



# *Sea Turtle Science*

## *An Educator's Guide*

**Grades:** 3-6

**Program Description:** This guide provided by the Oklahoma Aquarium will go over the characteristics that all reptiles share, the different types of turtles, the seven different species of sea turtle, sea turtle diets, threats to sea turtles and conservation efforts.

**\*Before your class visits the Oklahoma Aquarium\***

This guide contains information and activities for you to use both before and after your visit to the Oklahoma Aquarium. You may want to read stories about sea turtles and other reptiles to the students, present information in class, or utilize some of the activities from this booklet.

# *Sea Turtle Science*

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# *Sea Turtle Science*: Abstract

The seven remaining species of sea turtles are some of the most prehistoric animals on the planet. Sea turtles have roamed our seas since before the time of the dinosaurs and have remained virtually unchanged for the past 100 million years.

Sea Turtles are a reptile just like an alligator or snake. They breathe air, lay eggs and are ectothermic. Ectothermic is often called “cold blooded” but really their blood is not cold, they just regulate their internal temperature with their external world.

Six species of sea turtle are listed as endangered by the Endangered Species Act. The remaining seventh species, the flatback, does not have enough data to list their status. Sea turtle survival is threatened for many reasons, first and foremost is the loss of nesting beaches. Most sea turtles do not reach maturity for 35 years. When it is time to lay their eggs on the beach, female turtles will only return to their natal beach or the beach they were born on to lay those eggs. A lot can change on a beach in 35 years, condos, lights, roads and lots of people. Once hatchlings do hatch, unfortunately they often travel toward lights and roads instead of the ocean. Only 1 in 1000 sea turtles survives to adulthood and those who survive are then faced with other threats such as the pollution and trash in our oceans.

There are many conservation efforts in place to try and conserve such a primitive and fascinating animal. So as dire as the plight of the sea turtle may be, it is not hopeless; there are many things we all can do to help conserve this species as well as protecting their habitat.

# *Sea Turtle Science*: Educator Information

## What is a reptile?

All reptiles have certain characteristics that they all share; reptiles breathe air, are vertebrates, have scales, lay eggs and are ectothermic. Another name people often use for ectothermic is cold blooded. Reptiles don't actually have cold blood, what makes them different from us is that the temperature of their blood is controlled by their surroundings instead of being controlled internally. Other reptiles are alligators and other crocodilians, snakes, lizards, turtles and tuataras.

## Turtles, Turtles, Turtles

There are three different types of turtles; they all have certain similarities such as: a head, tail, shell and four limbs. Unlike other turtles, sea turtles are not capable of pulling their head and limbs inside of their shell. There are three classifications of turtles. Terrapins have long claws, webbed feet and are good swimmers. Terrapins are found near bodies of fresh water. Tortoises are land turtles without claws that are built like tanks and unable to swim. Sea turtles have flippers instead of legs which allow them to glide gracefully through the water, sometimes up to 20 miles per hour.

All turtles share the same primary defense, their shell. The shell protects all of the turtles internal organs. The top or dorsal shell is called the carapace and the bottom or ventral shell is called the plastron. The portion of the shell where the carapace and plastron meet is called the bridge. Turtle shells have their ribs and vertebrae fused into the carapace. The entire shell is covered in modified scales which are called scutes. The scutes are made of keratin like our fingernails and cover the bony plates of the shell. The scutes will occasionally shed. The one sea turtle that is the exception to the normal turtle shell is the leatherback sea turtle. Their shell is composed of leathery, oil saturated connective tissue which covers many loosely connected bones. The oil helps leatherbacks to maintain some heat as they dive down to the cold depths of 3000 feet.

## Sea Turtles!

Sea turtles are perfectly adapted to their life in the water. All sea turtles live in a marine or saltwater environment. They almost never leave the water. The exception to this is when the females come ashore to lay her eggs. Green sea turtles are also known to beach themselves occasionally in order to get some sun!

All sea turtles have the somewhat unique practice of only nesting on their natal beach, the beach they hatched on. Most sea turtles become mature and ready to reproduce around 20-30 years, and travel 1000's of miles in order to go from their feeding grounds to nesting grounds.

Remember, sea turtles are reptiles and therefore must breathe air. They can stay underwater anywhere from 30 minutes to 5 hours but then must surface to get a breath.

Sea turtles have great underwater senses, they see very well underwater, but are near sighted when on land. Their eyes have an eye lid and a gland that allows them to secrete the salt that they ingest. Their ears have a single bone and are very good at detecting low frequencies, such as the surf pounding the shore. Sea turtles have an excellent sense of smell. They "breathe" water through their nose and expel the water out of their mouths; this allows them to locate food even in murky areas.

There are seven different species of sea turtles: leatherback, hawksbill, flatback, Kemp's ridley, olive ridley, green and loggerhead, and each one have a unique diet. The shape of their beak gives the best clue as to what each one eats. Most species of sea turtles have an omnivorous diet with the exception of the green turtle. Greens start their lives as omnivores, but around the age of 7 or 8 they switch to an herbivorous diet.

Like other reptiles, sea turtles have very long life spans, with some species reaching 150 years old.

## Leatherback Sea Turtle

The leatherback is the only extant species left in its genus, Dermochelyidae, and is the largest of all living turtles. Unlike other turtles, they do not have a hard shell, but instead many small, loosely interlocking bones which are covered in a leathery, oil saturated covering. This flexible shell is one of the adaptations that allow them to dive extremely deep, up to 3000+ feet, and to live in colder waters. Leatherbacks are very large, up to 2000 pounds, and their body contains a lot of fat which allows them to regulate their own temperature for a time. Their lungs are also able to collapse without harming the animal under the intense pressure of deep water. A leatherback's favorite food is jellyfish and they have "hooks" within their mouths and throats which allows them to hold onto the slippery jellyfish.

## Hawksbill Sea Turtle

The hawksbill is one of the smaller species of sea turtle. They were hunted almost to the point of extinction for their beautiful carapace. The products made from this carapace are called tortoiseshell. The hawksbill earns its name from its hooked bird like beak that allows them to get into the cracks and crevices of the coral reef to find its favorite food, sponges! Sponges are composed of silica or glass, so it is quite amazing that hawksbills can digest them. Eating sponges makes them an important member of the ecosystem, it allows the surrounding coral to thrive and grow.

## Loggerhead Sea Turtle

The loggerhead is the most abundant sea turtle in the United States. They are named for their very proportionally large heads which are often mistaken for logs floating in the water. They grow to 300-400 pounds, but an incredible individual was found that was 1000 pounds! Their large size and powerful jaws allow it to crush through its favorite foods, various shellfish such as conchs, crabs, mussels, oysters and other mollusks. Loggerheads are known to travel 10,000 miles between their nesting grounds and foraging grounds.

## Kemp's Ridley and Olive Ridley Sea Turtle

The Kemp's ridley is one of two species of ridley turtles which are the smallest of the sea turtles only reaching approximately 100 pounds. The Kemp's was named for Richard M. Kemp, a fisherman, who discovered the species in Florida. The ridley turtles are very unique in their nesting habits, they nest in an "arribada". Arribada is Spanish for the arrival. All the females will climb onto the beach at the same time to nest. Unfortunately this makes both the females and their eggs very vulnerable to predation from both people and animals waiting for them on the beach. The Kemp's ridley is one of the most endangered of the sea turtles. The olive ridley is considered to be the most abundant, even though their numbers have declined 50% since the 1960's.

## Flatback Sea Turtle

The flatback is the sea turtle with the smallest range, they only nest and breed in Australian waters. Flatbacks lay fewer eggs than the other species of sea turtles, but the eggs are larger. They will also nest year round, not just in the summer. They are a medium sized sea turtle reaching about 185 pounds and they have a varied diet. The females are susceptible to attacks from salt water crocodiles as they try to climb onto the beach to nest. The eggs are eaten by a variety of animals, including, dingos, sand monitor lizards, birds and pigs. The flatbacks have a better chance of reaching adulthood than other sea turtles, 1 in 100, instead of 1 in 1000 reach sexual maturity.

## Green Sea Turtle

Green sea turtles grow to be quite large, up to 500-600 pounds. Their diet is unique among sea turtles, they start life as omnivores and then around 7 or 8 they are primarily herbivorous. Greens spend their day grazing along sea grass beds. They spend so much time underwater that they must bask at the surface of the water to get all the sunlight they need to warm their bodies and get important vitamins! Green turtles earn their name not because of the color of their carapace, but because of the color of their fat. Green turtles were often a food staple on sailing ships before refrigeration, because they could survive for very long periods of time in the holds of ships.

## Sea Turtle Conservation

Unfortunately, all species except the flatback are listed on the endangered species list. Flatbacks are listed as data deficient, because they are the least studied sea turtle.

There are many dangers facing sea turtles, they have many natural predators when they are young. Turtle eggs and hatchlings are a delicacy to many predators, including humans! As adults their only real predators are sharks and humans. Sea turtles are often caught in fishing gear and are unable to surface for air and drown. There is so much plastic littering our oceans that sea turtles are ingesting it, sometimes thinking they are jellyfish. Their digestive system becomes clogged with the plastics and they can not digest their food and starve.

Loss of habitat is a major contributing factor to the decline in sea turtle numbers. Sea turtles will only nest on their natal beach; turtles can take up to 35 years to reach maturity. A lot can change on a beach in 35 years. Condos, lights, roads, tourists and erosion all contribute to making beaches poor for nesting. When the hatchlings first emerge from their nest, their instinct guides them to the sound of the surf and the brightest horizon, which because of the moon, has been the ocean for millions of years. Now there is often a road and lights right off the beach and the hatchlings head the wrong way.

What can we do? You are already taking a step in the right direction by learning about sea turtles. There are many conservation efforts already in place. Many places have made it illegal to interfere with turtles or their nests, organizations will fence off the nests and guard the hatchlings on their journey to the shore. The federal government has mandated the use of Turtle Excluder Devices (TED's) in shrimp nets. This is an opening in the shrimp net that allows the turtle to escape while containing the shrimp. However, the biggest thing that everyone can do is to recycle, dispose of your trash properly and reduce your use of plastics. Instead of using disposable grocery sack, cutlery and water bottles, use reusable products. Reducing the amount of plastics in the ocean is vitally important not just for sea turtles, but all of us who call this planet home!



## **Vocabulary:**

<b>Arribada</b>	the Spanish word for arrival, used to refer to a mass nesting by the two species of ridley sea turtles
<b>Carapace</b>	the dorsal or top shell in all turtle species
<b>Caruncle</b>	a temporary egg tooth (tooth like projection) that reptiles and birds use to help escape from their egg
<b>Crustacean</b>	a class of arthropods such as lobsters, shrimp and crabs that have hard shells and jointed, paired legs
<b>Dorsal</b>	the top or back side of an organism
<b>Ectothermic</b>	regulating body temperature by your surroundings sometimes called “cold blooded”.
<b>Endangered</b>	when a species is in danger of becoming extinct
<b>Estuary</b>	where fresh and salt water meet, usually where a river flows into the sea
<b>Extant</b>	still in existence; not extinct
<b>Extinct</b>	when the last of a species dies so there are no longer any individuals in existence
<b>Hatchling</b>	baby turtles that have just hatched from their egg
<b>Genus</b>	a grouping of species with similar characteristics
<b>Migration</b>	traveling from one area to another usually for food or mating
<b>Natal Beach</b>	the beach where a turtle hatches from its nest and then the females return to lay their own eggs
<b>Plastron</b>	the ventral or bottom shell in all turtle species
<b>Poachers</b>	humans that hunt animals illegally. Laws in the U.S. protect endangered and threatened animals from being hunted or killed
<b>Predators</b>	animals that hunt and eat other animals for food
<b>Sea Grass</b>	grass that grows under water, usually in a large area called a bed; a good source of food and habitat for many types of aquatic animals
<b>Scute</b>	the scales that cover a turtles shell

<b>Species</b>	a group of related organisms that are capable of reproducing
<b>Threatened</b>	at risk for becoming endangered and possibly headed towards extinction
<b>Turtle Excluder Device (TEDS)</b>	a device that allows turtles to escape from fishing nets in order to breathe while keeping the catch in the net
<b>Ventral</b>	the bottom or front side of an organism
<b>Vertebrate</b>	an animal that has a backbone

## Resources:

### *Internet Resources:*

<http://marinebio.org>

<http://www.museumwales.ac.uk/en/home/>

<http://www.nmfs.noaa.gov/>

<http://www.nationalgeographic.com/>

<http://www.seeturtles.org/>

### BOOKS and REFERENCES:

Safina, Carl. (2006) Voyage of the Sea Turtle: In Pursuit of the Earth's Last Dinosaur. Henry Holt and Company

Devaux, Brenard, and Brenard De Wetter. (2000) On the Trail of Sea Turtles. Barron's Educational Series, Inc.

Van Meter, Victoria. (1992) Florida's Sea Turtles. Florida Power & Light Company

## **PASS STANDARDS MET:**

All education programs and their accompanying materials at the Oklahoma Aquarium will meet several Oklahoma PASS objectives in various disciplines. The following list is not all inclusive.

## **SCIENCE**

### **Science Processes and Inquiry**

- (grade 1-6) Process Standard 1 – Observe and Measure
- (grade 1-6) Process Standard 2 – Classify
- (grade 1-5) Process Standard 3 – Experiment and Inquiry
- (grade 1-6) Process Standard 4 – Interpret and Communicate
- (grade 1, 4-6) Process Standard 5 – Inquiry

### **Life Science**

- (grade 1) Standard 2 – Characteristics and Basic Needs of Organisms
- (grade 2) Standard 2 – Life Cycles and Organisms
- (grade 3) Standard 2 – Characteristics and Basic Needs of Organisms and Environments
- (grade 5) Standard 2 – Organisms and Environments
- (grade 4) Standard 3 – Characteristics of Organisms
- (grade 6) Standard 3 – Structure and Function in Living Systems
- (grade 6) Standard 4 – Populations and Ecosystems

### **Earth/Space Science**

- (grade 1) Standard 3 – Changes of Earth and Sky
- (grade 2) Standard 3 – Properties and Changes of Earth and Sky
- (grade 3) Standard 3 – Properties of Earth Materials
- (grade 4) Standard 4 – Properties of Earth and Moon

## **Internet Activities**

### **The threatened and endangered specie game**

[http://www.nmfs.noaa.gov/pr/pdfs/education/kids\\_gameoflife.pdf](http://www.nmfs.noaa.gov/pr/pdfs/education/kids_gameoflife.pdf)

### **Sea Turtle Quiz**

[http://www.conserveturtles.org/pdf/education/SeaTurtleMigrationTrackingEducatorsGuide-5\\_SeaTurtleQuiz.pdf](http://www.conserveturtles.org/pdf/education/SeaTurtleMigrationTrackingEducatorsGuide-5_SeaTurtleQuiz.pdf)

### **Systems and Connecting**

[http://www.sprep.org/att/publication/000547\\_SeaTurtleKitWeb.pdf](http://www.sprep.org/att/publication/000547_SeaTurtleKitWeb.pdf) page 44

### **Species on the edge**

[http://www.nmfs.noaa.gov/pr/pdfs/education/kids\\_speciesonedge.pdf](http://www.nmfs.noaa.gov/pr/pdfs/education/kids_speciesonedge.pdf)

### **Sea turtle coloring book**

<http://www.seaturtle.org/documents/seaTurtleColoringBook.pdf>

### **“Sea Turtles” Coloring Book**

[http://www.widecast.org/Resources/Docs/Ocean\\_Conservancy\\_2003\\_Sea\\_Turtles\\_coloring\\_book.pdf](http://www.widecast.org/Resources/Docs/Ocean_Conservancy_2003_Sea_Turtles_coloring_book.pdf)

# Turtle Simulation

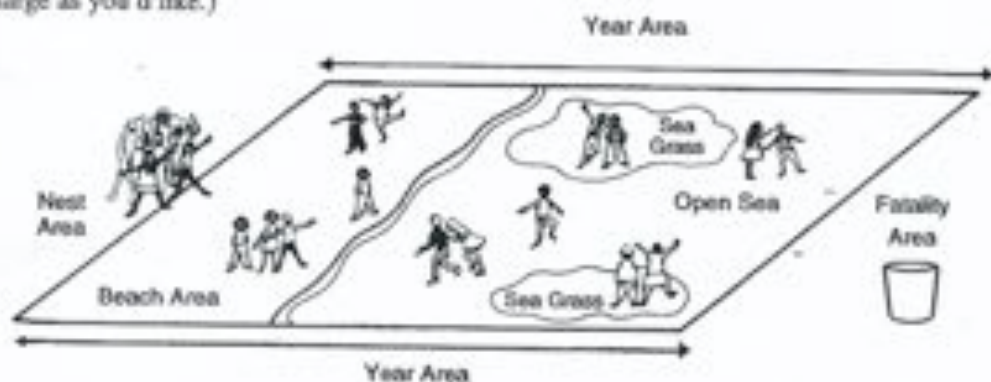
The turtle is the only reptile that has a shell. It has the ability to pull its head and legs into its shell for protection from predators. There are approximately 250 different species of turtles worldwide and more than 40 of those species are listed as endangered. In order for their continued survival, turtle conservation is essential. By participating in this turtle simulation, your students will realize just how difficult it is for turtles to survive.

## Materials

- several lengths of rope (enough to mark-off the playing field)
- approximately 1500 dried (uncooked) Navy beans
- plastic, self-sealing, sandwich-size bags (one per turtle)
- 2 packages of 3" x 5" (8 cm x 13 cm) index cards
- wearable signs (cardboard and string work well) that identify limiting factors: Predator, Hunters, Pollution, Habitat Loss, Food Shortage.
- area identification signs (cardboard, text-style signs work well): Year Area, Year Area, Nest Area, Beach Area, Open Sea, Sea Grass, Sea Grass
- empty bucket (fatality area)

## Directions

1. Using the rope, set up the playing field as shown. (Note: The game area can be made as small or as large as you'd like.)



2. Divide your class into two teams. Half of the students will role-play hatching turtles. Each hatching-turtle student represents 100 turtles, therefore give each student 100 Navy beans in a sealed, plastic bag. Have the hatching-turtles students stand in the Nest Area.
3. The remaining students will represent the Limiting Factors by wearing the prepared signs: Predator, Hunters, Pollution, Habitat Loss, and Food Shortage. (Note: Try to have half of the limiting factors be land-based, the other half sea-based.)
4. Explain to your students that this simulation is to demonstrate the hardships in the life cycle of sea turtles.

## Turtle Simulation (cont.)

### Directions (cont.)

5. Explain the playing field:

**Nest Area**—the area where the turtle eggs are laid and hatched. When the turtles are ten years old, they return, and once again, begin the egg-laying life cycle.

**Beach Area**—the area over which the baby turtles must cross to get into the open sea. This is often where newly born sea turtles lose their lives.

**Year Areas**—these areas are where the turtle-representing students need to go to get Growth Cards (index cards). They can only receive one Growth Card at a time. Also, they must travel in a back-and-forth pattern between the two Year Areas to receive their needed 10 Growth Cards (each card represents one year of growth). **Important Note:** Once a student has received 10 Year Cards, he or she needs to go back to the Nest Area to lay new eggs. When the student arrives in the Nest Area, he or she deserves a two-minute rest break. That student then receives an additional 100 Navy beans (baby turtles) and sets out once again to try and cross the Beach Area back into the Open Sea.

**Open Sea Area**—this is where the turtles live and roam for ten years until they have reached maturity and return to the nesting area.

**Sea Grass Areas**—these are the areas where turtles—four years and younger (students holding 0-4 Growth Cards)—can hide from predators for up to one minute.

**Fatality Area**—this is where the destroyed (tagged) turtles are laid to rest. If tagged, the turtle-representing student must give the limiting-factor student a pre-determined number of turtles (Navy beans):

- Tagged in Beach Area = 20 turtles
- Tagged in Open Sea Area (4 years or younger) = 10 turtles
- Tagged in Open Sea Area (5 years or older) = 2 turtles

6. Explain the game's rules:

- The turtles must survive the ever-present Limiting Factors. They are to try and pass by the Limiting Factors without being tagged. (**Note:** The students wearing the limiting-factor signs must stay within their pre-designated area. For example, a Beach-Area limiting factor student cannot enter the Open-Sea Area.)
- Limiting-factor students may not tag the same turtle-representing student twice in a row. After tagging four turtle-representing students, the limiting-factor student must deposit his or her collected destroyed turtles (Navy beans) into the Fatality Area (bucket). (**Note:** This student may not tag any turtles on his or her way to the Fatality Area.)
- Turtle-representing students that lose all 100 turtles (Navy beans) must go and sit by the Fatality bucket.

7. Explain the game's goal: The turtle-representing students' eggs are "hatched;" they then attempt to cross the beach area to go into the open sea, live there safely for ten years, then return to their nesting area to reproduce.

After the simulation experience has been conducted, take time to allow your students to summarize and share the feelings they experienced during the game. If possible, invite another class to play. Allow your students to be the facilitators and after-simulation discussion leaders.



# Learn to Be a Drain Brain!

































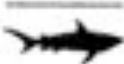







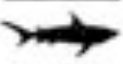




## Unlock the Secret Message and Discover How You Can Become a Drain Brain!

Have you ever wondered what those holes are at the edge of the sidewalk? They're called **storm drains** and they carry rain water off the street and into streams and rivers.

Soda bottles, paper cups, candy wrappers, cigarette butts and all of the trash in the street gets carried into storm drains with the rain water until it finally reaches the ocean and becomes debris.

Unlock the secret message by using the chart below to replace the shapes with the letters they match up with.

 = A	 = R
 = C	 = S
 = H	 = T
 = I	 = U
 = L	 = W
 = N	 = Y
 = O	
 = P	

(Answers on page 21)





# Sea Turtle Word Puzzle

To discover the secret message, fill in the definitions below and transfer the letters to the spaces in the grid with the corresponding number. All of the clues are based on sea turtles or threats to sea turtles. We have given you the first letter of each word.

	1	2	3	4	5	6
	7	8	9	10	11	12
13	14		15	16	17	18
19	20	21		22	23	24
	25	26	27	28		29
30	31	32		33	34	35
36	37	38	39	40		41
42		43	44	45	46	47
48	49	50	51		52	53
	54	55	56	57	58	59
60	61	62	63		64	65
66		67	68	69	70	71
72	73		74	75	76	77
78		79	80	81	82	

- D** — 56 45 29 48 66 3 64
- E** — — — 34 — — — 24
- E** 7 22 — 73 78 40 4 76 —
- H** 41 81 — — 21 — — 27 71
- L** 5 72 — 1 33 80 — — 68 19 —
- O** 52 — — 75 15 **R** 61 — 15 10 65 79
- V** — — 39 — — 53 38
- E** 14 — 31 — 82 — — — 62 — —
- F** 42 — — 37 — 12 —
- D** 38 30 69 —
- V** 17 **E** — — — — — 54 —  
and **E** — — 59 — — 7 **B** — — 50
- S** 28 14 — — —  
**I** — 23 — — 28 — 51
- H** 11 — — 48 — — 87 — — — — 60
- P** 28 — — — 2 70 — — 58
- D** 55 77 — — — — 18 — —
- E** 32 8 67 — 36 9 43 18 41 49

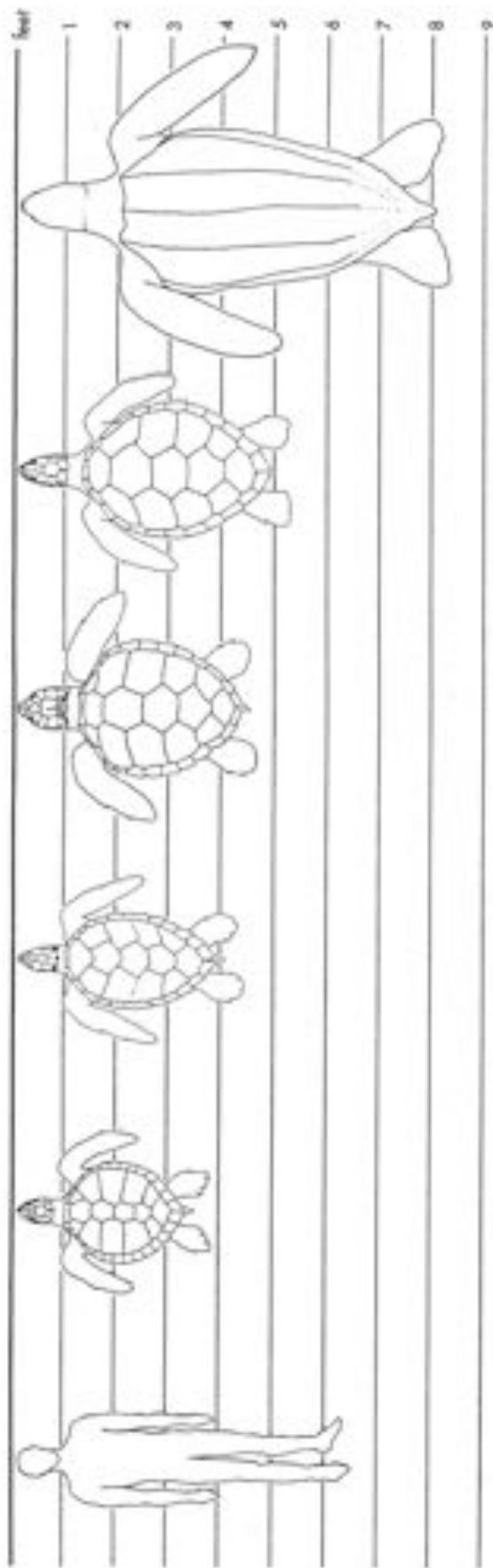
- Sea turtles have been on Earth for at least as long as these other prehistoric reptiles.
- The process of change through time that has made sea turtles the way they are today.
- The habitat sea turtles, and all the other creatures that sea turtles interact with, live in.
- The sea turtle species with the most beautiful shell.
- The largest sea turtle species.
- One of the sea turtle species that has a nesting behavior called "ambula".
- Animals, like sea turtles, that live in natural habitats.
- The natural world around us.
- The only beaches where sea turtles regularly nest in the United States are found in this state.
- Keep sea turtle hatchlings in the \_\_\_\_\_ to help them make it safely to the sea.
- These two kinds of birds like to catch and eat young sea turtle hatchlings.
- These boats catch, and accidentally drown, sea turtles in their nets.
- Using resources faster than they can be naturally reproduced (like poaching sea turtle eggs) is considered \_\_\_\_\_.
- Garbage in the sea (like floating balloons, which can look like jellyfish to sea turtles, and can block their intestines if eaten).
- These fishing devices are left to float out in the open ocean, and can kill sea turtles as well as other wildlife.
- What happens to endangered animals if they are not protected.

## Answers

1. Dinosaurs
2. Evolution
3. Ecosystem
4. Hawksbill
5. Leatherback
6. Olive Ridley
7. Wildlife
8. Environment
9. Florida
10. Dark
11. Vultures and Frigate Bird
12. Shrimp Trawlers
13. Unsustainable
14. Pollution
15. Driftnets
16. Extinction

*Turtle Excluder Devices  
can help save hundreds of  
thousands of endangered  
sea turtles every year.*

# Size Comparisons of Sea Turtles found in U.S. coastal waters



	Kemp's Ridley	Hawkbill	Loggerhead	Green	Leatherback
6' Human Adult for comparison	<p>average adult <b>2 ft. 90 lbs.</b></p> <p>average hatching <b>1<sup>3</sup>/<sub>4</sub> in. 6 oz.</b></p> <ul style="list-style-type: none"> <li>• smallest of all sea turtles</li> </ul>	<p>average adult <b>2.5 ft. 120 lbs.</b></p> <p>average hatching <b>1<sup>3</sup>/<sub>4</sub> in. 6 oz.</b></p> <ul style="list-style-type: none"> <li>• its beautiful shell is used to make "tortoiseshell" products</li> <li>• named for its hawk-like beak</li> </ul> 	<p>average adult <b>3 ft. 250 lbs.</b></p> <p>average hatching <b>1<sup>1</sup>/<sub>2</sub> - 2 in. 8 oz.</b></p> <ul style="list-style-type: none"> <li>• noted for its large head and thick neck</li> </ul>	<p>average adult <b>3.5 ft. 300 lbs.</b></p> <p>average hatching <b>1<sup>3</sup>/<sub>4</sub> - 2<sup>3</sup>/<sub>8</sub> in. 9 oz.</b></p> <ul style="list-style-type: none"> <li>• named for the green fat found under the shell, used for making "green turtle soup"</li> <li>• its shell color is actually brown or black</li> </ul>	<p>average adult <b>6 ft. 1100 lbs.</b></p> <p>average hatching <b>2 - 2<sup>1</sup>/<sub>4</sub> in. 14 oz.</b></p> <ul style="list-style-type: none"> <li>• has no shell, but a thick, "leathery" skin with 7 longitudinal ridges</li> <li>• largest leatherback known was nearly 9<sup>1</sup>/<sub>2</sub> feet long and 2000 lbs.</li> </ul>

average length of turtles is determined by carapace (the top shell), not nose to tail

 The truth... sea turtles migrate thousands of miles in a year!

## WORDSEARCH

See if you can find the words listed below in the WORDSEARCH. The words go up, down, across, diagonally, or backwards. Once you find all the words, think about what each has to do with sea turtles and efforts to protect them. Use your glossary to help you!

LOGGERHEAD	HAWKSBILL
KEMPS RIDLEY	OLIVE RIDLEY
HATCHLINGS	SEAGRASS
ENDANGERED	JELLYFISH
BEACH	SEA TURTLES
LIGHTS	SHORELINE
LEATHERBACK	PLASTRON
GREEN	CARAPACE
HABITAT	ESTUARY
POLLUTION	SCUTES
MIGRATE	POACHERS
NEST	PREDATORS

Can you find the mystery word?

S L E E I U I F D U L C N C D L  
 N O R S T A L P S R E Z P S H N C  
 E G V E T O N C S R A P H C N O  
 S H E B G O I L S H A R E W K S  
 T H E U E N T S E L E I R O S A  
 Y R A C A E I B P T V M E Y K P  
 I H L C D I R S I N G S C U N D  
 H A T C H I L P A I G H T A N G  
 I D E T A B R E A H T E P Y L G  
 K M S I G T H J K M S F J O J C  
 Y N U E M R T S F J O J C G E  
 W E M R T S F J O J C G E D D  
 E R S T A L P S R A P H C N O P  
 L O G V E T O N C S R A P H C N  
 S H E B G O I L S H A R E W K S  
 T H E U E N T S E L E I R O S A  
 Y R A C A E I B P T V M E Y K P  
 I H L C D I R S I N G S C U N D  
 H A T C H I L P A I G H T A N G  
 I D E T A B R E A H T E P Y L G  
 K M S I G T H J K M S F J O J C  
 Y N U E M R T S F J O J C G E  
 W E M R T S F J O J C G E D D




See if you can help the hatchlings find their way to the sea. They must make it to a healthy habitat in the ocean, where they will find plenty of food. Beware of all the threats on the beach and in the sea that might harm them.

Turtle Truth... Ancestors of today's sea turtles were giant land turtles that entered the sea when the dinosaurs lived.

# Draw Your Own Sea Turtle

1. Make an oval with a flat top.
2. Add a head. If you are making a loggerhead sea turtle, make the head **BIG**, like a log! If you are making a green sea turtle, the head will be smaller.
3. Add eyes.
4. Front flippers are next. Sea turtles cannot pull their legs and head into their shells, so there will be more forelimb (flipper) showing.
5. Next come the "scutes." Scutes are hard scales on the sea turtle's shell. Start with three hexagons (hexagons are six sided shapes)
6. Add line segments from your hexagons.
7. If you've done this part right, your turtle will have thirteen scutes. All sea turtles have scutes, except leatherbacks.
8. If you want to get fancy, you can add a band of smaller scales around the thirteen scutes. Your sea turtle will have "leathery" looking skin.
9. If you want a boy turtle, add a big tail, but if yours is a girl, the tail will just poke out a bit from under the shell.

 Turtle truth... Some females may nest many times in a season, laying hundreds and hundreds of eggs.

