



**Engage the  
Scientists and Engineers  
of Tomorrow**

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Vernier Software started in 1981 as a two-person, part-time company run by a physics teacher and a social worker. Today we have 110 employees, and we sell in over 150 countries. We are proud to celebrate our 40th year in 2021!

Last year in this catalog letter, we made a comment about “living in interesting times.” We were just talking about the complications of tariffs on our pricing. Now, in 2021, we are all really living through interesting times! With all the disruption of our business, we are pleased to say that we have been able to retain all of our employees (while working mostly from home). We have changed the way we do a lot of things, but like you, we are adapting.

When schools shut down in March, we quickly posted free experiment data so instructors would have something to share with students as they improvised ways to teach science remotely. And we literally pivoted—with Pivot Interactives—one of the best and most popular products for remote learning.

We now have a great collection of software tools for teaching science remotely, and they all work on Chromebooks, as well as computers and tablets. Our new Vernier Graphical Analysis Pro app includes data from many of the experiments in our lab books with videos taken of the procedure during data collection. With the Vernier Video Analysis app, students can take videos with their cell phones and analyze their motion data. If you have not tried out these programs, please do. All are available for a free 30-day trial.

And as we do every year, we have introduced some new Go Direct sensors. This year we added the Go Direct Weather System, Go Direct Thermocouple, Go Direct Static Charge, and Go Direct Platinum-Cell Conductivity.

And finally, we are excited to celebrate our 40th year with the introduction of LabQuest 3! It is a major upgrade to our LabQuest line of handheld data-collection tools with a large screen and advanced touch-screen abilities.

We know school budgets will be affected by COVID-19 this year, and we have decided not to raise prices on Vernier products. We encourage you to give our products a try on a 30-day (or longer) preview basis. Feel free to contact any of us personally at any time.

Stay positive and test negative!

John Wheeler  
CEO  
[jwheeler@vernier.com](mailto:jwheeler@vernier.com)

Dave and Christine Vernier  
Co-Presidents  
[dvernier@vernier.com](mailto:dvernier@vernier.com) and [cvernier@vernier.com](mailto:cvernier@vernier.com)



## Why Vernier? Endless Possibilities.

Our durable hardware and quality software are designed and priced for hands-on student use whether learning remotely or in the laboratory. We have ready-to-go experiments and resources in a wide variety of subjects, including

BIOLOGY • CHEMISTRY • PHYSICS • ENGINEERING  
AGRICULTURAL SCIENCE • ENVIRONMENTAL SCIENCE • PHYSIOLOGY

Our sensors and data-collection technology are so versatile that you can use them in nearly any science or engineering course.

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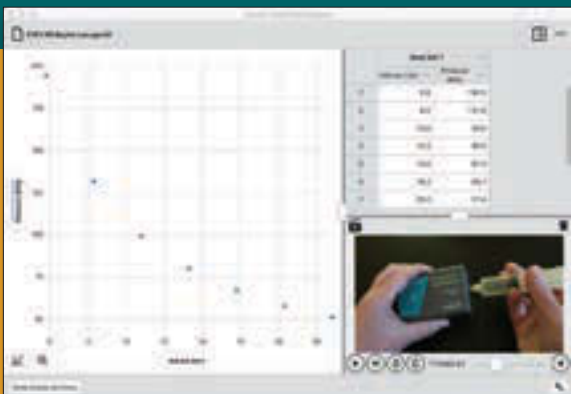
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## What's New?



### Vernier Graphical Analysis Pro

#### Meet Our Newly Enhanced App: Vernier Graphical Analysis™ Pro

We reimagined our award-winning Vernier Graphical Analysis™ app to meet the needs of today's educators. The Pro version features the ability for you and your students to perform live experiments and share the data over the internet in real time. Whether learning happens remotely or in person, your students can experience real experiments and think critically as they analyze and graph data.

As always, our solutions are supported by resources to help you teach. This app comes with dozens of experiment videos that include sample data and provides interactive graphing capabilities. Sign up for a free 30-day trial today!

Learn more at [vernier.com/graphical-analysis-pro](https://www.vernier.com/graphical-analysis-pro)

### Remote Learning Solutions



As the COVID-19 pandemic continues to disrupt education systems around the world, we want you to know we're here for you. We've worked hard to ensure you have the best resources to keep your students engaged with science as they learn remotely.

Learn more at [vernier.com/college-rls](https://www.vernier.com/college-rls)

### LabQuest 3



**LabQuest 3 is a powerful, advanced, easy-to-navigate, and versatile data-logging solution for STEM students.**

The all-new LabQuest® 3 is a standalone data-collection platform that students can use to collect, analyze, and interact with data efficiently. With its new touch-screen abilities, students can navigate the platform with ease, and because of its wireless capabilities, students can collect data anywhere.

Learn more at [vernier.com/labq3](https://www.vernier.com/labq3)

### Sensors



#### Go Direct Static Charge

Perform quantitative measurements of static charges with enhanced accuracy and performance. Learn more at

[vernier.com/gdx-q](https://www.vernier.com/gdx-q)



#### Go Direct Thermocouple

Collect reliable data during experiments that involve extreme temperatures. Learn more at

[vernier.com/gdx-tc](https://www.vernier.com/gdx-tc)



#### Go Direct Platinum-Cell Conductivity

Measure conductivity with greater accuracy and chemical compatibility. Learn more at

[vernier.com/gdx-conpt](https://www.vernier.com/gdx-conpt)



#### Go Direct Weather System

Easily monitor a wide variety of environmental factors with just one sensor. Learn more at

[vernier.com/gdx-wtva](https://www.vernier.com/gdx-wtva)



Students don't learn effectively by just sitting and listening—they need to be consistently engaged in what they are learning about. As educators, we are always looking for ways to optimize the learning experience for our students, especially in today's increasingly remote environment.

*David Craig,  
Oregon State University*

### Join these institutions, and hundreds of others, already using Vernier technology:

Arizona State University	McGill University	University of Cambridge
Baltimore City Community College	Miami University	University of Chicago
Benedictine University	Michigan Technological University	University of Hong Kong
California State University—Fullerton	Mississippi State University	University of Kansas
Cameron University	National University of Colombia	University of Minnesota—Minneapolis
Canisius College	National University of Singapore	University of Nebraska—Lincoln
Charles University	Oregon State University	University of Pennsylvania
Colorado School of Mines	Princeton University	University of Puerto Rico
Cornell University	Queensborough Community College	University of Sydney
Cuyahoga Community College	Quinnipiac University	University of Tennessee—Chattanooga
Delft University of Technology	Saint Mary's University	University of Toronto
Dickinson College	Stanford University	University of Washington
ETH Zurich	Stephen F. Austin State University	University of Wisconsin—Madison
Georgia Tech	Sungkyunkwan University	Vincennes University
Harvard University	TEC Monterrey	Virginia Commonwealth University
Haskell Indian Nations University	Texas A&M	Wake Technical Community College
Immaculata University	The Ohio State University	West Virginia Wesleyan College
Lehigh University	University of Arizona	Yale University
Lund University	University of British Columbia	
Massachusetts Institute of Technology	University of California—Berkeley	





# Biology

[vernier.com/biology](https://www.vernier.com/biology)

## Why Vernier?

Vernier biology solutions help students form a deep understanding of key scientific concepts. Whether you are introducing your students to enzymes or exploring primary productivity, our probeware and ready-to-go experiments are the right fit for your laboratory.

### Quality

Durable hardware for lab and field use

### Affordable

Designed for education and educational budgets

### Versatile

Supports a variety of devices and experiments



Your great products and superb support of them have been a major part of my labs and are very much appreciated.

*David Willey*  
*University of Pittsburgh*

# A Guide to Vernier Data Collection

We're here to support you as an educator as you incorporate data-collection technology into your instruction. See how our products provide you with affordable laboratory solutions designed for student success.

Our Guarantee: Most of our products are protected by a 5-year limited warranty. And after five years? We'll make every attempt to repair your equipment.

GDx

## What You Need to Get Started with Go Direct Sensors

### Go Direct Sensor

These versatile sensors connect to your device via Bluetooth® wireless technology or USB.

### Device

Go Direct® sensors connect to a wide variety of commonly used devices, including Chromebooks, computers, tablets, smartphones, and LabQuest 3.

### Software

Vernier Graphical Analysis™ Pro  
Vernier Spectral Analysis®

### Lab Book

Our popular, award-winning lab books provide hundreds of well-tested, customizable experiments. Our lab books come with a generous site license—purchase once and share files across your department.

LQ

## What You Need to Get Started with LabQuest 3

### Sensor

#### Go Direct Sensor

These versatile sensors connect to LabQuest® 3 via Bluetooth wireless technology or USB.

#### LabQuest Sensor

LabQuest sensors connect directly to LabQuest 3 sensor ports (BTA/BTD).

### LabQuest 3

LabQuest 3 serves as a standalone data-collection platform that works with all Vernier sensors.

### Software

LabQuest App

### Lab Book

Our popular, award-winning lab books provide hundreds of well-tested, customizable experiments. Our lab books come with a generous site license—purchase once and share files across your department.

## Software

### Vernier Spectral Analysis

GDx LQ

Spectral Analysis supports our family of spectrometers on computers, Chromebooks, and compatible mobile devices. Use it to generate full spectra, create standard curves, and conduct kinetics experiments.

### LabQuest App

LQ

LabQuest 3 has built-in software that gives your students real-time graphing capabilities in a handheld device. It's powerful, yet beautifully simple.

NEW

### Vernier Graphical Analysis Pro

GDx LQ

We are enhancing our award-winning Vernier Graphical Analysis™ app with advanced features that support remote learning and more advanced analysis of experiment data.

#### Free Trial for Educators

Try out Graphical Analysis Pro for free for 30 days. Access the sample experiments and enhanced analysis tools to use it with your students.

Get a free trial and learn about site license options at [www.vernier.com/graphical-analysis-pro](http://www.vernier.com/graphical-analysis-pro)



## Partnerships

### LabArchives

We have partnered with LabArchives to bring high-quality biology content to instructors through the Lab Builder library. Because all content is structured and standardized, instructors can arrange, customize, and add content to their courses with ease. [Learn more at vernier.com/lab-archives](http://www.vernier.com/lab-archives)

### ADInstruments

We have partnered with ADInstruments to provide state-of-the-art, customizable biology content using ADInstruments' platform, Lt. This platform supports real-time data collection and analysis with many Vernier sensors and includes instructional videos, quizzes, and classroom management tools. [Learn more at vernier.com/adinstruments](http://www.vernier.com/adinstruments)

**Free 30-Day  
Preview**

Not sure if our technology is right for your laboratory? Our risk-free preview program makes it easier to decide. Most Vernier products are available for a 30-day preview (or longer, if requested) to educational institutions.

# General Biology

## Go Direct CO<sub>2</sub> Gas

This sensor measures gaseous carbon dioxide concentration levels, air temperature, and relative humidity. With built-in temperature compensation and humidity protection, this sensor is ideal for measuring fermentation, respiration, and photosynthesis.

GDX-CO2 \$199

[vernier.com/gdx-co2](http://vernier.com/gdx-co2)

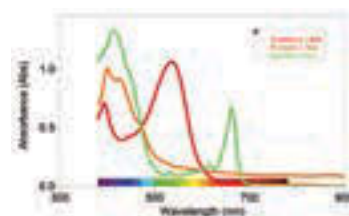


## Go Direct SpectroVis® Plus

Use this spectrophotometer to collect a full-wavelength spectrum (absorbance, percent transmittance, fluorescence, or intensity), study absorbance vs. concentration (create standard curves), or monitor enzyme activity (enzyme kinetics).

GDX-SVISPL \$399

[vernier.com/gdx-svispl](http://vernier.com/gdx-svispl)



**Vernier Spectral Analysis**

FREE DOWNLOAD

Learn more on page 7.

## Go Direct Tris-Compatible Flat pH

Use this sensor to measure the pH of solutions. It features a sealed, gel-filled, double-junction electrode, making it compatible with Tris buffers and solutions containing proteins or sulfides.

GDX-FPH \$115

[vernier.com/gdx-fph](http://vernier.com/gdx-fph)



## Go Direct Optical Dissolved Oxygen

Use this sensor to measure dissolved oxygen, water temperature, and atmospheric pressure. It's ideal for experiments in biology, ecology, and environmental science.

GDX-ODO \$298

[vernier.com/gdx-odo](http://vernier.com/gdx-odo)



## Biology with Vernier

This book includes 31 experiments for fundamental concepts in biology. The instructor information section included for each experiment contains reagent preparation information, sample data, and tips for successful completion.

Topics

- Cell respiration
- Membrane diffusion
- Osmosis
- Photosynthesis and transpiration
- Human physiology

[www.vernier.com/bwv](http://www.vernier.com/bwv)



**Download only**

BWV-E \$40

**Printed book +**

**download**

BWV \$48

## Investigating Biology through Inquiry

This book includes 22 investigations for many fundamental concepts in biology. Each investigation includes a preliminary activity, instructor information, sample researchable questions, and sample data.

Topics

- Cell and molecular biology
- Organismal biology
- Ecology
- Evolution

[vernier.com/bio-i](http://vernier.com/bio-i)



**Download only**

BIO-I-E \$40

**Printed book +**

**download**

BIO-I \$48

## Biology Go Direct Starter Package

Learn more at  
[vernier.com/gdp-bio-st](http://vernier.com/gdp-bio-st)

This package includes four sensors, which all work with our free Vernier Graphical Analysis app, as well as Graphical Analysis Pro and LabQuest 3.

- Go Direct Temperature
- Go Wireless® Heart Rate
- Go Direct Gas Pressure
- Go Direct CO<sub>2</sub> Gas

GDP-BIO-ST \$446



# Human Physiology

## Go Direct EKG

Use Go Direct® EKG to record electrical activity of the heart or skeletal muscles.

GDX-EKG \$159 [vernier.com/gdx-ekg](http://vernier.com/gdx-ekg)



## Go Direct Hand Dynamometer

Measure grip and pinch strength, and perform muscle fatigue studies.

GDX-HD \$109 [vernier.com/gdx-hd](http://vernier.com/gdx-hd)



## Go Direct Respiration Belt

Use this sensor to measure human respiration rate and study breathing patterns.

GDX-RB \$99

[vernier.com/gdx-rb](http://vernier.com/gdx-rb)



## Go Direct Spirometer

This multi-channel sensor can be used to measure tidal volume, vital capacity, flow rate, air pressure, and respiration rate.

GDX-SPR \$199

[vernier.com/gdx-spr](http://vernier.com/gdx-spr)



## Go Direct O<sub>2</sub> Gas

Use this sensor to measure gaseous oxygen concentration levels and air temperature.

GDX-O2 \$189

[vernier.com/gdx-o2](http://vernier.com/gdx-o2)



## Go Direct Blood Pressure

This affordable, non-invasive sensor is designed to easily measure human blood pressure.

GDX-BP \$105 [vernier.com/gdx-bp](http://vernier.com/gdx-bp)



## Human Physiology Experiments: Volume 1

This book contains 14 experiments that encourage students to investigate the physiology of the cardiac, muscular, respiratory, vascular, and nervous systems using Go Direct sensors.

[vernier.com/hsb-hp](http://vernier.com/hsb-hp)



**Download only**

HSB-HP-E \$30

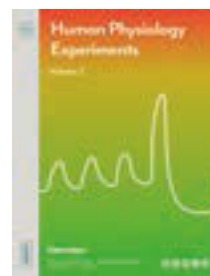
**Printed book + download**

HSB-HP \$38

## Human Physiology Experiments: Volume 2

An expansion of our *Human Physiology Experiments: Volume 1* lab book, the setup for these experiments is minimal—students are collecting data within minutes.

[vernier.com/alb-hp2](http://vernier.com/alb-hp2)



**Download only**

ALB-HP2-E \$30

**Printed book + download**

ALB-HP2-E \$38

## Human Physiology Go Direct Standard Package

This package includes 11 products that all work with our free Vernier Graphical Analysis™ app, as well as Graphical Analysis Pro and LabQuest® 3.

- Go Direct EKG
- Go Direct Force and Acceleration
- Go Direct Surface Temperature
- Go Direct Hand Dynamometer
- Go Direct Respiration Belt
- Go Direct O<sub>2</sub> Gas
- Go Direct Blood Pressure
- Go Direct Spirometer
- Go Wireless® Heart Rate
- Reflex Hammer Accessory Kit
- BioChamber 250 ⚡

GDP-HP-DX ⚡ \$1,164

Buy 8 or more packages at \$1,129 and save \$280.

**Learn more at**  
[vernier.com/gdp-hp-dx](http://vernier.com/gdp-hp-dx)

**Starter package also available**



⚡ For California Proposition 65 warning, see page 36.



# Biotechnology

## Spectrometers

### Go Direct SpectroVis® Plus

Use this spectrophotometer to collect a full-wavelength spectrum (absorbance, percent transmittance, fluorescence, or intensity), study absorbance vs. concentration (create standard curves), or monitor enzymatic activity (enzyme kinetics).

GDX-SVISPL \$399

[vernier.com/gdx-svispl](http://vernier.com/gdx-svispl)



### Vernier UV-VIS Spectrophotometer

This ultraviolet and visible light spectrophotometer is used to measure the absorbance spectra of various chemical and biochemical compounds such as DNA, proteins, and NADH.

VSP-UV \$2,100

[vernier.com/vsp-uv](http://vernier.com/vsp-uv)

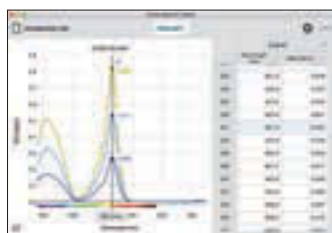


### Vernier Fluorescence/UV-VIS Spectrophotometer

This spectrophotometer measures the fluorescence and absorbance spectra of ultraviolet and visible samples such as quinine sulfate, fluorescein, rhodamine, and DAPI.

VSP-FUV \$2,899

[vernier.com/vsp-fuv](http://vernier.com/vsp-fuv)



## Vernier Spectral Analysis®

Our free Spectral Analysis app makes it easy to incorporate spectroscopy into your general biology and biotechnology experiments. Using the app, students can collect a full spectrum and explore topics such as plant pigments, enzyme kinetics, and Beer's law (standard curves).

FREE DOWNLOAD [vernier.com/spectral-analysis](http://vernier.com/spectral-analysis)

## Go Direct Tris-Compatible Flat pH

This pH sensor features a sealed, gel-filled, double-junction electrode, making it compatible with Tris buffers and solutions containing proteins or sulfides.

GDX-FPH \$115

[vernier.com/gdx-fph](http://vernier.com/gdx-fph)



## BlueView™ Transilluminator

This transilluminator uses super bright blue LEDs to illuminate electrophoresis gels stained with fluorescent dyes (e.g., SYBR® Safe). This combination is a safer alternative to ethidium bromide and a UV transilluminator.

BLUE-VIEW ⬆ \$419 [vernier.com/blue-view](http://vernier.com/blue-view)



## Stir Station

This combination stir plate/ring stand can be used with AC power (included) or four C batteries (not included).

STIR \$129 [vernier.com/stir](http://vernier.com/stir)



## OHAUS Scout Balances

Collect mass data from OHAUS Scout® balances using Logger Pro® 3 software or LabQuest 3. (OHAUS Scout USB Cable is required and not included.)

[vernier.com/ohaus](http://vernier.com/ohaus)



## Vernier and Bio-Rad Laboratories

Bio-Rad® combines high-quality supplies, equipment, and curricula with outstanding customer service and technical support—things we believe are important to teachers. Vernier and Bio-Rad enhance classroom experiences with joint experiments and curricula for biotechnology.

Download free sample experiments at [vernier.com/bio-rad-kits](http://vernier.com/bio-rad-kits)

# Environmental Science

## Go Direct Optical Dissolved Oxygen

Use this sensor to measure dissolved oxygen, water temperature, and atmospheric pressure. It is ideal for experiments in environmental science.

GDX-ODO \$298

[vernier.com/gdx-odo](http://vernier.com/gdx-odo)



## Go Direct Conductivity

Use this sensor to measure total dissolved solids (TDS) in aquatic samples or the salinity of soil samples.

GDX-CON \$99

[vernier.com/gdx-con](http://vernier.com/gdx-con)



## Go Direct Temperature

This rugged probe measures the temperature of a variety of substances including air, soil, and water.

Range: -40 to 125°C

GDX-TMP \$69

[vernier.com/gdx-tmp](http://vernier.com/gdx-tmp)



## Go Direct Tris-Compatible Flat pH

The flat glass shape of this pH sensor is more durable and easier to clean than the traditional pH bulb shape, making it the best choice for environmental science.

GDX-FPH \$115

[vernier.com/gdx-fph](http://vernier.com/gdx-fph)



## Go Direct Nitrate Ion-Selective Electrode

Use this sensor to measure nitrate concentration in water samples from water sources throughout your watershed.

GDX-NO3 \$249

[vernier.com/gdx-no3](http://vernier.com/gdx-no3)



## Go Direct Energy

Simpler to use than a multimeter, Go Direct® Energy measures the voltage and current output of a renewable energy system. Connect a source, such as a small wind turbine or solar panel, and our Vernier Graphical Analysis™ or Graphical Analysis Pro app displays voltage, current, power, and energy output.

GDX-NRG \$89

[vernier.com/gdx-nrg](http://vernier.com/gdx-nrg)



## NEW LabQuest 3

**LabQuest 3 is a powerful, advanced, easy-to-navigate, and versatile data-logging solution for STEM students.**

The all-new LabQuest® 3 is a standalone data-collection platform that students can use to collect, analyze, and interact with data efficiently. With its new touch-screen abilities, students can navigate the platform with ease, and because of its wireless capabilities, students can collect data anywhere.

LABQ3 \$339

[vernier.com/labq3](http://vernier.com/labq3)



## LabQuest App

LabQuest 3 has built-in software that gives your students real-time graphing capabilities in a handheld device. It's powerful, yet beautifully simple.

## NEW Go Direct Weather System

Easily monitor a wide variety of environmental factors with just one sensor.

Go Direct Weather System includes an affordable, wireless handheld sensor that measures ambient temperature, humidity, wind speed, wind chill, dew point, barometric pressure, and more. The included Go Direct Weather Vane accessory is required to report wind direction. Mounting Go Direct Weather System on a tripod is recommended (tripod not included).

GDX-WTVA \$128

[vernier.com/gdx-wtva](http://vernier.com/gdx-wtva)



## Davis Vantage Vue Weather Station

The wireless Davis® Vantage Vue® weather station provides accurate, reliable weather monitoring in a self-contained, easy-to-install system.

[vernier.com/weather](http://vernier.com/weather)



## Go Direct Sensor Clamp

Prevent accidental drops during field investigations with the Go Direct Sensor Clamp.

GDX-CLAMP \$12

[vernier.com/gdx-clamp](http://vernier.com/gdx-clamp)



## Renewable Energy with Vernier

The *Renewable Energy with Vernier* lab book features 26 experiments in wind and solar energy. The book contains a combination of explorations, classic experiments, inquiry investigations, engineering projects, and more.



**Download only**  
REV-E \$40

**Printed book + download**  
REV \$48

[vernier.com/rev](http://vernier.com/rev)

## Investigating Environmental Science through Inquiry

This book contains 34 inquiry-based environmental science investigations.\* Topics include Earth systems and resources, the living world, global change and population, energy resources and consumption, and pollution.



**Download only**  
ESI-E \$40

**Printed book + download**  
ESI \$48

[vernier.com/esi](http://vernier.com/esi)

## Water Quality with Vernier

With the 18 tests in *Water Quality with Vernier*,\* students investigate the water quality of a body of water by testing pH, total dissolved solids, dissolved oxygen, BOD, and more.



**Download only**  
WQV-E \$40

**Printed book + download**  
WQV \$48

[vernier.com/wqv](http://vernier.com/wqv)

\* Instructions for Vernier Graphical Analysis app are not yet available.

# Biology Products

## Go Direct Sensors

Product	Order Code	Price
Go Direct® Blood Pressure	GDX-BP	\$105
Go Direct CO <sub>2</sub> Gas	GDX-CO2	\$199
Go Direct Colorimeter	GDX-COL	\$119
Go Direct Conductivity	GDX-CON	\$99
Go Direct EKG	GDX-EKG	\$159
Go Direct Ethanol Vapor	GDX-ETOH	\$149
Go Direct Energy	GDX-NRG	\$89
Go Direct Force and Acceleration	GDX-FOR	\$99
Go Direct Gas Pressure	GDX-GP	\$89
Go Direct Hand Dynamometer	GDX-HD	\$109
Heart Rate Monitors		
Go Wireless Exercise Heart Rate	GW-EHR	\$79
Go Wireless® Heart Rate	GW-HR	\$89
Ion-Selective Electrodes		
Go Direct Ammonium Ion-Selective Electrode	GDX-NH4	\$249
Go Direct Nitrate Ion-Selective Electrode	GDX-NO3	\$249
Go Direct Light and Color	GDX-LC	\$79
Go Direct O <sub>2</sub> Gas	GDX-O2	\$189
Go Direct Optical Dissolved Oxygen	GDX-ODO	\$298
pH Sensors		
Go Direct pH	GDX-PH	\$89
Go Direct Tris-Compatible Flat pH	GDX-FPH	\$115
Go Direct Respiration Belt	GDX-RB	\$99
Spectrophotometers		
Go Direct SpectroVis® Plus	GDX-SVISPL	\$399
Vernier Fluorescence/UV-VIS Spectrophotometer	VSP-FUV	\$2,899
Vernier UV-VIS Spectrophotometer	VSP-UV	\$2,100
Go Direct Spirometer	GDX-SPR	\$199
Temperature Probes		
Go Direct Surface Temperature	GDX-ST	\$79
Go Direct Temperature	GDX-TMP	\$69
Go Direct Wide-Range Temperature	GDX-WRT	\$114
Go Direct Weather	GDX-WTHR	\$99
Go Direct Weather System	GDX-WTVA	\$128

## LabQuest Sensors

Product	Order Code	Price
PAR Sensor	PAR-BTA	\$229
Relative Humidity Sensor	RH-BTA	\$69
Salinity Sensor	SAL-BTA	\$119
Soil Moisture Sensor	SMS-BTA	\$109
Turbidity Sensor	TRB-BTA	\$112

## Accessories and Lab Equipment

Product	Order Code	Price
BioChamber 250 ⚠	BC-250	\$8
BioChamber 2000 ⚠	BC-2000	\$22
BlueView Transilluminator ⚠	BLUE-VIEW	\$419
Disposable Bacteria Filters (pkg. of 10)	SPR-FIL10	\$45
Disposable Mouth Pieces (pkg. of 30)	SPR-MP30	\$15
EKG Electrodes (pkg. of 100)	ELEC	\$15
Go Direct Charge Station	GDX-CRG	\$69
Go Direct Sensor Clamp	GDX-CLAMP	\$12
Nose Clip (pkg. of 10)	SPR-NOSE10	\$10
OHAUS® Balances ⚠	vernier.com/ohaus	
Primary Productivity Kit	PPK	\$44
Reflex Hammer Accessory Kit	RFX-ACC	\$29
Stir Station	STIR	\$129
Water Depth Sampler	WDS	\$89
Water Quality Bottles	WQ-BOT	\$28

## Lab Books\*

Product	Order Code	Price
<i>Biology with Vernier</i>	BWV	\$48
<i>Investigating Biology through Inquiry</i>	BIO-I	\$48
<i>Advanced Biology with Vernier</i>	BIO-A	\$48
<i>Human Physiology Experiments: Volume 1</i>	HSB-HP	\$38
<i>Human Physiology Experiments: Volume 2</i>	ALB-HP2	\$38
<i>Investigating Environmental Science through Inquiry</i>	ESI	\$48
<i>Renewable Energy with Vernier</i>	REV	\$48
<i>Water Quality with Vernier</i>	WQV	\$48

\* Includes printed book and download; also available as a download only



Learn more about Pivot Interactives and start a free 30-day trial\* at [pivotinteractives.com](https://pivotinteractives.com)

\* Not available in countries subject to GDPR

See all our products for biology at [vernier.com/biology](https://vernier.com/biology)

# Chemistry

[vernier.com/chemistry](https://www.vernier.com/chemistry)

## Why Vernier?

When you teach with Vernier, you're teaching with a complete chemistry solution. From titrations to spectroscopy, our sensors and instrumentation are backed by powerful analytical software, college-level experiments, and unparalleled support.

### Quality

Durable hardware for lab and field use

### Affordable

Designed for education and educational budgets

### Versatile

Supports a variety of devices and experiments



The use of these technologies helps to build students' proficiency using instrumentation while providing them with hands-on experience that will better prepare them for careers in the chemistry field.

*Seth Barrett, Ph.D.  
Muskingum University*





# A Guide to Vernier Data Collection

We're here to support you as an educator as you incorporate data-collection technology into your instruction. See how our products provide you with affordable laboratory solutions designed for student success.

Our Guarantee: Most of our products are protected by a 5-year limited warranty. And after five years? We'll make every attempt to repair your equipment.

## GD<sup>X</sup> What You Need to Get Started with Go Direct Sensors

### Go Direct Sensor

These versatile sensors connect to your device via Bluetooth® wireless technology or USB.

### Device

Go Direct® sensors connect to a wide variety of commonly used devices, including Chromebooks, computers, tablets, smartphones, and LabQuest 3.

### Software

Vernier Graphical Analysis™ Pro  
Vernier Spectral Analysis®  
Vernier Instrumental Analysis™

### Lab Book

Our popular, award-winning lab books provide hundreds of well-tested, customizable experiments. Our lab books come with a generous site license—purchase once and share files across your department.

## LQ What You Need to Get Started with LabQuest 3

### Sensor

#### Go Direct Sensor

These versatile sensors connect to LabQuest® 3 via Bluetooth wireless technology or USB.

#### LabQuest Sensor

LabQuest sensors connect directly to LabQuest 3 sensor ports (BTA/BTD).

### LabQuest 3

LabQuest 3 serves as a standalone data-collection platform that works with all Vernier sensors.

### Software

LabQuest App

### Lab Book

Our popular, award-winning lab books provide hundreds of well-tested, customizable experiments. Our lab books come with a generous site license—purchase once and share files across your department.

## Software

### Vernier Spectral Analysis GD<sup>X</sup> LQ

Vernier Spectral Analysis supports our family of spectrometers. Use it to generate full spectra, conduct Beer's law investigations, and investigate kinetics.

### Vernier Instrumental Analysis GD<sup>X</sup> LQ

Vernier Instrumental Analysis is used for more advanced instrumentation such as Go Direct Mini GCTM, Go Direct Polarimeter, and Go Direct Cyclic Voltammetry System.

### Logger Pro 3 LQ

Logger Pro 3 is our data-collection and analysis software for LabQuest sensors and spectrometers on Windows® and macOS® computers.

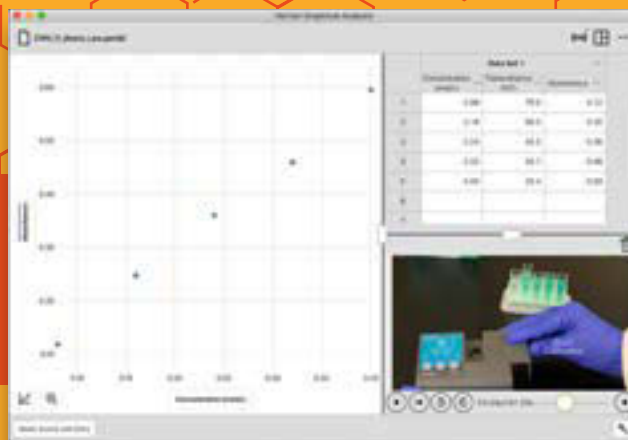
### NEW

### Vernier Graphical Analysis Pro GD<sup>X</sup> LQ

We are enhancing our award-winning Vernier Graphical Analysis app with advanced features that support remote learning and more advanced analysis of experiment data.

#### Free Trial for Educators

Try out Graphical Analysis Pro for free for 30 days. Access the sample experiments and enhanced analysis tools to use it with your students.  
**Get a free trial and learn about site license options at [vernier.com/graphical-analysis-pro](https://www.vernier.com/graphical-analysis-pro)**



## Partnerships

### LabArchives

We have partnered with LabArchives to bring high-quality chemistry content to instructors through the Lab Builder library. Because all content is structured and standardized, instructors can arrange, customize, and add content to their courses with ease.

**Learn more at [vernier.com/lab-archives](https://www.vernier.com/lab-archives)**

### ADInstruments

We have partnered with ADInstruments to provide state-of-the-art, customizable chemistry content using ADInstruments' platform, Lt. This platform supports real-time data collection and analysis with many Vernier sensors and includes pre- and post-lab questions and classroom management tools. **Learn more at [vernier.com/adinstruments](https://www.vernier.com/adinstruments)**

**Free 30-Day  
Preview**

Not sure if our technology is right for your laboratory? Our risk-free preview program makes it easier to decide. Most Vernier products are available for a 30-day preview (or longer, if requested) to educational institutions.

# General Chemistry

## Go Direct Temperature

Use this rugged temperature probe for investigating endothermic and exothermic reactions, determining the physical properties of water, and investigating intermolecular forces.

Range:  $-40$  to  $125^{\circ}\text{C}$

GDX-TMP \$69

[vernier.com/gdx-tmp](http://vernier.com/gdx-tmp)



## Go Direct pH

Go Direct pH is an important and versatile sensor for your laboratory. Conduct acid-base titrations, monitor pH changes during chemical reactions, and investigate buffers. The wireless connection makes it easier to do field-based studies such as testing the pH of surface water.

GDX-PH \$89

[vernier.com/gdx-ph](http://vernier.com/gdx-ph)



## Go Direct Gas Pressure

Explore gas laws and the Clausius-Clapeyron equation with this sensor that measures the absolute pressure of a gas.

GDX-GP \$89

[vernier.com/gdx-gp](http://vernier.com/gdx-gp)



## Go Direct SpectroVis® Plus

With a range of 380 to 950 nm, students can use this spectrophotometer to easily collect a full-wavelength spectrum, study absorbance vs. concentration, or monitor rates of reaction. Collect and analyze data using Vernier Spectral Analysis, LabQuest App, or Logger Pro® 3.

GDX-SVISPL \$399

[vernier.com/gdx-svispl](http://vernier.com/gdx-svispl)



## Go Direct Drop Counter

As an alternative to using a buret, the drop counter precisely records the number of drops of titrant added during a titration and then automatically converts it to volume.

GDX-DC \$99

[vernier.com/gdx-dc](http://vernier.com/gdx-dc)



## Stir Station

This combination stir plate/ring stand can be used with AC power (included) or four C batteries (not included).

STIR \$129

[vernier.com/stir](http://vernier.com/stir)



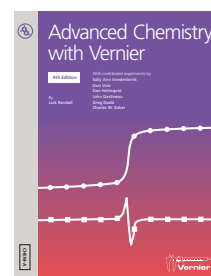
## Advanced Chemistry with Vernier

This book contains 35 ready-to-use student experiments that support general chemistry. Instructor notes with sample data are also included.

Topics

- Gas laws
- Titrations
- Spectroscopy
- Electrochemistry

[vernier.com/chem-a](http://vernier.com/chem-a)



**Download only**  
CHEM-A-E \$40

**Printed book + download**  
CHEM-A \$48

## Go Direct Polarimeter

The concept of chirality can be difficult for students to visualize. Go Direct® Polarimeter provides a visual representation of this concept by measuring the optical rotation of optical isomers such as sugars, amino acids, and proteins.

GDX-POL \$499

[vernier.com/gdx-pol](http://vernier.com/gdx-pol)



Reaction kinetics of sucrose

## Vernier Fluorescence/UV-VIS Spectrophotometer

The Fluorescence/UV-VIS Spectrophotometer measures the fluorescence and absorbance spectra of samples such as quinine sulfate, fluorescein, rhodamine, and DAPI.

VSP-FUV \$2,899

[vernier.com/vsp-fuv](http://vernier.com/vsp-fuv)

### Wavelength Range

- 220 to 850 nm

### Light Sources

- Visible: LED-boosted tungsten
- UV: Deuterium
- Fluorescence: exchangeable LEDs for excitation at 375 nm, 450 nm, and 525 nm (additional wavelengths sold separately)



## Go Direct Tris-Compatible Flat pH

Go Direct Tris-Compatible Flat pH is a double-junction electrode for measuring pH in Tris buffers and solutions containing proteins or sulfides. The flat glass shape makes it easy to clean and useful for measuring the pH of semisolids such as soil slurries and certain foods.

GDX-FPH \$115

[vernier.com/gdx-fph](http://vernier.com/gdx-fph)

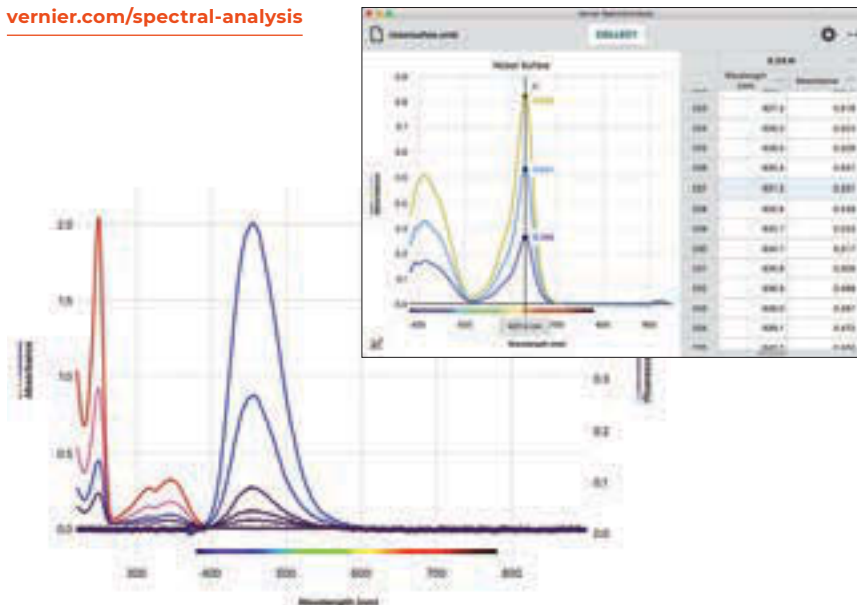


## Vernier Spectral Analysis

Our free Vernier Spectral Analysis® app makes it easy to incorporate spectroscopy into your chemistry experiments. Using the app, students can collect a full spectrum and explore topics such as Beer's law, kinetics, and fluorescence.

The user-friendly software includes analysis features such as curve fitting and data interpolation.

[vernier.com/spectral-analysis](http://vernier.com/spectral-analysis)



# Organic Chemistry

## Go Direct Melt Station

Go Direct Melt Station accurately measures melting temperatures of a solid (up to 260°C), and the real-time graphing provides a unique perspective of the melting process.

GDX-MLT ⚡ \$529

[vernier.com/gdx-mlt](http://vernier.com/gdx-mlt)



## Go Direct Wide-Range Temperature

Go Direct Wide-Range Temperature is designed to be used as you would use a thermometer for experiments such as the recrystallization of benzoic acid, simple and fractional distillations, determination of boiling points, the synthesis and analysis of aspirin and other organic compounds, and more.

Range: -20 to 330°C

GDX-WRT \$114

[vernier.com/gdx-wrt](http://vernier.com/gdx-wrt)



## Go Direct Mini GC

With the easy-to-use Go Direct Mini GC™ and the free Vernier Instrumental Analysis app, students can separate, analyze, and identify substances contained in a volatile liquid or gaseous sample. This portable gas chromatograph detects polar and nonpolar compounds allowing for a wide range of experiments. Sample experiments include fractional distillation and Fischer esterification.

GDX-GC \$2,499

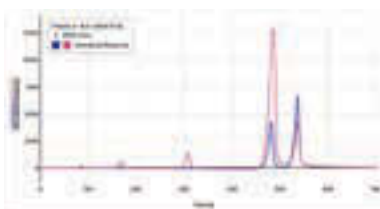
[vernier.com/gdx-gc](http://vernier.com/gdx-gc)



## Vernier Instrumental Analysis

With our free Vernier Instrumental Analysis™ app, students can collect and analyze data from our Go Direct Mini GC, Go Direct Polarimeter, and Go Direct Cyclic Voltammetry System (page 16) using computers, Chromebooks, or compatible mobile devices.

[vernier.com/instrumental-analysis](http://vernier.com/instrumental-analysis)



## Vernier UV-VIS Spectrophotometer

The Vernier UV-VIS Spectrophotometer generates a full spectrum, Beer's law graph, and kinetics traces of ultraviolet and visible-absorbing samples such as aspirin, DNA, proteins, and NADH.

VSP-UV \$2,100

[vernier.com/vsp-uv](http://vernier.com/vsp-uv)

### Wavelength Range

- 220 to 850 nm

### Light Sources

- Visible: LED-boosted tungsten
- UV: Deuterium



## Free Software

### Vernier Spectral Analysis

See page 14.

## UPDATED

## Organic Chemistry with Vernier

*Organic Chemistry with Vernier* contains 26 experiments that represent a broad range of topics and techniques taught in most college organic chemistry lab courses. The experiments in this book build upon prior knowledge, laboratory techniques, and skills students have learned in general chemistry courses.

### Topics

- Distillation
- Chromatography
- Synthesis
- Polarimetry

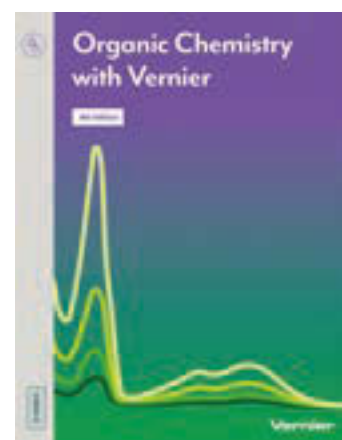
[vernier.com/chem-o](http://vernier.com/chem-o)

### Download only

CHEM-O-E \$40

### Printed book + download

CHEM-O \$48



# Analytical Chemistry

## Go Direct Cyclic Voltammetry System

Give your students hands-on experience with electrochemically active reactions using this affordable potentiostat and disposable screen-printed electrodes.

Easily incorporate electrochemistry into your curriculum using our e-book, *Electrochemistry Experiments with the Go Direct Cyclic Voltammetry System*, available for free with your purchase.

GDX-CVS \$899

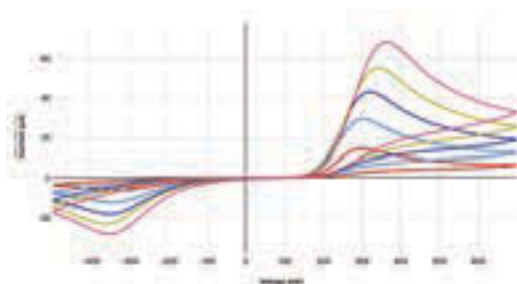
[vernier.com/gdx-cvs](http://vernier.com/gdx-cvs)



### Free Software

Vernier Instrumental Analysis™

See page 14.



Determining acetaminophen concentration in children's liquid Tylenol®

## Go Direct Polarimeter

The concept of chirality can be difficult for students to visualize. Go Direct® Polarimeter provides a visual representation of this concept by measuring the optical rotation of optical isomers such as sugars, amino acids, and proteins.

GDX-POL \$499

[vernier.com/gdx-pol](http://vernier.com/gdx-pol)



## Vernier UV-VIS Spectrophotometer

The Vernier UV-VIS Spectrophotometer generates a full spectrum, Beer's law graph, and kinetics traces of ultraviolet and visible-absorbing samples such as aspirin, DNA, proteins, and NADH.

VSP-UV \$2,100

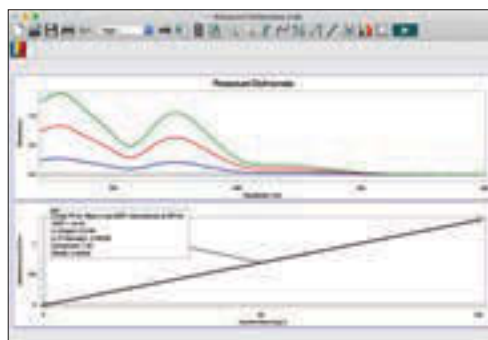
### Wavelength Range

- 220 to 850 nm

### Light Sources

- Visible: LED-boosted tungsten
- UV: Deuterium

[vernier.com/vsp-uv](http://vernier.com/vsp-uv)



Examining the absorbance spectrum of potassium dichromate using the Vernier UV-VIS Spectrophotometer and Logger Pro®

### Recommended Accessory

#### Vernier Spectrophotometer Optical Fiber

Analyze emissions spectra of gas discharge tubes or flame tests with this optical fiber.

VSP-FIBER \$74 [vernier.com/vsp-fiber](http://vernier.com/vsp-fiber)

### Free Software

Vernier Spectral Analysis®

See page 14.



## Go Direct pH

Use this general-purpose pH sensor to monitor the pH of aqueous solutions.

GDX-PH \$89

[vernier.com/gdx-ph](http://vernier.com/gdx-ph)



## Go Direct ORP

Measure the ability of a solution to act as an oxidizing or reducing agent.

GDX-ORP \$99

[vernier.com/gdx-orp](http://vernier.com/gdx-orp)



## Go Direct Drop Counter

This sensor precisely records the number of drops of titrant added during a titration and then automatically converts it to volume.

GDX-DC \$99

[vernier.com/gdx-dc](http://vernier.com/gdx-dc)





# Physical Chemistry

## Vernier Fluorescence/ UV-VIS Spectrophotometer

The Fluorescence/UV-VIS Spectrophotometer measures the fluorescence and absorbance spectra of ultraviolet and visible samples such as quinine sulfate, fluorescein, rhodamine, and DAPI.

VSP-FUV \$2,899

### Wavelength Range

- 220 to 850 nm

### Light Sources

- Visible: LED-boosted tungsten
- UV: Deuterium
- Fluorescence: exchangeable LEDs for excitation at 375 nm, 450 nm, and 525 nm (additional wavelengths sold separately)

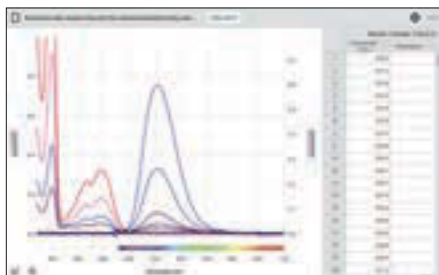


Free experiment downloads available at [vernier.com/vsp-fuv](http://vernier.com/vsp-fuv)

### Free Software

#### Vernier Spectral Analysis

See page 14.



Absorbance and fluorescence spectra of quinine sulfate at varying concentrations

## IMPROVED Vernier Flash Photolysis Spectrometer

The Vernier Flash Photolysis Spectrometer is perfect for students to explore the fundamental principles of photochemical reactions. This spectrometer now includes 13 detection filters for measuring the absorption and emission changes of a photoexcited sample with microsecond resolution. Excitation filters (2) are also included.

VSP-FP \$4,999

### Wavelength Range

- 450 to 750 nm

### Light Sources

- Xenon flashlamp (pump) white LED (probe)
- 13 exchangeable filters for detection wavelength
- 2 exchangeable colored glass filters for excitation wavelength

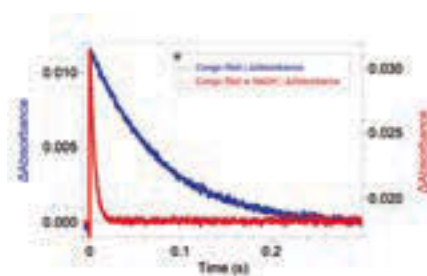


Free experiment downloads available at [vernier.com/vsp-fp](http://vernier.com/vsp-fp)

### Free Software

Collect data with the free all-inclusive Flash Photolysis Spectrometer Software.\*

\*Available for Windows® only



Fast photocatalysis of Congo Red

## Go Direct Mini GC

Teach students chromatography with an affordable, portable gas chromatograph that detects polar and nonpolar compounds. With the easy-to-use Go Direct Mini GC™ and the free Vernier Instrumental Analysis app, students can separate, analyze, and identify substances contained in a volatile liquid or gaseous sample. Go Direct Mini GC uses Bluetooth® wireless technology or USB to connect to your device.

Included with Go Direct Mini GC is our *Chromatography Experiments with the Go Direct Mini GC* e-book. This lab manual includes student instructions and instructor notes.

GDX-GC \$2,499

[vernier.com/gdx-gc](http://vernier.com/gdx-gc)



### Free Download

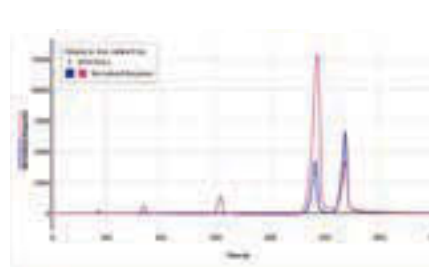
#### Chromatography Experiments with the Go Direct Mini GC e-book

Free with purchase of Go Direct Mini GC

### Free Software

#### Vernier Instrumental Analysis

See page 15.



Separating a mixture of alkanes, esters, and cyclic hydrocarbons

# Chemistry Products

## Go Direct Sensors

Sensor	Order Code	Price
Go Direct® Colorimeter	GDX-COL	\$119
Conductivity Probes		
Go Direct Conductivity	GDX-CON	\$99
Go Direct Platinum-Cell Conductivity	GDX-CONPT	\$169
Current Probes		
Go Direct Constant Current System	GDX-CCS	\$74
Go Direct Current	GDX-CUR	\$79
Go Direct Drop Counter	GDX-DC	\$99
Go Direct Electrode Amplifier	GDX-EA	\$64
Go Direct Gas Pressure	GDX-GP	\$89
Go Direct Melt Station ⚠	GDX-MLT	\$529
Go Direct ORP	GDX-ORP	\$99
pH Sensors		
Go Direct Glass-Body pH	GDX-GPH	\$139
Go Direct pH	GDX-PH	\$89
Go Direct Tris-Compatible Flat pH	GDX-FPH	\$115
Go Direct Radiation Monitor	GDX-RAD	\$179
Go Direct SpectroVis® Plus	GDX-SVISPL	\$399
Temperature Probes		
Go Direct Surface Temperature	GDX-ST	\$79
Go Direct Temperature	GDX-TMP	\$69
Go Direct Thermocouple	GDX-TC	\$109
Go Direct Wide-Range Temperature	GDX-WRT	\$114
Go Direct Voltage	GDX-VOLT	\$69

## LabQuest Sensors

Sensor	Order Code	Price
Colorimeter	COL-BTA	\$119
Conductivity Probes		
Conductivity Probe	CON-BTA	\$99
Platinum-Cell Conductivity Probe	CONPT-BTA	\$149
Current Probes		
Constant Current System	CCS-BTA	\$64
Current Probe	DCP-BTA	\$39
Drop Counter	VDC-BTD	\$99
Electrode Amplifier	EA-BTA	\$49
Gas Pressure Sensors		
Gas Pressure Sensor	GPS-BTA	\$89
Pressure Sensor 400	PS400-BTA	\$189
Instrumentation Amplifier	INA-BTA	\$79
Melt Station ⚠	MLT-BTA	\$519
ORP Sensor	ORP-BTA	\$89
pH Sensors		
Glass-Body pH Electrode BNC (requires Electrode Amplifier)	GPH-BNC	\$85
pH Sensor	PH-BTA	\$88
Tris-Compatible Flat pH Sensor	FPH-BTA	\$104
Polarimeter (Chemical) ⚠	CHEM-POL	\$499
Radiation Monitor	VRM-BTD	\$180
Temperature Probes		
Stainless Steel Temperature Probe	TMP-BTA	\$36
Surface Temperature Sensor	STS-BTA	\$25
Thermocouple	TCA-BTA	\$69
Wide-Range Temperature Probe	WRT-BTA	\$82
Voltage Probes		
Differential Voltage Probe	DVP-BTA	\$39
Voltage Probe	VP-BTA	\$12

## Instrumentation

Instrument	Order Code	Price
Go Direct Mini GC™	GDX-GC	\$2,499
Go Direct Cyclic Voltammetry System	GDX-CVS	\$899
Go Direct Polarimeter	GDX-POL	\$499

## Spectrometers

Spectrometer	Order Code	Price
Go Direct SpectroVis® Plus	GDX-SVISPL	\$399
Vernier Emissions Spectrometer	VSP-EM	\$799
Vernier Flash Photolysis Spectrometer	VSP-FP	\$4,999
Vernier Fluorescence/UV-VIS Spectrophotometer	VSP-FUV	\$2,899
Vernier Spectrometer (Ocean Optics dba Ocean Insight)	V-SPEC	\$1,999
Vernier UV-VIS Spectrophotometer	VSP-UV	\$2,100

## Lab Equipment

Equipment	Order Code	Price
Electrode Support	ESUP	\$10
OHAUS® Balances ⚠	vernier.com/ohaus	
Stir Station	STIR	\$129
Cuvette Rack	CUV-RACK	\$9
Go Direct Charge Station	GDX-CRC	\$69

## Lab Books\*

Equipment	Order Code	Price
<i>Advanced Chemistry with Vernier</i>	CHEM-A	\$48
<i>Chemistry with Vernier</i>	CWV	\$48
<i>Food Chemistry Experiments</i>	HSB-FOOD	\$38
<i>Investigating Chemistry through Inquiry</i>	CHEM-I	\$48
<i>Organic Chemistry with Vernier</i>	CHEM-O	\$48

\* Includes printed book and download; also available as a download only



Learn more about Pivot Interactives and start a free 30-day trial\* at [pivotinteractives.com](https://pivotinteractives.com)

\* Not available in countries subject to GDPR

See all our products for college chemistry online at [vernier.com/chemistry](https://vernier.com/chemistry)

# Physics

[vernier.com/physics](https://vernier.com/physics)



## Why Vernier?

Vernier started when one educator, Dave Vernier, decided to build solutions to bring physics to life for his students. Today, our complete physics solution is still powered by the desire to inspire students and foster learning and is backed by powerful software and unparalleled support.

### Quality

Durable hardware lasts for years of use

### Affordable

Designed for education and educational budgets

### Versatile

Supports a variety of devices and experiments



I really find your hardware, and especially *Logger Pro*, extremely helpful in my teaching. Couldn't do it without your stuff.

*Barbara Hughey*  
*Massachusetts Institute of Technology*

# A Guide to Vernier Data Collection

We're here to support you as an educator as you incorporate data-collection technology into your instruction. See how our products provide you with affordable laboratory solutions designed for student success.

Our Guarantee: Most of our products are protected by a 5-year limited warranty. And after five years? We'll make every attempt to repair your equipment.

## **GD**X What You Need to Get Started with Go Direct Sensors

### Go Direct Sensor

These versatile sensors connect to your device via Bluetooth® wireless technology or USB.

### Device

Go Direct® sensors connect to a wide variety of commonly used devices, including Chromebooks, computers, smartphones, tablets, and LabQuest 3.

### Software

Vernier Graphical Analysis™ Pro  
Vernier Spectral Analysis®  
Vernier Video Analysis™

### Lab Book

Our popular, award-winning lab books provide hundreds of well-tested, customizable experiments. Our lab books come with a generous site license—purchase once and share files across your department.

## **LQ** What You Need to Get Started with LabQuest Sensors

### LabQuest Sensor

LabQuest® sensors share data with your device via a wired connection (BTA/BTD) to an interface from the LabQuest family.

### Interface

An interface sends information from the sensor to the data-collection and analysis software. The LabQuest family includes LabQuest 3, LabQuest Stream®, and LabQuest Mini.

### Device

LabQuest sensors connect to computers, Chromebooks, and compatible mobile devices through a LabQuest interface.

### Software

Vernier Graphical Analysis Pro  
Logger Pro® 3

### Lab Book

Our popular, award-winning lab books provide hundreds of well-tested, customizable experiments. Our lab books come with a generous site license—purchase once and share files across your department.

## Software

### Vernier Spectral Analysis

**GD**X **LQ**

Spectral Analysis supports our family of spectrometers. The user-friendly interface walks students through the data-collection process and includes analysis features such as curve fitting and data interpolation.

### Vernier Video Analysis

**GD**X **LQ**

Students can use their smartphone or tablet in the laboratory or out in the field to record motion. They can then import the video into Video Analysis on any device to mark the object in motion, set the scale, and create graphs of the motion.

### Logger Pro 3

**LQ**

Logger Pro 3 is our data-collection and analysis software for LabQuest sensors and spectrometers on Windows® and macOS® computers.

### NEW

### Vernier Graphical Analysis Pro

**GD**X **LQ**

We are enhancing our award-winning Vernier Graphical Analysis app with advanced features that support remote learning and more advanced analysis of experiment data.

### Free Trial for Educators

Try out Graphical Analysis Pro for free for 30 days. Access the sample experiments and enhanced analysis tools to use it with your students.  
**Get a free trial and learn about site license options at [vernier.com/graphical-analysis-pro](https://www.vernier.com/graphical-analysis-pro)**



Free 30-Day  
Preview

Not sure if our technology is right for your laboratory? Our risk-free preview program makes it easier to decide. Most Vernier products are available for a 30-day preview (or longer, if requested) to educational institutions.

# Mechanics

## Dynamics Cart and Track System with Go Direct Sensor Cart

GDX

The Dynamics Cart and Track System with Go Direct Sensor Cart includes essential laboratory equipment for teaching dynamics and kinematics. With our Go Direct Sensor Cart, students can explore force, position, velocity, and acceleration directly on their device using Bluetooth wireless technology. There are no wires to create drag, and no additional equipment is required! Each cart features built-in sensors that simplify experiment setup and make this system the best choice for studying dynamics and kinematics.

with 1.2 m Track DTS-GDX \$535  
with 2.2 m Track DTS-GDX-LONG \$639

[vernier.com/dts-gdx](http://vernier.com/dts-gdx)

Additional Cart and Track options are available at  
[vernier.com/dynamics](http://vernier.com/dynamics)



## Go Direct Photogate

GDX

This double-gate sensor includes two photogates built into the arms of the sensor. It accurately measures velocity and acceleration.

GDX-VPG \$89

[vernier.com/gdx-vpg](http://vernier.com/gdx-vpg)



## Go Direct Force and Acceleration

GDX

Measure forces as small as  $\pm 0.1$  N and up to  $\pm 50$  N with this sensor that couples a 3-axis accelerometer with a stable and accurate force sensor. It also includes a 3-axis gyroscope for experiments involving rotation.

GDX-FOR \$99

[vernier.com/gdx-for](http://vernier.com/gdx-for)



## Go Direct Centripetal Force Apparatus

GDX

When combined with Go Direct Force and Acceleration (not included), the Centripetal Force Apparatus makes an ideal tool to explore rotational dynamics.

GDX-CFA \$299

[vernier.com/gdx-cfa](http://vernier.com/gdx-cfa)



## Moment of Inertia Accessory Kit

GDX LQ

With the Moment of Inertia Accessory Kit, students can explore inertia in a broader context. The kit expands the capabilities of the Vernier Centripetal Force Apparatus when investigating moments of inertia of different geometries.

CFA-MIK \$179

[vernier.com/cfa-mik](http://vernier.com/cfa-mik)



## Go Direct Motion

GDX

Use ultrasound to measure the position, velocity, and acceleration of moving objects.

GDX-MD \$99

[vernier.com/gdx-md](http://vernier.com/gdx-md)



## Vernier Video Analysis App

Students can use their smartphones and tablets in the laboratory or out in the field to capture motion. Once the video is inserted into the app, students set the scale and mark points within the video to track the object in motion. Vernier Video Analysis™ generates accurate and visually rich graphs and a data table reflecting the recorded motion.

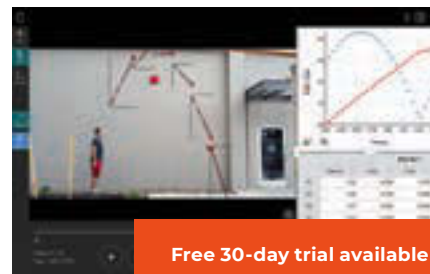
Video Analysis is a browser-based app that works on Windows®, macOS®, Android™, Chrome OS™, iOS, and iPadOS®.



### Vernier Video Analysis: Motion and Sports

This e-book features 12 investigations in which students use Vernier Video Analysis to explore velocity, acceleration, and sports activities.

Download only: HSB-VVAMS-E \$25 [vernier.com/hsb-vvams-e](http://vernier.com/hsb-vvams-e)



Free 30-day trial available  
[vernier.com/video-analysis](http://vernier.com/video-analysis)



# Waves and Sound

## Go Direct Sound

GDx

This is really two sensors in one—measure sound level in decibels, or capture and evaluate sound waveforms.

GDx-SND \$89

[vernier.com/gdx-snd](http://vernier.com/gdx-snd)



## Power Amplifier

Drive devices such as speakers, lamps, and small DC motors.

PAMP \$225

[vernier.com/pamp](http://vernier.com/pamp)



## Power Amplifier Accessory Speaker

Study mechanical waves on strings and springs.

PAAS-PAMP ⚡ \$125

[vernier.com/paas-pamp](http://vernier.com/paas-pamp)



# Thermodynamics

## Go Direct Gas Pressure

GDx

This sensor measures the absolute pressure of a gas.

GDx-GP \$89

[vernier.com/gdx-gp](http://vernier.com/gdx-gp)



## Go Direct Temperature

GDx

Go Direct® Temperature is a durable, stainless steel temperature sensor for use in liquids or air.

Range: -40 to 125°C

GDx-TMP \$69

[vernier.com/gdx-tmp](http://vernier.com/gdx-tmp)



## Go Direct Surface Temperature

GDx

An exposed temperature sensor makes this an ideal choice for situations where low thermal mass and extremely rapid response are needed. Use in air and water only.

Range: -25 to 125°C

GDx-ST \$79

[vernier.com/gdx-st](http://vernier.com/gdx-st)



## FLIR ONE® Gen 3 Thermal Camera

Reveal the hidden world of infrared vision. When used with our Vernier Thermal Analysis® Plus app, students can also collect temperature vs. time data for up to four points or regions, along with a thermal image video.

FLIRPRO-IO5 ⚡ \$399

[vernier.com/flirpro-ios](http://vernier.com/flirpro-ios)

## Vernier Thermal Analysis Plus App

This iOS and iPadOS® app enables graphing temperature vs. time for up to four points or regions when using a FLIR ONE camera.

[vernier.com/thermal-analysis](http://vernier.com/thermal-analysis)



# Electricity and Magnetism

## Go Direct Voltage

GDX

This sensor combines a wide input voltage range and high precision, making it an excellent choice for investigations of both AC/DC circuits and electromagnetism.

Ranges:  $\pm 20$  V and  $\pm 1$  V

GDX-VOLT \$69

[vernier.com/gdx-volt](http://vernier.com/gdx-volt)



## Go Direct Current

GDX

Measure electric currents in circuits with this versatile sensor.

Ranges:  $\pm 1$  A and  $\pm 0.1$  A

GDX-CUR \$79

[vernier.com/gdx-cur](http://vernier.com/gdx-cur)



## Go Direct Static Charge

GDX

With Go Direct Static Charge, students can easily perform quantitative measurements of static charges. Designed with ease of use in mind, this wireless sensor ensures enhanced accuracy and performance.

Range:  $\pm 100$  nC

GDX-Q \$99

[vernier.com/gdx-q](http://vernier.com/gdx-q)



## Go Direct 3-Axis Magnetic Field

GDX

Determine the magnitude and direction of a magnetic field at any point in space with this 3-axis sensor.

Ranges:  $\pm 5$  mT and  $\pm 130$  mT

GDX-3MG \$69

[vernier.com/gdx-3mg](http://vernier.com/gdx-3mg)



## Electrostatics Kit

When using the Electrostatics Kit with Go Direct Static Charge, students can conduct a range of experiments in electrostatics.

ESK-CRG \$119

[vernier.com/esk-crg](http://vernier.com/esk-crg)



## High-Voltage Electrostatics Kit

Use this kit to investigate the distribution of charge on a sphere, transfer of charge on contact between two spheres, and charging by induction.

HVEK-CRG \$289

[vernier.com/hvek-crg](http://vernier.com/hvek-crg)



## Extech® Digital Power Supply

This power supply provides constant current or constant voltage for physics activities that require DC power.

EXPS \$240

[vernier.com/expes](http://vernier.com/expes)



## Vernier Circuit Board 2

Use this convenient platform to study basic series and parallel circuits as well as RLC circuits. Many components for experimentation are provided, and additional components can be added to expand the capability of this useful board.

VCB2 \$129

[vernier.com/vcb2](http://vernier.com/vcb2)



## Electrostatic High-Voltage Genecon

A great addition to the High Voltage Electrostatics Kit, the Electrostatic High-Voltage Genecon generates both positive and negative charges and reliably creates charge differences in high humidity.

HVEK-GEN \$229

[vernier.com/hvek-gen](http://vernier.com/hvek-gen)



# Light and Optics

## Light Sensors

### Go Direct® Light and Color

GDX

This sensor combines visible light, UV, and RGB sensors to measure source emission, transmittance, and reflection of light in the visible light to ultraviolet electromagnetic spectrum.

GDX-LC \$79

[vernier.com/gdx-lc](http://vernier.com/gdx-lc)



### Light Sensor\*

LQ

Investigate polarizers, reflectivity, and solar energy with this sensor that approximates the human eye in spectral response. It's great for inverse square law experiments.

LS-BTA ⚡ \$59 [vernier.com/ls-bta](http://vernier.com/ls-bta)



LQ

### Diffraction Apparatus†

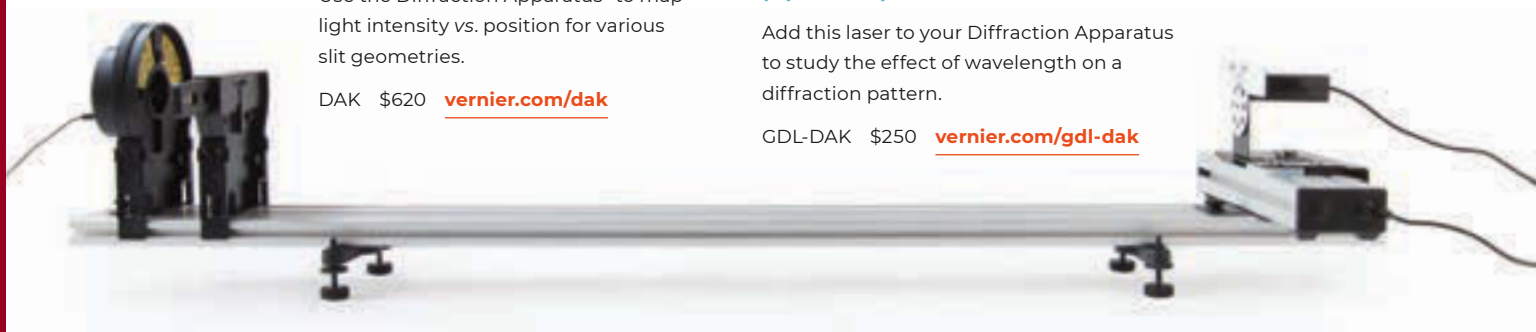
Use the Diffraction Apparatus\* to map light intensity vs. position for various slit geometries.

DAK \$620 [vernier.com/dak](http://vernier.com/dak)

### Green Diffraction Laser (optional)

Add this laser to your Diffraction Apparatus to study the effect of wavelength on a diffraction pattern.

GDL-DAK \$250 [vernier.com/gdl-dak](http://vernier.com/gdl-dak)



## Optics Expansion Kit

Use the Optics Expansion Kit\* with your dynamics track to conduct optics experiments, such as image formation with lenses and light intensity vs. distance. You can even use the kit to build a basic telescope.

Kit includes

- 3 lenses (100 mm converging lens, 200 mm converging lens, -150 mm diverging lens)
- Screen
- Combination luminous and point light source
- Light sensor holder
- Aperture screen
- Power supply

The Optics Expansion Kit is used in experiments in our *Physics with Vernier* and *Advanced Physics with Vernier—Beyond Mechanics* lab books.

OEK \$179

[vernier.com/oek](http://vernier.com/oek)

See website for replacement parts.

\* Requires an interface such as LabQuest 3 or LabQuest Mini

† Requires a Combination 1.2 m Track/Optics Bench (TRACK, \$135)

## Accessories

### Color Mixer Kit†

CM-OEK \$175 [vernier.com/cm-oek](http://vernier.com/cm-oek)

### Mirror Set

M-OEK \$59 [vernier.com/m-oek](http://vernier.com/m-oek)

### Polarizer/Analyzer Set

PAK-OEK \$85 [vernier.com/pak-oek](http://vernier.com/pak-oek)



# Modern Physics

## Radiation Monitors

Our radiation monitors detect alpha, beta, gamma, and X-ray radiation. They can be used to explore radiation statistics, measure the rate of nuclear decay, monitor radon progeny, and investigate the effects of shielding. The sensors include both LED and audible indicators.

### Go Direct Radiation Monitor



GDX-RAD \$179

[vernier.com/gdx-rad](http://vernier.com/gdx-rad)



### Vernier Radiation Monitor\*



VRM-BTD \$180

[vernier.com/vrm-btd](http://vernier.com/vrm-btd)



## Vernier Emissions Spectrometer

The Vernier Emissions Spectrometer gives precise measurements over a range of 350–900 nm. Use it with or without the Vernier Emissions Fiber (not included) to examine spectra of light bulbs, spectrum tubes, or the sun.

VSP-EM \$799

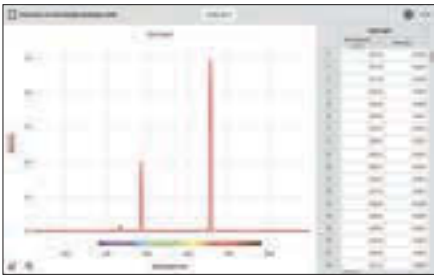
[vernier.com/vsp-em](http://vernier.com/vsp-em)



### Vernier Emissions Fiber

VSP-EM-FIBER \$88

[vernier.com/vsp-em-fiber](http://vernier.com/vsp-em-fiber)



### Vernier Spectral Analysis App

Our free Vernier Spectral Analysis® app with our Emissions Spectrometer makes it easy to analyze spectra. Students can quickly locate peaks or compare spectra from different sources.

[vernier.com/spectral-analysis](http://vernier.com/spectral-analysis)

## Spectrum Tube Power Supplies

### Single

This power supply features an ultra-safe design for electrifying spectrum tubes.

ST-SPS ⚡ \$255

[vernier.com/st-sps](http://vernier.com/st-sps)



### Carousel

This power supply holds up to eight gas spectrum tubes.

ST-CAR ⚡ \$319

[vernier.com/st-car](http://vernier.com/st-car)



## Spectrum Tubes

Spectrum Tubes are permanently enclosed in protective plastic carriers, with no exposed high voltage.

Hydrogen	ST-H ⚡	\$45
Nitrogen	ST-N ⚡	\$45
Helium	ST-HE ⚡	\$45
Neon	ST-NE ⚡	\$45
Carbon Dioxide	ST-CO2 ⚡	\$45
Air	ST-AIR ⚡	\$45
Argon	ST-AR ⚡	\$45



Spectrum Tubes carry a warranty of 2 years or 100 hours, whichever comes first (hydrogen tube: two years or 40 hours, whichever comes first).

[vernier.com/spectrum-tubes](http://vernier.com/spectrum-tubes)

⚡ For California Proposition 65 warning, see page 36.

# Additional Physics Products

## Mechanics

Product	Order Code	Price
Go Direct® Acceleration	GDX-ACC	\$99
3-Axis Accelerometer	3D-BTA	\$99
25-g Accelerometer	ACC-BTA	\$96
Bumper and Launcher Kit	BLK	\$89
Centripetal Force Apparatus	CFA	\$549
Dual-Range Force Sensor	DFS-BTA	\$109
Dynamics Cart and Track System	DTS	\$295
Dynamics Cart and Track System with Motion Encoder	DTS-EC	\$445
Eddy Current Brake	DTS-ECB	\$19
Encoder Fan Cart	CART-FEC	\$225
Fan Cart	CART-F	\$109
Force Plate	FP-BTA	\$289
Friction Pad DTS	DTS-PAD	\$32
Independence of Motion	IOM-VPL	\$59
Go Direct Sensor Cart Accessory Kit	GDX-CART-AK	\$58
Low-g Accelerometer	LGA-BTA	\$89
Motion Detector	MD-BTD	\$89
Photogate	VPG-BTD	\$49
Go Direct Projectile Launcher	GDX-PL	\$449
Vernier Projectile Launcher	VPL	\$389
Projectile Stop	PS-VPL	\$40
Pulley Bracket	B-SPA	\$12
Go Direct Rotary Motion ⚡	GDX-RMS	\$179
Rotary Motion Sensor ⚡	RMV-BTD	\$169
Rotational Motion Accessory Kit ⚡	AK-RMV	\$112
Time of Flight Pad	TOF-VPL	\$84
Ultra Pulley Attachment	SPA	\$24

## Waves and Sound

Product	Order Code	Price
Microphone	MCA-BTA	\$44
Sound Level Sensor	SLS-BTA	\$69

## Thermodynamics

Product	Order Code	Price
FLIR ONE® Pro Thermal Camera ⚡	FLIRPRO-IOS	\$399
FLIR ONE Pro LT for iOS Thermal Camera ⚡	FLIRLT-IOS	\$299
Gas Pressure Sensor	GPS-BTA	\$89
Stainless Steel Temperature Probe	TMP-BTA	\$36
Surface Temperature Sensor	STS-BTA	\$25

## Electricity and Magnetism

Product	Order Code	Price
Magnetic Field Sensor	MG-BTA	\$58
Power Amplifier	PAMP	\$225
Differential Voltage Probe	DVP-BTA	\$39
Current Probe	DCP-BTA	\$39
Instrumentation Amplifier	INA-BTA	\$79
Optional Breadboard Kit for the Vernier Circuit Board 2	VCB2-OB BK	\$29
Extech® Digital DC Power Supply	EXPS	\$240
Charge Sensor	CRG-BTA	\$79

## Light and Optics

Product	Order Code	Price
Polarizer/Analyzer Set for Optics Expansion Kit	PAK-OEK	\$85
Combination 1.2 m Track/Optics Bench	TRACK	\$135
Combination 2.2 m Track/Optics Bench	TRACK-LONG	\$239
Green Diffraction Laser	GDL-DAK	\$250

## Lab Books

Product	Order Code	Price
<i>Physics with Vernier</i>	PWV*	\$48
<i>Advanced Physics with Vernier—Mechanics</i>	PHYS-AM*	\$48
<i>Advanced Physics with Vernier—Beyond Mechanics</i>	PHYS-ABM*	\$48
<i>Physics Explorations and Projects</i>	PEP*	\$48
<i>Vernier Video Analysis: Motion and Sports</i>	HSB-VVAMS-E	\$25

\* Includes printed book and download; also available as a download only



Learn more about Pivot Interactives  
and start a free 30-day trial\* at  
[pivotinteractives.com](https://pivotinteractives.com)

\* Not available in countries subject to GDPR

This is just a sample of our physics solutions.  
To see the full suite of Vernier physics products,  
please visit [vernier.com/physics](https://vernier.com/physics)





# Engineering

[vernier.com/engineering](https://www.vernier.com/engineering)

## Why Vernier?

Vernier engineering solutions harness the power of analytical software and the precision of high-quality sensors to help students sharpen their design skills and prepare to enter the workforce. As with all of our solutions, our engineering technology is backed by unparalleled support.

### Quality

Durable hardware for lab and field use

### Affordable

Designed for education and educational budgets

### Versatile

Supports a variety of devices and experiments



Our projects are about more than just supporting the need for engineering education in local classrooms. Vernier products help deepen our students' learning through experiential, hands-on community engagement.

*Maija A. Benitz, Ph.D.  
Roger Williams University*

## A Guide to Vernier Data Collection

We're here to support you as an educator as you incorporate data-collection technology into your instruction. See how our products provide you with affordable laboratory solutions designed for student success.

Our Guarantee: Most of our products are protected by a 5-year limited warranty. And after five years? We'll make every attempt to repair your equipment.

GDX

### What You Need to Get Started with Go Direct Sensors

Go Direct® sensors connect directly (no interface required) to your computer, Chromebook™, or compatible mobile device via USB or Bluetooth® wireless technology. Collect and analyze data with Vernier Graphical Analysis™ Pro app, LabVIEW™, Python®, or JavaScript™.

**A Go Direct sensor**

**B Computer, Chromebook, tablet, smartphone**

**C Software**

- Vernier Graphical Analysis Pro
- National Instruments LabVIEW
- Python
- JavaScript

LQ

### What You Need to Get Started with LabQuest Sensors

LabQuest® sensors have a cable with a plug that makes it easy to connect and disconnect to an interface without any additional wiring. Use LabQuest sensors with a Vernier interface, Arduino®, NI ELVIS, NI myDAQ, or your own DAQ hardware. If using a non-Vernier interface, these sensors require a +5.0 volt supply voltage and output a 0 to 5 volt signal. Most sensors have a simple, linear calibration.

**A LabQuest sensor**

**B Interface (LabQuest, DAQ, or Arduino)**

**C Computer, Chromebook, tablet, smartphone**

**D Software**

- Vernier Graphical Analysis Pro
- Logger Pro® 3
- National Instruments LabVIEW
- Arduino IDE

NEW

## Vernier Graphical Analysis Pro

We are enhancing our award-winning Vernier Graphical Analysis app with advanced features supporting remote learning and more advanced analysis of experiment data.

GDX

LQ

### Free Trial for Educators

Try out Graphical Analysis Pro for free for 30 days. Access the sample experiments and enhanced analysis tools to use it with your students.

Get a free trial and learn about site license options at [vernier.com/graphical-analysis-pro](http://vernier.com/graphical-analysis-pro)



## Free 30-Day Preview

Not sure if our technology is right for your laboratory? Our risk-free preview program makes it easier to decide. Most Vernier products are available for a 30-day preview (or longer, if requested) to educational institutions.

# Introduction to Engineering

## Go Direct Energy

Go Direct Energy measures voltage and current as well as displays power and energy output of scale model wind turbines and solar panels, so students can quantitatively evaluate the effects of their design changes. It connects via Bluetooth wireless technology or USB to your device.

GDX-NRG \$89

[vernier.com/gdx-nrg](http://vernier.com/gdx-nrg)



## Vernier Variable Load

Use the Vernier Variable Load in conjunction with Go Direct Energy to provide a range of resistive loads for projects such as engineering wind turbines or investigating solar panels. Students can adjust the potentiometer to provide resistances between 6 and 255  $\Omega$  to determine the optimal load on a system.

VES-VL \$64

[vernier.com/ves-vl](http://vernier.com/ves-vl)

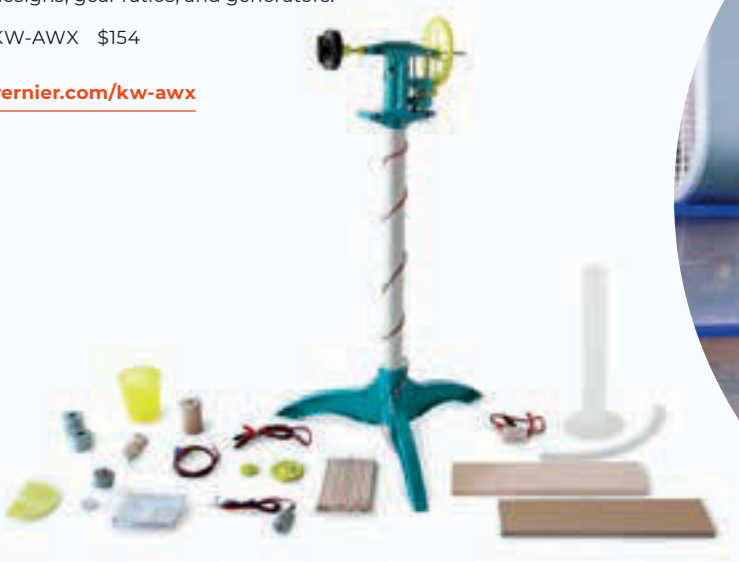


## Advanced Wind Experiment Kit

Use this kit as a fast and easy way to introduce the engineering aspects of wind turbine technology. Investigate different blade designs, gear ratios, and generators.

KW-AWX \$154

[vernier.com/kw-awx](http://vernier.com/kw-awx)



See all our products for engineering at [vernier.com/engineering](http://vernier.com/engineering)

# Wind Turbine Design

## Tower and Base Set

Do you need a tower for your turbine nacelle? This is the same tower that comes in the Advanced Wind Experiment Kit. The tower has a diameter that fits inside 1-inch PVC fittings.

KW-TBS \$24 [vernier.com/kw-tbs](http://vernier.com/kw-tbs)



## Basic Turbine Building Parts

The Basic Turbine Building Parts kit includes three hubs, a wind turbine generator, and 25 dowels, all in one package.

KW-BTPART \$16  
[vernier.com/kw-btpart](http://vernier.com/kw-btpart)



## Wind Turbine Generator with Wires

This is the primary generator for wind turbine experiments because it runs smoothly and provides high power output at a relatively low RPM.

KW-GEN \$7  
[vernier.com/kw-gen](http://vernier.com/kw-gen)



## Hub (3 Pack)

With these 12-hole crimping hubs, made from recycled plastic, students can turn a DC generator into a wind turbine.

KW-WTH3 \$22  
[vernier.com/kw-wth3](http://vernier.com/kw-wth3)



## Nacelle

Build a complete turbine by making your own tower and base with PVC pipe (from a hardware store) or use the Tower and Base Set. You will also need a generator and a way to affix the turbine blades.

KW-NAC \$18  
[vernier.com/kw-nac](http://vernier.com/kw-nac)



## simpleGEN

Students can use the easy-to-build AC generator of the simpleGEN to explore the basics of electrical generator design.

KW-SGEN \$59  
[vernier.com/kw-sgen](http://vernier.com/kw-sgen)



## Gear Set

The small 8-tooth gear fits on 2 mm driveshafts that are found on many DC generators. The gears have a keying feature and can be changed quickly and easily using the included hex locks. The hex locks secure to our 9/64 inch hex driveshaft, which is included in the Drivetrain Set (KW-DS, \$8).

Gear sizes: 64 teeth, 32 teeth, 16 teeth, 8 teeth  
KW-GEAR \$9  
[vernier.com/kw-gear](http://vernier.com/kw-gear)



## Balsa Blade Sheets

Balsa wood is very light weight and stiff, making it perfect for wind turbine blade design.

Balsa Blade Sheets (10 Sheets) KW-BBS10 \$12  
Balsa Blade Sheets (100 Sheets) KW-BBS100 \$96  
[vernier.com/kw-bbs10](http://vernier.com/kw-bbs10)



# Measurement and Instrumentation

## Biomedical Engineering with Go Direct Sensors GDX

With wireless options and multiple on-board sensors, Go Direct sensors are perfect for analyzing and studying physiological functions.

### Go Direct EKG

Go Direct® EKG has five channels: EKG, heart rate, EMG, EMG rectified, and voltage.

GDX-EKG \$159

[vernier.com/gdx-ekg](https://www.vernier.com/gdx-ekg)



### Go Direct O<sub>2</sub> Gas

This sensor measures gaseous oxygen concentration levels and air temperature.

GDX-O2 \$189

[vernier.com/gdx-o2](https://www.vernier.com/gdx-o2)



### Go Direct Blood Pressure

Go Direct Blood Pressure has seven channels: cuff pressure, mean arterial pressure, systolic pressure, diastolic pressure, pulse rate, oscillations, and envelope.

GDX-BP \$105

[vernier.com/gdx-bp](https://www.vernier.com/gdx-bp)



### Go Direct Temperature

This rugged, general purpose sensor has a temperature range of -40 to 125°C.

GDX-TMP \$69

[vernier.com/gdx-tmp](https://www.vernier.com/gdx-tmp)



### Go Direct Spirometer

Go Direct Spirometer has six channels: flow rate, volume, adjusted volume, cycle volume, respiration rate, and differential pressure.

GDX-SPR \$199

[vernier.com/gdx-spr](https://www.vernier.com/gdx-spr)



### Go Direct Surface Temperature

With a range of -25 to 125°C, this sensor is designed for use in situations in which low thermal mass or flexibility is required, such as on human skin.

GDX-ST \$79

[vernier.com/gdx-st](https://www.vernier.com/gdx-st)



### Go Direct Hand Dynamometer

Go Direct Hand Dynamometer has seven channels: force, x-axis acceleration, y-axis acceleration, z-axis acceleration, x-axis gyro, y-axis gyro, and z-axis gyro.

GDX-HD \$109

[vernier.com/gdx-hd](https://www.vernier.com/gdx-hd)



### Go Direct Respiration Belt

Go Direct Respiration Belt has four channels: force, respiration rate, steps, and step rate.

GDX-RB \$99

[vernier.com/gdx-rb](https://www.vernier.com/gdx-rb)



### Go Direct CO<sub>2</sub> Gas

Go Direct CO<sub>2</sub> Gas has three channels: CO<sub>2</sub> gas, temperature, and relative humidity.

GDX-CO2 \$199

[vernier.com/gdx-co2](https://www.vernier.com/gdx-co2)



### Go Direct Acceleration

This 3-axis acceleration sensor has two acceleration ranges ( $\pm 157 \text{ m/s}^2$  and  $\pm 1960 \text{ m/s}^2$ ) plus an altimeter and a 3-axis gyroscope.

GDX-ACC \$99

[vernier.com/gdx-acc](https://www.vernier.com/gdx-acc)



See all our products for engineering at [vernier.com/engineering](https://www.vernier.com/engineering)



# Arduino with LabQuest Sensors

LQ

Help students build coding skills and foster creative critical thinking with our complete packages for Arduino®, Vernier LabQuest® sensors, and engaging coding projects.

## Vernier Coding with Arduino—Analog Sensor Package

The package has everything needed for students to use Vernier sensors with Arduino microcontrollers, including the *Vernier Coding Activities with Arduino: Analog Sensors* e-book at no additional cost.

VCA-AS-PKG \$143 [vernier.com/vca-as-pkg](https://www.vernier.com/vca-as-pkg)



## SparkFun RedBoard with Cable

This Arduino-compatible board makes it easy to take sensor measurements when used with the Vernier Arduino Interface Shield.

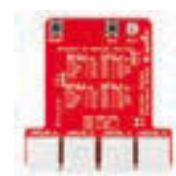
ARD-RED \$25 [vernier.com/ard-red](https://www.vernier.com/ard-red)



## Vernier Arduino Interface Shield

Conveniently connect the SparkFun® RedBoard or Arduino Uno to Vernier LabQuest sensors with the Vernier Arduino Interface Shield.

BT-ARD \$29 [vernier.com/bt-ard](https://www.vernier.com/bt-ard)



## Motion Detector

The Motion Detector uses ultrasound to measure position of objects.

Range: 0.15 to 6 m

Resolution: 1 mm

MD-BTD \$89 [vernier.com/md-btd](https://www.vernier.com/md-btd)



## Surface Temperature Sensor

Measure temperature where low thermal mass or flexibility is required.

Range: -25 to 125°C

STS-BTA \$25 [vernier.com/sts-bta](https://www.vernier.com/sts-bta)



## Digital Control Unit

Use the digital output lines of an interface to control DC electrical devices.

DCU-BTD \$61 [vernier.com/dcu-btd](https://www.vernier.com/dcu-btd)



## pH Sensor

This is a general-purpose pH sensor.

Range: pH 0 to 14

Accuracy: ±0.2 pH units

PH-BTA \$88 [vernier.com/ph-bta](https://www.vernier.com/ph-bta)



## Gas Pressure Sensor

Use the Gas Pressure Sensor to monitor pressure changes of a gas.

GPS-BTA \$89 [vernier.com/gps-bta](https://www.vernier.com/gps-bta)



## Anemometer

This is an impeller-type anemometer for measuring wind speed.

Range: 0.5 to 30 m/s (1 to 67 mph)

ANM-BTA \$89 [vernier.com/anm-bta](https://www.vernier.com/anm-bta)



Read the online guide and see all our products for Arduino at [vernier.com/arduino](https://www.vernier.com/arduino)

## Outreach

Use proven outreach tools to enhance your STEM community engagement projects. Foster an interest in engineering through coding, robotics, renewable energy exploration, and structural design and material science.

## LEGO® Robotics

Encourage creativity, critical thinking, and collaboration in primary and secondary students using a LEGO® MINDSTORMS® Education EV3 Core Set (LEGO-EV3-CORE, \$439.90).



## Bridge Building

Bring a new level of interest and excitement to your bridge building outreach activities using our Go Direct® Structures & Materials Tester (GDX-VSMT, \$999).



# National Instruments LabVIEW and Vernier

Introduce your students to NI LabVIEW™ software, a programming language used throughout the engineering disciplines. We have sample LabVIEW programs (VIs) for LabQuest Mini, myDAQ, Go Direct sensors, and other Vernier hardware.

## With LabQuest Sensors LQ



### LabQuest Mini

LabQuest Mini is a powerful, affordable, and easy to use sensor interface for data acquisition with more than 75 Vernier LabQuest sensors.

LQ-MINI \$169

[vernier.com/lq-mini](http://vernier.com/lq-mini)

### myDAQ Adapter

The myDAQ Adapter can be used to perform data acquisition with more than 75 Vernier LabQuest sensors and the NI myDAQ interface (sold separately). It is designed for use with NI LabVIEW software.

BT-MDAQ \$59

[vernier.com/bt-mdaq](http://vernier.com/bt-mdaq)



### Analog Protoboard Adapter

Use these adapters to connect Vernier LabQuest sensors to a non-Vernier interface, such as NI ELVIS. The connector fits into a standard prototyping board.

BTA-ELV \$10 [vernier.com/bta-elv](http://vernier.com/bta-elv)



## With Go Direct Sensors GDX

Integrate over 50 wireless sensors into your LabVIEW project to acquire data or control your NI DAQ hardware.

### Go Direct Acceleration



GDX-ACC \$99 [vernier.com/gdx-acc](http://vernier.com/gdx-acc)

### Go Direct Force and Acceleration



GDX-FOR \$99 [vernier.com/gdx-for](http://vernier.com/gdx-for)

### Go Direct Rotary Motion



GDX-RMS ⚡ \$179 [vernier.com/gdx-rms](http://vernier.com/gdx-rms)

### Go Direct Motion



GDX-MD \$99 [vernier.com/gdx-md](http://vernier.com/gdx-md)

### Go Direct Light and Color



GDX-LC \$79 [vernier.com/gdx-lc](http://vernier.com/gdx-lc)

### Go Direct Weather



GDX-WTHR \$99 [vernier.com/gdx-wthr](http://vernier.com/gdx-wthr)

See all our products for NI LabVIEW at [vernier.com/ni-labview](http://vernier.com/ni-labview)

⚡ For California Proposition 65 warning, see page 36.

## Wind Energy

Incorporate hands-on activities into your community engagement projects by challenging students to design and test wind turbines. Wind experiment kits, such as the KidWind MINI Wind Turbine with Blade Design (KW-MWTBD, \$65), are available for every level.



## Makeblock Robotics

Makeblock® provides low-cost, easy-to-assemble robotics systems, such as mBot™ (MBOT-P (pink) or MBOT-B (blue), \$73.49), that can be programmed with simple block-based coding, making them an attractive solution if you are considering robotics for outreach.



# Engineering Products


## Wind Turbine Design

Product	Order Code	Price
Advanced Wind Experiment Kit	KW-AWX	\$154
Balsa Blade Sheets (10 Sheets)	KW-BBS10	\$12
Basic Turbine Building Parts	KW-BTPART	\$16
Drivetrain Set	KW-DS	\$8
Gear Set	KW-GEAR	\$9
Go Direct® Energy	GDX-NRG	\$89
Hub (3 Pack)	KW-WTH3	\$22
Nacelle	KW-NAC	\$18
Tower and Base Set	KW-TBS	\$24
Vernier Variable Load	VES-VL	\$64
Wind Turbine Generator with Wires	KW-GEN	\$7

## Engineering with Arduino

Product	Order Code	Price
Anemometer	ANM-BTA	\$89
Digital Control Unit	DCU-BTD	\$61
Gas Pressure Sensor	GPS-BTA	\$89
Motion Detector	MD-BTD	\$89
pH Sensor	PH-BTA	\$88
SparkFun® RedBoard with Cable	ARD-RED	\$25
Surface Temperature Sensor	STS-BTA	\$25
Vernier Arduino® Interface Shield	BT-ARD	\$29
Vernier Coding Activities with Arduino: Analog Sensors lab book	VCA-AS-E	\$20

## LabQuest Sensors

Product	Order Code	Price
Barometer	BAR-BTA	\$71
Gas Pressure Sensor	GPS-BTA	\$89
Light Sensor 	LS-BTA	\$59
Magnetic Field Sensor	MG-BTA	\$58
Microphone	MCA-BTA	\$44
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Stainless Steel Temperature Probe	TMP-BTA	\$36

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## Biomedical Engineering

Product	Order Code	Price
Go Direct Acceleration	GDX-ACC	\$99
Go Direct Blood Pressure	GDX-BP	\$105
Go Direct CO <sub>2</sub> Gas	GDX-CO2	\$199
Go Direct EKG	GDX-EKG	\$159
Go Direct Hand Dynamometer	GDX-HD	\$109
Go Direct O <sub>2</sub> Gas	GDX-O2	\$189
Go Direct Respiration Belt	GDX-RB	\$99
Go Direct Spirometer	GDX-SPR	\$199
Go Direct Surface Temperature	GDX-ST	\$79
Go Direct Temperature	GDX-TMP	\$69


## NI LabVIEW and Vernier

Product	Order Code	Price
Analog Protoboard Adapter	BTA-ELV	\$10
myDAQ Adapter	BT-MDAQ	\$59
LabQuest® Mini	LQ-MINI	\$169

## Outreach

Product	Order Code	Price
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KidWind MINI Wind Turbine with Blade Design	KW-MWTBD	\$65
LEGO® MINDSTORMS® Education EV3 Core Set with Charger	LEGO-EV3-CORE	\$439.90
mBot™ by Makeblock® (blue)	MBOT-B	\$73.49
mBot by Makeblock (pink)	MBOT-P	\$73.49

## Go Direct Sensors

Product	Order Code	Price
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Go Direct Force and Acceleration	GDX-FOR	\$99
Go Direct Light and Color	GDX-LC	\$79
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Go Direct Rotary Motion 	GDX-RMS	\$179

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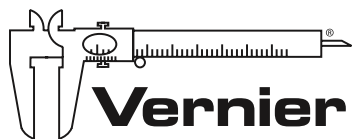
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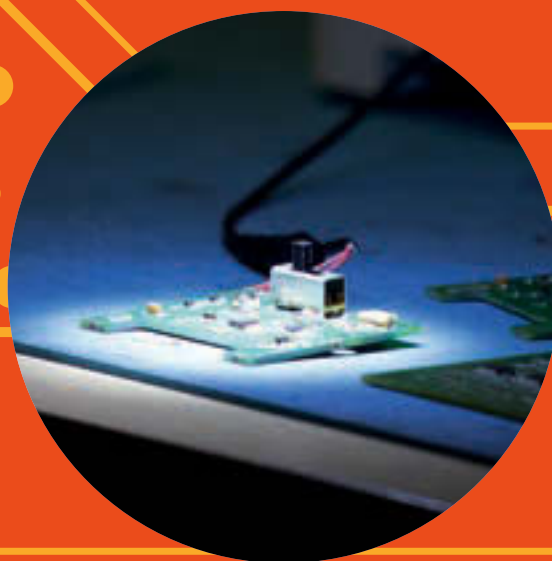


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