



# Classroom in a Backpack

**Well constructed lessons and activities**  
**Ideal for on-site measurements**  
**Extensive teachers manual**



 **HANNA**<sup>®</sup>  
instruments  
Laboratory & Industrial Division

# Water Quality Education Test Kit

(HI 3817BP)

## Everything students need to know about environmental water parameters all in one backpack!

Hanna Instruments is now offering a new series of test kits for use by educators and environmental science students. These portable kits are specifically designed for teachers to get the most out of their classroom time with well-constructed lessons and activities. The backpack is designed with all the necessary components in one place, reducing the chance of misplacing an item. The durable backpack is ideal to take out in the field for on-site measurements. The components are tied together by an extensive teachers manual that includes information about each parameter, classroom activities which are designed to introduce students to each parameter, and detailed field-testing procedures.

Using the supplied course of study in correlation with Hanna's parameter test kits and pocket testers, the Water Quality Backpack Lab™ for Education provides teachers with a valuable tool in helping their students assess the water quality of streams, rivers and lakes.

The Hanna Instruments Backpack Lab™ is an example of our innovation and desire to respond to the needs of our customers. Hanna looks forward to supporting teachers with our continuing Backpack Lab™ series.



A complete lesson plan for teachers and students

### Backpack Lab™ Water Quality Education Test Kit Includes:

- 110 tests each for Acidity & Alkalinity, 100 tests for Carbon Dioxide, Dissolved Oxygen, Hardness, Nitrate & Phosphate
- Hanna's pHep®4 waterproof pH/temperature tester
- Hanna's DiST®5 waterproof conductivity/Total Dissolved Solids (TDS) tester
- Secchi disk for turbidity
- Backpack-style carrying case which holds all components of the kit
- 72-page teachers manual with a curriculum that meets National Science Teachers Association Standards
- Overhead transparencies with summaries of each parameter
- Laminated, laboratory instruction cards with step-by-step field-test procedures
- Reproducible lab activity worksheets with instructions, goals, hypothesis, & testing procedure results/observations
- A glossary of key terms for classroom display



# Soil Quality Education Test Kit

(HI 3896BP)

## Explore three macronutrients and three parameters using test kits and meters!

Hanna Instruments introduces the second product in a series of kits specifically assembled for educator and environmental science student use. Using the popular Hanna Agriculture Combination Test Kit as its foundation, the Soil Quality Education Test Kit is designed to provide a complete unit for teachers to introduce students to important chemical tests to evaluate soil quality and fertility and relate these measurements to the principles of plant metabolism. The components are tied together by an extensive Teacher's Guide that includes in-depth background information about each parameter, classroom activities designed to introduce students to each parameter, and detailed field-testing procedures.

By combining Hanna's expertise in developing and manufacturing testing products for industrial applications, this kit addresses important issues related to soil quality and modern agricultural practices. Real-world examples help students to understand the relevance of macronutrients and other parameters in everyday life. The kit is an in-depth introduction to major soil quality topics, all presented in an easy-to-use format that makes lessons understandable and memorable.

### Backpack Lab™ Soil Quality Education Test Kit Includes:

- Agriculture Combination Test Kit for testing Nitrogen, Phosphorus, Potassium (NPK) and pH with enough materials for 50 tests of each parameter
- Hanna's pHep®4 waterproof pH/temperature tester
- Hanna's DiST®5 waterproof conductivity/Total Dissolved Solids (TDS) tester
- Hanna's HI 145 digital thermometer
- Backpack-style carrying case which holds all components of the kit
- 48-page teachers manual with a curriculum that meets National Science Teachers Association Standards
- Overhead transparencies with summaries of each parameter
- Laminated, laboratory instruction cards with step-by-step field-test procedures
- Reproducible lab activity worksheets with instructions, goals, hypothesis, and testing procedure results/observations
- A glossary of key terms for classroom display





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**Water Quality  
Education Test Kit**

**Soil Quality  
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#### HI 3817BP Backpack Lab™ Component Specifications

Chemical Test Kit Parameters	Code	Method	Range	Smallest Increment	Chemical Method	# of tests	Weight
<b>Acidity</b> (as CaCO <sub>3</sub> )	HI 3820	Titration	0-100 mg/L 0-500 mg/L	1 mg/L 5 mg/L	Methyl-orange Phenolphthalein	110	910g
<b>Alkalinity</b> (as CaCO <sub>3</sub> ) Phenolphthalein and total	HI 3811	Titration	0-100 mg/L 0-300 mg/L	1 mg/L 3 mg/L	Phenolphthalein/ Bromphenol blue	110	460g
<b>Carbon Dioxide</b> (as CO <sub>2</sub> )	HI 3818	Titration	0-10.0 mg/L 0-50.0 mg/L 0-100 mg/L	0.1 mg/L 0.5 mg/L 1 mg/L	Phenolphthalein	110	460g
<b>Dissolved Oxygen</b>	HI 3810	Titration	0-10 mg/L 0-5 mg/L	0.1 mg/L 0.05 mg/L	Modified Winkler	110	910g
<b>Hardness</b> (as CaCO <sub>3</sub> )	HI 3812	Titration	0-30 mg/L 0-300 mg/L	0.3 mg/L 3 mg/L	EDTA	100	460g
<b>Nitrate</b> (as NO <sub>3</sub> -N)	HI 3874	Colorimetric	0-50 mg/L	10 mg/L	Cadmium Reduction	100	156g
<b>Phosphate</b> (as orthophosphate PO <sub>4</sub> <sup>3-</sup> )	HI 3833	Colorimetric	0-50 mg/L	10 mg/L	Cadmium Reduction	100	156g

#### HI 3896BP Backpack Lab™ Component Specifications

Agriculture Test Kit Parameters	Code	Method	Range	Chemical Method	# of tests	Weight
<b>Nitrogen</b>	HI 3896	Colorimetric	traces, low, medium, high	Ned	50	1320g
<b>Phosphorus</b>		Colorimetric	traces, low, medium, high	Ascorbic acid	50	
<b>Potassium</b>		Turbidimetric	traces, low, medium, high	Tetraphenylborate	50	
<b>pH</b>		Turbidimetric	from 4 to 9 pH (1 pH increments)	pH indicators	50	

#### HI 145 Thermometer Parameter

Code	Range	Resolution	Accuracy	Probe	Battery Life	Weight
HI 145	-50.0 to 220 °C	0.1 °C (-50.0 to 199.9 °C) 1 °C (200 to 220 °C)	±0.3 °C (-20 to 90 °C) ±0.4 F.S. (outside)	Stainless steel 125 x 5mm (5 x 0.2")	approx. 10,000 hours	65g

#### HI 3817BP/HI 3896BP Backpack Lab™ Component Specifications

pHep™4 pH/Temp tester Parameters	Code	Range	Resolution	Accuracy	Calibration	Battery Life	Weight
<b>pH</b>	HI 98127	0.0 to 14.0	0.1	±0.1	Automatic	Approx. 300 hours	85g
<b>Temperature</b>		-5.0 to 60.0 °C or 23.0 to 140.0 °F	0.1 °C/0.1 °F	±0.5 °C/±1 °F			

#### DIST™5 EC/TDS/Temp Parameters

Code	Range	Resolution	Accuracy	Calibration	Battery Life	Weight
HI 98311	0 to 3999 µS/cm	1 µS/cm	±2% F.S.	Automatic	Approx. 100 hours	85g
<b>TDS</b>	0 to 2000 ppm	1 ppm	±2% F.S.			
<b>Temperature</b>	0.0 to 60.0 °C or 32.0 to 140.0 °F	0.1 °C/0.1 °F	±0.5 °C/±1 °F			

Authorized Distributor

