

# TEST YOUR SCIENTIFIC LITERACY

Here is a short "pop quiz" that probes aspects of science that are important in everyday life. Each question covers a small detail of the workings of the physical world, but represents an important area of knowledge. For example, we ask about the specific difference between atoms and molecules, but this is a proxy for a more general question like: How is matter constructed? In sum, we feel you are scientifically literate if you can place atoms and molecules on a continuum of structures ranging from quarks, the basic building blocks of matter, to quasars, the violent galaxies that are the most distant known objects we can see in the universe. These questions may seem simple to some (who can probably count themselves among the scientifically literate), but they are similar in tone and content to those asked of college graduates in a survey every other year. (Answers on page 54.)

- 1. Summer is hotter than winter because:**
  - a. Light from the sun travels in a straighter line in summer.
  - b. The earth is closer to the sun in summer.
  - c. The earth is tilted on its axis.
  - d. The moon reflects more sunlight in summer.
- 2. An atom differs from a molecule because:**
  - a. Molecules are made of atoms.
  - b. Atoms are made of molecules.
  - c. Gas is made of molecules, but solids are made of atoms.
  - d. Atoms and molecules are two words for the same thing.
- 3. Earthquakes occur in California because:**
  - a. Earthquakes always accompany volcanoes.
  - b. California is sinking into the Pacific Ocean.
  - c. Giant underground explosions occur every few years.
  - d. Two blocks of the earth's crust are grinding past each other.
- 4. A semiconductor is:**
  - a. An essential component of all wire.
  - b. A material that protects you from electrical shock.
  - c. A key substance in every piece of microelectronics.
  - d. An important type of oven insulation.
- 5. Genetic engineers can create new life forms because:**
  - a. Scientists can build living things atom by atom.
  - b. All genes are written in the same genetic code.
  - c. Scientists in Japan and the United States have collaborated.
  - d. All life is made from the same kind of cell.
- 6. Galaxies, like our Milky Way, are made of:**
  - a. Hundreds and hundreds of stars.
  - b. Thousands and thousands of stars.
  - c. Millions and millions of stars.
  - d. Billions and billions of stars.
- 7. Why do physicists want the Superconducting Super-collider, which will be built in Texas at a cost of \$35 for every U.S. citizen?**
  - a. To help develop fusion energy sources.
  - b. To probe the basic structure of matter.
  - c. To test radiation therapies for cancer.
  - d. To improve propulsion systems for jet engines.
- 8. The most abundant gas in our atmosphere is:**
  - a. Oxygen.
  - b. Carbon dioxide.
  - c. Nitrogen.
  - d. Smog.
- 9. Acid rain is caused by:**
  - a. The decay of dead trees near lakes and streams.
  - b. Poorly run chemical plants that manufacture acids.
  - c. Agent Orange.
  - d. Nitrogen and sulfur compounds released into the air from burning coal.
- 10. Why is the ozone layer of the earth's atmosphere important?**
  - a. It blocks harmful ultraviolet radiation.
  - b. It reduces the greenhouse effect.
  - c. It keeps the planet smelling fresh and clean.
  - d. It prevents oxygen from leaking into space.
- 11. Which of the following facts cause scientists to worry about the greenhouse effect?**
  - a. A variety of synthetic gases contribute to the greenhouse effect.
  - b. The concentration of atmospheric carbon dioxide has increased dramatically during the past century.
  - c. An inevitable byproduct of burning fossil fuels (our primary energy source) is carbon dioxide.
  - d. All of the above cause scientists to worry about the greenhouse effect.
- 12. Which of the following does not travel at 186,000 miles per second (the speed of light)?**
  - a. Microwaves in your microwave oven.
  - b. Radio waves from your local radio station.
  - c. The solar wind, streaming from the sun.
  - d. Light from a fluorescent light bulb.
- 13. The blueprint for every form of life is contained in:**
  - a. The National Institutes of Health near Washington, D.C.
  - b. DNA molecules.
  - c. Proteins and carbohydrates.
  - d. Viruses.
- 14. Sexual reproduction is important in evolution because:**
  - a. Having a mother and father increases chances of survival.
  - b. Sexual reproduction produces more offspring.
  - c. Sexual reproduction allows offspring to differ from each parent.
  - d. Sexual reproduction is fun.