NAVAL HISTORY STEM-H LESSON PLAN

Activity B - Using Sonar to Study the Ocean Floor

LESSON PLAN: How Do Submarines "see" Underwater?
DEVELOPED BY: J. Paul Parker, McCant's Middle School: An IB Candidate School, Anderson, SC
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ACTIVITY B: How Far is the Submarine From the Bottom? (Sonar Worksheet 1)

OBJECTIVE: Using the diagram the student will calculate the distance from each submarine to the bottom of the ocean, the ship and each other.

MATERIALS: worksheet, pencil, paper

INSTRUCTIONS:

Note: The students should calculate using the average speed of sound in saltwater: (5000ft/sec).

1. Using the diagram on the worksheet the student will calculate the distance from submarine 1 to the bottom of the ocean as if using active sonar and bouncing sound waves off the bottom of the ocean. In submarine 1 the sound wave takes 11.50 seconds to return from the ocean floor.

2. How deep is the submarine running if sonar takes .050 seconds to return from the ship on the surface?

3. (A) Calculate the depth of submarine 2 if the sonar wave takes .10 seconds to return to submarine 1.

   (B) How deep is submarine 2 running?

   (C) Calculate the distance from submarine 2 to the bottom of the ocean.

SONAR WORKSHEET 1

(Diagram Not to Scale)

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 Sub 1

 Sub 2

______________________Ocean Floor____