

Entada gigas Steals Your Heart!

The day was perfect. Paul left early that day, from his eastern Florida home, to spend a few hours searching the wrack. October's prevailing wind was blowing from the east and Paul knew it would be a great time to find floating objects that had blown westward toward the eastern shoreline. Paul had been a beachcomber for years and understood the importance of seed adaptations for dispersal. He thought to himself about the variety of seed dispersal mechanisms, but his favorite would always be the drift seeds.

Paul walked along the shore looking for the perfect spot to find the exceptional treasures known as sea beans. You didn't have to be an expert geographer to understand how far these unique seeds had traveled. The journeys of these varying seeds were a component in which legends had been written. An example was the Sea hearts, which were considered good luck charms during old English time, used by seafarers because they had undergone such incredible ocean journeys. Today he would spend considerable time searching through the line of debris beyond the shore.

It looked as though a clump of *Sargassum bacciferum* could hold a treasure trove of things to find. Yes! Three small beans were found in the tangle. Paul pulled out his handy guide-The Little Book of Sea-Beans and other Beach Treasures and quickly identified the three beans. Paul wrote in his journal the location of his find, the date and time. He added to his notes an illustration of the three beans, the measurements of the beans and labeled them using their common names then the scientific name-genus species.

How exciting it would be to actually trace the sea bean journey from its point of origin, where they had been originally dropped to the ground, washed into rivers or streams, and then finding their way to the ocean. Where had these seeds originally come from? If he had a map he could illustrate their point of origin, based on currents and winds he should be able to create a representation of the journey. He made note in his journal to follow up on this when he returned home.

Paul spent another hour or two and was able to locate two more beans. He put all the specimens in his collecting bag and decided he would call it a day. At home he would begin the project of creating maps that represented his beans. Who knew that so many people were interested in these marvelous finds? Paul sat at his computer that night to discover as much information as he could. He searched the website <http://www.seabean.com> to cross reference which beans he had discovered and to find out further research to enhance his knowledge base of the incredible drift seeds.

Directions:

1. Read the above story.
2. Before you begin your research, list details in the first two columns.
 - a. Using column one on the graphic organizer list all the facts you have obtained from the reading.
 - b. Using column two write any unknown information you will need to research further. Include all unknown vocabulary here.
3. Fill in the last column after completing your research.

Topic: Sea Beans-Seed Dispersal Mechanisms

WHAT I KNOW

WHAT I WANT TO KNOW

WHAT I LEARNED

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Paul's Sea Bean Laboratory

Based on the information researched and sample specimen supplied by Paul, complete the following laboratory.

Materials:

6 unknown sea beans

Metric ruler

Dissecting Microscope

Research and Handout Materials:

- "A Simple Guide to the Most Commonly Found Sea-Beans in Florida" by Cathie Katz 2001
- The Little Book of Sea-Beans and other Beach Treasures by Cathie Katz and Paul Mikkelsen 2002
- The Nature of Florida's Beaches by Cathie Katz 1995
- "Sea Bean Coloring Page" by Pete Zies
- "Knowing Beans About the Beach" by Julie Powers
- "Sea-Bean Identification" from The Drifting Seed by Pete Zies and Illustrations by Pamela Paradine 12/96 pgs 9-10
- "The World"-Map by National Geographic Society 2003
<http://www.nationalgeographic.com/xpeditions/atlas/world/world-bl.gif>

Procedure:

Part I

1. Obtain a sample sea bean from the supplied collection.
2. Using the dissection scope observe all details of your sample specimen.
3. Illustrate the sample using 7.5 cm drawings.
4. Using the supplied materials for research-identify the common name and genus species of the sample.
5. Create a legend beneath the specimen with the scientific name; include the magnification from the dissection scope.
6. Using the metric ruler measure the sea bean as illustrated in The Little Book of Sea-Beans and other Beach Treasures by Cathie Katz and Paul Mikkelsen 2002-
*Remember you must convert to metric measurement for all laboratories.
7. Repeat steps 1-6 for all six-sample specimen.

Part II

1. View the sample bean pod under the dissection scope. Answer each of the following questions.
 - a. What genus species does the supplied pod represent?
 - b. What is the function of the hairs, which are evident on the exterior of the pod?
 - c. What specialty cell type do the pod hairs represent?
 - d. What is the name of the hairs found on the pod?
 - e. Illustrate the sample pod, include all labeling.

Part III

1. Research in-depth one of the six provided seeds.
2. Discover the point of origin for the researched seed of choice.
3. Using the supplied world map, map out the ocean currents that shift the drift seeds around the globe.
4. Include on your map the journey your specific seed has taken from its place of origin (name the country and identify it on the map) to Paul's Florida home.

Going Further:

1. Complete the colorplate-The Sea Bean Coloring Page
2. Answer each of the following questions:
 - a. Define "what is a sea bean?"
 - b. Discuss in detail the varying methods of seed dispersal based on seed adaptations.
 - c. Seed and fruit dispersal is achieved with the aid of wind, water, animals, mechanical means, and humans. If you were "designing" a new plant, can you think of any new way in which it might be dispersed?
 - d. When volcanic activity or coral polyps cause new islands to appear in the oceans, they eventually acquire some vegetation. Would you expect the types of dispersal mechanisms for the flowering plants on these islands to be the same as they were for ancient continents?
 - e. Some sea beans are known for the chemical arsenal the seeds can emit. Using your Internet, research any sea bean that is known to produce potentially toxic amino acids that may or may not be a good resource for production of medications. Using the 5 W method (Who, What, Where, When and Why)-analyze the article. Email the instructor with the URL of the websites discovered and your analysis of the article.

*Questions c & d are taken from Introductory Plant Biology, Stern 9th Edition, 2003 page 152

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