

ENVIRONMENTAL

TECHNOLOGY SOLUTIONS FOR ENVIRONMENTAL

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

FEATURING!

Wireless Weather Sensor

NEW! Wireless Air Quality



PASCO®



PASCO PORTAL

FOR SCIENCE EDUCATION



CONTENT



SOFTWARE



EQUIPMENT



SUPPORT



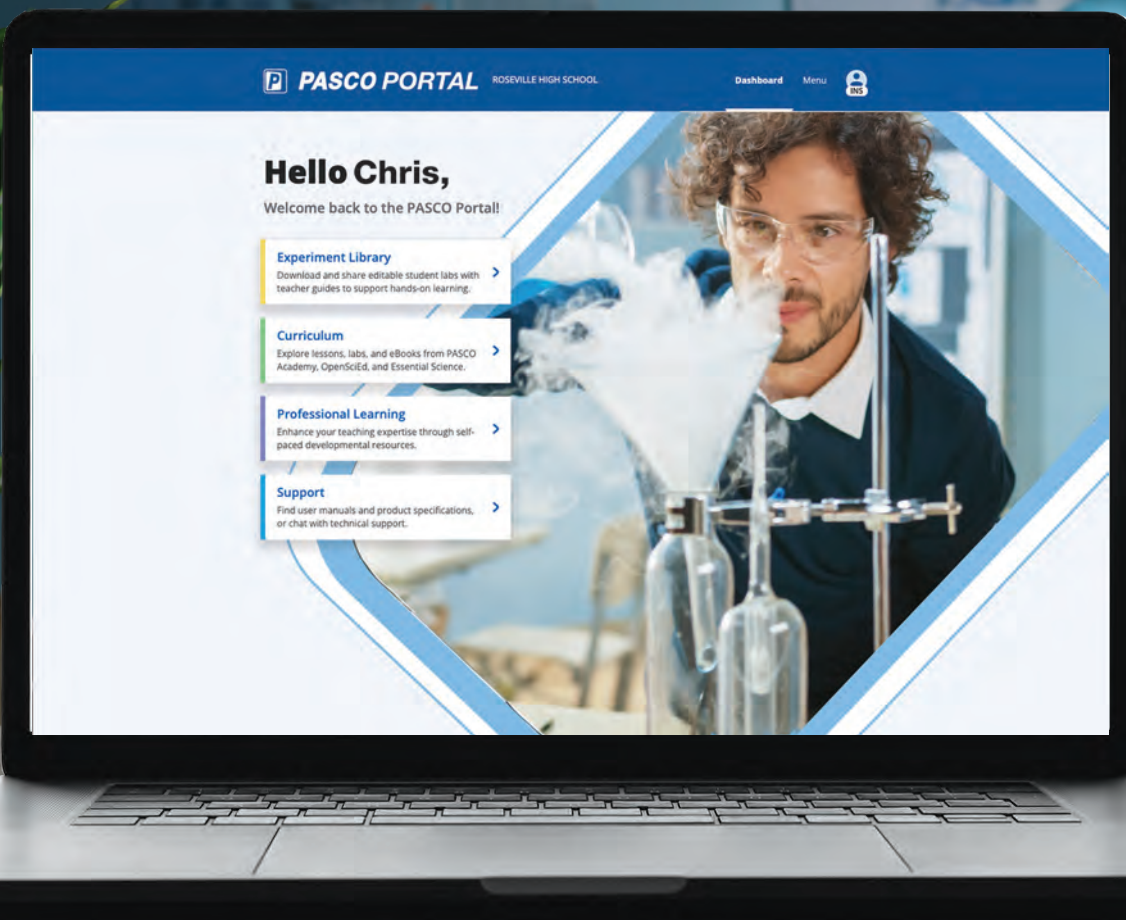
HOW TO'S



TRAINING



PRO DEV



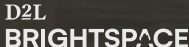
PASCO Portal is a Gateway to Science Designed by Teachers for Teachers

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



Google Classroom



canvas
BY INSTRUCTURE

D2L

BRIGHTSPACE

Blackboard

schoology

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 35 wireless sensors!



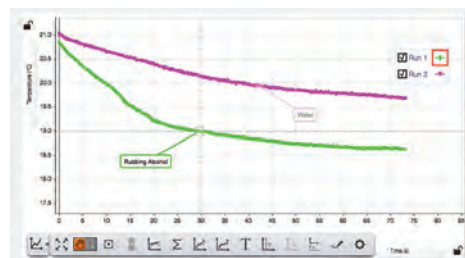
Complete Lab Stations

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 AG Science and Environmental Science.



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.



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.



Modeling Environmental Phenomenon

PASCO's EcoZone System has been designed to make qualitative and quantitative measurements as easy as observing. Students model and understand the complex interactions within, and among different ecosystems. Also see PASCO's Density Circulation Model (online).



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 pH Sensor

The best tool for measuring pH since litmus paper. The Wireless pH Sensor connects via Bluetooth® to monitor the pH of solutions.



Wireless Conductivity Sensor

This waterproof sensor connects via Bluetooth® to measure both conductivity (ionic content in solution) and total dissolved solids.



Wireless Colorimeter & Turbidity

Simultaneously measures the absorbance and transmittance of six different wavelengths. The sensor can be used to study Beer's Law (absorbance vs. concentration) and the rates of chemical reactions.



Wireless CO₂

The Wireless CO₂ Sensor measures carbon dioxide gas levels and wirelessly streams data to your computers, tablets, and smartphones.

Wireless Weather Sensor

This sensor is packed with 19 different measurements, including GPS, that can be monitored live or collected over the long term.



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.

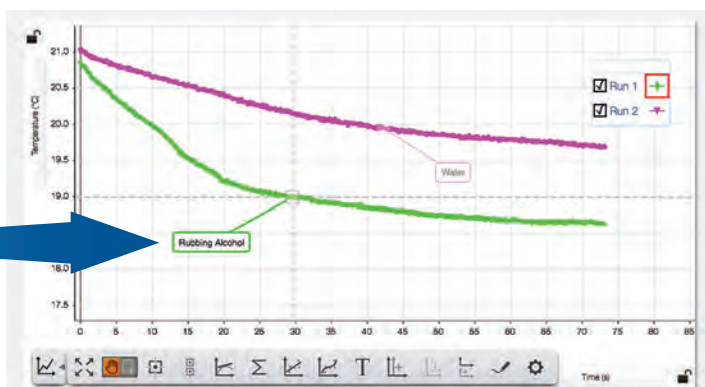
 Windows • Mac OS • iOS • chrome • 



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.



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 on all your devices 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, even 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.

AG Science Starter Lab Station

Together, the Agricultural Starter and Extension Lab Stations offer a lab-ready solution for exploring essential topics in agricultural and environmental science. Complete with wireless sensors, ten student labs, and a storage case, the Agricultural Lab Stations let students investigate essential topics such as soil quality, water treatment, and the energy content of food. Using the included lab handouts, students can also explore more advanced topics, as they work to extract and separate leaf pigments, determine the energy content stored in plant-based foods, and model ecosystems using factors that create challenging and optimal growing conditions.



AG Science Station Lab Titles

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

Starter Station Labs

- Determining Soil Quality
- Water Treatment
- Respiration of Germinating Seeds
- Plant Respiration & Photosynthesis
- Energy Content of Food
- Diffusion

Extension Station Labs

- Freshwater Quality Monitoring
- Modeling an Ecosystem
- Greenhouse Gases



AG Science Starter Lab Station

Includes the Agricultural Science Lab Manual and these Wireless Sensors:

- Temperature
- pH
- CO₂
- Conductivity
- Colorimeter & Turbidity



AG Science Extension Lab Station

Includes the Advanced Environmental Science Through Inquiry Lab Manual (digital) and these Wireless Sensors:

- Optical Dissolved Oxygen
- Weather with GPS
- EcoZone System

Lab Stations Support Advanced Environmental Science

Pair the AG Lab Stations with PASCO's Advanced Environmental and Earth Sciences Teacher Lab Manual to support student investigations of advanced environmental science topics.



Advanced Environmental and Earth Sciences Teacher Guide (PS-2979)

Designed by educators and curriculum experts, the Advanced Environmental and Earth Sciences Teacher Guide, includes twenty-one hands-on investigations. Each activity covers a core AP[®] Environmental Science topic and includes supporting documents to help guide both students and teachers through the investigation.

Agricultural Science Starter Lab Station	EB-6336
Agricultural Science Extension Lab Station.....	EB-6337
Advanced Environmental and Earth Sciences Teacher Guide.....	PS-2979

Wireless pH Sensor

The Wireless pH Sensor can be used to quickly obtain accurate pH readings, log data to the connected device, and even collect data autonomously for hours or weeks. Use the sensor for water quality studies, environmental monitoring, testing solutions, and chemical reactions.

Features:

- Simply pair and go, no cables or interfaces to manage
- Logs pH data directly onto the sensor for long-term experiments
- Compatible with Ion-Selective Electrodes (ISE) and the Oxidation Reduction Probe (ORP)
- Includes Bluetooth® connectivity and a long-lasting coin cell battery



Wireless pH SensorPS-3204

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/pressure
- Also reports ambient temperature and humidity



Wireless Oxygen Gas Sensor PS-3217

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.

Applications:

- Water quality investigations
- Study the effects of water pollution
- Measure Total Dissolved Solids (TDS). Up to 28 ppt
- Investigate solution properties
- Track the diffusion of ions through membranes



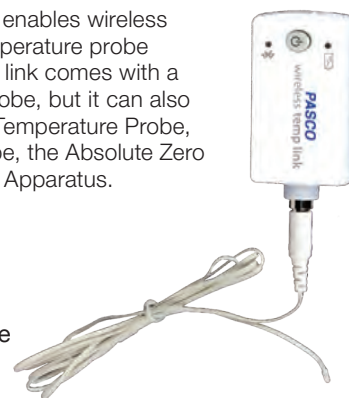
Wireless Conductivity SensorPS-3210

Wireless Temperature Link

The Wireless Temperature Link enables wireless connection for any PASCO temperature probe with a 3.5 mm connection. The link comes with a Fast Response Temperature Probe, but it can also connect to the Stainless Steel Temperature Probe, Skin/Surface Temperature Probe, the Absolute Zero Sphere, and the Ideal Gas Law Apparatus.

Features:

- Range of -30°C to 105°C
- Onboard datalogging
- Includes temperature probe
- Bluetooth® connectivity



Wireless Temperature Sensor Link PS-3222

Wireless Temperature Sensor

The Wireless Temperature Sensor connects to student devices to provide real-time temperature data anytime, anywhere. It can also store data to its onboard memory when long-term monitoring is required.

Features:

- Displays temperature data in real time
- Water-resistant
- Variable sampling rate for short, precise changes or lengthy, multi-day data collection
- Includes Bluetooth® connectivity and long-lasting battery



Wireless Temperature Sensor PS-3201

Wireless Light and Color Sensor

The Wireless Light and Color Sensor features two separate apertures: One measures ambient light from the side of the box, and the other measures percent color of directional light at the end of the box.

Features:

- Wirelessly connects to computers, Chromebooks, tablets, and smartphones
- On-board memory enables the sensor to function as an independent datalogger
- Variable sampling rate for short, precise experiments or lengthy, multi-day data collection
- Bluetooth® connectivity and long-lasting coin cell battery



Wireless Light and Color SensorPS-3248

Wireless Weather Sensor with GPS

The Wireless Weather Sensor is an all-in-one instrument for monitoring complex environmental conditions. It houses several sensing elements within a single unit to provide 19 different measurements. Use the sensor in logging mode with the Weather Vane Accessory for long-term monitoring, or use it as a handheld instrument to study microclimates and local environmental conditions.

Features:

- Logging mode for long-term experiments
- Water resistant for extended environmental monitoring
- Built-in light sensor for measuring light level and UV index
- Special SPARKvue map display for analyzing spatial data
- 19 different measurements that can be collected and analyzed



Visualize your data in seconds with a free ESRI's ArcGIS online account.



Wireless Weather Sensor with GPS	PS-3209
Weather Vane Accessory	PS-3553

EcoZone™ System

PASCO's EcoZone System is designed to help students model and understand the complex interactions within, and among, different ecosystems. The three clear acrylic EcoChambers are specially designed to accommodate PASCO sensors, making qualitative and quantitative measurements as easy as observing.

All three chambers interconnect, enabling students to study interactions between three different systems. Compare the traditional terrestrial, aquatic, and decomposition environments, or create unique biomes to model and measure.



EcoZone System	ME-6668
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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 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 Sensor NEWPS-3246



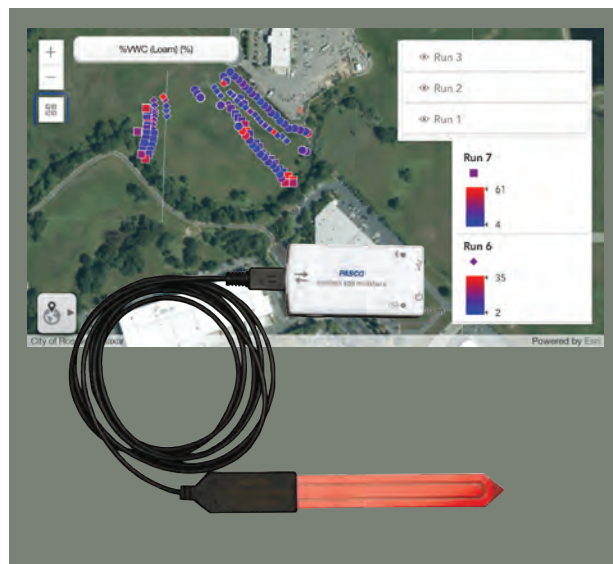
Wireless Soil Moisture Sensor

The Wireless Soil Moisture Sensor measures the volumetric water content (%VWC) of soil, reporting data in real time or storing it onboard the sensor's memory for long-term experiments. Durable and easy to use, the Wireless Soil Moisture Sensor is the perfect tool for monitoring controlled experiments both inside and outside of the classroom.

Features:

- Collect and display data in real time with PASCO software
- Collect data for hours, days, or weeks with Logging Mode
- Bluetooth® connectivity enables use in the classroom, lab, or field
- Use GPS data from a mobile device for GIS mapping activities
- Selectable calibrations for different soil types

Wireless Soil Moisture SensorPS-3228





Wireless Colorimeter & Turbidity Sensor

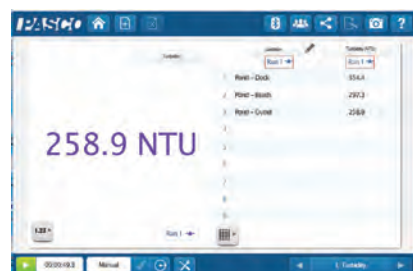
PS-3215

The Wireless Colorimeter & Turbidity Sensor simultaneously measures the absorbance and transmittance of six different wavelengths. The sensor can be used to study Beer's Law (absorbance vs. concentration), enzyme activity, photosynthesis, and the rates of chemical reactions (absorbance vs. time). After a simple calibration, students can quickly begin viewing live measurements as they materialize across the visible spectrum at 650 nm (red), 600 nm (orange), 570 nm (yellow), 550 nm (green), 500 nm (blue), and 450 nm (violet).

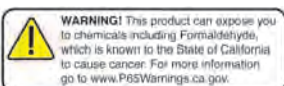
This sensor also functions as a high-quality turbidimeter for water quality analysis. Rather than simply measuring transmitted light, the Wireless Colorimeter and Turbidity Sensor measures light scattered at a 90 degree angle from the sample, resulting in accurate and repeatable measurements. Additionally, the internal housing for the cuvette is opaque, which limits ambient light interference to preserve accuracy.

Features:

- Stabilized light source for consistent readings
- Measures six different wavelengths simultaneously
- PASCO software displays the absorbance & transmittance at each wavelength in the appropriate color
- Quick and easy calibration
- Wireless design enables data collection in the field
- Pre-calibrated for ezSample Snap Vial Kits



Measure the absorbance and transmittance of a solution at six different wavelengths simultaneously!



Wireless Colorimeter & Turbidity SensorPS-3215

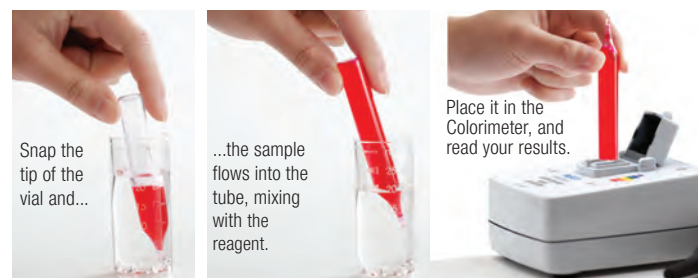
Includes USB Charging cable, 9 cuvettes, 2 cuvette racks, and one 100 NTU calibration cuvette.

Chemical Water Quality Testing in the Field

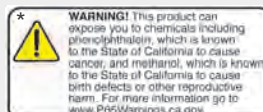
PASCO's ezSample water quality test kits simplify the chemical testing of water sources. Avoid the mess and difficulty of handling chemicals directly and get great results, even in the field.

Colorimetric Analysis

Conduct colorimetric tests in the field and avoid the mess and tedium of mixing chemicals. These ezSample Snap Vials contain a pre-formulated reagent to test a variety of water quality parameters. No more guessing at color variations — just drop the vial into the Wireless Colorimeter and read the concentration.



ezSample Snap Vial - Iron	EZ-2331
ezSample Snap Vial - Nitrate*	EZ-2333B
ezSample Snap Vial - Ammonia	EZ-2334A
ezSample Snap Vial - Phosphate	EZ-2337
ezSample Snap Vial - Chlorine	EZ-2339A
ezSample Field Titrator - Total Hardness	EZ-2338
ezSample Field Titrator - Alkalinity	EZ-2340





Wireless Ethanol Vapor Sensor

PS-4252

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.

Note: This is a gas sensor - it should not be submerged in liquids. If exposed to gases with ethanol concentrations above the recommended maximum of 3% the sensor element's life span will be shortened.

Specifications:

Accuracy: 20%

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

Auto Shut-Off: 1 hour

Resolution: 0.01%

Cross Sensitivities: H₂, CO, CH₄, Isobutane

Battery Type: Rechargeable LiPo

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 Magnetic Field Sensor

PS-3221

This 3-Axis Magnetic Field Sensor can sense the Earth's magnetic field, magnetic fields from current-carrying coils, and permanent magnets. There are two ranges: ± 50 gauss and ± 1300 gauss. This sensor is primarily for static fields.

Wireless Magnetic Field SensorPS-3221



AirLink Interface

PS-3200

The AirLink connects PASPORT sensors to a Mac or Windows computer, Chromebook, iPad, tablet, or smartphone via Bluetooth or USB connection. The USB cable is included.

AirLink InterfacePS-3200



PASPORT Salinity Sensor*

PS-2195

The PASPORT Salinity Sensor works with the 10X Salinity Sensor Probe to measure the salinity, conductivity, and temperature of fresh to brackish water sources. The sensor determines salinity based on electrical conductivity. It also features a built-in calculation, based on the Practical Salinity Scale (PSS), that compensates for changes in conductivity caused by temperature changes.

PASPORT Salinity SensorPS-2195



PASPORT Flow Rate/ Temperature Sensor*

PS-2130

PASCO's Flow Rate Sensor allows students to measure the rate of movement and temperature of streams, rivers, and other flowing systems. The propeller is a rugged, single-piece unit encased by protective material — no more losing pieces at the bottom of the stream.

PASPORT Flow Rate/Temperature SensorPS-2130



PASPORT Non-Contact Temperature Sensor*

PS-2197

The Non-Contact Temperature Sensor measures surface temperature by detecting the emitted infrared light. Record the temperature of objects without touching them!

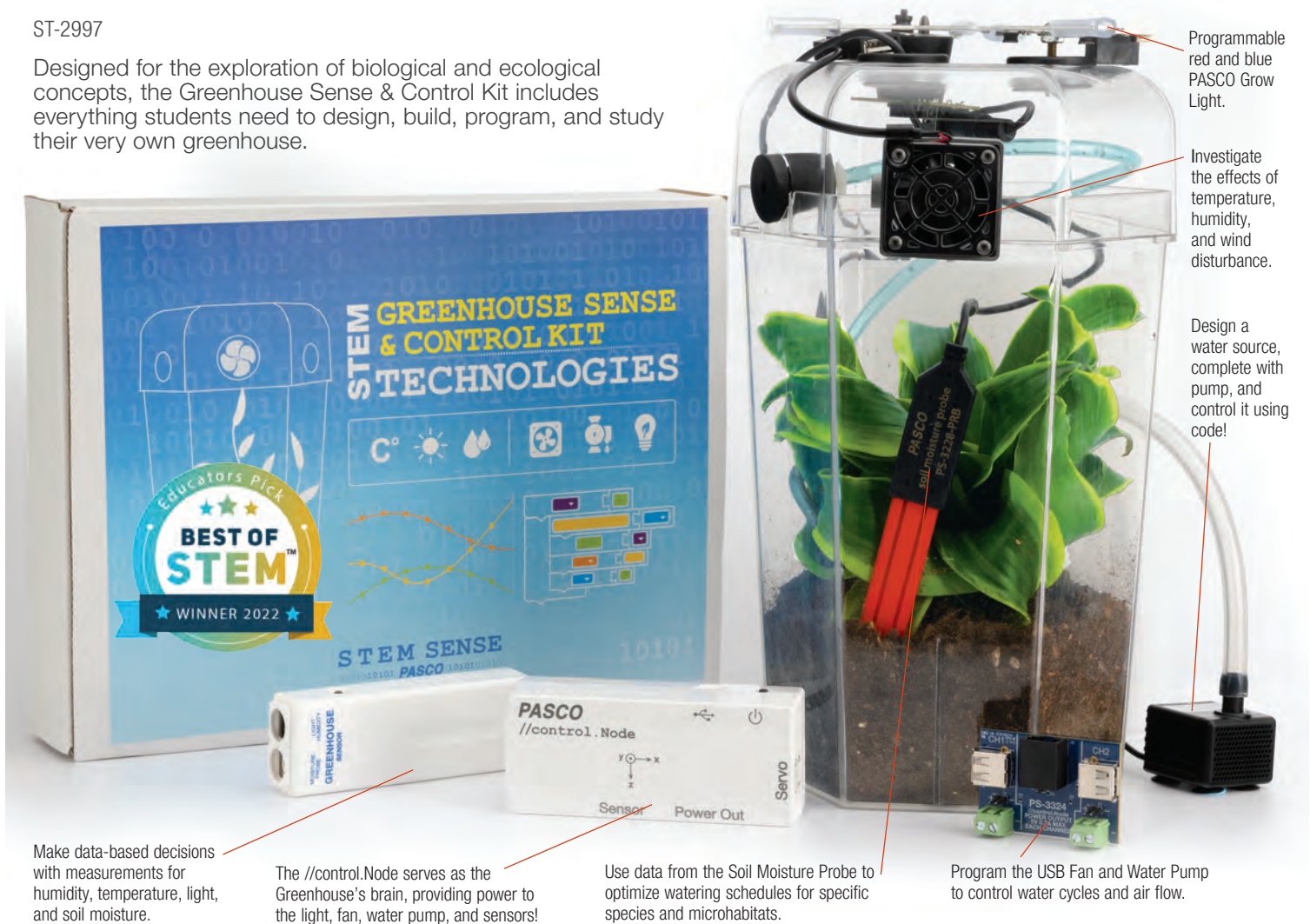
PASPORT Non-Contact Temperature SensorPS-2197

Greenhouse Sense & Control Kit

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.



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.

Build career awareness with activities that make real-world connections to:

- Agricultural monitoring
- Ecological management
- Plant physiology

Help students develop competency in:

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

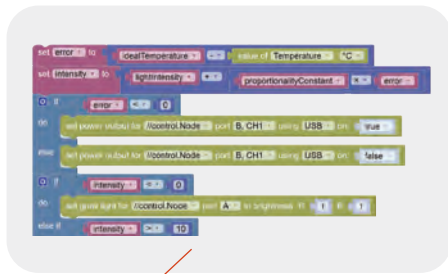


Student Activities

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

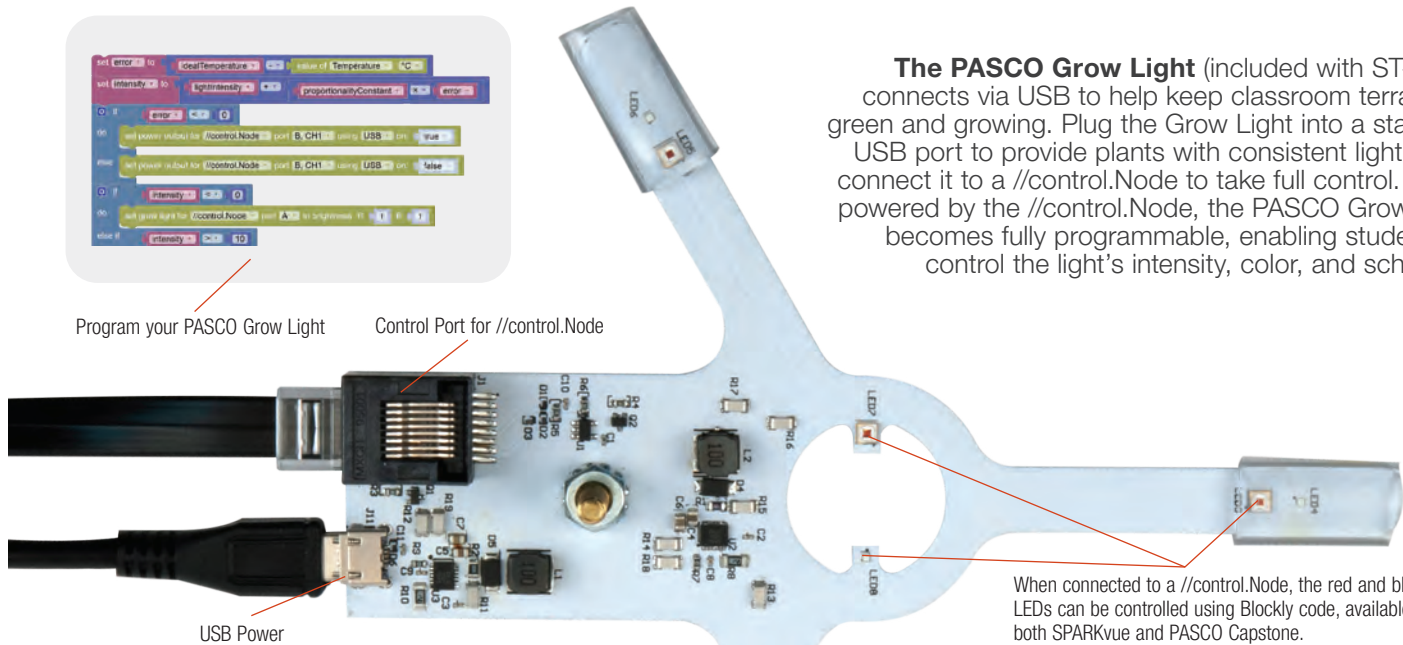


Greenhouse Sense & Control Kit



Program your PASCO Grow Light

Control Port for //control.Node



The PASCO Grow Light (included with ST-2997) connects via USB to help keep classroom terrariums green and growing. Plug the Grow Light into a standard USB port to provide plants with consistent lighting, or connect it to a //control.Node to take full control. When powered by the //control.Node, the PASCO Grow Light becomes fully programmable, enabling students to control the light's intensity, color, and schedule.

When connected to a //control.Node, the red and blue LEDs can be controlled using Blockly code, available in both SPARKvue and PASCO Capstone.

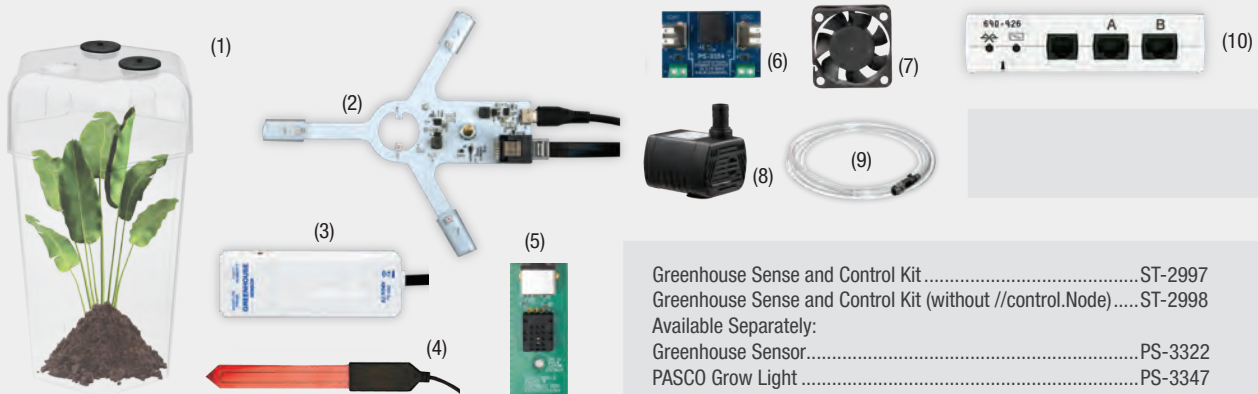
Shine a light on biological concepts!

- Study the effects of red and blue light on plant growth.
- Determine the optimum amount of light for a particular plant species.
- Program a light schedule to care for plants over weekends and breaks.



Greenhouse Sense & Control Kit Equipment

This complete kit includes: an EcoChamber (1), PASCO Grow Light (2), Greenhouse Sensor (3) Soil Moisture Probe (4), Humidity/Light/Temperature Probe (5), Power Output Module (6), Fan (7), Water Pump (8), tubing with drip-watering ends (9), and //control.Node (10).



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

Wireless Air Quality Sensor **NEW**

PS-3226

PASCO's Wireless Air Quality Sensor measures five environmental factors that experts consider fundamental to evaluating the atmospheric health of an area. This small but powerful device allows students to monitor temperature, humidity, particulate matter (1, 2.5, and 10 PM), volatile organic compounds (VOC's), and a combination measurement of ozone and nitrous oxide levels. Record the quality of classroom or community air throughout a normal day. Additionally students can monitor painted surfaces, new carpets, markers, or air fresheners inside your building. Compare size profiles of environmental particulates from dust, pollens, smoke, and haze to better understand their ability to spread and impact environmental health based on how far the particulates penetrate our lungs. Remote logging allows students to monitor their commute to and from school to pinpoint possible sources of pollution in their own community. Students can quantitatively determine the value of greenspaces around the community and their ability to filter out these pollutants.

Specifications:

Temperature:

Range: -40 to 80 °C

Resolution: 0.1 °C

Accuracy: ± 0.2 °C

Humidity:

Range: 0 to 100%

Resolution: 0.02%

Accuracy: ± 3%

Particulates:

Size: 1um, 2.5um, 10um

Range: 0 to 1000 ug/m3

Resolution: 0.02 ug/m3

Accuracy: ± 3%

O3/NOx:

Range: 0 to 20,000 ppb

Resolution: 5 ppb

Accuracy: ± 25 ppb

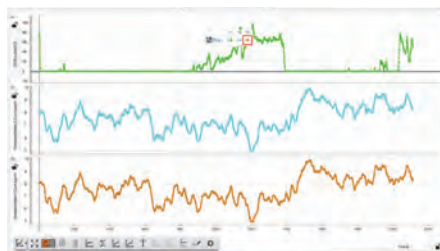
Warm up: 20 min on 1st run of day

VOC:

Range: 0 to 500 air quality index units

Resolution: 1 air quality index

Accuracy: Calibrated on ethanol but varies by compound



Wireless Air Quality SensorPS-3226