

# SCIENCE WEEK FOR KIDS ON GUANA

*prepared by Lianna Jarecki*

## **Guana Island**

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## 1. Introduction

Kids Science Week on Guana joined Marine Science Month for the first time in 2010, and it was a fabulous success. Jarecki family children aged 5 to 12 and three promising youths from Tortola studied Guana's fascinating marine environment with Guana's marine biologists from July 27<sup>th</sup> – 31<sup>st</sup>, 2010. The busy five-day week was full of field work, exploration and fun. Learning was field-oriented and hands-on, using specially prepared in-water field guides (Section 4).

The children gained confidence in the water, confidence in handling animals, and confidence in “doing” science (see Photo Diary, Section 2). They were consistently enthusiastic, focused and cooperative. Science Week was intensive learning in action, which will positively influence the children's future development of scientific reasoning.

The science week participants were organized by age into two camps with different but complementary programs. The “Baby dolphins” included four children aged 5 to 8, and the “Porpoises” included ten children aged 10 to 12. Three of the “Porpoises” were selected from Tortola's schools on the basis of academic merit by the BVI's Ministry of Education in cooperation with Tortola's Youth Empowerment Program.

The Porpoises group conducted an ecological study on shell size preference by soldier crabs and the availability of desirable shell sizes in the environment. This exercise was designed to take the participants through the various stages of scientific experimentation, including hypothesis testing and data analysis. Through demonstration, discussion, and hands-on activities, participants learned and used techniques for sampling populations; they made and recorded measurements; they

conducted a timed experiment with replicates and controls; they recorded observations; they analyzed data; they reported results; and, at the end of the week, they gave a formal presentation of their research findings (Section 5).

The week's highlights included the soldier crab shell-switching experiments, the marine life treasure hunt, diagnosing coral diseases, catching plankton in the salt pond, visiting the fish parasite ladies sorting their catch at the dock, night snorkeling, swimming with tarpons, and the evening of kids' presentations. The full schedule of Science Week 2010 activities is shown in Section 3, after the photo diary (Section 2).

The program was organized by Lianna Jarecki and Linda Forrester, and it consisted of presentations, field activities and a group research project. All seven of the research scientists on island shared their research and scientific approaches with the children. Scientists Dr Graham Forrester and Dr. Erinn Muller organized special lessons and field excursions relating to their individual research interests. Parents, Ellen Chandler, Divonne Holmes a Court, John Jarecki and Mercy Gelito supervised and helped teach the children, all the while lending great enthusiasm and energy to the Kids Week activities. Alexander Jarecki , Katherine Forrester, and Fiona Forrester worked as teenage assistants

## 2. Photo Diary of Kids Week Activities



Kids science week 2010 participants: (back row standing) Oliver Jarecki, Symarj Bobb, Tyler Jarecki, Alexander Jarecki, Katherine Forrester, Fiona Forrester, James Chandler; (middle row,

sitting on back of couch) N'Khoy Stoutt, Amber Jarecki-Meyers, Elsa Holmes a Court, Mackenzie Jarecki, (front row sitting) Paul Oliver, Emily Chandler, Madison Holmes a Court, George Holmes a Court, Robert Holmes a Court.



Program design and coordination: Lianna (at left with Oliver looking askance at a terrified brittle star) and Linda (at right discussing data analysis and presentation with the kids in Grenada living room).



Parent supervisors Divonne Holmes a Court, Ellen Chandler, Mercy Gelito, and John Jarecki (middle). Chaperone for Tortola participants, Nick Roberts (left)





Our teenage assistants: Katherine, Alexander (left photo), and Fiona (right photo).



Discovering intertidal invertebrates at North Beach (Symarj, Paul, George and Madi, left); Amber checks off the findings as Mercy holds the marine life treasure hunt guide (right).



The marine life treasure hunt: Sea Pearls, Lettuce Slugs, Reef Urchins and many more treasures!





An off-island adventure for the Baby Dolphins to Bluff Bay, Beef Island: Mackenzie, Madison, Amber, and Elsa (from left to right in left photo). Lianna showing Elsa and Madi how to find Sand Dollars and Sea Biscuits (right).



When in doubt, climb on Lianna (left)! Mackenzie with a Sea Biscuit (middle); collecting sponges, urchin tests, shells and other material for the Baby Dolphins poster presentations (right).



Lunch at the beach (left). Elsa prepares her poster presentation on Echinoderms (right).



Using a stereoscope to study the external anatomy of various marine invertebrates (N'Khoy left, James right).



Robert looks and explains his observations.





Searching for plankton in the salt pond (from left to right: Linda, Robert, Symarj , Lianna, Oliver, and John). George with plankton net (right).



Sorting the catch (Mackenzie, Linda and Amber, left; Oliver, Tyler and Lianna, middle). Juvenile crabs and aquatic insects caught from the pond (left).



Virgin Islands Television interviews Lianna at the Sugar Mill after our walk through the pond (left); Reef fish with external parasites caught by the scientists in White Bay (right).



Graham talks to the kids at the beach before jumping in to see the coral restoration project at White Bay (left). N'Khoy and Symarj (right).



Ready for the water! Emily (left); Oliver (middle); Elsa, Linda and Madi (right).



Snorkeling at Muskmelon. Photographed during our snorkel: spotted moray (middle); squid (right).





Mackenzie uses calipers to measure the diameter of whelk shell (left) and demonstrates how to safely handle a soldier crab (right; by holding down its large claw) in preparation for the soldier crab shell-switching experiment.



N'Kхой and Tyler tracking the soldier crab shell switching experiments. James with a soldier crab (right).



Enjoying a bit of leisure time in Guana's library: N'Kхой, George and Paul (clockwise from left in first photo); James and Symarj (second photo).



Field trip to Little Camano.



Snorkeling at Little Camano on our final day.



### 3. Kids Week Schedule of Activities

Porpoises (10 - 12 years)				
Tuesday	Wednesday	Thursday	Friday	Saturday
<b>Arrival</b>	Breakfast (come with bathing suits on)	Breakfast (come ready to snorkel)	Breakfast	Sleep In ( :)
	Collect Soldier Crabs at the laundry	Walk to White Bay	Walk to salt pond	Breakfast
	White Bay Safety and skills review	Snorkel Crab Cove/ Coral Health Survey	Study salt pond life	Baby Dolphins present projects
	View Elkhorn Restoration project		Walk to North Beach	Field trip to Little Camanoe
	Marine Life Treasure Hunt White Bay	Return and walk to garden	Snorkel the Atlantic side	
	Leave beach and clean up	Visit with Liao in the orchard	Leave beach and clean up	
	Using field guides	Free time at the beach	Free time	
	Beach Lunch Learn about calipers	Lunch	Beach Lunch	
	Ride to North Beach	Discuss Experiment	Leave beach, convene at Grenada patio	<b>Departure</b>
	Transect study of whelk populations (low tide at 14:38)	Soldier crab population study: measuring shell vs. claw size	Soldier crab study: Shell preference experiments --- AND --- Microscope techniques @ Poolside Grenada	
Go to White Bay	Free time			
White Bay Snorkel Safety and skills review	Go to White Bay	Free time	Clean up for dinner	
Leave beach, shower	Snorkel parasite study	Dinner	Pool Party and Dinner at Grenada	
Dinner	Leave beach, shower	Night Snorkel	Porpoises present projects using Powerpoint	
Presentation 1	Presentation 2			
	Beach Barbeque Dinner (at 7:30pm)			

Baby Dolphins (5 - 8 years)							
	Tuesday	Wednesday	Thursday	Friday	Saturday		
8:00		Breakfast (come ready to snorkel)	Breakfast (come ready to snorkel)	Breakfast	Sleep In (:		
8:30					Breakfast		
9:00	Arrival	Walk to White Bay	Walk to White Bay	Walk to salt pond	Baby Dolphins present projects  Field trip to Little Cannoe		
9:30		White Bay Safety and skills review	Snorkel / Explore Crab Cove	Study salt pond life			
10:00		Elkhorn restoration					
10:30		Collect echinoderm shells at Beef Island	Return and walk to garden	Free time			
11:00			Visit with Liao in the orchard				
11:30		Leave beach and clean up for lunch	Free time at the beach				
12:00							
12:30							
13:00		Beach Lunch	Lunch	Beach Lunch		Lunch	Lunch
13:30							
14:00	Ride to North Beach	Echinoderm anatomy	Leave beach, convene at dining area	Finish poster presentations	Departure		
14:30	Marine treasure hunt	Start work on poster presentations	Echinoderm classification				
15:00		Soldier crab study: measure empty shells with calipers	Work on poster presentations				
15:30	Go to White Bay	Free time	Microscope techniques -- AND -- Watch soldier crab experiments @ Poolside Grenada				
16:00		Go to White Bay	Free time				
16:30	White Bay Snorkel	Go to White Bay	Fun in the pool after finishing projects				
17:00	Safety and skills review	Demonstration of fish parasite study	Free time	Clean up for dinner			
17:30	Leave beach, shower	Free time	Dinner	Pool Party and Dinner at Grenada			
18:00	Dinner						
18:30							
19:00	Presentation 1	Presentation 2 @ Club Living Room	Night Snorkel	Porpoises present projects using Powerpoint			
19:30							
20:00		Beach Barbeque Dinner (at 7:30pm)					



4. Field guides and in-water exercises  
designed and used for Kids Science Week 2010 on Guana.

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## Common Coral Diseases of the Caribbean

(prepared by Erinn Muller)

### White Pox Disease



Circular white areas  
surrounded by healthy tissue:  
found on elkhorn coral

### White Band Disease



White band that moves from base of  
colony to branch tips: found on elkhorn  
and staghorn

Image: elkhorn coral

### White Band Disease



White band that moves from  
base of colony to branch tips:  
found on elkhorn and staghorn

Image: staghorn coral

### Black Band Disease



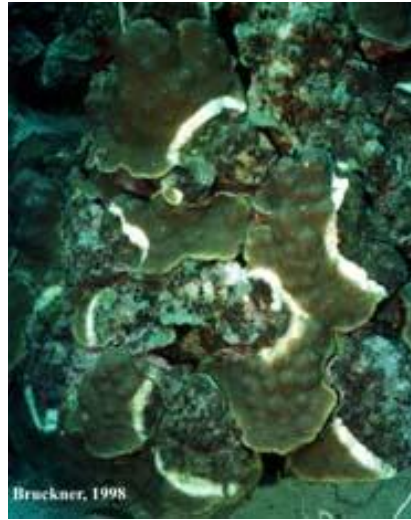
Black fuzzy band with white  
skeleton on one side and healthy  
tissue on the other: mostly found  
on shallow water brain corals

## White Plague



White patches of exposed coral skeleton: found on most coral species

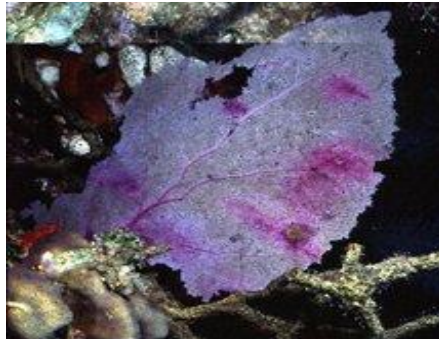
## Yellow Band Disease



Yellow band or blotches of bleached coral tissue: found on star corals



Dark purple spots: found on starlet coral

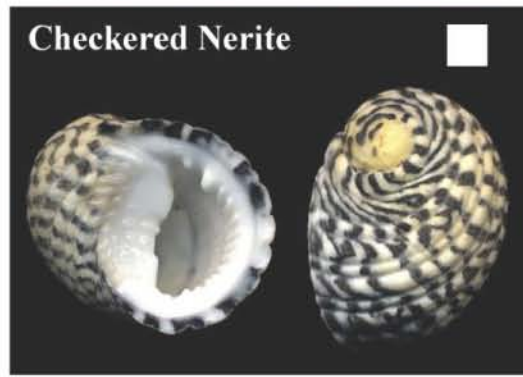
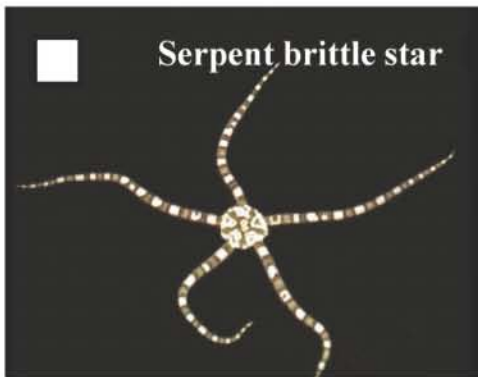
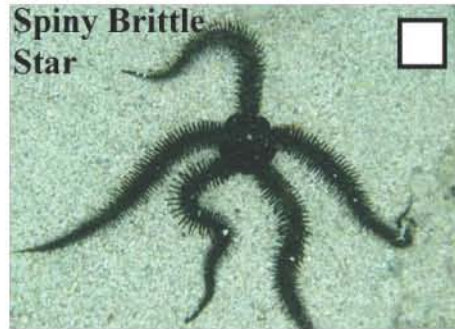


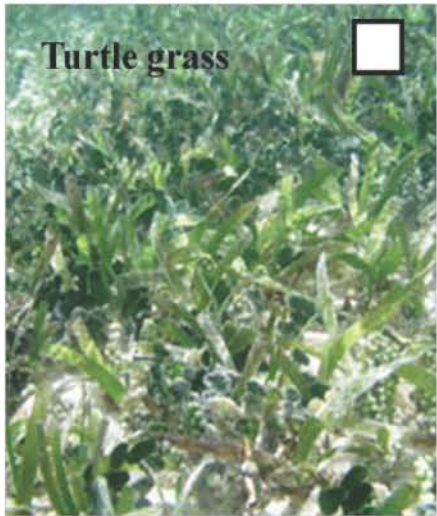
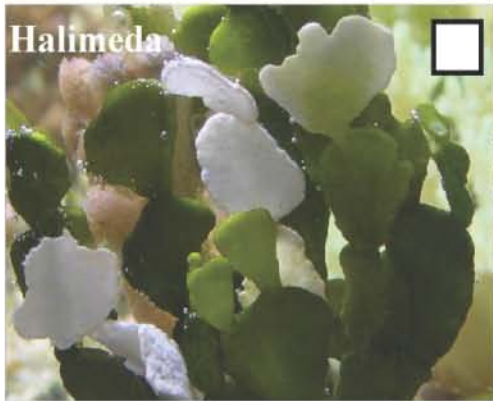
Dark purple spots with sometimes fuzzy areas on algae: found on sea fans



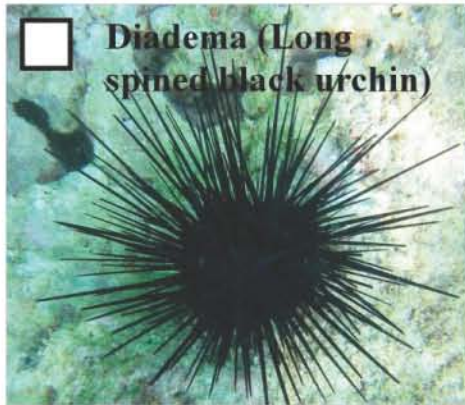
# Marine Treasure Hunt Guide and Checklist

(prepared by Lianna Jarecki)





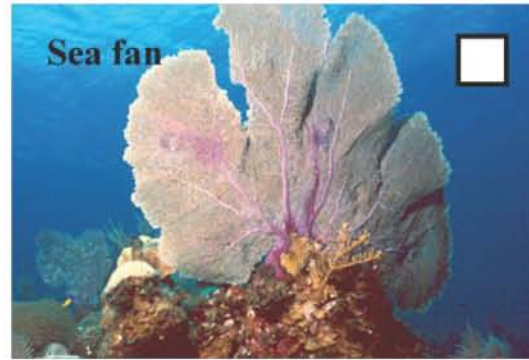




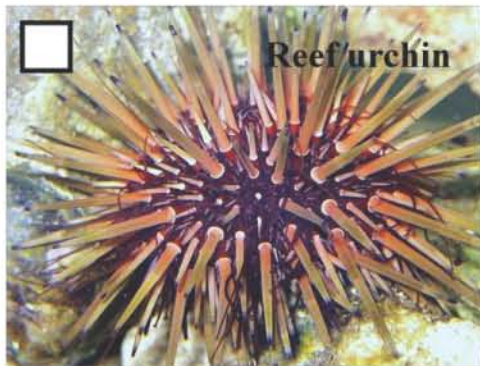
Diadema (Long spined black urchin)



Brittle Star



Sea fan



Reef urchin



Zoanthid



Gorgonian



Zoanthid



Tube worms

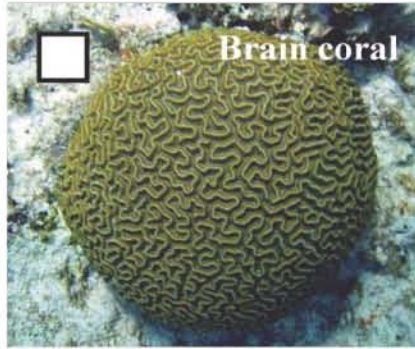


Turf algae

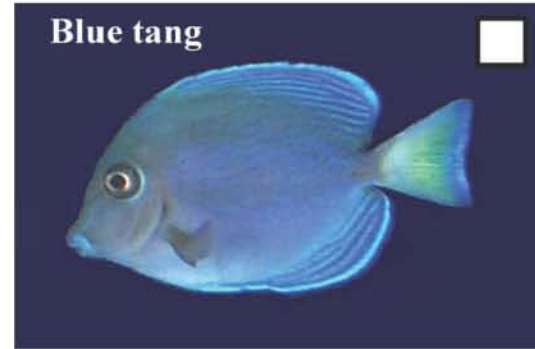




Elkhorn coral



Brain coral



Blue tang



Fire coral



Beehead Wras



Damsel fish



Finger coral



Stoplight Parrotfish ♀



Stoplight Parrotfish ♂



## 5. Participants' Final Presentation (Porpoise Group)

### Guana Island Science



#### YOUR HOME IS MY HOME

Whelks, Soldier crabs and the way they choose their homes.

#### INTRODUCTION

- Whelks are snails that live on the rocky shores of Guana.
- The whelks make shells that get bigger as the snails grow.
- They leave their shells behind when they die.
- Soldier Crabs then live in these empty shells for protection.
- The Soldier Crabs have to find bigger shells as they grow.
- We performed an experiment to answer this question:

*If soldier crabs are offered alternative sizes of whelk shells, will they change shells?*

#### METHODS

##### Expt. 1: Available Whelk Shell sizes in North Beach

We counted the size and amount of Whelk shells in a 40 meter transect.

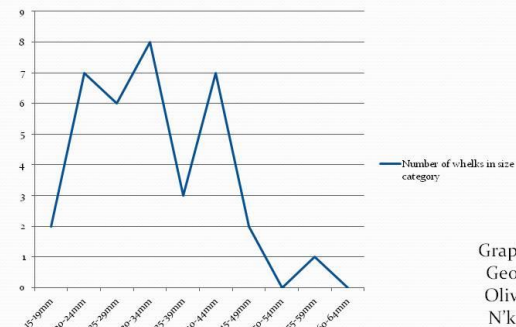
##### Expt. 2: Size of the crab shell vs. the size of the claw

We used calipers to measure the size of the shell and long side of the claw.

##### Expt. 3: Choose your Shell Experiment

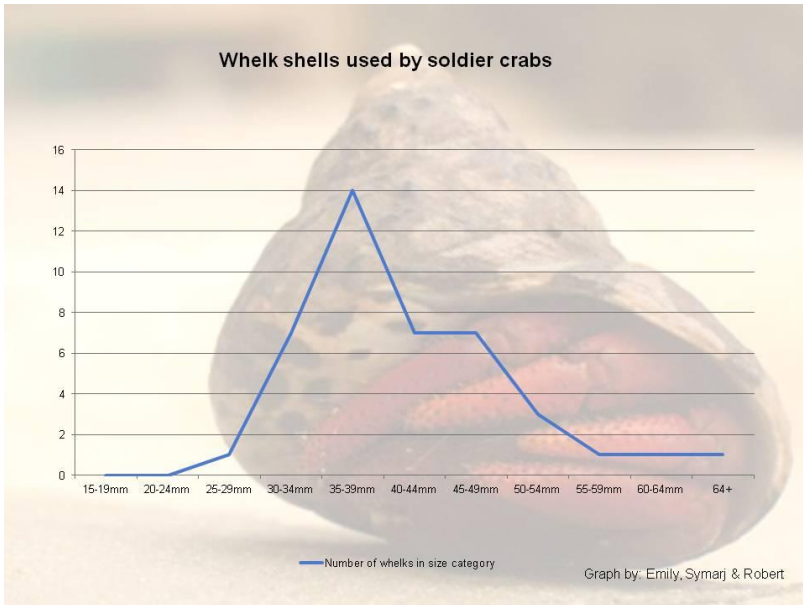
We gave the crabs two Whelk shells to choose from: one slightly bigger and one slightly smaller and then we observed.

### Whelk Sizes Found at North Beach



Note: only one whelk found bigger than 50mm.

Graph by:  
George,  
Oliver &  
N'khoy



## Conclusion

- From the first experiment, we learned the sizes of the whelks at North Beach to find out the possible sizes of shells to be available to soldier crabs.
- From the second experiment, we learned the size of the soldier crab's large claw as compared to its shell. We also compared the sizes of shells to see if the soldier crab shells were too big or too small for their shells.
- From the third experiment, we learned that most soldier crabs would like a bigger shell and will switch into a larger shell if given an opportunity.
  - 14 of 16 soldier crabs changed shells.
  - Every soldier crab that changed shells, moved to a larger shell.

