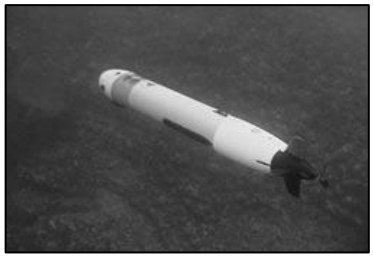
ANSWER ANSWER ANSWER

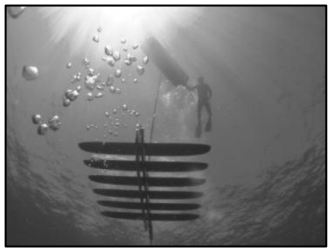
Round: 8A

1. Identify each type of autonomous vehicle pictured below.

Ocean glider (1 pt)



AUV (1 pt)



Wave Glider (1 pt)

2. Describe the principles that each vehicle shown in Question 1 uses for horizontal propulsion.

Vehicle A: *Controls buoyancy to descend or ascend and gets horizontal propulsion from flow over wings. (2 pts)*

Vehicle B: *Uses an electric motor to turn a propeller. (2 pts)*

Vehicle C: *Uses wave motion to flap vanes below the water to move forward. (2 pts)*

3. From the photos in Question 1, identify which vehicle would be most appropriate for each of the following scientific missions, and state why.

a. Measuring near surface salinity across the Atlantic Ocean for validation of the new NASA Aquarius satellite.

C OR Wave Glider(1 pt):Solar panels provide energy so it can propel itself long distances with no fuel, using wave motion to provide thrust (2 pts)

b. Using sidescan sonar to map potential mine fields in a bay.

B OR AUV (1 pt): AUVs acquire sidescan along straight lines and can maintain a certain depth in the water column close to the seafloor (2 pts)

c. Mapping full depth profiles of temperature and density fields across a continental margin.

A OR Ocean Glider (1 pt):Ocean glider follows an up and down pattern through the water column (2 pts)

4. What type of glider has both long range (40,000 km) and endurance (5 years) using environmental energy?

Thermal Glider (2 pts)