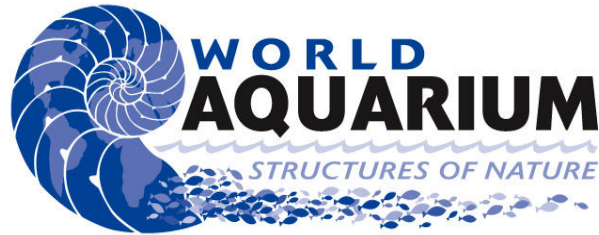


December, 2009

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@ City Museum
701 North 15th Street, 2nd Floor
St. Louis, MO 63103 USA
(314) 647-9594 Info. Hotline
(314) 647-6011 Administration
(314) 647-7874 Fax

Dear Educator,

We are excited to announce the 2010 aquatic and marine science program for high school students in the St. Louis Metropolitan Area. We are especially looking for the best ambassador representatives of your school that are high achievers in math and science who have an interest in what lives around and under the water and are currently sophomores or juniors.

Mrs. Sandra Murdock, chairperson of our Education Committee will be distributing applications which are required to be filled out along with high school transcripts, recommendations letters, and a cover letter from the student explaining why they would like to participate in this academy. We are also hoping that some students will do advanced efforts and develop an independent research project during the session which may be continued over the summer. We also expect each participant to do 40 hours of community service at the World Aquarium.

The six session course will take place at the World Aquarium, one Saturday each month, starting January with 2 sessions in May. In July 2010, the successful students will be able to travel to a marine biology field station in Florida to apply firsthand what they learned in our laboratories and also test new theories and meet with other marine and aquatic sciences professionals.

All expenses will be paid for each student's tuition, food and travel expenses. Applications must be postmarked no later than December 18, 2009 and selected students will be notified by January 5, 2010.

Objectives:

1. To motivate and encourage disadvantaged youth to seek careers in marine and aquatic sciences;
2. To provide a broad applied perspective on aquatic and marine sciences;
3. To give students exposure to scientific organization in marine and aquatic sciences;
4. To allow students to meet with leaders in aquatic and marine sciences;
5. To build new leaders in our community for student participants; and
6. To allow students to learn the scientific method and apply their learning to practices.

World Aquarium Aquatic and Marine Biology Institute

Proposed outline and curriculum

At the World Aquarium

Winter/ Spring 2010 – sessions meet on Saturdays in the 4th Floor Aquarium Classroom—9:30 AM – 3:30 PM – with team building activities.

Marine Biology Academy Proposed outline and curriculum

St. Louis World Aquarium

Winter/ Spring 2010

Text

Marine Biology

Peter Castro and Michael E. Huber

(Provided by instructor)

Day 1

Objectives: Students will learn to use the aquarium facilities
Explore using the scientific method
Develop scientific writing skills.

Aquarium Activity: Icebreaker/Aquarium Scavenger hunt and facilities tour
Introductions of Aquarium personnel, Overview of course rules and regulations (parent dismissal)

Lecture #1 Scientific method and marine biology topic overview (how to take notes)

Reading: (Bath tub toys article) pair reading using summary sheet

Discussion #1 Share paired reading

Investigation: Exploring Currents by Plotting Buoy Data Article summary. Using the summary format developed for the course.

Lecture #2 Geology of the ocean including: benthos, pelagic, intertidal zone, estuary, current, tides etc.

Homework: Free choice 4 articles to read and summarize for next class summarized with the summary format used in class. These papers will correlate with the activities we will do on the field portion of the course at Florida State University.

Day 2

Objectives: Students will attain skills to aid in writing a scientific research paper.
Students will write a lab report
Students will begin writing a background research paper

Aquarium Activity/ Icebreaker: TBA

Discussion #2: students report summaries of 4 free choice articles.

Lecture #3: How to write a cited research paper.

Activity: Writing a research paper (students will begin writing their paper)

Lecture #4: Marine Chemistry and how to write up a lab report

Lab #1 Chemistry of the ocean

Use water from the aquarium to find salinity, and explore the nitrogen cycle

Lab write-up: Marine chemistry lab

Homework: Complete writing the research paper and complete the lab report

Day 3

Objective: Students will use aquarium facilities to learn about primary production in the ocean.

Turn in lab report and background paper. If you turn in your papers you will become eligible to attend the field experience in Florida. Your class participation still has a great bearing on the field experience selection.

Review: Chemistry of the ocean and anything missed from Day 2

Lecture #4 Light and physics of light

Lecture #5 Marine Algae and diatoms

Aquarium Activity: Examine diatoms from the tanks of the aquarium and other premade microscope slides.

Lecture #6: Marine Plants

Lecture #7 Primary Production and the base of the food web

Lecture #8: Introduction to various marine ecosystems: Estuary, intertidal, Coral Reef, Open ocean, deep sea vents, and freshwater environments.

Discussion of field trip, location and objectives

Reading assignment: TBA

Day 4

Objective: Students will use aquarium facilities to learn about marine invertebrates.

Review: Physical oceanography and plants

Lab #2 Feeding reactions of the *condylactis* sea anemone

Aquarium Library Study: Pairs of students will use the aquarium library in a guided investigation of marine invertebrate classes

Class presentation: Small groups will present invertebrate findings to the class (5 min reports)

Aquarium activity: Students will be guided around the Aquarium to observe the invertebrates.

Lab #3 Construct a taxonomic key to gastropods and bivalves of the northern Gulf of Mexico

Lab #4 Oyster Lab

Lecture # 9 Wrap up tie up and add any needed information about marine invertebrates

Lecture #10: Man's impact on the ocean (could also be a video)

Reading assignment: TBA

Day 5:

Objective: Students will use aquarium facilities to learn about fish and their adaptations for survival.

Review: Physical oceanography, plants and invertebrates.

Lecture #11: Fish anatomy

Aquarium Activity: Inquiry lab involving structure and function of fishes in the aquarium.

Lab #5: Fish Dissection

Aquarium Activity: Investigating Sharks: Key to sharks and shark behavior

***Swim activity:** Likely to take place this day

Reading assignment: TBA

Day 6:

Objective: Students will use aquarium facilities to learn about marine mammals, birds and reptiles.

Review: Physical oceanography, plants, invertebrates and fish.

Lecture # 12: Marine mammals

Aquarium Activity: Observation and behavior of river otters

Lecture #13: Marine Birds

Activity: Bird identification

Lecture #14: Marine Reptiles

Lecture #15: Coast trip, packing list, and expectations (parental participation expected)
Activity: Sea turtle identification
Reading assignment: TBA

The above is a tentative outline of the course. It is subject to change.

*Students attending the field experience will have a portion of a class session at a local pool to learn basic snorkel skills. A minimal swimming proficiency is necessary to snorkel.

The “Aquarium Activities” above are activities designed to use the Aquarium specifically for the course and are not developed by the Aquarium to my knowledge. I would be happy to use activities already in print specific to the Aquarium if available and applicable.

In many cases underwater photos and video will be used from previous trips I have taken to help illustrate any of the lectures.

The “Aquarium Activities” above are activities designed to use the Aquarium specifically for the course. In many cases underwater photos and video will be used from previous trips to help illustrate any of the lectures.
We look forward to seeing your student applications!

Sincerely yours in conservation and education,

Leonard Sonnenschein, President
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