

Water Quality B - 2020

Test Breakdown and Recommendations

What Each Team Needs to Bring

- A **homemade** salinometer/hydrometer to test for the concentration of salt in a solution, between 1-10%
- Category C Eye protection for each individual, see sonic.org/eye-protection for details
- Writing utensils
- One 8.5" x 11" sheet of paper that may contain information on both sides. If in a sheet protector, the sheet protector must be sealed with tape.
- 2 non-graphing, non-programmable calculators

• *indicates a required item*

Test Breakdown

Prior to testing, 10 minutes will be used for instruction and to give the students a chance to calibrate their salinometer if they wish. 40 minutes will be given for the exam.

Part 1: Marine and Estuary Ecology *30% of total score (30/100 pts)*

- This portion will be multiple choice questions.
- Participants will be tested on their knowledge of recently killed coral, aquatic ecology, the water cycle, nutrient cycles, and aquatic food chains.
- Students may have to be able to interpret charts or graphs.

Part 2: Coral Reef Macroflora and Fauna Identification *30% of total score (30/100 pts)*

- Students will be shown images of a marine organism and be expected to label the organism with its common name, and which region its typically found in (global, indo-pacific, or Atlantic)
- Banded coral shrimp, Butterfly fish, Crown of thorns starfish, Fleshy algae, Hard coral, Lobster, Long-spined black sea urchins, Moray eel, Parrotfish, Pencil Urchin, Snapper, Sponge, Sweetlips, Triton, Barramundi Cod, Bumphead parrotfish, Giant clams, Humphead wrasse, Sea Cucumber, Flamingo Tongue Snail, Gorgonia, and Nassau Grouper are all organisms students are expected to know.
- Additional fill in the blank/multiple choice questions on general ecology of these.

Part 3: Water Monitoring and Analysis *30% of total score (30/100 pts)*

- This portion will consist primarily of matching. Students will have to match water qualities (turbidity, pH, fecal coliform, BOD, salinity, temperature, nitrates, dissolved oxygen, total solids, aragonite saturation, etc.) with the appropriate testing procedure.
- Additional questions regarding these water qualities will be asked as well.
- No physical tests will be performed by students during this portion.

Part 4: Salinometer Testing *10% of total score (10/100 pts)*

- Students must measure the salt concentration of a saline solution between 1- 10%
- Bringing a homemade salinometer to the event is worth 5% of the total score
- An accurate salinometer measurement ($\pm 1\%$) is worth 5% of the total score
- The salinometer must be able to operate within a 400mL-600mL beaker
 - o There will be at least 400mL of solution
- Calibration solutions of 0% and 10% will be available for students at the event
 - o These will be made with distilled water.
- Students **must** wear category C eye protection during this portion of the test.

Recommendations and Study tips:

- Study the online resources given by Science Olympiad
 - o <https://www.soinc.org/water-quality-b>
- Create flash cards of the macroflora and fauna with the image and corresponding name and region.
- Study the practice exam on the Science Olympiad website, some questions were adapted from this.
- Study the testing procedures used/various equipment used for measuring different water quality characteristics
- PRACTICE using your salinometer! Have someone make solutions with concentrations unknown to the team.