

# Water Quality

## Test Breakdown and Recommendations

### What Each Team Needs to Bring

- A salinometer/hydrometer to test for the concentration of salt in a solution, between 1-10%
- Eye protection for each individual
- One 8.5" x 11" sheet of paper that may contain information on both sides
- 2 stand-alone, non-programmable, non-graphing calculators

### Test Breakdown

#### Part 1: Freshwater Ecology (15 minutes)

- The test will consist of 7 multiple choice, 5 true or false, and 5 fill in the blank questions
- Participants will be tested on their knowledge of freshwater ecosystems, aquatic chemistry, and waste water treatment.

#### Part 2: Macroflora and Fauna Identification (15 minutes)

- Identification (common name) of **five** immature or adult macroinvertebrates by referencing a preserved specimen.
- Participants must label each macroinvertebrate by class (1-5) and feeding type (scraper, predator, shredder, collector).
- Identification (common name) of **five** aquatic nuisance plants or animals based on image only

#### Part 3: Water Monitoring and Analysis (15 minutes)

- Use of a homemade salinometer or hydrometer to determine the salt concentration of an unknown solution (1-10%)
- Must be able to test within  $\pm 1\%$  salt concentration for full credit
- Calibration solutions of 0% and 10% made with distilled water will be provided
- Points for salinity testing will account for 5% of the total score
- 4 multiple choice questions pertaining to freshwater chemical monitoring
- Two tiebreaker questions (not included in total score)

### Recommendations and Study tips:

- Review the 2019 training handouts on the Science Olympiad website
  - o <https://www.soinc.org/water-quality-b>
- Make flash cards of indicator species with pictures on one side and information on the other
- Use color coding to help emphasize key points
- Try building your salinometer/hydrometer using a pipet in place of a straw
- Calibrate your salinometer/hydrometer using solutions made with distilled water
- Test yourself using a timer to simulate the 15 minutes that will be given for each section