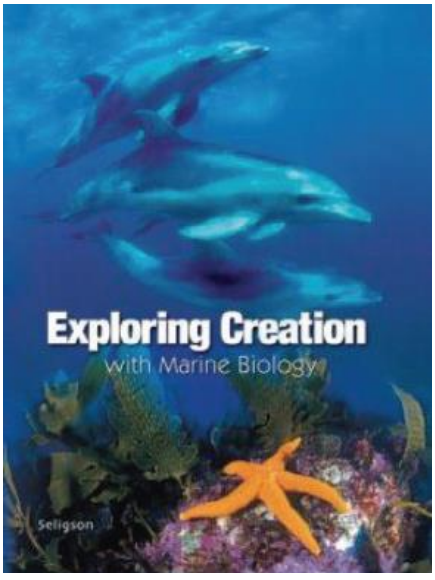
**LJ-MB**

# Apologia "Exploring Creation With Marine Biology" 1st Edition Lapbook Journal




This Lapbook Journal has been specifically designed for use with the book, "Exploring Creation with Marine Biology" 1st Edition by Apologia Science.

Designed by
Cyndi Kinney
of Knowledge Box Central
with permission from Apologia Science

Exploring Creation With Marine Biology 1st Edition Lapbook Journal

www.KnowledgeBoxCentral.com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# PLEASE, PLEASE, PLEASE

## Read THIS First!!

I know it's tempting to go ahead and get to "the good stuff," but I promise that your use of this product will be greatly enhanced if you take a few minutes to read a little more about it. Within this document, you'll learn how to set up your binder, which files to print, what types of paper to use, where to view pictures of completed booklets, frequently asked questions, what can be easily omitted due to time constraints, and so much more. Also, if after reading this, you think of tips that would have helped you assemble and use your product, please feel free to let me know. I do want to make sure that we are providing the best product to supplement these awesome Apologia books.

## Table of Contents

# Knowledge Box Central

www.knowledgeboxcentral.com

Welcome to our Lapbook Journal for Apologia's Exploring Creation With Marine Biology 1st Edition by Dr. Jay Wile.
We are very pleased to offer this product, as authorized by Dr. Wile.

**So...now you bought it...what do you do with it?**

I'll try to answer your questions here. Please note that there are several ways to use our Lapbook Journal, and the BEST way is the way that works for your student.

**First**, purchase a 4 inch 3-ring binder, and divide it into 3 sections. Your dividers should be labeled as follows:

*On Your Own Journal* (OYOJ)
*Study Guide Pages* (STP)
*Lab Reports* (LR)
*Module Summaries* (MS)

You may use the acronyms if your label space is limited.

**Now you have your binder ready….so what next?**

It's time to print! As for the order or printing...you may choose to print needed pages as you finish one module and begin the next….or you may choose to print everything up front. The choice is yours, but I would suggest marking off some time to print it all at once….that's just my opinion. Obviously, your time will dictate what you print when.

You will find 16 files within this product. These will consist of one file for each module of the book. Within each of these files (one per module), you will find the following:

1. On Your Own Journal Pages
2. Study Guide Lapbook Pages - Booklet Templates
3. Study Guide Lapbook Pages - Background Pages
4. Study Guide Journal Pages
5. Lab Reports (Supplies, Introduction, & Procedure filled out already)
6. Lab Reports (No information already filled in...only the report itself with the title of the experiment at the top)
7. Module Summary

**Now I will go into detail about how to print each of these files, what type of paper to print them on, and how to use them.**

As I said on the previous page, there are 16 files (one for each module of the book) included in this product, and within each of these files, you will find the following:

1. On Your Own Journal Pages
2. Study Guide Lapbook Pages - Booklet Templates
3. Study Guide Lapbook Pages - Background Pages
4. Study Guide Journal Pages
5. Lab Reports (Supplies, Introduction, & Procedure filled out already)
6. Lab Reports (No information already filled in...only the report itself with the title of the experiment at the top)
7. Module Summary

## 1. On Your Own Journal Pages

*Supplies Needed*: Regular White Copy Paper (unless you desire differently)

These pages will be solely devoted to the "On Your Own" questions that appear throughout each of the modules. Instead of the student having to re-write the questions in a notebook, we have provided the questions in a "Notebooking" styled setting. There will be ample space for the students to answer the questions within these Journal Pages, and the borders and graphics provide a decorative page for documenting learning.

We recommend that these pages be printed on regular, white paper. There is no need to print these pages on any special type or color, unless that is your preference.

For each module, print these pages, and file them all together under your "On Your Own Journal Pages" divider tab. As your student comes to these questions, he will go to this section to document his answers.

**IMPORTANT NOTE About Next Section:**

*NOTE: There are **TWO DIFFERENT OPTIONS** **for the Study Guide questions** – they are the Lapbook Pages **OR** the Journal Pages – depending on your student's preference).*
***There is NO NEED TO PRINT BOTH!!!!!***

**IMPORTANT NOTE About THIS Section:**

*NOTE: There are **TWO DIFFERENT OPTIONS** **for the Study Guide questions** – they are the Lapbook Pages (#2 & 3) **OR** the Journal Pages (#4) – depending on your student's preference).*
***There is NO NEED TO PRINT BOTH!!!!!***

**HOW do I know which one of these options to use????**

*** If your child enjoys hands-on projects, scrapbooking, crafty projects, etc., then you will probably want to use the Study Guide Lapbook Pages and their Background Pages (#2 and #3).

*** If your child does NOT enjoy these types of hands-on projects and would rather have a journaling-style area for documenting the answers to the Study Guide questions, then you will probably want to use the Study Guide Journal Pages.

You may change after a few modules. You may even want to use both...but not at the same time….just every other module.

## 2. Study Guide Lapbook Pages Booklet Templates & Background Pages

*Supplies Needed*: Regular White Copy Paper, Colored Paper, White Cardstock Paper (if desired), Glue, Scissors, Metal Brad Fasteners (if desired), Ribbon (if desired), Staples

This section is used with the Study Guide at the end of each module of the book. Instead of writing the questions and answers into a regular notebook, the student would complete these booklets to place into his binder.

This section provides more of a "hands-on" opportunity for your students. It is similar to the traditional lapbooks, but there are no folders in which to place the booklets.
SPECIAL NOTE: Remember, *IF your student DOES NOT want to create the lapbook booklets, we have added another option for the Study Guide Questions, and that is the Study Guide Journal in section 4.*

**Study Guide Lapbook Pages Booklet Templates & Background Pages...cont.**

We recommend that you print these on the following types of paper:
* Study Guide Lapbook Pages Booklet Templates: colored paper, any weight (we use 24#, multi-colored paper)
* Study Guide Lapbook Pages Booklet Templates Instructions: white copy paper (these will ultimately be thrown away, so the weight of the paper isn't important)
* Study Guide Lapbook Pages Background Pages: white cardstock (These can be printed on white paper, if you prefer. We print on white cardstock because it is more durable, holds the weight of the booklets, and holds up to years of "thumbing through" the pages.)

These lapbook-style booklets will provide a 3-dimensional aspect to your student's learning experience. Science has proven that the more senses a student uses when learning and reviewing new material, the more he will retain. So, by adding this section, your student will be able to use his own hands to create these memories. Also, the colors and shapes of the booklets will stimulate memory as well.

At the end of each module, allow the student time to create these booklets, and place them randomly (be creative!) on the Study Guide Lapbook Journal Background Pages (print as many copies of these as you need).

This is the most time consuming portion of the Lapbook Journal, and I know that time is very precious. So, if you simply cannot make time for creating ALL of the booklets, or if your student is at first resistant to this hands-on method, you may choose to have your student only complete a few of the booklets...maybe the ones that cover areas in which he needs extra study.

Allow the student to have fun with this section. As he cuts, glues, and folds, he will be creating something to look back on for years to come. He will also be creating something that will be WONDERFUL when it comes time to review! There is NO better way to learn, in my opinion, than for the student to be intensely involved in the process by using his hands.

**3. The Study Guide Lapbook Background Pages – *SPECIAL NOTE:*** You will need to print as many of these as necessary. How many you need depends on how many booklets that your student made. Allow your student to arrange the completed booklets in any order they desire – be creative! You may need a bunch of these pages printed if he really gets the hang of this!

## 4. Study Guide Journal Pages

*Supplies Needed*: Regular White Copy Paper

This section is OPTIONAL and **could** replace the Study Guide Lapbook Pages
These pages will be solely devoted to the "Study Guide" questions that appear at the end of each of the modules. Instead of the student having to re-write the questions in a notebook, we have provided the questions in a "Notebooking/Journal" styled setting. There will be ample space for the students to answer the questions within these pages, and the borders provide a decorative page for documenting learning.

If you choose to use these pages, print them, and file them all together under your "Study Guide Questions" divider tab.

## 5 & 6. Lab Reports

*Supplies Needed*: Regular White Copy Paper

This section is where the student will document all of the work done on the lab experiments within each module.

I conducted a poll before finalizing this section. I wanted to know if parents would like the Lab Reports to be partially completed….or whether they would rather have the student write in all of the information themselves. The responses were split right down the middle. Then, a really smart mom emailed and said, "Why don't you just put both formats in the Lapbook Journal?" So….that's exactly what I did!

There are **2 different sections of each file** that are devoted to Lab Reports. There will be a section that gives you Lab Reports with the Experiment Title & Number, Supplies, Introduction, & Procedure already filled in. The back of these reports has no information filled in – this is where the student will document his observations, conclusions, etc. and draw any diagrams necessary. The other section gives you Lab Reports with ONLY the Experiment Title & Number filled in...the rest is blank. So, choose which works for you. You may even want to try both...or you may change midway through the year...or depending on your time that week. The choice is yours!

Print these on regular white paper, unless you WANT to print them on cardstock. They are meant to be printed double-sided, but feel free to print them as a 2-page report, if that works better for you (or for your printer!). PLEASE NOTE: Some Lab Reports are longer than others (3-4 pages max), so be aware when printing. File them in the "Lab Reports" section, and refer to them each time your student performs a lab experiment.

**7. Module Summaries**

*Supplies Needed*: Regular White Copy Paper

This section is OPTIONAL and **could** even be used as a "Pre-Test." This is an exact copy of what is found at the back of the book, and it is exactly as it sounds...a summary of the entire module, with blanks to be filled in by the student.

If you choose to use these pages, print them, and file them all together under your "Module Summaries" divider tab.

**BOTTOM LINE:**

Here is what your 3-ring binder will look like:

** Section 1: On Your Own
** Section 2: Study Guide (either the lapbook booklets OR the journal pages)
** Section 3: Lab Reports
** Section 4: Module Summaries

***ONE OTHER OPTION:***

I have had a few moms tell me that they would RATHER divide their notebook into 16 sections – one for each module. These moms said that they put all of the above mentioned items in order in EACH section of the notebook.

The choice is yours.

**Frequently Asked Questions:**

1. What if I don't have enough time to do all of this? What's ok to leave out?

If you are really pushed for time, please don't feel that you have to "do it all!" I am cursed with this syndrome, and it rears it's head every time I get in a new piece of curriculum. YOU alone know what is best for your student, school, and family.

With that said, I'll say this. If I had to choose something to omit, I would probably first allow my student to use the Lab Reports that are partially filled in. This will save a lot of time….and frustration on the part of the student. If I still needed to omit something, then I would probably allow the student to answer some of the Study Guide questions either using the journal pages or verbally and only do some of the Lapbook Pages. However, I would be sure to NOT choose the lapbook booklets that deal with the easiest subject matter to leave out. I would allow the questions that deal with the easiest subject matter to be answered orally or via the journal pages, and require that the others be answered within the booklets.

2. What if I only have white paper, and I cannot afford to get (or don't have time to get) colored paper or cardstock?

We have made suggestions as to the colors and paper types that we would suggest, but they are ONLY suggestions. If your daughter is really into pink, and everything has to be pink….then print the whole thing on pink! If you are cramped for extra money, and you only have white paper, then print it all on white! I assure you that the color of the paper will not KEEP your child from learning. There is scientific research to support the improvement in memory when using colored paper, but who says the child can't color the paper themselves (the lapbook booklets)...draw pictures on them...make them his own. Or...just leave them white. The choice is ALWAYS yours.

**Frequently Asked Questions...continued...**

3. My friend wants to use this Lapbook Journal too. Can I let her use my copy? Oh, and my Co-op might want to use it too.

Our copyright states that any Ebook or CD is purchased for use by ONE household. If your Aunt Mary, Cousin Martha, and all of their children live in YOUR household (God Bless You!), then that includes them. You may print as many copies of the material as you need from the Ebook or CD for those in your household. However, PLEASE do not share these with friends and family who do NOT live with you.

As for Co-Ops, we do have a Co-Op License available. All you have to do is purchase the Ebook or CD version of the product as well as the Co-Op License through our website. In the "comments" section of the purchase, state which product(s) will be used at the Co-Op. That's it! It doesn't matter how many children are represented in your Co-Op….print away!! I assure you that it's WAY less expensive than for each family to purchase their own copy. You can all split the cost, and it comes out great for everyone.

4. Why are there very few color graphics in this product?

After much research, we believe that the children of this generation are visually over-stimulated. Between video games, internet, and television, there is very little left to the imagination. While colors play an important role in memory and retention of information, OVER-stimulation with colors has just the opposite effect.

Research ALSO shows that colored shapes have an effect on the memory that is amazing. Students will remember colored shapes much more than they will remember colored graphics on white paper.

Another reason…..colored ink costs homeschool moms TONS!

Without colored graphics, students will create their own! Allow them to draw pictures, color the borders, use their imaginations.

For these reasons, we have chosen to use few color graphics. We feel that this decision, although not the popular one, will benefit your students in the long run.

**Frequently Asked Questions...continued some more...**

5. My child doesn't like lapbooks, so why use this product?

If your child has never used lapbooking, he may not know what he's missing. However, if he just doesn't want to do it – no how and no way – then we have included "Study Guide Journal Pages" to replace the lapbooking portion of the product. They are included within the product, right after the lapbooking section.

6. What if I don't have a printer, or my printer isn't working?

Most print shops will allow you to email your document to them for printing. Or, you may choose to burn the Ebook to a CD and take it to them for printing.

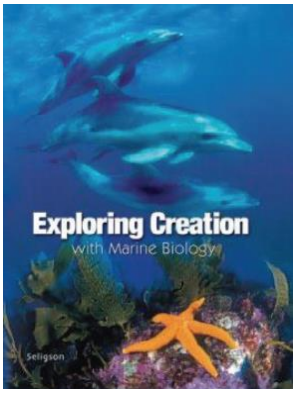
7. Is it OK to burn the Ebook to a CD?

Yes, absolutely! In fact, I would suggest it. My computer crashed last year, and I lost SO many wonderful homeschool products that were in Ebook format!! (still crying!)

8. What if I'm not creative, crafty...etc….and I don't really want to be?

That's ok. Not everyone enjoys working with "hands-on" products. That's why this product will work for you! All of the planning is done, and the instructions are written so that the student can read and follow them without assistance from an adult!


# Use the following pages at the beginning of each section of your notebook.




# Lapbook Journal For Exploring Creation With Marine Biology 1st Edition

## By

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# Exploring Creation With Marine Biology

# 1st Edition

# On Your Own Journal

# Exploring Creation With Marine Biology

# 1st Edition

# Study Guide Lapbook Pages

# Exploring Creation With Marine Biology

# 1st Edition

# Study Guide Journal Pages

# Exploring Creation With Marine Biology

## 1st Edition

## Lab Reports

# Exploring Creation With Marine Biology

# 1st Edition

# Module Summaries

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# Apologia Exploring Creation With Marine Biology 1st Edition Module 1

## The following pages are divided into 7 sections, with a page like this one between each section.

## The sections are:

*(1) **ON YOUR OWN QUESTIONS (Journal format)**
***STUDY GUIDE QUESTIONS:**
***(Choose either #2 OR #3 & #4 for these questions)***
(2) Study Guide Journal Pages
(3) Study Guide Lapbook Pages – Booklet Instructions & Templates
(4) Study Guide Lapbook Pages – Background Pages
***LAB REPORTS:**
***(Choose either #5 OR #6)***
(5) Lab Reports (Partially Completed)
(6) Lab Reports (Blank)
*(7) **MODULE SUMMARY**

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# The following section is:

# Apologia Exploring Creation With Marine Biology 1st Edition

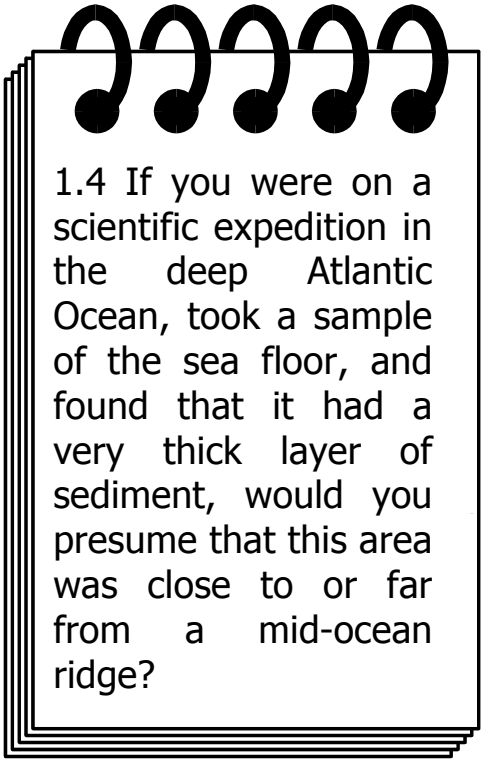
# Module 1

# On Your Own Journal Pages

1.1 What are the four major ocean basins of the world?

1.2 You have a sample of oceanic crust and a sample of continental crust. How could you tell which is which?

1.3 If a scientist discovered fossils of an extinct reptile on the west coast of southern Africa, and he knew that more examples of the same extinct fossil were found on the east coast of South America, would this discovery prove that the supercontinent Pangaea was indeed a reality?



1.4 If you were on a scientific expedition in the deep Atlantic Ocean, took a sample of the sea floor, and found that it had a very thick layer of sediment, would you presume that this area was close to or far from a mid-ocean ridge?

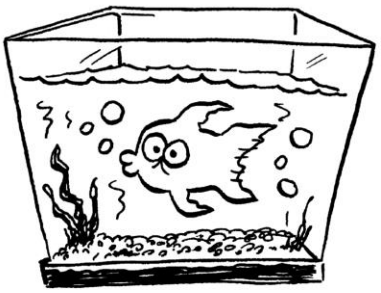
1.5 If an oceanic plate is colliding with a continental plate, what will most likely happen?

1.6 You are given a sample of sediment from the ocean. The container says it is a small sample of a large amount of sediment buildup. From which region of the ocean floor did the sample most likely come?

1.7 What gives water many of its unusual properties?

1.8 Benzene is a chemical that is liquid at room temperature. If frozen benzene is placed in liquid benzene, will it float or sink?

1.9 If you were given a fish in a fish tank and were told to keep the salinity of the water very high and the temperature of the water very low in order to keep this fish healthy, what part of the ocean do you think was the natural habitat of this fish?



1.10 The Red Sea is given its name due to an abundance of red bacteria that gives the water a reddish color. If the red bacteria were not able to live in the Red Sea, what color would the Red Sea appear to be and why?

1.11 During a terrible storm on the west coast of South America, a boat loses a box of its cargo of rubber ducks. One of the ducks is found in Japan months later. How did it get there?

1.12 Suppose you were looking for coral reefs (which love warm water) in the Atlantic Ocean relatively far from the equator. Would you tend to find them on the eastern coast of North America or the western coast of Europe?

1.13 If the moon were farther from the earth, what change would you expect in high tide and low tide?

1.14 A man living at the beach looks out his window and sees a full moon. What type of high tides can he expect in the next few days?

1.15 Would you expect to see greater overturn in the winter or summer months?

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# The following section is:

# Apologia Exploring Creation With Marine Biology
# 1st Edition
# Module 1

# Study Guide Journal Pages

**You MAY choose to use these INSTEAD of the Study Guide Lapbook Pages.**

1. **Define the following terms:**

**A. Oceanic crust:**

**B. Continental crust:**

**C. Plate tectonics:**

**D. Mid-ocean ridge:**

**E. Seafloor spreading:**

**F. Subduction:**

**G. Continental shelf:**

**H. Continental slope:**

**I. Continental rise:**

**J. Specific heat:**

**K. Salinity:**

**L. Coriolis effect:**

**M. Gyres:**

**N. Spring tide:**

**O. Neap tide:**

**2. Name the four large ocean basins of the world in order of increasing size.**

**3. Geologically speaking, what are the differences between the crust of the "oceans" and the crust of the "continents"?**

**4. If a specific location in the world is known for experiencing a large amount of earthquakes throughout modern history, what would you propose is occurring in the earth's crust underneath that area?**

**5. Given the fact that most of the deep ocean trenches in creation are located in the Pacific Ocean, what is the main type of plate interaction that occurs in that ocean?**

**6. Ocean crust is constantly being destroyed and reformed. Considering the four large ocean basins in the world, which ocean has the most oceanic crust formation? Which has the most oceanic crust destruction?**

**7. Although there is a large surface area under the oceans of the earth, in which main region of the ocean bottom do you find most of the marine life?**

**8. What one major property of water helps it hold its molecules together, keeping it from having severely colder boiling and freezing temperatures?**

**9. If a marine organism lives in an area where there are drastic changes in the weather resulting in extremely high and low air temperatures, what property of water prevents the organism from "feeling" such changes?**

**10. What will happen to the water near the ocean surface if a portion of the surface layer experiences excess evaporation? What will happen if that portion experiences a large drop in temperature?**

**11. Why is the ocean blue?**

**12. A fisherman was deep-sea fishing and pulled up a large bottom-dwelling grouper he had hooked. He was able to bring the fish up to the surface very quickly, but was surprised to see that the fish appeared extremely bloated (puffed up) and did not survive the stress of coming to the surface. What happened?**

**13. Why do winds not move in a straight line on the earth?**

**14. Suppose the earth rotated opposite of the direction it currently rotates. What effect would that have on the directions of the gyres shown in Figure 1.16?**

**15. Where do water molecules move in a surface wave?**

**16. During which phase (or phases) of the moon are the tidal ranges the largest and why?**

**17. Describe the two major layers of the deep ocean and the feature that separates them.**

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# The following section is:

# Apologia Exploring Creation With Marine Biology 1st Edition Module 1

# Study Guide Lapbook Pages – Booklet Instructions & Templates

**(You MAY choose to use the "Study Guide Journal" in place of this section. )**

# Apologia Exploring Creation With Marine Biology – 1st Edition - Module 1
# Study Guide Lapbook Pages - Booklet Templates Assembly Instructions

Question 1. a-0
Cut out along the outer black line edges of each page of the booklet. Then stack the pages in order, with the title page on top. Punch 2 or 3 holes along the left side of the stack, and secure with a ribbon or metal brad fasteners. You may choose to just staple the stack along the left side.

Questions 2 -7
Cut out along the outer black line edges of each page. Stack so that the title is on top and the pages get longer toward the back. Secure with staples at the top.

Questions 8-10
Cut out along the outer black line edges of each page. Stack so that the title is on the top. Secure along the left side of the booklet.

Question 11
Cut out along the outer black line edges. Fold along the center line so that the question is on the outside.

Question 12
Cut out along the outer black line edges. Fold along the center line so that the question is on the outside.

Questions 13-15
Cut out along the outer black line edges of the booklet. Fold along the center line so that the words are on the outside. Now cut along the short, horizontal dotted lines to create "flaps" under which to write your answers.

Question 16
Cut out along the outer black line edges of both pages. Stack so that the title is on the top. Secure with a staple or metal brad fastener at the top.

Question 17
Cut out along the outer black line edges. Fold along the center line so that the title is on the front.

# Module 1
# Study Guide Questions – Lapbook Booklet Templates

**Question #1: a-o**

# Module # 1

# Definitions

**a. Oceanic crust:**

**b. Continental crust:**

**c. Plate tectonics:**

**d. Mid-ocean ridge:**

**e. Seafloor spreading:**

## Question #1

**f. Subduction:**

**g. Continental shelf:**

**h. Continental slope:**

**i. Continental rise:**

**j. Specific heat:**

**k. Salinity:**

**l. Coriolis effect:**

**m. Gyres:**

**n. Spring tide:**

**o. Neap tide:**

## Questions #2-7

# Module 1: Questions #2-7

**Name the four large ocean basins of the world in order of increasing size.**

**Question #2**

**Geographically speaking, what are the differences between the crust of the "oceans" and the crust of the "continents"?**

**Question #3**

**If a specific location in the world is known for experiencing a large amount of earthquakes throughout modern history, what would you propose is occurring in the earth's crust underneath that area?**

**Question #4**

## Questions #2-7 continued

**Given the fact that most of the deep ocean trenches in creation are located in the Pacific Ocean, what is the main type of plat interaction that occurs in that ocean?**

**Question #5**

**Ocean crust is constantly being destroyed and reformed. Considering the four large ocean basins in the world, which ocean has the most oceanic crust formation Which has the most oceanic crust destruction?**

**Question #6**

**Although there is a large surface area under the oceans of the earth, in which main region of the ocean bottom do you find most of the marine life?**

**Question #7**

## Questions #8-10

# Properties of Water

**8. What one major property of water helps it hold its molecules together, keeping it from having severely coler boiling and freezing temperatures?**

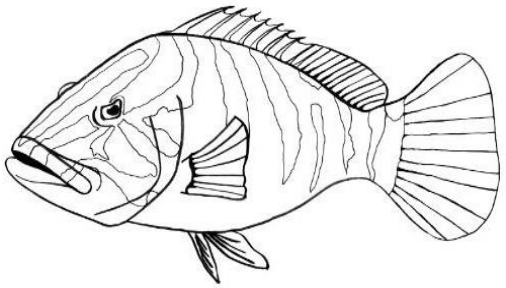
**9. If a marine organism lives in an area where there are drastic changes in the weather resulting in extremely high and low air temperatures, what property of water prevents the organism from "feeling" such changes?**

**10. What will happen to the water near the ocean surface if a portion of the surface layer experiences excess evaporation? What will happen if that portion experiences a large drop in temperature?**

## Question #11

# Why is the ocean blue?

## Question #12



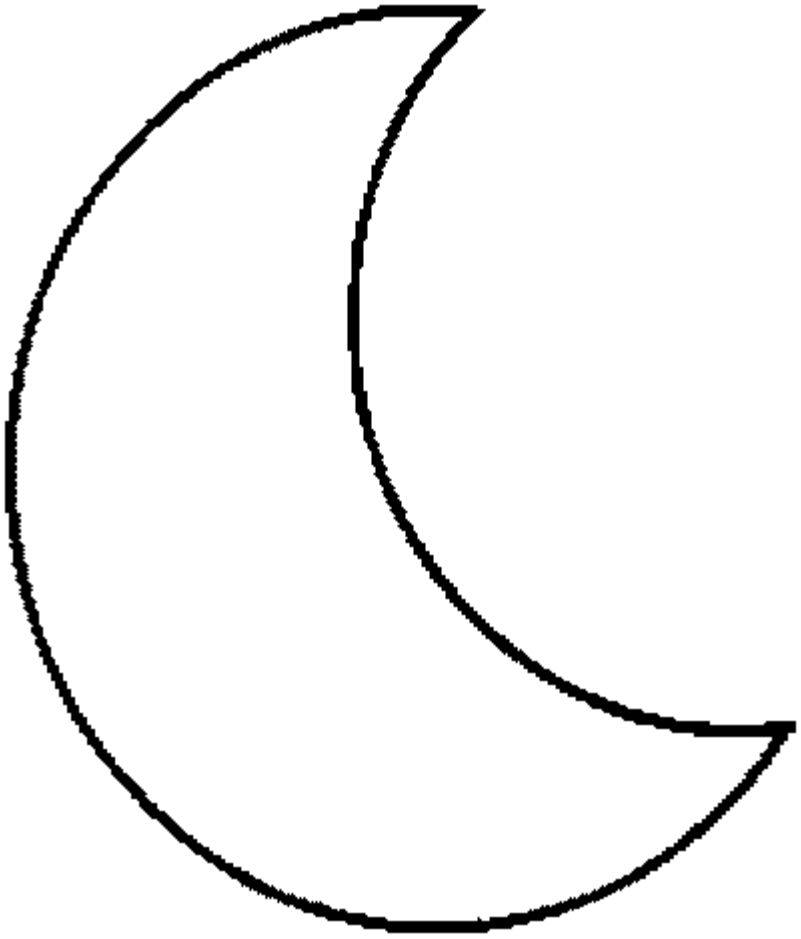
**A fisherman was deep-sea fishing and pulled up a large bottom-dwelling grouper he had hooked. He was able to bring the fish up to the surface very quickly, but was surprised to see that the fish appeared extremely bloated and did not survive the stress of coming to the surface. What happened?**

## Questions #13-15

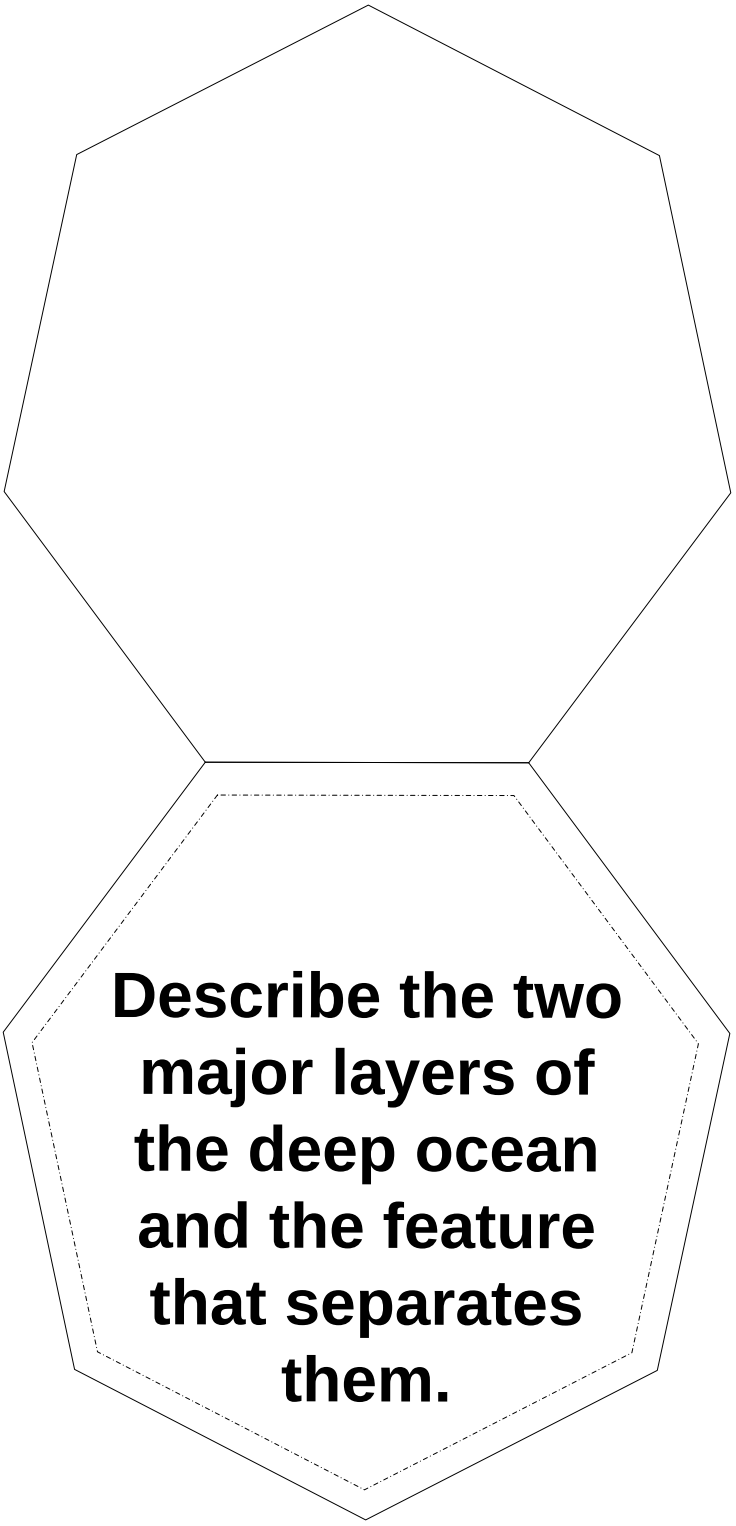
| | | |
|---|---|---|
| | MOTION OF THE OCEAN WAVES | **Why do winds not move in a straight line on the earth?** |
| | | **Suppose the earth rotated opposite of the direction it currently rotates. What effect would that have on the direction of the gyres in Figure 1.16?** |
| | | **Where do water molecules move in a surface wave?** |

## Question #16

**During which phase (or phases) of the moon are the tidal ranges the largest and why?**



## Question #17


Describe the two major layers of the deep ocean and the feature that separates them.

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# The following section is:

# Marine Biology
# 1st Edition
# Module 1

# Study Guide Lapbook Background Page (print as many as needed)

# Marine Biology
# Module 1

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# The following section is:

# Marine Biology
# 1st Edition
# Module 1

# Lab Reports
# (partially completed)

**You may choose to print these reports double-sided or single-sided. Some lab reports have more than 2 pages, so be aware when printing.

# Marine Biology

## Lab Report
## Experiment # 1.1
## The Expansion of Solid Water

**Date:** _____ **Name:** _____

### Supplies:

- A tall, clear or translucent *plastic* drinking cup or a 20-oz. empty water bottle
- Water
- A piece of masking tape

### Introduction:

When water is in its liquid phase, the molecules are in constant motion, some being held in small groups due to hydrogen bonding. When water freezes, the molecules slow down and pull apart from one another. You will observe the result of this movement in this experiment.

### Procedure:

1. Fill the cup or bottle 1/4 of the way with water.
2. Mark the water level by placing a piece of masking tape on the container so that the top side of the tape lines up with the level of the water.
3. Place the container in the freezer on a flat surface. If you are using a bottle, *do not* put a lid on top.
4. Allow the container to stay in the freezer overnight.
6. Note the level of the ice as compared to the position of the masking tape.
7. Allow the water to thaw in a sink and clean up.

# Marine Biology

## Lab Report
## Experiment # 1.1
## The Expansion of Solid Water

**Date:** _____ **Name:** _____

**Observations:**

**Diagram:**

**Summary:**

# Marine Biology

## Lab Report
## Experiment # 1.2
## Removing the Salt From Salt Water

**Date:** _____ **Name:** _____

**Supplies:**

- A liquid measuring cup
- Water
- A small saucepan
- Stove
- A tablespoon
- Salt
- Metal stirring spoon
- A small bowl

**Introduction:**

In order to determine the salinity of the salt water in the ocean, one first must be able to remove and measure the quantity of salt that is in solution. This experiment shows you one way this is done. NOTE: If you live near the coast and have access to ocean water, you can place 2 tablespoons of ocean water in the bowl and skip to step 8.

**Procedure:**

1. Measure 1 cup of water into the measuring cup, and pour it into the saucepan.
2. Place the saucepan on the stove and heat over medium heat. Do not let it boil.
3. Add two tablespoons of salt to the water while it is heating.
4. Stir the water until the salt dissolves and the water becomes clear again. It is okay if there is a little bit of undissolved salt left.
5. Turn off the stove and remove the saucepan.
6. Place 2 tablespoons of the salt-water mixture into a bowl, being careful not to transfer any undissolved salts. The water should appear clear.
7. Clean up everything except the bowl that has 2 tablespoons of salt water in it.
8. Allow the bowl of salt water to sit out for a few days until all the water is gone. (This process will occur more quickly in a warm, sunny window.)
9. Observe what is in the bowl.

# Marine Biology

## Lab Report
## Experiment # 1.2
## Removing the Salt From Salt Water

**Date:** _____ **Name:** _____

**Observations:**

**Diagram:**

**Summary:**

# Marine Biology

## Lab Report
## Experiment # 1.3
## The Effects of Salinity and Temperature on the Density of Water

**Date:** _____ **Name:** _____

**Supplies:**

- A measuring cup for liquids
- Six clear drinking glasses
- Water
- Small saucepan
- Stove
- Measuring tablespoon
- Salt
- Stirring spoon
- Two colors of food coloring (yellow and blue work the best)
- Chilled water from the refrigerator
- Turkey baster

**Introduction:**

Many parameters can affect the density of water. You will be performing a three-part experiment to observe how salinity and temperature affect water density. NOTE: If you live near the coast and have access to ocean water, you can use one cup of ocean water instead of making salt water in steps 1 - 3 .

**Procedure:**

1. Measure one cup of tap water and place it in the saucepan on the stove.
2. Heat the water on medium heat and add 2 tablespoons of salt.
3. Stir until the salt is dissolved, then remove the saucepan from the heat to cool. Turn off the burner.
4. While the salt water is cooling, perform the next part of the experiment by filling two of the glasses with tap water until they are one-third full.
5. Add two drops of blue food coloring to one glass and mix.
6. Add two drops of yellow food coloring to the other glass and mix.
7. Draw some of the blue water into the turkey baster, placing your finger over the tip so none will escape.
8. Very carefully, place the tip of the baster into the very bottom of the glass with the yellow water. Slowly squeeze the bulb of the baster so that the blue water is injected into the glass. You do not have to squeeze all the water out — just enough to observe where the blue water goes. Make a note of what happens. Rinse the baster with tap water.
9. For the second part of the experiment, fill a third glass with chilled water until it is one-third full.

# Marine Biology

## Lab Report
## Experiment # 1.3
## The Effects of Salinity and Temperature on the Density of Water

**Date:** _____ **Name:** _____

Procedure, continued:

10. Add two drops of blue food coloring and stir.
11. Fill the fourth glass one-third of the way with very hot water from the tap, being careful not to get burned. Add two drops of yellow food coloring to this glass and stir.
12. Now, using the turkey baster, draw some of the cold (blue) water and carefully place the tip of the baster into the very bottom of the glass with the hot yellow water.
13. Very slowly, squeeze the bulb of the baster so that the cold blue water comes out into the glass. Again, you do not have to squeeze all of it out — just enough to note where the blue water goes. Make a note of what happens. Rinse the baster with tap water.
14. Finally, once the salt water has come to room temperature, fill the fifth glass one-third full of the salt water and add two drops of blue food coloring to it. Stir.
15. Fill the sixth glass one-third full of tap water. Add two drops of yellow food coloring and stir.
16. Using the turkey baster, draw up some of the salt water (blue) and carefully place the tip of the baster into the very bottom of the glass with the yellow tap water.
17. Very slowly, squeeze the bulb of the baster so that the salty blue water comes out into the glass. Make a note of what happens.
18. Clean up everything and put it away.

# Marine Biology

## Lab Report
## Experiment # 1.3
## The Effects of Salinity and Temperature on the Density of Water

**Date:** _____ **Name:** _____

**Observations:**

**Diagram:**

**Summary:**

# Marine Biology

## Lab Report
## Experiment # 1.4
## The Coriolis Effect

**Date:** _____ **Name:** _____

**Supplies:**

- One sheet of cardstock
- Scissors
- A tack or push pin
- One foot of string
- A pencil
- A cork bulletin board or sheet of corrugated cardboard
- A marker

**Introduction:**

Winds do not move in straight lines on the earth. This experiment will illustrate why this happens.

**Procedure:**

1. Cut a circle about 6 to 7 inches in diameter out of card stock. To do this, tie a loop on one end of the string and push the tack through it into the center of the card stock and into the bulletin board.
2. Tie the pencil to the other end of the string and pull it taut.
3. Draw a circle on the card stock by moving the pencil along in a circular motion while continuing to keep the string taut.
4. Remove the card stock from the bulletin board and cut the circle out with the scissors.
5. Replace the circle back onto the bulletin board, affixing it through the center with the tack, but not so tightly that it cannot revolve.
6. Draw an arrow along the outside edge of the circle that points in a clockwise direction.
7. Next, have your helper stand on your right-hand side and place his finger at the 9 o'clock position on the circle. Meanwhile, place the marking pen at the center of the circle.
8. At the same time, have your helper begin to slowly spin the circle in a clockwise direction while you slowly try to draw a straight line downward.
9. Remove the circle and note whether the line you drew moved straight down, clockwise (with the rotation), or counter-clockwise (opposite of the rotation).

# Marine Biology

## Lab Report
## Experiment # 1.4
## The Coriolis Effect

**Date:** _____ **Name:** _____

**Observations:**

**Diagram:**

**Summary:**

# Marine Biology

## Lab Report
## Experiment # 1.5
## The Motion of Waves

**Date:** _____ **Name:** _____

**Supplies:**

- A tub
- Water
- A cork or small toy boat
- A 12-inch length of 2-by-4 wood

**Introduction:**

Surface waves actually move the molecules of water in a circular motion. You will observe this as you do this experiment.

**Procedure:**

1. Fill the tub with water until the water is about 3 inches deep.
2. Place the cork or boat in the very center of the tub.
3. Place the length of wood about halfway down into the water at the end of the tub near the spigot so that its longest side is in the water perpendicular to the length of the tub.
4. Gently but steadily move the plank about 10 times up and down. Move it about $^{1}/2$ to 1 inch in each direction, and keep it at the end of the tub. Do not let it splash! This should create a series of parallel waves moving down the length of the tub toward the cork. Observe the cork's position in the tub while you do this.
5. Allow the water to become still again. Reposition the cork, and repeat the experiment a few more times.

# Marine Biology

## Lab Report
## Experiment # 1.5
## The Motion of Waves

**Date:** _____ **Name:** _____

**Observations:**

**Diagram:**

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# Marine Biology

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## The Expansion of Solid Water

**Date:** _____ **Name:** _____

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**Procedure:**

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## Removing the Salt From Salt Water

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# Marine Biology

## Lab Report
## Experiment # 1.2
## Removing the Salt From Salt Water

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## The Effects of Salinity and Temperature on the Density of Water

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**Supplies:**

**Introduction:**

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## The Effects of Salinity and Temperature on the Density of Water

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## Lab Report
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## The Coriolis Effect

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**Introduction:**

Procedure:

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## Lab Report
## Experiment # 1.5
## The Motion of Waves

**Date:** _____ **Name:** _____

**Supplies:**

**Introduction:**

Procedure:

# Marine Biology

## Lab Report
## Experiment # 1.5
## The Motion of Waves

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# The following section is:

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# Module 1

# Module Summary

# Marine Biology

## Module Summary – Module 1

*Review the vocabulary words listed in Question #1 of the study guide*

Fill in the blanks. Many blanks contain more than one word.

Please note: I suggest that you actually write these paragraphs out rather than just filling in the blanks in the book.

The act of writing these things out is a form of studying.

1. The 4 large ocean basins of the world are the _____, the _____ , the _____ and the _____.

2. The part of the earth's crust that is covered with ocean is made up of _____ crust. This is composed mainly of _____, which is relatively dense solidified lava. The part of the earth's crust that is not covered with ocean is made up of _____ crust. It is composed mainly of _____, which is less dense than the crust under the ocean.

3. The crusts float on the earth's _____ . The slow-flowing material that makes up the mantle is called _____ because it sometimes behaves like liquid and sometimes behaves like solid.

4. Scientists hypothesize that all the continents of the world were once part of a large supercontinent called _____. The plates of the earth's crust are believed to have drifted to their present locations via a process known as _____.

5. There are two types of geological structures where two plates meet: a _____system, where two plates move away from each other via the process called_____; and a system where two plates move towards each other, one dipping down into the mantle. This process is called _____.

6. The geologic activity most commonly found around ridge systems is in the form of _____ and the geologic activity most often found around trench systems is in the form of _____.

7. Oceanic crust formation mostly occurs in the _____where there is a large mid-ocean ridge. Oceanic crust is destroyed mostly in the _____where there are more deep ocean trenches.

8. The gently sloped shallow section of the edge of a continent is called the _____. This location is where most ocean life is found. The _____is located at the point where the slope of the bottom begins to become steeper. The steeper section of a continental edge is called the _____. It reaches down to a gently sloping area at the base called the _____, where debris and sediment collect. The deepest region of the seafloor is called the _____.

9. The major property of water that keeps its molecules together is _____. This creates a flexible "skin" at the water's surface called _____.

10. Water naturally exists on earth in all three phases: solid - in the form of _____ or _____, liquid - in the form of _____, and gas - in the form of _____. When water freezes it becomes _____, allowing solid water to float on liquid water.

11. Because water has a high _____, it does not change temperature very quickly despite drastic air temperature changes.

12. Because water can dissolve more substances than most other liquids, it is often called the _____.

13. Seawater consists of pure water with materials dissolved in it. The solids come from _____ on land, carried to the ocean by rivers. They also come from the mantle area of the earth, released through deep openings called _____.

14. _____ is a measure of the total amount of salt dissolved in a solvent. Evaporation will result in _____ salinity of the water left behind.

15. The ocean is blue because _____ can penetrate much deeper than those of the other colors. The blue color is enhanced by the reflection of the _____on the surface.

16. _____ in the ocean increases dramatically with depth. For every 10 meters of depth, another _____is added.

17. _____ in our atmosphere result from temperature differences caused by heat from the sun. They do not move in straight lines because of the _____.

18. The major currents of the open ocean are driven by the wind. The circular patterns that result are called _____. They move _____in the Northern Hemisphere and _____ in the Southern Hemisphere.

19. Waves do not actually transport water, but they carry _____across the water's surface.

20. Tidal ranges are their largest during the _____and the _____. This is because of the gravitational pull of the aligned _____and _____. Scientists call this a _____. The smallest tidal range is when the moon and sun are at _____(during quarter moons). This is called a _____.

21. Cool winter temperatures cause the water temperature of the surface layer of the ocean to become colder, resulting in a _____ portion of water. As this portion begins to sink, it displaces the same amount of water in a deeper layer. This process is called _____.

22. The surface layer of the ocean is thin and well-mixed, being exposed to _____ and _____. It is generally _____ in temperature than the rest of the water column. The _____ is uniformly cold and much thicker than the surface layer. The _____ separates them and is a transitional zone between them.