

Mystic Seaport for Educators
Science on the 38th Voyage of the *Charles W. Morgan*
Lesson 6 of 6: North Atlantic Aliens- A Study of Marine Bioinvasions
Student Worksheet

Name: _____

Questions

1. Based on the interview with Dr. Carlton, there have been several sources of transportation for marine bioinvasions.
 - a. How did the three invasive species travel to the Gulf of Maine?
 - i. The common periwinkle (*L. littorea*):
 - ii. The Asian shore crab (*H. sanguineus*):
 - iii. The Asian and European shrimp (*P. macrodactylus* and *P. elegans*):
 - b. Modern ships are now often covered in anti-fouling paint in order to prevent bioinvasions by organisms that “foul,” or attach themselves to the ship’s hull. Is this an effective method of preventing *all* marine bioinvasions? Support your answer with evidence from the interview with Dr. Carlton.
 - c. Based on your answer in part b., design an additional method for preventing spread of bioinvasions by the modern shipping industry in the Gulf of Maine.

2. In his interview, Dr. Carlton explains that all three of the invasive species in New England are easily dispersed because they have “planktonic larvae.”
 - a. What does Dr. Carlton mean when he describes the larvae as “planktonic”?

 - b. At what stage in the life cycle (juvenile, young, adult) are these species most likely to travel to a different ecosystem?

3. **Challenge Question:** Imagine that you are in Rhode Island, where you have decided to explore the tide pools, or the small puddles of ocean water, that you found along the rocky beach. In order to take a better look at the organisms, you bring a few water samples back to the lab at your school. Upon further examination, you identify an invasive species of European shrimp.
 - a. Based on the time period in which it arrived in New England, what is the likely source of transportation for this invasive species?

 - b. Given the current increases in the worldwide human population, which leads to more global trade of goods and products, what would you expect to observe in a water sample gathered two years in the future? Why?