Name _____ Class _____ Date _____

1 Diving Into Ocean Ecosystems

BIGIDEAS

- An ecosystem is the interactions of all the living and non-living things in an environment, including its energy source.
- Biotic factors are all the living organisms in an ecosystem, while abiotic factors are all the non-living things in an ecosystem.
- Succession is a process of gradual changes that occur naturally in an environment. During this process living organisms replace other living organisms until a stable community is reached.

Engage

Activate Prior Knowledge

Throughout your study of *Marine Science: The Dynamic Ocean*, you will explore Earth's ocean and uncover many of its mysteries. Although there is much to learn, it is likely that you already know about and have had experiences with the ocean and ocean organisms. You may have swum in the ocean on a warm day. You may have visited an aquarium filled with ocean creatures. You may have eaten fish or purchased other products that came from the ocean.

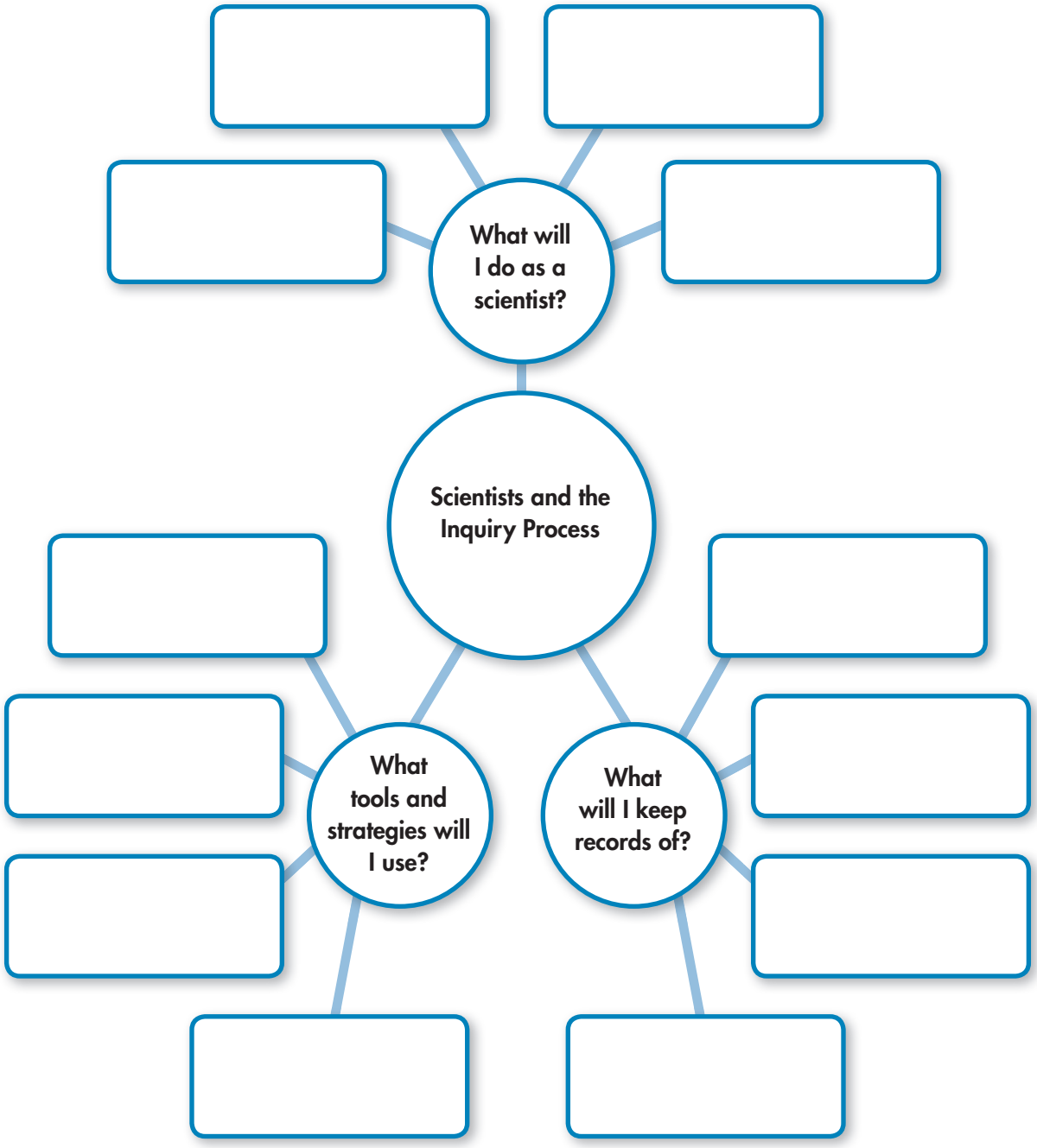
Write about an experience you have had that involves the ocean in some way.

Name _____ Class _____ Date _____

Reading Strategy: TAKING NOTES

Taking notes when you read is an important tool that can help you remember key concepts. One way to take notes and keep new information organized is by using a concept web such as the one below. A concept web is a type of graphic organizer used to show ideas that are related to a topic or concept. Concept webs can help you show relationships between ideas.

The Engage section of your textbook introduces you to scientific inquiry—the process you will use as a scientist to investigate the migration patterns of marine animals. As you read page 4 of the textbook, use the concept web to record key ideas about the work of scientists. Then use this note-taking skill as you complete other sections of the lesson.

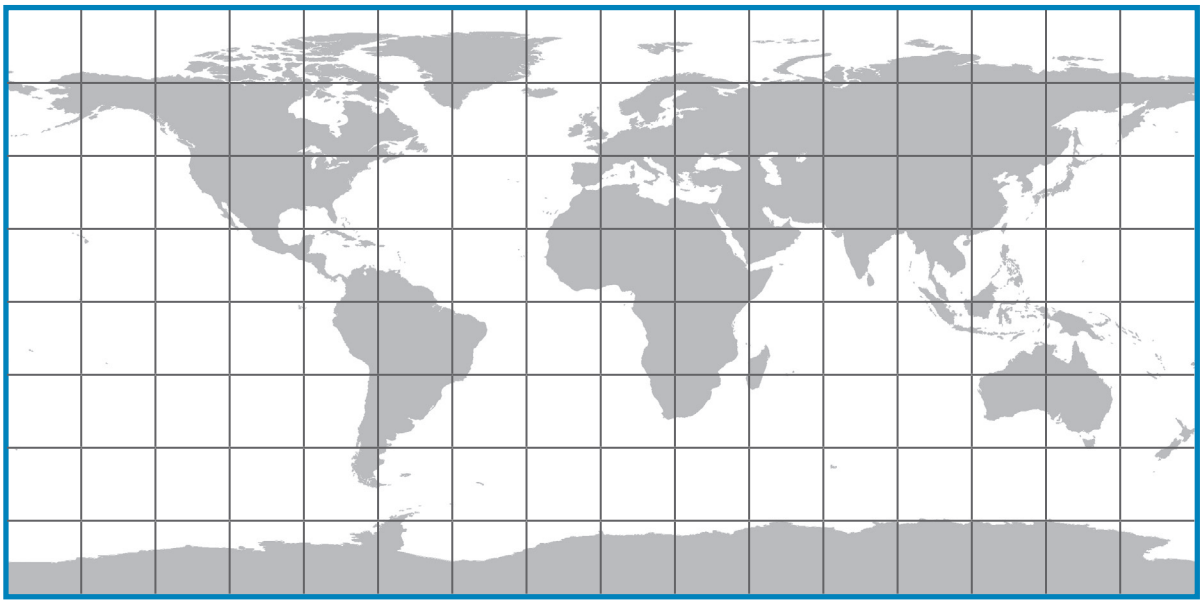


Name _____ Class _____ Date _____

Visual Literacy: Reading Maps

Reading and interpreting maps will be an important part of your journey in this Marine Science course. You will study maps as you track a marine animal species across the globe and will be expected to explain where on the map your animal is and where it is likely to move. In addition, you will analyze maps as you learn about ocean environments, currents and conditions of the ocean.

Before reading and trying the activities in your textbook, review the world map below. Label the oceans and continents. Then answer the questions that follow.



1. Which continents touch the Atlantic Ocean? _____

_____

2. Which continents touch the Indian Ocean? _____

_____

3. Where does one ocean stop and another start? Are the oceans separate bodies of water, or one continuous body? _____

_____

4. Predict which covers more of Earth—water or land? _____

_____

Name _____ Class _____ Date _____

Now calculate how much of Earth is covered by land and how much is covered by ocean. Using the blue grid on the world map, count how many squares are 'filled' by land and how many are 'filled' by water. Then follow the steps below to calculate the percentage of land mass covering Earth's surface and the percentage of ocean mass. You may be surprised at the answer.

Not all of the land or ocean will fill a box perfectly. You will have to estimate for some of the boxes. For example, look at Madagascar, the large island east of Africa. How many boxes do you think it will fill**?**

_____

Count and record the number of boxes each for:

Land = _____ squares

Ocean = _____ squares

Total number of squares = _____

Hint: Multiply the number of squares in the top row by the number of squares in the first column.

Percentage of land:

Divide the number of squares for land by the total number of squares.

_____ ÷ _____ = _____

Multiply the number that you calculated above by 100 to calculate percentage of land.

_____ × 100 = _____ %

Percentage of ocean:

Divide the number of squares for ocean by the total number of squares.

_____ ÷ _____ = _____

Multiply the number that you calculated above by 100 to calculate percentage of ocean.

_____ × 100 = _____ %

5. Which covers more of Earth's surface—land or ocean? _____

Name _____ Class _____ Date _____

Explore

Build Background

The activity on pages 6–7 of your textbook asks you to explore marine ecosystems. An ecosystem is the interaction of all the living and non-living things in an area, including its energy source. The living things, such as the plants and animals, make up the biotic factors. The non-living things, such as water, soil, air and sunlight, make up the abiotic factors. Living things in an ecosystem depend on the abiotic factors of their ecosystem and on one another for their survival.

Before trying the activity in your textbook, use the chart below to list all the biotic and abiotic factors in your 'classroom ecosystem' to familiarize yourself with these concepts. Then answer the questions that follow.

Biotic factors	Abiotic factors
Example: class pet	**Example: desk**

1. Did you find more biotic or abiotic factors in your classroom ecosystem? _____

_____

2. How do the biotic factors depend on one another and on the abiotic factors of the ecosystem? _____

_____

3. How is your classroom ecosystem similar to your school ecosystem? How does it differ?

_____

_____

Name _____ Class _____ Date _____

Explain

Review What You Learned

The list of marine ecosystems and their descriptions below are out of order. Match the ecosystem in the first column to the appropriate description of its characteristics in the second column. Record the letter of the correct description on the line provided.

Marine Ecosystems	Descriptions
1. _____ The Open Ocean	**a.** Environment with strong wave action; organisms are adapted to both wet and dry conditions
2. _____ Coral Reef	**b.** Wet and dry environment; long grasses; thick mud
3. _____ Kelp Forest	**c.** Extremely cold environment dominated by ice; very little sunlight during parts of the year
4. _____ Mangrove Forest	**d.** Sunny environment with dense forest of fast-growing seaweed
5. _____ Rocky Shore	**e.** Environment far from landforms with plenty of light and water temperatures that vary with depth; marine organisms can move about freely
6. _____ Polar Sea	**f.** Dark environment with cold water temperature; few animal communities
7. _____ Salt Marsh	g. Environment with warm temperatures; tree roots are covered during high tide and exposed during low tide
8. _____ Deep Ocean	**h.** Warm and shallow environment; reef built from seafloor; rich diversity of marine life

Name _____ Class _____ Date _____

Elaborate

Vocabulary Review

Complete the chart below as you read pages 9–15 of your textbook. Write the definition of each vocabulary term in your own words. Then, write a note to yourself on how you will remember the meaning of each term. Use the chart to review key concepts after you have finished the lesson.

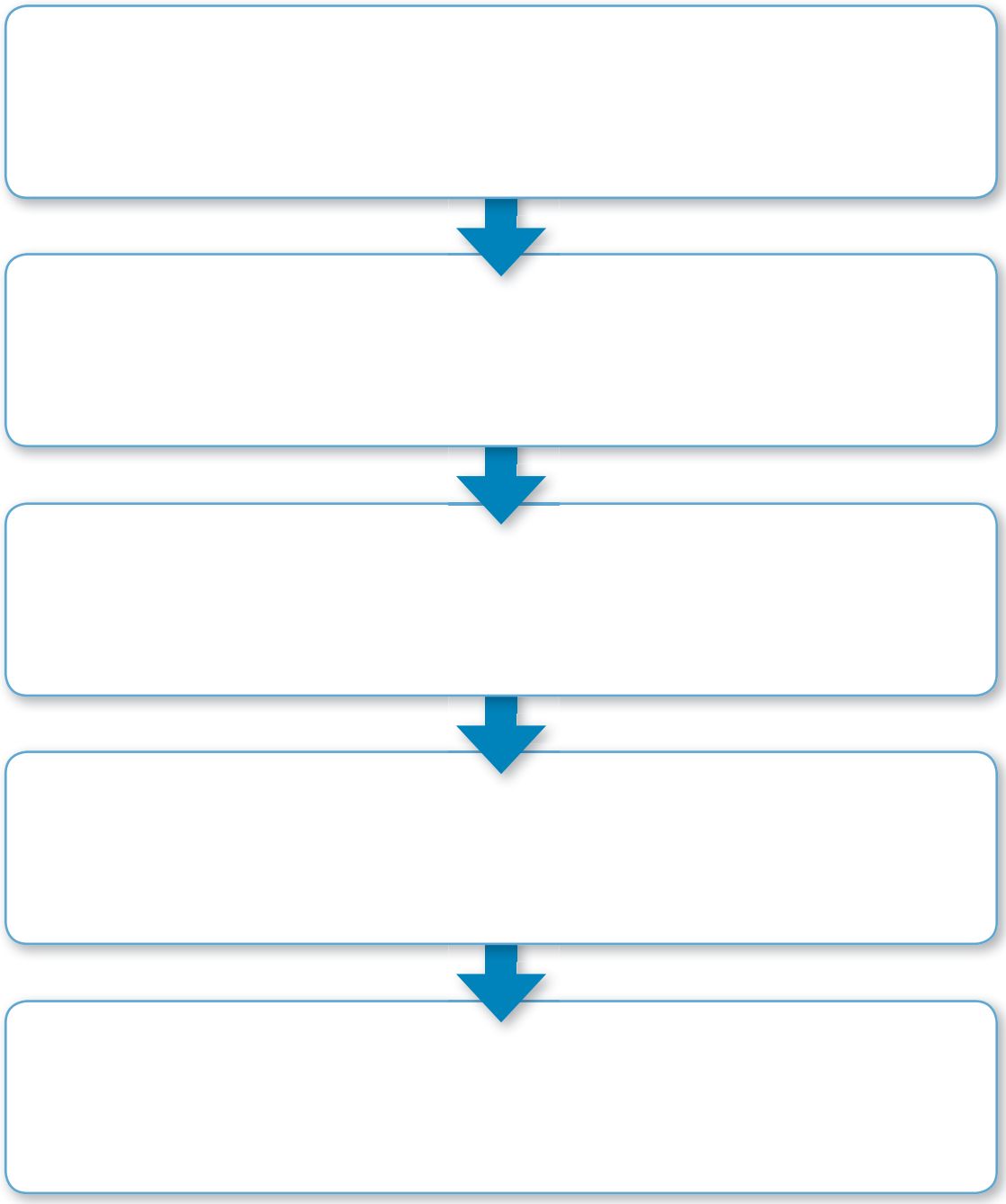
Term	Definition	How I Will Remember
Biological community		
Ecosystem		
Organism		
Succession		
Benthic		
Mangrove		

Name _____ Class _____ Date _____

Reading Strategy: SEQUENCE of EVENTS

Pages 9–12 of your textbook describe whale falls and how a whale carcass is slowly consumed and broken down by communities of marine organisms. Keeping track of the sequence in which processes such as this occur can help you understand processes and changes that happen over time. Remember, a sequence describes the order in which something happens.

After reading pages 9–12 of your textbook, use the Sequence of Events graphic organizer below to record in your own words the major stages in which a whale carcass is broken down.



Name _____ Class _____ Date _____

Evaluate

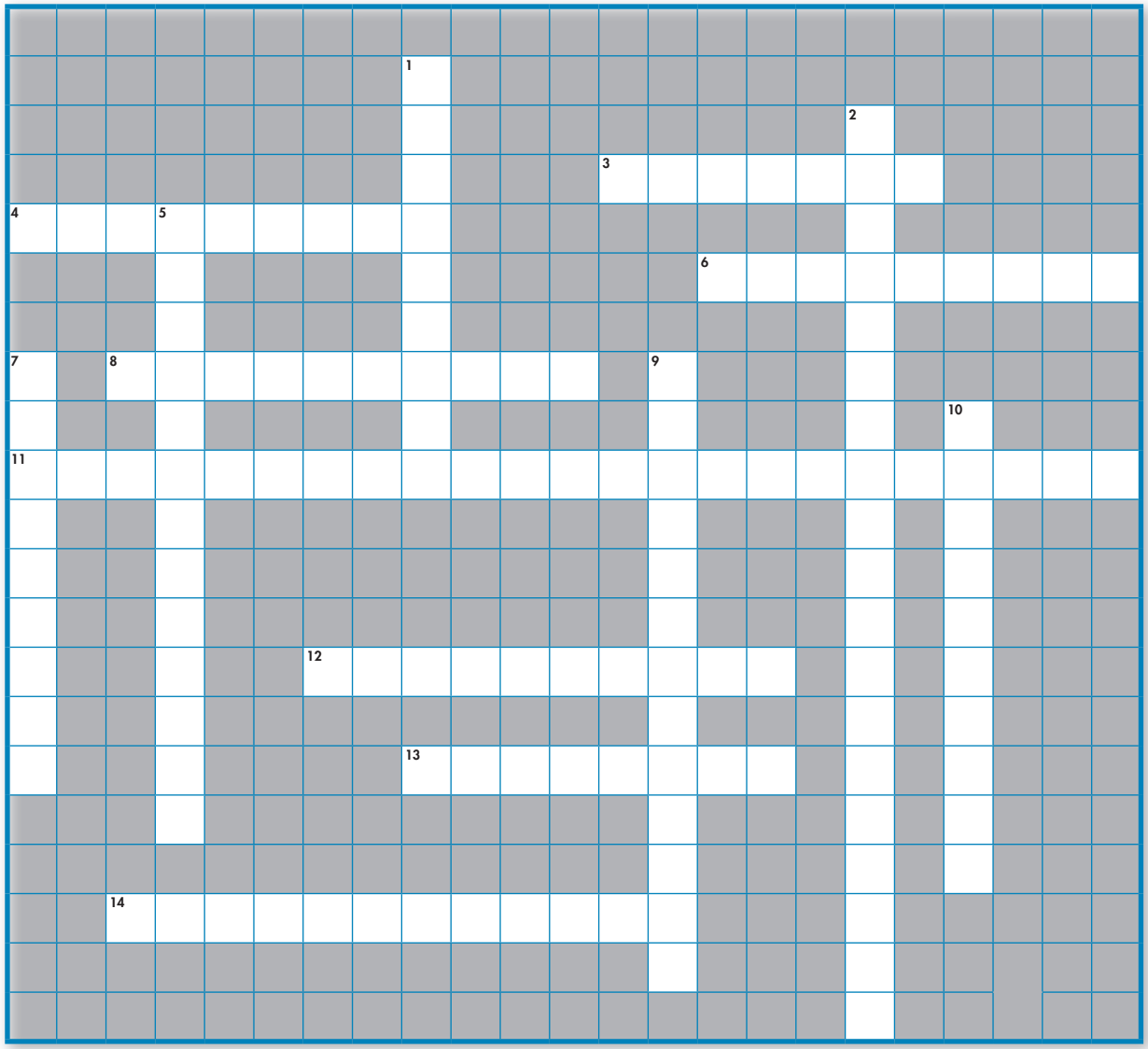
Lesson Summary

- The work of scientists includes asking questions, making observations, drawing conclusions and keeping detailed notes of research and experiments.
- Scientists use a variety of tools and technologies to observe and learn about an animal's movements and behavior.
- The ocean covers more than 70% of Earth and includes many diverse ecosystems.
- An ecosystem is made up of the interactions of all the living organisms (biotic factors) and non-living things (abiotic factors) in an area along with its energy source—typically the Sun.
- The relationship between organisms and their physical environment is important to the health of an ecosystem and the life that can exist.
- Succession is the process in which communities found in an ecosystem change over time. One species may increase its population, while another species may disappear. The replacement of one population by another occurs until a stable community is formed.
- Succession may be triggered in an ecosystem by gradual changes such as the death and decay of one or a small group of organisms to drastic changes such as tropical storms or oil spills that affect entire populations at once.
- Whale falls feed communities of marine organisms and provide an example of succession.
- National Marine Sanctuaries are a system of 14 marine protected areas in the United States. These National Marine Sanctuaries were created to protect marine habitats and organisms.

Lesson Review

Complete the crossword puzzle on the next page to review key terms and concepts from the lesson.

Name _____ Class _____ Date _____



ACROSS

3. Related to the bottom of the ocean

4. Living things

6. Dead whale that settles onto the ocean floor

8. Organisms that eat bones

11. Federally protected coastal marine environment

12. Organisms that stay and eat whale carcass for extended periods of time

13. A tropical tree that grows in saltwater

14. A living part of an ecosystem

DOWN

1. The living and non-living things interacting in an environment

2. All the organisms living together in an environment

5. A non-living part of an ecosystem

7. Organisms that decompose the final remains of an organism

9. Organisms that eat flesh off large species

10. Changes in an ecological community that occur over time

