes

## Supplies

- [Girl Scout Internet Safety Pledge](#)
- Cell phone with camera and an internet access application, like Google Chrome.
- ["Background on Sea Turtles"](#) document
- Pencil
- Colored Pencils (optional)



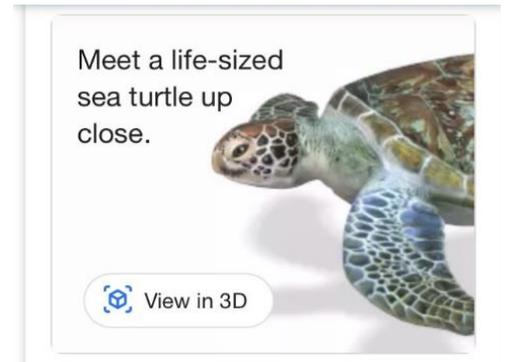
## Background

There are seven different species of sea turtle: Loggerhead, Leatherback, Green Sea Turtle, Kemp's Ridley, Olive Ridley, Hawksbill, and Flatback. Review the "Background on Sea Turtles" document with profiles with information about each species. List the five most common sea turtle species that visit Virginia's coast, starting from the most common visitor to least common.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

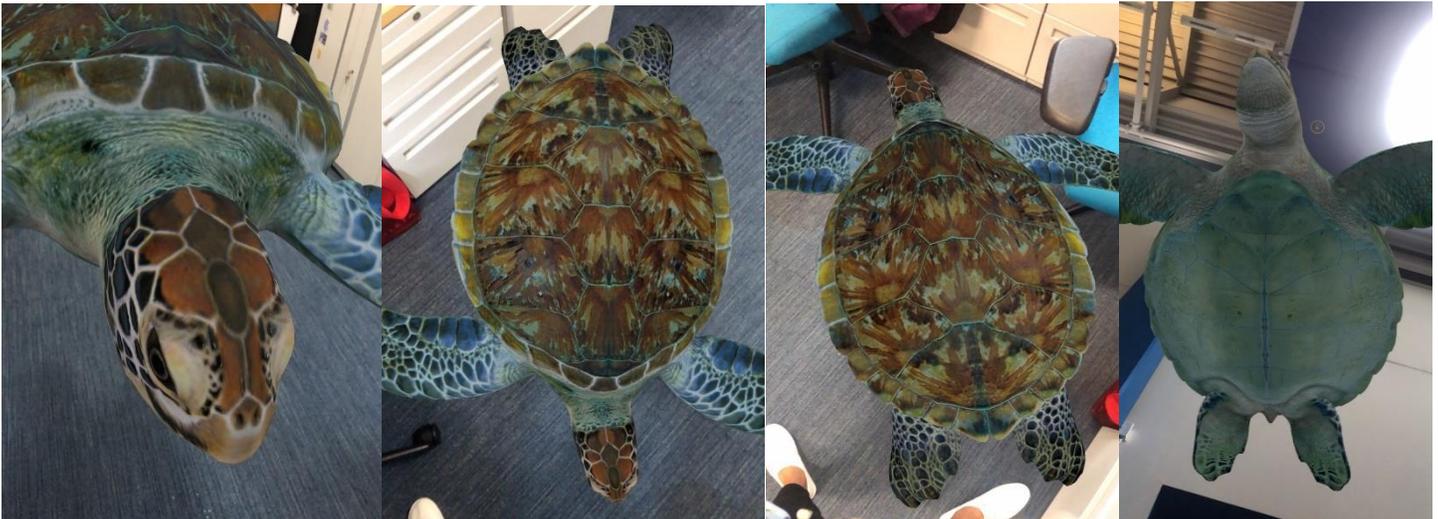
# Augmented Reality

1. Open your internet application and search “Sea Turtle” in the Google Search Engine.
2. Scroll down until you see “View in 3D” (see image on right)
3. Explore the AR turtle and move it around your surroundings. Enlarge the sea turtle to 125%, then return it to 100%.
4. Capture at least four screen-shots of the AR sea turtle. Listed below are four photograph suggestions. Check them off as you capture the photograph.
  - A. One close-up photograph of the head
  - B. One photograph of the dorsal side (top) from the front of the sea turtle.
  - C. One photograph of the dorsal side from behind the sea turtle.
  - D. One photo of the ventral side (bottom) of the sea turtle.



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- |   |   |  |  |
|---|---|--|--|
| <input type="checkbox"/> A: Photo of head | <input type="checkbox"/> B: Dorsal view from the cranial position | <input type="checkbox"/> C: Dorsal view from the caudal position | <input type="checkbox"/> D: Ventral view |
|---|---|--|--|

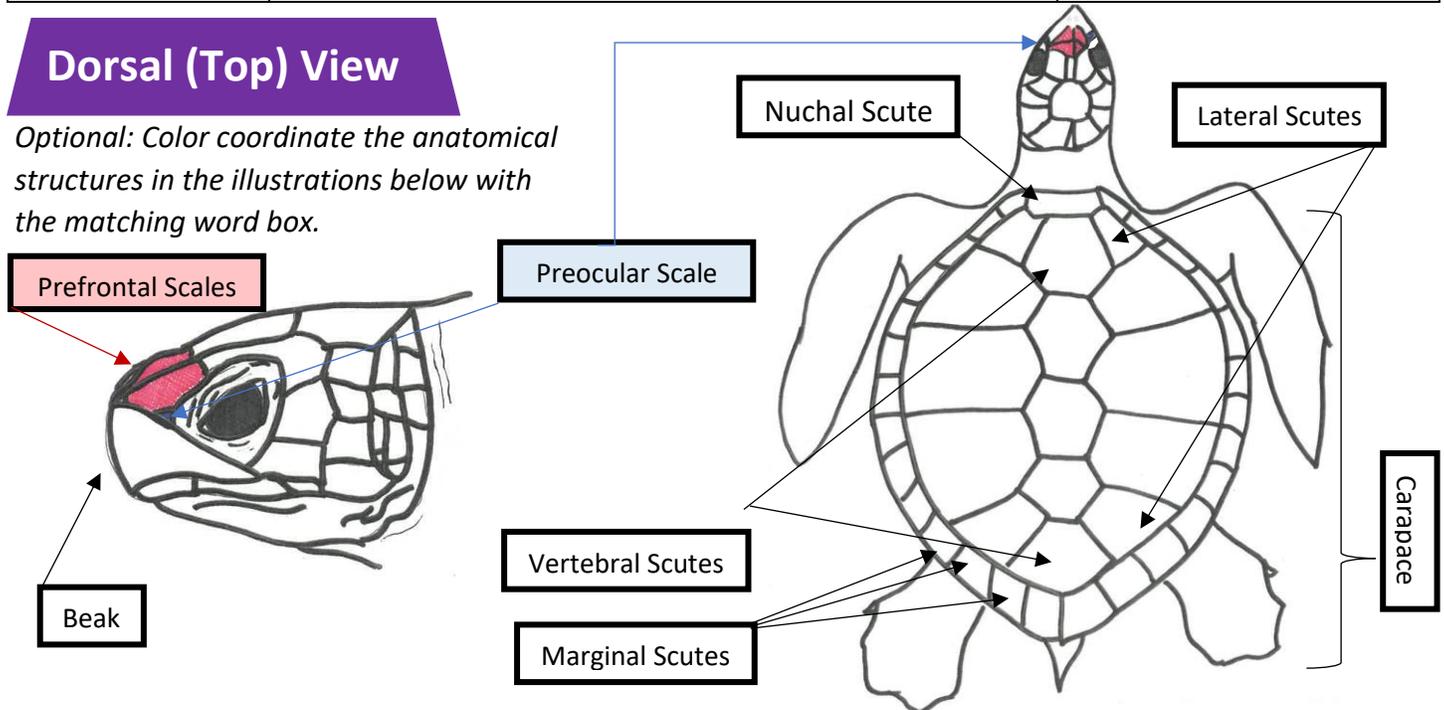


5. Take an additional photo and fix, change, manipulate, or add something to it. You can add a filter, crop the photo, insert an emoji, have a friend photo bomb, or add a text box to make it unique. Create and share a digital slideshow for family and friends.

## II. External Sea Turtle Anatomy

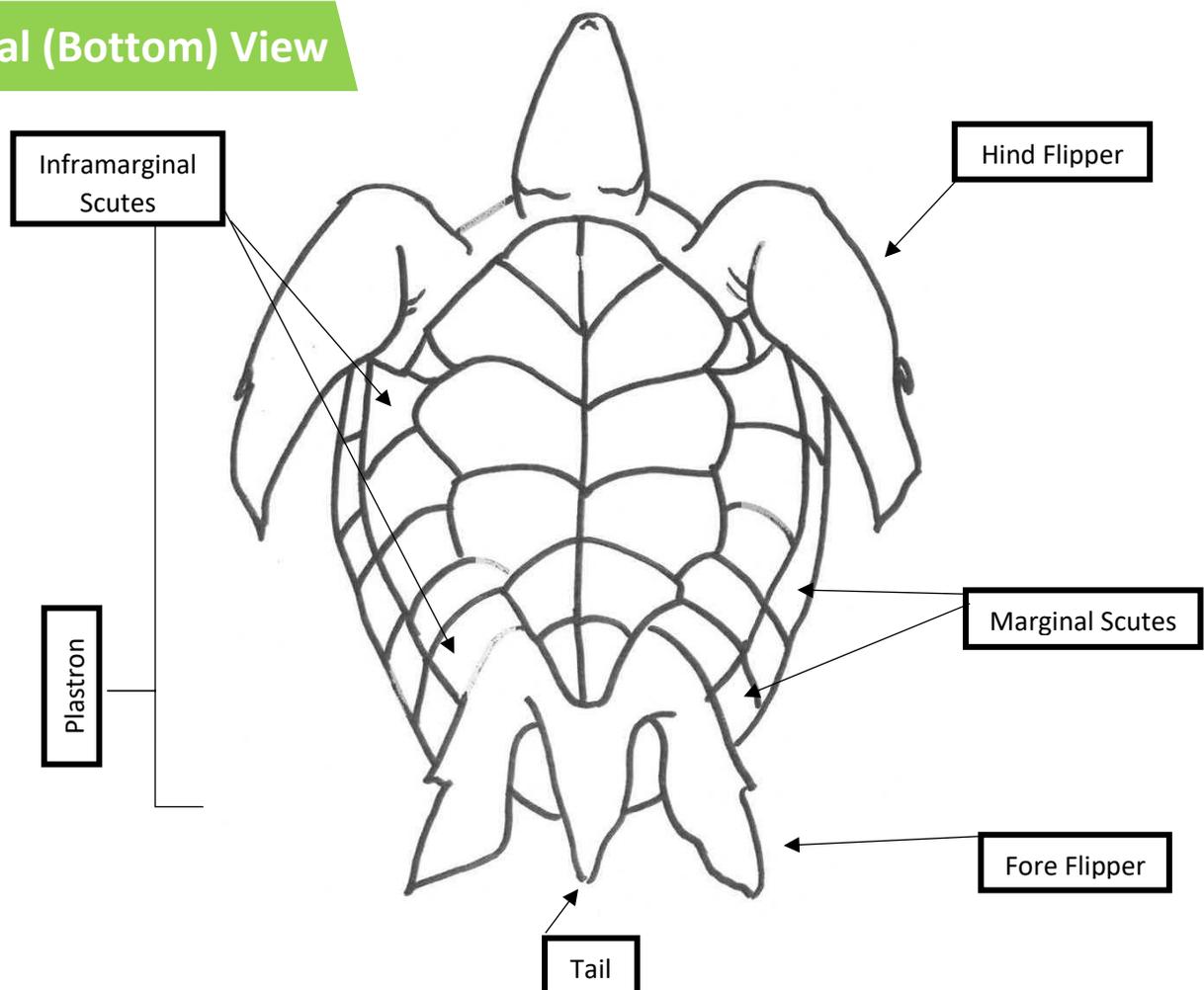
Now that you've taken pictures of your AR sea turtle, explore the anatomical features of sea turtles that will help identify the species of turtle used in Google AR. Identify and familiarize yourself with the structures listed below and count the number of each part on the augmented turtle.

Dorsal Side ( <i>Upper-side/Top</i> )		Number on Augmented Sea Turtle
<b>Carapace</b>	The top shell of the turtle that is covered in a specialized scale, called a scute. Each species of sea turtle has a unique carapace which can be used to identify the species. The carapace protects the internal organs and provides some camouflage for the sea turtle. In all but the leatherback, the carapace is fused to the sea turtle's backbone.	
<b>Lateral Scutes</b>	Specialized scales located on the carapace of the sea turtle. The scutes must be shed as the sea turtle grows and develops. The number and position of these scutes are specific to each individual species.	
<b>Vertebral Scutes</b>	Scutes that are located on the carapace that run along the vertebral column (spine).	
<b>Marginal Scutes</b>	Scutes that run along the outer edge of the carapace.	
<b>Beak</b>	Specialized structure that is uniquely adapted for catching and consuming the specific diet for each species.	
<b>Preocular Scales</b>	Scale located before the eyes.	
<b>Prefrontal Scales</b>	Scales located at the front of the head, which can be used to identify the species.	
<b>Nuchal Scales</b>	The first scute located on carapace, located immediately posterior (behind) the head).	



Ventral Side ( <i>Underside/Bottom</i> )		Number on Augmented Sea Turtle
<b>Plastron</b>	Portion of the shell located on the ventral side (underside) of the sea turtle.	
<b>Inframarginal Scutes</b>	Scutes located on plastron that touch the marginal scutes.	
<b>Fore Flippers</b>	Used to push the sea turtle through the water. When a female turtle is ready to nest, she will use her fore flippers and hind flippers to dig a pit and egg chamber	
<b>Hind Flippers</b>	Paddle-like appendages adapted to swimming in the ocean. Nesting females will use her hind flippers to cover her egg clutch with sand.	
<b>Tail</b>	The tail is considerably longer in male sea turtles.	

### Ventral (Bottom) View



### III. Sea Turtle Dichotomous Key

A dichotomous key is a tool used to determine the identity of something, such as the name of a butterfly or type of rock. By answering a series of questions that describe the physical characteristics of the object, the user is lead to the name of the object or organism. At each step, the user is given two choices; each choice leads to a different question. See an example of a simple dichotomous key that can be used to identify common writing tools.

Dichotomous Key for Writing Tools

- 1. A. Writes with ink.....Go to question 2  
B. Writes with graphite (lead).....Pencil
- 2. A. Writing tip is metal.....Pen  
B. Writing tip is felt.....Marker

The shape and number of scutes located on the carapace and plastron is distinct for each species of sea turtle. Therefore, we can use our observations and documentation of the AR sea turtle to identify what species it represents. Use the dichotomous key for Virginia’s sea turtles to identify the species.

### Key for Virginia Sea Turtles

- 1. A. Scutes arranged in a distinct pattern on carapace..... go to 2  
B. No scutes on carapace, scutes replaced by longitudinal ridges..**Leatherback**
  
- 2. A. Has 4 lateral scutes .....go to 3  
B. Has 5 lateral scutes .....go to 4
  
- 3. A. Scutes overlap one another, beak noticeably hooked .....**Hawksbill**  
B. Scutes do not overlap, beak not hooked .....**Green**
  
- 4. A. Small, terminal scute near tail on plastron.....**Kemp’s Ridley**  
B. No small, terminal scute near tail on plastron.....**Loggerhead**

According to the dichotomous key, what species of sea turtle is the augmented turtle? \_\_\_\_\_

# Answer Key

## I. Introduction

Virginia's 5 most common sea turtle visitors:

1. Loggerhead
2. Kemp's Ridley
3. Leatherback
4. Green
5. Hawksbill

## II. External Sea Turtle Anatomy: Number of anatomical parts on virtual sea turtle

- Dorsal/Top Side
  - Carapace-1
  - Lateral Scutes-4
  - Vertebral Scutes-5
  - Marginal Scutes-24
  - Beak-1
  - Preocular Scales-0
  - Prefrontal Scales-1 pair (2 individual scales)
  - Nuchal Scales-1
- Ventral/Bottom Side
  - Plastron-1
  - Inframarginal Scutes-4
  - Fore Flippers-2
  - Hind Flippers-2
  - Tail-1

## III. Sea Turtle Dichotomous Key

- Augmented sea turtle is a green sea turtle

# Girl Scout Alignments

**Nation's Capital [Endangered Species Patch Program](#) for Caddettes, Seniors and Ambassadors.** By reading "Background on Sea Turtle" document linked above and completing the activities, Cadettes, Seniors, and Ambassadors complete one out of the two required activities for Step 2: Investigate. Regional Species: Kemp's Ridley and Green Sea Turtle. The Virginia Aquarium is a member organization of the Association of Zoos and Aquariums (AZA) which sets high standards in animal care, educational family experiences, research, conservation, and educational programs. The Virginia Aquarium is the AZA lead organization for the Saving Animals From Extinction (SAFE) program for sea turtles. To understand how the Virginia Aquarium is taking initiatives to make significant and measureable contributions to sea turtle conservation, check out the SAFE program plan: [Sea Turtle SAFE Program Plan 2019](#).

## **Girl Scouts of the Colonial Coast [Explore Sea Turtles](#).**

- **Discover**
  - Sea turtles possess many special characteristics. Draw, label, and/or describe some of these characteristics. Tell a friend why these characteristics are important to sea turtles.
  - Draw or print a picture of a sea turtle. Label the carapace, lateral scutes, vertebral scutes, flippers, head, tail, and plastron.
- **Connect**
  - Use a dichotomous key to identify each sea turtle species by its physical characteristics. How do these characteristics make each sea turtle species uniquely adapted for its habitat and lifestyle?
  - Sea Turtles are marine reptiles. Provide examples of adaptations unique to marine reptiles (sea turtles) that allow them to live in a marine environment.

## **Brownie: Computer Expert**

- Step 2: All about animals.

## **Junior: Digital Photographer**

- Step 2: Photograph a pet
- Step 3: Change something

## **Cadette: Animal Helpers**

- Step 5: Get a sense of different animals' unique skills and abilities.

## **Ambassador: Photographer**

- Step 2: Take five photos from a different vantage point.
- Step 3: Capture the same person from five different perspectives.
- Step 4: Take a photo of a group or an individual in motion.
- Step 5: Make a digital slide show

## **Ambassador: Water**

- Step 3: Investigate endangered marine life.