

Teacher's Guide for ODYSSEY

May/June 2012: The Secret Lives of Seahorses

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Teacher's Note:

This guide contains project ideas, short answer, extended response, fill-in, and true/false with correction. The variation is designed to have the students think critically, as well as to test their comprehension. An answer key to the short answer sections can be found at the end of the guide.

Extended Response: Comprehension & Critical Thinking

The questions below can be used as written, simply answered in complete sentences or easily transformed into longer essay (ELA) style questions, or even research topics. In any case, have the students support their answers with details from the text or use critical thinking skills to create a thorough and interesting answer. The questions, essays and projects have been aligned with the **Common Core Standards**. Consider the level of your students when deciding how to use the questions.

"The Seahorse: Nature's Trick Question" p. 6-9

1. Why does the seahorse appear to be a singularly unique thing, according to scientists?
2. What strategy does the article suggest for trying to categorize a unique animal?
Project: *Make 4 T-charts comparing and contrasting seahorses with a pony, a kangaroo, a monkey and an armadillo. Although a seahorse fits into none of these categories, which do you think it is most like? Why? Write a short paragraph explaining your answer.*
3. Explain the function of the 'swim bladder' in seahorses.
4. What criteria confirm that the seahorse is in the biological class, 'Osteichthyes'?
5. Why is the adaptation of the grasping tail supposedly necessary?
6. What is the purpose of the seahorse's 'coronet'?
7. How many species of seahorses are presently known?

"Swimming With Seahorses" p. 10-13

1. Why are seahorses so challenging to find underwater?
2. What are the positives and negatives of studying seahorses underwater?
3. Explain the relationship/courtship between male and female seahorses.
4. Explain the specialized habitat needs of seahorses.
5. What are the similarities between pipefish and seahorses?
6. Why are seahorse populations shrinking?
7. How does protecting seahorses ensure healthy oceans for the future?
8. What has Project Seahorse done to advocate for seahorses?
9. How are seahorses used medicinally in other countries?
10. What is 'aquaculture'?

"Save the Seagrass, Save the Seahorse" p. 14-16

1. What is it important to restore the quickly disappearing eelgrass?
2. Explain how eelgrass grows and why it is a good habitat for several marine species.
3. List at least 3 reasons that eelgrass is disappearing and write a few sentences explaining each.
4. Why is using seeds more efficient than transplanting healthy eelgrass plants?
5. The end of the article on page 16 lists some ways that you can help to prevent the loss of a crucial habitat for marine animals. Choose one way that is realistic for you and explain how you could help.

"When you Can't Seahorses" p. 17-19

1. Why are seahorses called the 'chameleons of the sea'?
2. Other than concealment, how do seahorses use color change during social interaction?
3. Define these terms: crypsis, blending, disruption and countershading.
4. What are chromatophores?
5. Other than color, what else do seahorses use to conceal themselves?
6. Explain 'parallel evolution' and how it refers to seahorses.

Creative Writing Project: Read the Seri Indian Legend, "How the Seahorse Came to Be" on pages 20-23. Legends were stories that were handed down from generation to generation, often to explain things that were unknown. Brainstorm some ideas of your own and create your own Legend of the Seahorse. Use details to support your legend and be sure to make it interesting to the reader.

"Inhaling Breakfast" p. 26-27

1. Describe the method that seahorses use to catch and eat their breakfast? What is it called?
2. What is a tendon and how is it used by seahorses in the feeding process?
3. What is so amazing about the feeding of newborn seahorses?
4. What is the survival rate for newborn seahorses?
5. What are some of the advantages of the S-shaped body of the seahorse?
6. Why do seahorses have to slurp food constantly during the day in order to stay alive?
7. How have scientists been able to study this whole feeding process in seahorses?

"Seahorse Nanny" p. 31-33

Read the article in its entirety and then fill in the blanks. Refer back to the text if necessary.

1. The London Zoo pioneered seawater aquariums back in _____, and today remains at the forefront of conservation.
2. A baby seahorse is called a _____.
3. Male seahorses get pregnant every few days with each birth producing from _____ to _____ live babies in a brooding pouch.
4. The death rate of a seahorse before reaching sexual maturity is _____ to _____ percent.

5. The day-to-day care of the babies that Sam Guillamet (the aquarist at The London Zoo) provides, includes careful feeding, as well as _____.
6. Courting is done by the _____ seahorses, who darkens their head and tail, and puffs out their pouch.
7. Seahorses mate for life, and each morning these couples hold _____ and gently float up and down the tank while *possibly* renewing their vows.
8. _____-bred seahorses can never be put back into the ocean.
9. The genus for the seahorse is _____, which means 'horse sea monster'.
10. The Hippocampus appears both in Greek and _____ mythology.

"Shining Light on Seahorses" p. 34-37

Kerrie O'Donnell estimates that more than 25 million seahorses are taken from the oceans each year. Included in that number are seahorses caught or killed as bycatch. She has taken a very 'humanitarian' approach in helping to solve this problem by getting to personally know the fishermen. In a well-written essay, explain why this has turned out to be a good strategy. Do you feel her plan will work better than a formal protest or ban? Why or why not?

"Riverhorses" p. 38-39

1. What is an estuary?
2. Describe the typical habitat of seahorses.
3. What is the primary reason that seahorses aren't normally found in rivers?
4. Explain the daily tidal flow of the Thames River.
5. Why does the Thames River seem to encourage diverse plant and animal species?
6. Explain what was happening in London in the mid-nineteenth century that made the Thames environmentally unsound.
7. Why was it such exciting news that seahorses have begun to be found in the Thames River?

"Leafy the Sea Dragon" p. 40-43

Mark the following statements TRUE or FALSE. Provide the correct answer if FALSE.

_____ 1. You may see a Leafy Sea Dragon in his natural habitat if you are searching along the southern and western shore of Asia.

_____ 2. You need to search deep in the water, at approximately 165 feet, to possibly see a Leafy Sea Dragon.

_____ 3. Like other seahorse species, it is the Leafy Sea Dragon male who is responsible for raising the offspring.

_____ 4. Twice a year during mating season the male sea dragon lays 100-250 bright pink eggs.

- _____ 5. The Leafy Sea Dragon uses its appendages for movement.
- _____ 6. Sea dragons steer and turn using tiny translucent fins along the sides of their head.
- _____ 7. The full-grown Leafy Sea Dragon will be approximately 28 inches long.
- _____ 8. The Leafy Sea Dragon differs from his seahorse relatives because he cannot use his tail to hold on to branches while he feeds.
- _____ 9. The Leafy Sea Dragon is an excellent swimmer.
- _____ 10. The Leafy Sea Dragon is currently plentiful in the Australian waters.

ANSWER KEY:

"Seahorse Nanny"

1. 1853
2. fry
3. 100 to 900
4. 90 to 95
5. exercise
6. male
7. tails
8. aquarium
9. hippocampus
10. Roman

"Leafy the Sea Dragon"

1. False, Australia
2. True
3. True
4. False, female
5. False, camouflage and to evade predators
6. True
7. False, 18 inches
8. True
9. False, poor swimmers
10. False, endangered