

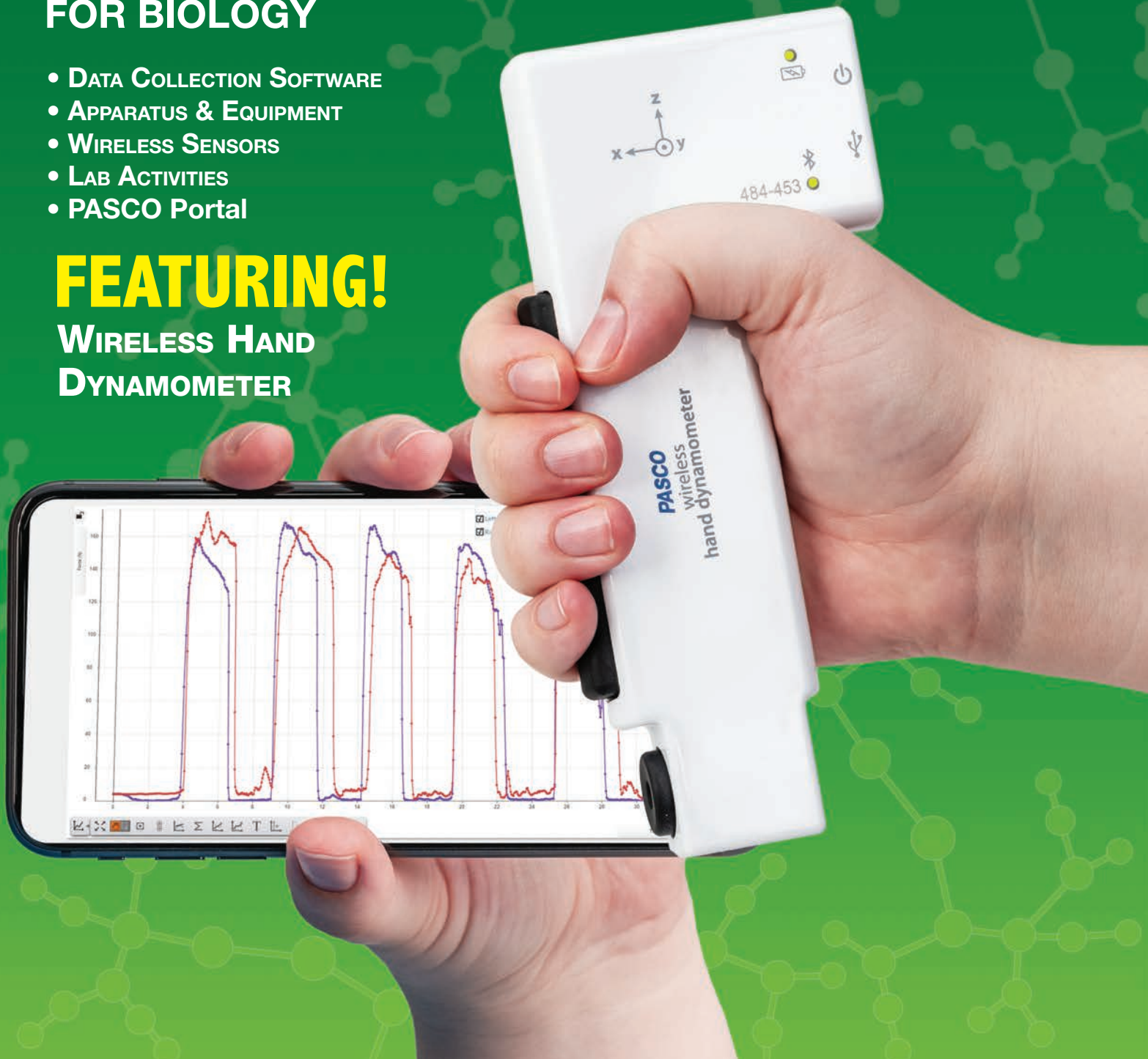
BIOLOGY

TECHNOLOGY SOLUTIONS FOR BIOLOGY

- DATA COLLECTION SOFTWARE
- APPARATUS & EQUIPMENT
- WIRELESS SENSORS
- LAB ACTIVITIES
- PASCO Portal

FEATURING!

WIRELESS HAND DYNAMOMETER



PASCO®



PASCO PORTAL

FOR SCIENCE EDUCATION



CONTENT



SOFTWARE



EQUIPMENT



SUPPORT



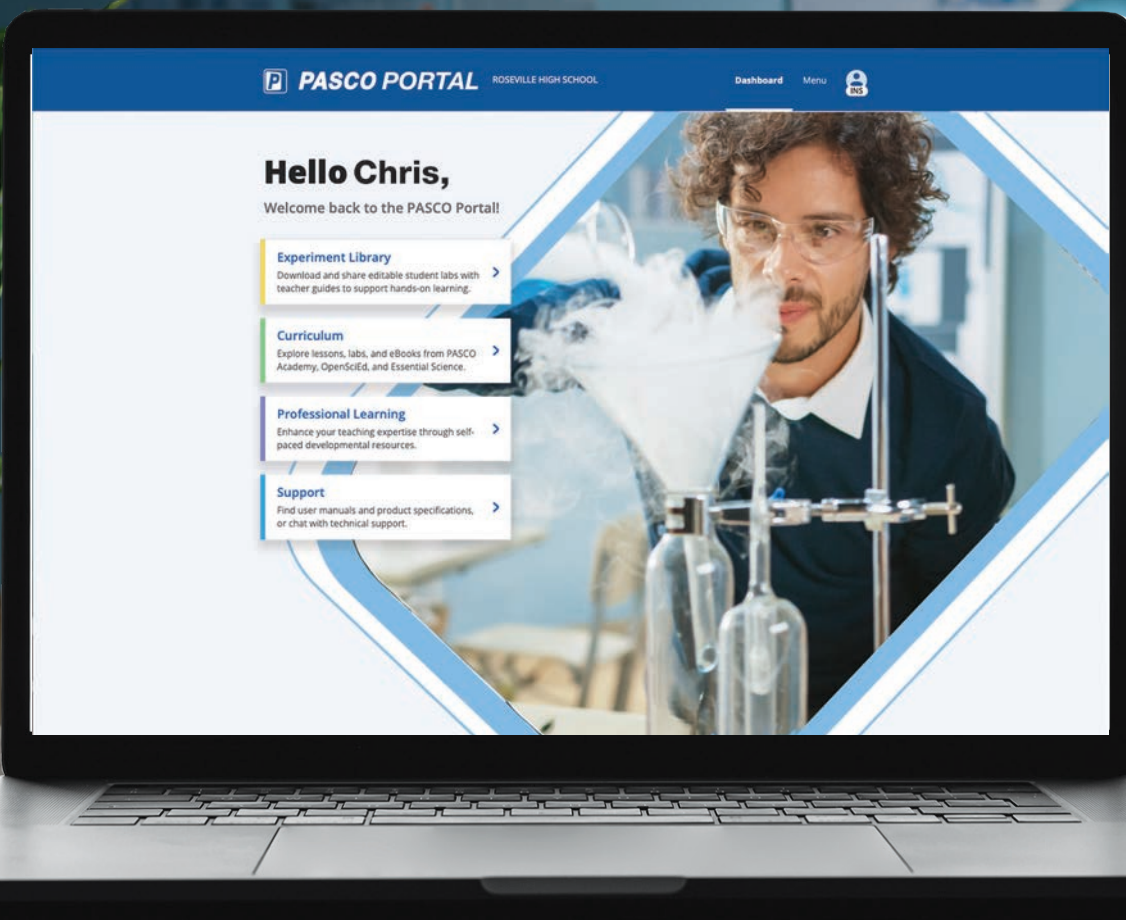
HOW TO'S



TRAINING



PRO DEV



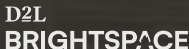
PASCO Portal is a Gateway to Science Designed by Teachers for Teachers

Introducing a new digital learning resource to power your modern science lab. PASCO Portal supports hands-on learning through standards-based lessons, labs, and professional development.

- ✓ Reduce your prep time
- ✓ Complete PD on your own schedule
- ✓ Get back to doing science



Compatible with Your Device & Learning Management Systems

 ClassLink  Clever  Google Classroom  canvas  Blackboard  D2L BRIGHTSPACE  schoolology



Sign up for **PASCO PORTAL®** and realize the full potential of PASCO's hands-on science solutions.

PASCO Portal provides instructors and lab managers with ready-to-use activities and content, suitable for core and supplemental curriculum. PASCO Portal keeps your teaching tools and professional learning resources in one place, facilitating seamless transition between instruction, assessment, and lab management practices. Utilize PASCO's award-winning hands-on solutions in science, STEM, and engineering programs, easier than ever before.



Access and distribute Essential Science or OpenSciEd curriculum labs or assignments right within your Learning Management System (LMS).



Search the PASCO Portal Lab Library which contains hundreds of engaging, standards-based lab activities for all science disciplines, including STEM.



Choose from PASCO's award-winning software, including PASCO Capstone, SPARKvue, and Chemvue—FREE with your PASCO Portal license



Tap into PASCO's 21st Century lab equipment and technologies. Our hands-on solutions are more accessible than ever with the PASCO Portal platform.



Get toll-free phone, email, and live chat support for PASCO Portal. Plus, easily search products and technical manuals all within PASCO Portal.



Take advantage of a robust collection of how-to videos designed to assist you with your PASCO equipment, technologies, and lab activities.



New science teacher? No problem! With PASCO Portal, you are equipped to dive into hands-on science learning experiences with on-demand training & professional development. Learn the technology, get tips for instruction, and earn certificates. Explore PASCO Portal's professional resources designed to enhance your knowledge and hone your skills in applying PASCO's hands-on science and STEM solutions to your lab. These resources have been pre-recorded and are available on-demand for your convenience.

PASCO Portal is wrapped in modern technology, compatible with most Learning Management Systems (LMS) including Google Classroom, Canvas, D2L Brightspace, Blackboard, and Schoology. Sign-On through Google, ClassLink, and Clever.



SSO Support



D2L

BRIGHTSPACE



LMS Support

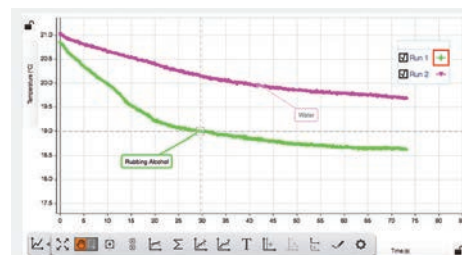
Award-Winning Hands-On Science Solutions

With PASCO Portal and our award-winning hands-on science solutions, you get the content and equipment you want, plus the functionality and support you expect. Basically, this is the science learning environment you've been looking for!



Sensor Technology

Our innovative, wireless sensors are rugged, low-cost, and easy to use. These powerful sensors provide students with an immersive and engaging method for collecting and analyzing data, eliminating the need for wires or interfaces. Explore our growing line of more than 40 wireless sensors!



Data Collection & Analysis Software

PASCO's SPARKvue is an award-winning tool for collecting and analyzing experimental data. The user-friendly platform optimizes data collection and provides tools for in-depth analysis within a compact yet powerful workspace. Works on all platforms.



Complete Lab Stations

PASCO Lab Stations make it easy to use sensor-based technology in your science classroom. Stations come with lab activities, wireless sensors, and equipment. Discover Lab Stations for High School Biology in this brochure.



Standards-Based Curriculum Solutions

PASCO developed kits to infuse OpenSciEd's trusted curriculum with our high-quality technology. The PASCO version of OpenSciEd's curriculum is especially tailored to integrate into your lessons, and only available on our digital platform, PASCO Portal.



STEM & Coding Solutions

STEM Sense solutions promote early excellence in science and STEM education with cross-curricular investigations that help young learners build strong foundations in science, programming, and data literacy.



Storage & Classroom Management

Use these rolling carts and storage trays to decrease your classroom management time and increase teaching and learning time.



Sensor Technology

PASCO's award-winning line of Wireless Sensors are durably designed, easy to use, and affordably priced to help educators bring real-world technology into the hands of students everywhere. Our Wireless Sensors feature student-friendly designs, manual and automated data collection, interactive displays and other modern features that enhance science learning. Plus, they connect directly to computers, Chromebooks, tablets, and mobile devices, making it easy to support student investigations, regardless of their device type.

- Original PASCO innovations, such as the //code.Node, Smart Cart, Modular Circuits and Wireless Weather Sensor with GPS
- Award-winning software supports Blockly coding for every sensor
- Onboard sensor memory with Logging Mode for long-term experiments
- Hundreds of free labs available for download from our online Experiment Library
- PASCO-ensured quality and backed by our five-year warranty

 Wireless Ethanol Vapor Sensor With this sensor, students can learn about anaerobic respiration by measuring the production of ethanol by bacterial or yeast fermentation.	 Wireless Optical Dissolved Oxygen Sensor This sensor is ideal for monitoring DO₂ in the lab or field. The optical technology is accurate, fast, and does not require stirring, filling solutions, warm-up, or frequent calibration.	 Wireless Colorimeter & Turbidity Simultaneously measures the absorbance and transmittance of six different wavelengths. The sensor can be used to study Beer's Law and is calibrated to read our Water Quality ezSample Kits directly.
 Wireless Conductivity Sensor This waterproof sensor connects via Bluetooth® to measure both conductivity (ionic content in solution) and total dissolved solids.	 Wireless CO₂ Sensor This sensor employs live data to make core labs such as photosynthesis, cellular respiration, and metabolism experiments engaging and impactful.	 Wireless Temperature Sensor A staple of every science class, this sensor drastically simplifies temperature measurements with its small footprint, long-lasting battery, and live datalogging.

Our growing line now includes over 40 Wireless Sensors!



SPARKvue

This FREE award-winning data collection and analysis software works on any platform!

SPARKvue's intuitive design has made it an award-winning tool for collecting and analyzing experimental data. The user-friendly platform optimizes data collection and provides tools for in-depth analysis within a compact, yet powerful workspace.

SPARKvue features Blockly coding, allowing students to use block-based code for sense and control of PASCO devices, including any of our sensors.

 Windows • Mac OS • iOS • chrome • 



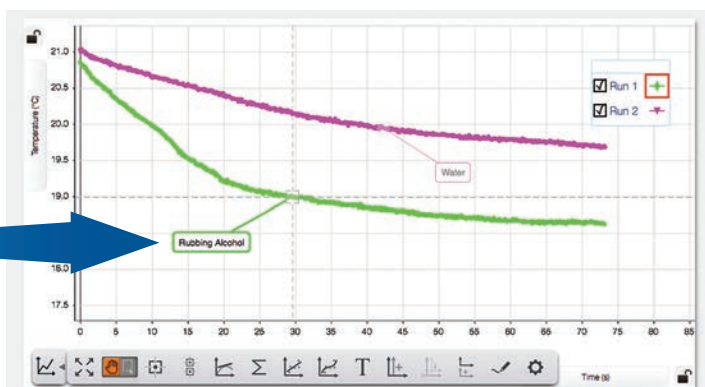
Collecting & Graphing Sensor Data MADE EASY!

Automate sensor data collection to monitor measurements in real time.

Save time with pre-made experiment files, or build your own custom displays that will have you up and running in minutes.



Student Sensor Data
Connect & Collect!



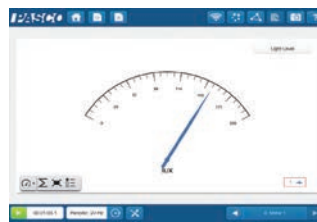
Rapid, Real-Time Data Collection & Analysis



Digits Display



Bar Graph Display



Meter Display



GIS Map Display

Free award-winning data collection and analysis software now runs in your browser!

We're excited to announce SPARKvue is now available **FREE** of charge as a browser-based application. This new version of our software as a Progressive Web Application (PWA) means you have free access to all the features of SPARKvue from Google Chrome and Microsoft Edge browsers. That's right: No download fees, subscription fees, or update fees, for Windows® and Mac®. Plus, the app is always updated to the latest version automatically, so you never have to worry about it. **Go to sparkvue.pasco.com to access the PWA.** SPARKvue is also available as a **FREE** app for iPad®, Android™ tablets, and Apple® and Android™ smartphones.

 **SPARKvue**® Launch now as a Web App **PWA** +



Looking for additional options? See pasco.com/sparkvue for more details.

Biology Lab Stations

Together, the Biology Starter and Extension Lab Stations offer a lab-ready solution for exploring essential topics in biology. Complete with Wireless Sensors, lab manual, and a custom storage case, these convenient stations let students perform a wide variety of investigations. Explore topics such as osmosis, enzyme activity, and membrane permeability. Pair the Biology Starter and Extension Lab Stations with PASCO's Advanced Biology Through Inquiry Teacher Lab Manual to perform more than twenty advanced biology investigations – plus dozens of free labs from the PASCO Experiment Library.



Biology Station Labs

The Biology Starter Lab Station supports 7 of the 10 included investigations. Add the Extension Lab Station to perform all 10 lab investigations.

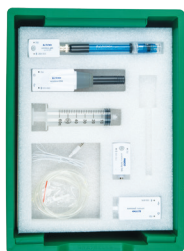
Starter Station Labs

- Enzyme Action
- Membrane Permeability
- Osmosis
- Respiration of Germinating Seeds
- Acid Rain
- Regulation of Body Heat
- Cellular Respiration in Yeast

Extension Station Labs

- Plant Respiration & Photosynthesis
- Plant Pigments
- Cell Size

The Biology Starter and Extension Lab Stations include 10 labs and the following Wireless Sensors and materials:



Biology Starter Lab Station

- Temperature
- Pressure
- pH
- CO₂
- Storage Case

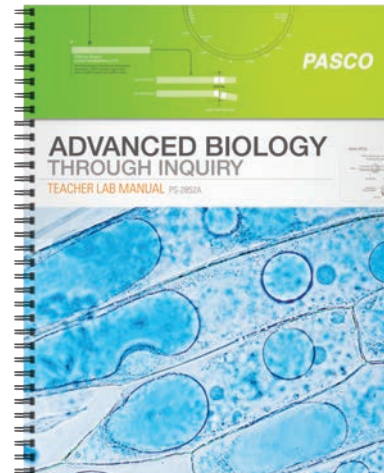


Biology Extension Lab Station

- Optical Dissolved Oxygen
- Colorimeter & Turbidity
- Conductivity
- EcoChamber

Lab Stations Support Advanced Biology

Use the Biology Lab Stations with PASCO's Advanced Biology Through Inquiry Lab Manual to support student investigations of advanced biology topics.



Advanced Biology Through Inquiry Teacher Lab Manual (PS-2852A)

Includes eighteen editable labs with pre- and post-lab questions, step-by-step instructions, software files, and helpful teaching tips.

Physiology Extension Bundle

PS-2935D



Add the Physiology Extension Bundle to support student studies of the heart cycle, human respiration, stimulus and response, and more! This bundle includes a Wireless EKG Sensor, a Wireless Spirometer, Spirometer Mouth Pieces, a Wireless Blood Pressure Sensor with Standard Cuff, and a Wireless Hand-Grip Heart Rate Sensor.

Biology Starter Lab Station.....EB-6334
 Biology Extension Lab StationEB-6335
 Essential Biology Teacher Lab Manual.....EB-6331

Advanced Biology Through Inquiry Teacher Guide.....PS-2852A
 Wireless Physiology Extension Bundle.....PS-2935D

Wireless CO₂ Sensor

Measure changes in carbon dioxide (CO₂) gas levels quickly and easily with the Wireless CO₂ Sensor. This sensor employs live data to make core labs such as photosynthesis, cellular respiration, and metabolism experiments engaging and impactful.

Features:

- Store up to 55,000 logged data points during long-term experiments
- Integrated stopper for use with sample bottle and common glassware



Wireless CO₂ Sensor (Carbon Dioxide)PS-3208



Wireless Oxygen Gas Sensor

The Wireless Oxygen Gas Sensor measures gaseous O₂ concentrations as well as humidity and air temperature. It is durable, accurate, and easy to use, enabling students to quickly and easily make measurements of photosynthesis, respiration, and oxygen cycling, both in open and closed systems.

Features:

- Bluetooth® and USB connectivity
- 0-100% Oxygen Gas Concentration
- ±1% Oxygen at constant temperature and pressure
- Also reports ambient temperature and humidity
- 2-3 year operating life with replaceable sensing element

Wireless Oxygen Gas Sensor.....PS-3217



Wireless Optical Dissolved Oxygen Sensor

The Wireless Optical Dissolved Oxygen Sensor is ideal for monitoring DO₂ in the lab or field. In addition to the dissolved oxygen sensor, it also includes probes for measuring atmospheric pressure and water temperature. The optical technology is fast, accurate, and does not require stirring, filling solutions, warm-up, or frequent calibration.



Wireless Optical Dissolved Oxygen SensorPS-3246



Wireless Sensors

Wireless Ethanol Vapor Sensor

NEW

The Wireless Ethanol Sensor measures the concentration of gaseous ethanol up to 3%. In biology and environmental science labs, students can learn about anaerobic respiration by measuring the production of ethanol by bacterial or yeast fermentation. Physics students can begin to explore combustion and thermodynamics. Chemistry students can compare vapor composition over simple solutions. Connect your students to studies of fermentation, respiration, solutions, and generation of alternative energy sources with the wireless Ethanol Sensor.

Specifications:

Range (w/o shortening lifespan): 0 to 3% gaseous ethanol

Accuracy: 20%

Resolution: 0.01%

Cross Sensitivities: H₂, CO, CH₄, Isobutane

Battery Type: Li ion rechargeable

Battery Capacity: 300 mAh

Logging: Yes

Connectivity: Bluetooth 5.2

Waterproof: no (splash resistant), use Teflon™ tape over sensor

Probe Diameter: 12 mm

Probe Length: 11 cm



Wireless Ethanol Vapor SensorPS-4252

Wireless Temperature Sensor

Welcome to the modern thermometer. The Wireless Temperature Sensor transmits live data and allows students to continuously monitor, log, and plot temperature measurements on nearly any device. When lab-time ends but the experiment continues, students can set the sensor to log data autonomously for days, weeks, or months, then download it for analysis later.

This durable, wireless sensor features a stainless steel probe for the most demanding of applications, as well as a battery that lasts over a year*. It can be used in a wide array of experiments and activities because it measures small, but significant temperature changes produced by chemical reactions, convection currents, and even skin temperatures.

Specifications:

Range: -40°C to 125°C

Resolution: 0.01°C

Accuracy: 0.5°C

Logging: Yes

Connectivity: Bluetooth 4.0



Wireless Temperature Sensor with Display

Our modern thermometer just keeps getting better. We've added a bright organic light-emitting diode (OLED) display on the sensor for users who want the ability to see instant data readings without the need for additional software, even in bright outdoor explorations.

Specifications:

Approximate Mass: 42 g

Range: -40°C to 125°C

Resolution: 0.01°C

Accuracy: ±0.5°C

Complete list of specifications can be found at pasco.com



NEW

Wireless Temperature SensorPS-3201

Wireless Temperature Sensor with DisplayPS-4201

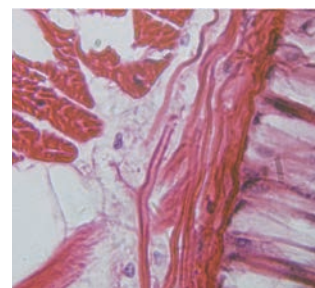
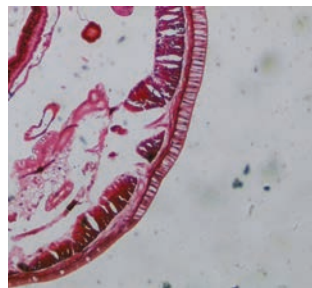
Standard Compound Optical Microscope

This standard optical microscope is great for general viewing of cell structures at 40x, 100x, 400x viewing. It gives insights to topics from Biology, Life Science, Anatomy and Physiology, Cellular and Field Biology. High quality optical lenses allow for fine details in high contrast to be studied in appropriate detail for starter to experienced microscope users. Perfect for establishing labs with sets of durable equipment classes can use for years. Compatible with student or professionally prepared slide set like the Microscope Slide Kingdom survey (SE-6214) to give students a solid start to explore cellular features and concepts across all living kingdoms.



Features:

- Observe small specimens like plant, animal, and bacterial cells, translucent objects such as insect larvae, or fine particles like powder
- 10 x eye piece
- 10x eyepiece and 4x, 10x, and 40x (oil) objective lenses provide magnification options of 40x, 100x, and 400x
- Adjustable focus between coarse and fine settings
- Dual light source (upper and lower LED) provides adjustable brightness
- Cord or cordless power options (External AC/DC Adapter or 3xAA Batteries)
- Equipped with a plain stage with clip and single lens condenser with disc diaphragm



Sample imagery above captured with standard eyepiece USB camera. Slides from the Kingdoms Survey, Prepared Slide Set (sold separately)

Standard Compound Optical MicroscopeSE-6213

Prepared Slide Set, Kingdoms SurveySE-6214

Wireless Pressure Sensor

The Wireless Pressure Sensor allows students to easily collect accurate gas pressure data for a wide range of applications. Included is a 60-cc syringe, tubing, and connectors that facilitate experiments such as Boyle's Law, measuring pinch-grip strength, and studying enzyme reactions. Within PASCO's software, students can easily select their desired units from a list containing kPa, mmHg, inHg, mbar, psi, atm, and torr.

Applications:

- Investigate pinch-grip strength and muscle fatigue
- Use it as a potometer to measure plant transpiration
- Study enzyme reactions using hydrogen peroxide and catalase

Wireless Pressure SensorPS-3203



Wireless Conductivity Sensor

The Wireless Conductivity Sensor measures the electrical conductivity of an aqueous solution. It is ideal for investigating the properties of solutions, including total dissolved solids (TDS) for water quality inquiry. Because it is temperature compensated, calibrations are less frequent and can be applied across a range of temperatures. With a range of 0 to 40,000 $\mu\text{S}/\text{cm}$ or 0-28 ppt salinity, this sensor can be utilized for chemical, biological, and environmental studies.

Applications:

- Perform water quality studies
- Study the diffusion of ions through membranes
- Determine the ionic content of an aqueous solution

Wireless Conductivity Sensor with Display

The Wireless Conductivity Sensor with Display has an improved range and decreased error when measuring the electrical conductivity of aqueous solutions. Its bright organic light-emitting diode (OLED) display makes data points easy to read for quick spot checks even in bright sunlight.



Wireless Conductivity SensorPS-3210A

Wireless Conductivity Sensor with DisplayPS-4210



Wireless EKG Sensor

The Wireless EKG Sensor measures electrical signals produced by contractions of the heart or muscles, and reports them in real-time on virtually any student device. The perfect sensor for fast-paced physiology courses, the EKG Sensor provides students with real-time feedback as they explore the effects of various stimuli on cardiac or muscular activity. Heart Rate data is reported in beats per minute (BPM), while the voltage (mV) detected from cardiac contractions is intuitively displayed in an EKG trace.

Features:

- Standard three-electrode design
- Easy-to-use, disposable stick-on electrodes
- No messy gel required
- Great for stimulus response reflex studies

Wireless EKG Sensor.....PS-3236



Wireless Sensors

Wireless Hand-Grip Heart Rate Sensor

With these Wireless Hand Grips, conducting physiology labs on the cardiovascular system or homeostasis is easier than ever before. Continuously monitor heart rate during exercise, or use the sensor to take initial and final measurements with fast and reliable heart rate detection.

Specifications:

Sensor Range: 0 to 240 beats per minute

Accuracy: ± 1 beat per minute

Maximum Sample Rate: Every two seconds

Default Sample Rate: Every five seconds

Approximate mass: 218 g



Wireless Hand-Grip Heart Rate SensorPS-3206

Wireless Exercise Heart Rate Sensor

The Wireless Exercise Heart Rate Sensor has a chest strap and will transmit data wirelessly up to 10 m away! The electrode belt fits around the ribcage (worn against the skin for best results, but can be worn over a shirt if a drop of saline solution is applied under the electrodes). As students move, their cardiac data transmits wirelessly to their device.

Applications:

- Compare a student's heart rate before, during, and after exercise
- Calculate recovery rate after physical activity
- Determine the effects of mild stimulants (e.g. caffeine)
- Investigate how heart rate changes when a student sits, reclines, stands or moves suddenly



Wireless Exercise Heart Rate SensorPS-3207

Wireless Spirometer

The Wireless Spirometer Sensor makes it safe and easy for students to collect respiratory measurements, including flow rate, pressure, and lung volume. Ideal for studies in health and human physiology, the Wireless Spirometer Sensor streamlines experiments by providing students with real-time data, interactive graphs, and intuitive analysis tools right on their devices. The disposable mouthpieces are designed for use with a single student and feature exchangeable filters that protect the sensor from particulates for maximum safety. Additional mouthpieces are available in convenient packs of ten.

Features:

- Measures flow rate, pressure, and lung volume
- Bi-directional air flow (inspiration and expiration)
- Displays volume in liters
- Exchangeable filter and disposable, hygienic mouthpieces



Wireless Spirometer.....PS-3234

Wireless Blood Pressure Sensor with Standard Cuff

PASCO's Wireless Blood Pressure Sensor allows students to quickly and easily measure both systolic and diastolic arterial blood pressure (mmHg) as well as heart rate (pulse in bpm). Comparing the digits display for systolic and diastolic pressure with the display of blood pressure from the real-time graph helps students gain a contextual understanding of the physiology of blood pressure.

Specifications:

Heart Rate Range:

36 to 200 bpm

Heart Rate Accuracy:

± 1 bpm

Heart Rate Resolution:

1 bpm

Blood Pressure Range:

0 to 375 mmHg

Blood Pressure Accuracy:

± 3 mmHg

Blood Pressure Resolution:

0.05 mmHg

Gauge Pressure Units:

mmHg, N/m², kPa, atm, psi



Wireless Blood Pressure Sensor with Standard Cuff.....PS-3218

Wireless Dynamometer - Photosynthesis Chamber

Wireless Hand Dynamometer

PASCO's Hand dynamometer combines a force load cell, 3 axis accelerometer, and gyrometer to analyze how grip strength changes through complex, swings, hits or jabs. Grip and pinch sensor on same load cell so are additive. Plot force and stamina as muscles fatigue. Combine with other physiology sensors to study correlate strength to breathing, ECG, heart rate, or blood pressure.

Specifications:

Force:

Range: 0 - 630 N (warning at 600N)

Accuracy: 0.01N

Precision: ± 0.1 N

Rotation: Range: ± 2000 °/s (± 637 rad/s)

Accelerometer:

Range: ± 16 g

Accuracy: ± 0.2 m/s²

Sample Rate: 500 hz

Connectivity: USB & Bluetooth 5.2

Logging: Yes

Product Battery: Li Po



Wireless Hand DynamometerPS-3253

Photosynthesis Chamber

PASCO's Photosynthesis Chamber (PS-3251) allows students to monitor common photosynthesis experiments in a controlled aquatic environment. Typical experiments require students to infer photosynthetic rate changes by using chloroplasts and dye. This chamber allows your students to better understand photosynthesis through direct measurements of oxygen, carbon dioxide, pH, and more, while controlling variables including light, temperature, and nutrient levels. This device is ideal for exploring aquatic plants, algal beads, and even the consumption of oxygen by respiration.

The lid features three convenient ports for sensors with included stoppers to maintain a closed system when sensors aren't in use. The ports accommodate PASCO's Wireless Temperature Sensor (PS-3201), Wireless Conductivity Sensor (PS-3210A), Wireless pH Sensor (PS-3204), and other ion selective electrodes for additional measurements.

A clear inner chamber allows full sunlight exposure while an opaque outer cover chamber blocks out light. Nine separate LED lights (white, red, green or blue) allow students to test variables such as light type and plant nutrient uptake and elimination.

Specifications:

Outer chamber dimensions: 8 x 11 x 5.5 cm

Inner Chamber Volume: 70 ml

Outer Chamber Volume: 200 ml

Light colors: Red, Green, Blue, and White

Light plate area: 50 x 50 mm

Number of LEDs: 9 for each color

Measurement Ports: 4: 21.9 mm adaptable to 12.3 mm, 19.5 mm id, 12.3 mm, 4, 4 mm

Light power adapter: 12.0 v 1.0 A



Dual chambers allow sample to set in temperature controlling water bath. LED lighting can be switched between white, green, blue and red. All sensors and probes shown in photos are sold separately.

Photosynthesis ChamberPS-3251

Spectrometry Equipment

Wireless Colorimeter and Turbidity Sensor

The Wireless Colorimeter simultaneously measures the absorbance and transmittance of six different wavelengths. The sensor can be used to study enzyme activity, photosynthesis, and the rates of chemical reactions. When using the ezSample Snap Vials, the colorimeter also functions as a turbidimeter for hassle-free water quality analysis.

ezSample: NO_3^{-1} | PO_4^{-3} | Fe^{+3} | NH_4^{+} | Cl^{-}

Color detection/peak wavelengths:

650 nm (red), 600 nm (orange), 570 nm (yellow),
550 nm (green), 500 nm (blue), 450 nm (violet)

Features:

- Stabilized light source for consistent readings
- Measures six different wavelengths simultaneously

Wireless Colorimeter & Turbidity Sensor PS-3215



Wireless Spectrometer (Vis)

The award-winning PASCO Wireless Spectrometer is specifically designed for modern teaching labs. It connects to student devices via USB or Bluetooth Low Energy and includes free Spectrometry software with built-in tools for spectral analysis. Scan times are fast, enabling students to collect a full spectrum of data in less than a second. Built-in plots are provided for common applications, including Absorbance vs. Wavelength, Intensity vs. Wavelength, Absorbance vs. Concentration (Beer's law), and Absorbance vs. Time (kinetics).

Measures: Intensity, absorbance, transmittance, and fluorescence

Compatibility: Windows®, Mac®, iPhone® and Android™ smartphones, iPad®, Android™ and Chrome™ tablets; includes software.

Resolution: 2-3 nm FWHM

Range: 390-950 nm

Fluorescence: 405 nm and 500 nm

Wireless Spectrometer (VIS).....PS-2600A



UV-Vis Spectrometer

The SE-3607 is an easy-to-use, wide range UV-Vis spectrometer that delivers fast, accurate and reliable performance for routine analyses in chemistry and biochemistry teaching labs. With USB connectivity and cross-platform Spectrometry Software, the PASCO UV-Vis Spectrometer improves collaboration between lab members, enabling data collected on a computer or laptop to be analyzed on tablets, iPads, and Chromebooks*.

Highlights:

- Spectral scans from 180-1050 nm
- Award-winning Spectrometry software (free)
- Adjustable scan averaging, signal integration time, and smoothing
- Graphs Absorbance vs. Wavelength (full spectrum scans)
- Graphs Absorbance vs. Concentration (Beer's law)
- Graphs Absorbance vs. Time (kinetics)

* Chromebooks are not compatible with the PASCO UV-Vis Spectrometer for data collection (analysis only).

UV-Vis SpectrometerSE-3607



Greenhouse Sense & Control Kit

ST-2997

Designed for the exploration of biological and ecological concepts, the Greenhouse Sense & Control Kit includes everything students need to design, build, program, and study their very own greenhouse.



Make data-based decisions with measurements for humidity, temperature, light, and soil moisture.

The //control.Node serves as the Greenhouse's brain, providing power to the light, fan, water pump, and sensors!

Use data from the Soil Moisture Probe to optimize watering schedules for specific species and microhabitats.

Program the USB Fan and Water Pump to control water cycles and air flow.

Student Activities

The Greenhouse Sense & Control Kit includes five student activities that can be edited to fit your course needs. Each activity focuses on a key concept in biology or environmental science and includes extensions to engineering and design practices.



Student Activities

- Program a Sunny Day for Plants
- Coding a Cooling Breeze
- Program Perfectly Timed Rain
- Optimize Water Movement
- Program a Greenhouse Sense and Control System



Help students develop competency in:

- Coding
- Problem solving
- Data collection and analysis
- Ecological concepts
- Science and Engineering practices

Greenhouse Sense and Control Kit	ST-2997
Greenhouse Sense and Control Kit (without //control.Node)	ST-2998
Available Separately:	
Greenhouse Sensor	PS-3322
PASCO Grow Light	PS-3347

Biology Lab Stations

Together, the Biology Starter and Extension Lab Stations offer a lab-ready solution for exploring essential topics in biology. Complete with Wireless Sensors, lab manual, and a custom storage case, these convenient stations let students perform a wide variety of investigations.

Explore topics such as osmosis, enzyme activity, and membrane permeability. Pair the Biology Starter and Extension Lab Stations with PASCO's Advanced Biology Through Inquiry Teacher Lab Manual to perform more than twenty advanced biology investigations – plus dozens of free labs from the PASCO Experiment Library.

