

Operation Water Drop

Safe Drinking Water Foundation

Teaching Suggestions - from one teacher to another...

I have used this program for quite a few years now, and have tried a variety of methods in delivering the hands-on aspects of testing our own water. What follows are some of my observations and preferences based on my classroom facilities, my students and my time frame.

To put my preferences in perspective – I have a very large classroom that doubles as a lab. I have 30 large desks, along with 3 full-sized lab benches with 36 additional chairs on the side. I have access to 2 large sinks in my room, along with 8 computers. My students are taking Gr. 10 Science, and I use the OWD program in either the chemistry or the ecosystem/sustainability unit. I have also used this in my Gr. 12 Geology class, when discussing ground water and hydrogeology issues. My class size varies between the ideal of 25 students, to upwards of 35, and each class often has a great diversity of learning aptitudes and attitudes. I work in a semestered school, and see classes every day for a full 75 minute period – travel time is not included.

Initial Preparation:

Prior to using OWD, I download the test instructions and print them. I also explain the program a few days before, and have students volunteer to collect water samples from various areas. We get a diverse selection of well water and town water – as students come from different geographical and municipal areas. We simply label the various source regions, such as Hantsport well water, Wolfville town water, Gaspereau aquifer (raw) etc., rather than just urban/rural/raw/local.

Depending on how you organize your students' experimental work through the tests, you would make a copy of the test instructions for each group or just one copy for yourself to read to them. I also set up all of the tests on a section of a lab bench or a large trolley, with the materials required for each test. I have the desks arranged into 5 groups, one group per type of water ("urban, control, local, raw, rural"). Paper towel is available on each table – a piece to put the garbage on, another for wiping any spills. A container (~ 500 mL to 1 L in size) is on each table to collect the "waste water" of the tests. I also provide each group with a small basin of soapy water, so that as students complete each test, they can wash the containers, pipettes, test tubes etc. for future use in other science activities. Once washed, these are collected on paper towel during the testing, and then sorted into bins I have set up on the side of a lab bench (i.e. test tubes, pipettes, containers with tops, cups, etc.)

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Option One (most suitable if there is a very large class)

Students work through each test together as a class, in 5 groups. The teacher explains each test and the group applies it to their type of water. In this scenario, I have each group designate a “runner” – a person who comes up to get the supplies for the test; a recorder – to write the results on the analysis results summary sheet (provided online); a washer and “remover of labels” (for reusable apparatus); a timer; the tester, and waste manager 😊. These roles are rotated through the group members.

The teacher would identify the type of test and call for runners to get the materials. The teacher would then explain the test, and go through the additional information about the test – i.e. what is the chemical; potential health issues; occurrence, etc. The class can be walked through the process together. Once the test is completed, the process is repeated for the other tests. A debriefing discussion and assessment of the results for each sample should follow.

Option Two (Independent co-operative groups)

The teacher explains the process and procedures of the overall program, with instruction and info sheets available at every group. The tests can be set out beforehand per group, or the students can still assign a runner to get the materials as they finish each test. The students work through each test, recording their results, and clean up once finished. The students could prepare a debriefing discussion and assessment of their results for each test – and an overall discussion should follow.

Note: Some of the tests take longer than others, so if time is an issue, the tests can be done over 2 periods. I find that I can usually manage to get all the tests done in a 75 minute period (with each option approach) if I have the students work through several tests simultaneously. For example, the Arsenic test requires a 10 minute waiting period, as does the Heterotrophic Plate Count test. These are done early in the period, and some other quick tests (such as Colour, pH, Total Hardness, Copper Analysis, Residual Free Chlorine, Ammonia, Manganese, and Iron) can be done in the interim.

With prior preparation of

- reviewing the instructions and resources provided by SDWF and the OWD program
- setting up your materials and classroom
- informing students and collecting water samples
- this resource is very easy to use and offers a valuable, hands-on experience for your students! There are other suggestions for further research and a deeper exploration of water issues available on the SDWF website – OWD is just one step toward greater awareness of a precious resource.