

Virtual Vent: Lesson Introduction Worksheet - KEY

Part I: Context (from Intro. To Virtual Vents video and Cruise Description)

1. How deep is the sea floor in the Niua hydrothermal vent field? (1400 meters)
2. What three countries surround the Niua volcano? (Fiji, Samoa, Tonga)
3. How wide is the Niua volcanic crater (500 m across)
4. What kinds of geochemical properties will scientists be looking at in the hydrothermal fluid? (metal and sulfide content, acidity, amount and type of particle)
5. What types of biological analyses will be done on the organisms collected at the hydrothermal vents? (genetic analysis, population connection, identification of species)
6. In what ways is the deep sea environment of the Niua hydrothermal vent field a hostile environment? (dark, high pressures, extreme temperatures)
7. How does the chemistry of the water change as it seeps through the cracks in the seafloor? (oxygen is removed, elements and metals from surrounding rock dissolve)
8. The towers and chimneys we see in the hydrothermal field are made up of what types of metals? (lead, zinc, copper, iron, gold)
9. Understanding life in the extreme conditions near hydrothermal vents can help scientists explain life in what other extreme environment? (on other planets)
10. In what ways will mining alter the hydrothermal vent communities? (cutting down chimneys, excavating sulfide deposits)

Part 2: Reflection

It is clear from the introduction and description that oceanographic cruises are multidisciplinary endeavors. Picture yourself as a part of the research crew on R/V Falkor's Virtual Vents project and write a paragraph reflection about which area of focus you would be most interested in exploring further. Include specific details that caught your attention and what you would like to further explore about these concepts.

(Anticipated student responses: Interest in the specific geographic region/plates, ROV technology, sea floor mapping, hydrothermal vent creation, physical makeup/geology, Fluids/geochemistry/temperature, Biology/energy conversion/symbiosis, and maybe others)