Exploring and Classifying Life

Before You Read

Before you read the chapter, respond to these statements.

1. Write an A if you agree with the statement.
2. Write a D if you disagree with the statement.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Exploring and Classifying Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• All science takes place in laboratories.</td>
</tr>
<tr>
<td></td>
<td>• All of the changes that take place during an organism’s life are called responses.</td>
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<tr>
<td></td>
<td>• Spontaneous generation is the idea that living things come from nonliving things.</td>
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<tr>
<td></td>
<td>• Organisms are classified into groups based on their similarities.</td>
</tr>
</tbody>
</table>

**Foldables Study Organizer**

Construct the Foldable as directed at the beginning of this chapter.

**Science Journal**

List three characteristics that you would use to classify underwater life.

<table>
<thead>
<tr>
<th>List three characteristics that you would use to classify underwater life.</th>
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</table>
Exploring and Classifying Life
Section 1 What is science?

Scan the list below to preview Section 1 of your book.

- Read all section headings.
- Read all bold words.
- Read all charts and graphs.
- Think about what you already know about how to solve problems.

Write three facts you discovered about scientific methods as you scanned the section.

1. 

2. 

3. 

Write a paragraph describing scientific methods. Use all of the vocabulary words in your description. Underline each vocabulary word.

review vocabulary

experiment

new vocabulary

scientific methods

hypothesis

control

variable

theory

law

academic vocabulary

reject

2 Exploring and Classifying Life
Section 1 What is science? (continued)

Main Idea

The Work of Science

I found this information on page ___________.

Solving Problems

I found this information on page ___________.

Details

Define science using information from this section.

Sequence the steps scientists use to solve problems. Study the figure in your book, then close your book and try to fill in the figure. Check your work by looking back at your book.

Analyze the role of controls and variables in an experiment. Fill in the missing words.

A control is the ___________ to which the ___________ of a test is ___________. A variable is ___________ that can be ___________. The number of variables that should be changed during an experiment is ___________.

State the problem

revise hypothesis

repeat many times

I found this information on page ___________.

Name __________________________ Date ________________

Exploring and Classifying Life 3
Section 1  What is science?  (continued)

Main Idea

Developing Theories

Contrast an opinion, a scientific theory, and a scientific law.

Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>Opinion</th>
<th>Scientific Theory</th>
<th>Scientific Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>What it is</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What it is based on</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measuring with Scientific Units

Summarize the metric units for each quantity below by listing them.

Length: __________________________

Volume: __________________________

Mass: __________________________

Safety First

Identify two important safety practices to follow in a laboratory.

1. __________________________

2. __________________________

SYNTHESIZE IT

A scientist collects data about ducks’ migration patterns every year between November and April. After five years, she draws conclusions and publishes a scientific paper. Describe the scientific methods she might have used. State why it was important to wait five years before publishing her results.
Predict what you will learn in Section 2. Read the title and main headings. List three topics that you predict will be discussed in the section.

1. 
2. 
3. 

Use raw materials in a sentence to show its scientific meaning.

raw materials

Find a sentence in Section 2 that uses each vocabulary term.

organism

cell

homeostasis

Use a dictionary to define chemical.

chemical
Main Idea

What are living things like?

I found this information on page __________.

Details

Organize the characteristics that define living things. Complete the graphic organizer.

Describe the relationship between a stimulus and a response. Complete the table. Then complete the flowchart to describe homeostasis.

<table>
<thead>
<tr>
<th>What It Is</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stimulus</td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td></td>
</tr>
</tbody>
</table>

Homeostasis

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>The conditions in an organism's cells change.</td>
<td></td>
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</tbody>
</table>
Contrast the ways organisms obtain energy in the table.

<table>
<thead>
<tr>
<th>Organism</th>
<th>How It Obtains Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td></td>
</tr>
<tr>
<td>Bacteria in places sunlight cannot reach</td>
<td></td>
</tr>
</tbody>
</table>

Classify the needs of all living things. Complete the concept map.

Summarize It

Choose one living thing and one nonliving thing with which you are familiar. Use the five characteristics of living things to explain how you know that each is living or nonliving. Complete the chart to organize your information.

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</tbody>
</table>
Skim Section 3, and write three questions that you have.

1. 
2. 
3. 

Define contaminate and use it in an original sentence.

contaminate

Write the vocabulary term that matches each definition.

the idea that living things come from nonliving things

the idea that living things come only from other living things

Use a dictionary to define estimate as both a noun and a verb.

noun: 

verb: 
Section 3 Where does life come from? (continued)

Main Idea

Life Comes from Life

I found this information on page ___________.

Details

Contrast the theories of spontaneous generation and biogenesis. Complete the table.

<table>
<thead>
<tr>
<th>Spontaneous Generation</th>
<th>Biogenesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of life</td>
<td></td>
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</tbody>
</table>

Sequence experiments that were conducted about the theory of spontaneous generation. Complete the time line.

- Who: __________________________
  What: __________________________
  1800s

- Who: __________________________
  What: __________________________
  1700s

- Who: __________________________
  What: __________________________
  1668

Complete key events in the evolution of life on Earth. Identify the event that scientists hypothesize occurred at each time.

about 5 billion years ago: __________________________

about 4.6 billion years ago: __________________________

more than 3.5 billion years ago: __________________________

Life’s Origins

I found this information on page ___________.

Exploring and Classifying Life
Organize information about Oparin’s hypothesis. Complete the outline.

I. Oparin’s hypothesis of Earth’s early atmosphere composition
   A. 
   B. 
   C. 
   D. 

II. What happened in the atmosphere
   A. 
   B. 

Complete the graphic organizer summarizing Stanley Miller and Harold Urey’s experiment.

CONNECT IT

Scientists’ theories of the origin of life have changed over time. How do these changes show the use of scientific methods?

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10.
Read the What You’ll Learn statements for Section 4. Rewrite each statement as a question. As you read, look for the responses to your questions.

1. __________________________________________
2. __________________________________________
3. __________________________________________
4. __________________________________________

Describe how an organism’s common name is different from its scientific name.

____________________________________________
____________________________________________
____________________________________________
____________________________________________

Read the definitions below. Write the vocabulary term that matches each definition.

____________________________________________
(first and largest category used to classify organisms)

____________________________________________
(evolutionary history of an organism)

____________________________________________
(group of similar species)

____________________________________________
(two-word scientific naming system)

Define similar using a dictionary.

____________________________________________
____________________________________________
____________________________________________

Exploring and Classifying Life

Section 4 How are living things classified?
Section 4 How are living things classified? (continued)

Main Idea

**Classification**

I found this information on page __________

**Details**

**Contrast** historic classification systems. Identify the categories or criteria used in each system.

<table>
<thead>
<tr>
<th>Categories or criteria</th>
<th>Early classification</th>
<th>Aristotle</th>
<th>Linnaeus</th>
</tr>
</thead>
<tbody>
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</table>

**Summarize** the 6 types of information that modern scientists use to determine an organism’s phylogeny.

1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________
6. __________________________

**Label** the groups used to classify organisms from least specific to most specific. Use the word bank to complete the diagram.

```
class    genus    order    species
family   kingdom  phylum
```

I found this information on page __________
Section 4  How are living things classified?  (continued)

Main Idea

Scientific Names
I found this information on page ____________.

Details

Summarize binomial nomenclature. Complete the sentences.

The first word of an organism’s scientific name is its ____________.

The second word might _____________________________.

Identify four reasons the system of binomial nomenclature is useful.

1. ____________________________________________

2. ____________________________________________

3. ____________________________________________

4. ____________________________________________

Distinguish between a field guide and a dichotomous key. Complete the Venn diagram.

Field Guide

Dichotomous Key

Both

Tools for Identifying Organisms
I found this information on page ____________.

SYNTHESIZE IT

Choose five similar plants or animals. Use what you know about their structures and features to develop your own dichotomous key to classify your choices. Use a dictionary to find the scientific name of each plant or animal to include in your key.