

Unit 3 An Issue to Analyze

Island at Risk: A Simulation

Student Textbook pages 408–409

There are many sites on the Internet that could be used as a resource for this investigation. While it is important for students to realize that while sodium arsenite is a useful herbicide and pesticide it has far reaching implications for immunity response. Students may want to study the effects of other substances similar to those of sodium arsenite.

Sodium arsenite is used in the manufacture of arsenical soap for use on skin, for treating vines against certain scale diseases, and as an insecticide, especially for termites. The primary interest in these studies relates to the immunotoxicology studies of gallium arsenide (GaAs). GaAs was shown to have a selective action on the immune system and arsenic was implicated as the immunotoxic component. These studies were conducted in part to confirm that arsenic was immunotoxic. Several studies have been reported indicating the immunotoxic potential of arsenic.

Many teachers have found that PowerPoint and Corel Presentations are useful tools that help students and teachers to present their research. The use of advertising flyers is also a useful tool, especially for students who do not have access to a computer at home. Posters are also useful as are tape interviews with experts. Some students may also want to do a video presentation.

It is possible for students to suggest ways to improve the environmental effects of these chemicals by suggesting alternative methods of alleviating the problems of pests and other factors that could affect crop production.

Assessment and Evaluation

Rubric for the Unit 3 Issue: Island at Risk is available in the “Assessment and Evaluation” Section in the front matter of this *Teacher’s Resource*.

Unit 3 Review Answers

Student Textbook pages 410–413

Answers to Knowledge/Understanding Questions

True/False

- | | | |
|------|------|------|
| 1. F | 2. F | 3. T |
| 4. F | 5. F | 6. T |
| 7. T | 8. F | 9. T |

Answers to Matching Questions

10. (a) When solute is added to an aqueous solution, the solute dissolves.
(b) When solute is added to an aqueous solution, the solute does not dissolve.
(c) A solution that contains a relatively small amount of solute.
(d) A solution that contains a relatively large amount of solute.
(e) A substance that produces H^+ when dissolved in water.
(f) NH_3
(g) H_2SO_3
(h) SO_3^{2-}
(i) A solution with a pH = 8
(j) A solution with a pH = 10

- (b) i. Add the magnesium chloride to cold water. Solubility of solids decrease with a decrease in temperature.
ii. Add the benzene to cold water. It will not dissolve at all as it is a nonpolar substance and will not dissolve in water which is highly polar.
iii. Bubble the CO through the boiling water. Its solubility will be very low as the solubility of gases in liquids decreases with an increase in temperature.
30. Student experimental design will vary with this project. Some aspects to take into consideration might be:
- Method of measuring pH
 - How many times pH is measures, once a week, every 2 weeks, etc.
 - How data is presented
 - Climate (cold weather means snow, and salt is used to melt the snow)
 - Is the water close to an industrial complex
- The pH may vary depending on the season, industries present in the area, location to farms, etc.
31. (a) i. yellow ii. blue iii. colourless
(b) pH is about 10.

Answers to Communicating Questions

The concepts presented here in questions 32–34 could be a very good project material to give as an assignment. Students could use presentation type of software, as well as videos, web pages, etc. They could present their findings and research to the class as a whole, or as mentioned, in electronic form.

Answers to Making Connections Questions

35. (a) These containers could remain inert for years. They will not react with water, or dissolve in water or any other solutions that these containers could come into contact with.
(b) The containers may corrode and the radioactive materials may dissolve in ground water and be carried off to the surrounding regions, contaminating a very large area.
(c) Student answers may vary. There is probably no real safe way to dispose of these radioactive wastes.
36. (a) NH_3 is a B-L base but not an Arrhenius base.
(b) ZnO is a B-L base but not an Arrhenius base.
(c) $\text{Cu}(\text{OH})_2$ is both a B-L base and an Arrhenius base.
(d) N_2H_2 could be a B-L base but not an Arrhenius base.
37. (a) Cesium. Cesium has a large atomic and ionic radius, making the attractive forces in an ionic crystal relatively weak when compared to strontium. The cesium compounds would be easily hydrated, making them more soluble in water.
(b) Genetic malformations, half-life of the isotopes, waste of productions of these isotopes, etc.