

Article Review

- New Frontiers & New Dangers
- Electromagnetic Radiation: Taming the Wild Energies
- Do You Want the Recipe?
- In the Kitchen with Poly
- Measuring Exposure to Radiation

Time

10 minutes
prep time.
5 minutes for
presentation
per question

Questions

1. (*New Frontiers-New Dangers*) Summarize briefly and succinctly what happens during a coronal mass ejection and the dangers this form of solar weather poses to the space station and astronauts.
2. (*Radiation: Friend and Foe*) Explain the relationship between frequency, wavelength, and energy. Use specific examples of different frequencies on the electromagnetic spectrum. Sketch a picture to illustrate your answer.
3. (*Radiation: Friend and Foe*) Explain the difference between ionizing radiation and non-ionizing radiation and give examples of each type. Explain the ionization process and give an example of matter that is ionized. Can non-ionizing radiation still be harmful? Give examples. (Suggestion: divide the topics between members of your group.)
4. (Teacher question) Explain the difference between radiation and radioactivity. Illustrate the popular use of the term "radiation," to imply dangerous radiation as used in medicine or nuclear power generation, etc. (This is an important lesson in semantics and in the various uses of such words in different situations and by different groups of scientists. Essentially, the term radiation need not necessarily evoke fear.)
5. (*The Human Recipe*) Briefly describe human DNA, where it resides, what it is made of, and what role it plays in reproducing human cells. (Suggestion: divide the topics between members of your group. Use sketches if possible.)
6. (*The Human Recipe*) Briefly explain what cell mutation is, the three types of mutation, and what systems of the body are most susceptible to damage by ionizing radiation. (Suggestion: divide the topics between members of your group. Use sketches if possible.)
7. (*In the Kitchen with Poly*) Briefly summarize the story of the Christmas Bricks by stating the important facts. Then answer the questions: What does ALARA stand for? What different ALARA options do the astronauts have to protect themselves from dangerous levels of radiation? (Suggestions: divide the topics between members of your group. Use sketches if possible.)
8. (*Measuring Exposure to Harmful Radiation*) How is radiation measured on the space station? Explain the difference between rads and rems. When are we exposed to radiation on earth and to how much are we exposed while participating in normal activities? What is a dose of radiation? (Hint: divide the topics between members of your group. Use sketches if possible.)