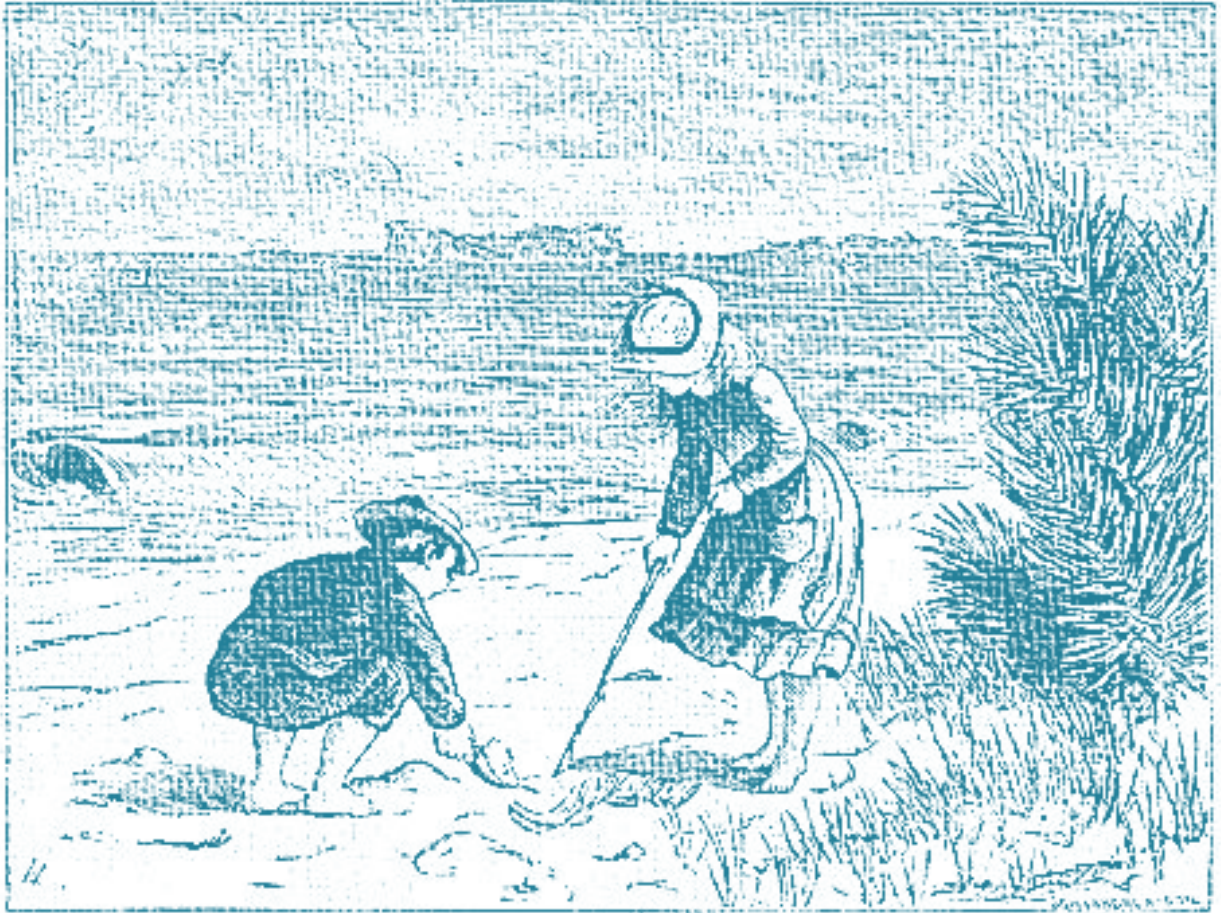


# Marine Biology



One

A Guided Study by Lisa Kelly



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# Book List

*Understanding the Sea* by Denis Sanderson-CA

*On the Seashore* by R. Cadwallader Smith-CA

*Pagoo* by H. C. Hollings

*Oceans* by Seymour Simon

*Who Eats What? : Food Chains and Food Webs* by Patricia Lauber

*Karl, Get Out of the Garden: Carl Linnaeus and the Naming of Everything* by Anita Sanchez

CA=Companion Album

## Optional Book List

*The Burgess Seashore Book for Children* by Thornton W. Burgess

*Coral Reefs* by Seymour Simon

*Dolphins* by Seymour Simon

*Whales* by Seymour Simon

*One Small Square: Coral Reef* by Donald Silver

*One Small Square: Seashore* by Donald Silver

*Graywings* by Alice E. Goudey

*Life in a Tidal Pool* by Alvin and Virginia Silverstein

*Along the Seashore* by M. Buck

*Sylvia Earle: Guardian of the Sea* by Beth Baker

*Far From Shore: Chronicles of an Open Ocean Voyage* by Sophie Webb

*Life in the Ocean: The Story of Oceanographer Sylvia Earle* by Claire A. Nivola

*Interrupted Journey: Saving Endangered Sea Turtles* by Kathryn Lasky

# Reading Schedule

Week #	Day One	Day Two	Day Three
1	Read - <i>Karl, Get Out of the Garden!</i>	SI: Animal Classification	SI: Photosynthesis
2	Read - <i>Who Eats What?</i>	SI: Food Chains I	SI: Food Chains II
3	Read - <i>Oceans</i>	SI: Tides	SI: Waves
4	Read - <i>Under. Sea</i> , 2 sect.	SI: Evaporation	SI: Water Cycle

This is only a small part of the reading schedule as this was made for a sample; a full schedule exists in the guide. This guide is structured for 2 terms or 24 weeks.

Year Three will use these books and this guide for Terms 2 and 3 of their year. Astronomy with *A Child's Introduction to the Night Sky* will be used in Term 1 of Year 3.

## Teaching Notes

**Flexibility** -this guide is meant to be flexible, allowing students from ages 8-11 to work together through it. The pages which are meant to be printed and consumed by the students will be contained in an additional PDF file at the website for your convenience. You may print as many as you need for your family, allowing families to easily use the guide with multiple students. Please adapt the guide as needed to best fit each of your students, keeping expectations in writing and details lower for younger children and adding in optional activities and raising expectations in writing and drawing work for older students.

**Living Books, Observations and Demonstrations** -this guide is based on living books with additional Science Inquiries providing the necessary opportunities to learn through observations and demonstrations. Science Inquiries are provided at least once per week, and in some cases there are two per week. These inquiries are demonstrations and object lessons primarily, with some activities and concept lessons as needed. Feel free to adapt these activities and demonstrations as needed.

**Notebooks** -you may wish for your students to record their notes and drawings into a notebook. If you wish to do this, then you may omit some of the printable, consumable pages as this may be unnecessarily repetitive. Your student could simply label their drawings rather than the printable page.

**Specimen Study** -there are several object lessons which revolve around **live or dead** specimens. Please feel free to alter these as needed. I included some objects lesson from various books which led the study of these specimens, but you can certainly change them as they best work for your family. Your family may prefer to study these animals in their natural settings or at an aquarium. If you choose to do it this way, then you may wish to combine some of studies together into one day, assuming that you may only be able to make a special trip to these locations once or twice. If both options are not possible, then make use of available online resources, books and documentaries. **If you choose to use live specimens, then please be sure that adult supervision is on hand for the experience.**

**Nature Experiences and Field Trips** –if possible, it would be very beneficial if your family could visit a beach, aquarium or other similar location so that your students can experience marine life personally.





## **Week 1**

### **Day One-Introduction to Classification**

Imagine being transported to a new planet, one in which no one had ever known of before now. Now pretend that people back on Earth want you to describe what you see. How hard would this be if everything you saw did not have a name yet?

Now imagine someone emptying a box of an assortment of many toys on a table. Pretend this person has asked you to organize the toys so that each of 6 children could have a set in which its components were similar in some way. How would you begin? (Maybe one group contains only toys which move, while another contains only action figures.) What would you do next? Do any problems arise? What do you do now? These are the types of questions a scientist must ask and answer as they try to solve a problem, answer a question or find a method which fulfills a request.

Note: If your students need more scaffolding with this concept, then consider having them actually sort an assortment of small toys. Let them experience the need to reorganize because a chosen category label presented too many problems to complete the task. However, don't let this become too stressful. Your students should enjoy this!

1. Have your students help you write a list of some very different animals and plants. Remember: Plants include trees, flowers, mosses, etc. and animals include birds, fish, insects, reptiles, etc. Let them notice that the list was created by speaking and writing the names of these plants and animals. (You-the teacher-wouldn't know what to write unless it had a name and the students wouldn't know what to call it without a name.) How did we come by these names?

2. Refer back to the list of plants and animals you've just created. Ask your students, which are plants and which are animals? How are plants and animals different?

Answers may vary: most plants can make their own food; animals must obtain food for energy; animals can move around; plants generally cannot move around, etc.

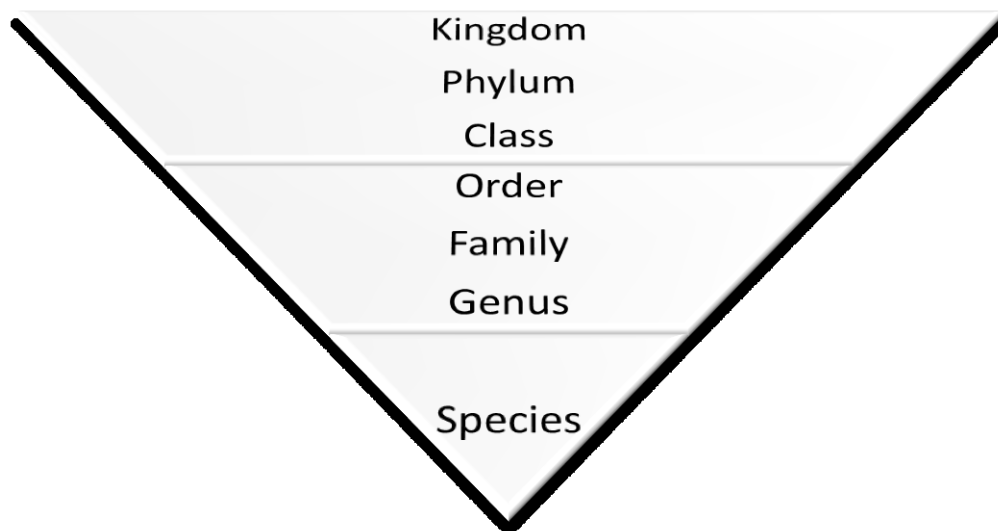
3. How are they alike?

Answers may vary: both need water; both grow; both are living organisms; both depend on the sun's energy, etc.

3a. Optional: Use the questions from #2 and #3 and their answers to create a Venn diagram which illustrates the differences and similarities between plants and animals. One circle would be labeled “Plants” and the other circle would be labeled “Animals”. Be sure there is an overlap or intersection of the two circles. An older student can create their own Venn diagram for their notebook. They can use a lid or bowl as a template to trace around with a pencil to create quality circles. A compass might also be helpful. Be sure they fill in their diagram and give it a title.

Answer Key for Venn Diagram: Plants-most plants make their own food; plants generally cannot move around; Animals-animals must obtain food for energy; animals can move around, Intersection-both need water; both grow; both are living organisms and both depend on the sun’s energy

## Science Words to Know



Locate and discuss Sweden and Lapland.

- ❖ Read *Karl, Get Out of the Garden: Carl Linnaeus and the Naming of Everything* by Anita Sanchez

Teacher: Be sure to read pp. 42-end as they serve as good teaching notes, but you may also wish to read them aloud as well.

Anita Sanchez, the author of this book, suggests this mnemonic for remembering the degrees of classification: “Kangaroos Play Cellos, Orangutans Fiddle, Gorillas Sing”.

### **Narration Suggestions**

	What problem did Karl identify? Explain why it was a problem and what Karl hoped to do to solve it.
	Tell about Karl (Carolus Linnaeus) and his life.
	“Truth ought to be confirmed by observation,” Karl said.  Explain what is meant by this. How does Karl devise his system of classification? How does he try to ensure that it is correct?
	How do scientists initially respond to Karl’s new ideas? How did they respond later?
	Give an account of the significance of Karl’s classification system.

Book Alternative: *Benny’s Animals: And How He Put Them in Order* by Millicent E. Selsam

### **Additional Resources**

- The Linnean Society of London offers teaching resources, including a free poster of Carl Linnaeus, which is linked at the website.

RY3, Science and Nature Study: Marine Biology

## Teaching Notes

Scientists use the classification system as a process to sort and identify known living organisms as well as for organizing new ones as they are discovered. This system is helpful as a structure for making comparisons between species, showing how they are similar and different from each other. It also allows relationships between species to be seen. The science of classification is **taxonomy** and is usually used in biology and paleontology.

Carl Linnaeus is often thought of as the “father of modern taxonomy”, since it is he who developed this **hierarchical** system. It is hierarchical because it moves a specific organism from its broadest and largest group down to its most specific group-its genus and species.

It was important to Linnaeus for each organism to have its own scientific name, since common names varied from location to location and sometimes an organism had more than one common name. It was often very confusing. An organism with its own specific, scientific name allowed for scientists all over the world to better communicate about it.

## Week 5

### Day One- *Understanding the Sea*

Share what you know of a food web. How are they different from food chains?

### Science Words to Know

- phytoplankton
- zooplankton
- photosynthesis
- food chain
- thermocline

➤ **Read 2 Sections: Plankton and Food Chains & Seasons and the Sea**

### Narration Suggestions

	Draw the diagram of the food chain included in the book. See the website for a large, color version of this food chain.  <u><a href="#">RY3, Science and Nature Study: Marine Biology</a></u>
	Explain the significance of phytoplankton.
	What does it mean to be the shark of a food chain? What other animals fit this spot of the food chain?
	Describe the seasons of the land. What factors cause life and the earth to change over the course of a year? Are these the same factors which cause changes with the sea?
	Describe the role thermocline plays in the changing of the seasons?

## 5/Day Two-*Pagoo*

What do you know of plankton?

### Science Words to Know

- diatom
- algae
- plankton –zooplankton and phytoplankton

Distinguish between copepod and zooplankton.

➤ **Read Chapter 1**

### Narration Suggestions

	Locate the following list of animals using page 10 as a reference: baby crab; spiny lobster; baby squid; young shrimp and young barnacle.
	Tell how Pagoo can survive even without his parents around to show him what to do to live.
	Draw a picture of young Pagoo using pages 8-9 as a guide.
	Create your own underwater scene on thick or watercolor heavy paper. Draw pictures of diatoms and copepods using this chapter as a guide. Color your pictures in completely in bright crayon colors, leaving the water portion alone. Now paint over your entire picture using watercolor paints in blues and greens. The pictures colored in crayon will resist the color of the watercolor paint, leaving a beautiful underwater scene.