

Marine Biology

Global Context: Scientific and Technical Innovation

MYP Personal Process Project 2014-2015

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Introduction

Context

To me, the PPP is seen as an opportunity to take charge of my own learning and be independent while finding answers. It is very important to choose a topic that will inspire me to remain focused and submersed in the project throughout the work period. Not only is the PPP a good demonstration of the skills learnt as an IB learner, it also will allow me to learn more about my passions.

For my Personal Process Project I have decided to involve my interest in Marine Biology. I chose this topic because I love animals and I want to know if becoming a marine biologist might be a suitable career option for myself in the future. Also, I am very interested in underwater environments and how different creatures relate, depend on and interact with one another. The idea of passively interacting with, observing and learning about creatures in an unfamiliar world sounds exciting to me. Furthermore, I have recently become a SCUBA diver. This was very difficult for me because I had some fears of enclosed spaces and being deep underwater. Through this project, I hope to gain a better understanding of behaviours and characteristics of the organisms I can see underwater.

Goal/Product

My goal is to *“Learn how to research underwater life”*. My goal is highly challenging because research contains many techniques and components and also I will be trying to become more comfortable in an environment that I fear. I will discover the techniques of researching underwater animals and help grow my inquiring and communicating skills. After developing my goal and global context I needed a guiding question to help me begin my research and focus my project. My guiding question is *“How can I use different techniques to research underwater life?”*

My iBook will help me achieve my goal because it is evidence of my research and documentation of underwater life. My iBook is a place where I can display the research that I have collected. It shows that my outcome of researching underwater life was successful by then end of the project. It will have all of the creatures I photographed, selected, identified and researched throughout the process of my project.

Global Context

Due to the biological nature of my topic, I have chosen a global context that all allow me to make my ideas more detailed and focused on my goal. The global context that will be guiding me through my exploration is Scientific and Technical Innovation. This is the study of *“how we understand the world in which we live”* therefore it fits perfectly with my project which looks at understanding the underwater world (International Baccalaureate Organization, 2014).

More specifically, I chose it because I will be able to focus on the two subheadings of the global context: *“the natural world and its laws”* and *“the interaction between people and the*

natural world". The first subheading will be guiding me through research and finding relationships between creatures, other creatures and their environments. I will be looking at the natural underwater world and observing the laws that take place in such a diverse ecosystem. The second subheading, will help me look at how humans have impacted the underwater world. This will be concerning photography and how humans capture photos underwater. Photography allows people to gain a better understanding of creatures while they observe and wait for the perfect shot. Also, some of my main research questions in the product will be focused on the way humans have impacted the lives of specific creatures because this relates to my global context.

Criterion A: Investigating

Prior Learning

In Biology class, we had been studying organisms, ecosystems and relationships in our Ecology unit. I have gained a lot of knowledge from this class concerning the human impact on ecosystems such as coral reefs. I wrote a One World Essay concerning the effect of artificial reefs on the loss of biodiversity in coral ecosystems. I have learnt about symbiotic relationships such as mutualism, commensalism, predation, herbivory and parasitism and how they link different creatures. I can apply this knowledge when establishing my research questions for each underwater creature. This will relate to my goal because I will be able to develop research questions that look into the behaviours, relationships and impacts that take place within the environment.

Recently, I took the PADI SCUBA Diver Course with my dad. From this course, I gained the knowledge about basic underwater skills such as buoyancy and breathing. These skills allow me to be safe underwater. Buoyancy is important because it allows you to stay upright underwater and not bump into the sea floor. This can cause destruction to the coral reef and it would be an example of the bad impacts humans have of this environment. Breathing underwater will allow me to stay down there for up to an hour. This will allow me to observe creatures easily and wait for the right moment to take a good photograph. This knowledge will make it much easier when beginning to document underwater life because I will not be worried about these challenges and feel comfortable in my environment. Another part of the next step of the course is to choose an "Adventure Dive" and one of the options is Underwater Naturalist. I have begun to read this chapter in the PADI book and have gained some knowledge on diving effects on the natural world, identifying creatures and how I can help preserve natural coral reefs. Knowing how to dive will allow me to take my photographs and identify the creatures, getting me one step closer to my goal.

In 7th grade, I took part in a photography project which allowed me to research basic photography skills. This was a long time ago so I had forgotten a lot of what I had been taught but when I began to research, it came back to me. This project allowed me to have prior experience in photography and looking for the best shot. I was able to apply this to underwater photography. Photography is a large part of documentation and because I have basic skills it will be feasible for me to learn the technique for my goal.

Literature Review

A large part of my PPP was conducting research to extend my knowledge further. My primary research was interviews with marine biologists and underwater photographers. First, I used the internet to find marine biologists that would be willing to help by answering some of my questions. I found a woman named Heather Spence, a marine biologist from the Coastal Marine Biology Organization in Australia (Personal Communication, 2014). She answered some simple questions that allowed me to begin my basic research (see Appendix A). She was a reliable source because her job includes many of the same things I will be doing in my project. She answered, however, her answers were vague. When I went diving in Thailand, I met many kind people who were willing to help, including my dive instructor. Tim Bradley, my dive instructor, is a PADI Dive Instructor who does underwater photography. He offered to let me use his own photographs but I insisted that this project must be made up of my personal experiences.

When conducting my introductory secondary research, I used sites such as *Expert Photography- A Beginner's Guide to Photography* to learn the basic photography skills. I learnt about balancing, cropping and the rule of thirds. These helped me take better photos, focusing on the subject (Dunlop, 2014). Then I used a site called *Guide to Photographing Fish* to direct my techniques to underwater particularly. On this site, I learnt about how water effects colours and light by decreasing as you go deeper (Gietler, 2013). I also learnt about the behaviours of underwater life and how to work around their natural instincts, for example to hide or swim away, to get the best photos by being patient and using the correct angles (Gietler, 2013). Finally, I also learnt that many underwater photographers adjust the contrast, saturation and backscatter of their photographs in Photoshop after documenting the creature to bring back a more realistic image (Gietler, 2013). Throughout the creation of my product, I used a variety of sources such as *Wikipedia* to find out more about the creatures I was researching. Since anyone can edit *Wikipedia*, it may not have been a reliable source but the information obtained was scientific and had very little bias. Wikipedia gave the scientific names/classifications for each creature, the location and the description. Some of the creatures researched using Wikipedia were: Crinoid Shrimp, Gilded Triggerfish and Porcupine-fish. Other sources used can be found in Appendix F.

The book I used to identify creatures throughout my entire project was: *Reef Fish Identification- Tropical Pacific*. It has many photos of over 2,000 different fish found in the tropical pacific ocean (Allen, G., Steene, R., Humann, P., DeLoach, N., 2003). It also contains basic information about them such as their name, scientific name, size, location and identification traits (Allen, G., Steene, R., Humann, P., DeLoach, N., 2003). This book was very reliable because it was written by four different authors each experienced in either photography, marine biology or SCUBA diving. The reliability of the sources is further discussed and ranked in Appendix B. As seen in Appendix C, I also used slates, provided by my dive instructor in Thailand to identify creatures while underwater. Another book I used was the PADI Adventures in Diving Manual: Underwater Naturalist section. This book is used in the certification process

of the PADI Advanced Openwater Diver course and it discusses human impact on ecosystems and safety underwater (PADI, 2010, Pg. 245).

Criterion B: Planning

Product/Outcome Specifications

I will conduct my research and display the results in my product. I have chosen my product to be an iBook containing research and photographs on the underwater life seen while SCUBA diving. Since my final product is not only a product but also an outcome, there are criteria for the product but also areas that must be met in order for me to have successfully achieved my goal. I must understand how to marine biologists photograph and research underwater life. This can be seen in my product based on my photos and information collected. I must have a wide knowledge of these basic techniques and be able to apply them underwater. The following list is the specifications I have chosen that will show if my product and outcome are successful and that I followed my plan to achieve it:

In order to be successful, my product/ outcome will show:

- iBook contains all criteria discussed in Appendix D
- different techniques to research underwater life (including photographs, basic introductory information and information applied to guiding question)
- taken part in dives and practiced techniques/skills underwater
- hyperlinks and galleries specific to iBooks to help use iBook
- shows planning- well organized
- have learnt something from my project that will stay with me

Developing Criteria for the Product

When making my product there are a few guidelines that must be followed in order to have a successful “high quality” product. In Appendix D, the detailed criteria for the product can be seen as a chart. This allows the product to be easily ranked according to each of the band levels. If all of the band levels receive the 6-8 mark then the product has been created according to the plan. The chart includes categories such as aesthetics, user/audience, environmental considerations, function and size/content.

Developing a Plan to Complete Project

In order to complete my project, a strict plan had to be made with due dates to ensure that none of the work was procrastinated or that I did not have sufficient time to complete. Most of these plans can be seen in Appendix E; the Overall Plan for PPP. A series of time periods were sectioned and small goals were set for each time period. This way all of the work would get done on time and well.

I used my research on photography to take better photos and document each creature and fish. Also I used my research to write a short couple paragraphs about the guiding research question for each. Both of these were displayed in the iBook as planned.

Criterion C: Taking Action

Creating my Product to Achieve my Goal

After completing a detailed plan, I began work on my product. I started out by creating my iBook that follows all of the points of my criteria for the product. To do this, I had successfully done dives in which I used photography skills and techniques to document underwater life. This was the most challenging part because it is very difficult to get the best angle underwater while you are focusing on not bumping into coral and other creatures. A good photograph was not worth damaging any underwater organism. Once the photographs were collected, I processed (cropped and edited) them and tried to improve them. This was a challenging part of my process because the photos were not all very good and they were difficult to edit. I conducted further research and used Photoshop to fix them but it was very difficult. Next, I chose which ones I was going to use. I have many ideas for each of the creatures and it's made it very difficult to choose. I ended up doing some research on almost all of them and when the creature was very interesting or different I decided to use them. After that, I collected substantial information for each of the research questions based on the individual creatures. Sometimes it was difficult to find reliable sources that contained the answers and information for my guiding questions.

After finishing my project, I have concluded that my product was efficient in helping me achieve my goal using the global context. The use of different techniques in documenting underwater creatures has allowed me to be very technical which is part of the global context, Scientific and Technical Innovation. The research and inquiry involved in my project has allowed me to explore the "natural world and its laws" as well as "the impact humans have of the natural world." I have been able to learn many new things about creatures and fish that live in the Pacific ocean that I would not have learnt had it not been for my project. I learnt many new things about around 25 different ocean creatures including human impacts, relationships with other creatures, behaviours and adaptations.

Criterion D: Reflecting

Evaluation of Product

After completing my product, I am very proud of the work I have done. My iBook looks very nice and it is completely finished. All of the pages, sections and chapters are well organized. However, due to the camera I used, the photos are not very good quality. They are in colour though and therefore they are still interesting to look at. I have 30 pages in my iBook. This includes 2 chapters, one introducing the dives and the other on applying techniques to document and research underwater life. All of the information I used is based on my specific research questions for each creature. This allows my iBook to be an extensive product that covers many aspects of my goal. I also have my references mentioned on each page in in-text citation form. Furthermore, my iBook has some biology, photography and SCUBA diving terminology but most of it is explained in the text. It is understandable for the target audience, teenagers and up. It could have been more detailed and gone into further depth about each creature. For the amount I

did write, I am very happy with it. What I have so far does a great job of informing the reader on underwater life, interactions, relationships and behaviours of creatures. I will continue to add onto my iBook even after PPP is over to increase my knowledge about underwater life. Since my iBook was created using iBooks Author, it is all technology based and therefore it is environmentally friendly.

In the end of my project, I have made sure that I have achieved all of my self-made criteria for my outcome as well. I have completed dives in which I used my newly learnt photography skills and techniques to identify marine life. This has allowed me to have many amazing experiences, meet many new people who share similar interests and discover new places and species I had never encountered before now. I have conducted substantial research on each of the research questions I came up with. When doing my research, I had an amazing time taking charge of my own learning. Finally, my project has allowed me to not only obtain new knowledge that I will remember for a long time, but to also allow me to keep an actual book containing my information and experiences.

Reflections on Knowledge & Understanding

My Personal Process Project has allowed me to gain a better understanding of the global context, Scientific and Technical Innovation. When producing my iBook, I had to look at all of my information through my global context as if it were a lens. Using the elements of the global context such as “the natural world and its laws” and “the impact of humans on the natural world”, I had to create my research questions in correspondence with these guidelines. I have learnt new scientific terminology and how to look at the biological side of marine life. I have also become more familiar with the technical aspect of photography.

When trying to find marine biologists that would be interested in being interviewed, I ran into some challenges because not all of the marine biologists were allowed or willing to answer my questions. This made it difficult to get a wide range of sources for my primary research. This was one of the main challenges. Later, when I met the PADI Dive Instructor, Tim Bradley, I told him about my project and how I was documenting underwater life. His way of capturing underwater life could be different than most people's and so I should have tried to contact more photographers to get their ideas and help.

My knowledge of underwater documentation and research has also increased drastically throughout the process of my project. I have learnt many techniques such as identification, classification, photograph and collecting information. These techniques are a large part of researching underwater life. One of the purposes of this project was to get to know marine biology more to decide if it is a possible career choice for me. I believe that it definitely could be. I love observing and researching animals and SCUBA diving, marine biology would allow me to do both. If I continue to write and take photographs for my iBook it will allow me to continue my learning process. Also, if I ever apply to marine biology programs in my future, the iBook would be a good example of my prior knowledge, interest and devotion to the subject.

Reflections on Skills as an IB Learner

The International Baccalaureate learner profile describes students in ways that allow for success. Ten different qualities that are demonstrated by IB students including: Inquirers, Knowledgeable, Thinkers, Communicators, Principled, Open-minded, Caring, Risk-takers, Balanced and Reflective (International Baccalaureate Organization, 2014). As an IB learner, I have improved as a risk taker, inquirer, reflector and communicator just in this one assessment. First of all, my risk taking skills have improved because I pushed past my fears of diving and went diving in order to take underwater photographs. Since I was also conducting a rather unpredictable project, I had to be ready for my plans to change. I did not know that I would see in particular creatures and therefor had base my project on whatever animals I saw. I have also improved as an inquirer because I had to come up with different questions for each new creature and dig deep into the research to find answers. Furthermore, my reflecting skills have increased greatly as well from keeping a process journal (see Appendix G) throughout the entire project. I had to write detailed reflections of each step of the process and really analyze my work. Finally I have improved as a communicator because I not only conducted research but presented it in a way that was understandable by my audience. I communicated with my supervisor as well throughout the entire project and that took a lot of planning, organizing and arranging. I am very proud of how far I have come since the beginning of my project and I have learnt many new things about the IB program and what it means to be an IB student.

Reference List

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(Further references used in research for product can be found in Appendix F)

Appendices

Appendix A: Heather Spence's Interview via. Email

Interview via. Email with Heather Spence of Costal Marine Biology Organization in Australia	
<u>Question</u>	<u>Answer</u>
1. <i>Where do you work? What is your job? What does that entitle? What do you do everyday?</i>	I work at the Costal Marine Biology Organization in Australia. I am mainly in charge of the databases and keeping track of information. I am a Marine Biologist but most of my job is not done interacting with animals, I have many colleagues however that do.
2. <i>What are some of the main aspects in the career of marine biology?</i>	There are many different careers that involve Marine Biology. Some are more hands-on and others, like mine, are based in an office.
3. <i>Does underwater photography play a large role in the documentation of underwater life?</i>	As I have mentioned, many of my colleagues work with marine creatures. Some of them are photographers that specialize in underwater life. This does take a huge role in documenting the underwater life but we still research them.
4. <i>How do I safely interact with underwater life?</i>	Do not touch, taunt or disturb underwater life. This tends tends to be a very important part of interacting <i>passively</i> with underwater creatures. (not leaving a lasting effect on them)
5. <i>What sites on the internet could help me with specific species and information about them?</i>	There are many databases that contain basic information and they will help you identify the organisms.
6. <i>Where are some of the best diving locations in the world and why?</i>	Since I am based in Australia, we have some of the most diverse diving right here. However, Malaysia, Thailand and Philippines have many of the world most popular coral reefs. Of course, it depends on the diving you wish to be doing.
7. <i>What effect has human research had on the wildlife? (ie. good and bad)</i>	This is a very large topic. You must do more research on this but to start you off, I am sure you have heard of coral "bleaching". This is caused my global warming. Also humans have begun to dive more and more causing disruptions in the habitats of many living creatures.
8. <i>What main pieces of information are generally collected when researching an animal?</i>	It depends on what you need to answer your questions. It is often good to have some basic understanding like the name, size, location, etc. Your further research question will allow you to research more specific and complex information.

Appendix B: OPVL Evaluation of Sources

Number	Source	Out of Five				Total (Out of 20)
Source #	Origin	Purpose	Value	Limitation		
1	<i>Reef Fish Identification: Tropical Pacific Book</i>					
	An excellent source: purpose is a identification booklet, authors are professional photographers/divers/marine biologists, current date, value is it is easy to use					
2	<i>A Beginner's Guide To Photography Website</i>					
	An okay source: purpose is a guide, author is a professional photographer, value is it teaches the basics of photography, limitation is the lack of date, advertisements suggest bias					
3	<i>Guide to Photographing Fish Website</i>					
	A very good source: current date, author is a competitive underwater photographer, purpose is a guide, value is it refines photography information to underwater					
4	<i>International Baccalaureate Organization- Learner Profile</i>					
	An excellent source: purpose is to inform on IB program, author is IB organization, value is information on global contexts/ATLs/Learner profile					
5	<i>Adventures in Diving Manual Book</i>					
	A very good source: purpose teach diving (not specifically for underwater naturalist), value is introductory information, current date, objective information					
6	<i>Wikipedia</i>					
	A good source: purpose is encyclopedia, value is available information on any creature, no date, anyone can edit, scientific information is not subject to bias					
7	<i>Heather Spence Interview</i>					
	A very good source: purpose is a marine biologist, value is she can answer questions, current date, it is bias and an opinion					
1	5	5	5	4	19	
2	3	5	3	2	13	
3	4	5	4	4	17	
4	5	5	5	5	20	
5	4	4	4	5	17	
6	3	3	5	4	15	
7	5	5	3	3	16	

Appendix D: Criterion for the Product

Your Goal:	Learn how to research underwater life.			
Your Global Context:				
Band Levels	<u>1-2 Limited</u>	<u>3-4 Adequate</u>	<u>5-6 Substantial</u>	<u>7-8 Rigorous</u>
Aesthetics	Unfinished iBook containing some bad quality photos and limited confusing information	Completely finished iBook containing moderate quality color photos and information	Completely finished iBook containing some good quality color photos and easy to understand information	Completely finished, well organized, iBook containing many photos and easy to understand but detailed information based on specific questions
User/Audience	Anyone	Teenagers and up	Teenagers and up User must have a basic understanding of biology	Teenagers and up User must have a basic understanding of biology, photography and SCUBA diving
Environmental Considerations	Printed single sided all in color	Printed double sided, in color	Partially Printed but mainly technology based	Technology based, not printed therefor environmentally friendly
Function	Attempts to inform user on underwater life	Informs user on underwater life	Informs user on underwater life and some techniques used to conduct research	Informs user on underwater life, interactions, relationships and behaviours, knowledge necessary as a Marine Biologist
Size/Content	1 chapter, on applying techniques to conduct research (approx. 5 pages)	1 chapter, on applying techniques to conduct research (approx. 10 pages)	2 chapters on applying techniques to conduct research (approx. 20 pages)	2 chapters, one introducing the dives, the other on applying techniques to conduct research (approx. 30 pages)

Appendix E: Overall Plan for PPP

Time Period (Week)	Process Journal	Report	Product
1-5	Decide topic, goal, global context, product, etc.		
6	Start entries Four-Boxes Signed	—	—
7	Update	Start Intro	—
8-9	Intro Research	Work on Intro	—
10	Timeline	Investigating Section Start Reference List Start	—
11	Develop Plan/ Criteria for Product (specifications/ achievements)	Planning Section Start	—
12	Reflect on Challenges	—	—
13-17	Entries about Project Process	Start Taking Action Section	Make Product (see Product time line)
Dec Break	Go Diving		
18	Reflecting on Process	Start Reflecting Section	Turn in draft of product
19	Reflecting on Process	Finish Up	Reflect on Evaluation of Draft
20	Reflecting on Process	Draft of Report Due	Change According to Reflection
21-23	Reflection Process	Make Final Changes/ Improvements	Final Should be Finished
24	FINAL DUE		
25	Exhibition		

Appendix F: Reference List of Product (APA Format)

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Appendix G: Process Journal Extracts (10 A4 Pages)

Sept. 10/2014- Four Boxes Signed by Mentor

Last week we were informed by our mentors that the four boxes sheet containing our goal, global context, guiding question and product had to be filled out and signed. I started by designing my goal based around what I felt passionate about. I love to SCUBA dive and I have

always been interested in animals and their environments. I took these two main ideas and combined them into my goal, "Learn how to document and research underwater life with available resources." From this goal I had to come up with a global context that would fit it. The reason for the global context is to help narrow your project down to a focus on one particular element or elements. I decided that the area of Scientific and Technical Innovation is probably the most suited to my goal and I wanted to look at documentation and research through scientific techniques. This is when I had to come up with a guiding question to help me begin my project somewhere. I came up with this, "Is the research and documentation required for the career as a marine biologist something I would like to do for my career?" This question looks at both the scientific side of my project and also how it relates to me and my choices. The final step to the four boxes was to design a product that would help you achieve your goal. I decided to make an iBook with research and documentation of underwater life. This will help me get to my goal because I will go into the field (underwater) and document underwater life and then I

Personal Project Process

Student:	Classroom:	Supervisor:
Sophia Biber	IOC	Mr. Morin
Topic: Marine Biology		
GOAL: What do I want to achieve by completing this project? 1. Learn how to conduct research on underwater life.		
GLOBAL CONTEXT 2. Scientific and Technical Innovation *The natural world and its laws. *The interactions between people and the natural world.		
GUIDING QUESTION: How can I explore my goal and NOT as a question? 3. How can I use techniques to conduct research on underwater life?		
PRODUCT: What product or outcome will lead me to achieve my goal? 4. An iBook containing research and techniques to obtain research on underwater life seen while scuba diving.		
Supervisor Approval 		Mentor Approval 

Note: Approval requires all four boxes to be clearly signed.

will research that organisms I have found. The next step in my project is to meet my supervisor to refine my four boxes even more. After that I must begin my research.

Since we have started our PPP, I have been very excited. I cannot wait to make an iBook and display my photos. Also I am very excited to go diving. I do notice some possible challenges however. I am sometimes uncomfortable underwater and it will take some self control to be able to dive down and take photos. This is good for me though because it allows me to **take risks** and try things that I may not have done before. There is also the challenges I will face when I plan out my project because sometimes I procrastinate and do not allow enough time to get things done. I must stay **organized** by following my plans and timelines.

Sept. 15/2014- First Meeting with Supervisor

Today I had my first meeting with my supervisor who is also a mentor, Mr. Francis Morin. I brought my four boxes in order to discuss my project and find out where I should go from here. We first talked about my goal that I had written. Mr. Morin believed that I could refine my goal more in order to have a clearer project. He said that since I have the word "and" in my goal it sounds like two goals. I refined this goal down to "Learn how to conduct research on underwater life". I removed documentation from my goal because documentation is a form of research that I can include but it doesn't need to be in my goal. I agree with him entirely. It will be much easier for me to stay on topic and not stray from my goal if I have a clear singular idea in my head.

Second, we talked about my global context. We decided that Scientific and Technical Innovation was a very good choice as long as I know what subheadings my project would fall under. Looking at the PDF given to us by Ms. Helen Zhang, I decided that my project best fits under these two strands of this global context:

- *The natural world and its laws*
- *The interaction between people and the natural world*

These two strands will help be better understand and refer to my global context later on in my project. Next we discussed my supporting question. Mr. Morin thinks that the question I have is a good question to answer later on in my project but it shouldn't be my guiding question. I should have a guiding question that sounds more and revolves more around my goal. Later I came up with this question, "How can I use techniques to conduct research on underwater life?" I haven't visited my supervisor since so I do not know if this was more along the lines of a guiding question. Finally, we discussed my product and Mr. Morin thought it was good that I was doing an iBook to show how I conducted research and the information obtained from it. My next step towards my PP Project will be to meet my supervisor for one final signature on my four boxes and then I will begin conducting research. I must have my introductory research done by Wednesday, 24, September. So that when I go on October break to Phuket I can begin my field documentation. This includes beginning to answer the following questions:

- What techniques are used to research underwater life?
- How are these techniques done?
- Who can I talk to to understand this better? Who does this for a job?

I came up with these questions after **reflecting** on my meeting. These will help me narrow down my ideas and stay focused. I am very excited about starting to research and gain more knowledge about the techniques of researching underwater life. Some of my strengths so far is my goal because I have a clear understanding of how it links to my global context. Something I need to continue working on is my product idea. I need to make sure I have a clear idea on what I am going to include in order for it to help me achieve my goal.

Sept. 25/2014- Introductory Research

Today I finished my introductory research. These bits of information will help me successful document and research underwater life while staying safe and well-prepared. Below the research box I have **evaluated** each of the sources used for the particular research. This is an example of how I used the OPVL (origin, purpose, value, limitation) format in order to decide how valuable a source was, how well it related to the task at hand, whether or not it was good information and if it was reliable.



Technique 1: Photography/Documentation

Photography Basics:

Exposer

Aperture

-the wider the more light is let in

Shutter Speed

-length of time the lens is allowed to take in light

ISO

-allows camera to be more sensitive to light

Depth of Field

-allowing more light creates a shallow dept of field

White Balance

-responsible for colour cast of entire photo

Focal Length

Crop Factor

-automatically crops the image to narrow

Composition

The Rule of Thirds

-divide photo into thirds and shows the points of focus

Balance

-balance allows viewer to feel more relaxed rather than uneasy

Taking It Underwater:

Photography

Colour

-the deeper you go you start to lose colours: red, yellow

Behaviour

- fish are unpredictable

- what time of day, where

Facts

-get 12 inches close (shooting through too much water)

- shoot up not down

- bring a dive light

Photoshop- Processing My Photos

Contrast

-water removes contrast from photo

Saturation

- saturation increases the contrast between colours

Colour Balancing

- due to dept, reds will be light

Backscatter

- photo looks grainy and unfocused due to backscatter

Expert Photography- A Beginner's Guide to Photography

(<http://expertphotography.com/a-beginners-guide-to-photography/>)

Origin: This is a guide to beginner's Photography written by a man named Josh from Brighton, England.

There is no date unfortunately. **Purpose:** The author created this website to inform new photographers on the basics of taking photos. There are some advertisements suggestion bias towards certain cameras, doesn't affect data. **Value:** This source has helped me with the technique of photography I am going to need when researching underwater life. The author has many blogs and I have read some of his comments. Many people found his work helpful and valid. Therefore the information obtained from him will help me learn how to take good photos. **Limitation:** There is no date so I am unable to tell whether or not the site is current. The information is objective and therefore doesn't need evidence to back it up.

Underwater Photography Guide

<http://www.uwphotographyguide.com/fish-photography>

Origin: This is a guide to underwater photography written by a man named Scott Gietler in 2013. The whereabouts unknown. **Purpose:** The author created this source to teach underwater photography to a range of experienced divers. There are some advertisements selling cameras. **Value:** This source gives me the skills I need to learn in order to take good underwater photos. Scott Gietler is a famous underwater photographer and has many photos online in contests and on websites. **Limitation:** This source is relatively current, 2013. The information is objective.

Sept. 28/2014- Phuket Diving

Today I took my first step into documenting the wildlife that I am planning on researching. We went on a diving trip to three different dive sites: Koh Bida Nok (Phi Phi Islands), Palong Wall (Phi Phi Islands) and Shark Point.

In the first dive site, Koh Bida Nok, we saw many colourful soft corals and a wide range of wildlife. The high points of this dive was the large schools of fish. There were many Crown of Thorn starfish and at one point we saw a sea turtle. My dad and I had the opportunity to swim alongside a huge school of yellow and white fish. It was very interesting and it made me very excited. Since I researched safety before my dive I made sure that I was careful around the

Crown of Thorn starfish because their spines can break off and imbed in skin causing swelling and pain. I got some good photographs and I used some of the skills I researched prior to this vacation. I made sure to shoot my photos from below or at the same level to avoid distorted images. After safely exiting the water, I made sure to write down notes in order to remember all of the key points when I am writing this journal later.



Our next dive was with the Black Tip Reef Sharks at Palong Wall. Here the coral wasn't as colorful but we were able to see the sharks from a distance. I tried to document the reef sharks but I was unable to get close enough for a good picture. This is an example of "shooting through too much water" (talked about in the techniques). The sharks did not pose a threat because they were more afraid of us than we were of them. They kept their distance and often swam away before we got within 10 meters. My diving instructor said after the dive, "this species of shark are very docile and not known to be of any danger to humans."

The final dive site was at Shark Point. This was a very challenging dive due to the current. Before the dive, we were briefed on how we are to remain safe during our descent. The current was very strong when you got too far from the rocks so we had to make a hurried descent. Once we were under water I rarely noticed the current. We dove down a wall and saw many eels and corals. There was one point where the current pushed me towards the rock and I had to swim away because I saw the spines of a Scorpion fish camouflaged in the rock. I was a bit scared because Scorpion fish are very venomous but I got some good pictures then swam away, keeping my distance.

The next step towards my research is to begin choosing which organisms to research based on what I saw. I will do this by looking over my photography and choosing the best examples that show I used my prior research to conduct it. I will then find out what this organism is and some basic information to include in my iBook. I have also received a reply from the marine biologist I contacted named Heather Spence. She has answered my questions although the answers are not very detailed. I am sure that some of her ideas will help me later on when researching these creatures I have photographed.

Oct. 6/2014- Specifications

In order to begin working on my product I must first decide on how I will go about making the best product possible to achieve my goal. In order to do this I must create specifications that allow me to determine if my product successfully helped me achieve my goal or not. The questions below help me formulate the product/goal specifications:

- **What do I want my outcome to be?**

I would like to gain an understanding on how Marine Biologists document and conduct research on underwater life. I will do this by creating an iBook explaining techniques I have learnt and organisms I found underwater. There will be basic information to help gain a better understanding of these organisms and the biology behind them. It will be an interactive book

where people can learn the skills I had to learn to conduct my research. By the end of the project I should be able to use techniques such as photography, research and identification on underwater life and this should be apparent in my product, the iBook.

- **How will I demonstrate a "high quality" product?**

I want my product to be complete with colour pictures, basic information and the techniques I used to research it for each organism (photograph, research, identification). It will help the reader gain a better understanding of how I used these techniques to conduct research on underwater life. There must be a variety of organisms that each take different techniques to research and capture in photograph (eg. corals to fish). People will be able to learn about my diving experiences and all of the different things I saw and researched over my PPP. It is captivating and interesting to look at and read.

- **What is the difference between a successful outcome and an unsuccessful outcome?**

I will know that I have done my project well if I have a clear understanding of each of my techniques and they are covered substantially in my iBook. I must also have been able to apply my learning to document actual wildlife and include this in my iBook. I will know that it is unsuccessful if my iBook is unclear and there is not many forms of underwater life documented, researched and displayed inside. Most importantly, the iBook must show that I have achieved my goal of learning how to research underwater life.

- **What specific vocabulary needs to be included?**

Since my topic is marine biology the vocabulary needs to be scientific yet understandable to a variety of readers and audiences. I must discuss the animals using specific scientific vocabulary as long as I understand what I have written. There should be scientific classification in *latin* route words. Since my target audience is peers my age, it must still be comprehensible and fluent to read.

- **How do these specifications allow me to test and evaluate my product within my chosen global context?**

Using the criterion for product table (see next extract), I will be able to test my product to find out how well I created it according to my specifications. I will be able to evaluate my product according to my global context. Whether or not I have achieved my goal will be based on my own personal learning, reflection and presentation of the documentations and research. If I have successfully filled an interactive iBook with my own underwater photographs, my own research and my own interpretations of the animals, I will know that I have completed my goal. Also, I must be sure that I have achieved my "Achievements to reach goal" seen in the Oct.16/2014 extract. If I have successfully completed each of these, I will be able to say that I have a successful product that shows that I have achieved y goal through the outcome.

Oct. 16/2014- Achievements to Reach Goal

By the end of my project I need to know if I have truly used my outcome to achieve my goal. In order to test this, I have come up the a few bullet point of achievements to reach my goal. The following achievements are signs that I have effectively done everything I wanted to in the time I was given for my PPP.

- I have an iBook following all of the points discussed in the Criteria for Product.*
- I have successfully done dives in which I use photography skills and techniques to document underwater life.*
- I have conducted substantial research about each of my research questions for each individual creature.*
- I have produced my product/ outcome with the Global Context, Scientific and Technical Innovation clearly and concisely.*
- I have learnt something from my product that will stay with me for many years to come.*

Oct. 26/2014- Product Planning

Timeline Planner- Product	
<u>Week</u>	<u>What do I want to do in this time?</u>
12-13	- Begin making iBook (first chapter explaining techniques), use research
14-15	- Choose photos from Phuket and begin research on specific organisms
16-17	- add research to iBook
Winter Break	- document in the philippines - do research on organisms - add to iBook
18	- Finishing touches on iBook

• Is my plan logical and feasible?

In order to complete my product in 9 weeks, I came up with the plan above and I think my plan is logical and feasible. Logical meaning that it makes sense to the project and feasible meaning that it is possible to do the work in the given time period. I have given enough time for each step of the process to take place and I have left a week at the end to finish off my iBook. It has also left time for me to work on my process journal and report during this time as well.

• Which research did I use to create my plan and why?

The research I used to create my plan was finding out how much time I had to finish my product, when I would be able to conduct my underwater documentation (vacation times) and what information I would need in each chapter of my iBook (eg. what information needed for technique or organism). With these specific pieces of information, I was able to delegate time for each of the mini goals I had set.

• Does my plan allow me to meet my evaluation criteria?

I believe that 9 weeks is enough time for me to complete my 3 chapter (approx. 30 page) iBook. I will be able to conduct all related research and documentation in order to make my iBook informative and aesthetically pleasing in that time. As long as I stay with my plan and manage my time and self well I believe it will be plenty of time to create a product that helps me achieve my desired outcome and goal.

• How does this plan allow me to develop my understanding of my Global Context?

This plan allows me to look further into the global context of Scientific and Technical Innovation because I will be researching “the natural world and its laws” when I am looking into the information on each organism and I will be taking part in “the interaction between people and the natural world” when I am SCUBA diving and documenting the underwater life.

Oct. 29/2014- PPP Day

During PPP day today we did many courses to help us with our project. First of all we shared with three people from our group. I shared with two classmates, Ji Beom and Bruce. They gave me some good feedback on my project. They think that maybe I should focus more on one type of underwater life in order to make my topic more specific. They were also not sure if I should include my techniques for researching underwater life and my actual example of underwater life in my iBook. This is very good constructive criticism because I now have to reflect and decide which of my ideas will help me best show how I have achieved my goal. I think it is a good idea to refine my product and do a more detailed and complete iBook based on

just the examples after I have used the research techniques. This will create a product that is stronger and demonstrates my goal and outcome more.

Next we had a course on searching and how to use search engines to gain information related to your research question. This course was with Ms. Emily Johnson. We looked at different search engines such as DuckDuckGo, Google, Bing, Yahoo, etc. Then we learnt how using certain key words can narrow down your search and give you more specific data. This course was specifically helpful to me because my entire project is based on research and reliable sources on the internet. I think that this was a very helpful session because now I am stinger at refining my search terms and getting more precise results.

After that we had a class with Ms. Helen Zhang and Mr. Andrew Messom to look at a standardization sample of the PPP. Together we graded this PPP and looked at the criteria for Investigating, Planning, Taking Action and Reflecting. This course cleared up a lot of my questions concerning how we will be graded and what the IB graders would like to see throughout our project's process. We talked about how the process journal and product are there to help support our report and they should be referred to and elaborated on throughout the 3,500 word report. I think that this will help me formulate my ideas more throughout this process now that I know how my entire process will be recorded and graded. After this course I am beginning to feel the pressure of the PPP. There are many things the need to be included in order to **communicate** everything to the moderators. The report needs to be straight to the point and easy to read. The essential information needs to be found in the correct places in order for the moderators to find it and grade it. In order to submit the best possible report, process journal and product, I will continue to send these to a variety of different mentors and supervisors to get different and fresh ideas and eyes to look at them.

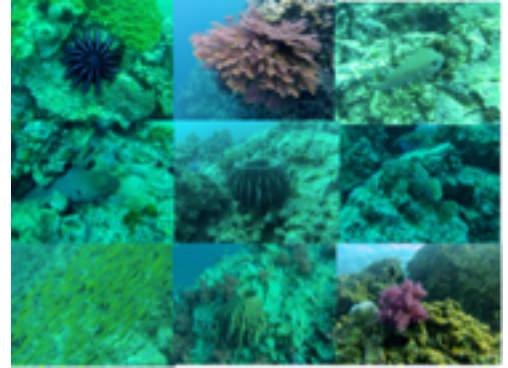
Later we had a course on APA referencing with Mrs. Michelle Rinker in the library. We found out where to go to find helpful guides on using APA. Also she explained to us what the IB moderators are looking for and how we can achieve this. She also explained a quick review on how to site APA format and why it is important. I was feeling unsure about my siting skills and now I am prepared to site my research in full APA.

After today, I am very confident on what to do next. over the next 6 weeks I will be working on my product. I need to begin by taking the research I made at the beginning concerning the techniques of underwater research and begin to add it to my iBook. Then I need to start researching some of my chosen organisms from the Phuket dives. This information will go in my iBook after the techniques.

Nov. 16 /2014 -Beginning Work on iBook

I have begun working on my iBook and I have decided to change a certain key part of it. I originally had planned to do an entire first chapter on the actual techniques I used such as photograph, safety, SCUBA diving and online research. I have now decided to cut out this chapter and just have my documented wild life. I talked to my supervisor and he said that it is up to me how I portray my information. I am very excited to do this and I will also learn more about iBooks Author. I have even begun to learn about widgets and I have done some research on using iBooks Author. It will be challenging to learn all of the different ways to create hyperlinks, galleries and more.

I have also chosen the photos and organisms that I am going to use from my first dives in Phuket, Thailand. I have found out the names of each organism (identification) and I will begin my research soon. I am very excited to learn more about each animal. It took me a very long time to choose these nine photos and I am still not completely sure if these are the exact organisms I will use.



Some of the photos are quite nice but other are lacking colour and they are not how I remember seeing the animals in person. I think this is because of something called “shooting through too much water”. This is where I tried to take the photos too deep or from too far away and most of the colours are gone. It is a shame but I have done some more research and for my next diving trip I have purchased a yellow GoPro filter and a red GoPro filter. This will help put the colour back in the photographs. Many marine biologists use these or then enhance the photos after on the computer. I have cropped some of the photos and I have changed some of the saturations to add more colour to the photos I already have. I have overcome a challenge and found a solution to the problem. However, I am sure that none of the photos will look absolutely professional but since I am using a small GoPro and no lighting, I am sure that is understandable.

Dec. 11/2014- Meeting with Supervisor to Share Draft of Product

Today was the last day I could meet with my supervisor before the break. I wanted to show him what I have worked on so far in my product. I have a page of my iBook on Crown of Thorns Starfish. I have the basic information and some further research on the impacts on the environment and fun facts. The impacts on the environment relate to my global context of Scientific and Technical Innovation. I am very proud of my first page and I am excited to continue. I spent three hours just researching this creature because I kept finding out new things. This is when I truly loved the PPP because it allowed me to learn things that interest me and that I am passionate about.

Crown of Thorns Starfish
(*Acanthaster planci*)

Basic Information:
Classification:
 Kingdom: Animalia
 Phylum: Echinodermata
 Class: Asterozoa
 Order: Irotherida
 Family: Acanthasteridae
 Genus: Acanthaster
 Species: *Acanthaster planci*
Size:
 ADULT: 20-40 cm
Locations:
 Tropical Pacific and Indian

How do Crown of Thorns Starfish affect their environment? What have humans done to prevent this?
 These seemingly innocent starfish are the cause of many coral reef deaths all over the world. Crown of Thorns Starfish are voracious predators that feed on the live coral polyps. They place their stomachs over the coral and use enzymes to digest their food. An adult Crown of Thorns starfish can consume up to 6 square meters of coral each year. When the populations become too much, large dead zones may occur. For example Australia's Great Barrier Reef is suffering from overpopulation of Crown of Thorns starfish.

Humans have become a big part of population control. Divers remove and kill, using sodium hypochlorite, large quantities of these starfish to preserve the biodiversity of the corals. However in many reefs all over the world Crown of Thorns starfish are already too overpopulated in order to remove.

Source:
 Wikipedia: Crown of Thorns Starfish, n.d.
 Crown of Thorns Starfish, 2015.

While discussing with my supervisor, he suggested that I try to refine my research about each organism by deciding on a specific question for each one. This would help my information be more detailed and substantial because I would have a specific main idea to discuss with each creature. I loved this idea because it will allow me to go deeper with my research rather than just finding the basic facts. I am very excited to continue my documentation on underwater



animals. Over the break coming up I will be going to the Philippines to dive and observe underwater life. There I will be taking the rest of my pictures for my iBook.

Dec. 28/2014- Philippines Diving

I just got back from my vacation in the Philippines. It was beautiful and I got to scuba dive almost everyday. During this time, I documented many underwater creatures using a GoPro. The quality of the images was okay but not great. The deeper you go while scuba diving, the more colour and light is dissolved by the water. Some of the photos are very blue and the colours are dull. I tried to use underwater filters but without the proper lighting system it did not work. The photos appeared yellow and red due to the filter.



However, I made the best out of the situation and I have a great time passively interacting with the natural world. I also got to meet many other divers and dive instructors that do underwater photography. They had a lot of the same interests as me: photography, animals, diving and even marine biology.

My dive instructor, Tim, offered to help with my project if I needed. He does underwater photography and he may be able to help me with identifying some of the organisms. I found him on Facebook and I will be emailing him if I have any more questions.



Dive Sites:

Siquijor Dive Sites- Tubod Sanctuary

Tubod Sanctuary was just off the beach of our resort. I snorkelled and went diving here. It is a beautiful site with many hard and soft corals. Since it is a sanctuary, it is protected and conserved in order to maintain the habitats from the marine life. While I was diving and snorkelling here I got many beautiful photos and some are included in my iBook.

Mait

Mait was another beautiful dive site. I got to see many anemone fish up close and I got to try different angles when taking my photos. There were some absolutely amazing heads of corals but some of the most interesting things we saw were in the sandy slopes. We saw animals there, buried under the sand and ones that camouflaged themselves such as the Robust Ghost Pipefish. Unfortunately, this is the site where I tried using the GoPro filters. Many of the photos ended up looking like this one so I decided not to include them in my product.

Oslob

Here was the site we saw the whale sharks. Unfortunately the day we went the water was very rough and the visibility was low. We ended up staying on the surface with our scuba gear and just snorkelling. The whale sharks were beautiful yet I was a little sad that the people were feeding them. I have decided to do a question concerning human impact on the whale sharks for my iBook.

Tubod Point

Tubod Point was just a short boat ride away from our hotel. We went diving here with our dive master, Jun Jun. We saw many amazing creatures but the highlight was seeing a Blue Ribbon Eel for the first time. It was very cool and I was so excited. I will definitely be including this eel in my iBook. The dive was absolutely beautiful and the visibility was very clear.

Paliton Wall

This was my favourite dive site of the entire trip. I was a bit nervous at the beginning because it was my first wall dive and I was a bit scared about being at the “drop off”. It was stunning though and I ended up being extremely proud that I did it. I saw one of the most amazing fish there as well. It was a Giant Frogfish. It was so exquisite because I had just been looking through a book and I saw it and said “I would love to see one of those”. The dive was amazing and I can’t wait to go back and do it again.

Dauin Dive Sites-

Dauin North

This was the first dive I did with a new instructor, Tim. He was very kind. We did a beach entry and the village children were all playing in the water around us. It was a beautiful little dive with a very strong current. My highlights were near the end when we saw a turtle and a small Remora. It was trying to attach onto our legs and fins. It was very cute. Unfortunately, the GoPro's battery had run out and we were unable to take a photo.

Apo Island Dive Sites-

Chapel

This was the first dive site out of three we did on our day trip to Apo Island. This was a beautiful dive in which we saw huge heads of corals and soft corals. There was many schools of fish and it was very colourful. We saw a group of Garden Eels poking out of the sand and they were very cool. We also saw a Banded Sea Snake.

Katipanan

At this second site, we saw many Nudibranchs. These are slug-like creatures that display amazing colours. I loved capturing photos of them throughout the trip and I will definitely include them in my iBook. I also started looking for smaller things. Inside one of the Feather Sea Stars I found a small zebra- striped shrimp called a Crinidae Shrimp.

Largahan

This was our final site of the trip. The name Largahan means “tiny bubbles”. This is because there is volcanic activity under the sand that causes small bubbles to escape with hot air inside them. Here we saw a school of reef squid. The visibility wasn’t great however once we were on the bottom we could see everything we needed to see. It was beautiful and a very enjoyable final dive.

Mar. 1- Post-PPP Reflection

Today I finished my PPP project (apart from the exhibition). I am so proud of myself and how hard I have worked throughout the process. Looking back at the time spent writing my report, reflecting in my process journal, meeting with my supervisor, taking underwater photos, editing photos and forming my product, I am happy that I chose this idea. I will remember the PPP for a very long time and I will have my product to always remind me. I have read through my report and process journal and cannot help but feel relieved yet still a bit sad. I have finished the project that marks the end of MYP. Through this project, I will be leaving MYP and entering DP next year. I can only imagine how much the writing of the report will have taught me when I come to writing my Extended Essay and even further on in the future when I write papers in university. This has definitely been a learning experience and although it was stressful at times and extremely challenging, I got to focus on my passions. The next step is to display my finished project with the NIS community at the PPP Exhibition on March 9-10. I cannot wait to share what I have learnt with everyone around me.