

# K-12 Catalog

2025

# Thank you, from our hearts to yours.



You've shared a passion with us for inspiring students and furthering their interest in STEM careers, and for this we are so grateful.

## Vernier Volunteers

As a company, we volunteer for organizations such as Habitat for Humanity, The Humane Society, Oregon Museum of Science & Industry, Portland Symphony, Oregon Public Broadcasting, LEGO® Robotic Tournaments, Meals-on-Wheels, The Nature Conservancy, Oregon Food Bank, and many other organizations.

Vernier employees are encouraged to volunteer for non-profit organizations of their choice on company time and receive four hours of pay each month for their volunteer time. Vernier employees regularly volunteer at schools—teaching children to read, teaching art literacy, and helping with field trips and other school functions.

# Welcome!

Dear Educators and Partners,

What a warm welcome I have received this year! I'm so thrilled to join the mission that Dave and Christine created at Vernier and to work alongside educators who are at the heart of everything we do. My decision to join Vernier as CEO was deeply personal—shaped by my father's career as a teacher and administrator—and grounded in a shared commitment to advancing science education through hands-on learning and tools that make STEM accessible and engaging for all students.

At Vernier, we know that STEM education is transformative. Our solutions are not just designed for data collection but to empower students to become active participants in their learning. When students can observe real-world phenomena, ask questions, conduct investigations, and analyze data, they move beyond what's possible from only reading or watching to gain a deeper understanding of science. This experiential approach helps students build critical thinking skills and fosters a resilient mindset that will serve them in any path they choose, from continuing in higher education to entering the workforce.

Vernier data-collection tools transform a classroom from a place where science is talked about to a place where it is actively experienced. Through real-time data collection and analysis, students begin to form critical connections and see firsthand how science shapes the world around them. This is where the inspiration happens—where science becomes personal, exciting, and meaningful. Our goal is for students to see themselves as real scientists and problem solvers, gaining confidence to navigate our rapidly changing world with knowledge, curiosity, and skill.

For me, the chance to support educators and create these moments of inspiration for students is a privilege and a passion. I am excited to continue the Vernier legacy of excellence and to work alongside all of you as we inspire the next generation of thinkers, explorers, and problem solvers. Together, let's make science accessible, engaging, and empowering for every student.

Warm regards,



Jill Hedrick, CEO

## About Vernier Science Education

Vernier Science Education® was co-founded in 1981 by Dave and Christine Vernier. The company is now owned by a Perpetual Purpose Trust, which empowers Vernier to stay committed to our core mission and values far into the future.

Vernier is proud to be recognized for its philanthropic commitment, environmental policies, steady growth, and as one of the Best 100 Companies to Work For in Oregon for more than 25 years.



2024 Best Companies to Work For in Oregon



2024 Healthiest Employers of Oregon



2024 Best Green Companies in Oregon

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Inside back cover STEM Classroom

For college products, visit [vernier.com/college](https://vernier.com/college)

## 10 Tips for Writing Your Best Grant Proposal

We understand that grants are essential for obtaining the supplies, tools, and resources necessary to address the many needs of your students.

This year, with school budgets in such a precarious place, securing grant funding means you and your students can have the support needed to thrive, no matter where learning takes place.

We have created an infographic with 10 tips for grant writing to help you perfect your proposal with newfound confidence.

In addition, discover tips and opportunities for funding your K–12 STEM projects in our updated grant-writing guide. This comprehensive resource includes best practices for writing a successful grant proposal, as well as over 100 upcoming national and state-specific funding opportunities.



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

# What's New

## Vernier Connections®

**NEW**

Vernier Connections deepens students' understanding of scientific concepts and develops critical skills such as inquiry, problem solving, communication, and collaboration. Phenomenon-based, three-dimensional lessons combine the benefits of web-based learning with hands-on investigation.

[Learn more on page 4.](#)

## **NEW** Vernier Data Collection and Analysis Bundle

Make data collection and analysis easy and engaging for students with our 4-in-1 software bundle! This 3-year subscription provides access to robust apps that help students explore complex phenomena and connect scientific concepts to the real world.

DCA-3YR \$499

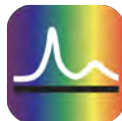
[vernier.com/dca-3yr](http://vernier.com/dca-3yr)



**Vernier Graphical Analysis® Pro**



**Vernier Video Analysis®**



**Vernier Spectral Analysis®**



**Vernier Instrumental Analysis®**

## **NEW** Accessories for an Eco-Friendly Lab

Three new products are now a part of the Vernier high school chemistry lineup, offering reliable, easy-to-use solutions that enhance the lab experience for students and educators. These accessories can be used alongside Vernier Go Direct® sensors to provide impactful learning experiences that are both efficient and environmentally conscious.

[Learn more on page 36.](#)



### Electrochemistry Half-Cell Plate

ECHEM-PLT \$59

[vernier.com/echem-plt](http://vernier.com/echem-plt)



### Electrochemistry Metals Kit

ECHEM-MTLS ⚡ \$20

[vernier.com/echem-mtls](http://vernier.com/echem-mtls)



### Precision Volume Dispenser

DC-DISP \$85

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



# Now Shipping

## Go Direct Salinity

Go Direct Salinity precisely measures the total dissolved salt content of ocean or brackish water.

GDX-SAL \$180

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



## Go Direct Soil Moisture

This sensor uses capacitance to measure the volumetric water content of soil.

GDX-SM \$149

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



Watch the video!

## Go Direct Force Plate

Measure the forces developed during stepping, jumping, and other human-scale actions. Observe change in apparent weight as you ride an elevator or measure reaction forces as you lean against a wall.

GDX-FP \$399

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



Watch the video!

## Cart Fan

Use the Cart Fan with the Dynamics Cart and Track System and Go Direct carts to investigate constant acceleration, balanced/unbalanced forces, and variable thrust angles.

DTS-CFAN \$89

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



Watch the video!



## Inspiring future generations of STEM-literate citizens

Web-based, interactive lessons designed to put hands-on investigation at the heart of students' learning

Vernier Connections deepens students' understanding of scientific concepts and develops critical STEM skills such as inquiry, problem solving, communication, and collaboration. The phenomenon-based lessons in Connections can be used to facilitate independent and cooperative learning or integrated into whole-class instruction. Formative assessment tasks focus on student reasoning and are designed to provide evidence of mastery of the three-dimensional elements.



3D learning  
designed for  
the NGSS

**TEKS**

Aligned to  
the TEKS



Delivers  
relevant & accessible  
content



Integrates with  
your LMS

Connections lessons keep students engaged as they progress through an inquiry cycle. Students are empowered to explore observable phenomena and their causes, develop explanations, and draw connections to their everyday lives.

### Key features include

**A content library** that can be filtered by standard, topic, completion time, Vernier sensor, keyword, and more to quickly find the right lesson

**Hands-on investigations** that leverage Vernier sensors to develop students' skills in collecting and analyzing experimental data

**Formative assessment** with automated feedback integrated throughout the lesson so students can monitor and adjust their own learning

**Real-time progress monitoring tools** that make it easy for teachers to quickly identify students in need of support and topics in need of review

Time-saving **automated grading** and one-click grade passback to the LMS

Coming 2025  
[vernier.com/connections](http://vernier.com/connections)



# Getting Started

## A Guide to Vernier Data Collection

Our data-collection technology helps students record and analyze data from real-world phenomena and make critical connections with concepts and practices that support the development of scientific and critical thinking skills as well as real-world applications of science. Get to know our range of STEM solutions designed to inspire scientific curiosity and support student success.

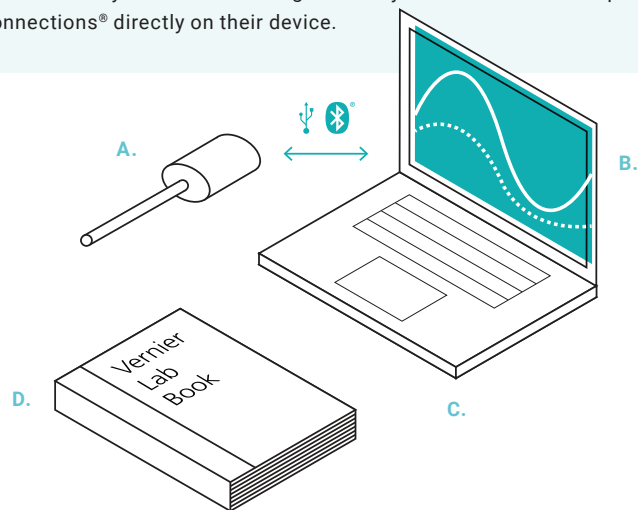
[vernier.com/getting-started](https://www.vernier.com/getting-started)





## Why Choose Go Direct Sensors?

Go Direct® sensors are an ideal fit for schools with one-to-one computing solutions. These sensors can connect to any Bluetooth® wireless technology-enabled device—like laptops, Chromebooks, or tablets—or connect via a wired USB connection. The flexible, wireless connection makes it easy for students to log and analyze data in Vernier Graphical Analysis® or Vernier Connections® directly on their device.



### What You Need to Get Started

#### A. Go Direct Sensor

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

#### B. Vernier Graphical Analysis Pro

With Vernier Graphical Analysis Pro, students can collect, graph, analyze, and share scientific data collected from Vernier sensors.

Learn more at

[vernier.com/graphical-analysis](https://www.vernier.com/graphical-analysis)

#### Vernier Connections

Connections' phenomenon-based lessons can be used to facilitate independent and cooperative learning or be integrated into whole-class instruction.

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

#### C. Device

Go Direct sensors connect to a wide variety of devices commonly used in classrooms, including Chromebooks, computers, compatible mobile devices, and LabQuest® 3.

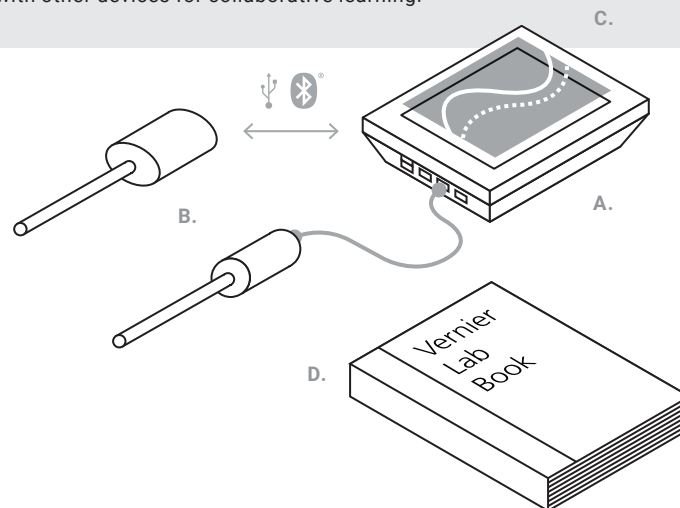
#### D. Lab Book

Step-by-step instructions at your fingertips save valuable time when integrating probeware into your curriculum. Many of our lab books provide support for Go Direct sensors and the Graphical Analysis app.

Our lab books come with a generous site license. Purchase once and share files school wide.

## Why Choose LabQuest 3?

LabQuest 3 is an ideal solution for schools looking to provide students with an easy-to-use data-logging device. The built-in data-collection and analysis app works with all Vernier sensors, including LabQuest and Go Direct sensors. And as a standalone device, it minimizes on-screen distractions while still allowing students to share data in real-time with other devices for collaborative learning.



### What You Need to Get Started

#### A. LabQuest 3

With its large, high-resolution screen, LabQuest can be easily navigated using gestures. It also offers fast data collection, wireless connectivity with Wi-Fi and Bluetooth wireless technology, and a rechargeable, high-capacity battery.

#### B. Sensors

Compatible with all Vernier sensors, LabQuest 3 connects wirelessly with the family of Go Direct sensors and connects easily to our wired LabQuest sensors.

#### C. Software

LabQuest 3 has built-in software, LabQuest App, that gives your students real-time graphing and analysis capabilities in one handheld device. LabQuest 3 also offers built-in apps, such as a Periodic Table, Sound Recorder, and more, and includes student instructions for over 75 of our most popular experiments.

#### D. Lab Book

Looking for even more lab ideas? 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 school wide.

LEARN MORE ABOUT LABQUEST 3 ON PAGE 12.

# Vernier Graphical Analysis Pro

Deepen students' understanding of natural phenomena through meaningful interaction with data.

With the Vernier Graphical Analysis® app, students can visualize and interact with experiment data collected using nearly any Vernier sensor. Unlock key features with Graphical Analysis Pro and do more with your Vernier sensors to deepen and extend learning. With access to Pro, you can enrich live instruction while providing more opportunities for students to interact with and analyze data outside of class time.

## Unlock Pro Access

A subscription site license to Graphical Analysis Pro provides all students and educators at your K-12 school with unlimited access to our award-winning app.

### 1-Year Site License (unlimited seats)

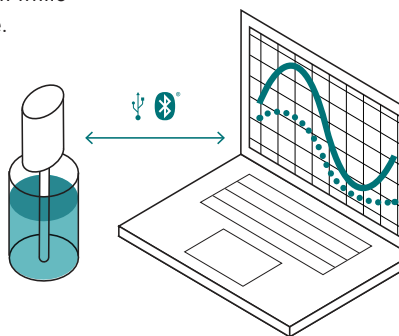
GAP-1YR \$149

### 3-Year Site License (unlimited seats)

GAP-3YR \$299

### 5-Year Site License (unlimited seats)

GAP-5YR \$499



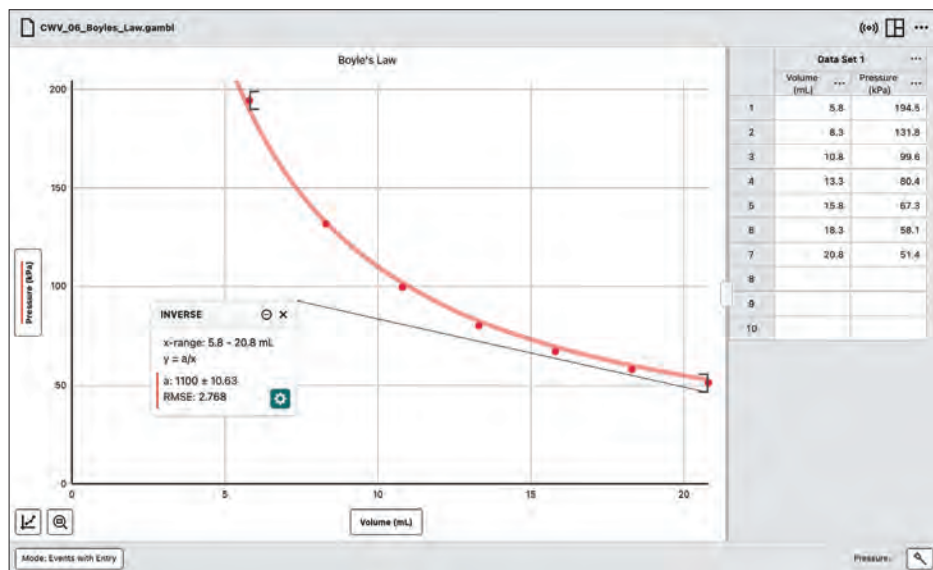
**NEW**

### 4-in-1 Bundle

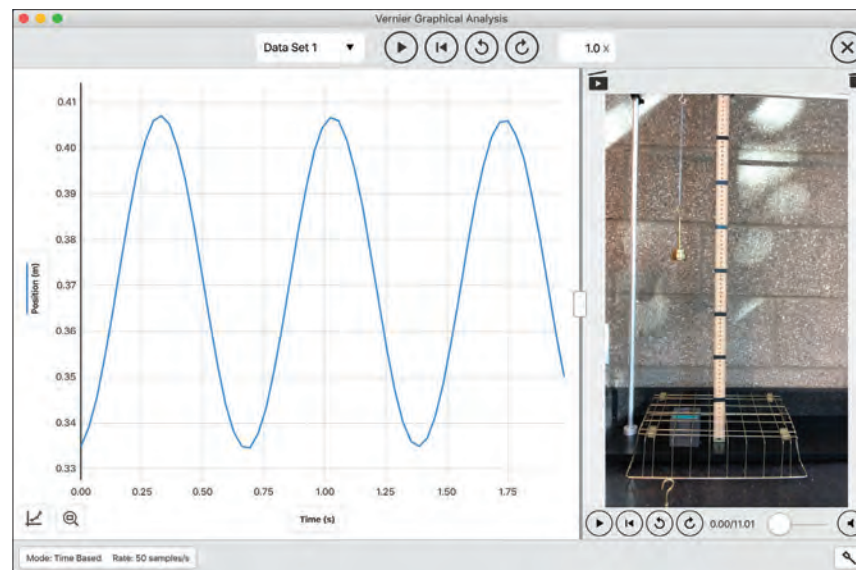
Get all the apps you need to make hands-on data collection easy and engaging for your students! Our new 4-in-1 bundle gives you a 3-year subscription to Vernier Graphical Analysis Pro, Vernier Video Analysis®, Vernier Spectral Analysis®, and Vernier Instrumental Analysis®.

DCA-3YR \$499

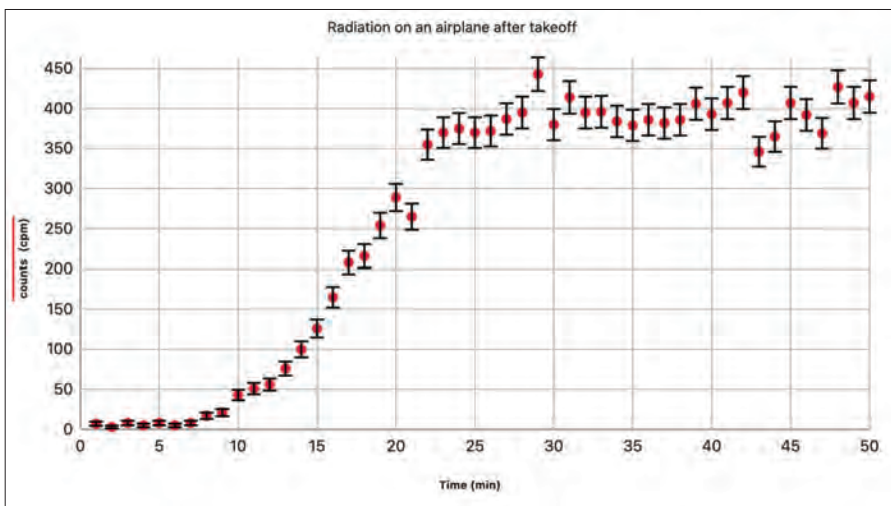
[vernier.com/dca-3yr](http://vernier.com/dca-3yr)



Choose curve fits from a library of functions or define your own equation. Display uncertainty of fit parameters.



Collected sensor data is synchronized with the video, allowing students to replay, speed up, slow down, and pause recorded experiments at key moments.



Use advanced analysis features, such as error bars, to describe measurement uncertainty.

“The data-sharing feature is outstanding. The engagement is so much better when doing demo labs.”

— John Kunishima

Robert O. Townsend Junior High  
Chino Hills, CA

## Awards



## FREE 30-DAY TRIAL

Get a 30-day free trial and learn about site license options and e-books at [vernier.com/gapro](https://www.vernier.com/gapro)

## Key Features

With the free Graphical Analysis app, students can visualize and interact with experiment data collected using nearly any Vernier sensor.

### Graphical Analysis Pro Features That Teachers Love

**Live data sharing** during demonstrations—great for in-person and remote learning

**More graph types**, including bar, histogram, and FFTs, plus the ability to plot categorical items

**Video-sensor data sync**, which enables students to replay, speed up, slow down, and pause recorded experiments at key moments in time

**Library of over 45 sample experiments** ready to be analyzed by students as prep work, homework, or a makeup assignment

**Graph annotations** so students can demonstrate their comprehension of the graph—and the underlying scientific concepts

**Custom curve fits** that enable students to fit a function of their choosing to experimental data

For more information, go to [vernier.com/graphical-analysis](https://www.vernier.com/graphical-analysis)



# Vernier Video Analysis



Investigate projectile motion.



WORKS ON  
CHROMEBOOKS!

## Study Motion Everywhere

Vernier Video Analysis® helps students make connections between the classroom and the real world. With this streamlined app, students can use videos they find or record their own with mobile devices to measure motion of objects that they can't measure with a sensor.

### 1-Year Site License (unlimited seats)

VVA-1YR \$225

### 3-Year Site License (unlimited seats)

VVA-3YR \$450

## Features

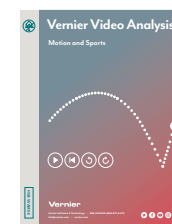
- Vernier Video Analysis app is compatible with multiple browsers and platforms: ChromeOS™, Windows®, macOS®, iOS, iPadOS®, and Android.™
- Students can use prepared videos, found videos, or their own videos for analysis.
- The app makes it possible to do experiments that cannot be done with sensors, such as analyzing the motion of a basketball in flight—objects can be tracked automatically by the app.
- Analysis is easy with multiple graphing options, so students are able to think critically about the collected data—they can even analyze the motion of multiple objects in a single video.
- With this app, you can apply vectors and vector components over the video after tracking a moving object, illuminating changes in position, velocity, and acceleration.
- When multiple objects have been marked, just enter their masses and the app can automatically calculate and display the center of mass location.
- Annual site-licensing makes purchasing and renewing quick and easy.

## FREE 30-DAY TRIAL

Get a 30-day free trial and learn about site license options and e-books at [vernier.com/video-analysis](https://www.vernier.com/video-analysis)

## Vernier Video Analysis: Motion and Sports

Vernier Video Analysis: Motion and Sports features 12 investigations using Vernier Video Analysis. In addition to traditional physics concepts such as velocity and acceleration, its investigation of sports activities expands learning opportunities and further connects the study of motion to students' daily lives.



**Download only**  
HSB-VVAMS-E  
\$29

## Vernier Video Analysis: Conservation Laws and Forces

This e-book features 12 investigations dealing with topics such as conservation of energy and momentum using the Vernier Video Analysis app.



**Download only**  
HSB-VVACL-F-E  
\$29





## Vernier Spectral Analysis



### Collect, Share, and Analyze Spectrometer Data

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

Compatible with ChromeOS, Windows, macOS, iOS, iPadOS, and Android.

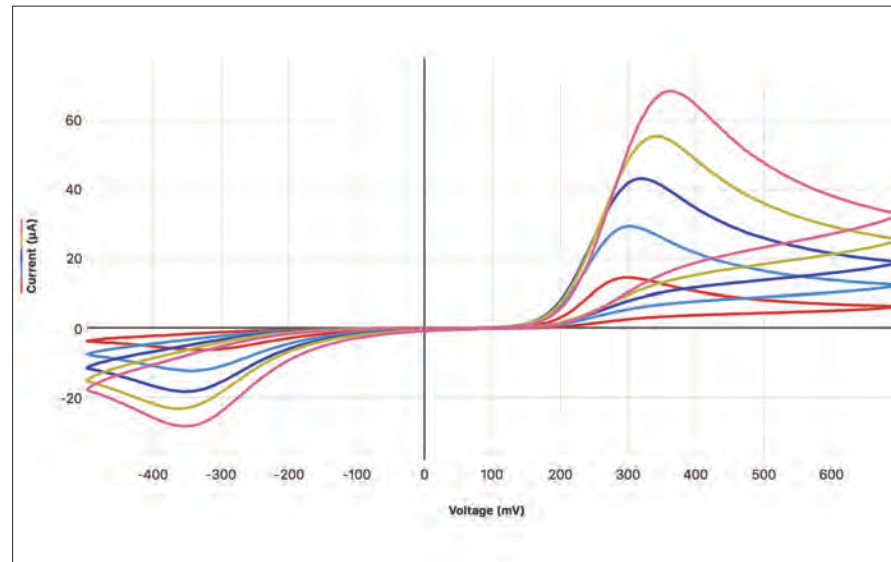
#### Features

- Follow on-screen instructions for simplified Beer's law or kinetics data collection.
- Collect full absorbance spectrum or percent transmittance data in less than one second.
- Analyze data with built-in analysis tools, including data interpolation and curve fits.
- Determine the order of kinetics reaction with the calculated columns function.
- Understand color transmission using the color strip shown on full spectrum graphs.
- View a full spectrum of your sample while collecting data for Beer's law or kinetics experiments.
- View spectral lines by collecting intensity vs. wavelength data.

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



## Vernier Instrumental Analysis



### Incorporate Instrumentation into Your Curriculum

Our free Vernier Instrumental Analysis® app makes it easy to incorporate instrumentation into your chemistry curriculum. With this app, students can collect and analyze data from Mini GC, Mini GC Plus, Go Direct Mini GC™, Go Direct Cyclic Voltammetry System, and Go Direct Polarimeter using computers, Chromebooks, or other mobile devices.

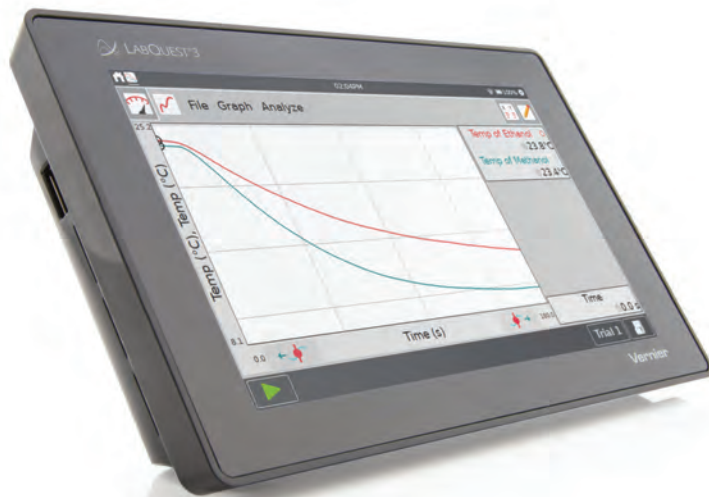
Compatible with ChromeOS, Windows, macOS, iOS, iPadOS, and Android.

#### Features

- Perform peak integration.
- Split peaks present in your gas chromatograms.
- Determine peak retention time and area.
- Directly measure the optical rotation value of a sample in your polarimeter at a single point or over time.
- Capture and analyze polarimetry data to identify optically active compounds.
- Analyze, save, and export gas chromatography, voltammetry, and polarimetry data.
- Explore electrochemistry and redox reactions with voltammograms.

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

# LabQuest 3



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

LabQuest® 3 reimagines data collection by providing students with an innovative, easy-to-use interface. A larger screen and advanced touch screen abilities make it easier for students to collect, graph, and analyze data wherever they are—in the classroom or in the field. Challenge your students to gain a deeper understanding of science through data with the accessible, groundbreaking LabQuest 3.

- Connects wirelessly to the family of Go Direct® sensors
- Easy-to-use platform enables students to generate graphs and analyze results
- An excellent choice for laboratories, classrooms, or in-the-field investigations

LABQ3 \$399

*LabQuest 3 purchase includes LabQuest 3 unit, rechargeable battery (in unit), AC power adapter, micro USB computer connection cable, and Quick-Start Guide*



## Full-Featured Data-Collection Platform

The most engaging and effective approach to science is interactive, with students collecting and analyzing data to understand and apply core concepts. Graphing and analyzing data is an essential component of the inquiry and learning process. LabQuest 3, with its built-in data-collection and analysis app that works with all Vernier sensors, supports hands-on data collection in the classroom, in the lab, and in the field.

- No laptops, Chromebooks, or tablets? No problem. LabQuest 3 can do it all—data collection, data analysis, and data sharing—no other device is needed.
- Keep your expensive computers safe from spills, drops, and crashes—use LabQuest 3 in the chemistry lab, at the watershed, or next to your bridge tester.
- With a portable design, your students take it anywhere they go.
- LabQuest 3 works with both Go Direct and wired LabQuest sensors.



## Connectivity to Other Platforms

### USB Sensor Interface

If you want to use your own computer or Chromebook™ to collect data, use LabQuest 3 as a conduit between our wired LabQuest sensors and your device. LabQuest 3 works as a USB sensor interface with Vernier Graphical Analysis®

### One-to-Many Data Sharing

Students can share real-time data with multiple devices for a truly hands-on, collaborative learning experience. Use LabQuest 3 to transfer data wirelessly to computers, and mobile devices running Vernier Graphical Analysis®

Data Sharing from a LabQuest 3 can also be used to connect wired LabQuest sensors to mobile devices that don't support a USB interface.

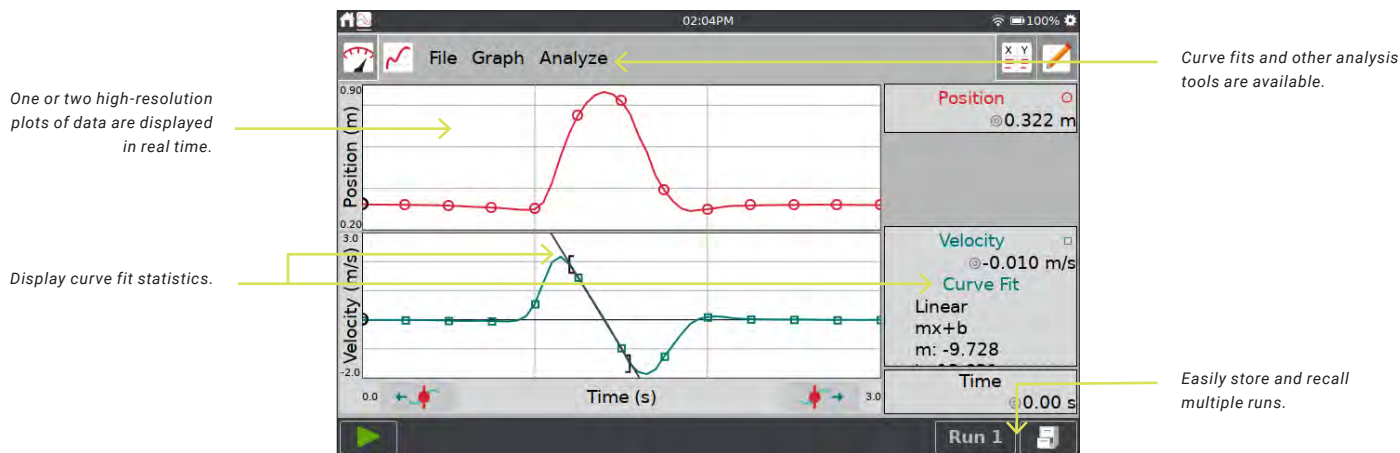
*\*Data Sharing from LabQuest 3 is not supported in the Progressive Web App version of Vernier Graphical Analysis®*

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

## LabQuest App

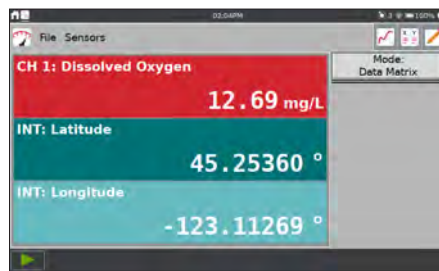
LabQuest 3 has built-in software that gives your students real-time graphing capabilities in a handheld device. It's powerful, yet beautifully simple.

- Collect data and view in a Data Table, Meter, and Graph.
  - Perform curve fits.
  - Use built-in sensors—GPS and Microphone.
  - Draw a prediction before collecting data.
  - Display two graphs at once.
  - Display a tangent line or use the Integral function tool.
  - Calculate statistics for your data.
- Learn more about built-in applications and other great features at [vernier.com/labq3](http://vernier.com/labq3)

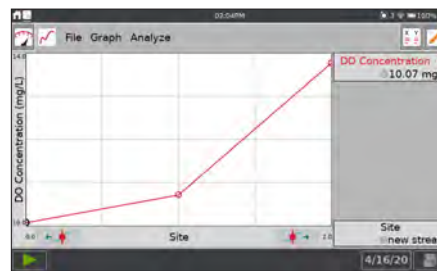


## One-Touch Simplicity

Your students can collect data and view them in a Meter, Graph, or Data Table.



Meter



Graph

Site	Latitude (°)	Longitude (°)	Altitude (m)	DO Conc (mg/L)
new stream	45.50782	-122.85773	66	10.07
pond	45.50790	-122.85690	61	10.71
entrance	45.50841	-122.85613	51	13.77

Data Table

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

# LabQuest 3 Accessories and Replacement Parts

Product	Order Code	Price
LabQuest Charge Station	LQ3-CRG	\$149
LabQuest 3 Stand	LQ3-STN	\$5
LabQuest Power Supply*	LQ3-PS	\$11
LabQuest Lanyard	LQ3-LAN	\$9
LabQuest 3 Battery*	LQ3-BAT	\$34
LabQuest Battery Boost 3	LQ-B00ST3	\$119
Vernier Micro USB Cable*	CB-USB-MICRO	\$5
Vernier Micro USB to USB-C Cable	CB-USB-C-MICRO	\$9

\*Included with LabQuest 3

# LabQuest Viewer App



## LabQuest Viewer

Teach students how to use LabQuest® by projecting your LabQuest screen. Display live images of all LabQuest units in your lab to monitor student progress or compare group data. LabQuest Viewer® is compatible with both macOS® and Windows® computers.

Computer software includes a site license for every teacher's computer in your school.

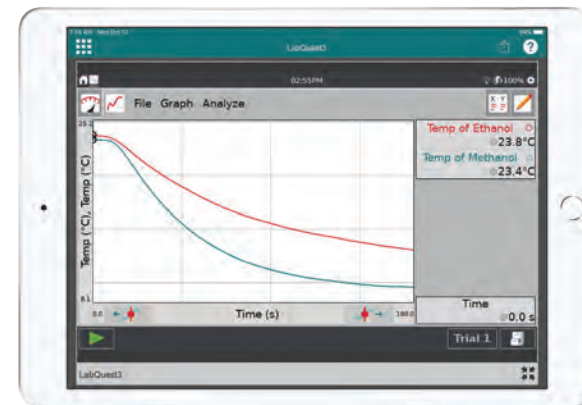
**CD** LQ-VIEW \$79  
**Download** LQ-VIEW-E \$79

For more information, visit [vernier.com/lq-view](http://vernier.com/lq-view)

## LabQuest Viewer for iPad

Use LabQuest Viewer app for iPad® on your classroom iPad to wirelessly view and control LabQuest. When your iPad is used with a projector, you can easily display any LabQuest screen for the entire class to see.

For more information, visit [vernier.com/lq-view-ipad](http://vernier.com/lq-view-ipad)





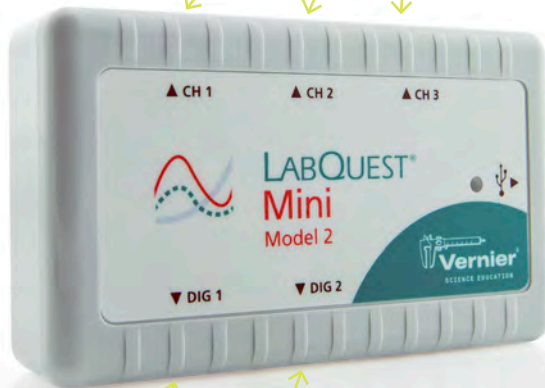


## LabQuest Mini

LabQuest Mini (Model 2) brings the power of our award-winning LabQuest technology to you when you don't need the versatility of a standalone device. The perfect solution for educators collecting data using LabQuest sensors with a computer or Chromebook,™ LabQuest Mini interfaces with Vernier Graphical Analysis® (computers and Chromebooks only).

LQ-MINI \$189

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



*Three analog sensor ports for use with most sensors, such as temperature, pH, and force*

**USB connectivity**

Connect LabQuest Mini to a Windows or macOS computer or a Chromebook to collect data.

*Two digital sensor ports for use with digital sensors, such as motion detectors, photogates, chemical polarimeters, diffraction apparatus, and drop counters*

## Go!Link

The Go!Link® USB sensor interface is a quick and affordable way to get started with data-collection technology. It's a single-channel interface that connects most of our LabQuest sensors to your computer or Chromebook USB port.

GO-LINK \$75

Learn more at [vernier.com/go-link](http://vernier.com/go-link)



**USB connectivity**

Connect Go!Link to a Windows or macOS computer or a Chromebook to collect data.

*One analog port for use with most sensors, such as temperature, pH, and force*

### USING GO DIRECT SENSORS? NO INTERFACE REQUIRED!

An interface is required when using wired LabQuest sensors. LabQuest Mini and Go!Link are not for use with Go Direct® sensors.

# High School

Encourage your students and build their confidence in pursuing STEM career paths with hands-on experience using data-collection technology from Vernier. Our technology supports you as you prepare students to meet the NGSS and state standards through experiments that support three-dimensional learning.

[vernier.com/high-school](https://www.vernier.com/high-school)



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For college products, visit [vernier.com/college](https://www.vernier.com/college)

## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

# Lab Books & Investigations



## E-books and Printed Books—the Choice Is Yours

Many of our popular, award-winning lab books are available in both e-version and printed formats. When you purchase a printed book, you also receive the electronic version. When you purchase either format, you receive

- Anytime access to the most up-to-date versions of experiments on all supported Vernier software (free Vernier web account required)
- Editable student files and complete teacher information files, including sample data and supplies lists
- A generous site license—purchase once and share files with other teachers in your school

## Helping You Meet Standards and Learning Objectives

Vernier understands that helping students meet standards is an important part of teaching. As standards change, we are committed to providing you with the most current information. You will find the following alignments and correlations for Vernier lab books at [vernier.com/standards](https://www.vernier.com/standards)

- NGSS (Next Generation Science Standards)
- CSTA (Computer Science Teachers Association)
- AP\* (Advanced Placement Program)
- IB† (International Baccalaureate Diploma Program)

## Ideas for Your Science Classroom

If you are looking for experiments that can help you excite your students about STEM, check out our extensive library. We make it easy to find ideas from fellow educators and Vernier professionals.

Visit [vernier.com/ideas](https://www.vernier.com/ideas)

## NGSS Aligned

To learn about the Next Generation Science Standards and Vernier, visit [vernier.com/ngss](https://www.vernier.com/ngss)

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

\* AP and Advanced Placement Program are registered trademarks of the College Entrance Examination Board, which was not involved in the production of and does not endorse this product.

† The IB Diploma Program is an official program of the International Baccalaureate Organization (IBO) which authorizes schools to offer it. The material available here has been developed independently of the IBO and is not endorsed by it.



HIGH SCHOOL

# Biology

Our biology solutions include high-quality sensors, easy-to-use software, and exceptional technical support to set up you and your students for classroom success.

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



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

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

MOST POPULAR

Use Go Direct® CO<sub>2</sub> Gas to measure carbon dioxide gas levels, air temperature, and relative humidity. It's an excellent sensor for measuring fermentation, cell respiration, and photosynthesis.

GDX-CO2 \$229

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



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

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

GDX-O2 \$219

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





## Go Direct Gas Pressure

Use Go Direct Gas Pressure to monitor gas pressure in a variety of experiments. Easily change the displayed units to any one of seven options. This sensor includes a syringe, tubing, and stoppers to ease experiment setup.

GDX-GP \$105

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



## Go Direct pH

This is an important and versatile sensor for lab and field activities alike. Go Direct pH is a general-purpose pH sensor used to monitor pH of aqueous solutions.

GDX-PH \$109

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



## Go Direct Optical Dissolved Oxygen

Use this sensor to measure dissolved oxygen, water temperature, and atmospheric pressure.

GDX-ODO \$385

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



## Go Direct Conductivity

Go Direct Conductivity determines the ionic content of an aqueous solution by measuring its electrical conductivity. It features a built-in temperature sensor, so you can simultaneously read conductivity and temperature.

GDX-CON \$129

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



## Go Direct Temperature

Unlike a traditional thermometer, Go Direct Temperature allows students to collect real-time temperature measurements of a single instance or over a period of time.

GDX-TMP \$79

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



## Go Direct EKG

Go Direct EKG measures electrical activity in the heart and electrical signals produced during muscle contractions.

GDX-EKG \$175

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



## Human Physiology Go Direct Standard Package

This package includes nine sensors that work with Vernier Graphical Analysis® Pro and LabQuest® 3. Two useful accessories are also included.

### Sensors

- Go Direct® Blood Pressure
- Go Direct EKG
- Go Direct Force and Acceleration
- Go Direct Hand Dynamometer
- Go Direct O<sub>2</sub> Gas
- Go Direct Respiration Belt
- Go Direct Surface Temperature
- Go Direct Spirometer
- Go Wireless® Heart Rate

### Accessories

- Reflex Hammer Accessory Kit
- BioChamber 250 ⚡

GDP-HP-DX ⚡ \$1,363

Buy 8 or more packages at \$1,336 and save \$216.

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

## Go Direct PAR

Go Direct PAR (Photosynthetically Active Radiation) measures photosynthetic light levels in both air and water.

GDX-PAR \$299

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



## Go Direct Soil Moisture

Simply insert this rugged sensor into the soil to be tested, and the volumetric water content of the soil is reported in percent.

GDX-SM \$149

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



## Lab Books for Human Physiology

Our experiments are designed to encourage students to explore the physiology of various human organ systems. The setup for these experiments is minimal—students are collecting data within minutes.

**Printed book + download** HSB-HP \$45

**Download only** HSB-HP-E \$35

**Printed book + download** ALB-HP2 \$45

**Download only** ALB-HP2-E \$35

[vernier.com/product/human-physiology-experiments/](http://vernier.com/product/human-physiology-experiments/)



## Go Direct Hand Dynamometer

Measure grip strength, pinch strength, and muscle fatigue wirelessly.

GDX-HD \$135

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



## Go Direct Weather System

Easily monitor a wide variety of environmental factors with just one sensor. The included Go Direct Weather Vane accessory is required to report wind direction.

GDX-WTVA \$164

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



## LabQuest 3

LabQuest 3 can serve as a standalone data-collection platform that works with all of our sensors. This makes it an excellent choice for teachers and students in the classroom and in the field.

LABQ3 \$399

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

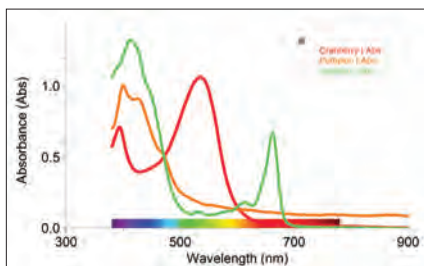


## Go Direct SpectroVis Plus

Introduce your students to spectroscopy with our affordable Go Direct SpectroVis® Plus. Students can easily collect a full-wavelength spectrum (absorbance, percent transmittance, fluorescence, or intensity), study absorbance vs. concentration (standard curve), or monitor enzyme activity (kinetics). Collect and analyze data using Vernier Spectral Analysis® app or LabQuest App.

GDX-SVISPL \$479

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



⚡ For California Proposition 65 warning, see pp. 78–79.

## Biology Go Direct Starter Package

This package includes 4 sensors that work with Vernier 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 \$512

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



## Biology Go Direct Standard Package

This package includes 11 sensors that work with Vernier Graphical Analysis Pro and LabQuest 3. Two sampling chambers are also included.

- Go Direct Temperature
- Go Direct Gas Pressure
- Go Direct O<sub>2</sub> Gas
- Go Direct CO<sub>2</sub> Gas
- Go Direct Colorimeter
- Go Direct Conductivity
- Go Direct EKG
- Go Direct pH
- Go Direct Optical Dissolved Oxygen
- Go Direct Respiration Belt
- Go Wireless® Heart Rate
- BioChamber 250 ⚡
- BioChamber 2000 ⚡

GDP-BIO-ODX ⚡ \$1,820

Buy 8 or more packages at \$1,784 and save \$288.

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

## Biology with Vernier

*Biology with Vernier* addresses the fundamentals of a high school biology course with 31 experiments that include cell respiration, photosynthesis, membrane diffusion, osmosis, human physiology, transpiration, fermentation, and more.

[Learn more at vernier.com/bwv](http://vernier.com/bwv)






Printed book + download BWV \$59

Download only BWV-E \$45

# Featured Products

## Go Direct Sensors

Sensor		Order Code	Price
Go Direct® Blood Pressure		GDX-BP	\$125
Go Direct CO <sub>2</sub> Gas		GDX-CO2	\$229
Go Direct Colorimeter		GDX-COL	\$135
Go Direct Conductivity		GDX-CON	\$129
Go Direct EKG		GDX-EKG	\$175
Go Direct Ethanol Vapor		GDX-ETOH	\$169
Go Direct Force and Acceleration (for use with Reflex Hammer Accessory Kit)		GDX-FOR	\$119
Go Direct Gas Pressure		GDX-GP	\$105
Go Direct Hand Dynamometer		GDX-HD	\$135
Heart Rate Monitors			
Go Wireless® Exercise Heart Rate		GW-EHR	\$79
Go Wireless Heart Rate		GW-HR	\$99
Go Direct O <sub>2</sub> Gas		GDX-O2	\$219
Go Direct Optical Dissolved Oxygen		GDX-ODO	\$385

Go Direct PAR		GDX-PAR	\$299
pH Sensors			
Go Direct pH		GDX-PH	\$109
Go Direct Tris-Compatible Flat pH		GDX-FPH	\$139
Go Direct Respiration Belt		GDX-RB	\$125
Go Direct Salinity		GDX-SAL	\$180
Go Direct Soil Moisture		GDX-SM	\$149
Go Direct SpectroVis® Plus		GDX-SVISPL	\$479
Go Direct Spirometer		GDX-SPR	\$229
Temperature Probes			
Go Direct Surface Temperature		GDX-ST	\$99
Go Direct Temperature		GDX-TMP	\$79
Go Direct Weather System		GDX-WTVA	\$164

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



## LabQuest Sensors

Sensor	Order Code	Price
25-g Accelerometer	ACC-BTA	\$110
Blood Pressure Sensor	BPS-BTA	\$120
CO <sub>2</sub> Gas Sensor	C02-BTA	\$299
Colorimeter	COL-BTA	\$128
Conductivity Probe	CON-BTA	\$129
EKG Sensor	EKG-BTA	\$179
Ethanol Sensor	ETH-BTA	\$135
Gas Pressure Sensor	GPS-BTA	\$103
Hand Dynamometer	HD-BTA	\$124
Heart Rate Monitors		
Exercise Heart Rate Monitor	EHR-BTA	\$99
Hand-Grip Heart Rate Monitor	HGH-BTA	\$129
O <sub>2</sub> Gas Sensor	O2-BTA	\$219
PAR Sensor	PAR-BTA	\$259
pH Sensors		
pH Sensor	PH-BTA	\$105
Tris-Compatible Flat pH Sensor	FPH-BTA	\$124
Soil Moisture Sensor	SMS-BTA	\$148
Spirometer	SPR-BTA	\$240
Temperature Probes		
Stainless Steel Temperature Probe	TMP-BTA	\$45
Surface Temperature Sensor	STS-BTA	\$34

## Accessories

Accessory	Order Code	Price
Go Direct Charge Station	GDX-CRG	\$89
Go Direct Sensor Clamp	GDX-CLAMP	\$14
Reflex Hammer Accessory Kit	RFX-ACC	\$29

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

## Spectrophotometers

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

Spectrophotometer	Order Code	Price
Go Direct SpectroVis Plus	GDX-SVISPL	\$479
Go Direct Fluorescence/UV-VIS Spectrophotometer	GDX-SPEC-FUV	\$3,499
Go Direct UV-VIS Spectrophotometer	GDX-SPEC-UV	\$2,999
Go Direct Visible Spectrophotometer	GDX-SPEC-VIS	\$1,999

## Digital Microscopes

Equipment	Order Code	Price
Celestron® Digital Microscope Imager	CS-DMI <sup>⬆</sup>	<a href="https://www.vernier.com/cs-dmi">vernier.com/cs-dmi</a>
5MP Celestron Digital Microscope	CS-5MP <sup>⬆</sup>	<a href="https://www.vernier.com/cs-5mp">vernier.com/cs-5mp</a>
USB Digital Microscope	BD-EDU-100	\$119

## Lab Books\*

Title	Order Code	Price
<i>Biology with Vernier</i>	Printed book + download: BWV	\$59
	Download only: BWV-E	\$45
<i>Investigating Biology through Inquiry</i>	Printed book + download: BIO-I	\$59
	Download only: BIO-I-E	\$45
<i>Human Physiology Experiments: Volume 1</i>	Printed book + download: HSB-HP	\$45
	Download only: HSB-HP-E	\$35
<i>Human Physiology Experiments: Volume 2</i>	Printed book + download: ALB-HP2	\$45
	Download only: ALB-HP2-E	\$35
<i>Agricultural Science with Vernier</i>	Printed book + download: AWV	\$59
	Download only: AWV-E	\$45

## Looking for Replacement Parts?

Visit [vernier.com/replacements](https://www.vernier.com/replacements)

HIGH SCHOOL

# Environmental Science

Help your students see that the environmental science concepts discussed in the classroom have serious implications on the world around them. Our hands-on investigations and data-collection technology help students form a better understanding of phenomena.

[vernier.com/environmental-science](http://vernier.com/environmental-science)



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

## Go Direct Soil Moisture

This sensor uses capacitance to measure the volumetric water content of soil.

GDX-SM \$149

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



## Go Direct Optical Dissolved Oxygen

This optical sensor makes it easy to measure dissolved oxygen in water, atmospheric pressure, and water temperature.

GDX-ODO \$385

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



## Go Direct Salinity

Go Direct® Salinity precisely measures the total dissolved salt content of ocean or brackish water.

GDX-SAL \$180

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



## Go Direct Tris-Compatible Flat pH

The flat glass, double-junction design makes this sensor a good choice for environmental science.

GDX-FPH \$139

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



## Go Direct Conductivity

Go Direct Conductivity determines the ionic content of an aqueous solution by measuring its electrical conductivity.

GDX-CON \$129

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



## Go Direct Surface Temperature

This sensor has an exposed thermistor that results in an extremely rapid response time, making it perfect for use in air and water.

GDX-ST \$99

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



## Go Direct Light and Color

Measure light intensity in the visible-to-ultraviolet electromagnetic spectrum. An RGB color sensor detects relative contributions of primary colors in light.

GDX-LC \$99

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



## 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 used to measure ambient temperature, humidity, wind speed, and more. The included Go Direct Weather Vane accessory is required to report wind direction.

GDX-WTVA (sensor and vane) \$164

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



## Strengthen students' critical thinking skills by introducing them to alternative energy solutions to real-world problems.

The KidWind Project and Vernier have teamed up to provide the technology, resources, and support you need for your students to investigate renewable energy.

- **Engage your students** as they watch power output and energy production data develop in real time.
- **Inspire creativity** as your students build and test prototypes, test solutions to engineering problems, and optimize designs.
- **Measure** voltage and current, and calculate power, without using a multimeter.
- **Set up activities quickly** and easily, creating more time for instruction and exploration.



## KidWind Advanced Wind Experiment Kit

Discover advanced concepts of wind turbine technology, including gearboxes and generator construction (with the optional KidWind simpleGEN). Students use the blades they design to generate electricity, lift weights, and pump water. This kit is recommended for use with our *Renewable Energy with Vernier* lab book.

KW-AWX \$174

### KidWind Advanced Wind Experiment Kit Classroom Pack

KW-AWXC \$444

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



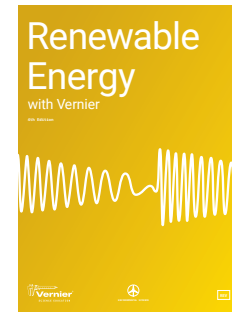
## Renewable Energy with Vernier

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.

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

Printed book +  
download  
REV \$59

Download only  
REV-E \$45



## Solar Energy Exploration Kit

Explore solar energy with this innovative science kit designed to help students investigate energy transformations. Experiment with basic circuits and learn about important factors in photovoltaic systems.

KW-SEEK \$89

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



## KidWind Blade Design Consumables

Bulk balsa, chipboard sheets, and dowels for blade making in the classroom. Pack includes 100 balsa sheets, 150 chipboard sheets, and 250 dowels.

KW-BDC \$169

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



## Go Direct Energy

This sensor quantifies the voltage, current, power, and energy output of small wind turbines and solar panels, such as those used in our KidWind Experiment Kits.

GDX-NRG \$99

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





## LabQuest 3

LabQuest 3 is a powerful, easy-to-navigate, and versatile data-logging system.

LabQuest® 3 can serve as a standalone data-collection platform that works with all of our sensors. This makes it an excellent choice for teachers and students in the classroom as well as in the field.

LABQ3 \$399

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



## Go Direct Sensor Clamp

The Go Direct® Sensor Clamp securely fastens to a wand-style Go Direct sensor, and the included lanyard works as a strap to prevent accidental drops during investigations in the field. Sensors are sold separately.

GDX-CLAMP \$14

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



## Environmental Science Go Direct Starter Package

This package includes four sensors that work with Vernier Graphical Analysis® Pro and LabQuest 3.

- Go Direct Temperature
- Go Direct Tris-Compatible Flat pH
- Go Direct Conductivity
- Go Direct Optical Dissolved Oxygen

GDP-EV-ST \$732

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



## Investigating Environmental Science through Inquiry

The *Investigating Environmental Science through Inquiry* lab book contains 34 inquiry-based environmental science investigations.

Topics include

- Earth systems and resources (air, water, and soil)
- The living world
- Global change and population
- Energy resources and consumption
- Pollution

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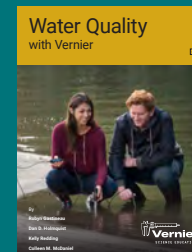
Printed book + download ESI \$59

Download only ESI-E \$45

## Water Quality with Vernier

The *Water Quality with Vernier* lab book contains 18 water quality tests, including pH, total dissolved solids, dissolved oxygen, BOD, flow rate, turbidity, nitrates, and phosphates.

[Learn more at vernier.com/wqv](http://vernier.com/wqv)



Printed book + download WQV \$59

Download only WQV-E \$45

# Featured Products

## Go Direct Sensors

Sensor		Order Code	Price
Go Direct® CO <sub>2</sub> Gas		GDX-CO2	\$229
Go Direct Colorimeter		GDX-COL	\$135
Go Direct Conductivity		GDX-CON	\$129
Go Direct Current		GDX-CUR	\$99
Go Direct Energy		GDX-NRG	\$99
Go Direct Ethanol Vapor		GDX-ETOH	\$169
Ion-Selective Electrodes			
Go Direct Ammonium Ion-Selective Electrode		GDX-NH4	\$299
Go Direct Calcium Ion-Selective Electrode		GDX-CA	\$299
Go Direct Chloride Ion-Selective Electrode		GDX-CL	\$299
Go Direct Nitrate Ion-Selective Electrode		GDX-NO3	\$299
Go Direct Light and Color		GDX-LC	\$99








Go Direct O <sub>2</sub> Gas		GDX-O2	\$219
Go Direct Optical Dissolved Oxygen		GDX-ODO	\$385
pH Sensors			
Go Direct pH		GDX-PH	\$109
Go Direct Tris-Compatible Flat pH		GDX-FPH	\$139
Go Direct Salinity		GDX-SAL	\$180
Go Direct Soil Moisture		GDX-SM	\$149
Go Direct SpectroVis® Plus		GDX-SVISPL	\$479
Temperature Probes			
Go Direct Surface Temperature		GDX-ST	\$99
Go Direct Temperature		GDX-TMP	\$79
Go Direct Voltage		GDX-VOLT	\$95
Go Direct Weather System		GDX-WTVA	\$164

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

## Go Direct Accessories

Accessory		Order Code	Price
Go Direct Charge Station		GDX-CRG	\$89
Go Direct Sensor Clamp		GDX-CLAMP	\$14

## LabQuest Sensors

Sensor		Order Code	Price
Conductivity Probe		CON-BTA	\$129
Flow Rate Sensor		FLO-BTA	\$139
pH Sensor		PH-BTA	\$105
Tris-Compatible Flat pH		FPH-BTA	\$124
Salinity Sensor		SAL-BTA	\$149
Soil Moisture Sensor		SMS-BTA	\$148
Turbidity Sensor		TRB-BTA	\$124

## Lab Equipment

Equipment	Order Code	Price
KidWind Advanced Wind Experimenty Kit	KW-AWX	\$174
KidWind Basic Wind Experiment Kit	KW-BWX	\$134
Solar Energy Exploration Kit	KW-SEEK	\$89
KidWind 2V/400mA Solar Panel	KW-SP2V	\$21
Vernier Variable Load	VES-VL	\$79
Primary Productivity Kit	PPK	\$49
Water Depth Sampler	WDS	\$114
Water Quality Bottles	WQ-BOT	\$28

## Lab Books

Title	Order Code	Price
<i>Climate and Meteorology Experiments</i> (Go Direct sensors only)	Printed book + download: HSB-CM	\$29
	Download only: HSB-CM-E	\$24
<i>Investigating Environmental Science through Inquiry</i>	Printed book + download: ESI	\$59
	Download only: ESI-E	\$45
<i>Renewable Energy with Vernier</i>	Printed book + download: REV	\$59
	Download only: REV-E	\$45
<i>Solar Energy Explorations</i>	Printed book + download: MSB-SOLAR	\$29
	Download only: MSB-SOLAR-E	\$24
<i>Water Quality with Vernier</i> (LabQuest® sensors only)	Printed book + download: WQV	\$59
	Download only: WQV-E	\$45
<i>Wind Energy Explorations</i>	Printed book + download: MSB-WIND	\$29
	Download only: MSB-WIND-E	\$24

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Looking for Replacement Parts?

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HIGH SCHOOL

# Earth Science

When you use Vernier technology to teach Earth science, you can count on our affordable sensors, intuitive software, and creative solutions to help your students understand key Earth science concepts.

[vernier.com/earth-science](https://www.vernier.com/earth-science)



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

## Go Direct Temperature

MOST POPULAR

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

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

GDX-TMP \$79

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



## Go Direct Temperature Teacher Pack

GDX-TMP-TP \$702

Includes 8 Go Direct<sup>®</sup> Temperature Probes and a Go Direct Charge Station.



## Go Direct 3-Axis Magnetic Field

Useful for topics in geology, this sensor can determine the magnitude and direction of a magnetic field at any point in space.

GDX-3MG \$99

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





## Go Direct pH

This wireless sensor monitors the pH of aqueous solutions and is perfect for lab and field experiments alike.

GDX-PH \$109

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



## Go Direct pH Teacher Pack

GDX-PH-TP \$935

Save money when you purchase the Go Direct pH Teacher Pack, which includes 8 Go Direct pH Sensors and a Go Direct Charge Station.



## Go Direct Conductivity

Go Direct Conductivity determines the ionic content of an aqueous solution by measuring its electrical conductivity.

GDX-CON \$129

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



## Go Direct Light and Color

Measure light intensity in the visible-to-ultraviolet electromagnetic spectrum. An RGB color sensor detects relative contributions of primary colors in light.

GDX-LC \$99

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



## Go Direct Motion

Go Direct Motion uses ultrasound to measure the position, velocity, and acceleration of moving objects.

GDX-MD \$129

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



## Climate and Meteorology Experiments Go Direct Package

This package includes all the sensors needed to do the activities in the *Climate and Meteorology Experiments* lab book.

- Go Direct® Surface Temperature (2)
- Go Direct Light and Color
- Go Direct Weather System

GDP-CM \$461

Buy 8 or more packages at \$452  
and save \$72.

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



## 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 used to measure ambient temperature, humidity, wind speed, and more. The included Go Direct Weather Vane accessory is required to report wind direction.

GDX-WTVA (sensor and vane) \$164

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



## Climate and Meteorology Experiments

This lab book is packed with interactive experiments that challenge students to use data-collection technology to explore storm systems and other important weather-related topics.

Learn more at [vernier.com/hsb-cm](http://vernier.com/hsb-cm)

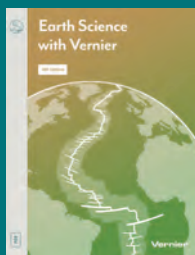


Printed book + download HSB-CM \$29  
Download only HSB-CM-E \$24

## Earth Science with Vernier

In addition to the 33 experiments in *Earth Science with Vernier*, the six projects in this lab book engage students as they learn about the world around them.

Learn more at [vernier.com/esv](http://vernier.com/esv)



Printed book + download ESV \$59  
Download only ESV-E \$45

## Go Direct Surface Temperature

This sensor has an exposed thermistor that results in an extremely rapid response time, making it perfect for use in air and water.

GDX-ST \$99

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



# Featured Products

## Go Direct Sensors

Sensor	Order Code	Price
Go Direct 3-Axis Magnetic Field	GDX-3MG	\$99
Go Direct CO <sub>2</sub> Gas	GDX-CO2	\$229
Go Direct Conductivity	GDX-CON	\$129
Go Direct Current	GDX-CUR	\$99
Go Direct Energy	GDX-NRG	\$99
Go Direct Light and Color	GDX-LC	\$99
Go Direct Motion	GDX-MD	\$129
Go Direct O <sub>2</sub> Gas	GDX-O2	\$219
Go Direct Optical Dissolved Oxygen	GDX-ODO	\$385
pH Sensors		
Go Direct pH	GDX-PH	\$109
Go Direct Tris-Compatible Flat pH	GDX-FPH	\$139
Temperature Probes		
Go Direct Surface Temperature	GDX-ST	\$99
Go Direct Temperature	GDX-TMP	\$79
Go Direct Voltage	GDX-VOLT	\$95
Go Direct Weather	GDX-WTHR	\$135
Go Direct Weather System	GDX-WTVA	\$164

## Go Direct Accessories

Accessory	Order Code	Price
Go Direct Charge Station	GDX-CRG	\$89
Go Direct Sensor Clamp	GDX-CLAMP	\$14

## Looking for Replacement Parts?

Visit [vernier.com/replacements](https://www.vernier.com/replacements)

## LabQuest Sensors

Sensor	Order Code	Price
Anemometer	ANM-BTA	\$109
Barometer	BAR-BTA	\$79
Flow Rate Sensor	FLO-BTA	\$139
Magnetic Field Sensor	MG-BTA	\$69
Salinity Sensor	SAL-BTA	\$149
Soil Moisture Sensor	SMS-BTA	\$148
Stainless Steel Temperature Probe	TMP-BTA	\$45
Tris-Compatible Flat pH Sensor	FPH-BTA	\$124
Turbidity Sensor	TRB-BTA	\$124

## Accessories & Lab Equipment

Product	Order Code	Price
Electrode Support	ESUP	\$10
KidWind Basic Wind Experiment Kit	KW-BWX	\$134
Solar Energy Exploration Kit	KW-SEEK	\$89
KidWind 2V/400mA Solar Panel	KW-SP2V	\$21
Vernier Resistor Board	VES-RB	\$19

## Lab Books

Title	Order Code	Price
<i>Earth Science with Vernier</i>	Printed book + download: ESV	\$59
	Download only: ESV-E	\$45
<i>Water Quality with Vernier</i> (LabQuest® sensors only)	Printed book + download: WQV	\$59
	Download only: WQV-E	\$45
<i>Climate and Meteorology Experiments</i> (Go Direct sensors only)	Printed book + download: HSB-CM	\$29
	Download only: HSB-CM-E	\$24

See all our products for Earth science at [vernier.com/earth-science](https://www.vernier.com/earth-science)

HIGH SCHOOL

# Chemistry

Vernier chemistry resources cover an array of key concepts to help prepare your students for what lies ahead. From gas laws to spectroscopy, our products are backed by an extensive collection of experiments and unparalleled technical support.

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



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

## Go Direct Temperature

MOST POPULAR

Students can use this rugged, general-purpose sensor to monitor temperature.

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

GDX-TMP \$79

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



## Go Direct Temperature Teacher Pack

GDX-TMP-TP \$702

Includes 8 Go Direct<sup>®</sup> Temperature Probes and a Go Direct Charge Station.



## Go Direct pH

Conduct acid-base titrations, monitor pH changes during chemical reactions, and investigate household acids and bases. The wireless connection makes it easier to do field-based studies such as testing the pH of surface water.

GDX-PH \$109

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



## Go Direct pH Teacher Pack

GDX-PH-TP \$935

Save money when you purchase the Go Direct pH Teacher Pack, which includes 8 Go Direct pH Sensors and a Go Direct Charge Station.





## Go Direct Gas Pressure

Explore pressure changes and gas laws with this sensor that measures the absolute pressure of a gas.

GDX-GP \$105

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



## Go Direct Conductivity

Go Direct Conductivity determines the ionic content of an aqueous solution by measuring its electrical conductivity. It features a built-in temperature sensor to simultaneously read conductivity and temperature.

GDX-CON \$129

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



## Go Direct Colorimeter

Explore absorbance and percent transmittance in a variety of experiments including Beer's law (absorbance vs. concentration) and kinetic studies (concentration vs. time). Students select between four wavelengths (430 nm, 470 nm, 565 nm, 635 nm) to set up their experiment.

GDX-COL \$135

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



## Go Direct ORP

Determine the equivalence point of an oxidation-reduction titration or the oxidizing ability of chlorine in swimming pools. This sensor measures the capacity of a solution to either release or accept electrons from chemical reactions.

GDX-ORP \$119

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



## Go Direct Constant Current System

Determine Avogadro's number and perform various electroplating and electrolysis experiments. This system combines a DC power source with a built-in current sensor to eliminate the need for a separate power supply. It can deliver up to 0.6 A at 5 V DC.

GDX-CCS \$95

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



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

Measure the carbon dioxide levels in beverages and food products with Go Direct CO<sub>2</sub>. Investigate the chemical makeup of baking soda, explore what makes soft drinks fizzy, or determine the rate of fermentation by yeast while metabolizing different sugars.

GDX-CO2 \$229

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



## NEW Accessories for an Eco-Friendly Lab

Three new products are now a part of the Vernier high school chemistry lineup, offering reliable, easy-to-use solutions that enhance the lab experience for students and educators. These accessories can be used alongside Vernier Go Direct® sensors to provide impactful learning experiences that are both efficient and environmentally conscious.

### Electrochemistry Half-Cell Plate

The Electrochemistry Half-Cell Plate is a reusable, low-volume platform that holds up to eight metal-ion half-cells, each accessing the central salt bridge. When paired with the Electrochemistry Metals Kit and Go Direct Voltage Probe, it ensures precise, consistent exploration of oxidation-reduction reactions, the electrochemical series, and Nernst variables, while simplifying the setup and cleanup of electrochemical experiments.

ECHEM-PLT \$59

[vernier.com/echem-plt](http://vernier.com/echem-plt)

### Electrochemistry Metals Kit

The Electrochemistry Metals Kit provides a convenient, reusable set of seven different metal samples for conducting electrochemical experiments (aluminum, copper, iron, lead, nickel, silver, and zinc). When paired with a half-cell plate and voltage probe, this convenient kit simplifies the study of oxidation, reduction, the electrochemical series, and Nernst variables.

ECHEM-MTLS \$20

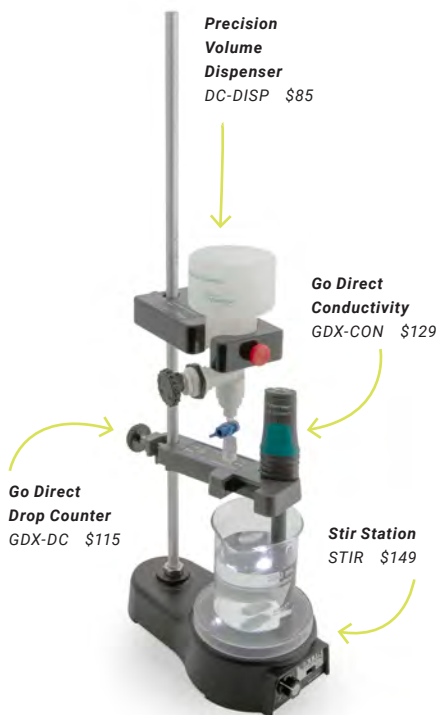
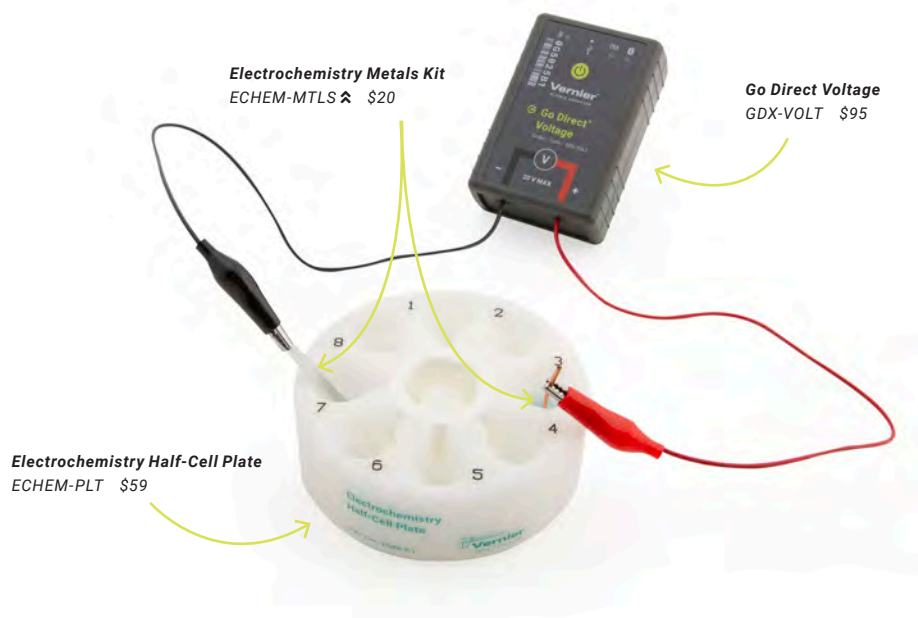
[vernier.com/echem-mtls](http://vernier.com/echem-mtls)

### Precision Volume Dispenser

The Precision Volume Dispenser gives students and educators a precise, rugged, and easy-to-use alternative to a burette. It can be used with the Go Direct Drop Counter, Go Direct pH Sensor, Go Direct Conductivity Probe, and Go Direct Oxidation-Reduction Potential (ORP) Sensor to conduct acid-base, conductometric, or potentiometric titrations.

DC-DISP \$85

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



## Forensic Chemistry Experiments

This book includes 15 phenomena-based, 3D-aligned experiments that engage high-school and college-level chemistry students in forensics cases, from identifying a mystery powder to solving a fictional murder. Students explore core chemistry concepts using Vernier sensors such as pH, pressure, conductivity, and temperature.

**Printed book + download**

HSB-FCHEM \$45

**Download only**

HSB-FCHEM-E \$35

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



## Food Chemistry Experiments

This book includes 14 phenomena-based experiments that use Vernier sensors such as spectrophotometers, temperature probes, and CO<sub>2</sub> gas sensors to explore key chemistry concepts centered around food—from analyzing carotenoids in vegetables to measuring iron in cereal.

**Printed book + download**

HSB-FCHEM \$45

**Download only**

HSB-FCHEM-E \$35

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



## Go Direct SpectroVis Plus

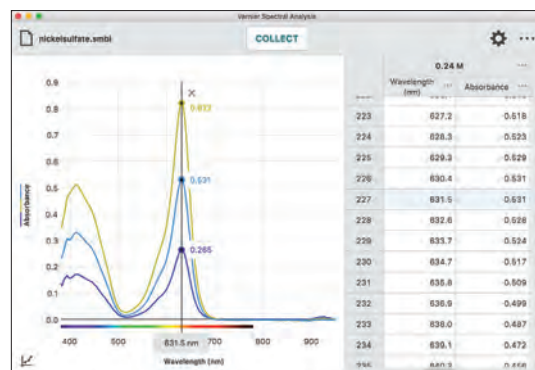
Introduce your students to spectroscopy with the affordable Go Direct SpectroVis® Plus Spectrophotometer. With a range of 380 to 950 nm, students can easily collect a full-wavelength spectrum (absorbance, percent transmittance, fluorescence, or intensity), study absorbance vs. concentration (Beer's law), or monitor rates of reaction (kinetics). Collect and analyze data using Vernier Spectral Analysis® or LabQuest® App.

GDX-SVISPL \$479

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



Our innovative, easy-to-use instruments collect data within seconds. Explore our full suite of spectrometers at [vernier.com/spectrometers](http://vernier.com/spectrometers)



## Vernier Spectral Analysis App

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.

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

FREE DOWNLOAD

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



## Chemistry Go Direct Starter Package

This package includes four sensors that work with Vernier Graphical Analysis® Pro and LabQuest 3.

- Go Direct Temperature (2)
- Go Direct Gas Pressure
- Go Direct pH

GDP-CH-ST \$372

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



## Chemistry Go Direct Standard Package

This package includes 8 sensors that work with Vernier Graphical Analysis Pro and LabQuest 3.

- Go Direct Temperature (2)
- Go Direct Gas Pressure
- Go Direct pH
- Go Direct Voltage
- Go Direct Conductivity
- Go Direct Colorimeter
- Go Direct Drop Counter

GDP-CH-DX \$846

Buy 8 or more packages at \$830 and save \$128.

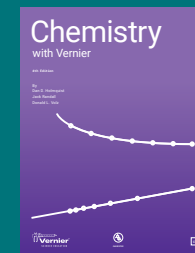
[Learn more at vernier.com/gdp-ch-dx](http://vernier.com/gdp-ch-dx)



## Chemistry with Vernier

Combine *Chemistry with Vernier* with a package (shown above) to teach students the essentials of chemistry. This lab book contains 36 ready-to-use student experiments and instructor information, including sample data.

[Learn more at vernier.com/cwv](http://vernier.com/cwv)























Printed book + download CWV \$59  
Download only CWV-E \$45

MORE CHEMISTRY LAB BOOKS ON PAGE 39

# Featured Products

## Go Direct Sensors

Sensor		Order Code	Price
Go Direct® CO <sub>2</sub> Gas		GDX-CO2	\$229
Go Direct Colorimeter		GDX-COL	\$135
Go Direct Conductivity		GDX-CON	\$129
Go Direct Platinum-Cell Conductivity		GDX-CONPT	\$189
Go Direct Constant Current System		GDX-CCS	\$95
Go Direct Current		GDX-CUR	\$99
Go Direct Drop Counter		GDX-DC	\$115
Go Direct Electrode Amplifier		GDX-EA	\$79
Go Direct Ethanol Vapor		GDX-ETOH	\$169
Go Direct Gas Pressure		GDX-GP	\$105
Go Direct Melt Station		GDX-MLT <sup>‡</sup>	\$599
Go Direct Mini GC™		GDX-GC	\$3,999
Go Direct ORP		GDX-ORP	\$119
<b>pH Sensors</b>			
Go Direct Glass-Body pH		GDX-GPH	\$159

Go Direct pH		GDX-PH	\$109
Go Direct Tris-Compatible Flat pH		GDX-FPH	\$139
Go Direct Polarimeter		GDX-POL	\$545
Go Direct Radiation Monitor		GDX-RAD	\$219
<b>Spectrometers</b>		<a href="http://vernier.com/spectrometers">vernier.com/spectrometers</a>	
Go Direct Emissions Spectrometer		GDX-SPEC-EM	\$950
Go Direct Fluorescence/UV-VIS Spectrophotometer		GDX-SPEC-FUV	\$3,499
Go Direct SpectroVis® Plus		GDX-SVISPL	\$479
Go Direct UV-VIS Spectrophotometer		GDX-SPEC-UV	\$2,999
Go Direct Visible Spectrophotometer		GDX-SPEC-VIS	\$1,999
<b>Temperature Probes</b>			
Go Direct Surface Temperature		GDX-ST	\$99
Go Direct Temperature		GDX-TMP	\$79
Go Direct Thermocouple		GDX-TC	\$118
Go Direct Wide-Range Temperature		GDX-WRT	\$139
Go Direct Voltage		GDX-VOLT	\$95

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



## Go Direct Charge Station

Accessory	Order Code	Price
Go Direct Charge Station	GDX-CRG	\$89

## LabQuest® Sensors

Sensor	Order Code	Price
Colorimeter	COL-BTA	\$128
Conductivity Probe	CON-BTA	\$129
Current Probes		
Constant Current System	CCS-BTA	\$79
Current Probe	DCP-BTA	\$49
Drop Counter	VDC-BTD	\$109
Electrode Amplifier	EA-BTA	\$55
Gas Pressure Sensor	GPS-BTA	\$103
Instrumentation Amplifier	INA-BTA	\$89
Melt Station	MLT-BTA ⚡	\$629
ORP Sensor	ORP-BTA	\$115
pH Sensors		
Glass-Body pH Electrode BNC (requires Electrode Amplifier)	GPH-BNC	\$95
pH Sensor	PH-BTA	\$105
Tris-Compatible Flat pH Sensor	FPH-BTA	\$124
Radiation Monitor	VRM-BTD	\$199

Temperature Probes		
Stainless Steel Temperature Probe	TMP-BTA	\$45
Surface Temperature Sensor	STS-BTA	\$34
Thermocouple	TCA-BTA	\$79
Wide-Range Temperature Probe	WRT-BTA	\$119
Voltage Probes		
Differential Voltage Probe	DVP-BTA	\$49
Voltage Probe	VP-BTA	\$14

## Balances

Sensor	More Info
OHAUS Scout® (120 g) ⚡	<a href="http://vernier.com/ohs-123">vernier.com/ohs-123</a>
OHAUS Scout (220 g) ⚡	<a href="http://vernier.com/ohs-222">vernier.com/ohs-222</a>
OHAUS Scout (420 g) ⚡	<a href="http://vernier.com/ohs-422">vernier.com/ohs-422</a>

## Spectrometers

Spectrometer	Order Code	Price
Go Direct Emissions Spectrometer	GDX-SPEC-EM	\$950
Go Direct Fluorescence/UV-VIS Spectrophotometer	GDX-SPEC-FUV	\$3,499
Go Direct SpectroVis Plus	GDX-SVISPL	\$479
Go Direct UV-VIS Spectrophotometer	GDX-SPEC-UV	\$2,999
Go Direct Visible Spectrophotometer	GDX-SPEC-VIS	\$1,999

## Gas Chromatograph

Gas Chromatograph	Order Code	Price
Go Direct Mini GC™	GDX-GC	\$3,999

## Lab Equipment and Accessories

Accessory	Order Code	Price
Cuvette Rack	CUV-RACK	\$9
Electrode Support	ESUP	\$10
Melt Station Capillary Tubes	MLT-TUBE	\$24
Plastic Cuvettes (100)	CUV	\$24
Stir Station	STIR	\$149
<b>NEW</b> Precision Volume Dispenser	DC-DISP	\$85
<b>NEW</b> Electrochemistry Half-Cell Plate	ECHEM-PLT	\$59
<b>NEW</b> Electrochemistry Metals Kit	ECHEM-MTLS ⚡	\$20

## Lab Books<sup>†</sup>

Title	Order Code	Price
<i>Chemistry with Vernier</i>	CWV	\$59
<i>Advanced Chemistry with Vernier</i>	CHEM-A	\$59
<i>Vernier Chemistry Investigations for Use with AP* Chemistry</i>	APCHEM	\$59
<i>Investigating Chemistry through Inquiry</i>	CHEM-I	\$59
<i>Food Chemistry Experiments</i>	HSB-FOOD	\$45
<i>Forensic Chemistry Experiments</i>	HSB-FCHEM	\$45
<i>Organic Chemistry with Vernier</i>	CHEM-0	\$59

<sup>†</sup> Books listed here include printed book and download; also available as a download only.

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Looking for Replacement Parts?

Visit [vernier.com/replacements](http://vernier.com/replacements)

HIGH SCHOOL

# Physical Science

From matter and energy to motion and forces, Vernier offers the support you need and the technology your students can use to investigate physical science.

[vernier.com/physical-science](http://vernier.com/physical-science)



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

## Go Direct Sensor Carts

With our Go Direct® Sensor Carts, students can explore force, position, velocity, and acceleration directly on their devices via Bluetooth® wireless technology—no wires or additional equipment required. Each cart features built-in sensors to simplify experiment setup.

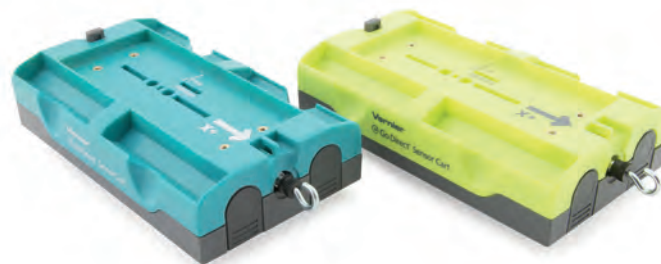
**Go Direct Sensor Cart (Green)**

GDX-CART-G \$205

**Go Direct Sensor Cart (Yellow)**

GDX-CART-Y \$205

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



## Go Direct Temperature

MOST POPULAR

Students can use this rugged, general-purpose sensor to monitor temperature.

Range: -40 to 125°C

GDX-TMP \$79

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



## Go Direct Temperature Teacher Pack

GDX-TMP-TP \$702

Includes 8 Go Direct Temperature Probes and a Go Direct Charge Station.



## Go Direct Light and Color

Students use this sensor to measure the brightness of a light bulb or the reflectance of light from various objects. They can also measure UV light and relative amounts of red, blue, and green light.

GDX-LC \$99

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



## Go Direct Force and Acceleration

Students use this sensor to measure forces of up to 50 N. The included 3-axis accelerometer makes it a versatile sensor for many topics in physical science.

GDX-FOR \$119

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



## Go Direct Sensors

Sensor	Order Code	Price
Go Direct 3-Axis Magnetic Field	GDX-3MG	\$99
Go Direct Acceleration	GDX-ACC	\$115
Carts and Tracks		
Dynamics Cart and Track System with Go Direct Sensor Carts	DTS-GDX	\$636
Go Direct Sensor Cart (Green)	GDX-CART-G	\$205
Go Direct Sensor Cart (Yellow)	GDX-CART-Y	\$205
Go Direct Conductivity	GDX-CON	\$129
Go Direct Current	GDX-CUR	\$99
Go Direct Energy	GDX-NRG	\$99
Go Direct Force and Acceleration	GDX-FOR	\$119
Go Direct Gas Pressure	GDX-GP	\$105
Go Direct Light and Color	GDX-LC	\$99
Go Direct Motion	GDX-MD	\$129
Go Direct pH	GDX-PH	\$109
Go Direct Photogate	GDX-VPG	\$105
Go Direct Sound	GDX-SND	\$99
Go Direct Structures & Materials Tester	GDX-VSMT	\$1,199
Temperature Probes		
Go Direct Surface Temperature	GDX-ST	\$99
Go Direct Temperature	GDX-TMP	\$79
Go Direct Thermocouple	GDX-TC	\$118
Go Direct Voltage	GDX-VOLT	\$95

## Go Direct Charge Station

Accessory	Order Code	Price
Go Direct Charge Station	GDX-CRG	\$89

## Accessories

Accessory	Order Code	Price
Friction Block	PHY-FRBL	\$17
Hanging Masses	PHY-HM250 ⚡	\$23
Meter Stick	PHY-METER	\$11

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

## Go Direct pH

Go Direct pH is a general-purpose pH sensor used to monitor pH of aqueous solutions.

GDX-PH \$109

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



## Physical Science with Vernier

*Physical Science with Vernier* contains 40 ready-to-use experiments for physical science. Experiments are included for nine Vernier sensors and cover a variety of topics in chemistry and physics.

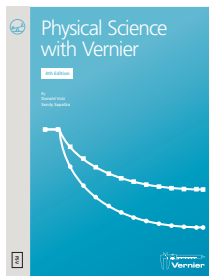
[vernier.com/psv](http://vernier.com/psv)

**Printed book + download**

PSV \$59

**Download only**

PSV-E \$45



HIGH SCHOOL

# Physics

From kinematics to optics, Vernier technology helps your students connect the dots between the classroom and the real world. Our physics products enable student and educator success so that you can spend less time troubleshooting and more time teaching your students about the scientific principles of the world around them.

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

## Cart Fan

The Cart Fan is a modular fan you can add to the Dynamics Cart and Track System and Go Direct carts that provides a constant force for dynamics investigations. Using one or multiple fans on a single cart allows students to investigate constant acceleration, balanced/unbalanced forces, and variable thrust angles.

DTS-CFAN \$89

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



FOR MORE INFORMATION ABOUT CART AND TRACK SYSTEMS, SEE PAGE 46.

## Go Direct Force Plate

Measure the forces developed during stepping, jumping, and other human-scale actions. Observe change in apparent weight as you ride an elevator or measure reaction forces as you lean against a wall.

GDX-FP \$399

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



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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



## Go Direct Motion Detector

Go Direct® Motion uses ultrasound to measure the position, velocity, and acceleration of moving objects.

GDX-MD \$129

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



## Go Direct Force and Acceleration

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. Use it to measure pushes and pulls in the classroom or outdoors.

GDX-FOR \$119

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



## Go Direct Photogate

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

GDX-VPG \$105

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



## Go Direct Acceleration

Collect acceleration, rotation, and altitude data in the classroom or in the field.

GDX-ACC \$115

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



## Go Direct Voltage

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.

GDX-VOLT \$95

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



## Go Direct Current

Measure electric currents in circuits with this versatile sensor.

GDX-CUR \$99

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



## Go Direct 3-Axis Magnetic Field

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

GDX-3MG \$99

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



## Go Direct Sound

Use this sensor to easily capture and evaluate waveforms, or measure sound level in decibels.

GDX-SND \$99

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



## Vernier Graphical Analysis Pro

Unlock key features with Vernier Graphical Analysis® Pro and do more with your Vernier sensors to deepen and extend learning. With access to Pro, you can enrich live instruction while providing more opportunities for students to interact with and analyze data outside of class time.

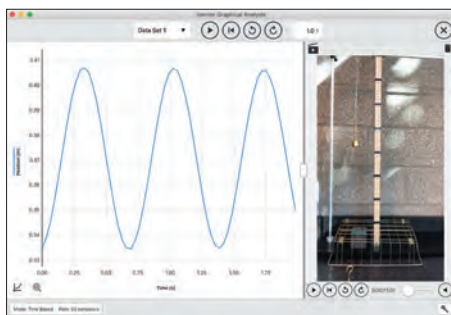
**1-Year Site License (unlimited seats)**  
GAP-1YR \$149

**3-Year Site License (unlimited seats)**  
GAP-3YR \$299

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

### FREE 30-DAY TRIAL

Get a 30-day free trial and learn about site license options at [vernier.com/gapro](http://vernier.com/gapro)



## Vernier Video Analysis

The Vernier Video Analysis® app brings video analysis to your students in an easy-to-use, streamlined application. Students can design their own scientific investigations, record videos, and then analyze the motion. This app gives your students the opportunity to observe and study hard-to-replicate phenomena regardless of device—it even works with Chromebooks!

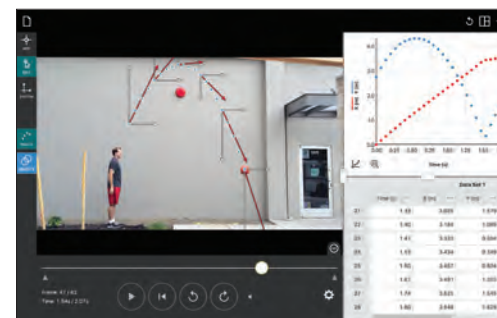
**1-Year Site License (unlimited seats)**  
VVA-1YR \$225

**3-Year Site License (unlimited seats)**  
VVA-3YR \$450

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

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Get everything you need with our new 4-in-1 software bundle! **3-Year Site License** DCA-3YR \$499 | Learn more at [vernier.com/dca-3yr](http://vernier.com/dca-3yr)

### Advanced Physics with Vernier—Mechanics

Teach mechanics concepts at the AP\* or college level. Experiments are designed for an interactive teaching style, with planned moments for instructor- or student-led discussion.

**Printed book + download** PHYS-AM \$59  
**Download only** PHYS-AM-E \$45

[vernier.com/phys-am](http://vernier.com/phys-am)



### Advanced Physics with Vernier—Beyond Mechanics

The second of a two-volume set, this book focuses on second-semester topics in college physics. It is recommended for AP\* and IB<sup>2</sup> physics courses.

**Printed book + download** PHYS-ABM \$59  
**Download only** PHYS-ABM-E \$45

[vernier.com/phys-abm](http://vernier.com/phys-abm)

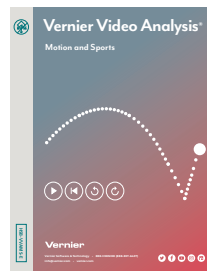


### Vernier Video Analysis: Motion and Sports

In addition to traditional physics concepts such as velocity and acceleration, the 12 investigations in this book include analysis of sports activities. This further connects concepts of motion to students' daily lives.

**Download only** HSB-VVAMS-E \$29

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



### Vernier Video Analysis: Conservation Laws and Forces

Examine topics beyond basic motion using the 12 investigations in this book. Like its counterpart (left), videos are included in the electronic download, making it easy to integrate video analysis into homework or classwork.

**Download only** HSB-VVACLf-E \$29

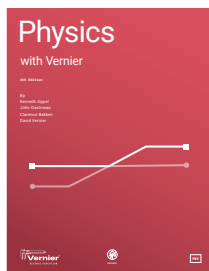
[vernier.com/hsb-vvaclf-e](http://vernier.com/hsb-vvaclf-e)



## Physics with Vernier

*Physics with Vernier* has 35 experiments in mechanics, sound, light, electricity, and magnetism. This book has a wide variety of experiments for motion detectors, force sensors, light sensors, magnetic field sensors, photogates, temperature probes, and more.

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



**Printed book + download** PWV \$59  
**Download only** PWV-E \$45

## Sensor Cart Physics

(Go Direct sensors only)

Students use the Vernier Go Direct® Sensor Cart to complete the 24 investigations in this e-book—the guided-inquiry format gives students agency in choosing what they measure and analyze.

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



**Download only** HSB-SCP-E \$45

## Physics Explorations and Projects

*Physics Explorations and Projects* is a collection of investigations aligned to the NGSS. These investigations invite students to explore phenomena without extensive instructions. The guided-inquiry format encourages students to choose what variables to measure and analyze.

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



**Printed book + download** PEP \$59  
**Download only** PEP-E \$45

## Physics Go Direct Standard Package

This package includes 12 products that work with Vernier Graphical Analysis Pro and LabQuest® 3.

- Go Direct Motion
- Go Direct Force and Acceleration
- Go Direct Voltage
- Go Direct Current (2)
- Go Direct Photogate
- Go Direct Acceleration
- Go Direct Sound
- Go Direct Light and Color
- Go Direct 3-Axis Magnetic Field
- Ultra Pulley Attachment
- Picket Fence

GDP-PHY-DX \$1,092

Buy 8 or more packages at \$1,071 and save \$168.

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



## Physics LabQuest 3 Standard Package

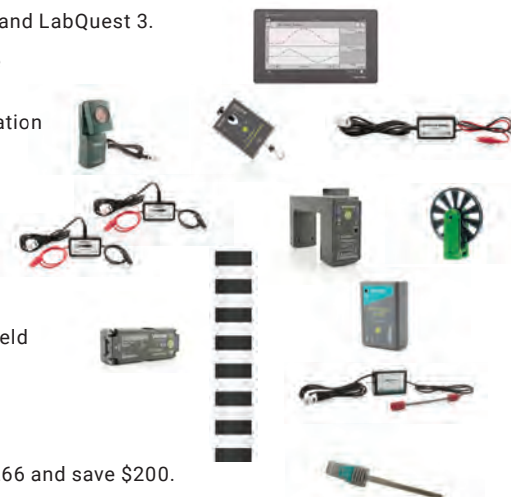
This package includes 13 products that work with Vernier Graphical Analysis Pro and LabQuest 3.

- Vernier LabQuest 3 Interface
- Motion Detector
- Go Direct Force and Acceleration
- Differential Voltage Probe
- Current Probe (2)
- Go Direct Photogate
- Go Direct Acceleration
- Go Direct Sound
- Light Sensor †
- Go Direct 3-Axis Magnetic Field
- Ultra Pulley Attachment
- Picket Fence

LQ3-PHY-DX † \$1,291

Buy 8 or more packages at \$1,266 and save \$200.

Learn more at [vernier.com/lq3-phy-dx](http://vernier.com/lq3-phy-dx)



† For California Proposition 65 warning, see pp. 78–79.

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† The IB Diploma Program is an official program of the International Baccalaureate Organization (IBO) which authorizes schools to offer it. The material available here has been developed independently of the IBO and is not endorsed by it.

## Dynamics Cart and Track Systems

### One Dynamics System—Three Ways to Collect Data

Depending on your budget and your needs, we offer three ways to collect motion data.

1

### Go Direct Sensor Cart

The wireless Go Direct® Sensor Cart includes an optical encoder on a wheel to sense the displacement of the cart, on or off the track. No interface is needed to use this system with the Vernier Graphical Analysis® Pro app. Students can perform impulse and momentum experiments with the built-in force sensor, and the 3-axis accelerometer means you can take your Sensor Cart off campus to investigate accelerations on a swing or merry-go-round.

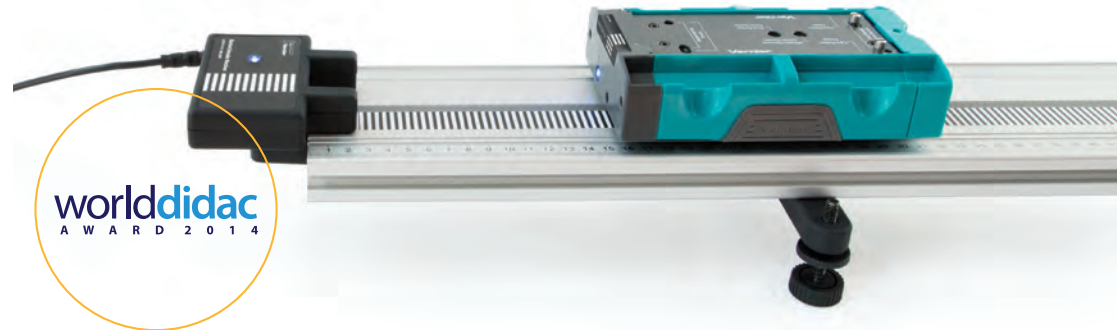


2

### The Motion Encoder\*

VERNIER EXCLUSIVE

For classrooms already equipped with data-collection interfaces, the Motion Encoder dramatically improves data quality and simplifies experiment setup over the traditional ultrasonic Motion Detector. An optical sensor under the dynamics cart senses the passage of the cart over a striped decal on the track. The displacement information is sent as an encoded IR signal to a receiver at the track's end. This optical-only system provides excellent, repeatable, and noise-resistant data.



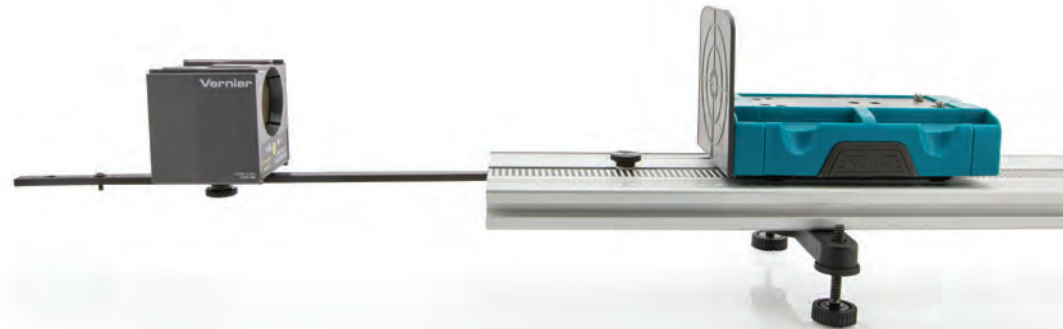
\* U.S. Patent No. 9,488,503

3

### A Traditional Motion Detector

The Motion Detector is the classic method for collecting position data. Use a Motion Detector bracket to measure cart motion for the entire length of the track. You can even use two Motion Detectors at once to study cart collisions.

Unlike the Motion Encoder or Go Direct Sensor Cart, the Motion Detector can be used for dynamics experiments other than cart-on-track experiments. Students can graph their own walking motion, study a simple pendulum, or graph a ball toss with a Motion Detector. If you want to use only a Motion Detector for all of your motion experiments, get the Dynamics Cart and Track System without the Motion Encoder or Go Direct Sensor Cart.





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

BUILT-IN SENSORS = LOWER TOTAL COST

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 \$636

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

with 2.2 m Track DTS-GDX-LONG \$748

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



## Dynamics Cart and Track System with Motion Encoder

THIS OPTION REQUIRES AN INTERFACE SUCH AS LABQUEST 3 OR LABQUEST MINI

The Dynamics Cart and Track System with Motion Encoder includes an optical position sensing system to record cart motion.

with 1.2 m Track DTS-EC \$540

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

with 2.2 m Track DTS-EC-LONG \$652

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



## Dynamics Cart and Track System

USE WITH SENSORS YOU ALREADY OWN—SENSORS ARE NOT INCLUDED

The Dynamics Cart and Track System features the Combination Track/Optics Bench, two low-friction plastic carts (one standard and one with an adjustable plunger), and attachment accessories.

with 1.2 m Track DTS \$360

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

with 2.2 m Track DTS-LONG \$472

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



## Cart Fan

The Cart Fan is a modular fan you can add to Dynamics Cart and Track Systems and Go Direct carts that provides a constant force for dynamics investigations. Using one or multiple fans on a single cart allows students to investigate constant acceleration, balanced/unbalanced forces, and variable thrust angles.

DTS-CFAN \$89

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



## Friction Pad DTS

Add a Friction Pad to any of our plastic dynamics carts to study the effect of consistent friction on the motion of the cart.

DTS-PAD \$32

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



## Motion Encoder Cart and Receiver

This kit includes a fully assembled Motion Encoder Cart, as well as the Motion Encoder Receiver and Motion Encoder Long Track Strip.

DTS-MEC \$267

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



## Eddy Current Brake

Eddy current brakes are used as a braking system for high-speed trains and roller coasters. Recreate this unusual braking system in your classroom or laboratory by installing our Eddy Current Brake into the end cap of a plastic Vernier dynamics cart. As the cart moves over the track, the magnets in the Eddy Current Brake create an electromagnetic drag on the cart that is proportional to the cart's speed.

DTS-ECB \$19

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



## Bumper and Launcher Kit

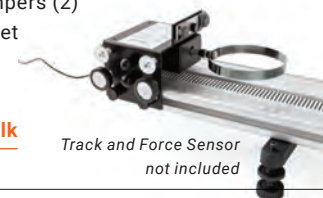
With the Bumper and Launcher Kit, students can use the Dynamics Cart and Track System to perform Hooke's law experiments or study momentum and impulse.

The kit includes

- Clay (~20 grams)
- Clay holders (2)
- Dual-magnet bumper
- Force sensor mounting screw
- Hoop bumpers (2)
- Magnetic bumpers (2)
- Rubber bumpers (2)
- Track bracket

BLK \$99

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



# 1D Motion and Force



## Go Direct Motion

Go Direct® Motion uses ultrasound to measure the position, velocity, and acceleration of moving objects.

GDX-MD \$129

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

## Go Direct Photogate

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

GDX-VPG \$105

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



## Go Direct Sensor Carts

We've added wireless sensors to our popular dynamics cart. Each cart includes an encoder wheel to report position, velocity, and acceleration, plus a force sensor and a 3-axis accelerometer. Conduct basic physics investigations with or without a track.

Go Direct® Sensor Cart (Green)

GDX-CART-G \$205

Go Direct Sensor Cart (Yellow)

GDX-CART-Y \$205

INCLUDES  
24  
EXPERIMENTS

### Sensor Cart Physics



Download only  
HSB-SCP-E \$45



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

## Picket Fence

The Picket Fence has eight opaque bars spaced every 5 cm, silk-screened directly onto clear plastic. Drop the picket fence through a photogate to obtain records of position, velocity and acceleration vs. time in order to measure  $g$ .

PF \$10

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



## Ultra Pulley Attachment

Add an Ultra Pulley to your Photogate to monitor motion as a string passes over the pulley or as the pulley rolls along a table.

SPA \$24

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



## Go Direct Force Plate

Measure the forces developed during stepping, jumping, and other human-scale actions. Observe change in apparent weight as you ride an elevator or measure reaction forces as you lean against a wall.

GDX-FP \$399

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



## Go Direct Force and Acceleration

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. Use it to measure pushes and pulls in the classroom or outdoors.

GDX-FOR \$119

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



## LabQuest Products for 1D Motion and Force

Product		Order Code	Price
<b>Accelerometers</b>			
Low-g Accelerometer <a href="http://vernier.com/lga-bta">vernier.com/lga-bta</a>		LGA-BTA	\$99
3-Axis Accelerometer <a href="http://vernier.com/3d-bta">vernier.com/3d-bta</a>		3D-BTA	\$105
25-g Accelerometer <a href="http://vernier.com/acc-bta">vernier.com/acc-bta</a>		ACC-BTA	\$110
Dual-Range Force Sensor <a href="http://vernier.com/dfs-bta">vernier.com/dfs-bta</a>		DFS-BTA	\$124
Force Plate <a href="http://vernier.com/fp-bta">vernier.com/fp-bta</a>		FP-BTA	\$395
<b>Motion Detectors</b>			
Motion Detector <a href="http://vernier.com/md-btd">vernier.com/md-btd</a>		MD-BTD	\$105
Go! Motion <a href="http://vernier.com/go-mot">vernier.com/go-mot</a>		GO-MOT	\$139
Photogate <a href="http://vernier.com/vpg-btd">vernier.com/vpg-btd</a>		VPG-BTD	\$55



## Go Direct Projectile Launcher

Use the Go Direct® Projectile Launcher to investigate important concepts in two-dimensional kinematics. Launch steel balls at angles between 0 and 90 degrees and over distances up to 2.5 m.

GDX-PL \$499

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



### Independence of Motion Accessory

The Independence of Motion Accessory enables students to use the Vernier Projectile Launcher to perform the classic experiment where one ball is dropped as another is projected horizontally. The balls strike the floor simultaneously.

IOM-VPL \$59

[vernier.com/iom-vpl](http://vernier.com/iom-vpl)



### Time of Flight Pad

The Time of Flight Pad is used with a projectile launcher or photogate (not included) to precisely measure how long a projectile has been in motion.

TOF-VPL \$84

[vernier.com/tof-vpl](http://vernier.com/tof-vpl)



## Go Direct Rotary Motion Package

The Go Direct Rotary Motion Sensor and Rotational Motion Accessory Kit can be used to study rotational inertia, conservation of angular momentum, and additional rotational motion concepts.

GDX-RMPK \$324

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



### Go Direct Rotary Motion

Measure angular displacement, angular velocity, and angular acceleration easily and precisely.

GDX-RMS \$195

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



### Rotational Motion Accessory Kit

Use this kit with a rotary motion sensor to study the motion of a physical pendulum; the rotational inertia of disks, rings, and point masses; and the conservation of angular momentum.

AK-RMV \$129

[vernier.com/ak-rmv](http://vernier.com/ak-rmv)







## Go Direct Centripetal Force System

Easily measure angular velocity and centripetal force and acceleration without the hassle of wires using this system (includes a Go Direct Centripetal Force Apparatus and Go Direct Force and Acceleration).

GDX-CFAF \$444

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



## Go Direct Centripetal Force Apparatus

This rotational system mounted on a solid base is designed to work with Go Direct Force and Acceleration (not included).

GDX-CFA \$325

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



## Moment of Inertia Kit

Expand the capabilities of a Vernier centripetal force apparatus to investigate moments of inertia of different geometries.

CFA-MIK \$219

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



## Motor Accessory Kit

Control the rotational rate of the Go Direct Centripetal Force Apparatus so students can focus on a single variable.

GDX-CFA-MAK \$199

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



## Go Direct Force and Acceleration

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. Use it to measure pushes and pulls in the classroom or outdoors.

GDX-FOR \$119

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

## Hanging Masses

PHY-HM250 \$23

## Friction Block

PHY-FRBL \$17



## Go Direct Voltage

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.

GDX-VOLT \$95

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



## Go Direct Current

Measure electric currents in circuits with this versatile sensor.

GDX-CUR \$99

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



## High Current Sensor

Range:  $\pm 10$  A

HCS-BTA \$89

[vernier.com/hcs-bta](http://vernier.com/hcs-bta)



## Instrumentation Amplifier

Range:  $\pm 1$  V

INA-BTA \$89

[vernier.com/ina-bta](http://vernier.com/ina-bta)



## Go Direct 3-Axis Magnetic Field

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

GDX-3MG \$99

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



## Go Direct Static Charge

Unlike a traditional electroscope, Go Direct® Static Charge offers a means for quantitative measurement and analysis of positive and negative charges of objects that would not be possible in a traditional lab—such as measuring the charge on a balloon.

GDX-Q \$109

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



## 30-Volt Voltage Probe

Range:  $\pm 30$  V

30V-BTA \$59

[vernier.com/30v-bta](http://vernier.com/30v-bta)



## Power Amplifier

Use this as a power supply for DC and AC circuit investigations or to drive devices such as speakers, lamps, and small DC motors.

PAMP \$249

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



# Electricity and Magnetism

## 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.

VCB2 ⬆ \$145

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



## Extech® Digital Power Supply

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

EXPS \$259

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



## Electrostatics Kit

Students use the Electrostatics Kit to perform a range of experiments in electrostatics with Go Direct Static Charge.

ESK-CRG ⬆ \$129

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



# Thermodynamics

## Temperature Probes

### Go Direct Surface Temperature

Range:  $-25$  to  $125^{\circ}\text{C}$

GDX-ST \$99



### Go Direct Temperature

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

GDX-TMP \$79



### Surface Temperature Sensor

Range:  $-25$  to  $125^{\circ}\text{C}$

STS-BTA \$34



### Stainless Steel Temperature Probe

Range:  $-40$  to  $135^{\circ}\text{C}$

TMP-BTA \$45



[vernier.com/temperature-sensors](http://vernier.com/temperature-sensors)

## Gas Pressure Sensors

### Go Direct Gas Pressure

Range: 0 to 400 kPa

GDX-GP \$105



### Gas Pressure Sensor

Range: 0 to 210 kPa

GPS-BTA \$103



[vernier.com/gas-pressure-sensors](http://vernier.com/gas-pressure-sensors)



## Resonance Apparatus

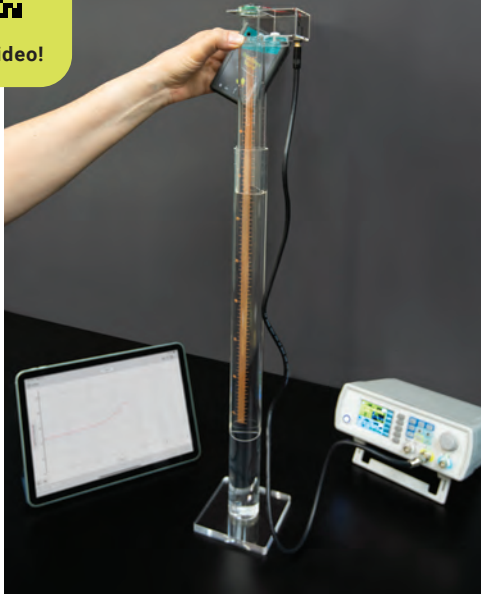
The Resonance Apparatus is used for the classic experiment of determining the speed of sound using the principle of resonance in a tube that is closed at one end. Fill the apparatus with water and use a tuning fork or the included speaker to produce sound. Listen for the resonance while moving the inner tube, or use a sound sensor to locate the resonance lengths.

RES-APP \$199

[vernier.com/res-app](http://vernier.com/res-app)



Watch the video!

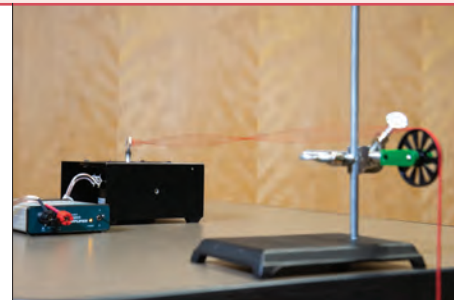


## Frequency Generator

Easily connect the Frequency Generator to the Power Amplifier to create sine, square, sawtooth, and triangle waves at a wide range of frequencies. It also outputs DC voltage.

FGEN-PAMP \$189

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



## Power Amplifier

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

PAMP \$249

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



## Microphone

Display and study the waveforms of sounds from voices and musical instruments. This sensor is also appropriate for speed of sound experiments.

MCA-BTA \$55 [vernier.com/mca-bta](http://vernier.com/mca-bta)



## Go Direct Sound

Use Go Direct® Sound to easily capture and evaluate waveforms.

GDX-SND \$99

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



## Sound Level Sensor

Use the Sound Level Sensor to easily measure sound level in decibels (dB) in a variety of experiments.

Range: 55 to 110 dB

SLS-BTA \$69 [vernier.com/sls-bta](http://vernier.com/sls-bta)



## Power Amplifier Accessory Speaker

Study mechanical waves on strings and springs.

PAAS-PAMP ⚡ \$155

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





## Go Direct Light and Color

Measure light intensity in the visible to ultraviolet electromagnetic spectrum. An RGB color sensor detects relative contributions of primary colors in light.

GDX-LC \$99

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



## Light Sensor

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 \$69

[vernier.com/ls-bta](http://vernier.com/ls-bta)



## Optics Expansion Kit

Use the Optics Expansion Kit with your dynamics track (not included) 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 *Physics with Vernier* and *Advanced Physics with Vernier—Beyond Mechanics* experiments.

OEK \$199

Download free sample experiments at [vernier.com/oek](http://vernier.com/oek)

\* The Light Sensor Holder can be used with any style Vernier light sensor.

## Combination Dynamics Track and Optical Bench

The Combination Dynamics Track and Optical Bench is aluminum and includes a metric scale. Extremely rigid, this 1.2 (or 2.2) meter track will not sag under use. The track includes two Adjustable Two Foot Levelers.

1.2 m Track TRACK \$160

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

2.2 m Track TRACK-LONG \$272

[vernier.com/track-long](http://vernier.com/track-long)

## Polarizer/Analyzer Set

PAK-OEK \$89

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



## Mirror Set

M-OEK \$69

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



Light source not included

## Color Mixer

CM-OEK \$189

Download a free sample experiment at [vernier.com/cm-oek](http://vernier.com/cm-oek)



## Diffraction Apparatus

Using the Diffraction Apparatus, with its included Red Diffraction Laser, high-precision slits, and High Sensitivity Light Sensor, students can create, view, and measure diffraction and interference patterns.

The Diffraction Apparatus requires a Combination Track/Optics Bench (not included).

DAK \$669

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



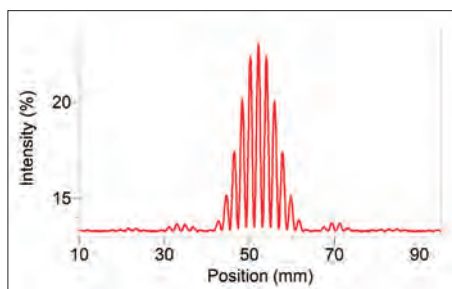
## Combination 1.2 m Track/ Optics Bench

TRACK \$160 [vernier.com/track](http://vernier.com/track)

## Green Diffraction Laser (optional)

Add this 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)



See website for replacement parts.

## Go Direct Emissions Spectrometer

This emissions spectrometer connects to your device via Bluetooth® wireless technology or USB to give precise measurements over a range of 350–900 nm. Use it with or without an optical fiber (not included) to examine spectra of light bulbs, spectrum tubes, or the sun.

GDX-SPEC-EM \$950

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



### Vernier Emissions Fiber

VSP-EM-FIBER \$94

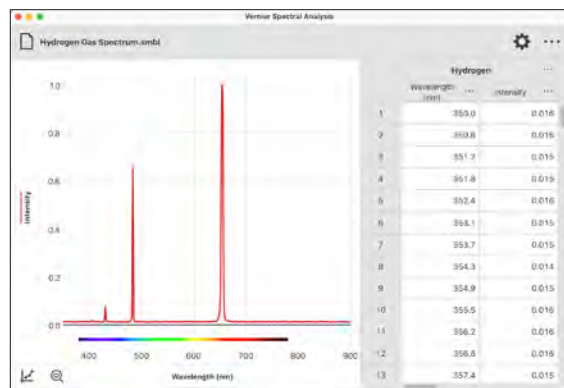
[vernier.com/vsp-em-fiber](http://vernier.com/vsp-em-fiber)



## Vernier Spectral Analysis App

Our free Vernier Spectral Analysis® app makes it easy to incorporate spectroscopy into your physics lab. Using the app, students can analyze spectra from diverse sources such as spectrum tubes, light bulbs, and the sun.

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



## Radiation Monitors

### Go Direct Radiation Monitor

Explore radiation statistics, measure the rate of nuclear decay, and monitor radon progeny. Go Direct® Radiation Monitor detects alpha, beta, gamma, and X-ray radiation, and includes LED and audible indicators.

GDX-RAD \$219

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



### Vernier Radiation Monitor

The Vernier Radiation Monitor detects alpha, beta, gamma, and X-ray radiation and can be used for experiments in nuclear counting statistics, shielding, and decay rate measurements.

VRM-BTD \$199

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



## Spectrum Tube Single Power Supply

These power supplies feature an ultra-safe design for electrifying spectrum tubes.

ST-SPS ⚡ \$299

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



## Spectrum Tubes

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

All Spectrum Tubes are sold separately:

Hydrogen	ST-H ⚡	\$49	
Nitrogen	ST-N ⚡	\$49	
Helium	ST-HE ⚡	\$49	
Neon	ST-NE ⚡	\$49	
Carbon Dioxide	ST-CO2 ⚡	\$49	
Air	ST-AIR ⚡	\$49	
Argon	ST-AR ⚡	\$49	

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

*Spectrum Tubes carry a two-year warranty (hydrogen tube: two years or 40 hours, whichever comes first; all other tubes: two years or 100 hours, whichever comes first).*

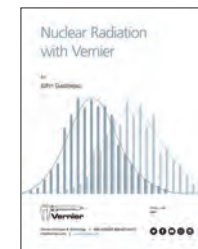
## Nuclear Radiation with Vernier

This free e-book includes six experiments for data collection with a radiation monitor:

- Distance and Radiation
- Counting Statistics
- Lifetime Measurement
- Background Radiation Sources
- Radiation Shielding
- Alpha, Beta, and Gamma

FREE DOWNLOAD

[vernier.com/nrv-e](http://vernier.com/nrv-e)



# Featured Products

Looking for Replacement Parts?

Visit [vernier.com/replacements](http://vernier.com/replacements)

## Go Direct Sensors

Sensor	Order Code	Price
Go Direct 3-Axis Magnetic Field	GDX-3MG	\$99
Go Direct Acceleration	GDX-ACC	\$115
Carts and Tracks		
Dynamics Cart and Track System with Go Direct Sensor Carts	DTS-GDX	\$636
Go Direct Sensor Cart (Green)	GDX-CART-G	\$205
Go Direct Sensor Cart (Yellow)	GDX-CART-Y	\$205
Go Direct Centripetal Force Apparatus	GDX-CFA	\$325
Go Direct Current	GDX-CUR	\$99
Go Direct Force and Acceleration	GDX-FOR	\$119
Go Direct Force Plate	GDX-FP	\$399
Go Direct Gas Pressure	GDX-GP	\$105
Go Direct Light and Color	GDX-LC	\$99
Go Direct Motion	GDX-MD	\$129
Go Direct Photogate	GDX-VPG	\$105
Go Direct Projectile Launcher	GDX-PL	\$499
Go Direct Radiation Monitor	GDX-RAD	\$219
Go Direct Rotary Motion	GDX-RMS ⚡	\$195
Go Direct Sound	GDX-SND	\$99
Go Direct Static Charge	GDX-Q	\$109
Temperature Probes		
Go Direct Surface Temperature	GDX-ST	\$99
Go Direct Temperature	GDX-TMP	\$79
Go Direct Voltage	GDX-VOLT	\$95

## Go Direct Charge Station

Accessory	Order Code	Price
Go Direct Charge Station	GDX-CRG	\$89

## LabQuest® Sensors

Sensor	Order Code	Price
Accelerometers		
3-Axis Accelerometer	3D-BTA	\$105
25-g Accelerometer	ACC-BTA	\$110
Low-g Accelerometer	LGA-BTA	\$99
Carts and Tracks		
Dynamics Cart and Track System with Motion Encoder	DTS-EC	\$540
Encoder Fan Cart	CART-FEC	\$245
Current Sensors		
Current Probe	DCP-BTA	\$49
High Current Sensor	HCS-BTA	\$89
Electricity and Magnetism Sensors		
Charge Sensor	CRG-BTA	\$89
Magnetic Field Sensor	MG-BTA	\$69
Force Sensors		
Dual-Range Force Sensor	DFS-BTA	\$124
Force Plate	FP-BTA	\$395
Gas Pressure Sensor	GPS-BTA	\$103
Light Sensors		
Diffraction Apparatus	DAK	\$669
Light Sensor	LS-BTA ⚡	\$69
Motion Detectors		
Go! Motion® (USB sensor)	GO-MOT	\$139
Motion Detector	MD-BTD	\$105
Photogate	VPG-BTD	\$55
Power Amplifier	PAMP	\$249
Projectiles		
Projectile Launcher	VPL	\$440
Time of Flight Pad	TOF-VPL	\$84

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

Radiation Monitor	VRM-BTD	\$199
Rotary Motion Sensor	RMV-BTD ⚡	\$189
Sound Sensors		
Microphone	MCA-BTA	\$55
Sound Level Sensor	SLS-BTA	\$69
Temperature Probes		
Stainless Steel Temperature Probe	TMP-BTA	\$45
Surface Temperature Sensor	STS-BTA	\$34
Voltage Probes		
30-Volt Voltage Probe	30V-BTA	\$59
Differential Voltage Probe	DVP-BTA	\$49
Instrumentation Amplifier	INA-BTA	\$89
Voltage Probe	VP-BTA	\$14

## Emissions Spectrometer

Spectrometer	Order Code	Price
Go Direct Emissions Spectrometer	GDX-SPEC-EM	\$950

## Physics Lab Supplies

Part	Order Code	Price
Cart Fan	DTS-CFAN	\$89
Friction Block	PHY-FRBL	\$17
Hanging Masses	PHY-HM250 ⚡	\$23
Meter Stick	PHY-METER	\$11
Solenoid	PHY-SN700	\$79
Frequency Generator	FGEN-PAMP	\$189
Electrostatics Kit	ESK-CRG ⚡	\$129
Extech Digital DC Power Supply	EXPS	\$259
Spectrum Tube Single Power Supply	ST-SPS ⚡	\$299

HIGH SCHOOL

# Engineering and Coding

Encourage curiosity, build confidence, and spark an interest in STEM careers in your students. Vernier solutions give your students practical ways to learn engineering design principles and integrate sensor data into computer science concepts.

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



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

## PLTW Engineering and Computer Science

Project Lead The Way (PLTW) empowers students to develop in-demand, transportable knowledge and skills through programs in computer science, engineering, and biomedical science.

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

# PLTW

## Go Direct Structures & Materials Tester

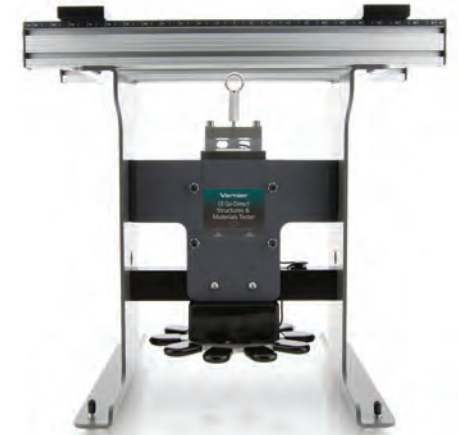
Use our Go Direct® Structures & Materials Tester to evaluate the strength of model bridges and engineered structures by measuring the applied load. Utilizing both load and displacement sensors, your students can evaluate the properties of materials.

### Benefits

- Force and displacement sensors connect via Bluetooth® wireless technology or USB
- Uses Vernier Graphical Analysis® Pro app to collect and analyze data
- Exact force and displacement for bends and breaks
- Accurate positioning for center and off-center loading
- Free software simplifies bridge-building contests
- Includes *Materials Testing: Beams to Bridges* e-book

GDX-VSMT \$1,199

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

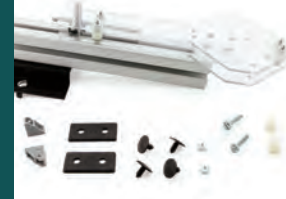


## Truss Tester Accessory

The Truss Tester Accessory attaches to the Go Direct Structures & Materials Tester, holds a single truss upright, and makes it possible for the load to be applied in a variety of locations.

VSMT-TRUSS \$149

[vernier.com/vsmt-truss](http://vernier.com/vsmt-truss)



## Go Direct Bridge Competition Software

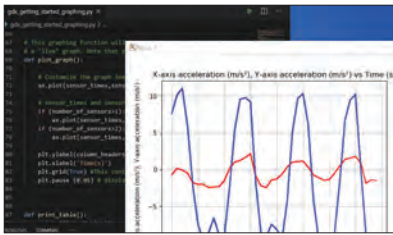
Make data collection easy and seamless for bridge-building competitions with our free Go Direct Bridge Competition Software. This software provides real-time graphing to give students immediate feedback on bridge performance and displays side-by-side comparisons for the entire class.

FREE DOWNLOAD

[vernier.com/godirect-bridge-competition-software](http://vernier.com/godirect-bridge-competition-software)

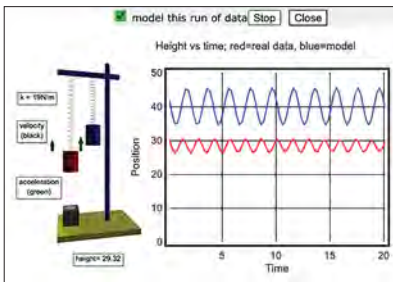


# Code with Python



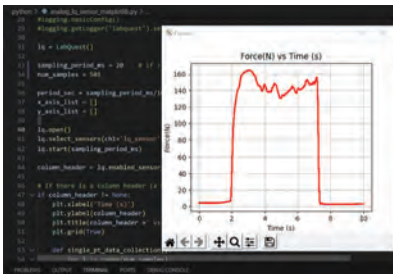
## Python with Go Direct Sensors

Create Python® code to capture data from Go Direct sensors. Supported on Windows® 10, macOS® and Linux (including Raspberry Pi®)



## Web VPython with Go Direct Sensors

Create 3D animations in a browser with Web VPython and Go Direct sensors. Both are compatible with a Chrome™ browser on Windows, macOS, and Chromebooks.



## Python with LabQuest Sensors

Communicate with your LabQuest® sensors in Python. For LabQuest and Python, we offer support for Windows and macOS.

```

1.1 1.2 1.3 Boyle's Law
boyles_law.py
from Go_Direct import *
sensor = gdx()
the_p = []
the_v = []
reciprocals = []
samples = 6
for n in range(samples):
    while True:
        clear_history()
        print('pressure = {:.2f} kPa'.format(sensor))
        print('Press [enter] to measure')
    
```

## Python with TI Calculators and Go Direct Sensors

Students can code beyond the screen of select TI calculators by integrating live sensor data into their Python programming language activities.

Available resources for using Python with Vernier sensors include a GitHub® repository, an introductory guide, and sample programs and activities.

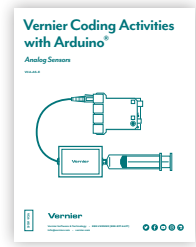
[vernier.com/python](https://www.vernier.com/python)

For other coding solutions, including Scratch, JavaScript, and LabVIEW™, see [vernier.com/hs-engineering](https://www.vernier.com/hs-engineering)

# Code with Arduino

Combining Vernier sensors with the inexpensive, easy-to-program Arduino® microcontrollers makes integrating coding and engineering into your curriculum simple and affordable.

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



## Practice Engineering Design with Renewable Energy

Challenge students to apply their knowledge as they explore the engineering design of wind turbines.

KidWind Advanced Wind Experiment Kit	KW-AWX	\$174
Go Direct Energy	GDX-NRG	\$99
KidWind Basic Building Parts	KW-BTPART	\$16
<i>Renewable Energy with Vernier</i>		
• Printed book + download:	REV	\$59
• Download only:	REV-E	\$45

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

HIGH SCHOOL

# Math

Confidence in math grows when students grasp its connection to everyday life. And now with enhanced compatibility between Vernier and Texas Instruments, students can explore math in tangible, real-world scenarios by wirelessly capturing and analyzing data on their TI calculators in real time.

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



## Wirelessly Collect and Analyze Data on TI Calculators with Vernier Go Direct Sensors

Unlock the doors to a deeper understanding of math and science through real-time data collection and analysis. Using the Vernier DataQuest® app on the TI-Nspire™ CX II and TI-Nspire CX II CAS calculators, students can predict, collect, and analyze data from select Go Direct sensors.

Connect any compatible Go Direct® sensor wirelessly using the TI Bluetooth® Adapter or directly through USB.



**TI Bluetooth Adapter**  
TI-CALC-BTADPT \$23  
*\*Includes cable; TI calculators sold separately*



**TI Calculator Data-Only Go Direct Sensor Cable**  
CB-GDX-TICALC \$9  
*\*TI calculators sold separately*



Seamlessly connect your TI calculator to supported Go Direct sensors using the Vernier DataQuest App and the TI Bluetooth Adapter.



This data-only sensor cable is specially designed to transmit data from supported Go Direct Sensors without depleting the calculator's battery.



Go Direct Temperature  
GDX-TMP \$79



Go Direct pH  
GDX-PH \$109



Go Direct Gas Pressure  
GDX-GP \$105



Go Direct Light and Color  
GDX-LC \$99



Go Direct Force and Acceleration  
GDX-FOR \$119



Go Direct Motion  
GDX-MD \$129

### TI-Nspire Go Direct Package

Add hands-on exploration using Go Direct sensors to your TI-Nspire CX II and TI-Nspire CX II CAS handhelds with this convenient package. (TI-Nspire calculators sold separately.)

- Go Direct Force and Acceleration
- Go Direct Gas Pressure
- Go Direct Light and Color
- Go Direct Motion
- Go Direct pH
- Go Direct Temperature
- Data-Only Go Direct Sensor Cable
- TI Bluetooth Adapter

GDP-TICALC \$672 [vernier.com/gdp-ticalc](http://vernier.com/gdp-ticalc)

## Python Programming with TI and Vernier




Empower students to code their own data-collection programs with Python®! By downloading and transferring Python modules for Go Direct sensors to their TI graphing calculators, students can easily experiment with input and output controls using their collected data.

TI-Nspire CX II (TI-NSCX2)	TI-84 Plus CE Python (TI-84PCE)
Supports 6 Go Direct sensors	Supports 6 Go Direct sensors
Connects with 1 Go Direct sensor at a time	Connects with 1 Go Direct sensor at a time
Uses up to 4 sensor channels at a time (for sensors that have multiple sensor channels)	Uses 1 sensor channel at a time (for sensors that have multiple sensor channels)
Requires TI-Bluetooth Adapter	Requires TI-Bluetooth Adapter

Learn more about the TI Go Direct Python Module at [www.education.ti.com/go-direct](http://www.education.ti.com/go-direct)

## More Options to Collect Data with TI Calculators

Connect a Vernier sensor directly to any TI-Nspire handheld or TI-84 Plus graphing calculator and start collecting data. Collect data with the CBR 2 motion detector or EasyTemp® temperature probe, or use EasyLink® with a supported sensor to explore math and science concepts found in real-world phenomena such as light, pressure, force, and more.

Product	Order Code	Price	URL
 CBR2	CBR2	\$103	<a href="http://vernier.com/cbr2">vernier.com/cbr2</a>
 EasyLink	EZ-LINK	\$79	<a href="http://vernier.com/ez-link">vernier.com/ez-link</a>
 EasyTemp	EZ-TMP	\$48	<a href="http://vernier.com/ez-temp">vernier.com/ez-temp</a>

For other solutions, see [vernier.com/math](http://vernier.com/math)

## Calculator Products

For more information about compatibility, see our website.

Product	Order Code	Price		
Calculators	TI-84 Plus CE Python	TI-84PCE	\$135	
	TI-84 Plus CE Python Teacher Pack (10 EZ-Spot calculators & charging station)	TI-84PCE-TPK	\$1,377	
	TI-84 Plus Calculator	TI-84PL	\$111	
	TI-84 Plus EZ-Spot Teacher Pack (10 EZ-Spot calculators)	TI-84PL-TPK	\$1,105	
	TI-Nspire CX II Handheld	TI-NSCX2	\$143	
	TI-Nspire CX II Teacher Pack (10 EZ-Spot handhelds & docking station)	TI-NSCX2-TPK	\$1,514	
	TI-Nspire CX II CAS Handheld	TI-NSCXCAS2	\$145	
	TI-Nspire CX II CAS Teacher Pack (10 handhelds & docking station)	TI-NSCXCAS2-TPK	\$1,542	
	Charging/ Docking Station	TI-84 Plus CE Charging Station	TI-84PCE-CS	\$73
		TI-Nspire CX Docking Station	TI-NSCX-DS	\$130
Data Collection	CBR 2	CBR2	\$103	
	EasyLink	EZ-LINK	\$79	
	EasyTemp	EZ-TMP	\$48	
	Go Direct Sensor Connectivity Kit for TI Calculators* (includes TI Bluetooth Adapter and Data-Only Sensor Cable)	TICALC-GDX-BTUSB-KT	\$32	
	TI Bluetooth Adapter	TI-CALC-BTADPT	\$23	
	TI Calculator* Data-Only Go Direct Sensor Cable	CB-GDX-TICALC	\$9	
	Emulator Software/ Online Calculators	TI-SmartView™ Emulator software for TI-84		
TI-84 Plus CE Online Calculator				
TI-Nspire CX Online Calculator				
TI-Nspire CX Student Software				
TI-Nspire CX CAS Student Software				
	TI-Nspire CX Premium Teacher Software			
Miscellaneous Accessories	Easy to Go! USB Adapter	MINI-USB	\$22	
	Go! to Easy USB Adapter	USB-MINI ↕	\$9	
TI Navigator™ System	30-User TI-Nspire CX Navigator System	TI-NAV-CX30	\$2,220	
	10-User TI-Nspire CX Navigator System	TI-NAV-CX10	\$1,289	
	10-User TI-Nspire CX Navigator Add-on†	TI-NAV-10ADDON	\$829	

TI products purchased in the United States are covered by a one-year warranty based on the date of purchase. Units are warranted against defective materials or workmanship.

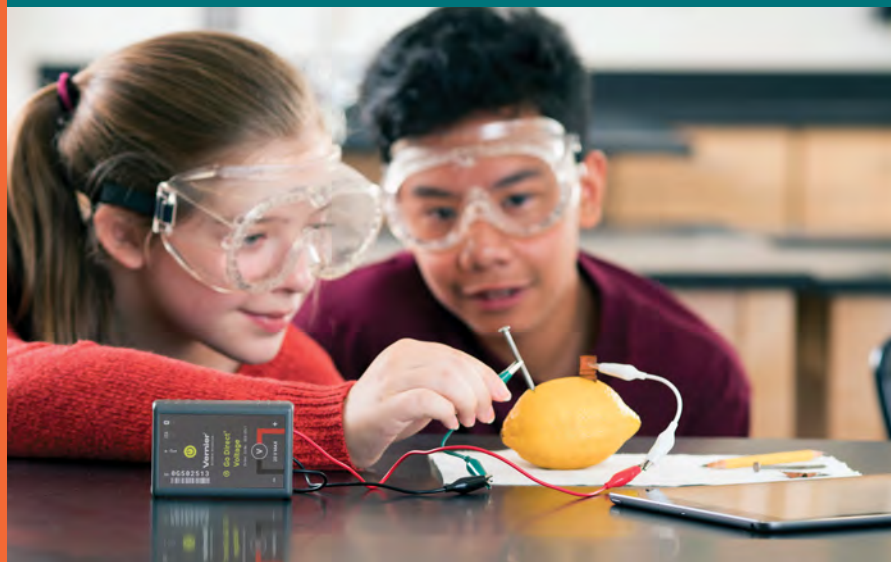
\* Supports TI-Nspire CX II and TI Nspire CX II CAS calculators only

† Requires purchase of a Navigator system

# Middle School

Hands-on learning with technology is ideal for middle school students. Enhance their discovery and understanding of the world around them with the use of Vernier technology. Using our versatile, cutting-edge products and ready-to-go experiments correlated to the NGSS, you can encourage your students' curiosity and prepare them for high school—and the world beyond.

[vernier.com/middle-school](https://www.vernier.com/middle-school)



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

## Go Direct Temperature

MOST POPULAR

Students can use this rugged, general-purpose sensor to monitor temperature.

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

GDX-TMP \$79

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



## Go Direct Temperature Teacher Pack

GDX-TMP-TP \$702

Includes 8 Go Direct® Temperature Probes and a Go Direct Charge Station



## Go Direct Force and Acceleration

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. Use it to measure pushes and pulls in the classroom or outdoors.

GDX-FOR \$119

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





## Go Direct Motion

Go Direct Motion uses ultrasound to measure the position, velocity, and acceleration of moving objects.

GDX-MD \$129

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



## Go Direct 3-Axis Magnetic Field

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

GDX-3MG \$99

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



## Go Direct Gas Pressure

Go Direct Gas Pressure measures the absolute pressure of a gas.

GDX-GP \$105

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



## Go Direct pH

Go Direct pH is a general-purpose pH sensor used to monitor pH of aqueous solutions.

GDX-PH \$109

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



## Go Direct Light and Color

Go Direct Light and Color combines the power of multiple sensors to measure light intensity in the visible range and UV portions of the electromagnetic spectrum.

GDX-LC \$99

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



## Go Direct Voltage

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

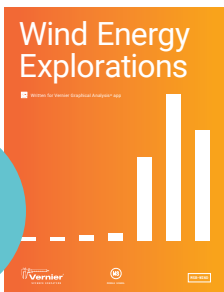
GDX-VOLT \$95

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



## Wind Energy Explorations

Students gain an understanding of energy, circuits, and loads, as well as practice engineering design as they use this lab book to explore wind energy.



INCLUDES  
9  
EXPERIMENTS

**Printed book + download**  
MSB-WIND \$29

**Download only**  
MSB-WIND-E \$24

[vernier.com/msb-wind-e](http://vernier.com/msb-wind-e)

## Wind Energy Explorations Go Direct Packages

### Single Station Package (shown below)

This package includes

- Go Direct® Energy (1)
- Vernier Resistor Board (1)
- KidWind Basic Wind Experiment Kit

GDP-MS-WE \$252



Learn more at [vernier.com/gdp-ms-we](http://vernier.com/gdp-ms-we)

### Classroom Package

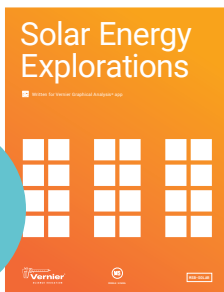
This package includes

- Go Direct Energy (3)
- Vernier Resistor Boards (3)
- KidWind Basic Wind Experiment Classroom Pack (includes materials for 6 to 10 groups of 2 to 4 students each)

GDP-MS-WEC \$708

## Solar Energy Explorations

Solar energy provides a relevant topic for students to explore energy, temperature, and electrical circuits, culminating in an engineering design project.



INCLUDES  
9  
EXPERIMENTS

**Printed book + download**  
MSB-SOLAR \$29

**Download only**  
MSB-SOLAR-E \$24

[vernier.com/msb-solar](http://vernier.com/msb-solar)

## Solar Energy Explorations Go Direct Package

This package includes sensors that work with Vernier Graphical Analysis® Pro and LabQuest® 3. It also includes an experiment kit and a resistor board.

- Go Direct Energy
- Solar Energy Exploration Kit
- Go Direct Surface Temperature
- Vernier Resistor Board

GDP-MS-SE \$306

Buy 8 or more packages at \$300 and save \$48.



Learn more at [vernier.com/gdp-ms-se](http://vernier.com/gdp-ms-se)

## OpenSciEd

Vernier knows that science education is not static. Your students need to understand critical scientific concepts, use these concepts to solve problems, and understand how they connect to the real world. These objectives are incorporated into the main pillars of the three-dimensional learning framework developed by the National Research Council.

We are proud to partner with OpenSciEd®, a provider of high-quality, open-source science instructional materials. Our partnership gives you access to free field-tested and EQuIP-approved units that support the three-dimensional learning approach. Vernier provides free downloadable supplements that integrate data-collection technology into these units. When Vernier technology is paired with OpenSciEd's classroom-tested curriculum, your students establish a deep understanding of critical scientific concepts through data collection.

Learn more at [vernier.com/opensci-ed](http://vernier.com/opensci-ed)



## Exploring Life Science

From yeast to humans, this e-book provides opportunities for students to learn about life science.

Learn more at [vernier.com/msb-ls-e](http://vernier.com/msb-ls-e)



Download only  
MSB-LS-E \$13

## Exploring Life Science Go Direct Package

This package contains the following: Go Direct Gas Pressure, Go Wireless® Heart Rate, Go Direct Conductivity, and Gas Pressure Sensor Bulb.

GDP-MS-LS \$340

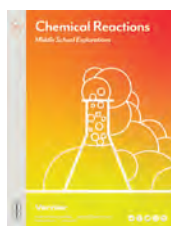
Buy 8 or more at \$334 and save \$48.



## Middle School Explorations: Chemical Reactions

In the six experiments in this book, students gain an understanding of various types of chemical reactions as they build a model to explain what goes on at the molecular level during a chemical reaction.

Learn more at [vernier.com/msb-cr-e](http://vernier.com/msb-cr-e)



Download only  
MSB-CR-E \$24

## Go Direct Temperature

This is a rugged, general-purpose sensor that students can use to monitor temperature.

GDX-TMP \$79

Teacher pack is also available (includes 8 Go Direct Temperature Probes and a Charge Station).

GDX-TMP-TP \$702



## Middle School Science Go Direct Package

This package includes 12 sensors that work with Vernier Graphical Analysis Pro and LabQuest 3.

- Go Direct Motion Detector
- Go Direct pH
- Go Direct Voltage
- Go Direct Temperature (2)
- Go Direct Light and Color
- Go Direct Force and Acceleration
- Go Direct Gas Pressure
- Go Wireless Heart Rate
- Go Direct Conductivity
- Go Direct 3-Axis Magnetic Field
- Gas Pressure Sensor Bulb

GDP-MS-DX \$1,148

Buy 8 Middle School Science Go Direct Packages at \$1,126 each and save \$176!

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



## Middle School Science with Vernier

The *Middle School Science with Vernier* lab book contains 38 experiments in Earth science, life science, and physical science written specifically for students in grades 6–8. Making use of 10 different Vernier sensors, your students will enjoy doing these well-tested science experiments.

Includes experiments from these e-books

- *Exploring Life Science*
- *Exploring Earth and Space Science*
- *Exploring Physical Science*

Learn more at [vernier.com/msv](http://vernier.com/msv)



Printed book + download  
MSV \$59

Download only  
MSV-E \$45

## Exploring Physical Science

From matter and energy to motion and forces, students explore a wide variety of topics in basic chemistry and physics in this e-book.

Learn more at [vernier.com/msb-ps-e](http://vernier.com/msb-ps-e)



Download only  
MSB-PS-E \$24

### Exploring Physical Science Go Direct Package

This package contains the following Go Direct® sensors: Temperature (2), Gas Pressure, Force and Acceleration, Motion Detector, Voltage, 3-Axis Magnetic Field, and Light and Color.

GDP-MS-PS \$804

Buy 8 or more at \$788 and save \$128.



## Exploring Earth and Space Science

Weather, soil, and water quality are a few of the Earth science topics students explore in this e-book.

Learn more at [vernier.com/msb-ess-e](http://vernier.com/msb-ess-e)



Download only  
MSB-ESS-E \$24

### Exploring Earth and Space Science Go Direct Package

This package contains the following Go Direct sensors: Temperature (2), Light and Color, Motion Detector, Conductivity, and pH.

GDP-MS-ESS \$624

Buy 8 or more at \$612 and save \$96.



## Exploring Motion and Force with Go Direct Sensor Cart

In this e-book, students explore the force of friction, aspects of motion, and simple machines such as levers, ramps, and pulleys.

Learn more at [vernier.com/msb-cart-e](http://vernier.com/msb-cart-e)



Download only  
MSB-CART-E \$24

### Exploring Motion and Force with Go Direct Sensor Cart Package

This package contains the following Go Direct sensors: Sensor Cart (Green) and Sensor Cart (Yellow).

GDP-MS-SC \$410

Buy 8 or more at \$402 and save \$64.



The Cart Guide helps make it easy to take your dynamics experiments off track. Sold as a package of 10 Cart Guides.

CGUIDE-10 \$99



# Featured Products

## Go Direct Sensors

Sensor	Order Code	Price
Go Direct 3-Axis Magnetic Field	GDX-3MG	\$99
Carts and Tracks		
Dynamics Cart and Track System with Go Direct Sensor Carts	DTS-GDX	\$636
Go Direct Sensor Cart (Green)	GDX-CART-G	\$205
Go Direct Sensor Cart (Yellow)	GDX-CART-Y	\$205
Go Direct Conductivity	GDX-CON	\$129
Go Direct Current	GDX-CUR	\$99
Go Direct Energy	GDX-NRG	\$99
Go Direct Force and Acceleration	GDX-FOR	\$119
Go Direct Gas Pressure	GDX-GP	\$105
Go Wireless® Heart Rate	GW-HR	\$99
Go Direct Light and Color	GDX-LC	\$99
Go Direct Motion	GDX-MD	\$129
Go Direct Optical Dissolved Oxygen	GDX-ODO	\$385
pH Sensors		
Go Direct pH	GDX-PH	\$109
Go Direct Tris-Compatible Flat pH	GDX-FPH	\$139
Go Direct Sound	GDX-SND	\$99
Go Direct Structures & Materials Tester	GDX-VSMT	\$1,199
Temperature Probes		
Go Direct Surface Temperature	GDX-ST	\$99
Go Direct Temperature	GDX-TMP	\$79
Go Direct Voltage	GDX-VOLT	\$95
Go Direct Weather System	GDX-WTVA	\$164

## Go Direct Charge Station

Accessory	Order Code	Price
Go Direct Charge Station	GDX-CRG	\$89

## Additional Products

Products	Order Code	Price
Cart Guide (pkg. of 10)	CGUIDE-10 ⚡	\$99
pH Storage Solution	PH-SS	\$25
KidWind Basic Wind Experiment Kit	KW-BWX	\$134
Solar Energy Exploration Kit	KW-SEEK	\$89
Vernier Resistor Board	VES-RB	\$19

## Coding

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

Products	Order Code	Price
Go Direct Force and Acceleration (for use with Scratch)	GDX-FOR	\$119

## Lab Books

Title	Order Code	Price
<i>Middle School Science with Vernier</i>	Printed book + download: MSV	\$59
	Download only: MSV-E	\$45
<i>Exploring Motion and Force with Go Direct Sensor Cart</i>	MSB-CART-E	\$24
<i>Exploring Physical Science*</i>	MSB-PS-E	\$24
<i>Exploring Life Science*</i>	MSB-LS-E	\$13
<i>Exploring Earth and Space Science*</i>	MSB-ESS-E	\$24
<i>Solar Energy Explorations</i>	Printed book + download: MSB-SOLAR	\$29
	Download only: MSB-SOLAR-E	\$24
<i>Wind Energy Explorations</i>	Printed book + download: MSB-WIND	\$29
	Download only: MSB-WIND-E	\$24
<i>Earth Science with Vernier</i>	Printed book + download: ESV	\$59
	Download only: ESV-E	\$45
<i>Climate and Meteorology Experiments</i>	Printed book + download: HSB-CM	\$29
	Download only: HSB-CM-E	\$24

\* All experiments from this e-book are included in Middle School Science with Vernier.

See all our products for middle school science at [vernier.com/middle-school](https://www.vernier.com/middle-school)

## LabQuest 3 Interface and Sensors

Learn more about LabQuest® 3 and sensors at [vernier.com/labq3](https://www.vernier.com/labq3)

## Looking for Replacement Parts?

Visit [vernier.com/replacements](https://www.vernier.com/replacements)

# Elementary School

Technology engages young students. Our carefully designed hands-on data-collection technology helps elementary school teachers introduce young learners to science and STEM. We've created easy-to-use resources to help you educate and inspire your students.

[vernier.com/elementary-school](http://vernier.com/elementary-school)



## Professional Development

We are here to help. Our webinars, workshops, and personalized training options offer innovative ways to engage students with STEM in a traditional classroom or virtual environment.

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

## Elementary Science Go Direct Package

This package includes 8 products that work with Vernier Graphical Analysis<sup>®</sup> Pro and LabQuest<sup>®</sup> 3.

- Go Direct<sup>®</sup> Temperature
- Go Direct Light and Color
- Go Direct Motion
- Go Direct 3-Axis Magnetic Field
- Go Direct Gas Pressure
- Go Direct Voltage
- Go Direct Force and Acceleration
- Gas Pressure Sensor Bulb

GDP-EL-DX • \$732  
Buy 8 or more packages at \$718  
and save \$112.

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



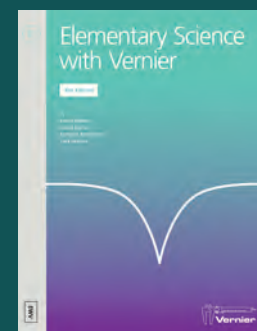
## Elementary Science with Vernier

This collection of experiments for elementary students includes the topics of temperature, motion, force, magnetism, light, electricity, and gas pressure.

### Includes Experiments from These E-books

- *Investigating Temperature*
- *Investigating Gas Pressure*
- *Investigating Motion*
- *Investigating Force*
- *Investigating Light*
- *Investigating Magnetism*
- *Investigating Voltage*

Learn more at [vernier.com/ewv](http://vernier.com/ewv)



Printed book + download  
EWV \$59

Download only  
EWV-E \$45

## Investigating Wind Energy



**Printed book + download**  
ELB-WIND \$27

**Download only**  
ELB-WIND-E \$24

With the *Investigating Wind Energy* lab book, students conduct investigations to learn about energy transfer, basic electric circuits, and blade design.

### Investigating Wind Energy Package

Contains the following products

- Go Direct Energy
- Vernier Resistor Board
- KidWind MINI Wind Turbine with Blade Design

GDP-EL-WE \$187  
Buy 8 or more at \$184 and save \$24.

[vernier.com/gdp-el-we](http://vernier.com/gdp-el-we)

## Investigating Solar Energy



**Printed book + download**  
ELB-SOLAR \$27

**Download only**  
ELB-SOLAR-E \$24

The *Investigating Solar Energy* lab book draws on solar energy as a real-world example through which to investigate energy transfer, series and parallel circuits, and other factors that affect solar panel output.

### Investigating Solar Energy Package

Contains the following products



- Go Direct Energy
- Go Direct Surface Temperature
- Solar Energy Exploration Kit
- Vernier Resistor Board

GDP-EL-SE \$306  
Buy 8 or more at \$300 and save \$48.

[vernier.com/gdp-el-se](http://vernier.com/gdp-el-se)

# Featured Products

## Go Direct Sensors

Sensor		Order Code	Price
Go Direct 3-Axis Magnetic Field		GDX-3MG	\$99
Go Direct Energy		GDX-NRG	\$99
Go Direct Force and Acceleration		GDX-FOR	\$119
Go Direct Gas Pressure		GDX-GP	\$105
Go Direct Light and Color		GDX-LC	\$99
Go Direct Motion		GDX-MD	\$129
Go Direct Sound		GDX-SND	\$99
Go Direct Surface Temperature		GDX-ST	\$99
Go Direct Temperature		GDX-TMP	\$79
Go Direct Voltage		GDX-VOLT	\$95
Go Direct Weather		GDX-WTHR	\$135

## Go Direct Accessories

Go Direct Charge Station		GDX-CRG	\$89
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## Coding

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

Go Direct Force and Acceleration (for use with Scratch)		GDX-FOR	\$119
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See all our products for elementary school science at [vernier.com/elementary-school](http://vernier.com/elementary-school)

# Sensors & Accessories

## The Vernier Sensor Advantage

### Outstanding Performance

With over 40 years of experience developing technology for education, we design our sensors for active, hands-on experiments. Vernier sensors are rugged, classroom-proven technology that are well supported and easy to use. The sensors provide consistent, high-quality results for the demands of the classroom.

### Connect & Collect

Simply connect, and you're ready to collect. All Vernier sensors on the following pages are automatically detected and set up for data collection when used with Vernier software.

### Go Direct Sensors

Our Go Direct® sensors connect directly to a computer, Chromebook™ or mobile device via Bluetooth® wireless technology or USB connection. Most sensors include a rechargeable battery to power the sensor when used wirelessly.

### LabQuest Sensors

Our LabQuest® sensors require an interface from the LabQuest family, such as LabQuest 3 or LabQuest Mini. The interface sends information from the sensor to the data-collection and analysis software on a device such as a computer, Chromebook, or mobile device.

For more information on sensor compatibility, visit [vernier.com/sensors](https://www.vernier.com/sensors)

### Generous Warranty

Buy with confidence. Most Vernier sensors are covered by a 5-year limited warranty. During the warranty period, Vernier will repair or replace the item if there is a defect in materials or workmanship. Outside the warranty, Vernier will attempt to repair most products, often at no charge.

## Sensors

### Go Direct Sensors

Sensor	Order Code	Price
Go Direct 3-Axis Magnetic Field	GDX-3MG	\$99
Go Direct Acceleration	GDX-ACC	\$115
Go Direct Blood Pressure	GDX-BP	\$125
Carts and Tracks		
Dynamics Cart and Track System with Go Direct Sensor Carts	DTS-GDX	\$636
Go Direct Sensor Cart (Green)	GDX-CART-G	\$205
Go Direct Sensor Cart (Yellow)	GDX-CART-Y	\$205
Go Direct Centripetal Force Apparatus (requires Go Direct Force and Acceleration)	GDX-CFA	\$325
Go Direct CO <sub>2</sub> Gas	GDX-CO2	\$229
Go Direct Colorimeter	GDX-COL	\$135
Conductivity Probes		
Go Direct Conductivity	GDX-CON	\$129
Go Direct Platinum-Cell Conductivity	GDX-CONPT	\$189
Go Direct Constant Current System	GDX-CCS	\$95
Go Direct Current	GDX-CUR	\$99
Go Direct Cyclic Voltammetry System	GDX-CVS	\$999
Go Direct Drop Counter	GDX-DC	\$115
Go Direct EKG	GDX-EKG	\$175
Go Direct Electrode Amplifier	GDX-EA	\$79
Go Direct Energy	GDX-NRG	\$99
Go Direct Ethanol Vapor	GDX-ETOH	\$169
Go Direct Force and Acceleration	GDX-FOR	\$119
Go Direct Force Plate	GDX-FP	\$399
Gas Pressure Sensors		
Go Direct Gas Pressure	GDX-GP	\$105
Go Direct Wide-Range Pressure	GDX-WRP	\$219
Go Direct Wide Range Pressure (Liquid and Gas Compatible)	GDX-WRPL	\$249
Go Direct Hand Dynamometer	GDX-HD	\$135

### Heart Rate Monitors

Go Wireless® Exercise Heart Rate	GW-EHR	\$79
Go Wireless Heart Rate	GW-HR	\$99

Go Direct Ion-Selective Electrode Amplifier	GDX-ISEA	\$79
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### Ion-Selective Electrodes (ISE)\*

Go Direct Ammonium ISE	GDX-NH4	\$299
Go Direct Calcium ISE	GDX-CA	\$299
Go Direct Chloride ISE	GDX-CL	\$299
Go Direct Nitrate ISE	GDX-NO3	\$299
Go Direct Potassium ISE	GDX-K	\$299

Go Direct Light and Color	GDX-LC	\$99
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Go Direct Melt Station	GDX-MLT ⚡	\$599
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Go Direct Mini GC	GDX-GC	\$3,999
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Go Direct Motion	GDX-MD	\$129
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Go Direct O <sub>2</sub> Gas	GDX-O2	\$219
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Go Direct Optical Dissolved Oxygen	GDX-ODO	\$385
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Go Direct ORP	GDX-ORP	\$119
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Go Direct PAR	GDX-PAR	\$299
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### pH Sensors

Go Direct Glass-Body pH	GDX-GPH	\$159
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Go Direct pH	GDX-PH	\$109
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Go Direct Tris-Compatible Flat pH	GDX-FPH	\$139
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Go Direct Photogate	GDX-VPG	\$105
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Go Direct Polarimeter	GDX-POL	\$545
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Go Direct Projectile Launcher	GDX-PL	\$499
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Go Direct Pyranometer	GDX-PYR	\$299
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Go Direct Radiation Monitor	GDX-RAD	\$219
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Go Direct Respiration Belt	GDX-RB	\$125
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Go Direct Rotary Motion	GDX-RMS ⚡	\$195
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\* Ion-Selective Electrodes require excellent chemical technique and careful calibration to obtain accurate results; they are not recommended for elementary or middle school students.



Go Direct Salinity	GDX-SAL	\$180
Go Direct Soil Moisture	GDX-SM	\$149
Go Direct Sound	GDX-SND	\$99
<b>Spectrometers</b>		
Go Direct Emissions Spectrometer	GDX-SPEC-EM	\$950
Go Direct Fluorescence/UV-VIS Spectrophotometer	GDX-SPEC-FUV	\$3,499
Go Direct SpectroVis® Plus	GDX-SVISPL	\$479
Go Direct UV-VIS Spectrophotometer	GDX-SPEC-UV	\$2,999
Go Direct Visible Spectrophotometer	GDX-SPEC-VIS	\$1,999
Go Direct Spirometer	GDX-SPR	\$229
Go Direct Static Charge	GDX-Q	\$109
Go Direct Structures & Materials Tester	GDX-VSMT	\$1,199
<b>Temperature Probes</b>		
Go Direct Surface Temperature	GDX-ST	\$99
Go Direct Temperature	GDX-TMP	\$79
Go Direct Thermocouple	GDX-TC	\$118
Go Direct Wide-Range Temperature	GDX-WRT	\$139
Go Direct Voltage	GDX-VOLT	\$95
Go Direct Weather	GDX-WTHR	\$135

## LabQuest Sensors

Sensor	Order Code	Price
<b>Accelerometers</b>		
3-Axis Accelerometer	3D-BTA	\$105
25-g Accelerometer	ACC-BTA	\$110
Low-g Accelerometer	LGA-BTA	\$99
Anemometer	ANM-BTA	\$109
Barometer	BAR-BTA	\$79
Blood Pressure Sensor	BPS-BTA	\$120
Charge Sensor	CRG-BTA	\$89
CO <sub>2</sub> Gas Sensor	CO2-BTA	\$299
Colorimeter	COL-BTA	\$128
Conductivity Probe	CON-BTA	\$129
Constant Current System	CCS-BTA	\$79
<b>Current Probes</b>		
Current Probe	DCP-BTA	\$49
High Current Sensor	HCS-BTA	\$89

Diffraction Apparatus	DAK	\$669
Digital Control Unit	DCU-BTD	\$69
Drop Counter	VDC-BTD	\$109
EKG Sensor	EKG-BTA	\$179
Electrode Amplifier	EA-BTA	\$55
Energy Sensor	VES-BTA	\$99
Ethanol Sensor	ETH-BTA	\$135
Flow Rate Sensor	FLO-BTA	\$139
<b>Force Sensors</b>		
Dual-Range Force Sensor	DFS-BTA	\$124
Force Plate	FP-BTA	\$395
<b>Gas Pressure Sensors</b>		
Gas Pressure Sensor	GPS-BTA	\$103
Pressure Sensor 400	PS400-BTA	\$229
Hand Dynamometer	HD-BTA	\$124
<b>Heart Rate Monitors</b>		
Exercise Heart Rate Monitor	EHR-BTA	\$99
Hand-Grip Heart Rate Monitor	HGH-BTA	\$129
Instrumentation Amplifier	INA-BTA	\$89
<b>Ion-Selective Electrodes (ISE)*</b>		
Ammonium ISE	NH4-BTA	\$299
Calcium ISE	CA-BTA	\$299
Chloride ISE	CL-BTA	\$299
Nitrate ISE	NO3-BTA	\$299
Potassium ISE	K-BTA	\$299
Light Sensor	LS-BTA ⚡	\$69
Magnetic Field Sensor	MG-BTA	\$69
Melt Station	MLT-BTA ⚡	\$629
Microphone	MCA-BTA	\$55
<b>Motion Detectors</b>		
Dynamics Cart and Track System with Motion Encoder	DTS-EC	\$540
Motion Detector	MD-BTD	\$105
O <sub>2</sub> Gas Sensor	O2-BTA	\$219
ORP Sensor	ORP-BTA	\$115
PAR Sensor	PAR-BTA	\$259

<b>pH Sensors</b>		
Glass-Body pH Electrode BNC (requires Electrode Amplifier)	GPH-BNC	\$95
pH Sensor	PH-BTA	\$105
Tris-Compatible Flat pH Sensor	FPH-BTA	\$124
Photogate	VPG-BTD	\$55
Power Amplifier	PAMP	\$249
Projectile Launcher	VPL	\$440
Pyranometer	PYR-BTA	\$279
Radiation Monitor	VRM-BTD	\$199
Relative Humidity Sensor	RH-BTA	\$79
Respiration Monitor Belt (requires Gas Pressure Sensor)	RMB	\$63
Rotary Motion Sensor	RMV-BTD ⚡	\$189
Salinity Sensor	SAL-BTA	\$149
Soil Moisture Sensor	SMS-BTA	\$148
Sound Level Sensor	SLS-BTA	\$69
Spirometer	SPR-BTA	\$240
<b>Temperature Probes</b>		
Extra-Long Temperature Probe	TPL-BTA	\$99
Stainless Steel Temperature Probe	TMP-BTA	\$45
Surface Temperature Sensor	STS-BTA	\$34
Thermocouple	TCA-BTA	\$79
Wide-Range Temperature Probe	WRT-BTA	\$119
Turbidity Sensor	TRB-BTA	\$124
<b>UV Sensors</b>		
UVA Sensor	UVA-BTA	\$118
UVB Sensor	UVB-BTA	\$119
<b>Voltage Probes</b>		
30-Volt Voltage Probe	30V-BTA	\$59
Differential Voltage Probe	DVP-BTA	\$49
Voltage Probe	VP-BTA	\$14

## USB-Only Sensors

Sensor	Order Code	Price
Go! Motion®	GO-MOT	\$139
Go!Temp®	GO-TEMP	\$49
OHAUS® Balances ⚡	vernier.com/ohaus	
Vernier Flash Photolysis Spectrometer	VSP-FP	\$5,999

⚡ For California Proposition 65 warning, see pp. 78–79.

# Accessories & Replacement Parts

## Sensors

Part Name	Order Code	Price
<b>Blood Pressure Sensors</b>		
Small Blood Pressure Cuff	CUFF-SM	\$35
Standard Blood Pressure Cuff	CUFF-STD	\$32
Large Blood Pressure Cuff	CUFF-LG	\$40
<b>CO<sub>2</sub> and/or O<sub>2</sub> Gas Sensors</b>		
250 mL Nalgene® Bottle (1 opening)	C02-BTL	\$5
BioChamber 250 (250 mL) (2 openings)	BC-250 ⚡	\$9
BioChamber 2000 (2000 mL) (2 openings)	BC-2000 ⚡	\$22
<b>Colorimeters</b>		
Cuvette Lids (pkg. of 100)	CUV-LID	\$9
Cuvette Rack	CUV-RACK	\$9
Plastic Cuvettes (Visible Range) (pkg. of 100)	CUV	\$24
<b>Conductivity Probes</b>		
Conductivity Low Standard (500 mL)	CON-LST	\$25
Conductivity Middle Standard (500 mL)	CON-MST	\$25
Conductivity High Standard (500 mL)	CON-HST	\$25
<b>Dissolved Oxygen Probe (Go Direct®, order code GDX-ODO)</b>		
Go Direct Optical Dissolved Oxygen Replacement Cap	GDX-ODO-CAP	\$79
Optical DO Probe Metal Guard	ODO-GRD	\$64
<b>Dissolved Oxygen Probe (Non-optical, order code DO-BTA)</b>		
DO Calibration Solution (60 mL)	DO-CAL	\$5
DO Filling Solution (130 mL)	FS	\$6
DO Polishing Strips	PS	\$4
DO Probe Membrane Cap	MEM	\$15
<b>Drop Counters</b>		
Microstirrer	MSTIR	\$9
Precision Volume Dispenser	DC-DISP	\$85
Reagent Reservoir, 2 Valves, and Tip	VDC-RR	\$10
Stopper Stem	PS-STEM	\$1
Plastic 2-Way Valve	PS-2WAY	\$2
<b>EKG Sensors</b>		
EKG Electrodes (100)	ELEC	\$19
<b>Electrode Amplifier (Go Direct, order code GDX-EA)</b>		
Go Direct pH Electrode BNC	GDX-PH-BNC	\$50
Go Direct Glass-Body pH Electrode BNC	GDX-GPH-BNC	\$94
Go Direct Flat pH Electrode BNC	GDX-FPH-BNC	\$83
Go Direct ORP Electrode BNC	GDX-ORP-BNC	\$59

<b>Electrode Amplifier (LabQuest®, order code EA-BTA)</b>		
pH Electrode BNC	PH-BNC	\$68
Glass-Body pH Electrode BNC	GPH-BNC	\$95
Flat pH Electrode BNC	FPH-BNC	\$84
ORP Electrode BNC	ORP-BNC	\$62
<b>Energy Sensors</b>		
Vernier Resistor Board	VES-RB	\$19
Vernier Variable Load	VES-VL	\$79
<b>Ethanol Sensors</b>		
Ethanol Cap Assemblies (pkg. of 3)	ETH-CAPS	\$10
Ethanol Stopper	ETH-STOP	\$6
Ethanol Tape	ETH-TAPE	\$3
<b>Force Sensors</b>		
Reflex Hammer Accessory Kit	RFX-ACC	\$29
Replacement Accessory Rod	ACC-R0D	\$4
Springs Set	SPRINGS	\$18
Dual-Range Force Sensor Replacement Parts Kit	DFS-RPK	\$24
Bumper Launcher Kit	BLK	\$99
Hoop Bumpers for Bumper and Launcher Kit	H00PS-BLK	\$19
<b>Gas Chromatographs</b>		
GC Septa (pkg. of 4)	GC-SEP	\$34
GC Syringe, 1 µL Hamilton	GC-SYR-MIC	\$129
<b>Gas Pressure Sensors</b>		
Gas Pressure Sensor Bulb (1)	GPS-BULB1	\$7
Gas Pressure Sensor Bulb (set of 4)	GPS-BULB4	\$25
Pressure Sensor Accessories Kit	PS-ACC	\$12
#1 1-Hole Rubber Stopper	PS-ST0P1	\$1
#5 2-Hole Rubber Stopper	PS-ST0P5	\$1.50
Luer-Lock Connector	PS-LUER	\$1
Plastic 2-Way Valve	PS-2WAY	\$2
Plastic Tubing	PS-TUBING	\$1
Plastic Tubing Clamps (pkg. of 100)	PTC	\$129
Stopper Stem	PS-STEM	\$1
Syringe (20 mL, plastic)	PS-SYR	\$2
Syringe (20 mL, plastic) (pkg. of 10)	PS-SYR10	\$18
<b>Heart Rate Sensors</b>		
Heart Rate Hand Grips	HR-GRIP	\$41
Exercise Heart Rate Strap	HR-STRAP	\$21
Polar Transmitter Module	HR-TRANS	\$58

<b>Ion-Selective Electrodes</b>		
ISE Ammonium Replacement Module <sup>†</sup>	NH4-MOD	\$89
ISE Calcium Replacement Module <sup>†</sup>	CA-MOD	\$89
ISE Nitrate Replacement Module <sup>†</sup>	N03-MOD	\$89
ISE Potassium Replacement Module <sup>†</sup>	K-MOD	\$89
ISE Ammonium Low Standard (500 mL)	NH4-LST	\$25
ISE Ammonium High Standard (500 mL)	NH4-HST	\$25
ISE Calcium Low Standard (500 mL)	CA-LST	\$25
ISE Calcium High Standard (500 mL)	CA-HST	\$25
ISE Chloride Low Standard (500 mL)	CL-LST	\$25
ISE Chloride High Standard (500 mL)	CL-HST	\$25
ISE Nitrate Low Standard (500 mL)	N03-LST	\$25
ISE Nitrate High Standard (500 mL)	N03-HST	\$25
ISE Potassium Low Standard (500 mL)	K-LST	\$25
ISE Potassium High Standard (500 mL)	K-HST	\$25
<b>Melt Stations</b>		
Melt Station Capillary Tubes (pkg. of 100)	MLT-TUBE	\$24
<b>Motion Detectors</b>		
Go! Motion® to Computer Cable	GMC-USB	\$5
Motion Detector Cable	MDC-BTD	\$5
Motion Detector Clamp	MD-CLAMP	\$15
<b>pH and ORP Sensors</b>		
Microstirrer	MSTIR	\$9
pH Buffer Capsules (10 each of pH 4, 7, 10)	PH-BUFCAP	\$34
pH Storage Bottles (pkg. of 5)	BTL	\$10
pH Storage Solution (500 mL)	PH-SS	\$25
<b>Photogates</b>		
Cart Picket Fence	PF-CART	\$6
Go Direct Photogate Timing Cable	VPG-CB-GDX	\$8
Go Direct Time of Flight Pad Cable	T0F-CB-GDX	\$8
Laser Pointer	LASER	\$24
Laser Pointer Stand	STAND	\$29
Photogate Bar Tape Kit	TAPE-VPG ⚡	\$17
Picket Fence	PF	\$10
Pulley Bracket	B-SPA	\$12
Ultra Pulley Attachment	SPA	\$24
<b>Polarimeters (Chemical)</b>		
Polarimeter Sample Cells (pkg. of 4)	CELLS-POL	\$69

<sup>†</sup> ISE modules have a life expectancy of 1 to 2 years. We recommend that you do not purchase ISE replacement modules too far in advance of their expected time of use; degradation occurs while replacement modules are stored on the shelf.

Power Amplifier (order code PAMP)		
Accessory Speaker	PAAS-PAMP ⬆	\$155
Projectile Launchers		
Goggles (set of 2)	GGL-VPL	\$6
Time of Flight Pad	TOF-VPL	\$84
Steel Balls (set of 6)	STB-VPL	\$7
Projectile Stop	PS-VPL	\$40
Independence of Motion Accessory	IOM-VPL	\$59
Wax Tape (300 ft.)	WXT-VPL	\$18

Rotary Motion Sensors		
Rotational Motion Accessory Kit	AK-RMV ⬆	\$129
Rotary Motion Motor Kit	MK-RMV ⬆	\$12
Rotary Motion Sensor Replacement Pulley	RMV-PULLEY	\$5
Rotary Motion Sensor Replacement Parts Kit	RMV-RPK	\$25

Salinity Sensors		
Salinity Standard (500 mL)	SAL-ST	\$25

Spectrophotometers/Spectrometers		
Cuvette Lids (pkg. of 100)	CUV-LID	\$9
Cuvette Rack	CUV-RACK	\$9
Plastic Cuvettes (visible) (pkg. of 100)	CUV	\$24
Plastic Cuvettes (UV-VIS) (pkg. of 100)	CUV-UV ⬆	\$179
Quartz Cuvettes (pkg. of 2)	CUV-QUARTZ	\$299
Fluorescence/UV Quartz Cuvette (pkg. of 1)	CUV-QUARTZ-FUV	\$249
Spectrophotometer Optical Fiber (for GDX-SVISPL, GDX-SPEC-UV, GDX-SPEC-FUV)	VSP-FIBER	\$79
Vernier Emissions Fiber (for GDX-SPEC-EM, GDX-SPEC-VIS)	VSP-EM-FIBER	\$94

Spirometers		
Disposable Bacterial Filter (pkg. of 10)	SPR-FIL10	\$45
Disposable Bacterial Filter (pkg. of 30)	SPR-FIL30	\$129
Disposable Mouthpiece (pkg. of 30)	SPR-MP30	\$17
Disposable Mouthpiece (pkg. of 100)	SPR-MP100	\$39
Noseclip (pkg. of 10)	SPR-NOSE10	\$10
Noseclip (pkg. of 30)	SPR-NOSE30	\$25
O <sub>2</sub> Gas Sensor to Spirometer Adapter	O2-SPR	\$8

Structures & Materials Testers		
Truss Tester Accessory	VSMT-TRUSS	\$149

Turbidity Sensor (order code TRB-BTA)		
Turbidity Accessories Replacement Kit	TRB-ACC	\$39
Turbidity Bottles (pkg. of 6)	TRB-BOT	\$39

Voltage and Current Probes		
Electrochemistry Half-Cell Plate	ECHEM-PLT	\$59
Electrochemistry Metals Kit	ECHEM-MTLS ⬆	\$20
Inductor	IND	\$40

Large Capacitor	VCB2-CAP	\$30
Miniature Alligator Clips for Vernier Circuit Board	VCB-GATOR	\$15
Optional Breadboard Kit for the Vernier Circuit Board 2	VCB2-0BBK	\$29
Replacement Lamps for Vernier Circuit Board	VCB-BULB	\$12
Resistivity Rods	RRS ⬆	\$89
Vernier Circuit Board 2	VCB2 ⬆	\$145

## Dynamics Cart and Track System

Part Name	Order Code	Price
For any Cart		
Cart Guide (pkg. of 10)	CGUIDE-10 ⬆	\$99

For any Cart and Track System		
Adjustable Two Foot Leveler	AL-VDS	\$10
Adjustable End Stop	AS-VDS	\$8
Anti-Roll Pegs	VDS-ARP10	\$3
Axles and Wheels for Cart	WHEELS-VDS	\$15
Cart Picket Fence	PF-CART	\$6
Cart-Plunger Cart (plastic)	DTS-CART-P	\$84
Cart-Standard Cart (plastic)	DTS-CART-S	\$73
Motion Detector Bracket	DTS-MDB	\$11
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Photogate Bracket	PGB-VDS	\$5
Pulley Bracket	B-SPA	\$12
Vernier Dynamics System Replacement Parts Kit	VDS-RPK ⬆	\$29

For Dynamics Cart and Track Systems Only (Plastic Carts)		
Cart Fan	DTS-CFAN	\$89
DFS/Accelerometer Fasteners	DTS-ACC	\$9
Eddy Current Brake	DTS-ECB	\$19
Friction Pad DTS (for plastic carts)	DTS-PAD	\$32
Mass DTS (hexagonal bars)	DTS-MASS	\$16
Motion Detector Reflector Flag	DTS-FLAG	\$9

For Vernier Dynamics Systems Only (Metal Carts)		
Friction Pad (for metal carts)	PAD-VDS	\$35
Mass for Dynamics Carts (500 g block)	MASS	\$12

## BTA/BTD Cables & Adapters

Part Name	Order Code	Price
Analog Cables and Adapters		
Analog Bare Wire Cable	CB-BTA	\$5
Analog Breadboard Cable	BB-BTA	\$12
Analog ProtoBoard Adapter	BTA-ELV	\$12

Analog Sensor Extension Cable (2 m)	EXT-BTA	\$12
Digital Cables and Adapters		
Digital Bare Wire Cable	CB-BTD	\$5
Digital Breadboard Cable	BB-BTD	\$11
Digital ProtoBoard Adapter	BTD-ELV	\$12
Digital Sensor Extension Cable (2 m)	EXT-BTD	\$12

## LabQuest 3, LabQuest 2, and Original LabQuest

Part Name	Order Code	Price
LabQuest Battery Boost 3	LQ-B00ST3	\$119
LabQuest Charge Station	LQ3-CRG	\$149
LabQuest Power Supply	LQ3-PS	\$11
Vernier Mini USB Cable	CB-USB-MINI	\$5
Vernier USB Type C to Mini USB Cable	CB-USB-C-MINI	\$9

For LabQuest 3 Only		
LabQuest 3 Battery	LQ3-BAT	\$34
LabQuest 3 Lanyard	LQ3-LAN	\$9
LabQuest 3 Stand	LQ3-STN	\$5

For LabQuest 2 and Original LabQuest Only		
LabQuest Tether (pkg. of 5)	LQ-TETH-5	\$5
LabQuest Lanyard	LQ-LAN	\$5
LabQuest SD Card	LQ-SD	\$12
LabQuest Stylus (pkg. of 5)	LQ2-STYL-5	\$5

For LabQuest 2 Only		
LabQuest 2 Lab Armor	LQ2-ARMOR	\$15
LabQuest 2 Stand	LQ2-STN	\$5
LabQuest 2 Battery	LQ2-BAT	\$23

For Original LabQuest Only		
Original LabQuest Battery	LQ-BAT	\$19

## Go Direct

Part Name	Order Code	Price
Go Direct Charge Station	GDX-CRG	\$89
Go Direct Sensor Cart Charge Station	GDX-CART-CRG	\$149
Go Direct Sensor Clamp	GDX-CLAMP	\$14
Go Direct Sensor Connectivity Kit for TI Calculators	TICALC-GDX-BTUSB-KT	\$32
Vernier Micro USB Cable	CB-USB-MICRO	\$5
Vernier USB Type C to Micro USB Cable	CB-USB-C-MICRO	\$9

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# Welcome to the Vernier STEM Classroom

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Everything we do for high school science educators and their students can be found in the Vernier STEM Classroom.

The Vernier STEM Classroom® is an integrated approach to using the full catalog of Vernier hardware, software, content, assessment, professional development, and technical support to make a high-quality STEM education possible for all high school students. Enhancing the Vernier STEM Classroom is **Vernier Connections**®, (see page 4–5) a powerful web-based platform that combines our data-collection tools, lessons and experiments, and formative assessment to support educators in engaging all students with hands-on, culturally relevant science education.



# What is the Vernier STEM Classroom<sup>®</sup>?



## Hardware

Designed for education and built to last, **Vernier hardware is durable, dependable, and affordable.** Our comprehensive catalog of science education hardware includes **sensors, probes, interfaces, and lab equipment**—all of which are designed to help students engage with key STEM concepts.

## Software

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## Content

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When it comes to professional development for science educators, **we offer a variety of in-person and online options. From subject-specific webinars to personalized training with our science education experts,** we help educators address their unique challenges and equip them with skills and resources to ensure success.

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