Grades K-2: Distance Learning Lab Guide (KEY)

*Student Guardians- On the Distance Learning Lab webpage there are videos and corresponding activities to do with your students. You can also discuss the review questions below. Some activities require a printer or craft supplies, if you don't have those simply watch the videos instead.

Clean Water section:

- Watch: "Soak-Spread-Slow Stormwater Song" and "Freddy the Fish Teaches About Stormwater" videos.
    - What are some ways that rain water can become dirty before it enters a creek, river, or the ocean? *It can pick up bad things like pollutants, such as sediment, chemicals, extra nutrients, litter, and oil and can carry it to our waterways on roads and other hard surfaces.*
    - How can we help keep the water clean? *Use plants to soak up rain water like a sponge, rain barrels can help collect and spread out the rainwater, and rain gardens can slow down stormwater.*
- Do: "Slowing Down Stormwater Activity Sheet".
    - Help your students time how long it takes for them to complete the 3 mazes on the worksheet.
    - Have students pour some water along the side of the sink and watch how quickly it moves to the drain. This would be like the maze with only the road. Next, have students help you pour some water onto a sponge, and explain that this is like the maze with all of the plants, the rain garden! The plants help to soak up the rain water like a sponge and keep it from riding on the road and other hard surfaces where it can become dirty water and enter the river, sound, or ocean.

Coastal Exploration & Investigations section:

- Watch: "Lady Swan Boat Tour"
    - If you were on a boat ride, what types of animals do you think you might see?
    - What different colors did you see on the boat ride?
    - Draw a picture of what you might see on a boat ride out to an island.
- Watch: Hammocks Beach State Park videos
    - Frogs and Toads, Seashells, Sea Turtles
    - What is something new you learned about the animals that live on our coast?
    - Why is it important to take care of these animals and their homes? *A healthy coast connects us all. Each animal plays an important role in nature.*
    - *For additional videos, check out the Hammocks Beach State Park Facebook page. They are posting nature videos and crafts weekly!
- Watch & Do: "Pelican Pete Story Time" & "Pelican Pete Craft"
    - What was Pete's favorite food? *fish*
    - What was it called when Pete cleaned his feathers? *Preening*
    - Do: The Pelican Pete Craft
        - Name your pelican!

Oysters section:

- Watch: "Oyster Display at Down East Earth Day"
    - What other animals were in the oyster tanks? *Hermit crab, shrimp*
    - What was different about the tank with the oysters vs. the one without oysters? *The tank with oysters was cleaner because the oysters had filtered/cleaned the water. The tank without oysters was still dirty. Oysters help clean our waterways!*
- Watch & Do: "Oyster Story Time" and craft
    - How did Chester and Meredith oysters help save the water? *They told all of their oyster friends to help clean the water by filtering the water (breathing in the dirty water and breathing out clean water)*
    - Were the grasses sick at the end of the story? *No, the oysters helped to clean the water, healing the grasses.*
    - What were some other animals in the story? *Fish, Blue Crab, Heron, Turtles*

Estuaries and Living Shorelines section:

- Optional: Print "Salt Marsh Data Sheet" and have students circle any animals or plants they see while watching the videos below.
- Watch: "Waters of Life" and "Aqua Kids visit the Rachel Carson Reserve"
    - What are some animals found in an estuary? *Plumed worms, mud snails, fiddler crabs, birds, diamondback terrapins, fish, shrimp etc.*
- Watch: "Living Shoreline Life"
    - What kinds of animals can live in a living shoreline? *Fish, shrimp, crabs, snails, worms etc.*
    - What did the spider crab do to help it blend in or *camouflage* with its surroundings (what did it do to help it look more like the nature around it)? *It attached algae and shells to its back to help it look like the nature around it.*
- Do: "Living Shoreline Coloring Page"
- Do: "NC Coastal Reserve Estuary Coloring Book"

Marine Debris section:

- Watch: "Boys & Girls Club Public Service Announcement"
    - What are some ways we can help keep the water and beach clean? *Use reusable items, throw away or recycle trash items, do a cleanup.*
- Optional: Walk around your yard to collect and throw away any trash you may see. Download and use the Marine Debris Tracker App to record data on your findings. Be sure to practice safe social distancing and stay at least 6 feet away from others. Use the "Marine Quest- Turtle Trash Collectors" program to submit photos of trash you find for badges.

Grades 3rd-5th: Distance Learning Lab Guide (KEY)

On the Distance Learning Lab webpage, watch the videos and do the activities listed below. Answer the review questions after each video or activity. Be sure to ask an adult in your home for permission before doing any activities. Some activities require a printer or craft supplies, if you don't have those simply watch the videos instead.

Clean Water section:

- Watch: "Stormwater Demonstration at Southeast Office" and "Tour of New Hanover County Arboretum" videos.
    - Which squares did the best job of soaking up the rain water in the rain water demonstration video? *The squares with plants or permeable pavement (with pebbles).*
        - Which square did the worst job of absorbing the rain water? *The concrete block, all of the water was collecting at the top and picking up oil and grease from cars, trash, debris and pet waste that would flood into our waterways.*
- Watch: "Soak-Spread-Slow Stormwater Song" and "Freddy the Fish Teaches About Stormwater" videos.
    - What are some ways that rain water can become dirty before it enters a creek, river, or the ocean? *It can pick up bad things like pollutants, such as sediment, chemicals, extra nutrients, litter, and oil and can carry it to our waterways on roads and other hard surfaces.*
    - How can we help keep the water clean? *Use plants to soak up rain water like a sponge, rain barrels can help collect and spread out the rainwater, and rain gardens can slow down stormwater.*
- Do: "Slowing Down Stormwater Activity Sheet". Time how long it takes for them to complete the 3 mazes on the worksheet.
    - Pour some water in the sink and watch how quickly it moves to the drain. Next, pour some water onto a kitchen sponge.
        - Which surface that you poured water over would be like the maze with only the road? *The sink.*
        - Which surface you poured water over would be like the rain garden maze? *The sponge surface.*
        - How is the rain garden like a sponge? *Plants help to soak up the rain water like a sponge and keep it from riding on the road and other hard surfaces where it can become dirty water and enter the river, sound, or ocean.*
- Do: "A Crumpled Watershed Model" activity and questions.

Coastal Exploration & Investigations section:

- Watch: "Lady Swan Boat Tour"
    - Draw a picture of what you might see on a boat ride out to an island.
- Watch: Hammocks Beach State Park videos
    - Frogs and Toads, Seashells, Sea Turtles
    - What is something new you learned about the animals that live on our coast?

- Why is it important to take care of these animals and their homes? *A healthy coast connects us all. Each organism plays an important role in nature.*
- *For additional videos, check out the Hammocks Beach State Park Facebook page. They are posting nature videos and crafts weekly!

- Watch: Jennette's Pier Videos
  - Squid Dissection
    - What kind of animal is a squid? *Mollusk*
    - What do squid use their fins for? *To swim around*
    - What do squid like to eat? *Tiny squid, crabs, shrimp, fish etc.*
    - What do squid use their ink sac for? *To confuse predators so they can escape.*
  - Beach Explorations
    - What kinds of shells are common on NC beaches? *Whelks, moon snails, oysters, scallops, clams etc.*
    - What were some bivalves (2 shelled animals) they showed in the video? *Oysters, Clams, Scallops, Mussels*
    - What is a fulgurite? *Natural tubes made when lightning strikes the sand.*
    - Name your favorite seashell: _____
  - Plankton Investigations
    - Are plankton able to swim? *No, planktonic means to drift, and they go wherever the water takes them.*
    - What are the two types of plankton? *Phytoplankton (plant plankton) and Zooplankton (animal plankton)*
    - Why is plankton important? *Phytoplankton give us oxygen to breathe, and plankton is an important part of the food chain.*
- Watch & Do: Watch the "Marine Quest QuaranSTEAM" video, do experiments outlined. Have an adult in your home help with the 5 different experiments. If you do not have permission from an adult to do an activity, just watch the video.
  - What are water molecules made of up? *1 oxygen atom and 2 hydrogen atoms. H2O.*
  - What allowed the paper clip to stay on top of the water*? Surface Tension. The water is sticky because of hydrogen bonds and cohesion.*
  - Why is water considered the Universal Solvent? *It can dissolve more substances than any other solvent on our planet.*
  - What happened in the experiment when the fresh water flowed into the salty water? *The salt water sank to the bottom because it is denser.*
- Watch & Do: "Pelican Pete Story Time" & "Pelican Pete Craft"
  - What was Pete's favorite food? *fish*
  - What was it called when Pete cleaned his feathers? *Preening*
  - Do: The Pelican Pete Craft
    - Name your pelican!
  - Learn more about Brown Pelicans here:
    - https://nc.audubon.org/brown-pelican-3
    - https://www.coastalreview.org/2017/06/birding-banks-brown-pelicans/
    - https://www.allaboutbirds.org/guide/Brown_Pelican/id

- Beacon Island: https://www.nccoast.org/project/beacon-island/

Oysters section:

- Watch: "Oyster Display at Down East Earth Day"
  - What other animals were in the oyster tanks? *Hermit crab, shrimp*
  - What was different about the tank with the oysters vs. the one without the oysters? *The tank with oysters was cleaner because the oysters had filtered/cleaned the water. The tank without oysters was still dirty.*
- Watch & Do: "Oyster Story Time" and craft
  - How did Chester and Meredith oysters help save the water? *They told all of their oyster friends to help clean the water by filtering the water (breathing in the dirty water and breathing out clean water)*
  - Were the grasses sick at the end of the story? *No, the oysters had helped to clean the water, healing the grasses.*
  - What were some other animals in the story? *Fish, Blue Crab, Heron, Turtles*

Estuaries and Living Shorelines section:

- Do: Print "Salt Marsh Data Sheet" and circle any animals or plants you see while watching the videos below.
  - Watch: "Waters of Life" and "Aqua Kids visit the Rachel Carson Reserve"
    - Why are estuaries so important? *They serve as buffers from storms, are filters, and are as nurseries for finfish and shellfish.*
    - What are some animals found in an estuary? *Plumed worms, mud snails, fiddler crabs, birds, diamondback terrapins, fish, shrimp etc.*
    - What is brackish water? *A mixture of fresh and salt water.*
    - Which plant did the Aqua Kids eat in the salt marsh? *Pickle weed/Glasswort.*
- Watch: "Living Shoreline Construction at Trinity Center" and "Living Shoreline Life"
  - What is a living shoreline? *A way to protect shorelines from erosion that works with nature and provides habitat.*
  - What did they use to build a living shoreline in the video at Trinity Center? *Recycled oyster shells*
  - Why did they use recycled oyster shells? *They help to slow down erosion, and baby oysters, called Spat, attach to the old shells and a new living oyster reef forms.*
  - What kinds of animals can live in a living shoreline? *Fish, shrimp, crabs, snails, worms etc.*
- Do: Living Shoreline Coloring Page
- Do: NC Coastal Reserve Estuary Coloring Book
- Do: NC Coastal Reserve- Estuary Activity Book
- Do: Estuary Escapades Activity Pages
  - What is an estuary? *A coastal ecosystem where fresh water from rivers meet salty water from the sea.*

Marine Debris section:

- Watch: NOAA Marine Debris Program videos
    - What is Marine Debris? *Trash and other objects that end up in the ocean or coastal environments.*
    - What are some impacts of marine debris? *Marine animals can mistake marine debris for food or become entangled in it. Marine debris can also cause habitat damage and hurt the economy.*
    - What are some things we can do to reduce marine debris? *Prevention: reduce, reuse, recycle. Use reusable shopping bags and bottles. Join a cleanup.*
- Watch & Do: "Rubber Band Game"
    - Did you escape from the marine debris?
    - Can animals who are entangled in marine debris still be affected even if they escape? *Yes*
        - How so? *They may have used up a lot of energy to escape and are not able to search for food as easily or hide from predators. They may be injured.*
- Watch: "Crab Pot Videos"
    - Why are abandoned crab pots dangerous to wildlife? *They can continue to catch crabs and other animals who get trapped and die in the abandoned pots.*
    - Why did the watermen want to help remove the crab pots? *To keep the waters clean and protect the natural resource which they depend on to make a living.*
- Watch: Boys & Girls Club Public Service Announcement
    - What are some ways we can help keep the water and beach clean? *Use reusable items, throw away or recycle trash items, do a cleanup.*
- Optional: Walk around your yard to collect and throw away any trash you may see. Download and use the Marine Debris Tracker App to record data on your findings. Be sure to practice safe social distancing and stay at least 6 feet away from others. Use the "Marine Quest- Turtle Trash Collectors" program to submit photos of trash you find for badges.

Grades 6th-8th: Distance Learning Lab Guide (KEY)

On the Distance Learning Lab webpage, watch the videos and do the activities listed below. Answer the review questions after each video or activity. Be sure to ask an adult in your home for permission before doing any activities. Some activities require a printer or craft supplies, if you don't have those simply watch the videos instead.

Clean Water section:

- Watch: "Tour of SE Office" and "Tour of New Hanover County Arboretum"
    - How does a rain garden help protect local waterways? *It catches and infiltrates rain water slowly into the ground instead of allowing it to flow and become polluted stormwater runoff.*
    - What kind of plants are in the rain gardens? *Native plants such as bald cypress tree, dwarf palmetto, and pink muhly grass.*
- Watch: "North River Wetlands Preserve Drone Footage"
    - How has the conversion of farm fields back into forested freshwater wetlands, creeks, and saltmarsh helped to protect water quality in surrounding waterways? *The wetlands now filter and absorb runoff from neighboring lands, and help to hold rainwater on the property so that it doesn't become polluted runoff.*
- Watch: "Reduce Runoff: Slow It Down, Spread It Out, Soak It In"
    - What is a rain garden? *Small depression garden that catches runoff and retains water rather than letting it run off of the site. They mimic nature and allow water to soak into the ground.*
    - What is a rain barrel? *A barrel that hooks up to the rain gutter on a building and collects water during a rain storm that can be used later to water plants in your yard.*
- Do: Look through the "Walk the Loop for Clean Water" webpage.
    - What is the #1 polluter of coastal creeks and sounds? *Stormwater runoff.*
    - Watch the videos under Station 1: "How to build a rain garden", "How to install rain barrels" and ""Pervious pavement in action".
        - What are some benefits to building a rain garden? *Rain gardens help remove pollutants from stormwater, slow down water flow, provide habitats for insects and birds, help reduce flooding, and make your property more attractive.*
        - What can you use the water in a rain barrel for? *Outdoor water use, such as watering plants and washing cars.*
        - Did the permeable pavement absorb the rain water quickly? *Yes, after someone threw a trashcan full of water on the pavement it soaked it up very quickly.*
- Do: Slowing Down Stormwater Activity Sheet. Time how long it takes for them to complete the 3 mazes on the worksheet.
    - Pour some water in the sink and watch how quickly it moves to the drain. Next, pour some water onto a kitchen sponge.
        - Which surface that you poured water over would be like the maze with only the road? *The sink.*
        - Which surface you poured water over would be like the rain garden maze? *The sponge surface.*

        - How is the rain garden like a sponge? *Plants help to soak up the rain water like a sponge and keep it from riding on the road and other hard surfaces where it can become dirty water and enter the river, sound, or ocean.*
- Do: A Crumpled Watershed Model activity and questions.
- Do: Look through the SmartYards publication.
    - What are some ways we can help reduce polluted stormwater in our yards? *Build a rain garden or backyard wetland, reroute your downspout, use a rain barrel, plant native plants, use permeable pavement, build a living shoreline if you live along the sound.*
    - Are there any methods in the publication that you use at your home or would like to use in the future?

Coastal Exploration & Investigations section:

- Watch: Lady Swan Boat Tour
    - Draw a picture of what you might see on a boat ride out to an island.
- Watch: Hammocks Beach State Park videos
    - Frogs and Toads, Seashells, Sea Turtles
    - What is something new you learned about the animals that live on our coast?
    - Why is it important to take care of these animals and their homes? *A healthy coast connects us all. Each organism plays an important role in nature.*
    - *For additional videos, check out the Hammocks Beach State Park Facebook page. They are posting nature videos and crafts weekly!
- Watch: Jennette's Pier Videos
    - Squid Dissection
        - What kind of animal is a squid? *Mollusk*
        - What do squid use their fins for? *To swim around*
        - What do squid like to eat? *Tiny squid, crabs, shrimp, fish etc.*
        - What do squid use their ink sac for? *To confuse predators so they can escape.*
    - Beach Explorations
        - What kinds of shells are common on NC beaches? *Whelks, moon snails, oysters, scallops, clams etc.*
        - What were some bivalves (2 shelled animals) they showed in the video? *Oysters, Clams, Scallops, Mussels*
        - What is a fulgurite? *Natural tubes made when lightning strikes the sand.*
        - Name your favorite seashell: _____
    - Plankton Investigations
        - Are plankton able to swim? *No, planktonic means to drift, and they go wherever the water takes them.*
        - What are the two types of plankton? *Phytoplankton (plant plankton) and Zooplankton (animal plankton)*
        - Why is plankton important? *Phytoplankton give us oxygen to breathe, and plankton is an important part of the food chain.*

- Watch & Do: Watch the "Marine Quest QuaranSTEAM" video, do experiments outlined. Have an adult in your home help with the 5 different experiments. If you do not have permission from an adult to do an activity, just watch the video.
    - What are water molecules made of up? *1 oxygen atom and 2 hydrogen atoms. H_2O.*
    - What allowed the paper clip to stay on top of the water? *Surface Tension. The water is sticky because of hydrogen bonds and cohesion.*
    - Why is water considered the Universal Solvent? *It can dissolve more substances than any other solvent on our planet.*
    - What happened in the experiment when the fresh water flowed into the salty water? *The salt water sank to the bottom because it is denser.*
- Watch: "N.C. Sea Grant Beachcombing Program"
    - How many shells does a bivalve have? *Two*
    - How do many marine snails use their operculum? *They use it like a trap door to protect themselves from predators. Operculum means little lid.*
    - What are some different types of crabs you may find on N.C. beaches? *Blue Crab, Spider Crab, Purse Crab (this is just a few that were mentioned, there are many others as well).*
    - What are sea beans? *Seeds from tropical plants that have washed up on the beach.*

Oysters section:

- Watch: "Oyster Display at Down East Earth Day"
    - What other animals were in the oyster tanks? *Hermit crab, shrimp*
    - What was different about the tank with the oysters vs. the one without the oysters? *The tank with oysters was cleaner because the oysters had filtered/cleaned the water. The tank without oysters was still dirty.*
- Watch: Oyster Shell Bagging Video
    - How many gallons of water can one oyster filter in a day? *Up to 50 gallons a day!*
- Watch: UNC-TV- Oyster Farming Video
    - What do oysters feed on? *Phytoplankton*
    - Why are oysters important? *They provide food and habitat. They also filter the water, and contribute to better water quality. Important for the coastal economy and mariculture business.*
- Do: Visit www.ncoysters.org and check out their educational page for more oyster related activities.

Estuaries and Living Shorelines section:

- Do: Print "Salt Marsh Data Sheet" and circle any animals or plants you see while watching the videos below.
    - Watch: "Estuaries!: Exploring NC-Edge of Life", "Waters of Life" and "Aqua Kids visit the Rachel Carson Reserve".
        - Why are estuaries so important? *They serve as buffers from storms, are filters, and are as nurseries for finfish and shellfish.*
        - What are some animals found in an estuary? *Plumed worms, mud snails, fiddler crabs, birds, diamondback terrapins, fish, shrimp etc.*

        - What is brackish water? *A mixture of fresh and salt water.*
        - Which plant did the Aqua Kids eat in the salt marsh? *Pickle weed/Glasswort.*
- Watch: "UNC-TV Living Shorelines", "Living Shoreline Construction at Trinity Center", "Moor Shore Rd. Living Shoreline", "Steepy Interview" and "Living Shoreline Life" videos.
    - What is a living shoreline? *A way to protect shorelines from erosion that works with nature and provides habitat.*
    - What did they use to build a living shoreline in the video at Trinity Center? *Recycled oyster shells.*
    - Why did they use recycled oyster shells? *They help to slow down erosion, and baby oysters, called spat, attach to the old shells and a new living oyster reef forms.*
    - What kinds of animals can live in a living shoreline? *Fish, shrimp, crabs, snails, worms etc.*
- Do: "Estuary Escapades Activity" Pages
    - What is an estuary? *A coastal ecosystem where fresh water from rivers meet salty water from the sea.*
- Do: "NC Coastal Reserve- Estuary Activity Book"

Marine Debris section:

- Watch: NOAA Marine Debris Program videos
    - What is Marine Debris? *Trash and other objects that end up in the ocean or coastal environments.*
    - What are some impacts of marine debris? *Marine animals can mistake marine debris for food or become entangled in it. Marine debris can also cause habitat damage and hurt the economy.*
    - What are some things we can do to reduce marine debris? *Prevention: reduce, reuse, recycle. Use reusable shopping bags and bottles. Join a cleanup.*
- Watch & Do: "Rubber Band Game"
    - Did you escape from the marine debris?
    - Can animals who are entangled in marine debris still be affected even if they escape? *Yes*
        - How so? *They may have used up a lot of energy to escape and are not able to search for food as easily or hide from predators. They may be injured.*
- Watch: "Crab Pot Videos"
    - Why are abandoned crab pots dangerous to wildlife? *They can continue to catch crabs and other animals who get trapped and die in the abandoned pots.*
    - Why did the watermen want to help remove the crab pots? *To keep the waters clean and protect the natural resource which they depend on to make a living.*
- Watch: "Boys & Girls Club Public Service Announcement"
    - What are some ways we can help keep the water and beach clean? *Use reusable items, throw away or recycle trash items, do a cleanup.*
- Optional: Walk around your yard to collect and throw away any trash you may see. Download and use the Marine Debris Tracker App to record data on your findings. Be sure to practice safe social distancing and stay at least 6 feet away from others. Use the "Marine Quest- Turtle Trash Collectors" program to submit photos of trash you find for badges.

Grades 9th - Adult: Distance Learning Lab Guide (KEY)

On the Distance Learning Lab webpage, watch the videos and do the activities listed below. Answer the review questions after each video or activity. Some activities require a printer or craft supplies, if you don't have those simply watch the videos instead.

Clean Water section:

- Watch: "Tour of SE Office" and "Tour of New Hanover County Arboretum"
    - How does a rain garden help protect local waterways? *It catches and infiltrates rain water slowly into the ground instead of allowing it to flow and become polluted stormwater runoff.*
    - What kind of plants are in the rain gardens? *Native plants such as bald cypress tree, dwarf palmetto, and pink muhly grass.*
- Watch: "North River Wetlands Preserve Drone Footage"
    - How has the conversion of farm fields back into forested freshwater wetlands, creeks, and saltmarsh helped to protect water quality in surrounding waterways? *The wetlands now filter and absorb runoff from neighboring lands, and help to hold rainwater on the property so that it doesn't become polluted runoff.*
- Watch: "Reduce Runoff: Slow It Down, Spread It Out, Soak It In"
    - What is a rain garden? *Small depression garden that catches runoff and retains water rather than letting it run off of the site. They mimic nature and allow water to soak into the ground.*
    - What is a rain barrel? *A barrel that hooks up to the rain gutter on a building and collects water during a rain storm that can be used later to water plants in your yard.*
- Do: Look through the "Walk the Loop for Clean Water" webpage.
    - What is the #1 polluter of coastal creeks and sounds? *Stormwater runoff*
    - Watch the videos in the Station 1 section, "How to build a rain garden", "How to install rain barrels" and ""Pervious pavement in action"
        - What are some benefits to building a rain garden? *Rain gardens help remove pollutants from strormwater, slow down water flow, provide habitats for insects and birds, help reduce flooding, and make your property more attractive.*
        - What can you use the water in a rain barrel for? *Outdoor water use, such as watering plants and washing cars.*
        - Did the permeable pavement absorb the rain water quickly? *Yes, after someone threw a trashcan full of water on the pavement it soaked it up very quickly.*
- Do: "A Crumpled Watershed Model" activity and questions.
- Do: Look through the "SmartYards" publication.
    - What are some ways we can help reduce polluted stormwater in our yards? *Build a rain garden or backyard wetland, reroute your downspout, use a rain barrel, plant native plants, use permeable pavement, build a living shoreline if you live along the sound.*
    - Are there any methods in the publication that you use at your home?

Coastal Exploration & Investigations section:

- Watch: “Lady Swan Boat Tour”
- Watch: Hammocks Beach State Park videos
    - “Frogs and Toads”, “Seashells”, “Sea Turtles”
    - What is something new you learned about the animals that live on our coast?
    - Why is it important to take care of these animals and their homes? *A healthy coast connects us all. Each organism plays an important role in nature.*
    - *For additional videos, check out the Hammocks Beach State Park Facebook page. They are posting nature videos and crafts weekly!
- Watch: Jennette’s Pier Videos
    - Squid Dissection
        - What kind of animal is a squid? *Mollusk*
        - What do squid use their fins for? *To swim around*
        - What do squid like to eat? *Tiny squid, crabs, shrimp, fish etc.*
        - What do squid use their ink sac for? *To confuse predators so they can escape.*
    - Beach Explorations
        - What kinds of shells are common on NC beaches? *Whelks, moon snails, oysters, scallops, clams etc.*
        - What were some bivalves (2 shelled animals) they showed in the video? *Oysters, Clams, Scallops, Mussels*
        - What is a fulgurite? *Natural tubes made when lightning strikes the sand.*
        - Name your favorite seashell: _____
    - Plankton Investigations
        - Are plankton able to swim? *No, planktonic means to drift, and they go wherever the water takes them.*
        - What are the two types of plankton? *Phytoplankton (plant plankton) and Zooplankton (animal plankton)*
        - Why is plankton important? *Phytoplankton give us oxygen to breathe, and plankton is an important part of the food chain.*
- Watch & Do: Watch the “Marine Quest QuaranSTEAM” video, and do the experiments outlined. Have an adult in your home help with the 5 different experiments. If you do not have permission from an adult to do an activity, just watch the video.
    - What are water molecules made of up? *1 oxygen atom and 2 hydrogen atoms. H2O.*
    - What allowed the paper clip to stay on top of the water? *Surface Tension. The water is sticky because of hydrogen bonds and cohesion.*
    - Why is water considered the Universal Solvent? *It can dissolve more substances than any other solvent on our planet.*
    - What happened in the experiment when the fresh water flowed into the salty water? *The salt water sinks to the bottom because it is denser.*
- Watch: “N.C. Sea Grant Beachcombing Program”
    - How many shells does a bivalve have? *Two*

- How do many marine snails use their operculum? *They use it like a trap door to protect themselves from predators. Operculum means little lid.*
- What are some different types of crabs you may find on NC beaches? *Blue Crab, Spider Crab, Purse Crab (this is just a few that were mentioned, there are many others as well).*
- What are sea beans? *Seeds from tropical plants that have washed up on the beach.*

Oysters section:

- Watch: "Oyster Display at Down East Earth Day"
  - What was different about the tank with the oysters vs. the one without the oysters? *The tank with oysters was cleaner because the oysters had filtered/cleaned the water. The tank without oysters was still dirty.*
- Watch: "Oyster Shell Bagging" Video
  - How many gallons of water can one oyster filter in a day? *Up to 50 gallons a day!*
- Watch: "UNC-TV- Oyster Farming" Video
  - What do oysters feed on? *Phytoplankton*
  - Why are oysters important? *They provide food and habitat. They also filter the water, and contribute to better water quality. Important for the coastal economy and mariculture business.*
- Do: Visit www.ncoysters.org and check out their educational page for more oyster related activities.

Estuaries and Living Shorelines section:

- Do: Print "Salt Marsh Data Sheet" and circle any animals or plants you see while watching the videos below.
  - Watch: "Estuaries!: Exploring NC-Edge of Life", "Waters of Life" and "Aqua Kids visit the Rachel Carson Reserve"
    - Why are estuaries so important? *They serve as buffers from storms, are filters, and serve as nurseries for finfish and shellfish.*
    - What are some animals found in an estuary? *Plumed worms, mud snails, fiddler crabs, birds, diamondback terrapins, fish, shrimp etc.*
    - What is brackish water? *A mixture of fresh and salt water.*
    - Which plant did the Aqua Kids eat in the salt marsh? *Pickle weed/Glasswort*
- Watch: "UNC-TV Living Shorelines", "Living Shoreline Construction at Trinity Center", "Moor Shore Rd. Living Shoreline", "Steepy Interview" and "Living Shoreline Life" videos
  - What is a living shoreline? *A way to protect shorelines from erosion that works with nature and provides habitat.*
  - What did they use to build a living shoreline in the video at Trinity Center? *Recycled oyster shells.*
  - Why did they use recycled oyster shells? *They help to slow down erosion, and baby oysters, called spat, attach to the old shells and a new living oyster reef forms.*
  - What kinds of animals can live in a living shoreline? *Fish, shrimp, crabs, snails, worms etc.*
- Do: Visit www.livingshorelinesacademy.org

- For more background on living shorelines complete the learning modules under the "Learn" tab of the webpage. You can choose to learn from a homeowner or contractor perspective.

Marine Debris section:

- Watch: NOAA Marine Debris Program videos
  - What is Marine Debris? *Trash and other objects that end up in the ocean and coastal environments.*
  - What are some impacts of marine debris? *Marine animals can mistake marine debris for food or become entangled in it. Marine debris can also cause habitat damage and hurts the economy.*
  - What are some things we can do to reduce marine debris? *Prevention: reduce, reuse, recycle. Use reusable shopping bags and bottles. Join a cleanup.*
- Watch & Do: "Rubber Band Game"
  - Did you escape from the marine debris?
  - Can animals who are entangled in marine debris still be affected even if they escape? *Yes.*
    - How so? *They may have used up a lot of energy to escape and are not able to search for food as easily or hide from predators. They may be injured.*
- Watch: "Crab Pot Videos"
  - Why are abandoned crab pots dangerous to wildlife? *They can continue to catch crabs and other animals who get trapped and die in the abandoned pots.*
  - Why did the watermen want to help remove the crab pots? *To keep the waters clean and protect the natural resource which they depend on to make a living.*
- Do: Look through the "NC Marine Debris Strategic Plan" document
  - What are the main goals laid out in the plan? *Lead and Coordinate marine debris reduction efforts, Prevent marine debris, Remove marine debris, Prevent and Remove Abandoned and Derelict Vessels, Research and Assessment efforts.*
  - What are some ways that you can become involved in reducing marine debris along our coast? *Participate in shoreline cleanup efforts, share information on the threats of marine debris with friends and family, properly dispose of your trash, reduce your use of single use plastics etc.*
- Optional: Walk around your yard to collect and throw away any trash you may see. Download and use the Marine Debris Tracker App to record data on your findings. Be sure to practice safe social distancing and stay at least 6 feet away from others. Use the "Marine Quest- Turtle Trash Collectors" program to submit photos of trash you find for badges.