

ENVIRONMENTAL EDUCATION catalog





Who We Are...

Hach Company – the leading manufacturer of reliable and accurate water testing instruments and equipment for over 50 years – was the first to make laboratory testing procedures easy to use, affordable, and available to everyone. Hach's portable kits and innovative ideas have always met the real needs of scientists and educators. That's why Hach kits have pre-measured reagents in handy powder pillows; rugged, chemical-resistant cases that carry samples and other liquids upright; step-by-step instructions in every kit; and superior scientific technology for more accurate results every time. The name, Hach, has been synonymous with water testing for decades. Come to think of it, most of today's water science professionals probably grew up using Hach test kits.

Welcome to Hach's Exciting Environmental Education Catalog!

Actually, this is more than a catalog. It's a companion resource for teachers and environmental advocates. You'll find that it's filled with pictures and detailed descriptions of our terrific environmental education products. It also provides lots of ideas and advice for learning and investigating.

Hach test kits are a great choice for young scientists learning about water science and soil testing, and for anyone involved in environmental monitoring. Each kit comes complete with *everything* you'll need to start testing – enclosed in a sturdy case that keeps all your reagents upright while you carry them. Although our kits are ideal for students of all ages, the results they provide are accurate and reliable enough to satisfy any scientist! Hach is the world leader in water science – and it shows in the quality of every test kit we sell.

We hope you'll agree that our catalog is intelligently organized, efficient and easy to use – just like our test kits! Keep it handy and refer to it often... and let us know how you like it!

Thanks!



Finding Your Way Around This Catalog is Easy

- **If you are looking for test kits for a specific application**, check the Table of Contents.
- **If you are looking for test kits for a specific parameter**, use the Quick-Find Index. It refers you to every page (and every kit) that covers each parameter.
- **If you have not decided what test you want to conduct**, turn to page 4, “What to Test.” You’ll find practical suggestions on how to design and carry out a water quality investigation.
- **If you’re not certain what test method is appropriate for the user’s age and experience**, read “How to Test” on page 5. It offers a brief description of every kind of test method available in this catalog.
- **Simple icons signal which test methods are used with each kit**. See page 5 for a guide to identifying the icons. Every kit description also shows you exactly what test parameters are covered, the appropriate age group for the methods included, and how many tests can be performed with each kit.

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Whether you're teaching water science or monitoring local lakes and rivers, this page can help you make decisions about where to start and what tests are most appropriate for your water quality investigation. You'll also want to subscribe to Hach's *Teaching Water Science* newsletter (back issues are available) and connect with our H2O University website www.hach.com/h2ou/ (see page 23).

Field Testing and Environmental Monitoring

Basic water quality testing is crucial in determining if natural bodies of water can support diverse populations of aquatic life. Investigating and comparing the water quality of nearby streams, lakes and ponds is also a great way to enliven classroom discussions on photosynthesis, respiration and eutrophication.

Start with simple tests for pH, hardness, temperature, and alkalinity. Alkalinity is important to fish and aquatic life because it buffers against pH changes and makes the water less vulnerable to acid rain. Be sure to measure the levels of dissolved oxygen and carbon dioxide. If you can, test for phosphate, nitrate, and ammonia. Refer to the "Tips for Teachers" on page 13 to know when these test parameters indicate pollution. The *Water, Water Everywhere* package (page 23) includes an invaluable "Water Quality Factors Reference Unit," which is packed with information on over 25 key water quality factors.

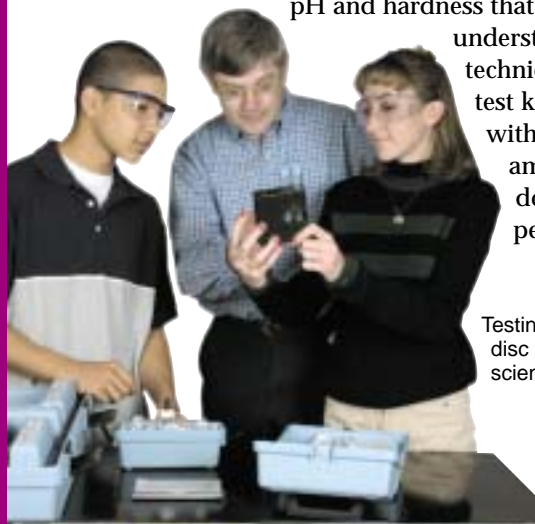


Teacher Ed Brogie likes the cross-curricular value of teaching water science.

Testing Tap Water in the Classroom

If you haven't taken your students into the field before, take it one step at a time. Start in the classroom with tests like

pH and hardness that help your students to understand scientific techniques, using a simple test kit and tap water. Start with the question, "What am I drinking?" Science doesn't get much more personal than that!



Testing for chlorine with a color disc helps students develop scientific technique.

Choosing a Single-Parameter or a Multi-Parameter Kit

Single-parameter kits are great when you want to test for one specific water quality factor. But when you have several tests to carry out, multi-parameter kits – designed and assembled to test for a variety of factors – are the most cost-effective, convenient and flexible choice. Self-contained and ready-to-use, the multi-parameter kits have everything you'll need to conduct all the tests you need.

And we do mean everything – all the hardware, glassware, reagents, and other materials needed to perform about 100 tests on each parameter. Most comparably priced kits usually include reagents for only 30 to 50 tests.

Hach's multi-parameter kits let students work in small groups, each testing a unique parameter, then combining their results for a comprehensive profile of the river or stream. Multi-parameter kits are also preferred by most environmental research groups because a broad spectrum of tests can be performed with a single portable laboratory.

Choosing Parameters that are of Special Local Interest

Choose a test kit that allows you to focus on environmental issues specific to your region. For example, the Fish and Wildlife Conservation Kit (page 14) lets you determine the basic health of an aquatic ecosystem. Where water pollution is suspected, the Water Pollution Laboratory (page 14) will give you answers. If you're worried about runoff in mining country, order the Acid Mine Drainage Test Kit (page 15). In farming country, you'll want to check fertility of your soil (page 18) or test for nitrates in well water. On the coast, explore estuaries with the Saltwater Aquaculture Kit 3 (page 20). Microbiological test kits (page 22) are invaluable in determining the safety of drinking water coming from unknown sources or in disaster recovery.

Focus on Local Issues!

"Here in Nebraska, we have a persistent problem with nitrates in our ground water – mainly the result of run-off and fertilizers used in farming. High nitrate levels are unsafe in drinking water, so our kids go into the community and offer free nitrate testing on local wells. The class advertises locally, and when community members respond, the team goes to work. The kids collect samples, run the tests and discuss the results with homeowners. They get to apply all their skills and help their neighbors. It's a lesson they will never forget!"
High School Teacher Ed Brogie – Laurel, Nebraska.

Choose the method that matches the group and the task at hand. Even the youngest and most inexperienced scientists will build confidence with Test Strips and Color Cubes. The Color Disc and Drop Count Titration both

require a bit more technique, and they provide stepped-up accuracy. The Digital Titrator is surprisingly easy to use and extremely accurate. And where absolute accuracy is required, choose one of our instrument-based test kits.

Colorimetric Methods

A colorimetric test simply measures the color that develops when a reagent is added to a sample. The intensity of the resulting color is directly related to the concentration of the parameter being tested. (That's Beer's Law, by the way.) Once the sample changes color, you can visually compare the intensity of the color against a known standard (using Hach Test Strips, Color Cubes or Color Discs). For greater accuracy, you can measure the intensity of the sample color with a Hach colorimeter or spectrophotometer.



Look for these icons throughout the catalog!

	WATER QUALITY TEST STRIPS Simply dip the strip into your sample and compare to the color chart. Requires minimal user technique; semi-quantitative.
	COLOR CUBE Mix your sample with premeasured reagents, and match the developed color to the adjoining calibrated color comparator. Accuracy $\pm 20\%$.
	COLOR DISC Rotate the continuous gradient color wheel to obtain a color match with the reacted sample. Accuracy $\pm 10\%$.
	ACCUVAC™ Insert the glass AccuVac® ampul into your sample and snap off the tip. The sample is drawn into the ampul and reacts with the reagent. Measure the color change with a color disc, colorimeter or spectrophotometer.
	COLORIMETER Instrument based DR/800 Series Colorimeter for excellent accuracy and cost-effective portability (more details on page 16).
	SPECTROPHOTOMETER INSTRUMENT The DR/2010 Spectrophotometer for superior accuracy, more flexibility, and more powerful data management. (You'll find more details on page 17.)

Electrochemical Methods

An electrochemical test confirms the presence or absence of a parameter by measuring the electrical activity of a sample. Hach offers many PocketPal™ and sensION™ meters to choose from. They're incredibly powerful and accurate, yet amazingly simple to use – even for young scientists!

	pH TESTER The Hach Pocket Pal™ goes anywhere and uses electrochemical measurement to read pH. (More details on page 11.)
	sensION™ Electrochemical Meter The ultimate in power, precision, convenience and long-term value! sensION meters come with fast-reading electrodes and intuitive software.

Titration Methods

Tests based on titration measure the volume of a reagent of known strength that must be added to a sample to produce precipitation or a change in color. Basic titration tests are as easy as counting the drops from an eye dropper. Hach's Digital Titrator makes the process much more accurate. Once you've reached the endpoint, the Digital Titrator tells you how much titrant you've dispensed. For a close look, turn to page 6.

	DROP COUNT TITRATION Using the dropper provided, add titrant to the prepared sample just until the color changes. Inexpensive; accuracy $\pm 10\%$.
	DIGITAL TITRATOR Dispense a precise amount of titrant with the turn of a knob. Interchangeable titrant cartridges; accuracy $\pm 1\%$. (More details on pages 6-7.)

Turbidimetric Methods

Turbidity is the measure of cloudiness caused by particles suspended in a liquid. Hach's Pocket Turbidimeter™ shines a beam of light through a sample, precisely measures the scattering caused by the particles, and reports turbidity in Nephelometric Turbidity Units (NTU). Hach also offers a visual extinction "dipstick" method developed specifically for sulfate and potassium.

	POCKET TURBIDIMETER™ Instantly measures the turbidity (cloudiness) of your water sample.
	EXTINCTION A visual turbidimetric method for sulfate and potassium.

New! Water Quality Test Strips

Hach Water Quality Test Strips make water testing easy, safe, and fast – without having to handle reagents!

They're made with Hach's unique, reagent-coated pads, using the same proven chemistries as other Hach color comparator tests. And they cost pennies for each test.

Use these handy Test Strips to measure more than a dozen different parameters. With Hach's 5-in-1 Test Strips, you can measure total and free chlorine, hardness, alkalinity, and pH – all with a single Test Strip!



It's as easy as 1-2-3.

1. Just dip the Test Strip into your sample.
2. Wait for color to develop.
3. Compare the color of the pad to the color chart on the package to read your results in 1 minute or less!

Parameter	Cat. No.	Grade Level	Method	Ranges	No. of Tests
Alkalinity Test Strips	27448-50	K+		0-240 ppm	50
Ammonia Test Strips	27553-25	K+		0.0-6.0 ppm (NH ₃ -N)	25
Chloride Quantab®	27449-40	K+		30-600 ppm Cl	40
Low Range				0.005-0.1% NaCl	titrators
Chloride Quantab®	27513-40	K+		300-6000 ppm Cl	40
High Range				0.05-1.0% NaCl	titrators
Chlorine Test Strips	27450-50	K+		Free: 0-10 ppm	50
Free and Total				Total: 0-10 ppm	
Copper Test Strips	27451-25	K+		0-3 ppm	25
Hardness Test Strips	27452-50	K+		0-425 ppm	50
			0-25 gpg		

Parameter	Cat. No.	Grade Level	Method	Ranges	No. of Tests
Iron Test Strips	27453-25	K+		0-5 ppm	25
Nitrate / Nitrite	27454-25	K+		Nitrate: 0-50 ppm Nitrite: 0-3 ppm	25
pH Test Strips	27456-50	K+		4-9 pH units	50
Phosphate Test Strips	27571-50	K+		0-50 ppm PO ₄	50
5 in 1 Test Strips	27552-50	K+			50
Total Chlorine				0-10 ppm	
Free Chlorine				0-10 ppm	
Total Hardness (as CaCO ₃)				0-25 gpg	
				0-425 ppm	
Total Alkalinity (as CaCO ₃)				0-240 ppm	
pH				6.2-8.4 pH units	

Digital Titrator

Kids, teachers, and water science professionals all love Hach's patented Digital Titrator, because it's faster, easier and more accurate than a conventional buret. Any teacher who has watched a glass buret tip over and break in the lab will also appreciate the Digital Titrator's sturdy design!

The Digital Titrator produces repeatable results ($\pm 1\%$) – whether it's used by a 7th grader or a college senior. The system is completely portable, and its high-density polyethylene cartridges make the entire titration process simple. Ready-to-use titrant solutions are available in light-weight, interchangeable cartridges, each accommodating 40 to 100 tests (depending upon your sample concentration). The Digital Titrator comes with a detailed instruction manual outlining all available procedures, and it's backed by a lifetime warranty.

Digital Titrator #16900-01 (Titrant and Indicator required.

See chart on page 7.)



The Digital Titrator records the exact volume of titrant delivered on a numerical counter.

Using the Digital Titrator is Easy!

Simply attach the titrant cartridge to the Digital Titrator, and turn the knob on the delivery tube to dispense a precise amount of titrant into the sample. The Digital Titrator even records the exact volume of titrant delivered on a numerical counter. Once the end point is reached, the displayed number is used to calculate the sample concentration. The cartridge can then be capped – to safely preserve remaining titrant for future use.

New! Just Add Water™ Kits

Introducing Hach's new Just Add Water™ Classroom Science Kits. Each one is a complete water science lesson!

Our Just Add Water™ kits make water testing incredibly simple. And totally fun! Every kit comes with a variety of our most popular Water Quality Test Strips, detailed instructions, and a complete teacher-tested curriculum on diskette. Each kit listed below is available as a Level 1 kit for grades 3-6 and Level 2 for Middle/Junior High School.

Drinking Water Kit – A great introduction to the sources of drinking water, how our bodies use water, and how water reaches our homes. Tests include pH, hardness, copper and chlorine.

Drinking Water Kit Level 1: #27880-00. Level 2: #27643-00.

Ponds & Streams Kit – Learn about environmental waters! The water cycle, watersheds, the effects of acid rain, and the sources of non-point-specific pollution. Tests include alkalinity, phosphates, pH and nitrates.

Ponds & Streams Kit Level 1: #27876-00. Level 2: #27877-00.

Wastewater Kit – A perfect complement to our Drinking Water Kit, focusing on where our wastewater goes and the importance of the treatment process. Tests include chlorine, phosphates and nitrates with safe, easy test strips.

Wastewater Kit Level 1: #27878-00. Level 2: #27879-00.



Test Kit Theme	Cat. No.	Grade Level	Method	Parameters	No. of Tests
Just Add Water Kit	Level 1 27880-00	3-6		pH, Hardness, Copper, Chlorine	50 each
Drinking Water	Level 2 27643-00	7-9			
Just Add Water Kit	Level 1 27876-00	3-6		Alkalinity, pH, Phosphate, Nitrate	50 each
Ponds and Streams	Level 2 27877-00	7-9			
Just Add Water Kit	Level 1 27878-00	3-6		Chlorine, Phosphate Nitrate	50 each
Wastewater	Level 2 27879-00	7-9			

Digital Titrator Cartridges

Once you have Hach's Digital Titrator, you can test for many different parameters. More than 75 concentrated titrant solutions are available for the Digital Titrator. They are contained in compact cartridges and formulated for measuring more than 40 water testing parameters. Cartridges protect titrant solutions from contamination, save time, and help



make testing economical. They can be changed in seconds – eliminating the need to clean glassware. And since each cartridge contains concentrated solutions, you save money by using low volumes and storing unused solutions for later use.

Our Most Popular Titrant Cartridges

Parameter	Range	DT Cartridge Cat. No.	Indicator (Required) Cat. No.	
Acidity	10-160 mg/L CaCO ₃	14377-01	14550-99	Bromphenol Blue, 50 ml
Acidity, Total	10-160 mg/L CaCO ₃	14377-01	942-99	Phenolphthalein, pk/100
Alkalinity	10-160 mg/L CaCO ₃	14388-01	942-99	Phenolphthalein, pk/100
Alkalinity, Total	10-160 mg/L CaCO ₃	14388-01	943-99	Bromcresol Green/Methyl Red pk/100
Carbon Dioxide	10-100 mg/L CO ₂	14378-01	942-99	Phenolphthalein, pk/100
Chloride	2.5-150 g/L Cl ⁻	14397-01	1057-66	Chloride 2 Powder Pillows (100 ml) pk/50
Chlorine, Free	0-3.00 mg/L Cl ₂	22923-01	14070-99	DPD Free Chlorine pk/100
Chlorine, Total	0-3.00 mg/L Cl ₂	22923-01	14064-99	DPD Total Chlorine pk/100
Hardness, Calcium	100-4000 mg/L CaCO ₃	14399-01	282-32	Potassium Hydroxide, 8N, 100 ml
			852-99	CalVer 2 Powder Pillows, pk/100
Hardness, Total	100-4000 mg/L CaCO ₃	14399-01	424-32	Buffer Solution Hardness 1, 100 ml
			851-99	ManVer 2 Powder Pillows, pk/100
Iron	10-100 mg/L Fe ³⁺	20817-01	984-99	Sodium Periodate Powder Pillows, pk/100
			20815-99	Buffer, Citrate, pk/100
Oxygen, Dissolved	1-10 mg/L DO	22675-01	349-32	Starch Indicator Solution, 100 ml
			1071-66	Manganous Sulfate Powder Pillows, pk/50





Single-Parameter Kits

Kids of all ages love feeling like real scientists – mixing, matching, measuring, and best of all – watching things turn color! Hach single-parameter kits make it easy for you to give your class a real-life, hands-on experience testing water for meaningful characteristics. **Alkalinity** in streams, for example, is important to fish and aquatic life because it

buffers against **pH** changes and makes the water less vulnerable to acid rain. Whether you're a limnologist or a neophyte, each Hach Test Kit contains everything you'll need to test water from a nearby stream or simply to test your town's drinking water. In the field and in the lab, Hach kits make learning fun and memorable.



B. Ammonia Color Cube Kit

On field trips, test for ammonia with rugged color cubes.
Cat. No. 22669-00



C. Carbon Dioxide Titration Kit

Carbon dioxide testing helps explain respiration in streams.
Cat. No. 1436-33



D. Chlorine Color Disc Kit

The color disc makes chlorine testing accurate and easy.
Cat. No. 2231-33












E. Chlorine AccuVac®/Color Disc Kit

Test for total chlorine with photometric measurement.
Cat. No. 25030-50



A. Alkalinity Titration Kit

Testing a stream for alkalinity can help you teach students about chemical titration, fish, pH, and acid rain.
Cat. No. 24443-33

	Parameter	Cat. No.	Grade Level	Method	Ranges	No. of Tests
	Acidity Titration Kit AC-6	2223-33	7+		5-100 mg/L 20-400 mg/L	100
A	Alkalinity Titration Kit AL-AP	24443-33	7+		0.4-8 gpg 1-20 gpg	100
B	Ammonia Color Cube Kit Low Range	22669-00	7+		0-0.8 mg/L	25
	Ammonia Color Disc Kit Mid-Range	24287-33	7+		0-2.5 mg/L	100
C	Carbon Dioxide Titration Kit CA-23	1436-33	7+		1.25-25 mg/L 2-40 mg/L 5-100 mg/L	200
	Chloride Titration Kit 8-P	1440-01	7+		5-100 mg/L 20-400 mg/L	100
	Chlorine Color Cube Kit As free chlorine	20603-00	3+		0-2.5 mg/L	50
	Chlorine Color Cube Kit As total chlorine	20604-00	3+		0-2.5 mg/L	50
D	Chlorine Color Disc Kit CN-66: As free and total chlorine	2231-33	3+		0-3.5 mg/L	50 Free 50 Total

Single-Parameter Kits



Hach Single-Parameter Kits let you design your own science project. Each kit comes with everything you need to test one specific parameter, and you can combine them any way you want. For example, you might divide the class into two groups to determine the health of a stream for aquatic life. One group can test for **dissolved oxygen, alkalinity, temperature, and turbidity**, while the other group tests for

carbon dioxide, pH, nitrates and phosphates. You can also choose the test method best-suited to your class (see grade level recommendations listed for every product). All Hach's educational kits are based on the same science as our professional kits. Hach – the world leader in water science – takes learning seriously.



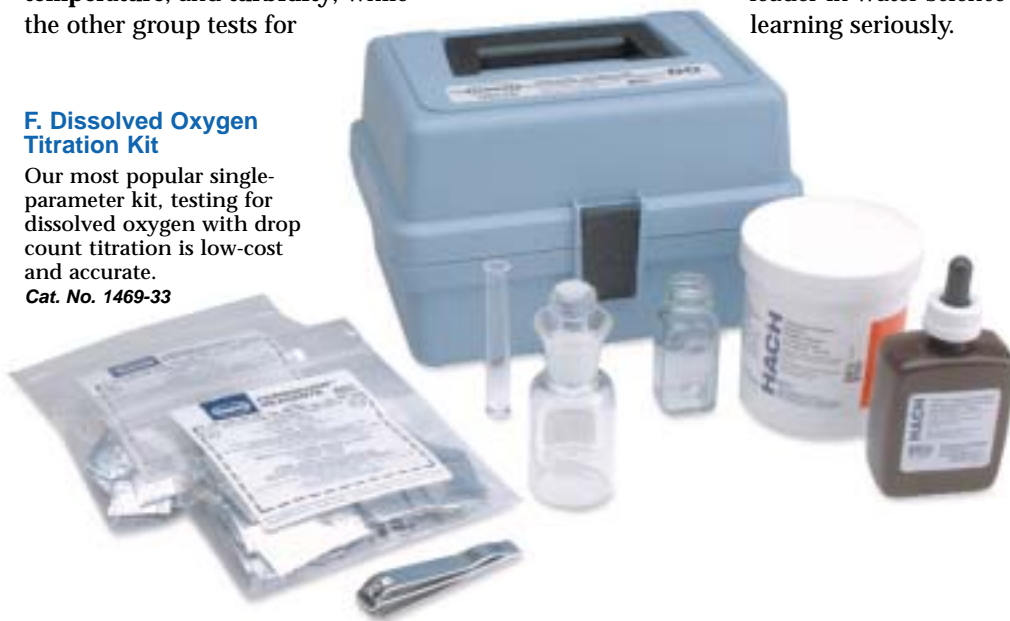
G. Hardness Titration Kit

Testing water for hardness brings alive any discussion of limestone.
Cat. No. 1453-00

F. Dissolved Oxygen Titration Kit

Our most popular single-parameter kit, testing for dissolved oxygen with drop count titration is low-cost and accurate.

Cat. No. 1469-33



H. sension™6 Dissolved Oxygen Meter

Accurate, portable and waterproof, the sension6 Portable Dissolved Oxygen Meter comes complete with a robust new electrode and beakers; easy-to-follow, illustrated procedures; personalized service, and technical support.

Cat. No. 51850-10



Parameter	Cat. No.	Grade Level	Method	Ranges	No. of Tests
Chlorine AccuVac®/Color Disc Kit As total chlorine	25030-50	7+		0-2.5 mg/L	25
Chromium Color Cube Kit	12527-00	7+		0-1.0 mg/L	50
Chromium Color Disc Kit CH-8	1834-00	7+		0-1.5 mg/L	100
Copper Color Cube Kit As free copper	14497-00	3+		0-2.5 mg/L	50
Copper Color Cube Kit As complexed copper	21822-00	3+		0-2.5 mg/L	25
Copper Color Disc Kit CU-6: As free and total copper	21941-00	3+		0-5 mg/L	50
Dissolved Oxygen Titration Kit OX-2P	1469-33	7+		0.2-4 mg/L 1-20 mg/L	100
Dissolved Oxygen AccuVac®/Color Disc Kit	25150-50	7+		0-15 mg/L	25
Hardness Titration Kit 5-B Total: Bulk Powder	1453-00	5+		1-30 gpg	100
sension6 Dissolved Oxygen Meter	51850-10	7+		0-20.0 mg/L	

Tips for Teachers

It's easy to take water samples from a shallow (less than two feet deep) creek or stream. You don't need a boat or dock. Just figure on one pair of rubber boots per group or – in warm weather and clean water – sneakers and rolled-up jeans for everyone! For more information on designing your project, refer to Hach's *Water, Water Everywhere, "Teacher's Guide."* (page 23)



Preferred by educators *and* water science professionals, Hach kits make learning fun and relevant. “A test using a color disc, for instance, only takes ten minutes. That’s short enough to hold a fifth-grader’s interest, and it’s easy enough for him or her to succeed. But the test procedure,” explains master teacher, Terry Lewis of Pierre, South Dakota, “is also *full* of skills that all students need to

develop. So, they’re learning the skills and processes they need to meet national standards – and they’re having a lot of fun doing it.” You might test a local stream for **nitrates**, using a color disc, and teach students about eutrophication. Hach’s Single-Parameter Kits are ready to go – completely outfitted, rugged, and designed to keep all materials and samples upright and secure.



A. Hardness Titration Kit

Test water for hardness and develop new skills with drop count titration.
Cat. No. 1454-33



B. Nitrate Color Cube Kit

Testing for nitrate with a color cube is easy for young scientists.
Cat. No. 14037-00



D. Nitrate AccuVac®/Color Disc Kit

Single-use AccuVac® ampules let you test for nitrate without sample-cell cleanup.
Cat. No. 25110-50



Nitrate Test Strips (for more, see page 6)

An easy way to test for nitrates – with no waste-disposal problems.
Cat. No. 27454-25

C. Nitrate Color Disc Kit

The color disc makes nitrate testing easy and accurate. Lively discussion is bound to follow on the effects of farm and garden fertilizers leaching into streams.
Cat. No. 14161-33



	Parameter	Cat. No.	Grade Level	Method	Ranges	No. of Tests
A	Hardness Titration Kit 5-EP Total: Powder Pillows	1454-33	5+		1-30 gpg	100
	Iron Color Cube Kit	14008-00	3+		0-5 mg/L	50
B	Nitrate Color Cube Kit High Range	14037-00	5+		0-50 mg/L	50
C	Nitrate Color Disc Kit NI-14 Low Range	14161-33	5+		0-1 mg/L 0-10 mg/L	50
	Nitrate Color Disc Kit NI-11 High Range	1468-03	5+		0-50 mg/L	100
D	Nitrate AccuVac®/Color Disc Kit High Range	25110-50	5+		0-50 mg/L	25
	Nitrite Color Cube Kit Low Range	20596-00	5+		0-1.0 mg/L	50
	Nitrite Color Disc Kit NI-15 Low Range	21820-00	5+		0-0.5 mg/L	100
	pH Color Cube Kit Narrow Range	12519-00	3+		pH 6.5-8.5	50

Single-Parameter Kits



Kids love science best when it relates to real life. With Hach Single-Parameter Kits, students can design a research project right in their own back yards. They may want to learn more about their favorite fishing hole. Teachers have found that visiting the same test site again and again gives students a sense of connection to the place and a database of information that shows them

New SINGLETs™ Pre-mixed pH Buffer Solutions

Each single-use pouch contains 20 mL of standardized solution for a distinct pH value. Just tear open the pouch and insert the electrode. The convenient foil packet keeps your buffer solution fresh and contaminant free.

SINGLET™ Buffer Solution pH 7.00/pH 10.01 (10 each) #27698-20
SINGLET™ Buffer Solution pH 4.01/pH 7.00 (10 each) #27699-20



F. sension1 Field pH Meter

Makes pH testing quick and easy in lab, field or classroom. Just dip the unit's sturdy electrode into the sample, and immediately read your results on the meter.
Cat. No. 51700-10

how their lake or stream is doing. Be sure to take along Hach's sension1 Field pH Meter. Built to last and battery powered, this hardworking instrument is waterproof, and it even floats! With easy and intuitive programming, this meter prompts you through each test sequence with touch-key commands.



E. Pocket Pal™ pH Tester

Electrochemically measures pH and displays the results on an easy-to-read liquid crystal display (LCD).
Cat. No. 44350-33



G. Pocket Turbidimeter™

Serious water testing requires accurate, on-site turbidity measurement.
Cat. No. 52600-00

	Parameter	Cat. No.	Grade Level	Method	Ranges	No. of Tests
E	Pocket Pal™ pH Tester	44350-33	3+		pH 0-14	1000 hrs*
	Buffers for pH Calibration (Pocket Pal™ Tester)	22269-95 22270-95 22271-95	3+		pH 4.01 pH 7.00 pH 10.00	15 pk
	pH Color Disc Kit 17F Mid Range	1470-06	3+		pH 5.5-8.5	200
	pH Color Disc Kit 17N Wide Range	1470-11	3+		pH 4.0-10.0	300
	Phosphate Color Disc Kit PO-19 Orthophosphate	2248-33	3+		0-1 mg/L 0-5 mg/L 0-50 mg/L	100 C
	Phosphate Color Disc Kit PO-24 Total Phosphate	2250-01	3+		0-1 mg/L 0-5 mg/L 0-50 mg/L	50 C/T
	Phosphate Color Cube Kit Orthophosphate	12522-00	3+		0-5 mg/L	50 C
F	sension1 Field pH Meter	51700-10	7+		pH 0-14	
	Sulfate Extinction Kit SF-1	2251-00	5+		50-200 mg/L	100
	Sulfite Titration Kit SU-5	1480-02	5+		1-20 mg/L 10-200 mg/L	100
G	Pocket Turbidimeter™	52600-00	5+		0.1-400 NTU/FNU	

Tips for Teachers

Turbidity is the cloudiness caused by particles suspended in water. Turbidity in lakes and rivers results from natural causes and soil erosion from logging, mining, and dredging operations. It is an important measurement because too many suspended particles can prevent sunlight from reaching water plants, thereby reducing photosynthesis and the production of oxygen for fish and aquatic life.



*Battery Life; C for clear samples; T for turbid samples

The Educator's Color Cube Test Kit

Perfect for young scientists – and a favorite with kids and teachers! Color cubes are used for nine important water quality tests: chlorine, chromium, copper, iron, nitrate, nitrite, ammonia, phosphorus, and pH. Kids like the color comparisons, and teachers prefer the color cube for its scientific simplicity and rugged design. The cubes combine a sample mixing cell with a calibrated, stepped color comparator in a single molded plastic piece.



Color Cube School Package #24823-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Color Cube School Package 24823-00		5+	Ammonia	0-0.8 mg/L	25
			Chlorine, Total	0-2.5 mg/L	50
			Chromium	0-1.0 mg/L	50
			Copper, Total	0-2.5 mg/L	25
			Iron, Ferrous	0-5 mg/L	50
			Nitrate	0-50 mg/L	50
			Nitrite	0-1.0 mg/L	50
			pH	pH 6.5-8.5	50
			Phosphate	0-5 mg/L	50

The Educator's Color Disc Test Kit

An excellent tool for more accomplished students, this kit uses the color disc to measure seven key water quality factors: chlorine, chromium, copper, iron, nitrate, phosphorus, and pH. The color disc method provides greater accuracy than a color cube, because students can compare samples to a continuous-gradient color wheel.



Color Disc School Package #24822-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Color Disc School Package 24822-00		7+	Chlorine, Total	0-3.5 mg/L	100
			Chromium	0-1.5 mg/L	100
			Copper, Free	0-5 mg/L	100
			Iron	0-5 mg/L	100
			Nitrate	0-1 & 0-10 mg/L	50
			pH	pH 4.0-10.0	300
			Phosphate	0-1, 0-5, 0-50 mg/L	100



The Educator's Titration Test Kit

Drop-count titration is a low-cost, yet accurate, method that enables students to measure a wide range

of important water quality factors. Using titration, this kit measures alkalinity, carbon dioxide, chloride, chromium, hardness, hydrogen sulfide, dissolved oxygen, and sulfate. The titration endpoint is easy to detect.

Titration School Package #24824-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Titration School Kit 24824-00		7+	Alkalinity	0.4-8 or 1-20 gpg	100
			Carbon Dioxide	1.25-25 mg/L	200
			Chloride	2-40 mg/L	
				5-100 mg/L	100
			Chromium	5-100 mg/L	
				50-1000 mg/L	100
			Hardness	1-30 gpg	100
			Hydrogen Sulfide	0-5 mg/L	18
			Oxygen, Dissolved	0.2-4/1-20 mg/L	100
			Sulfate	50-200 mg/L	100

Tips for Teachers

You can demonstrate ecological principles by monitoring the water quality of a nearby river, stream or lake. Ask your class to unravel the interconnected web of life: human activities can cause water quality degradation; water pollution negatively impacts the biological community; polluted ecosystems adversely affect human populations.

Suspect pollution when water quality testing shows **low levels** of dissolved oxygen and **high levels** of phosphates, nitrate, and ammonia – especially if the pH is very low or very high.

The Educator's Water Quality Test Kit

Ideal for a classroom introduction to water quality issues, this popular starter kit is completely equipped for field or laboratory measurements of dissolved oxygen, phosphorus, nitrate, chloride, and temperature. Bring classroom discussion alive with drop-count titration and color disc colorimetry test findings. Working in small groups, students can test the water at several spots along a small stream to discover the effects, for example, of farm and urban fertilizers on water quality. Combining this kit with Hach's companion resource – the complete teaching package of *Water, Water Everywhere* (available as product # 21976-00) – you'll have the confidence you need to plan and carry out the first of many water quality investigations.

Basic School Package #24821-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Basic School Package		7+	Chloride	5-100/20-400 mg/L	100
			Nitrate	0-1 & 0-10 mg/L	50
			Oxygen, Dissolved	0.2-4 & 1-20 mg/L	100
			Phosphate	0-1, 0-5, 0-50 mg/L	100
			Temperature	-10 to 110 °F	



The Water Ecology Test Laboratory

An excellent choice for class and research teams assigned to monitor water quality in the field. The Water Ecology Test Laboratory contains six different, self-contained water test kits in one rugged carrying case. Each test kit comes in its own compact case and includes everything you need to test for six water quality parameters, including acidity, alkalinity, hardness, carbon dioxide, dissolved oxygen, and pH. The laboratory comes with Hach's popular *Water, Water Everywhere* environmental science curriculum.

Water Ecology Test Kit #26724-33

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Water Ecology Set 26724-33		7+	Acidity	5-100, 20-400 mg/L	100
			Alkalinity	0.4-8 or 1-20 gpg	100
			Carbon Dioxide	1.25-25, 2-40 mg/L	200
			Hardness	5-100 mg/L	100
			Oxygen, Dissolved	1-30 gpg	100
			pH	0.2-4, 1-20 mg/L	50
			pH	0.0-14.0	200 hrs*

*Battery Life

The following test results indicate pollution in fresh water aquatic environments:

- Dissolved Oxygen**...less than 4 to 5 parts per million (ppm) or mg/L
- Phosphate**more than 0.01 – 0.03 ppm (mg/L) in lakes
- Phosphate**more than 0.1 ppm (mg/L) in rivers and streams
- Nitrate**more than 10 ppm (mg/L) (maximum allowed in public drinking water)
- Ammonia**more than 0.1 ppm (mg/L)
- pH**.....lower than 5.0 or higher than 9.0



Checking your water sample is fast and easy with the Pocket Pal™ pH Tester. It comes with many of these kits; just look for the icon!



The Stream Survey Kit

A favorite with citizen and student groups for serious watershed, river, and stream surveys. This kit provides everything you need to monitor six key parameters in determining the health of a river, creek, or stream: ammonia, nitrate, dissolved oxygen, pH, total phosphate, and temperature. Using colorimetric, electrochemical, and titration methods, the Stream Survey Kit includes enough reagents and apparatus to conduct approximately 100 tests for each parameter. The handy polypropylene carrying case keeps reagents upright and secure.

Stream Survey Kit #27120-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Stream Survey Kit 27120-00		7+	Ammonia	0-2.5 mg/L	100
			Nitrate	0-1, 0-10 mg/L	100
			Oxygen, Dissolved	0.2-4.0, 1-20 mg/L	100
			pH	pH 0-14	—
			Phosphate, Total	0-1, 0-5, 0-50 mg/L	100
			Temperature	-10-110 °C 0-220 °F	—



The Fish & Wildlife Conservation Kit

Find out if ponds, lakes, wetlands, rivers, and streams are healthy for fish and wildlife. Using drop-

count titration and color disc colorimetry (the same analytical methods used by fish and wildlife conservation professionals), this kit comes with everything you need to test water for acidity, alkalinity, carbon dioxide, hardness, dissolved oxygen, and pH – six key factors in determining water's ability to support life. Like all Hach multi-parameter kits, The Fish and Wildlife Conservation Kit is the most cost-effective way to test for a specialized group of parameters.

AL-36B Test Kit #1802-33

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Fish and Wildlife Conservation Test Kit AL-36B 1802-33		7+	Acidity	1 drop = 0.133 or 0.33 gpg as CaCO ₃	100
			Alkalinity	0.4-20 gpg as CaCO ₃	100
			Carbon Dioxide	5-100 mg/L as CO ₂	100
			Hardness	0-30 gpg as CaCO ₃	100
			Oxygen, Dissolved	1-10 mg/L as DO	100
			pH	pH 4-10	300

The Water Pollution Laboratory

When investigating suspected pollution, you want scientifically accurate and useful results. Get serious with Hach's Water Pollution Laboratory – a portable lab containing six different water test kits for the seven key parameters that can indicate pollution: dissolved oxygen, free and total chlorine, phosphate, nitrate, ammonia, and pH. Each test kit comes in its own compact case and includes step-by-step instructions, safety materials, and Hach's *Water, Water Everywhere* environmental science curriculum.

Water Pollution Kit #26725-33



Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Water Pollution Set 26725-33		7+	Ammonia	0-2.5 mg/L	100
			Chlorine, Free/Total	0-3.5 mg/L	50
			Nitrate	0-1, 0-10 mg/L	50
			Oxygen, Dissolved	0.2-4, 1-20 mg/L	100
			pH	pH 0-14	200 hrs*
			Phosphate	0-1, 0-5, 0-50 mg/L	100

*Battery Life

Tips for Teachers

On your next field trip, point out the foam floating down streams and collecting in the eddies around rocks and shore. If your students test that water, they'll probably find detergents. How did detergents get there? Storm water carries detergents and other household waste (oil, gasoline, etc.)

The Surface Water Test Kit

An ideal tool for monitoring water quality in ponds, streams, and lakes. The Surface Water Test Kit uses cost-effective and easy-to-use drop-count titration, color disc colorimetry, and the Pocket Pal™ pH Tester to measure ammonia, free and total chlorine, nitrate, dissolved oxygen, pH, phosphorus, and temperature. The kit is light-weight, yet outfitted to give you all the tests and sampling flexibility you need. And like all Hach multi-parameter kits, the rugged carrying case holds water samples and liquid reagents in a secure, upright position. *Surface Water Test Kit #25598-33*



Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Surface Water Test Kit 25598-33		7+	Ammonia	0-2.5 mg/L	100
			Chlorine, Free & Total	0-3.5 mg/L	100
	Nitrate		0-50 mg/L	100	
	Oxygen, Dissolved		0.2-4, 1-20 mg/L	100	
	pH		pH 0-14	200 hrs*	
			Phosphorus	0-1 mg/L	100
				0-5 mg/L	
	Temperature	0-50 mg/L			
		-1-48 °C -30-120 °F			

*Battery Life

The Acid Mine Drainage Test Kit

An excellent kit for examining water quality in mining country. Water runoff in areas where strip mining

has occurred, for example, is often either acidic or alkaline and may contain high concentrations of soluble metal salts. Such runoff has the potential to alter the pH and otherwise contaminate streams and lakes. The Acid Mine Drainage Test Kit provides the analytical capabilities needed to measure acidity, alkalinity, iron, and pH. Using easy drop-count titrations and color disc colorimetry, this kit is outfitted for back-country use.

Acid Mine Drainage Test Kit #14058-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Acid Mine Drainage Test Kit MD-2 14058-00		7+	Acidity	1 drop = 0.4 or 1 gpg as CaCO ₃	100
			Alkalinity	1 drop = 0.4 or 1 gpg as CaCO ₃	100
	Iron		0-10 mg/L	100	
	pH		pH 4-10	300	

The Storm Water Test Kit

The ideal package for on-site or laboratory monitoring of storm sewer out-flow (frequently carrying detergents and other household waste) and industrial discharge. This hard-working kit includes the Pocket Pal™ pH Tester for quick pH measurements and all reagents and materials needed for color disc colorimetry readings on detergents, total chlorine, copper and phenols.

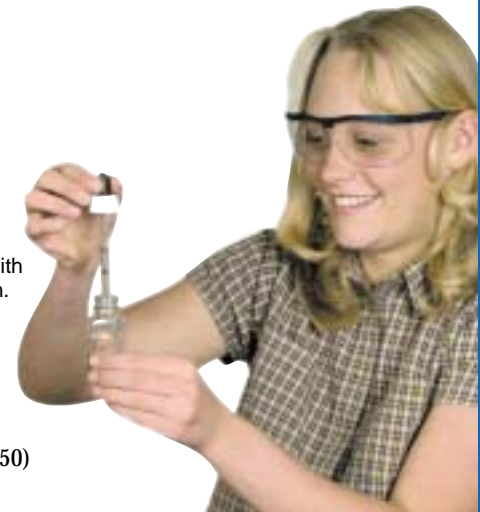
Storm Water Test Kit #24813-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Storm Water Test Kit 24813-00		10+	Chlorine, Total	0-3.5 mg/L	100
			Copper	0-5 mg/L	100
	Detergents		0-1 mg/L	32	
	pH		pH 0-14	200 hrs*	
			Phenols	0-5 mg/L	50
		0-1 mg/L			

*Battery Life

from our homes into nearby streams and creeks. It's a BIG problem for fish and aquatic life. Even when foaming does not occur, a detergent surface film can form and prevent oxygen/carbon dioxide exchange!

Students love the dramatic color change they get with drop count titration.



The Water, Water Everywhere Education Lab

Preferred by educators as the most complete package available for classroom investigations and water quality discussions. This practical and comprehensive kit offers one easy-to-store, easy-to-use portable system for testing a complete range of water quality parameters: total chlorine, total iron, HR nitrate, dissolved oxygen, pH, temperature, and turbidity. The Education Laboratory comes with the DR/820 Colorimeter and the highly acclaimed teaching tool, the *Water, Water Everywhere* curriculum. This clearly written three volume set includes the Student Reading Unit, the Student Water Quality Reference Unit, and the Teachers Guide with worksheets, activity guides, tests, and answer keys.

Water, Water Everywhere Education Lab CEL/820 #26876-00



Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
CEL/820 Water Water Everywhere Educational Lab 26876-00		7+	Chlorine, Total	0-2.00 mg/L	100
			Iron, Total	0-3.00 mg/L	100
			Nitrate, HR (as N)	0-30.00 mg/L	100
			Oxygen, Dissolved	0-15.00 mg/L	25
			pH	pH 6.5-8.5	100
			pH (test strips)	pH 0-14	100
			Temperature	-10-110 °C	—
			Turbidity	1000 FAU	—

The Environmental Water Quality Lab

Most important environmental tests can be performed with this professional-level kit. It's actually a portable laboratory, containing everything necessary for fast, on-the-spot results for field testing. The laboratory includes Hach's DR/850 Colorimeter, Pocket Turbidimeter™ Analysis System, a digital titrator, reagent sets, equipment, and illustrated manuals, all packed inside a sturdy, field ready carrying case.

CEL/850 Environmental Water Quality Lab #26878-00



DR/800 Series (Field) Colorimeter

Get it with a kit, or buy it separately! You'll want one of Hach's DR/800 Series colorimeters for its scientific accuracy, easy-to-use software, step-by-step program prompts, push-button method selection, automatic wavelength selection, and datalogging capability. It's famously robust and infinitely portable.

DR/820 Colorimeter tests for 20+ parameters #48440-00

DR/850 Colorimeter tests for 50+ parameters #48450-00

DR/890 Colorimeter tests for 90+ parameters #48470-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
CEL/850 Environmental Water Quality Lab 26878-00		7+	Acidity (as CaCO ₃)	10-4000 mg/L	100
			Alkalinity (as CaCO ₃)	10-4000 mg/L	100
			Ammonia (as NH ₃ -N)	0-0.5 mg/L	100
			Carbon Dioxide	10-1000 mg/L	100
			Chlorine, Free	0-2.0 mg/L	100
			Chlorine, Total	0-2.0 mg/L	100
			Hardness (as CaCO ₃)	10-4000 mg/L	100
			Iron, Total	0-3.0 mg/L	100
			Manganese, HR	0-20 mg/L	100
			Nitrate, LR	0-0.50 mg/L	100
			Nitrite, LR (as N)	0-0.35 mg/L	100
			Phosphate	0-2.5 mg/L	100
			Sulfide	0-0.7 mg/L	100
			Tannin/Lignin	0-9.0 mg/L	100
			Temperature	-10-110 °C	—
			Turbidity	0-400 NTU	—
			Zinc	0-3.0 mg/L	100



The Environmental Water Quality Lab (above) is an excellent choice for volunteers who monitor storm sewer out-flow and industrial discharge.



The Basic Water Quality Lab

A favorite with professionals and serious citizen watchdog groups, Hach's comprehensive water testing system gives you laboratory accuracy with the ultimate in convenience and portability. The Basic Water Quality Lab is equipped with the instruments, apparatus, and reagents needed to test 20 water quality parameters: alkalinity, bromine, calcium, carbon dioxide, chloride, free and total chlorine, chromium, conductivity, complexed and free copper, dissolved oxygen, fluoride, hardness, iodine, total iron, ammonia nitrogen, nitrate nitrogen, pH, reactive phosphorus, total phosphorus, and sulfate. The laboratory includes a DR/2010 Spectrophotometer, a portable pH meter, a Pocket Pal™ Conductivity Tester, and complete step-by-step instructions.

All that, and it fits into one sturdy polypropylene carrying case.

Basic Water Quality Lab DREL/2010 Kit #26700-19

Pictured with optional 2100P Portable Turbidimeter #46500-00



DR/2010 (Field/Lab) Spectrophotometer

A high-performance spectrophotometer for colorimetric testing in both the field and the lab. The portable DR/2010 delivers everything

from rugged construction and a portable battery pack to superior optics and sophisticated datalogging. You'll appreciate its intuitive software with preprogrammed calibrations, factory-installed procedures, illustrated manuals, and on-screen prompts. The DR/2010 can even store up to 1,000 sample readings. A great value with our kit, this quality instrument can also be purchased separately.

DR/2010 Spectrophotometer #49300-00

Basic Water Quality Lab (above)

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
DREL/2010 Basic Water Quality Lab 26700-19		7+	Alkalinity (as CaCO ₃)	10-4000 mg/L	100
			Bromine	0-4.5 mg/L	100
			Calcium	10-4000 mg/L	100
			Carbon Dioxide	10-1000 mg/L	100
			Chloride	10-10,000 mg/L	100
			Chlorine, Free & Total	0-2 mg/L	100
			Chromium	0-0.60 mg/L	100
			Conductivity	0.2-4.0 mS/cm	100
				10-1999 mg/L TDS	
			Copper, Complexed & Free	0-5 mg/L	100
			Fluoride	0-2 mg/L	100
			Hardness (as CaCO ₃)	10-4000 mg/L	100
			Iodine	0-7 mg/L	100
			Iron, Total	0-3 mg/L	100
			Nitrogen, Ammonia	0-0.50 mg/L	100
			Nitrogen, Nitrate	0-30 mg/L	100
			Oxygen, Dissolved	1-10+ mg/L	100
			pH	pH 0-14	—
			Phosphorus, Reactive	0-2.5 mg/L	100
			Phosphorus, Total	0-2.5 mg/L	100
Sulfate	0-70 mg/L	100			

Tips for Teachers

Even if you've never used a spectrophotometer before, it's easy! Just enter a two-digit code for the test you wish to perform, scroll to the proper wavelength, insert the blank, zero the instrument, insert the sample, and the read the results directly or store them for later use.

Portable and accurate, DR/800 Series Colorimeters operate with push-button ease and keep track of your data. Choose from a range of colorimeters that test from 20 to 90 different parameters!



The Soil Fertility Kit – the NPK-1

An introductory, scientifically relevant experience for students measuring four key factors in the determination of soil fertility: phosphorus, potassium, nitrate-nitrogen, and pH. Using three different modes of analysis (dipsticks, color disc colorimetry, and the Pocket Pal™ pH Tester), the Soil Fertility Kit includes enough reagents and apparatus for at least 100 tests for each factor – making this in-the-field analysis highly cost-effective and practical.

Soil Fertility Kit #24959-00



Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Soil Fertility Kit 24959-00		7+	Nitrate-Nitrogen	0-60 mg/L	100 each
			pH	pH 0-14	
			Phosphorus	0-130 mg/L	
			Potassium	0-250 mg/L	

The NTrak® Soil Test Kit

Created to measure soil nitrate-nitrogen levels, this kit was developed in conjunction with Iowa State University to benefit both crop production and water quality. Using the accurate and easy-to-use NTrak® color disc technology, users can test soil to check for optimal fertilizer application to crops without sacrificing yields and without contributing to groundwater contamination. The kit contains apparatus and reagents for 50 tests and includes a step-by-step instruction manual.

NTrak® Kit #24116-00



Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
NTrak® Kit 24116-00		7+	Soil (Nitrate-Nitrogen)	0-30 ppm	50



The Soil Saturation Extract Kit

Everything you need to prepare soil saturation extract for conductivity, pH or nutrient measurements. The

kit also makes it easy to extract greenhouse growing media to determine pH, salts, water soluble nitrogen, phosphorus, potassium, calcium, and magnesium. Complete instructions walk you through soil sampling methodology, extract preparation, and result interpretation.

Soil Saturation Extract Kit #18700-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Soil Saturation Extract Kit 18700-00		7+	Soil Extraction	—	N/A

Soil testing can be a key part of any environmental monitoring project. Hach's soil testing kits are appropriate for both beginners and professionals.



The Soil & Irrigation Water Testing Lab



The perfect companion for soil science professionals and groups monitoring soil and irrigation water changes. Suitable for on-site or laboratory determinations, this portable laboratory includes everything needed to measure more than 27 soil and water quality parameters. Portable and dependable in two sturdy field carrying cases, this laboratory includes the DR/2010

Spectrophotometer, a conductivity/TDS meter, a portable pH meter and complete step-by-step instructions.

Soil and Irrigation Water Lab DREL/2010 #26700-22



The Soil & Irrigation Water Kit

The ideal kit for more complete soil fertility analysis, site characterization, and irrigation water quality assessment under a wide variety of conditions. This well-designed and versatile kit – a favorite with teachers and students as well as soil research professionals – is highly effective in the classroom, in the field, and even in remote locations. Includes reagents for 300 tests in each parameter!

Soil and Irrigation Water Kit #24960-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Soil & Irrigation Water Kit 24960-00		7+	SOIL TESTS		
			% Base Saturation	0-100%	300
			Calcium & Magnesium	0-M* meq/100 g	300
			Cation Exchange Capacity	0-M* meq/100 g	—
			Exchangeable Sodium	—	300
			Free-Lime Estimation	—	300
			Gypsum Requirement	0-360 kg/ha (0-15 tons/acre)	300
			Lime Requirement	0-360 kg/ha (0-15 tons/acre)	300
			Nitrate-Nitrogen	0-60 ppm	300
			pH	pH 0-14	—
			Phosphorus	0-130 ppm	300
			Potassium	0-250 ppm	300
			Sodium, Exchangeable	—	300
			Soil Texture Estimation	—	—
			Total Exchangeable Acidity	0-M* meq/100 g	300
			IRRIGATION WATER TESTS		
			Calcium & Magnesium	10-4000 mg/L as CaCO ₃	300
			Conductivity	0.2-4.0 mS/cm	—
			Nitrate-Nitrogen	0-50 mg/L	300
			pH	pH 0-14	—
			Potassium	0-5 mg/L	300
			Sodium Estimation	—	—
			Sodium Adsorption Ratio	—	—

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
DREL/2010 Soil and Irrigation Water Lab 26700-22		7+	SOIL TESTS		
			% Base Saturation	0-100%	100
			Calcium & Magnesium	0-M* meq/100 g	100
			Cation Exchange Capacity	0-M* meq/100 g	—
			Exchangeable Sodium	—	100
			Free-Lime Estimation	—	100
			Gypsum Requirement	0-M* meq/100 g	100
			Lime Requirement	0-360 kg/ha (0-15 tons/acre)	100
			Nitrate-Nitrogen	0-60 ppm	100
			pH	pH 0-14	—
			Phosphorus	0-625 ppm	100
			Potassium	0-558 ppm	100
			Salinity	0.2-4.0 mS/cm	100
			Sulfate	0-100 pm	100
			Soil Texture Estimation	—	—
			Total Exchangeable Acidity	0-M* meq/100 g	100
			IRRIGATION WATER TESTS		
			Alkalinity	10-4000 mg/L as CaCO ₃	100
			Chloride	10-100 mg/L	100
			Conductivity	0.2-4.0 mS/cm	100
			Hardness	10-4000 mg/L as CaCO ₃	100
			Iron	0-3.00 mg/L	100
			Nitrate-Nitrogen	0-30.0 mg/L	100
			pH	pH 0-14	—
			Phosphorus, Reactive	0-2.50 mg/L	100
			Potassium	0-7.0 mg/L	100
			Sodium Estimation	—	—
Sodium Adsorption Ratio	—	—			
Sulfate	0-70 mg/L	100			

The Freshwater Aquaculture Kit FF-1A

Cost effective and accurate, this kit combines colorimetry and drop-count titration with continuous-gradient color discs to test nine water quality parameters important to healthy fish production: alkalinity, ammonia, carbon dioxide, chloride, dissolved oxygen, hardness, nitrite, pH, and temperature. As with most Hach kits, enough reagents and equipment are supplied for 100 or more tests of each parameter.

Freshwater Aquaculture FF-1A #2430-02



Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Aquaculture Test Kit FF-1A 2430-02		7+	Alkalinity	0.4-8 gpg	100
			Ammonia	0-3 mg/L	300
			Carbon Dioxide	5-100 mg/L	100
			Chloride	5-400 mg/L	100
			Hardness	1-30 gpg as CaCO ₃	100
			Nitrite	0-0.5 mg/L	100
			Oxygen, Dissolved	0.2-20 mg/L	100
			pH	pH 4-10	300
			Temperature	-30 to 120 °F	

The Saltwater Aquaculture Kit FF-3

This unique test kit was designed specifically for saltwater applications. In fact, two of its tests (one for ammonia-nitrogen and a convenient chloride titration test for salinity) were developed exclusively for this kit. It uses Hach's Digital Titrator titration and color disc colorimetry to test for: acidity, alkalinity, ammonia, carbon dioxide, chloride, dissolved oxygen, hardness, nitrite, pH, and temperature. As with most Hach kits, reagents and apparatus are included for 100 or more tests for each parameter.

Saltwater Aquaculture FF-3 #2430-03

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Aquaculture Test Kit FF-3 2430-03		7+	Acidity	100-4000 mg/L as CaCO ₃	≤ 100
			Alkalinity	100-4000 mg/L as CaCO ₃	≤ 100
			Ammonia	0-3 mg/L	100
			Carbon Dioxide	10-100 mg/L	≤ 100
			Hardness	100-4000 mg/L as CaCO ₃	100
			Nitrite	0-0.5 mg/L	100
			Oxygen, Dissolved	0-10 mg/L	100
			pH	pH 4-10	300
			Salinity	2-100 ppt as salinity	≤ 100
			Temperature	-30 to 120 °F	



The Freshwater Aquaculture Kit FF-2

An ideal choice for professionals, this kit lets you measure 10 critical water quality parameters using

highly accurate digital titration and continuous gradient color disc colorimetry. The package includes Hach's Digital Titrator and everything you need to carry out 100 tests each for acidity, alkalinity, ammonia, carbon dioxide, chloride, dissolved oxygen, hardness, nitrite, pH, and temperature in a sturdy carrying case.

Freshwater Aquaculture FF-2 #2430-01

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Aquaculture Test Kit FF-2 2430-01		7+	Acidity	100-4000 mg/L as CaCO ₃	≤ 100
			Alkalinity	100-4000 mg/L as CaCO ₃	≤ 100
			Ammonia	0-3 mg/L	300
			Carbon Dioxide	10-100 mg/L	≤ 100
			Chloride	10-160 mg/L	100
			Hardness	100-4000 mg/L as CaCO ₃	100
			Nitrite	0-0.5 mg/L	100
			Oxygen, Dissolved	0-10 mg/L	100
			pH	pH 4-10	300
			Temperature	-30 to 120 °F	

The Salt Water Master Kit

Ideal for monitoring water quality in aquariums and commercial lobster and crab tanks. The Saltwater Master Kit uses quick and easy color cube colorimetry to measure four critical parameters: ammonia, nitrate, nitrite, and pH. Enough reagent sets are included to carry out 50 tests for each parameter.

Saltwater Master Test Kit #20686-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
Saltwater Master Test Kit 20686-00		7+	Ammonia	0-3.0 mg/L	50
			Nitrate	0-50 mg/L	50
			Nitrite	0-0.75 mg/L	50
			pH	pH 6.5-8.5	50

The All Waters Aquaculture Lab

Suitable for both freshwater and saltwater analysis, this scientifically precise and convenient laboratory is the choice of most researchers, educators, and wildlife management professionals.

You will appreciate the versatility and flexibility of The All Waters Aquaculture Laboratory. It provides the instruments, reagents, apparatus, and step-by-step instructions you need to measure 13 important water parameters: alkalinity, ammonia (for saltwater), carbon dioxide, chloride, conductivity, copper, dissolved oxygen, hardness, nitrite, pH, reactive phosphorus, salinity, and temperature.

Durable instruments include the DREL/2010 Spectrophotometer, portable pH meter, and a portable conductivity/TDS meter.

All Waters Aquaculture Lab DREL/2010 Kit #26700-40

Pictured with optional 2100 P Portable Turbidimeter #46500-00



The Freshwater Aquaculture Lab

Monitoring freshwater quality is fast and easy with this portable laboratory. Offering a range of

analytical capabilities in one convenient package, this hard-working package includes the DR/850 Colorimeter, EC10 pH/mV/Temp Meter, Hach's Digital Titrator, the TDS Pocket Pal™ Tester, and illustrated instrument and procedure manuals – all in one sturdy field case. You'll get enough reagent sets and apparatus for 100 tests for acidity, alkalinity, ammonia, carbon dioxide, chloride, total hardness, iron, HR nitrate, LR nitrite, pH, reactive phosphorus, TDS, temperature and turbidity, and 25 tests for dissolved oxygen.

Freshwater Aquaculture Lab CEL/850 #26879-00

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
DREL/2010 Aquaculture Lab 26700-40		7+	Alkalinity	10-1000 mg/L	100
			Ammonia (for saltwater)	0-0.5 mg/L	100
			Carbon Dioxide	10-1000 mg/L	100
			Chloride	10-1000 mg/L	100
			Conductivity	0-199.9 mS	—
			Copper	0-210 µg/L	100
			Hardness	10-1000 mg/L	100
			Nitrate	0-0.3 mg/L	100
			pH	0-14	—
			Oxygen, Dissolved	0-10, 0-45 mg/L	50
			Phosphorus, Reactive	0-2.50 mg/L	100
			Salinity	0-100 ppt*	100
			Temperature	-30 to 120 °F	—

*Parts per thousand

Test Kit Model / Cat. No.	Method	Grade Level	Test	Range or Readout	No. of Tests
CEL/850 Aquaculture Lab 26879-00		7+	Acidity (as CaCO ₃)	10-4000 mg/L	100
			Alkalinity (as CaCO ₃)	10-4000 mg/L	100
			Ammonia (as N)	0-0.50 mg/L	100
			Carbon Dioxide	10-1000 mg/L	100
			Chloride	10-10,000 mg/L	100
			Hardness, Total (as CaCO ₃)	10-4000 mg/L	100
			Iron	0-3.0 mg/L	100
			Nitrate, HR (as N)	0-30 mg/L	100
			Nitrite, LR (as N)	0-0.35 mg/L	100
			Oxygen, Dissolved	0-15 mg/L	25
			pH	pH 0-14	—
			Phosphorus, Reactive	0-2.5 mg/L	100
			TDS	10-1990 mg/L	—
			Temperature	-5.0-105 °C	—
			Turbidity	1-1000 FAU	—



The DR/850 Colorimeter is included with our hardworking Freshwater Aquaculture Lab – a great value!

The Safe Drinking Water Lab

Only from Hach! A completely outfitted, portable, cost-effective, and easy-to-use microbiological laboratory. Hach's Safe Drinking Water Laboratory gives you fast, reliable test results for both organic and inorganic water quality parameters. And it includes the only truly portable incubator – plug it in, or run it on battery to incubate samples right in the field. This “lab in a box” is equally effective for professional and grade school investigations of drinking water safety. Now you can seriously evaluate drinking water sources for possible contamination by testing for total coliforms and *E. coli*, free and total chlorine, nitrate, total dissolved solids (TDS), and pH.

MEL P/A Safe Drinking Water Lab #25696-00



Bacteria, Yeast, and Mold Paddle Testers

Hach's innovative Paddle Testers make it simple and safe to test liquids and solid surfaces for suspected bacteria, yeast and mold. See what grows on the Paddle Tester in four easy steps:

1. Remove the paddle from its vial.
2. Press each side of the paddle to the surface to be tested.
3. Return the paddle to its vial and incubate.
4. Count the colonies against the paddle grid.

Every paddle has a double-sided slide of agar (growing medium), backed with a plastic grid and attached to a plastic cap. Three kinds of Paddle Testers let you test for total aerobic bacteria along with: yeast and mold; total coliforms; or disinfection control.

Total Aerobic Bacteria/Yeast and Mold Paddle Tester #26108-10

Total Aerobic Bacteria/Total Coliforms Paddle Tester #26109-10

Total Aerobic Bacteria/Disinfection Control #26195-10



Waterborne Pathogens Tester

Now you can carry out safe and efficient testing for some very nasty stuff: *Salmonella*, *Proteus*, *Klebsiella*,

Citrobacter, *Clostridium*, *Edwardsiella* and other hydrogen sulfide-producing organisms. Hach's unique PathoScreen™ Medium is packaged in pre-measured powder pillows, so all you have to do is empty the pillow into your sample. Next, incubate for 24 to 48 hours, and look for a black color change. It's easy, reliable, inexpensive, and an excellent alternative to coliform testing.

PathoScreen™ Medium P/A Pillows, 100-mL sample, 50/pk #26106-96

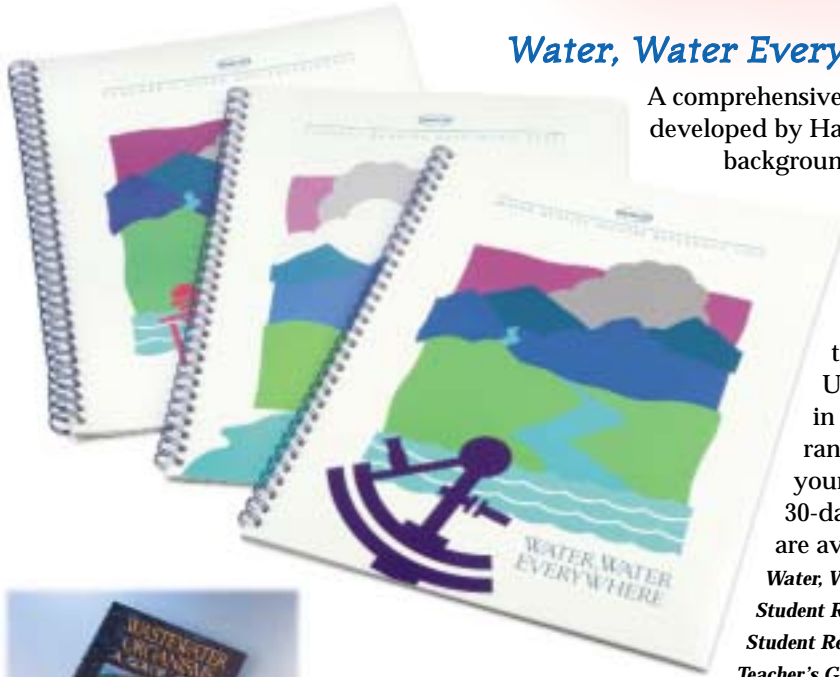


Tips for Teachers

Start your discussion of drinking water safety by testing for total coliforms and *E. coli* to determine if a potable water source has dangerous fecal contamination. Next, test for chlorine to determine if levels of chlorine are available to maintain proper disinfection. Remember, about 0.5 mg/L of free chlorine is needed to kill bacteria without causing water to smell or taste unpleasant. Be sure to test drinking water for pH, because chlorine disinfection becomes less effective as pH levels rise. Determine the nitrate level; over 10 mg/L in drinking water can cause infant death and adult illness. Finally, check TDS measurements for an indication of overall water quality. High TDS suggests high levels of salinity, metals and inorganic compounds.

Test Kits and Supplies	Cat. No.	Grade Level	No. of Tests
Disposable P/A Test	23232-12	3+	12/pk
Disposable P/A Test w/MUG	24016-12	3+	12/pk
Paddle tester:	26195-10	3+	10/pk
Total Aerobic Bacteria/Disinfection Control Paddle tester:	26109-10	3+	10/pk
Total Aerobic Bacteria/Total Coliforms Paddle tester:	26108-10	3+	10/pk
Total Aerobic Bacteria/Yeast and Mold PathoScreen™ Medium P/A Pillows	26106-96	3+	50/pk
Practical Manual of Groundwater Bacteria	26178-00	7+	—
Sampling Bottles w/Dechlorinating Agent (12)	25991-12	3+	12/pk
Whirl-Pak w/Dechlorinating Agent	20753-33	3+	100/pk

Water, Water Everywhere Educator's Package



A comprehensive curriculum on water quality issues and investigation developed by Hach Company. *Water, Water Everywhere* gives educators the background and instructions necessary to design field investigations around pH and acid rain, thermal pollution, coliform bacteria in water, lead in drinking water, groundwater analysis, wastewater treatment, and determination of the health of a stream for fish and aquatic life by measurement of dissolved oxygen. The three-volume package includes the "Student Reading Unit," the "Water Quality Reference Unit," and the "Teacher's Guide." Ideally suited for students in grades 7 through 12, the program features a complete range of hands-on experiments using simple test kits. On your school/organization letterhead, ask us for a FREE, 30-day examination of these materials. Quantity discounts are available.

Water, Water Everywhere complete packet #21976-00

Student Reading Unit #21975-00

Student Reference Unit #21974-00

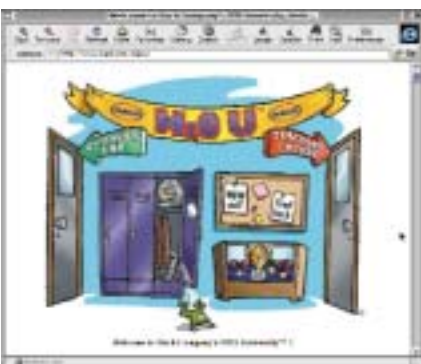
Teacher's Guide #24760-00

Water Handbooks

In *Wastewater Organisms*, you'll find laboratory-quality, color photographs of bacteria, algae, protozoa, invertebrates, and parasites. You

will also learn how to observe and count most wastewater organisms. Written by Sharon G. Berk and John H. Gunderson. #26158-00

D. Roy Cullimore's *Practical Manual of Groundwater Microbiology* addresses a large number of microbial events that can occur in groundwater, including biofouling, corrosivity and biodegradation. #26178-00



Hach Web-Based Support

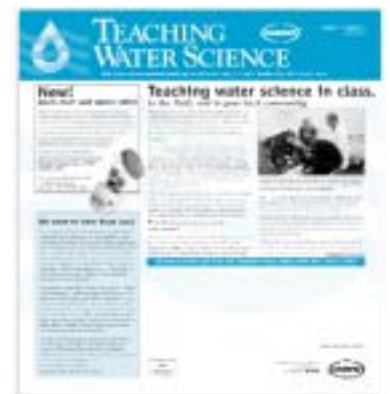
Check out Hach Company's H2O University at www.hach.com/h2ou/.

Dedicated to environmental

and water science education, this web site is a valuable water quality resource for both students and teachers. Come here first for information on water testing, water quality, and important safety information. You'll find the *Teaching Water Science* online newsletter, posters, product information, and lots of links to other environmental education sites. It's free!

Teaching Water Science

Here's a FREE newsletter packed with real life stories from master teachers – sharing their experiences in teaching water science! You can learn what other teachers are doing with water quality testing and benefit from their ideas. Of course, you can also use it as a forum to tell your stories about class explorations in environmental education. For your FREE subscription, just call 1-800-227-HACH. Outside the USA, call 970-669-3050. View the newsletter online at www.hach.com/h2ou/.



Hach Test Kits Are Your Best Choice For The Classroom, Laboratory, And Field!

For More Than 50 Years, educators, scientists, and environmental advocates have trusted the accuracy and reliability of Hach equipment. In fact, Hach was the first to make reliable laboratory testing easy to use, affordable, and available to everyone – regardless of age and ability.

Everything You Need Is Included.

Hach kits are convenient, too. Each kit comes with everything you need to start testing – even flasks and beakers.

They're Economical.

Most Hach kits include enough reagent to carry out 100 tests on each parameter – far more than others. And with the wide range of kit configurations available from Hach, we have a test kit to meet every budget.

Detailed, Easy-To-Follow Instructions.

Even beginners get professional results with Hach's proven methods. Every kit comes with illustrated instructions that guide you through each procedure step by step.

Pre-Measured Reagents.

Hach's powder pillows contain the exact amount of reagent needed for one test. No mixing. No measuring. Just open and pour.

Rugged, Upright Carrying Cases.

Durable, chemical-resistant cases stand up to repeated use and difficult field conditions. No spills! They carry samples and other liquids upright and secure.



Young scientists learn new skills with Hach Color Cubes. Look for the Educator's Color Cube Test Kit on page 12.



Easy-to-use Hach instruments can put powerful data management and accurate results into your hands. Learn more about Hach colorimetric instruments on pages 16 and 17.

Don't See What You Need?

Call to find out about all the other kits we offer! This catalog includes only our most popular kits for education and environmental monitoring. If you can't find the kit you need, give us a call. Chances are we'll be able to ship it to you right away.

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