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Oceanography with Lab

Please review the FAQs and contact us if you find a problem.

Credits: 1

Recommended: I would consider this an easier course than the "core" science courses.

Course Description: Students will study oceanography as a science from many different aspects. Chemical, physical, and geological oceanography will be explored. Students will study not only the ocean but water systems, coastlines and marine life including plants, algae, vertebrates and invertebrates. Students will complete hands-on as well as virtual labs. Students will research and share their findings using projects, written and oral reports, and power point presentations.

Notes: The base of this course is GA Virtual Learning's Oceanography course. The pdf worksheets and labs are from there. The beginning of the course brings up millions of years. I bring in a Bible-based article to show another perspective. Later in the course I bring in a documentary to show scientists with opposing view points. There is a lot of optional printing (*). It's for people who want more time off of the computer. If you are more interested in saving money, just skip over those and read them online. Answers are on their way for the tests and some other significant assignments. However, not all assignments have answers at this time. If students are filling in a worksheet, they will find the answers in the material and write them in and should not need to check them, and sometimes points are awarded just for completing an assignment. There are, besides tests, quizzes which are self graded and grading rubrics for labs. Materials are listed in bold next to the day number.

Materials Needed

Day 1(*)

If a link is not working to follow the steps on the FAQ page.

1. (*)Print out your first quarter grading sheet or use the Excel version.
2. It's time for a lesson on science. Science is the collection of observations made about the world. When something is being observed, there are basic assumptions being made. If your basic assumption is that the oceans have a Creator you would draw different conclusions than those who assume no creator. Scientists come to different conclusions because they are using different lenses to look at the question. The base of this course, Oceanography, assumes no Creator and a millions of year old earth. I start with the assumption that the earth has a Creator because I know it's true. I also believe in a literal 6-day creation and so believe the earth is young, relatively speaking. Below you'll find an article by a PhD scientist to help you see that different conclusions are made when you start from a different mindset, one of faith in the truth of the Bible.
3. Read the introduction and copy down the key terms. Leave room for writing definitions.
4. Read page 2 and write in definitions for each type of oceanography.
5. Tell someone which you are most interested in and why.
6. Read page 3. No, you don't have to learn the information about millions of years, but that is

what the mainstream call “fact.”

7. Read this article about how we see evidence of a young earth in the oceans. Don’t forget that you aren’t alone in believing this way. Smart people agree with you!
8. Talk to your parents about what you read.
9. Write in the definition of basin.
10. Look at the map on page 3. Where is it the most shallow? Where is it deepest?
11. What’s the biggest ocean? (answer: Pacific)
12. What percent of the Earth is covered with water? (answer: 71%)
13. What percent of the Earth’s water is fresh? (answer: 3%)

Day 2

1. Read page 4 on the history of oceanography.
2. Fill in definitions on your key terms list.
3. Do some online research to learn more about one of the men listed.
4. Write a paragraph on what you learned.
5. Record 5 points for a complete paragraph.

Day 3

1. Draw a to scale map of something. It can be your desk (add symbols and a key and show where the computer is, the lamp, the pencil…); it could be your room, your yard…
2. Measure and divide to draw to scale.
3. Add symbols and a key.
4. Make sure to include your scale.
5. Here is a site if you need help, map, key and scale
6. Record 5 points for a complete map.

Day 4

1. Read page 5 on ocean resources. Always add in definitions when you come across them.
2. On page 6 answer the questions for thought in separate, complete paragraphs.
3. Record 5 points for each complete paragraph which answers the question.

Day 5*

1. *Complete the What is Oceanography worksheet.
2. Record 10 points for completing the worksheet. Lose a point for any missing answer.

Day 6

1. Complete the Fun Facts worksheet. You will need to look up the answers.
2. Record 10 points for completing the worksheet. Lose a point for any missing answer.

Day 7*

1. *Complete the From the Ocean to the Sea worksheet.
2. Record up to 10 points for a completed chart and up to 6 points for the analyze questions.

Day 8

1. Review your terms, put them away, and do the quiz activities on page 7.
2. Check your answers. Click and drag to reveal: (g, j, e, c, d, a, h, f, i, b)
3. Record your scores out of 10 and 11.

Day 9

1. Write down the key terms. Leave room for definitions and fill them in as you come to them.
2. Read page 2 on the scientific method. Copy down the definitions.
3. Design a simple experiment following the steps of the scientific method. You don't have to write up a report, but you need to record your observations/data.
4. What are your different types of variables?

Day 10

1. Read page 3 on graphs. Write your definitions and watch the presentation.
2. Make a graph using Excel or Open Office, or if you insist, graph paper. Gather up some oceanography facts as your data and graph it.
3. Record five points for a labeled graph.

Day 11

1. Watch the presentation on page 4 on how to write a lab report.
2. Read this guide to writing a lab report.
3. Write a lab report for your Day 9 experiment.
4. Record 10 points for a compete report including: introduction, methods, results, analysis and references. Okay, you don't need references on this one. Take two points off for any missing part.

Day 12

1. Complete page 6 activities.
2. Complete the question for thought on page 5.
3. Record five points for a complete answer.

Day 13(*)

1. Use this list of Latin roots, prefixes and suffixes and complete the (*)name game assignment.
2. Present your pictures and names, meanings and reasons.
3. Record 4 points for each organism if you include each of those things.
4. Read over your definitions for this unit's vocabulary. You should know their meanings.

Day 14(*) (Materials: aluminum foil, pennies or a bunch of the same small coins)

1. (*)Complete the lab, Sink or Float.
2. (*)Here is your rubric that you will be scored with.
3. Complete the lab and record your score.
4. There is a test tomorrow on this unit. You should review all of the information on page 2 of the unit.

Day 15(*)

1. You can review your scientific method notes but then put them away.
2. (*)Take the test.
3. Check your answers.
4. Record your score out of 30, one point for each question/blank if correct and up to five points for each picture. Take off one point for anything missing from the pictures section. (potential for 2 points extra credit)

Day 16

1. Today's assignment requires you to use your observational skills.
    1. First, go to this site. Click on each of the six pictures in the band and listen to the sounds of the ocean. How does using your sense of hearing contribute to the scientific method? Make 2 observations using your sense of hearing for the sounds produced by each picture.
    2. Next, watch this video. How does your sense of sight contribute to the scientific method? Write a brief paragraph of what you see from the video.
2. Record 7 points: 2 for the the 2 observations and 5 for a complete paragraph answering the second part.

Day 17*

1. Copy the key terms.
2. Read page 2 and write in definitions.
3. *Color in the ocean basins on this map and make a key telling what's what.
4. Save this map.

Day 18

1. Read about maps.
2. Complete this presentation on maps. (alternate link)
3. Draw the Mid-Atlantic Ridge on your map according to its description on page 2.

Day 19(*) (Materials: stiff cardboard–cereal box, etc., two pieces of paper, Exacto knife or some cutting tool for cutting slits)

1. Read page 3 and write down your definitions. There is a typo toward the top of the page,

   "The continental shelf is a gradually sloping end of a continental shelf…" should be "The continental slope is a gradually sloping…" Makes more sense, right?
2. (*)Make a sea floor spreading model. You can cut your paper down to size if your cardboard isn't big enough for a full piece.
3. If this is taking you too long, you can finish on Day 20.
4. Show your model to someone and explain the things listed under pupil outcomes.
5. Record 10 points: 5 points for model and 5 points for successfully explaining.

Day 20

1. Take a dive. Explore this site and go deep into the ocean.
2. Tell someone about what you learned.

Day 21

1. Read page 4 about plate tectonics. Write in your definitions.
2. Complete this interactive on the earth's plates and boundaries.
3. Here's an article about Pangea from a Christian perspective. Here's one more with some thoughts and verses.
4. Move the plates.

Day 22 (Materials: I guess you could say this is optional–need to make sediment dessert, cookie crumbs, mini chocolate chips,…)

1. Read page 5 about sediments.

2. Click on a fossil forms and view the steps.
3. Scroll down the opening page and read the overview directions.
4. Draw layers of sediment and fossil. Label your labels with names from page 5.
5. Show your drawing to someone and explain what type of sediment is in each layer.
6. Now create a desert for everyone based on your drawing and the overview directions.

Day 23(*)

1. (*)You have two days to complete this lab on Mapping the Ocean Floor. This is made to be done on Excel or similar program, but you can do it by hand.

Day 24

1. Finish your ocean floor map graph and analysis.
2. Record 19 points for completing the chart, 10 points for the graph, 18 points for the analysis (2 each). Total is 47. Add 3 for completing it on time.

Day 25(*)

1. (*)Answer the questions on this Ocean Basin Worksheet. Use your notes and the site to help you.
2. Record 10 points for completing it. Take off 1 point for each incomplete answer.

Day 26(*)

1. (*)Answer the questions on this Ocean Floor Worksheet. Use your notes and the site to help you.
2. Record 10 points for completing it. Take off 1 point for each incomplete answer.

Day 27(*)

1. (*)Complete the table and the crossword puzzle on this Plate Tectonics Worksheet. Use your notes and the site to help you.
2. Record 5 points for finishing the table. Take off 1 point for each incomplete area.
3. Record 5 points for finishing the crossword puzzle. Take off 1 point for each incomplete space.

Day 28(*)

1. (*)Set up this Salty Water lab and finish the procedure until you have to let it sit.
2. You can review your terms and definitions but then put them away.
3. Do the crossword and matching activities on page 7 as quizzes.
4. Record your score out of 22.

Day 29

1. Finish your salty water lab and write it up completely.
2. Use the rubric to grade your lab. Record your score.
3. You might want to save this for your portfolio.

Day 30

1. You should do this at a computer that you can print from if possible.
2. Complete this online lab about ocean characteristics.
3. Follow the directions carefully.
4. Print your table and your answers.
5. You may want to save this for your portfolio.

6. Record up to 8 points for your chart for completing all of the components and up to 9 points for the 9 questions.

Day 31

1. Write down the key terms.
2. Read page two and write down definitions.
3. Read this extra page on water cohesion and adhesion.
4. Read about solutions. You can skip the last paragraph on colloids.
5. They call water the universal solvent. Does that mean it dissolves everything?
6. Explain to someone how water sticks to itself.

Day 32

1. Read about the hydrolic cycle on page 3 and write in your definitions.
2. Can you say what's happening in each point on the diagram? (And just if you think this is fun, you can, if you want, put together this water cycle diorama to help you remember the terms.)
3. Click on Earth Science Simulations and then NOAA: The Water Cycle. Click on "Global Impact" and then click on play and watch the presentation.
4. Read about use and overuse of ground water. Play with the simulation and then answer the questions.

Day 33

1. Read page 4 about salinity and page 5 about hydrogen. Take notes.
2. Also read page 6 about dissolved oxygen. Make sure you are writing down definitions.
3. Take a look at this diagram. Study it and explain to someone what it is showing. (answer: When waste enters the water, what happens to the oxygen levels?)

Day 34

1. Go through this virtual lab on dissolved oxygen.
2. You will not be creating it on your own. You will use their samples. Keep clicking on next. If you ever get stuck like the next page isn't there, click on what you need from the left side bar menu. Fill in the analysis using the sample problem. Answer the questions and take the quiz.
3. Record 18 points for a completed, correct chart; up to 4 points for the quiz; 16 points for the graph, take off points for incompleteness. Total: 38

Day 35

1. Read page 7 about minerals. Make sure you are always writing down the definitions for your terms.
2. Read about the nitrogen cycle.
3. Watch this animation on the nitrate cycle.
4. Complete the activities on page 9 for review. You don't have to record your score. Do it thoughtfully to help you learn/remember the terms.

Day 36(*)

1. (*) Complete the Chemical Oceanography Worksheet. Remember, this isn't a quiz. You can go through the material and find the answers.
2. Record 10 points for completion.

Day 37(*) (Materials needed: ruler, salt, one small potato)

1. (*) Complete the Salinity Experiment Lab.
2. Write up your lab.
3. Use the rubric to grade your lab. Record your score.

Day 38

1. Complete this water cycle activity.
2. Here are your directions.
3. Here is your link. Click for instructions at the top of the water cycle activity.
4. Record 10 points if you completed the activity and answered all ten points on your directions.

Day 39

1. Complete this lab on water pH and contaminant levels.
2. I couldn't find a lab on testing ocean water, but remember that all of our water is connected. It all ends up back in the ocean.
3. Test the water; fill in the chart. You can print it or just make your own. You're done when all of the different types of water are declared safe. Click on the button on top of the box on the bottom of your screen in the water treatment plant to see if it is safe.
4. Record up to 50 points for a completed chart and each type of water being safe. Subtract five points for any unsafe water levels!

Day 40(*)

1. Below is your test for this unit.
2. Answer the two questions for thought on page 8. Your answer should include at least two parts for both the magic show and the salt water question. You may score up to four points for that section.
3. (*)Complete this terms test.
4. Record a total score of up to 24.

Day 41

1. Copy down the key terms about physical oceanography.
2. Read page 2 about climate.
3. Read page 3 about the greenhouse effect and global warming. Make sure you write down definitions.
4. The video on the page doesn't work. Read about how global warming affects the oceans.
5. Explore how greenhouse gases affect climate.
6. Explain to someone what is happening in the simulation.

Day 42

1. Global warming is what is taught as truth. Here's a documentary that aired on British television. These aren't Christians going against status quo. These are scientists telling what they believe is true. You can decide for yourself about global warming. You do need to know what it is. This documentary more than anything can show you that scientist don't all agree! People like to make you feel stupid if you don't agree with what "all scientists say." The truth is that scientists don't agree on a lot of things.

Day 43

1. Read page 4 about El Nino and page 5 about the Corolis Effect. Make sure you are taking notes

and writing definitions.
2. Read about El NIna.
3. Check out these animations. Describe what is happening during El Nino and El Nina.
4. What does this El Nino animation show?

Day 44

1. Complete this Climate Activity by creating a presentation. Make sure you create a cover slide and a credits slide.
2. Here is the link to your information site.
3. Present your finished product to an audience. Read your slides and explain to them.
4. Record up to 2 points for each slide: 1 point for content and 1 for presentation. Add 1 point for the cover slide and 1 for the credits slide. Add 1 point for finishing today. (total 15)

Day 45 (Materials: One large clear glass jar (large enough to hold a plastic or paper cup), Two paper cups, Soil (such as potting or topsoil), Outdoor thermometer (small enough for the base to fit in the cup), Spray bottle with water.0

1. Complete this Global Warming Experiment.
2. You don't have to write up a lab. You can copy and paste this into a word processing program and fill in the blanks and write in answers to the questions.
3. Record your score out of 25. Give yourself 25 points for completing the assignment. Take off 1 point for any missing answer.

This is the end of the first quarter. You should save some of your labs in your portfolio. You could also save a test and worksheet answers. To figure out your grade: total up your scores and divide by the total possible. Then multiply it by 100. Your goal is to get an A. Where are you losing points? How can you keep from losing them next quarter?

Day 46(*)

1. (*)Print out next quarter's grading sheet or use the Excel version.
2. Read over these questions on ocean currents.
3. Use this lesson to answer the questions.
4. Follow the directions and complete a flight path.
5. Record one point for each number completed and answered. (15 points)

Day 47

1. Follow the directions on this world climate activity.
2. Use this website to find your weather data.
3. Record 1 point for each ? you responded to. (That's 15 possible points.) Record 5 points for each of the three bullet points you graphed. (another 15 points)

Day 48 (Materials needed: ice, blue food coloring–doesn't have to be blue, hot water, clear glass cup, bowl, a large clear straw)

1. Complete this Ocean Currents and Temperature Lab.
2. Reminder: guide to writing a lab report.
3. Write up your lab.
4. Use the rubric to grade your lab.
5. Divide your score in half and record your score out of 50.

Day 49

1. Review your terms and definitions.
2. Complete the crossword puzzle on page 7 as your quiz.
3. Record your score out of 11.
4. Now complete this test. This is a sample of what your final will be like.
5. Check your answers. Save this test to study from at the end of the course when you will take your final.

Day 50*

1. Copy down the key terms on "Moving Water." As always fill in the definitions as you read.
2. Read about currents on page 2.
3. View this video showing a simulation of ocean currents.
4. *Print out this map of the world and draw on the ocean currents.
5. Show someone your map and describe where the wind currents go and how they affect the ocean currents.

Day 51

1. Read about waves on page 3. Fill in definitions.
2. Copy the formula and study the diagram.
3. Watch the global impact lesson. There may be a topic introduced here that you may be interested in learning more about during the end-of-the-year project.
4. Use the tsunami website. Click on the waves tab and watch the waves by clicking on play.
5. Now catch a wave and measure a wave. Scroll down to answer the questions.

Day 52

1. Read about the power of waves.
2. Use all of the links on the top right to read the other articles: tsunamis, freak waves…then also use the animation and videos.

Day 53

1. Read about tides on page 4. Fill in definitions.
2. Watch the lesson and global impact videos on tides.
3. Do the "Predicting the Tides" activity. Follow the directions.

Day 54

1. Read page 5 about coastlines. Write definitions.
2. Study this sea level map. (You can move around the map.)
3. Write a paragraph stating the trends based on the observations you've made about the map.

Day 55

1. Complete the current mapping activity, using this link instead of the one in the PDF.
2. Complete this for Day 56. Use the rubric to guide you. Make it nice!

Day 56

1. Complete your current mapping activity.
2. Present your project to an audience.
3. Grade your project. (Add 10 points if you completed the project on time.)

4. Divide your score in half. Record your score.

Day 57

1. Complete the high tide low tide assignment.
2. Use the link given for your data.
3. Give yourself 1 point for each question completed. (27 total points, a, b, c… are each separate points)

Day 58(*) (Materials: 11" x 14" white paper–doesn't have to be exact, you could tape to regular pieces of paper together to make them longer; 3 speed electrical fan, gooseneck lamp-or other light source, clock or watch, rectangular clear plastic storage box, water, metric ruler)

1. (*)Complete the Making Waves lab. If you don't have the materials, use the animation to get your wave height data.
2. You can finish your graph and write up tomorrow if necessary.

Day 59

1. Complete your lab write up.
2. Use the rubric to grade your lab.
3. Record your score.
4. Do the embedded review activities on page 7 (not the link).

Day 60

1. Play a game to practice the unit content.
2. Take the waves, tides and currents quiz. Click on start.
3. Record your score out of 15.

Day 61

1. Copy the list of key terms.
2. Read about the different zones on page 2 and take notes, filling in definitions. (info from this site)

Day 62

1. Read about blue water. Use the arrows to read each page. Take notes.
2. Take the quiz.

Day 63

1. Read about the littoral zone.
2. Use the arrow and then click each flashing point.
3. Write a paragraph on the difficulties/dangers of this zone.
4. State your thesis. Support it with details. Conclude.
5. Record up to five points. Take off 1 point for each thing missing (from #4).

Day 64

1. Read about the ocean floor. Use the arrows.
2. Take the quiz.

Day 65

1. Read about ocean habitats on page 3.

2. Read more about the types of living things in an ecosystem.
3. An **autotroph** is a producer. They form nutritional substance from carbon dioxide (CO_2).
4. A **heterotroph** is a consumer. They get nutrition from complex substances.
5. Make a diagram using all of the orange words on page 3, showing their relationship.

Day 66

1. Read about the beaches. Use the arrows.
2. Take the quiz.

Day 67

1. Read about the coral reefs. Use the arrows.
2. Take the quiz.

Day 68

1. Read about the estuaries. Use the arrows.
2. Take the quiz.

Day 69

1. Read about the hydrothermal vents. Use the arrows.
2. Take the quiz.

Day 70

1. Read about the kelp forests. Use the arrows.
2. Take the quiz.

Day 71

1. Read about the sea grass beds. Use the arrows.
2. Take the quiz.

Day 72

1. Read about the marine food chain on page 4.
2. Read through this slide show on **trophic level** and the **ecological pyramid**.
3. Try placing ocean animals on a food web. (Skip the login.)

Day 73

1. Read about ocean ecosystems.
2. Answer the questions.

Day 74

1. Read about marine communities on page 5 and take notes.
2. Explain to someone what each orange word is. No reading definitions! Explain in a way they can understand.

Day 75

1. Read about ocean water (use the arrows) and take the quiz.

Day 76

1. Read about human impact on page 6 and take notes.

2. Read about human impact on marine ecosystems.
3. Write a paragraph about human impact on marine ecosystems. Make any point you want. State your thesis. Use details. End with a conclusion.
4. Record 5 points. Take off 1 point for any of those pieces missing.

Day 77

1. Read the question for thought assignment on page 7.
2. Watch the youtube video.
3. Write a paragraph to state your position.
4. State your thesis. Use details. End with a conclusion.
5. Record 5 points. Take off 1 point for any of those pieces missing.

Day 78 (Materials: 1 ketchup or soy sauce packet from a restaurant or a Milky Way mini candy individually sealed or a pen cap with a bit of clay, a 1 or 2 liter clear plastic bottle)

1. Complete The Cartesian Diver Experiment.
2. Answer the questions.
3. Record 25 points, 1 off for any answer not given.

Day 79

1. Use the links below on animal adaptations to answer the questions. (You can do your own research if you can't find an answer.)
    - one
    - two
    - three
    - four
2. Record 10 points, 1 for each answer completed. (Answers)

Day 80

1. Complete the crossword puzzles on page 8. There are four.
2. Review your notes and prepare for a test. Make sure you know pages 5 and 6 and trophic level and the ecological pyramid.

Day 81(*)

1. (*)Take the marine ecosystems test. The test refers to "tropic level." It's a typo. It should read "trophic level."
2. Check your answers. (The numbers in parenthesis tell you how many points that question is worth.) ANSWER CORRECTION: (#6 answer is "pyramid of energy")
3. Add three points to your score. Record your score out of 45 points.
4. You might want to save this for your portfolio.

Day 82

1. Follow the directions and answer the questions in the Tox Town Activity.
2. Use the given link.
3. Record 15 points, 1 for each complete answer.

Day 83

1. Copy the key terms.

2. Read about barrier islands on page 2.
3. What are some of Georgia's barrier islands? (answer)
4. Read this article on barrier islands?
5. What are the two main functions of barrier islands? (answer: scroll to bottom of this page of the article)

Day 84

1. Read about the wetlands on page 3.
2. Make sure you are writing in your definitions.
3. Read about why wetlands are important.

Day 85

1. Make a chart.
2. List four different types of wetlands. (Here's a secondary site. Here's one more site.)
3. For each list where it's found, a plant species and an animal species in that habitat, and a plan for preservation.
4. Record 40 points (2 points for each part of the chart filled in-2o items in the chart).

Day 86

1. Save the wetlands!
2. Use links as necessary. You should cite sources in the project you are going to make.
3. Create a brochure to let people know what they should do about it! Save the wetlands!
4. Here is your rubric.
5. It is due on Day 88.
6. Save this for your portfolio when you are finished.

Day 87

1. Work on your brochure.
2. Use graphics.
3. Write a paragraph convincing people.
4. Make a clear point.
5. Cite sources.
6. Here is your rubric.

Day 88

1. Finish your brochure.
2. Score it out of 100 using this rubric.
3. Record your score.

Day 89

1. Read page 4 about coral reefs.
2. Draw a diagram of each kind of reef. Label it. Show them to someone and explain them.
3. Write in your definitions.

Day 90

1. Research and answer the questions as a coral research diver.
    - In your journal, define and diagram a coral polyp.

- Be able to identify and visually represent at least eight different species of coral and indicate whether it is classified as soft or hard.
- Describe the general habitat of coral, how it lives, and how it reproduces.
- How do the animal and plant organisms depend on each other? Explain three of these symbiotic relationships.
- What are the natural enemies of the coral? Explain why they are threats.
    - Questions from: http://www2.lhric.org/kat/diver.htm

2. Present your answers orally to an audience. Ask them to grade you based on the following.
    - 2 points for each of the five answers if they were expressed with clarity.
    - 3 points for each of the five answers if they displayed expertise.
3. Record your score out of 25.

This is the end of the second quarter. You should save at least a lab, test and your brochure in your portfolio. To figure out your grade: total up your scores and divide by the total possible. Then multiply it by 100. Your goal is to get an A. Where are you losing points? How can you keep from losing them next quarter?

Day 91(*)

1. (*) Print out the third quarter grading sheet or use the Excel version.
2. Use the links on the page to answer the ten questions about coral reefs. Some of the links on the page are not working properly. You can find try these sites as well: Coral Reef Alliance and Ocean Portal
3. Record up ten points. Take away one point for any answer not found.
4. Can you identify safe and unsafe practices in the coral reef?

Day 92

1. Research answer the questions as a marine biologist using the sites given. (You don't have to "research" eight animals. You can just identify them.)
    - What animals live in and around the reef? Identify and visually represent five.
    - How do these animals contribute within the ecosystem?
    - Assess the importance of some of these animals outside of the ecosystem.
    - Choose three animals and justify why it is so important that each be saved from extinction.
        - Questions from: http://www2.lhric.org/kat/bio.htm
2. Present your answers orally to an audience. Ask them to grade you based on the following.
    - 2 points for each of the four answers if they were expressed with clarity.
    - 3 points for each of the four answers if they displayed expertise.
3. Record your score out of 20.

Day 93

1. Read about special adaptations. Use the link at the bottom of the page to read more.
2. Follow the directions and design your coral reef dweller.
3. Read through the links on the left about sea dwellers. Tell someone about what you think is the most interesting animal you read about.

Day 94

1. Research and answer the questions as a marine botanist using the sites given.

- What plants live in and around the coral reef? Identify and visually represent three.
- How does each contribute to the ecosystem?
- Assess the importance of some of these plants outside of the ecosystem.
- Choose 3 plants and rank order them according to their importance. Justify why it is so important that they be saved from extinction.
    - Questions from: http://www2.lhric.org/kat/bot.htm

2. Present your answers orally to an audience. Ask them to grade you based on the following.
    - 2 points for each of the four answers if they were expressed with clarity.
    - 3 points for each of the four answers if they displayed expertise.
3. Record your score out of 20.

Day 95

1. Identify the coral reef inhabitants. Use the links on the page to help you. There are 20 with 2 bonus ones. Record 1 point for each one that you find to identify.
2. Record your score out of 10. (Potential for extra credit)
3. *Complete part two and find the information for whichever organism you choose. You can print the template to fill out with the info.

Day 96

1. Answer the questions as a marine environmentalist. Search the internet, as necessary, to find answers.
    - What is a coral reef? What is it composed of? In what parts of the world are reefs usually located?
    - How are reefs usually formed? What does a volcano have to do with a coral reef
    - What is an atoll and what is its relationship to a coral reef?
    - What are the major types of reefs that exist in the world, and where are they located?
    - Discuss the reef as an ecosystem, detailing the interdependence of the individual species.
    - Choose at least three organizations which are researching reefs and give detailed descriptions of their efforts to preserve them.
        - Questions from: http://www2.lhric.org/kat/env.htm
2. Present your answers orally to an audience. Ask them to grade you based on the following.
    - 2 points for each of the six answers if they were expressed with clarity.
    - 3 points for each of the six answers if they displayed expertise.
3. Record your score out of 30.

Day 97

1. Use the links to read about things that damage the coral reef.
2. Fill in the blanks on the eight phrases.
3. Record 1 point for each one filled in.
4. Write a paragraph about human impact on the coral reef.
5. Record up to 5 points for the eight phrases. Take 1 point off for each incomplete answer.
6. Record up to 5 points for your paragraph. Take 1 point off for any piece missing. It should have a topic sentence (thesis), details/examples, conclusion.
7. Total is out of 10 points.

Day 98

1. Complete the Bermudian Coral Food Web.
2. Use these links to help.
    - fishes, plants, and zooplankton
3. Follow the directions and answer the discussion questions. Answer with what and why.
4. Record 10 points for making a food web for 10 organisms.
5. Record 2 points for each discussion question answered telling both what and why. Take off 1 point for any incomplete part of the answer.
6. Total: 14 points

Day 99(*)

1. (*)Start your Coastal Ecosystem Power Point project. (You can request to do a project other than a power point.)
2. (*)Here is your rubric.
3. This is due on Day 101.

Day 100

1. Work on your project.
2. Make sure you understand how you will be graded with your rubric.

Day 101

1. Complete your project.
2. Grade your project with the rubric.
3. Record your score out of 90.

Day 102

1. Read about shores on page 5 and fill in your definitions.
2. Complete the review exercise on page 7.
3. On Day 103 there will be a test on the marine communities from this section of the course. Look through the pages and your notes to prepare.

Day 103(*)

1. (*)Take your Marine Communities Test.
2. Check your answers.
3. 1 point for each correct T/F statement. Score up to 3 points for the questions at the end–score for clarity, completeness, and correctness. Add two points to your score.
4. Record your score out of 25 points.
5. You might want to hold onto this for your portfolio.

Day 104

1. Read the intro to Marine Plants and copy down the key terms.
2. Read page 2 and write in the definitions. Use the online dictionary to listen to how the words are pronounced. Click on the speaker by the word.
3. Practice the terms on page 5.
4. Read the orange words on page 2 to someone.

Day 105

1. You have three days to complete the "I Didn't Know" power point project. (You can present

your project in a different format.)
2. Each one starts with a "I didn't know…" comment. Each one also includes a picture and a fact. You may need to do some research to come up with your fact statements. You can use the unit to come up with your I didn't know statements.
3. You will present your project to an audience when it is complete.
4. Here is your rubric.

Day 106

1. Work on your project.

Day 107

1. Finish and present your "I Didn't Know" project.
2. Score your project with the rubric.
3. Record your score out of 90.

Day 108

1. Complete the Red Tide article assignment. Use the link on the assignment.
2. Score 1 point for each question answered in your summary. (total possible: 10)
3. Add up to 5 points for writing your summary in a structured paragraph(s) with introduction, details and conclusion.
4. You might want to include this in your portfolio.

Day 109 (Materials: only if you can get it, if not, you can do it virtually: Sprig of Elodea, Water w /Baking Soda, clear glass, Timer or Watch, 60 watt light)

1. Set up and complete Elodea Lab. Make a chart to record your data. (See #2 below.)
2. If you don't have the plant, you can do this lab virtually. Complete the lab with the light at 200 and at 130. (alternative link)
3. You will write up your lab with analysis on Day 110.

Day 110

1. Write up your lab.
2. You might want to save this for your portfolio.
3. Score your lab.
4. Record your score.

Day 111(*)

1. (*)Complete this aphotosynthesis virtual lab using this virtual lab set up.
2. Record the data and answer the analysis questions. You do not need to write up a lab.
    - points for each numbered question answered. (total: 20)
    - points for each complete block of data gathered. (total: 15)
3. Record your score out of 35.

Day 112

1. Write about the importance of marine plant life. Think about ecosystem balance and global impact. (need help?)
2. Write in complete paragraphs.
3. Record 1 point for each specific example or specific fact included.

4. Add 1 point for a topic sentence. Add 1 point for a conclusion sentence.
5. Record your score out of 5. (potential for extra credit!)

Day 113

1. Review the terminology from the course so far.
2. Click on "view" for each unit that's been completed. On usually the second to last page number there are vocab review activities.
3. Complete the review activities. Take note of where you had any trouble.

Day 114

1. Read over your key terms and definitions lists. Focus on the areas where you had trouble.

Day 115

1. Take this test, Midterm 2.
2. You will not record this grade. You will see how much you are remembering from the course.
3. Check your answers.
4. You will need to know this information for your final, a test at the end of the course.

Day 116

1. Copy the key terms.
2. Read the overview of marine invertebrates on page 2 and copy the definitions and take notes.
3. Search out images of each of the orange words. Draw a picture of each kind. I always recommend Google safe search whenever looking for images. Other safe searches do not work as well.

Day 117

1. Read more on plankton. Watch the video.
2. Make a diagram or diagrams that shows the relationships between various types of plankton. You can use broad categories such as consumer, producer, zooplankton, animal plankton, but also add on smaller categories of plankton where they would belong.

Day 118

1. Read page three on starfish and watch the video.
2. If the video isn't working for you, here's the same thing at a different link.
3. Read page four on mollusca.
4. For each orange word, animal category, list some examples of that type of animal.

Day 119

1. Read page five on worms.
2. Create a diagram or chart that compares and contrasts the six different types of worms.

Day 120* (Materials: crustacean–a shrimp, a crawfish or crayfish, a lobster; if you can't, you can just look at the pictures.)

1. Read page six about crustaceans.
2. They belong to the group of arthropods. What's significant about them? (answer: They are the largest group of animals.)
3. Identify the parts of a crustacean. If you can't do the dissection, you can read through and look at the pictures.

4. Here are two dissection activities. Use the pictures and instructions and try to identify the parts listed and delineated.
    - one
    - two
5. *Print and label the fiddler crab. (I would copy and paste on to a document and then print.)

Day 121 (Materials: ruler, index card — you can print a ruler from online if needed and use a regular piece of paper instead of an index card)

1. Complete the fiddler crab population estimation lab.
2. Answer the analysis questions.
3. Score up to 10 points, 1 for each trial completed, tracing the square inch and counting the crabs.
4. Score 2 points for each analysis question answered. (total 8 possible)
5. Score 5 points for each completed calculation: average, area, estimation of population. (total 15 possible)
6. Score 2 points if you completed every part of the assignment. Never turn in incomplete work!
7. Record your score out of 35.

Day 122*

1. *Print page 3. Follow the directions to fill in the phylum chart.

Day 123(*)

1. (*)Match the pictures of meroplankton to what they become.
2. Do the review activities on page 8.

Day 124(*)

1. (*)Take the invertebrate quiz.
2. Check your answers.
3. Record your score out of 25.

Day 125

1. Complete the Who Am I project.
2. It is due on Day 127.
3. Here is your rubric.

Day 126

1. Work on your project.

Day 127

1. Finish your project.
2. Present your project.
3. Use the rubric to score your project.
4. Ask your audience to score your oral presentation out of 10.
5. Record your score out of 100.

Day 128

1. Take one of the "Who Am I" phyla and write a short essay on it.
2. Your essay should have 5 paragraphs: introduction finishing with a thesis statement, three paragraphs each beginning with a topic sentence that supports your thesis and include specific

facts and details, and a conclusion.
3. This is due on Day 130.

Day 129

1. Work on writing your essay.

Day 130

1. Finish and edit your essay.
2. Score your essay using this rubric. Total possible is 20.
3. Add 5 points if all five parts of the essay are present.
4. Record your score out of 25.

Day 131

1. Copy down the key terms in the marine vertebrates unit.
2. Read page 2 about fish. Take notes on the orange words.
3. Build a fish until your fish survives, alternate link.
4. Identify the fish.

Day 132*

1. Read page 3 about sharks and rays.
2. *Print out or draw a shark and label it with everything listed.
3. Read about skates and rays. This mentions millions of years. This guess as to the age is obviously opposed to what I believe about the young age of the earth.
4. Take a look at ray anatomy.

Day 133

1. Read page 4 on marine reptiles.
2. Read about the four types of marine reptiles. If you click on the links in the reading, you can see some short videos.
    - sea turtles
    - sea snakes
    - salt water crocodile
    - iguana
3. Watch the video, just because baby loggerhead turtles are cute. Actually, see how amazing they are. No parent teaches them where to go or how to get there safely. They were created with everything they needed.
4. Make a diagram or chart that shows what characteristics the four types share and don't share.

Day 134

1. Read page 5 about birds.
2. Read about penguins.
3. Check out this page (and site if you are interested) on penguin research.
4. Take the penguin challenge. (also on page 5)

Day 135

1. Read page 6 about marine mammals.
2. Research dolphins.

3. Create an outline detailing their classification, habitat, characteristics, anatomy, food, and predators. (example outline)
4. This is due on Day 136. Write a title and then use the words above as your headings. You need at least three points under each of the headings listed above.

STOP

It's time to save your work in your portfolio. You should save tests, labs and something that shows any project you completed and are proud of. Calculate your grade by dividing your total score by the total possible.

Day 136(*)

1. (*)Print out your grading sheet for the fourth quarter or you can use the Excel version.
2. Your outline is due.
3. Score 18 points if it is in correct form with 6 headings and 3 points for each one. -1 for each of the 18 points missing.
4. Add 1 point for a title.
5. Add 1 point for finishing on time.
6. Record your score out of 20.

Day 137

1. Read about manatees.
2. Answer the questions for thought on page 7.
3. Score a point for each thoughtful answer. There are 11 question marks. Record your score out of 10. (potential for extra credit)

Day 138

1. Use the links on the right to learn about sharks. Go through each link from basic facts through "fact or fiction."
2. Take the quiz. (For the first question, your answer choices are more than 100, more than 200, more than 300, more than 400. Choose the most appropriate. Yes, I know that more than 100 encompasses the other answers. But if another is more appropriate, then that answer is wrong.)
3. Check your answers.
4. Record your score out of 16.

Day 139(*)

1. (*)Complete the inventive ichthyologists assignment.
2. You can turn it in on Day 140.

Day 140

1. Finish your inventive ichthyologist assignment.
2. Score up to 10 points for your Atlantic Ocean characteristics. There should be ten.
3. Score up to 10 points for your fishes adaptations and characteristics that it has in order to survive, if you can explain how its characteristics help it survive in that environment.
4. Score 5 points for paragraph or diagram.
5. Record up to 25 points.

Day 141(*)

1. (*) Complete all the parts of this fish lab.

2. You have three days. Today complete part A.
3. Do the review activity.

Day 142

1. Complete part B of the fish lab.
2. Do the review activity to review key terms.

Day 143

1. Complete the extension activity.
2. Score up to 10 points for part A if all of the answers were found.
3. Score up to 10 points for part B if all of the fish were identified.
4. Score up to 5 points for completing the extension activity.
5. Record your score out of 25.
6. Complete the second review activity as a quiz.
7. Record your score.

Day 144 (*)

1. Begin researching whales. Follow the directions on this whale watching sheet.
2. This is due on Day 150.
3. Research. Take notes. Record sites and other resources used for a bibliography or citations page.
4. Create an outline.
5. Write at least seven paragraphs.
6. Here is your rubric. Read it over and make sure you do what it takes to get a perfect score.

Days 144-149

1. Work on your report. Read the instructions on Day 144 to make sure you are doing everything needed.

Day 150

1. Finish your report. Make sure it has a title and a bibliography.
2. Score it according to the rubric for up to 70 points.
3. Add 10 points if it is complete with title, bibliography, and at least seven paragraphs.
4. Add 10 points if you made an outline.
5. Add 10 points for completing on time IF you completed it by Day 150. You must finish your work on time!
6. Record your score out of 100.
7. Play the turtle voyager game on that page. These are the same type, loggerheads, as the cute baby turtle video we watched earlier. Play to the end. Make sure you read the facts as you go.

Day 151(*)

1. Read over page 2 about Georgia's islands and the associated vocabulary. You don't have to learn all of their names. You don't need to know about them. You should know what a barrier island is. Were you surprised at how many islands are along Georgia's coast? I was. Use the links below for the extras on page 2.
2. Here is the Georgia coast slide show bigger since it's hard to read.

3. Explain to someone what a barrier island is.
4. (**)Answer these questions while you read this newsletter on loggerheads.
5. There are 13 questions. Score 1 point for each found and completed answer.
6. Record your score.

Day 152

1. Now we're going to explore the coast of Maine. This site provides a variety of data from the area which you will analyze.
2. We're going to start with phytos. You'll read the page and use the links to answer the questions in bold. There are three main questions to answer. Use the links and follow the directions on those pages. Answer the questions as they come up. Use the data to draw conclusions.
3. Write answers to each of those three main questions on the first page. Write each with a topic sentence, restating the question. Then give the answer with specific data observations that support the answer. Score up to three points for each answer if it includes a topic sentence, answer and data support. (total: 9 points)

Day 153*

1. *Print the data tracking_sheet. (You will use this again on Day 154.)
2. Complete activities 1 to 3 about mixed or layers. Follow the links. Answer the questions. These are your big questions to answer. "According to your Gulf of Maine research, are certain types of phytoplankton thrive better under layered conditions? How about mixed conditions? Does the diversity of "successful species" change from season to season?"
3. Write answers to each of those three main questions. Write each with a topic sentence, restating the question. Then give the answer with specific data observations that support the answer. Score up to three points for each answer if it includes a topic sentence, answer and data support. (total: 9 points)

Day 154

1. Complete activities 4 and 5.
2. Here are your big questions to answer. Can a storm event can change ocean layering? "In general, which factor (i.e., temperature, salinity or fluorescence) was most affected by the storm?" You will also calculate the thermocline strength before and after an Autumn storm event.
3. Write answers to each of those two main questions. Write each with a topic sentence, restating the question. Then give the answer with specific data observations that support the answer. Score up to three points for each answer if it includes a topic sentence, answer and data support. You will also score three points for your calculations. (total: 9 points)

Day 155

1. Next you will be looking at regional data sets.
2. Here are your main questions. "What is the pattern of temperature with depth along track? Are there any "blobs" of unusually hot or cold water at depth? Where might these "water masses" have come from?" "Is the densest water at bottom?" "Can you detect a general pattern of surface productivity?" "What is the general pattern of chlorophyll concentration? Does it change from southwest ("1") to northeast ("12″)? Is this what you expected based on surface data?"
3. Write answers to each of those eight main questions. Write each with a topic sentence, restating

the question. Then give the answer with specific details that support the answer. Score up to three points for each answer if it includes a topic sentence, answer and support. (total: 24 points)

Day 156

1. Read the page and answer the questions about spring.
2. Here are your big questions. "Do deep plankton look similar to those from surface waters?" "How might phytos that are not growing or reproducing contribute to the ecosystem?" "Did these stations have something in common in terms of location and / or depth and did they have layered conditions?" "What types of phytos were sampled at depth and where did these "spring bloomers" come from?"
3. Write answers to each of those four main questions. Write each with a topic sentence, restating the question. Then give the answer with specific data observations that support the answer. Score up to three points for each answer if it includes a topic sentence, answer and data support. (12 points)

Day 157

1. Explore sea surface temperature.
2. Write responses to the three "key questions" in the box on the page and show your understanding.
3. Write answers to each of those the key questions. Write each with a topic sentence, restating the question. Then give the answer with specific data observations that support the answer. Score up to three points for each answer if it includes a topic sentence, answer and data support. (9 points)

Day 158

1. We're going to look at maps today.
2. Do part two on the Greenland problem. Answer the question (4 points)
3. Scroll down and read through activity 3 as well. Use the red outline map to compare the sizes of the yellow boxed areas in activity three.
    - Write your observations. (3 points)
4. Look through these different types of map projections. Name five that you think have good qualities and why. Name five that you think are flawed and why. (10 points)
5. Record your score out of 17.

Day 159

1. Make a scale drawing of 5000 to 1 of these phytoplankton: cyanobacteria, coccolithophores, diatoms and dinoflagellates. (adapted from bigelow.org)
2. Score two points for each drawing for accuracy and scaled size. (8 points)

Day 160 – Day 179

1. You should look at your vocabulary that you've been writing down. You should study a little each day to prepare for the final on Day 180. You should know the vocabulary for the final.
2. Also, it's important to know the information that was on your two midterms. They were practice for the final.
3. You should go through the course and make sure you can answer the "Essential Questions" listed at the top of the first page of each unit.

4. You will also be working on a final project due on Day 180.
5. For your final project you will take up a cause: Save the _____ ! You are going to create a media campaign to rally others to join your cause.
    - It could be the beaches, the reefs, the manatees, the seahorses, whatever you have interest in. I'll give you some sites to give you some ideas if you are feeling clueless.
    - Your project will have three parts.
        1. a persuasive essay for an opinion piece in a newspaper
        2. a print ad for a full-page magazine ad, a brochure or a poster or flyer
        3. a commercial for either radio or TV
    - Your persuasive essay should have quotes with in text citations or at least references to statistics that are cited in the text. Here are some sites to help with the pieces of your project.
        1. how to write a persuasive essay
        2. how to make a print ad
        3. You might want to use this design aid for your print ad if you don't feel confident in your own skills to work from scratch. You could use this for either the brochure or the poster/flyer.
        4. how to make a commercial
    - Here are your rubrics:
        1. Persuasive Essay Rubric (40 points)
        2. Print Ad Rubric (16 points–You will double your score for up to 32 points.)
        3. TV or Radio Commerical Rubric (out of 32 points) SKIP the group work part — Points for the TV only section get added on as extra points.
    - If you don't have an idea off the bat, peruse these sites for inspiration.
        1. toxins in water
        2. conservation news
        3. ocean pollution
        4. endangered species
        5. You don't have to find something from this list. These are to help you come up with an idea for a cause.

Day 180

1. Present the pieces of your project and get a score for all of its parts. Record the total out of 100. There is potential for a little extra credit.)
2. Take your final. Each question is marked with how many points it is worth.
3. Grade your final.
4. Record your scores. They are both out of 100.
5. Figure your final grade.
6. Congratulations on finishing the course!
7. Please take the polls below. Answer honestly to help other students choose the best courses for themselves.

Evidence of a young earth