



# Backpack Lab™



## **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.

HANNA instruments® parameter test kits and pocket testers, provide teachers with a valuable tool in helping 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.

## **Backpack Lab™**

### **Backpack Lab™ Water Quality Educational Test Kit Includes:**

- 110 tests each for acidity and alkalinity, 100 tests for carbon dioxide, dissolved oxygen, hardness, nitrate and phosphate
- pHep®4: water-resistant pH/temperature tester by HANNA instruments®
- DiST®5: water-resistant conductivity and TDS tester by HANNA instruments®
- Secchi disc for turbidity
- Backpack-style carrying case which holds all the components of the kit
- Extensive teachers manual with a curriculum that meets the National Science Teachers Association Standard
- Overhead transparencies with summaries of each parameter
- Laminated instruction cards with step-by-step field test procedures
- Lab activity worksheets with instructions, goals, hypothesis, testing procedure results and comments
- A glossary of key terms for classroom display

## Backpack Lab™

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

- Agriculture combination test kit for testing nitrogen, phosphorous, potassium and pH, with enough materials for 50 tests for each parameter
- **pHep®4**: water-resistant pH/temperature tester by **HANNA instruments®**
- **DiST®5**: water-resistant conductivity and TDS tester by **HANNA instruments®**
- **HANNA instruments®** HI 145 digital thermometer
- Backpack-style carrying case which holds all the components of the kit
- Extensive teachers manual with a curriculum that meets the National Science Teachers Association Standard
- Overhead transparencies with summaries of each parameter
- Laminated instruction cards with step-by-step field test procedures
- Lab activity worksheets with instructions, goals, hypothesis, testing procedure results and comments
- A glossary of key terms for classroom display



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

**HANNA instruments®** introduces the second kit specifically assembled for educator and environmental science student use.

Using the popular **HANNA instruments®** 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 instruments®** 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.

## Specifications

### HI 3817BP Backpack Lab™

Parameter	Code	Method	Range	Smallest Increment	Method	Number of Tests	Weight
Acidity (CaCO <sub>3</sub> )	HI 3820	Titration	0-100 mg/L	1 mg/L	Methyl-orange	110	910 g
			0-500 mg/L	5 mg/L	Phenolphthalein		
Alkalinity (CaCO <sub>3</sub> ) P & Total	HI 3811	Titration	0-100 mg/L	1 mg/L	Phenolphthalein/ Bromphenol blue	110	460 g
			0-300 mg/L	3 mg/L			
Carbon Dioxide (CO <sub>2</sub> )	HI 3818	Titration	0.0-10.0 mg/L	0.1 mg/L	Phenolphthalein	110	460 g
			0.0-50.0 mg/L	0.5 mg/L			
			0-100 mg/L	1 mg/L			
Oxygen, Dissolved	HI 3810	Titration	0.0-10.0 mg/L	0.1 mg/L	Modified Winkler	110	910 g
Hardness (CaCO <sub>3</sub> )	HI 3812	Titration	0.0-30.0 mg/L	0.3 mg/L	EDTA	approx. 100	460 g
			0-300 mg/L	3 mg/L			
Nitrate (NO <sub>3</sub> N)	HI 3874	Colorimetric	0-50 mg/L	10 mg/L	Cadmium reduction	100	156 g
Phosphate (Orthophosphate PO <sub>4</sub> <sup>3-</sup> )	HI 3833	Colorimetric	0-5 mg/L	1 mg/L	Ascorbic acid	100	160 g

pHep®4

Parameter	Code	Range	Resolution	Accuracy	Calibration	Battery Life	Weight
pH	HI 98127	-2.0 to 16.0 pH	0.1 pH	±0.1	Automatic	approx. 300 hours	85 g
Temperature		-5.0 to 60.0°C	0.1°C	±0.5°C			

DiST®5

Parameter	Code	Range	Resolution	Accuracy	Calibration	Battery Life	Weight
EC	HI 98311	0 to 3999 µS/cm	1 µS/cm	±2% F.S.	Automatic	approx. 100 hours	85 g
TDS		0 to 2000 ppm	1 ppm	±2% F.S.			
Temperature		0.0 to 60.0°C	0.1°C	±0.5°C			

### HI 3896BP Backpack Lab™

Parameter	Code	Method	Range	Chemical Method	Number of Tests	Peso
Nitrogen	HI 3896	Colorimetric	Traces, low, medium, high	Ned	50	1320 g
Phosphorus		Colorimetric	Traces, low, medium, high	Ascorbic acid	50	
Potassium		Turbidimetric	Traces, low, medium, high	Tetraphenylborate	50	
pH		Colorimetric	4 to 9 pH (1 pH increments)	pH indicators	50	

HI 145-00 Specifications

	Range	Resolution	Accuracy	Probe	Battery Life	Weight
Temperature	-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. 10000 hours	65 g

pHep®4

Parameter	Code	Range	Resolution	Accuracy	Calibration	Battery Life	Weight
pH	HI 98127	-2.0 to 16.0 pH	0.1	±0.1	Automatic	approx. 300 hours	85 g
Temperature		-5.0 to 60.0°C	0.1°C	±0.5°C			

DiST®5

Parameter	Code	Range	Resolution	Accuracy	Calibration	Battery Life	Weight
EC	HI 98311	0 to 3999 µS/cm	1 µS/cm	±2% F.S.	Automatic	approx. 100 hours	85 g
TDS		0 to 2000 ppm	1 ppm	±2% F.S.			
Temperature		0.0 to 60.0°C	0.1°C	±0.5°C			