



Student Worksheet: Wet Maps

Name: _____ Date: _____ Class: _____

Introduction

As a class, you will briefly review and discuss mapping technology, sonar, and how it is used to map the seafloor. Then, you will gather data to address the question, **How do scientists create and use maps to help them identify features on the ocean floor?** Using the materials provided by your teacher, you will simulate multibeam sonar to map a hidden seafloor feature inside a box. CAREFULLY follow the directions and work as a group to collect, record, and analyze your mapping data.

Learning Procedure

Each group member will be responsible for a task. Group members should rotate duties throughout the lesson.

Student 1: place and move the sounding rods

Student 2: read the depths off the sounding rods

Student 3: confirm the numbers read off by the first student

Student 4: record the data on the worksheet

Your teacher will distribute all materials. DO NOT OPEN your seafloor mystery box.

Observe the measurements and colors on the sounding rods (pencils/wooden dowels). Answer the following questions in the space provided.

What do the pencils/wooden dowels represent? Which way should you insert these into the box to measure the depth? Why?

Multibeam Mapping Simulation Instructions

You will use your sounding rods to measure the depth under each of the holes in the lid of your box and then plot the data to create a 3D model of the mystery seafloor feature. As you “map”, think about what might be inside your box.

Let's start mapping!

- **Student 1** starts with Row 1 and inserts the 4 sounding rods into holes 1A, 1B, 1C, and 1D to measure each depth. **Student 2** reads off the depths while Student 3 confirms all measurements are correct. **Student 4** records all data reported on the **Mapping Simulation Data Group Sheet**. **Student 1** will remove the sounding rods and move to holes 1E, 1F, 1G, 1H to complete “mapping” the first row.
- When your group has finished measuring the depths in Row 1, use the same procedure to measure the depths of the remaining rows/holes, and record the data from your measurements one row at a time.





- Once all depths have been measured and recorded on the **Mapping Simulation Data Group Sheet**, plot the results for each row on the **Row Data Graph Sheet** (be sure to first color the grid as indicated in your data sheet). Use one copy of the data sheet for **each** row (you should have 9 data sheets). It will be quickest if each group member is responsible for plotting specific rows of data.
- When all **nine** graphs are completed, cut them out and make sure to leave the border at the bottom of each graph. Fold and tape each graph in order of the rows onto black paper or a manila folder. The folded edge of each graph should lie on the folder. Stand the graphs up to see the 3D model of the mystery landscape inside the box!

Putting the Pieces Together

Discussion Questions

1. Analyze the data you collected to help you describe what seafloor feature you think is inside your box. Justify your response with evidence from your model.

2. Open the box and look at the actual seafloor feature inside. Compare it to your paper model. How close did your paper model come to the actual seafloor feature? Describe the similarities and differences.

3. Modern maps are made using multibeam sonar. Using a description of the classroom tools used to model multibeam sonar (the box and rods), support the claim that you accurately modeled multibeam sonar in the activity. Your answer must include these terms: rod, sounding, false-color, sound, depth, ship.

4. Identify at least 2-3 limitations of this multibeam sonar model. In other words, what aspects of the box/rod model are *not* accurate to multibeam sonar? What issues with the model indicate this is *not* a perfect model.

5. Describe at least 2-3 ways you could improve the model of multibeam sonar to get higher quality data and a better model of the seafloor feature in your box. Be specific.
