Chapter 1 – Introduction to Chemistry – Answer Key

Chapter 1: 1, 3, 5, 8, 9, 10, 12 - 19, 21, 22, 30, 36 (18 total)

Section Review 1.1

1. Match the numbered terms in the right column with the lettered terms in the left column.

__4___	a.	Technology	1.	Life
__3___	b.	Organic chemistry	2.	Matter and its changes
__1___	c.	Biochemistry	3.	Carbon
__2___	d.	Chemistry	4.	Applications
__5___	e.	Analytical chemistry	5.	Composition

3. Explain the difference between *pure* and *applied* chemistry.

Pure chemistry examines chemical aspects of the world for the sake of knowledge alone; applied chemistry uses this knowledge to solve real-world problems.

Section Review 1.2

5. Name at least three areas of science in which chemistry plays an important role.

a. agriculture

b. medical and biotechnological sciences

c. materials science

Section Review 1.3

8. Describe the steps involved in the scientific method. Provide an example.

Observation: My stomach is growling
Hypothesis: Maybe I'm hungry
Experiment: Eat something and see what happens

9. Distinguish between a *theory*, a *hypothesis*, and a *scientific law*.

A law is a concise statement that summarizes the results of a broad variety of observations and experiments. A hypothesis is a proposed explanation or reason for what is observed. A theory is an extensively tested explanation for experimental results.

10. Why should a hypothesis be developed *before* experiments take place?

The design of the experiments will be guided by the proposed hypothesis

Section Review 1.4

12. Explain why it is important to study chemistry every day.

It is better to pace the content over many days, rather than trying to cram a whole lot of conceptual information right before an exam.

13. Why is chemistry best studied with a pencil in hand?

What you write is retained longer than what you only see.

14. Explain the value of discussing chemistry with others.

If you can explain a concept clearly to someone else, you probably understand the concept. You can also learn from listening to the explanation offered by others.

15. Briefly describe what your strategy for studying chemistry will be throughout the upcoming year.

Study, write, explain

Chapter 1 Review

16. Define *chemistry*. What is *matter*? 1.1

Chemistry is the study of matter and the changes that matter undergoes. Matter is the stuff material things are made of.

17. Describe the difference between chemistry and chemical technology. 1.1

Chemistry is the study of matter and its changes for the sake of understanding; chemical technology is the application of this knowledge to attain specific goals,

18. Match each numbered term with a lettered term. 1.1

__4___	a.	Physical chemistry	1.	Composition
__3___	b.	Organic chemistry	2.	Life
__1___	c.	Analytical chemistry	3.	Carbon
__5___	d.	Inorganic chemistry	4.	Behavior
__2___	e.	Biochemistry	5.	Without carbon

19. Refer to problem 19, in your Chapter Review, then match each numbered photograph with the lettered field of chemistry it best represents. 1.2

__2___	a.	Materials science	1.
__5___	b.	Energy	2.
__1___	c.	Medicine and biotechnology	3.
__6___	d.	Agriculture	4.
__3___	e.	Environment	5.
__4___	f.	Astronomy and space	6.

21. Why is the ozone layer surrounding Earth important? 1.2

The ozone layer helps to protect the Earth from harmful ultraviolet rays.

22. Provide at least two benefits of replacing some of the steel in automobiles with plastics. 1.2

a. Some plastics are more durable than steel and do not experience rust.

b. Automobiles made with more plastic components are lighter weight than those made with steel, as a result, they are more energy efficient.

30. You have a sore throat, so you go to the doctor, who examines you and says she thinks you may have strep throat. She takes a sample to test for strep bacteria. What parts of the scientific method is the doctor applying?

The doctor's hypothesis is that you have strep throat. She tests the hypothesis with an experiment to learn whether your throat is infected with strep bacteria.

36. Criticize the statement, "Theories are proven by experiments."

A theory can never be proven. Although a theory may be strongly supported by existing experiments, there is always the possibility that a new kind of experiment will prove the theory to be false.