

## Appendix A Sensors for Real-World Math

You can purchase the sensors used in this book from Vernier Software & Technology at [www.vernier.com](http://www.vernier.com) or from a distributor for Texas Instruments and Vernier products. The TI CBR 2 is also available directly from Texas Instruments at [education.ti.com](http://education.ti.com) or 1-800-TI-CARES.

<b>Item</b>	<b>Activity</b>	<b>Vernier Order Code</b>
Vernier Motion Detector or TI CBR™2 or Go! Motion	1, 6, 8-14, 19, 21-23, 25, 27, 28, 30	MD-BTD  CBR2  GO-MOT
Microphone	26	MCA-BTA
Dual-Range Force Sensor	2, 4, 8, 9	DFS-BTA
Vernier Light Sensor or TI Light Sensor (packaged with the CBL 2)	16, 24	LS-BTA
Gas Pressure Sensor	3, 5, 15	GPS-BTA
pH Sensor	20, 31	PH-BTA
Voltage Probe (packaged with the CBL 2 and LabPro)	18	VP-BTA
Stainless Steel Temperature Probe or EasyTemp™	7, 17, 29	TMP-BTA  EZ-TMP

### Motion Detectors

The Motion Detector functions like an automatic range finder on a Polaroid camera. This sonar device emits ultrasonic pulses at a rate adjustable between 10 and 50 times per second. The time it takes for the reflected pulses to return is used to calculate distance, velocity, and acceleration.

The CBR 2 works precisely like the Motion Detector and has the added capability of connecting directly to a TI Graphing Calculator.

## **Microphone**

The Vernier Microphone is housed in a wand, with an electret microphone positioned at the end. Use it to display and study the waveform of sounds from voices, musical instruments, or tuning forks.

## **Dual-Range Force Sensor**

This affordable force sensor has two ranges: -10 to +10 N and -50 to +50 N. It can be easily mounted on a ring stand or dynamics cart, or used as a replacement for a spring scale. Use it to study friction, simple harmonic motion, impact in collisions, or centripetal force.

## **Light Sensors**

The Vernier Light Sensor approximates the human eye in spectral response and can be used over three different illumination ranges, selected with a switch. It can be used for inverse square law experiments or for studying solar energy.

The TI light sensor measures irradiance. The sensor's spectral response is between 300 nm and 1100 nm.

## **Gas Pressure Sensor**

The Vernier Gas Pressure Sensor has a range of 0 to 210 kPa, or about 2.1 atmospheres. It includes an accessory kit consisting of a syringe for Boyle's law experiments, tubing, connectors, and rubber stoppers.

## **pH Sensor**

The pH Sensor is a Ag/AgCl combination electrode sensor with a range of 0 to 14 pH units.

## **Voltage Probe**

The Voltage Probe is included with the LabPro and CBL 2 interfaces, and is used to measure electrical potential between -10 and 10 V.

## **Temperature Probes**

The Stainless Steel Temperature Probe is an accurate, durable, and inexpensive thermistor based sensor for measuring temperature. Range: -25°C to +125°C

The EasyTemp is a sensitive and durable solid state temperature sensor designed to connect directly to the mini USB port found on the TI-84 Plus graphing calculators. Range: -10°C to +110°C.