

Activity Title: Creating a Decision Tree to Choose an Ocean Career

Subject (Focus/Topic): Student will conduct research on ocean careers and create a decision tree to use as a tool in selecting a career.

Grade Level: 9-12

Average Learning Time: Two 58-minute class periods.

Lesson Summary (Overview/Purpose): The purpose of this lesson is two-fold: (1) enable students to identify and distinguish the relevant aspects of a range of ocean-related careers; and (2) enable students to construct a decision tree to utilize as a tool in selecting an ocean career aligned with their capabilities and desires.

Overall Concept (Big Idea/Essential Question):

1. What do I want to do with my life?
2. What are the advantages and disadvantages of various ocean careers?
3. How can complex, multi-variable questions be decided?

Specific Concepts (Key Concepts):

1. Ocean Careers
2. Decision Trees

Focus Questions (Specific Questions):

1. What are the relevant factors in choosing a career?
2. Which factor in choosing a career is more important – money or satisfaction?
3. How much education do I need or want?
4. What are the different types of ocean careers?
5. What is a decision tree?.

Objectives/Learning Goals:

1. Students will consider, compare, and evaluate a variety of ocean careers, develop a list of rated criteria to apply to each career, and create a decision tree to assist in choosing a career.

Background Information: None is required.

Materials & Technical Requirements: Library/internet/media resources for research.

Ocean Careers:

- NOAA OceanAge Careers: <http://oceanexplorer.noaa.gov/edu/oceanage/>
- Woods Hole Oceanographic Institute Marine Careers: <http://www.whoi.edu/page.do?pid=9546>

- Monterey Bay Aquarium: <http://www.mbari.org/education/careers.html>
- Centers for Ocean Science Career Excellence: http://www.oceancareers.com/2.0/career_listing.php?action=alphabetical_list
- Ocean Business: <http://www.oceanbusiness.com/en/associatedmeetings/oceancareers/default.aspx>
- Marine Careers: http://www.marinecareers.net/field_oceanengineering.php

Decision Trees:

- Decision Tree: <http://decisiontreemodel.blogspot.com/>
- How to make a decision tree: http://www.ehow.com/how_5925160_create-decision-tree-word.html

Teacher Preparation: Teacher should study ocean careers and practice making decision trees before teaching this lesson.

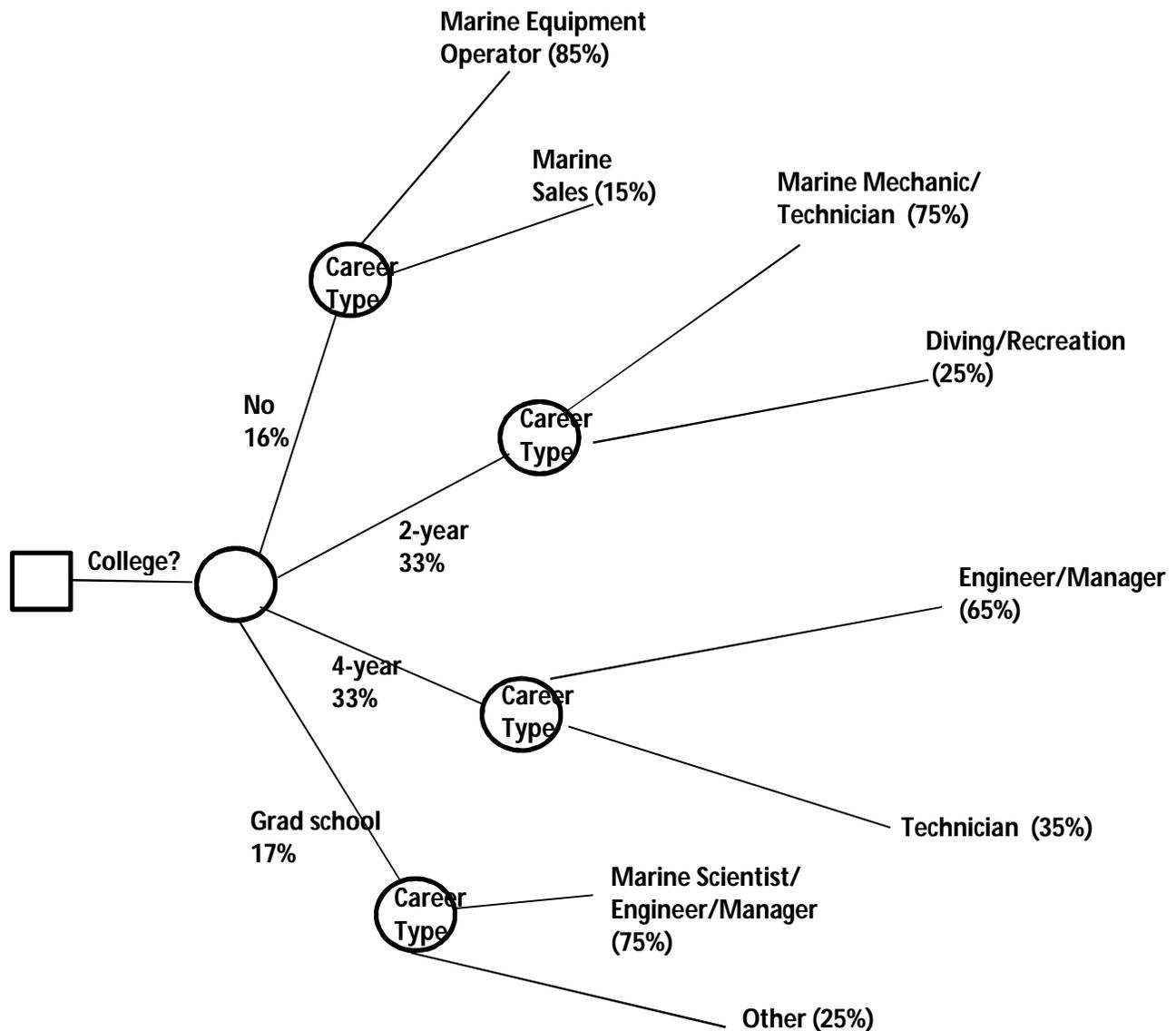
About Decision Trees:

A decision Tree consists of 3 types of nodes:-

1. Decision nodes - commonly represented by squares
2. Chance nodes - represented by circles.
3. End nodes - represented by triangles

The probability of each option is shown above each branch. The two or more branches that sprout from the same node must all add up to one (100%); for example, if one node has two options, and one of the branches probabilities is 40 percent, then the other branch probability must be 60 percent. The probability percent is based on historical facts; unfortunately there is not always historical data to follow, so a decision tree is only as good as the research and educated guesses that supports it.

Example:



Keywords:

1. Marine Careers
2. Decision Trees

Pre-assessment Strategy/Anticipatory Set (Optional):

1. Teacher will ask students to think briefly and write one paragraph stating whether they want to go to college, and why.

Lesson Procedure:

1. Teach the concept of a decision tree.
 - a. Introductory lecture on decision trees, using blackboard.
 - b. Have students create a sample decision tree on a simple decision (e.g., what to eat for lunch, or what to wear today).
 - c. Have students present their decision trees to the class.
2. Researching ocean careers.
 - a. Method A – Online Research.
 - i. Have students use the online resources listed above to research ocean careers
 - b. Method B – Personal Research
 - i. Students can interview in person, by telephone, or by email persons who have worked or are working in ocean careers
 - ii. Students should present their research findings to the class to create a combined database of information on ocean careers.
3. Have students create a decision tree to decide upon an ocean career
 - a. Students use their knowledge of decision trees and ocean careers to create an Ocean Career Decision Tree.
 - b. This exercise can be very flexible and student can focus on the career aspect that's most interesting to them, e.g., pay scale, type of work, geographic location, amount of education required, etc. Students can make more than one decision tree.
4. Students present their decision trees to the class
5. Summative Reflection. Each student writes a short reflection considering whether creating a decision tree was helpful to them in thinking about ocean careers.

Assessment and Evaluation:

The effectiveness of the exercise, and student evaluation, will be accomplished through two means:

1. Observation: Teacher will observe performance of students during panel discussion.
2. Summative Reflection.

Standards:

• **National Science Education Standard(s) Addressed:** This lesson primarily addresses National Science Education Standard F – Science in Personal & Social Perspectives, for grades 9-12. In particular, this lesson focuses on the following aspects of Standard F:

➤ Science & Technology in Local, National, and Global Challenges

• **Ocean Literacy Principles Addressed:** Principle 6: The Ocean and Humans are Inextricably Interconnected, and Principle 7: The Ocean is Largely Unexplored.

Author:

Bruce Taterka
Lead Teacher of Science & Technology
West Morris Mendham High School
65 East Main Street
Mendham, NJ 07945
btaterka@wmmhs.org

Creation date: May 2011