1. What is the ***Key Concept*** for section 1-4? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Main Idea: Imaging technologies provide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of life.

\*Use the correct term to fill in the description with the correct type of technology:

*light microscope (LM), magnetic resonance imaging (MRI), transmission electron microscope (TEM),* and *scanning electron microscope (SEM).*

\*Highlight/color-code the part of the definition that will help you remember each term.

 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ uses light and lenses to magnify images, can be used with living specimens, and can clearly magnify specimens up to about 1500 times.

 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ uses electrons and computers to magnify specimens and produce three-dimensional images, cannot be used to observe living specimens, creates images that are computer colorized, and can clearly magnify specimens more than 100,000 times.

 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ uses electrons and computers to magnify specimens and produce two-dimensional images, cannot be used to observe living specimens, creates images that are computer colorized, and can clearly magnify specimens more than 100,000 times.

 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ uses strong magnetic fields to show a cross section of a body part and can show both soft tissues and dense tissues. Cross sections can be combined by computer to give a complete image of the whole area.

Main idea: Complex systems are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Choose the best answer to the question.**

 6. Which of the following studies do you think would be most suitable for a computer model?

a. A study of how fast an epidemic disease could spread in a city.

b. A study of what life forms can be found in a local pond.

c. A study of how animals react to confinement in a zoo or wildlife park.

d. A study of how a new type of plastic could be used and what properties
it has.

 7. What kinds of systems are scientists most likely to model using computers?

a. biological systems c. simple systems

b. physical systems d. complex systems

Main Idea: The tools of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ genetics give rise to new biological studies.

Choose whether the statement is true or false.

 8. *true* / *false* Scientists now have the ability to manipulate DNA.

 9. *true* / *false* It is not possible to map the entire human genome.

 10. *true* / *false* A gene is a type of computer model used to study diseases.

Vocabulary Check: *match each word or phrase with its correct meaning.*

 a. gene b. molecular genetics c. genomics d. microscope

\_\_\_\_\_11. the study of genomes

 \_\_\_\_\_12. a tool for enlarging images

 \_\_\_\_\_13. the study and manipulation of DNA

 \_\_\_\_\_14. a segment of DNA that stores genetic information

15. Differentiate between reliability and validity. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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16. Why is computer modeling used in biological studies? Why do they have limitations?

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17. Provide examples of how technology has helped biologist gain a better understanding of life.

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18. Go to your online student edition of the text and go to “interactive review” and then on “self- checks”. Take the 1-4 Self-Check Quiz and record your score below. Write out missed questions or if you did not miss any, write out the most difficult one.

\_\_\_\_\_\_\_\_\_\_ / \_\_\_\_\_\_\_\_\_\_