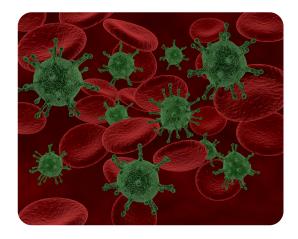
Chapter 1

What is Biology? Worksheets



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- Lesson 1.1: Science and the Natural World
- Lesson 1.2: Biology: The Study of Life

1.1 Science and the Natural World

Lesson 1.1: True or False

Name_	Class Date
Write tr	ue if the statement is true or false if the statement is false.
	1. A hypothesis must be based on scientific knowledge.
	2. A scientific theory is a guess about how or why something happens.
	3. Scientists make predictions that tell what will happen under any and all conditions.
	4. The scientific method includes the steps involved in a scientific investigation.
	5. "Did life on Earth evolve over time?" This question can be answered scientifically.
	6. Experiments are performed under controlled conditions.
animal.	7. Scientists can study all aspects of the natural world, including experimenting on an extinct
	8. The dependent variable is always the opposite of the independent variable.
	9. Communicating your results allows others to test your hypothesis.
	10. Experimental evidence that agrees with your prediction supports your hypothesis.
	11. The first step in a scientific investigation is always to develop a hypothesis.
	12. Scientists gradually build an increasingly accurate and detailed understanding of the natural
world.	
	13. Newton discovered the law of gravity when an apple fell from a tree and hit him on the head
	14. Scientific evidence is any type of data that may either agree or disagree with a prediction.
	15. Scientific theories are broad explanations that are widely accepted as true.

Lesson 1.1: Critical Reading

Name	Class	Date
Read these passages from the tes	xt and answer the questions that fo	llow.
Nature Can Be Understood		
scientists strive to increase their	r understanding of the natural we	ral laws. By discovering natural laws, orld. Laws of nature are expressed as lways happens under certain conditions
of gravity states that objects alv Newton could explain many nat fall to the ground, but he could	ways fall towards Earth because of ural events. He could explain not a also explain why the moon orbits l	scovered by Sir Isaac Newton. The law the pull of gravity. Based on this law, only why objects such as apples always Earth. Isaac Newton discovered laws of m to explain why objects move as they
Science Cannot Answer All	Questions	
is anything that is detected eithat extend human senses. The	ther through human senses or witings that cannot be observed or n	that can be observed. An observation th instruments and measuring devices neasured by current means — such as e. Consider these two questions about
Did life on Earth evolve ovWas life on Earth created		
-	ered by science on the basis of science. Therefore, it is outside the re	entific evidence and logic. The second alm of science.
Questions		
1. What is an observation?		
2. What is a scientific law?		
3. What scientific law explains v this law?	why the moon orbits the Earth? When	hat does the law state? Who developed
4. Complete this sentence: Natu	ral laws allow scientists to	

 $5.\ {\rm Can}$ science answer all questions? Justify your answer.

Lesson 1.1: Multiple Choice

Name	Class	Date

Circle the letter of the correct choice.

- 1. Assumptions scientists make include:
 - (a) Nature can be understood through systematic study.
 - (b) Scientific ideas never need to be revised.
 - (c) Science can provide answers to all questions.
 - (d) all of the above

2. A hypothesis

- (a) is the first step in a scientific investigation.
- (b) is based on what a scientist believes.
- (c) is a possible question to a scientific answer.
- (d) can be proved incorrect.

3. A scientific theory

- (a) is based on lots of evidence.
- (b) is a guess about how or why something happens.
- (c) can never be altered or changed.
- (d) none of the above
- 4. Which is the correct order in a scientific investigation?
 - (a) ask a question, test the hypothesis, communicate results, draw conclusions
 - (b) make observations, ask a question, form a hypothesis, test the hypothesis
 - (c) draw conclusions, ask a question, form a hypothesis, test the hypothesis
 - (d) ask a question, make observations, test the hypothesis, draw conclusions

5. To test a hypothesis,

- (a) a scientist first collects evidence.
- (b) a scientist first draws conclusions.
- (c) a scientist first makes a prediction.
- (d) a scientist first makes observations.

6. An experiment

- (a) is performed under controlled conditions.
- (b) generally tests how one variable is affected by another.
- (c) contributes important evidence that helps scientists better understand the natural world.
- (d) all of the above

7. Food chains are scientific models that

- (a) represent simple systems in nature.
- (b) make the scientific systems easier to understand.
- (c) are based on mathematical equations.
- (d) are based on a prediction.
- 8. Science cannot answer all questions.
 - (a) The above statement is true because science cannot answer matters of belief.
 - (b) The above statement is true because all science is based on logic.
 - (c) The above statement is false because science can prove that life evolves over time.
 - (d) The above statement is false because science is based on observations and evidence.

Lesson 1.1: Vocabulary I

Name	Class	Date
Match the vocabulary word	d with the proper definition.	
Definitions		
1. a statement th	nat describes what always happens unde	er certain conditions in nature
2. a possible ans	wer to a scientific question	
3. any type of da	ata that may either agree or disagree wi	ith a prediction
4. a plan for aski	ing questions and testing possible answer	ers
5. a representation	on of part of the real world	
6. a broad explan	nation for events that is widely accepted	d as true
7. detected either human senses	r through human senses or with instrum	nents and measuring devices that exter
8. a special type	of scientific investigation that is perform	med under controlled conditions
9. developed the	laws of motion	
10. a statement t	that tells what will happen under certain	in conditions
11. developed the	eory of relativity	
12. a distinctive	way of gaining knowledge about the na	tural world
Terms		
a. Albert Einstein		
b. evidence		
c. experiment		
d. hypothesis		
e. Isaac Newton		
f. model		
g. observation		
h. prediction		
i. science		
j. scientific investigation		
k. scientific law		

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l. scientific theory

Lesson 1.1: Vocabulary II

Name	$____$ Class $___$	Date
Fill in the blank with the	appropriate term.	
1. An and measuring devices the		through human senses or with instruments
2. An conditions.	is a special type of scientific inves	stigation that is performed under controlled
3. A scientific conditions in nature.	is a statement that des	scribes what always happens under certain
4. A model is a represent	ation of part of the real	·
5 i	s any type of data that may either ag	gree or disagree with a prediction.
6. Scientific investigation	are done by following the scientific	,
7. The goal of	is to understand the natu	ral world.
8. A hypothesis is a poss	ible answer to a scientific	
9. Matters of	are outside the realm of so	cience.
10. A scientific	is a broad explanation for	or events that is widely accepted as true.
11. The last step in a sci	entific investigation is	what you have learned with others.
	is a distinctive way of gaining knowle	dge about the natural world that starts with

Lesson 1.1: Critical Writing

Name	Class	Date
Thoroughly answer the question below. sentences.	Use appropriate academic vo	cabulary and clear and complete
Discuss why science is not able to answer your response.	all questions. Incorporate the	steps of the scientific method into

1.2 Biology: The Study of Life

Lesson 1.2: True or False

Name_	Class Date
Write to	ue if the statement is true or false if the statement is false.
	1. A cell is the basic unit of the structure and function of all living things
	2. An adaptation is a characteristic that helps a living thing survive and reproduce.
	3. Natural selection is a change in the characteristics of living things over time.
	4. A population consists of many different species.
	5. Charles Darwin developed the theory of evolution by natural selection.
	6. All living things must maintain homeostasis.
	7. The characteristics of all living things are controlled by genes.
	8. The four unifying principles of biology are the cell theory, the gene theory, homeostasis, and
gravity.	
	9. Deer sometimes eat the starlings (birds) that sit on them.
	10. The cells of many different organisms are very similar.
	11. Simple life forms, like bacteria, have simple chemistry.
	12. Simple life forms, like bacteria, do not grow and develop.
	13. Every living thing begins life as a single cell.
	14. The mole's touch organ is an adaptation because it helps the mole survive in its dark.
	15. There are at least 100 million different species live on Earth today.

Lesson 1.2: Critical Reading

Name	Class	Date

Read this passage from the text and answer the questions that follow.

Evolution of Life

The diversity of life on Earth today is the result of evolution. Life began on Earth at least 4 billion years ago, and it has been evolving ever since. At first, all living things on Earth were simple, single-celled organisms. Much later, the first multicellular organisms evolved, and after that, Earth's biodiversity greatly increased.

Today, scientists accept the evolution of life on Earth as a fact. There is too much evidence supporting evolution to doubt it. However, that wasn't always the case.

Darwin and the Theory of Evolution

The idea of evolution has been around for centuries. In fact, it goes all the way back to the ancient Greek philosopher Aristotle. However, evolution is most often associated with Charles Darwin. Darwin published a book on evolution in 1869 titled *On the Origin of Species*. In the book, Darwin stated the theory of evolution by natural selection. He also presented a great deal of evidence that evolution occurs. Despite all the evidence Darwin presented, his theory was not well received at first. Many people found it hard to accept the idea that humans had evolved from an ape-like ancestor, and they saw evolution as a challenge to their religious beliefs. Darwin had actually expected this type of reaction to his theory and had waited a long time before publishing his book for this reason. It was only when another scientist, named Alfred Wallace, developed essentially the same theory of evolution that Darwin put his book into print.

Although Darwin presented a great deal of evidence for evolution in his book, he was unable to explain how evolution occurs. That's because he knew nothing about genes. As a result, he didn't know how characteristics are passed from parents to offspring, let alone how they could change over time.

Evolutionary Theory After Darwin

Since Darwin's time, scientists have gathered even more evidence to support the theory of evolution. Some of the evidence comes from fossils, and some comes from studies that show how similar living things are to one another. By the 1930s, scientists had also learned about genes. As a result, they could finally explain how characteristics of organisms could pass from one generation to the next and change over time.

Using modern technology, scientists can now directly compare the genes of living species. The more genes different species share in common, the more closely related the species are presumed to be. Consider humans and chimpanzees. They share about 98% of their genes. This means that they shared a common ancestor in the not-too-distant past. This is just one of many pieces of evidence that show we are part of the evolution of life on Earth.

Questions

- 1. What were the first living things on Earth?
- 2. Who is most often associated with developing the theory of evolution?

3. What is the name of the process by which evolution occurs?
4. What discovery allowed scientists to explain how characteristics are passed from parents to offspring?
5. Cite one piece of evidence that demonstrates we are evolutionarily closely related to chimpanzees.

Lesson 1.2: Multiple Choice

Circle the letter of the correct choice.

- 1. The cell theory states that
 - (a) all living things are made up of cells.
 - (b) living cells may come from other living cells.
 - (c) all living things remain single-celled.
 - (d) all of the above
- 2. Levels of organization of an individual organism includes
 - (a) the tissue.
 - (b) the population.
 - (c) the community.
 - (d) all of the above
- 3. Which is the best definition of "biology"?
 - (a) The science of living organisms.
 - (b) The study of humans and animals.
 - (c) The study of plants, humans, and animals.
 - (d) The science of life.
- 4. Homeostasis is
 - (a) the ability to give rise to offspring.
 - (b) maintaining a stable internal environment.
 - (c) the ability to detect and respond to changes in their environment.
 - (d) the ability to grow and develop.
- 5. Evolution
 - (a) is a change in characteristics of living things over time.
 - (b) occurs by natural selection.
 - (c) explains how modern organisms have descended from ancient life forms.
 - (d) all of the above
- 6. An example of a symbiotic relationship in which one organism is harmed is
 - (a) the relationship between a flock of starlings and a red deer stag.
 - (b) the relationship between a lion and an antelope.
 - (c) the relationship between humming birds and flowers.
 - (d) the relationship between humans and their pet dogs.
- 7. Cells
 - (a) are all unique; no two cells are similar.
 - (b) come from other cells, except for the very first cell of a new organism.
 - (c) are the basic unit of structure and function of all living things.
 - (d) are all circular in shape.
- 8. To be classified as a living organism, an object must
 - (a) maintain homeostasis.
 - (b) have a complex chemistry.
 - (c) be made of at least one cell.
 - (d) all of the above

Lesson 1.2: Vocabulary I

i. homeostasis

k. organisml. population

j. natural selection

Name_	Class	Date
Match t	he vocabulary word with the proper definition.	
Definit	ions	
	1. the basic unit of the structure and function of living things	
	2. the process by which evolution occurs	
	3. the same species that live in the same area	
	4. all of the populations that live in the same area	
	5. maintaining a stable internal environment	
	6. a change in the characteristics of living things over time	
	7. an individual living thing	
	8. the diversity of living things	
	9. all the living things in a given area, together with the nonliving en	vironment
	10. a characteristic that helps a living thing survive and reproduce	
	11. a group of similar ecosystems	
	12. the science of life	
Terms		
a. adap	tation	
b. biodi	versity	
c. biolog	gy	
d. biom	e	
e. cell		
f. comm	unity	
g. ecosy	stem	
h. evolu	tion	

Lesson 1.2: Vocabulary II

Name	Class	Date	
Fill in the blank with the	e appropriate term.		
1	developed the theory of evolution	by natural selection.	
2. All living things grow	and		
3. A cell is the basic uni	t of the structure and	of living things.	
4. An adaptation is a chenvironment.	aracteristic that helps a living the	hing survive and	in a given
5. The process of mainta	ining a stable internal environment	ent is	
6. A	_ is made of cells of the same kin	nd.	
7. An	is an individual living thing.		
8 is a	relationship between living thing	gs that depend on the same resources.	
9. An ecosystem consists	s of all the living things in a give	n area, together with the nonliving _	.
	is a change in the characteristic	s of living things over time.	
11. The	is the part of Earth where	all life exists.	
12	is the process by which living th	nings give rise to offspring.	

Lesson 1.2: Critical Writing

Name	Class	Date	
Thoroughly answer the questions belower the continuous sentences.	ow. Use appropriate academic	vocabulary and clear and	complete
List and describe three characteristics	necessary to define life		