

Hydrogeology: *Water for the World* ***Trial Event***

DESCRIPTION: Students will manipulate a groundwater computer model, answer questions about groundwater concepts, and evaluate solutions, based on hydrogeological evidence, to reduce anthropogenic effects on groundwater.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 50 Minutes

EVENT PARAMETERS: The supervisor will supply answer sheets, testing resources, and modeling resources which will include access to The Groundwater Foundation's Hydrogeology Challenge online groundwater modeling tool. Students cannot bring notes, texts, or references; however they will be allowed to create notes during the competition. A list of possible concepts, the Contaminant Table, the Remediation Table, an example Remediation Techniques Table, and the Hydrogeology Challenge link can be found at www.groundwater.org/so.html. Supervisors and students should refer to the Event Guide available at www.groundwater.org/so.html for sample tests, event set-up recommendations and more.

THE COMPETITION: Students will be given 50 minutes to complete Parts 1 – 3. Students may create notes during the event. All notes must be handed in. Students will complete Parts 2 & 3 using a pre-selected scenario from the Groundwater Foundation's Hydrogeology Challenge.

1. Students take a written test on groundwater concepts and vocabulary.

- a. Students may utilize resources such as maps, charts, graphs, models, and scientific publications to answer questions. Resources to be provided by event supervisor.
- b. Questions can be multiple choice, true/false, fill in the blank, or short answer.
- c. **Possible concepts include:** hydrologic properties, specific yield, porosity and permeability, water table variations, aquifer recharge and discharge, transmissivity, aquifer storage, effects of groundwater withdrawals, characteristics of groundwater flow, and contaminants and the impact to a groundwater system. A complete list of concepts for regional, state, and national tournaments is available on the Hydrogeology event page at www.groundwater.org/so.html.

2. Students will use and manipulate a pre-selected scenario from the Hydrogeology Challenge under static pumping conditions to answer questions.

- a. Event supervisors will provide the event modeling scenario URL to students.
- b. Students must fully complete the given modeling scenario in static conditions and answer any questions. Questions can be multiple choice, true/false, fill in the blank, or short answer.
- c. Students will submit model results online.

3. Students will be given a set of circumstances for which they will: 1) evaluate the risk of contamination to wells in the pre-selected Hydrogeology Challenge scenario, and 2) complete a Remediation Techniques Table.

- a. The set of circumstances must include the following: non-static conditions (at least one well must be pumping water), a pollutant (from the Contaminant Table), and a pollution source to be located at one well. The set of circumstances may include well types, well uses, and/or any other relevant information.
- b. Students will manipulate the Hydrogeology Challenge scenario to determine which wells are at risk of contamination by the pollutant and how long until the contamination may occur.
- c. Students will fill out a Remediation Techniques Table (see example table at www.groundwater.org/so.html).
- d. Students will use their results from the Hydrogeology Challenge and Remediation Techniques Table to answer questions about the scenario. Questions can be multiple choice, true/false, fill in the blank, or short answer.

SCORING: Highest score wins. Part 1 = 25%, Part 2 = 25%, Part 3 = 50%. First tiebreaker: highest score on Part 3. Second tiebreaker: highest score on pre-selected questions from Part 1 and 2. Answers must include units where appropriate.

Recommended Resources: All reference and training resources including the groundwater modeling program and Event Guides for students, judges, and event supervisors are available at www.groundwater.org/so.html.

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Questions? Contact hydro@groundwater.org