



Lesson 3: Sea Turtle Evolution and Anatomy

Description: Students will design a timeline showing the relative timing of events in sea turtle history. They will complete a worksheet comparing sea turtle and human anatomy.

Objectives:

By the conclusion of the activities, students will

- Be able to create and place events on a timeline
- Be able to list similarities and differences between sea turtle and human anatomy
- Be able to explain the function of various organs in the body.

You will need:

- Copies of chapter 3, *Sea Turtle Evolution and Anatomy* for each student.
- Word wall words (3-14 to 3-17)—printed, cut out and laminated (if desired)
- Copies of worksheets for Activities 1 and 2 (pages 3-4 to 3-6 and 3-10 to 3-11) for each student
- 12” rulers (for Activity 1) for each student

Standards:

Florida Sunshine State Standards-

English Language Arts

- **LAFS.5.RI.2.4** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

Mathematics

- **MAFS.5.NBT.2.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- **MAFS.5.NBT.1.4** Use place value understanding to round decimals to any place.
- **MAFS.5.OAT.2.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

Science

- **SC.5.L.14.1** Identify the organs in the human body and describe their functions, including the skin, brain, heart, lungs, stomach, liver, intestines, pancreas, muscles and skeleton, reproductive organs, kidneys, bladder, and sensory organs.



Common Core Standards-
ELA/Literacy

- **RI.5.4** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

Mathematics

- **NBT.B.6.** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- **NBT.A.4** Use place value understanding to round decimals to any place.
- **OA.B.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

Vocabulary:

Ancestor: An animal in the past from which a modern animal developed.

Archelon: [ARR-keh-lon] A type of sea turtle that lived with the dinosaurs.

Fossil: The remains of a plant or animal from long ago preserved in earth or rock.

Extinct: A species that no longer exists.

Adaptation: Something that has changed to allow a plant or animal to survive in its environment.

Fused: Stuck or melted together.

Keratin: A type of protein that forms human hair and nails.

Esophagus: [ee-SOFF-a-guss] The tube that leads from the mouth through the throat to the stomach.

Papillae: Finger-like objects that stick out in a sea turtle's throat.

Navigate: To make one's way about, over, or through.

Procedure:

1. Add words for this lesson (3-14 to 3-17) to your sea turtle word wall. Review these words with students (see Vocabulary above for definitions).
2. Have students read "Sea Turtle Evolution and Anatomy" (Chapter 3 in *One in a Thousand: Those Amazing Sea Turtles*).

Activities:

There are two activities to accompany this lesson. Both activities are student-directed and involve students completing information on worksheets.



Activity 1: **Creating a Sea turtle Evolution Timeline** (pages 3-4 to 3-6). This activity is modified from *Tow the Line* from Newport Aquarium's *Educator's Guide to Sea Turtles*.

http://www.seaturtle.org/documents/Educators_Guide.pdf) Give each student a copy of the instructions, a blank sheet of letter-size paper, a ruler and a pencil. Have them create a timeline showing major events in sea turtle evolution.

Activity 2: **Comparing Sea Turtle and Human Anatomy** (pages 3-10 to 3-11). Give each student a copy of the worksheet. Have them follow the instructions to complete the worksheet.





Name: _____

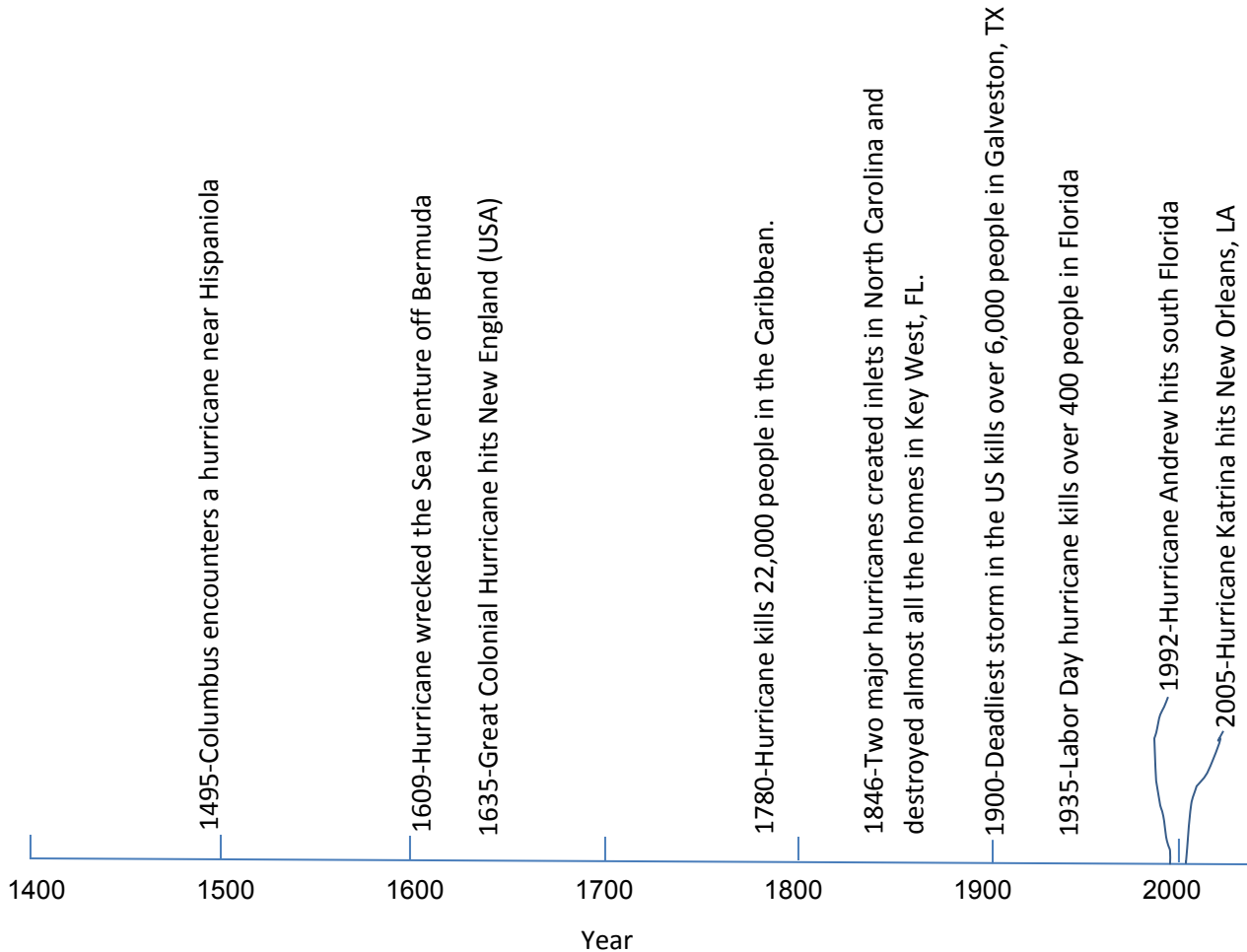
Creating a Sea Turtle Evolution Timeline

1. Use a ruler to draw a line that is 10 inches long on your blank sheet of paper. Make the line close to one of the edges of the piece of paper. Make small marks on the line at every inch, including at the very beginning and very end of the line.

Your line should look something like this (but longer and with more marks!):



2. Your line is a timeline that you will use to show when different events happened. For example, the timeline below shows information about major hurricanes. Notice that the dates are regularly spaced along the timeline.





3. You are going to create a timeline to show some major events in the Earth's history, including sea turtle history. You will need to decide what dates to put on your marks along the timeline. Look at the events listed below. Notice that these dates are millions of years ago. The oldest date has the largest number. The smallest number is the most recent date.

- a. What is the oldest date? _____
- b. What is the most recent date? _____

Events/Dates to include on timeline:

<u>Event</u>	<u>Date</u>
Ocean formed	3,800 million years ago
First vertebrate animals appeared	505 million years ago
First reptiles appeared	315 million years ago
First mammals appeared	220 million years ago
Jurassic period (age of dinosaurs) began	205 million years ago
Archelon lived	65 million years ago
Modern humans appeared	0.5 million years ago

4. Your timeline will need to have dates that include the oldest and most recent dates. Look at your earliest date (the biggest number). Round that date to the nearest thousand. What is that number?

_____ (A)

Write that number underneath the first mark on your timeline. (This is the mark at the left end of the line.) Write the words "Millions of years ago" underneath the timeline (leave enough room to fill in numbers at each mark).

How many marks are there that do not have numbers? _____ (B)

Divide the number on your timeline by the number of marks that do not have numbers (A/B).

Write your result here: _____ (C). This will be the number of (millions of) years between each of the marks on the timeline.



5. Start on the mark that is on the very right of the timeline. Write a zero under that mark.
6. Go one mark to the left of the zero mark. Write your value from step 4 (C) under that mark.
7. Move left to the next mark. The value of this mark will be $2 \times (C)$.
8. The next mark to the left will have a value of $3 \times (C)$.
9. Continue filling in the values for each of the marks on the timeline.
10. Now that you have the dates (in millions of years) marked on the timeline, you can figure out where to put each of the events. Some of the events might be very close together. You might need to write in small letters to fit them all on your timeline. Write the words so they are sideways to the timetable. You can turn the page to make it easier to write in this direction. You can also use lines to show where the event should fit on the timeline (look at Hurricane Andrew and Hurricane Katrina on the hurricane timeline).



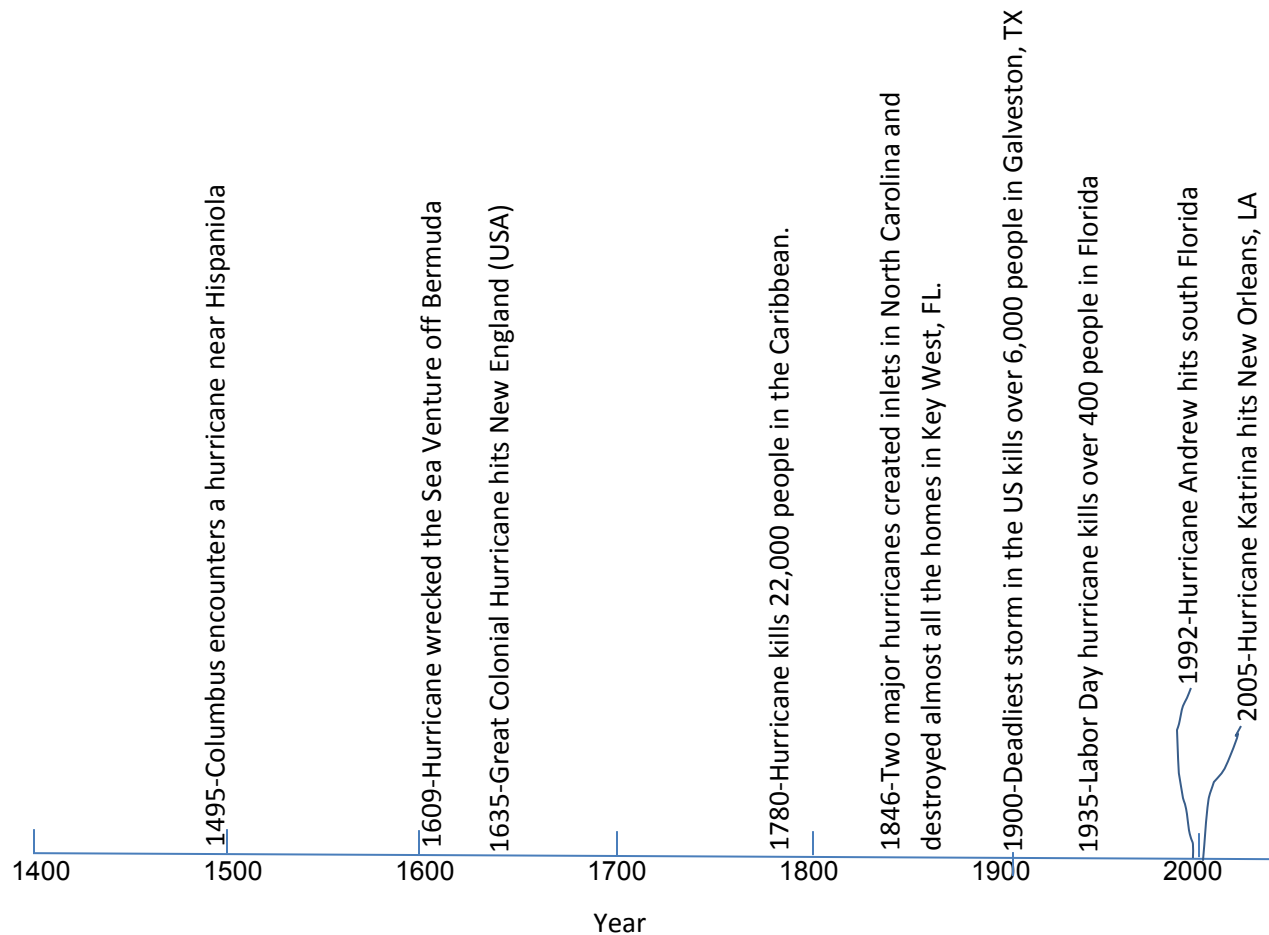
Creating a Sea Turtle Evolution Timeline Answers

1. Use a ruler to draw a line that is 10 inches long on your blank sheet of paper. Make the line close to one of the edges of the piece of paper. Make small marks on the line at every inch, including at the very beginning and very end of the line.

Your line should look something like this (but longer and with more marks!):



2. Your line is a timeline that you will use to show when different events happened. For example, the timeline below shows information about major hurricanes. Notice that the dates are regularly spaced along the timeline.



3. You are going to create a timeline to show some major events in the Earth's history, including sea turtle history. You will need to decide what dates to put on your marks along the timeline. Look at the events listed below. Notice that these dates are millions



of years ago. The oldest date has the largest number. The smallest number is the most recent date.

- a. What is the earliest date? 3,800 million years ago
- b. What is the most recent date? 0.5 million years ago

Events/Dates to include on timeline:

<u>Event</u>	<u>Date</u>
Ocean formed	3,800 million years ago
First vertebrate animals appeared	505 million years ago
First reptiles appeared	315 million years ago
First mammals appeared	220 million years ago
Jurassic period (age of dinosaurs) began	205 million years ago
Archelon lived	65 million years ago
Modern humans appeared	0.5 million years ago

4. Your timeline will need to have dates that include the oldest and most recent dates. Look at your earliest date (the biggest number). Round that date to the nearest thousand. What is that number?

4,000 (A)

Write that number underneath the first mark on your timeline. (This is the mark at the left end of the line.) Write the words “Millions of years ago” underneath the timeline (leave enough room to fill in numbers at each mark).

How many marks are there that do not have numbers? 10 (B)

Divide the number on your timeline by the number of marks that do not have numbers (A/B).

$$4,000/10 = 400$$

Write your result here: 400 (C). This will be the number of (millions of) years between each of the marks on the timeline.

5. Start on the mark that is on the very right of the timeline. Write a zero under that mark.
6. Go one mark to the left of the zero mark. Write your value from step 4 (C) under that mark.



7. Move left to the next mark. The value of this mark will be 2 X (C).
8. The next mark to the left will have a value of 3 x (C).
9. Continue filling in the values for each of the marks on the timeline.
10. Now that you have the dates (in millions of years) marked on the timeline, you can figure out where to put each of the events. Some of the events might be very close together. You might need to write in small letters to fit them all on your timeline. Write the words so they are sideways to the timetable. You can turn the page to make it easier to write in this direction. You can also use lines to show where the event should fit on the timeline (look at Hurricane Andrew and Hurricane Katrina on the hurricane timeline).

The final timeline should have values of (left to right) 4,000; 3,600; 3,200; 2,800; 2,400; 2,000; 1,600; 1,200; 800, 400 and 0 million years before present.



Comparing Sea Turtle and Human Anatomy

Are sea turtles and people alike or different? The answer could depend on what you are comparing.

Circle the correct answer:

1. Sea turtles are REPTILES MAMMALS AMPHIBIANS

2. Humans are REPTILES MAMMALS AMPHIBIANS

3. Do sea turtles have an internal skeleton (called an endoskeleton), an external skeleton (exoskeleton), or both? Write your response in a complete sentence.

4. What type of skeleton do humans have? Write your response in a complete sentence.

Sea turtles and people do not look at all alike on the outside. However, they do have many of the same body parts as humans.

5. Circle the name of the organ that pumps blood around the body (of both sea turtles and humans):

Heart

Liver

Pancreas

Kidneys

6. Circle the name of the organ that coordinates the body's senses:

Heart

Brain

Stomach

Liver

7. Circle **all** of the organs that help people (and sea turtles) digest food:

Skin

Heart

Stomach

Intestines

Pancreas

Liver



8. Let's compare the anatomy of a loggerhead sea turtle and a human. Place check marks (✓) in the columns to show if the body part is found in a loggerhead, a human, or both.

Body part	Loggerhead sea turtle	Human
Shell		
Skin		
Hair		
Eyes		
Mouth		
Ears		
Nostrils		
Arms		
Legs		
Flippers		
Tail		



Comparing Sea Turtle and Human Anatomy Answers

Are sea turtles and people alike or different? The answer could depend on what you are comparing.

Circle the correct answer:

1. Sea turtles are REPTILES MAMMALS AMPHIBIANS

2. Humans are REPTILES MAMMALS AMPHIBIANS

3. Do sea turtles have an internal skeleton (called an endoskeleton), an external skeleton (exoskeleton), or both? Write your response in a complete sentence.

Sea turtles have both an internal and external skeleton.

4. What type of skeleton do humans have? Write your response in a complete sentence.

Humans have internal skeletons.

Sea turtles and people do not look at all alike on the outside. However, they do have many of the same body parts as humans.

5. Circle the name of the organ that pumps blood around the body (of both sea turtles and humans):

Heart

Liver

Pancreas

Kidneys

6. Circle the name of the organ that coordinates the body's senses:

Heart

Brain

Stomach

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7. Circle all of the organs that help people (and sea turtles) digest food:

Skin

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8. Let's compare the anatomy of a loggerhead sea turtle and a human. Place check marks (✓) in the columns to show if the body part is found in a loggerhead, a human, or both.

Body part	Loggerhead sea turtle	Human
Shell	✓	
Skin	✓	✓
Hair		✓
Eyes	✓	✓
Mouth	✓	✓
Ears	✓	✓
Nostrils	✓	✓
Arms		✓
Legs		✓
Flippers	✓	
Tail	✓	

Ancestor

Archelon

Fossil

Extinct

Adaptation

Fused

Keratin

Esophagus

Papillae

Navigate