Bioathon hints for 2016

Note: The field identification will be outside and will be held rain or sunshine. Please make sure your students are prepared to go outdoors for up to an hour at any point during the day.

Note: We will provide non-latex gloves but students will come in contact with preserved organisms containing trace amounts of formalin and phenol. Also, the veins and/or arteries may be injected with latex. Please check with your students about possible allergies.

Field Identification

This activity will involve a search for some common organisms or their parts during a brief field trip. This search will require general knowledge of ecology including identification of common plants and animals and familiarity with their obvious external structures. Students may NOT use guide books, notes or any electronic devices while out in the field. You are encouraged to bring a watch so students will know when to return to the van (Cell phones will NOT be allowed while out in the field). Students should be prepared to go outside in all weather conditions.

Dissection

This activity will be the dissection of a preserved vertebrate animal with the identification of organs or structures required. Students will NOT have access to dissection guides and will have to base their identifications on memory from their high school dissection experience and on the relationships of unknown organs to those that are known. Dissection tools, safety goggles and gloves will be provided but participants should wear old clothing and/or bring a laboratory apron or coat. Anyone with long hair should tie it back prior to starting the dissection. Grading will be based primarily on the correctness of the identification but points will also be awarded for the quality of the dissection. Points may be deducted for failing to clean-up.
Medical Laboratory Sciences

Hint 1:
Know the difference between gram-positive and gram-negative bacteria stains.

Hint 2:
Be familiar with common food and waterborne parasites and bacteria.

Hint 3:
Understand how illnesses caused by these parasites and bacteria are spread and transmitted.

Hint 4:
Know commonly performed medical laboratory tests and specimens collected for:

- *Giardia lamblia*
- *Salmonella spp.*
- *Campylobacter jejuni*
- *Listeria monocytogenes*
- *Vibrio vulnificus*
- *Toxoplasma gondii*
- *Clostridium botulinum*

Hint 5:
Be familiar and understand how to perform a dipstick urinalysis, correct usage of a microscope, how to read and understand a complete blood count, and know what’s commonly found in a spinal tap/ CSF.
Molecular Biology and Genetics

Hint 1: Review the different mutations in the fruit flies from the following website:
http://www.exploratorium.edu/exhibits/mutant_flies/mutant_flies.html

Hint 2: What are the functions of different enzymes in the process of cloning
Examples of the enzymes are:
   1. Ligase
   2. Phosphatase
   3. Restriction enzymes

Hint 3:
a) Review the process of DNA gel-electrophoresis and different constituents that are necessary in the making of a gel.
b) What is the function of the loading buffer/dye?
c) How is size of the DNA determined based on the gel image?

Hint 4: Understand how to construct a restriction map.

Hint 5: What are restriction enzymes and how do they work. (sticky ends, blunt ends, palindrome sequences)