

## Marine Science Research /Community Service Project Outline

To obtain marine science research and/or community service project credit, students must use the workbook and the following science project outline to guide them throughout their work. The **Science Project Outline** (see below) can be downloaded and copied so that students can record and save their individual responses to the prompts. Simply click on the **“Science Project Outline Link”** to download the document. **You should have an electronic copy and print out a hard copy as well.** If you require a hard (paper) copy, please request that one be sent to you. Prior to the start of your voyage, you should have completed the Title, Objective, Question, Hypothesis, Background Information/Resources, Materials, and Procedure sections. During the voyage, you will work with staff scientists to complete the Data/Observations, Analysis, Discussion/Extension Questions sections. This outline is part of the project workbook and will need to be completed and turned in (temporarily) with the **Science Project Workbook** during the student’s voyage.

Time used to complete your outline—which is part of the *required* Science Project Workbook—is included in the hours earned for your research and/or community service credits. *Participating students will receive their workbooks (via e-mail and regular mail) at the end of April or early May.* The workbook will prepare you for your work and should be kept in a very safe place, as you will be required to bring it to the BVI and use it throughout your voyage. Additional paper copies will be available only under special circumstances. Although your research and community service project hours will be recorded separately by the SeaTrek staff, you will need the workbook to confirm your participation and provide proof of the specific tasks and work you completed. Students should continuously communicate questions, concerns and needs with the lead marine biologist ([scienceproject@seatrekbvi.com](mailto:scienceproject@seatrekbvi.com))—especially where requested throughout the web site and workbook.

A. **Title:** This is the name of the research/community service project you will be working on. *Example: Plankton Investigation*

**Your Project Title:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. **Objective:** This is the purpose of the lab, which is to develop and answer a question and to test a hypothesis that attempts to answer that question. It is very important that you are specific and thoughtful so ask the lead marine biologist if you need help. The following is an example of each type of a question and its proposed hypothesis:

•**Question (Q):** Students should come up with at least five relevant questions based on their topic of study (coral reefs, reef fish, sea turtles, plankton, or environmental conservation). After collecting related background information and contacting the lead biologist, students will select one question upon which to focus their research.

Q1. \_\_\_\_\_

Q2. \_\_\_\_\_

Q3. \_\_\_\_\_

Q4. \_\_\_\_\_

Q5. \_\_\_\_\_

•**Hypothesis (H):** A hypothesis is a possible explanation for an observed phenomenon or question. Students must provide a hypothesis (educated guess) for the one question they select as their main research question.

*Examples:*

*Q. Is there a higher percentage of phytoplankton (algae) or zooplankton (animal plankton) in five drops of seawater?*

*H. I predict that there will be more phytoplankton in five drops of seawater because it is summertime and—like land plants—the algae are reproducing more rapidly due to increased daylight hours.*

*Q. Is the diversity (number of different species) of phytoplankton in three drops of seawater greater than that of the zooplankton?*

*H. The diversity of phytoplankton is greater than that of zooplankton because more fish eat zooplankton than phytoplankton.*

*Q. Do the populations of phytoplankton and zooplankton change throughout the seasons? How? Why?*

*H. The amounts of phytoplankton and zooplankton change throughout the seasons because different physical (rainfall, currents, nutrients, salinity, temperature) and biological (predator/prey populations, human activities, reproductive strategies) conditions change and affect the amounts and types of plankton.*

**Focus Question:** \_\_\_\_\_

**Focus Question Hypothesis:** \_\_\_\_\_

**C. Background Information/Resources:** This section will provide information (internet sites, videos, professional contacts, images, articles, keywords/vocabulary) that will help students compile and record necessary background information. Students will also be asked to record additional sources and information that they find useful in completing their projects. *Example: Source: Wikipedia ; Web address: <http://en.wikipedia.org/wiki/Plankton>*

**Source 1:** \_\_\_\_\_

**Source 2:** \_\_\_\_\_

**Source 3:** \_\_\_\_\_

**Source 4:** \_\_\_\_\_

**Source 5:** \_\_\_\_\_

**Additional Sources:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**D. Materials:** This section lists all of the equipment and resources needed to complete their projects. Students will read about their selected project and work with the lead marine biologist to complete this section. Special attention should be paid to include materials that may not normally be available according to the basic design of the research. For example, if students decide to research phytoplankton and want to focus on a certain species or collect it in a certain way (at night, at a certain depth, etc.), they should inform the lead biologist and bring the necessary background information with them on their voyage. As much as possible, biologist will work to obtain the unique/specialized equipment required. *Example: The plankton investigation will require the use of a plankton net, microscope, Petri dish, microscope slides, eye dropper, identification cards/plankton field guides, paper/pencil for sketching, appropriate background information, etc.)*

**Materials List:** \_\_\_\_\_

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\_\_\_\_\_

**E. Procedure:** These are the step-by-step instructions for doing the research investigation. Students will read about their selected project and use the reference materials provided in the workbook to complete this section. Prior to the voyage, this section will be rather general and can be updated and clarified after students arrive in the BVI. For example, students may not know the exact methods and procedures until they participate in the marine science presentations and training activities that occur during the voyage. *Example: For the plankton investigation, students will work with the staff biologists to deploy the plankton net and collect a sample of seawater. Then they will use the eye dropper to place a small sample on the microscope slide and Petri dish. Microscopes will then be used to observe, count and identify the different types of plankton. Students will then sketch a variety of phytoplankton and zooplankton and discuss their features, relationships and function within the marine environment. Finally, with the help of the staff biologists, students will use their observations and analyze their data to draw conclusions and complete the scientific method and project outline.*

**Step 1:** \_\_\_\_\_

**Step 2:** \_\_\_\_\_

**Step 3:** \_\_\_\_\_

**Step 4:** \_\_\_\_\_

**Step 5:** \_\_\_\_\_

**Step 6:** \_\_\_\_\_

**Step 7:** \_\_\_\_\_

**Step 8:** \_\_\_\_\_

**Step 9:** \_\_\_\_\_

**Step 10:** \_\_\_\_\_

**Additional Steps/Notes:** \_\_\_\_\_

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