Sensor Technology

Transform plain explanations into hands-on explorations with our award-winning Wireless Sensors. Explore more than 30 durable Wireless Sensors for science and STEM learning.

Data Collection & Coding

Discover SPARKvue, our award-winning data-collection and analysis software for K-8 science and STEM courses. SPARKvue is compatible with iOS, Android™, and Chrome™ devices, as well as Mac® and Windows® computers.

Complete Lab Stations

Equip your students for science success with ready-made Lab Stations. Each kit comes classroom-ready with Wireless Sensors, hands-on labs, and a convenient storage case.

Real-World Observation and Measurement

Help students model and understand the complex interactions within and among different ecosystems, with our EcoZone System. Leverage their acquired knowledge for an engineering design challenge and bring STEM into your classroom with our Renewable Energy Kit.

Professional Learning & Support

PASCO offers free online and technical support to help ensure our customers' success. You can also join us in sunny California for a PASCO Summer Institute! These events offer a unique opportunity to extend your professional skills, connect with like-minded educators, and explore new approaches for engaging students in STEM learning. For more information on 2024 opportunities, visit **www.pasco.com/institutes**

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.

- Includes 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 Weather Sensor with GPS
Capable of making 19 measurements and logging GPS data, this all-in-one instrument is ideal for investigating complex environmental conditions.

Wireless Motion Sensor
This sensor measures the position, velocity, and acceleration of objects, and it even includes a 180° rotatable head for creative applications.

Wireless Hand-Grip Heart Rate Sensor
Easily measure heart rate before, during, and after exercise with live data that wirelessly transmits to your devices.

Wireless Light and Color Sensor
This sensor features two separate apertures for measuring light level (lux), illuminance, UV index, and color intensity.

Wireless Sound Sensor
Get two sensors in one wireless package: A sound wave sensor and a sound level sensor with both dBA and dBC-weighted scales.

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 30 Wireless Sensors!

SPARKvue

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

Windows • **Mac OS** • **iOS** • **chrome** • **ANDROID**

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.
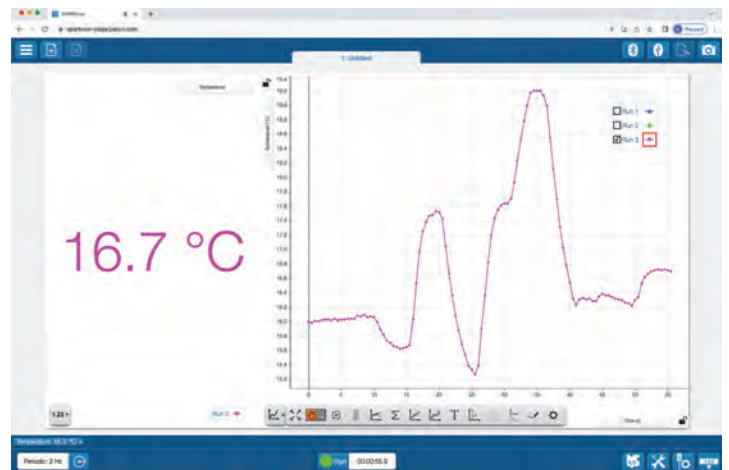
Student Data Collection...MADE EASY!

Student-Entered Data & Graphing
MADE EASY!

Choose manual data collection to record live values with the click of a button.

Make a mistake? No problem! Simply select a data point to replace it.

Student-Entered Data
Enter Data!

Graph & Analyze Student-Entered Data

Collecting & Graphing *Sensor* Data
MADE EASY!

Automate sensor data collection to monitor measurements in real time.

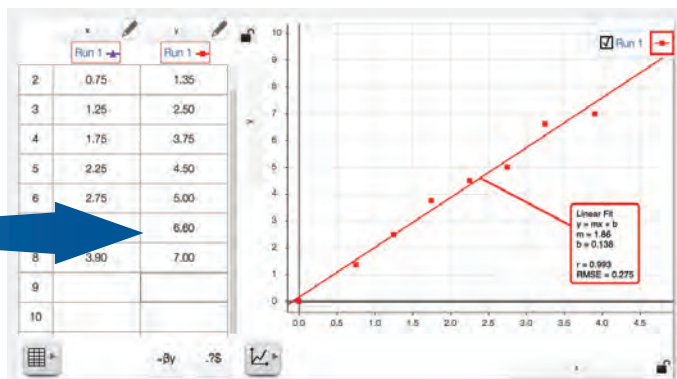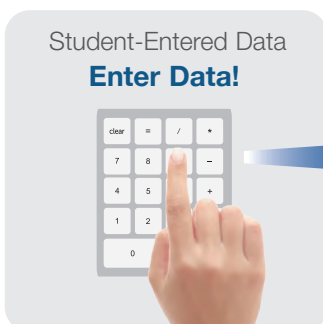Save time with pre-made experiment files, or build your own custom displays that will have you up and running in minutes.

Student Sensor Data
Connect & Collect!
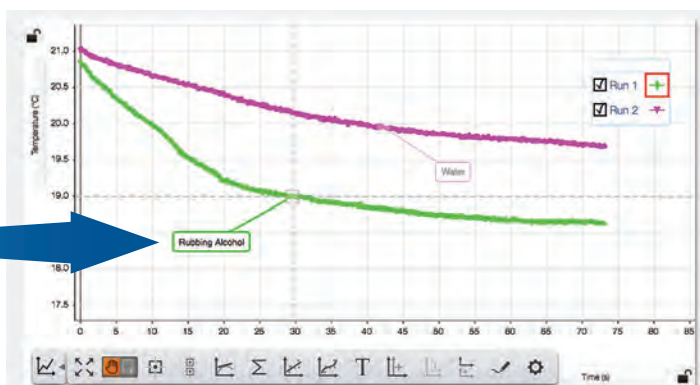
Rapid, Real-Time Data Collection & Analysis

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 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 Chromebook™, iPad®, Android™ tablets, and Apple® and Android™ smartphones.

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

Elementary School Science Solutions

Introduce students to the foundations of science learning with hands-on solutions from PASCO.

Our simple designs let learners explore the world around them using intuitive sensors and software that bring science topics to life. From first studies of light and temperature to early explorations of weather and sound, PASCO has everything you need to connect your students to science phenomena.

Elementary Science Starter Lab Station

Together, the Elementary Science Starter and Extension Lab Stations provide a comprehensive solution for exploring a variety of key science concepts. Complete with Wireless Sensors, ten student activities, and a convenient storage case, the Elementary Science Lab Stations support student explorations of essential science topics such as temperature, light, and sound. Visit the PASCO Experiment Library to discover additional activities for elementary science, complete with student handouts, answer keys, and helpful teacher tips.
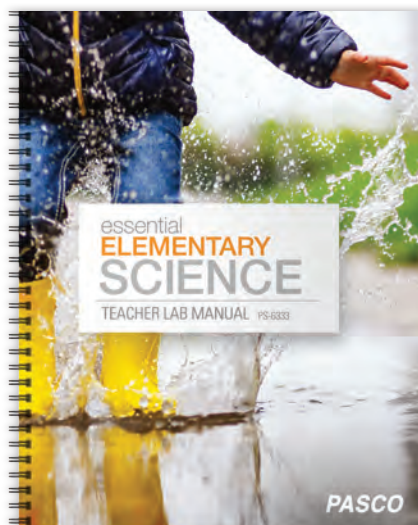
Elementary Science Lab Titles
The Elementary Science Starter Lab Station supports 7 of the 10 labs.
Add the Extension Lab Station to do all 10 lab titles.

Starter Station Labs	Extension Station Labs
Temperature and Change	Determining Sound Levels
Evidence of Chemical Reactions	Weather and Climate: Microclimates
Thermal Insulators and Conductors	Weather and Climate: Monitoring Weather
Can Plants Survive Without Light?	
How a Greenhouse Works: Heat	
How a Greenhouse Works: Light	
MatchGraph	

The Elementary Science Starter & Extension Lab Stations include a lab manual as well as these Wireless Sensors and materials:

Elementary Science Starter Lab Station
• Temperature
• Light
• Motion
• Storage Case

Elementary Science Extension Lab Station
• Sound
• Weather

Elementary Science Starter Lab Station.........................PS-3314

Elementary Science Extension Lab Station PS-3315
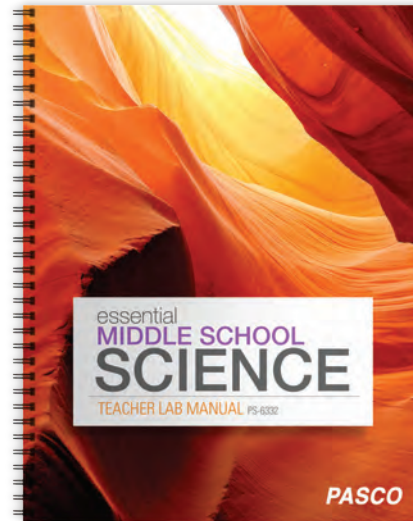
Middle School Science Solutions

Equip your students for science success with world-class solutions from PASCO.

Our award-winning sensors and software empower students to explore real-world phenomena, while also helping them develop the skills they'll need for future science courses. Whether they're learning about forces and motion or uncovering local weather patterns, help prepare students for their next step with reliable solutions from PASCO.

Middle School Science Starter Lab Station

The Middle School Science Starter and Extension Lab Stations offer a turnkey solution for investigating an array of core science concepts. Complete with Wireless Sensors, ten student activities, and a convenient storage case, the Middle School Science Lab Stations let students study key concepts such as seasons, forces, and motion. Visit the PASCO Experiment Library to explore additional activities for middle school science and STEM.

Middle School Science Lab Titles

The Middle School Science Starter Lab Station supports 6 of the 10 labs.
Add the Extension Lab Station to do all 10 lab titles.

Starter Station Labs	Extension Station Labs
Describing Motion	Photosynthesis
Night and Day	Humidity and Dew Point
Seasons and Temperatures	Forces and Interactions
Thermoregulation	Waves and Energy
Introduction to Acids	
Acid Rain and Weathering	

The Middle School Science Starter & Extension Lab Stations include a lab manual as well as these Wireless Sensors and materials:

Middle School Science Starter Lab Station

- Temperature
- Light
- pH
- Motion
- Storage Case

Middle School Science Extension Lab Station

- CO_2
- Weather
- Sound
- Force/Acceleration

Middle School Science
Starter Lab Station.........................PS-3312

Middle School Science
Extension Lab Station PS-3313

//code.Node

PS-3231

The //code.Node is a turnkey coding solution that combines real-world sensor inquiry, Blockly coding, and live data displays to drive computational thinking in STEM learning. It includes six interactive sensors and four device outputs that measure and respond to phenomena using code created in SPARKvue or Capstone software.

Specifications:

Maximum Sample Rate: 100 Hz
Light Level Sensor Range: 600 to 50,000 lx (not calibrated)
Sound Level Sensor Range: 70 to 100 dB (not calibrated)
Magnetic Field Sensor Range: ±50 gauss
Acceleration Sensor Range: ±8 g
Speaker Frequency Range: 10 to 10,000 Hz
Ambient Temperature Sensor: Range: -25°C to 40°C
Ambient Temperature Sensor: Resolution: 0.05°C
Ambient Temperature Sensor: Accuracy: ±1°C
Connectivity: USB or Bluetooth 5.2
Logging: No
Battery: Rechargeable LiPo
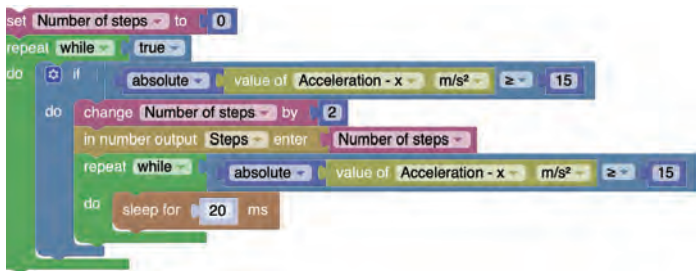
Block-Based Coding

Blockly simplifies the programming process for new coders. Visual coding blocks connect like puzzle pieces to help students master the basics of programming, without having to worry about their syntax.

|	
//code.Node PS-3231	
//code.Node Holder PS-3233	
//code.Node Multi-Pack (Set of 8) PS-3311	

Coding with Vehicle Sensor Technologies Kit

ST-7820

Explore the science and sensors behind today's modern vehicles, while teaching students about physical science as they design, test, measure and code with sensors that mimic real-world vehicle technology.

Activities & Video Lessons
- **Crash Test:** Impact Alert System
- Investigating Odometers
- Engineering Turn Signals
- 3-2-1 Launch!
- **The Need for Speed:** Radar Detectors
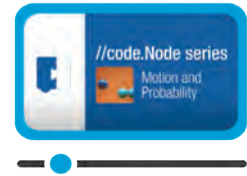
Build career awareness with activities that make real-world connections to:
- Automotive engineering
- Real-life vehicle sensors
- Crash test engineering

Help students develop competency in:
- Problem-solving, logic, and critical thinking
- Computational thinking
- Data collection and analysis
- Mathematics
- Technology and programming

Coding with Vehicle Sensor Technologies Equipment

The Coding with Vehicle Sensor Technologies Kit comes classroom-ready with all the equipment, accessories, and software needed to complete the included activities. The complete kit includes a //code.Node; a //code.Node Cart; a color-printed booklet of student activities; two light spring bumpers; six 50-g masses; a 1.5-m roll of measuring tape; a spool of thread; and two block person figurines.

Includes:
- //code.Node   PS-3231
- //code.Node Cart   PS-3235
- Color-Printed Booklet of Student Activities
- Light Spring Bumpers (Qty. 2)
- 50 g Masses (Qty. 6)
- Soft Measuring Tape, 1.5m
- Spool of Thread
- Block Person Figurines (Qty. 2)

Coding with Sensor Technologies Kit...................ST-7800	

Standard Compound Optical Microscope

SE-6213

The Standard Compound Optical Microscope is great for general viewing of cell structures at magnification settings of 40x, 100x, and 400x. This microscope is ideal for lessons in biology, life science, anatomy and physiology, and cellular and field biology. It includes high-quality optical lenses that easily adjust to view the subject in appropriate detail, making this lab essential suitable for both beginner and experienced microscope users. This microscope is durable, making it perfect for student labs and years of normal class use. It's compatible with student-prepared slides as well as professionally prepared slide sets like the Kingdoms Survey Prepared Slide Set (SE-6214), giving students a solid start to the exploration of 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
- 10x 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 3 AA Batteries)
- Equipped with a plain stage with clip and single lens condenser with disc diaphragm

Prepared Slide Set, Kingdoms Survey

SE-6214

This set of slides gives students an overview of cell types for biology and life science laboratory investigations. These slides are professionally stained and mounted, providing students an example of properly prepared slides for further slide preparation on their own, while offering an initial study of cellular features that is optimally visible. The set is compatible with the Standard Compound Optical Microscope (SE-6213), but also will work with other units.
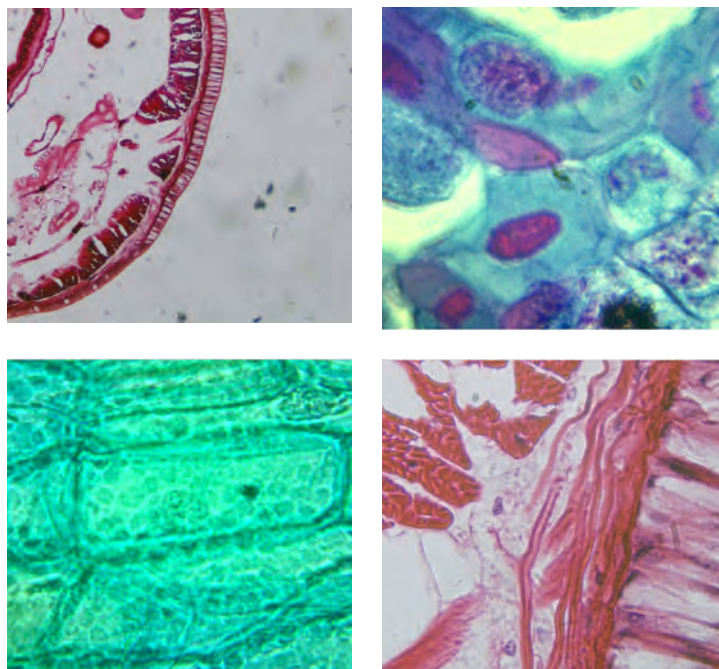
Sample imagery above captured with standard eyepiece USB camera. Slides from the *Kingdoms Survey Prepared Slide Set* (sold separately)

The Standard Compound Optical Microscope, together with the optional USB (eyepiece) camera and Kingdoms Survey Prepared Slide Set, makes a great solution for primary (K-8) science classrooms.

Standard Compound Optical Microscope	SE-6213
Prepared Slide Set, Kingdoms Survey	SE-6214
Microscope Camera (USB)	SE-6216

Wireless Sensors

Wireless pH Sensor

Equally capable in the lab or field, the Wireless pH Sensor eliminates the hassle of cables, reducing spills and improving safety. It can transmit data in real time, or store data for days when continuous monitoring is required. The Wireless pH Sensor enhances countless activities, including introductory pH lessons, investigations into household acids and bases, water quality studies, and much more.

Features:

- Bluetooth® connectivity and a long-lasting coin cell battery
- Logs pH data directly onto the sensor for long-term experiments

Wireless pH Sensor.. PS-3204

Wireless Temperature Sensor

Welcome to the modern thermometer. Students can access instant temperature readings, but also continuously monitor, log, and plot temperature data.

Perform These Experiments:

- Explore freezing and melting points
- Study temperature changes
- Measure the energy content of food
- Monitor temperature differences between light and dark surfaces
- Compare energy efficiency between light bulbs

Wireless Temperature Sensor... PS-3201

Wireless Pressure Sensor

The Wireless Pressure Sensor allows students to easily collect accurate gas pressure data for a wide range of applications. It can also be used as a potometer.

Perform These Experiments:

- Investigate gas production using yeast
- Measure changes in air pressure in a model respiratory system

Wireless Pressure Sensor PS-3203

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.

Features:

- Wireless design enables free movement
- Long-lasting, coin cell battery
- Displays live graphs for student analysis

Wireless Hand-Grip Heart Rate Sensor................................. PS-3206

Wireless CO2 Sensor

Measure changes in carbon dioxide (CO_2) gas levels quickly and easily with the Wireless CO_2 Sensor. The sensor is temperature-compensated and can operate in high humidity environments, such as the included 250-mL sample bottle.

Demonstrate:

- Measure respiration in compost or other decomposer-rich environments
- Explore carbohydrate consumption rates due to human activity
- Monitor CO_2 levels during photosynthesis and respiration experiments
- Study carbon cycling in a model ecosystem
- Monitor CO_2 levels for indoor air quality

Wireless CO_2 Sensor (Carbon Dioxide)................................... PS-3208

Wireless Weather Sensor with GPS

The Wireless Weather Sensor 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 record ambient conditions that are relevant to environmental phenomena.

Features:

- Logging mode for long-term experiments
- Water-resistant for extended environmental monitoring
- 19 different measurements that can be collected and analyzed individually or simultaneously

Wireless Weather Sensor with GPS PS-3209

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 Sensor...........................PS-3248

Wireless Sound Sensor

The Wireless Sound Sensor contains Sound Level and Sound Wave functions that measure true sound level (intensity) and relative changes in sound pressure level as sound waves incident on the sensor.

Applications:

- Measure sound level and frequency
- Explore sound and human hearing
- Measure the speed of sound in air
- Study sound waves

Wireless Sound Sensor PS-3227

Wireless Force Acceleration Sensor

Capable of simultaneously measuring force, acceleration, and rotational velocity, this sensor is ideal for experiments involving rotating platforms, moving carts, spring oscillations, collisions, and impulse. Students can use the finger-holes for handheld applications, or mount it onto a cart or rod.

Features:

- ±50 N
- 3-axis accelerometer
- 3-axis gyroscope
- Built-in rod clamp
- Onboard datalogging

Wireless Force Acceleration Sensor...................................... PS-3202

Smart Cart Patent Number 10,481,173

Smart Carts are ideal for studying mechanics topics, such as kinematics and dynamics. The built-in load cells enable two Smart Carts to visually demonstrate Newton's Third Law with ease. Built-in sensors for force and acceleration enable students to investigate Newton's Second Law in minutes. Smart Carts truly are a physics lab on wheels, and now you can own the most advanced physics cart ever created, all without the restrictions of cables.

Features:

- Records and displays live motion data
- Rechargeable battery
- Collects data on or off a track

Smart Cart (Red)	ME-1240
Smart Cart (Blue)	ME-1241

Wireless Motion Sensor

The Wireless Motion Sensor connects via Bluetooth or USB to your device and uses ultrasound to measure the position, velocity, and acceleration of objects. This enables students to take turns measuring their own distance to the sensor, while the class observes their motion materializing as a graph in real time.

FREE MatchGraph! Software

Download Mac®, Windows® and Android™ versions at pasco.com. iOS version available on Apple App Store.

Applications:

- Pair with free MatchGraph! software to teach motion-graphing
- Explore speed and velocity
- Clips directly to PASCO Dynamics Tracks

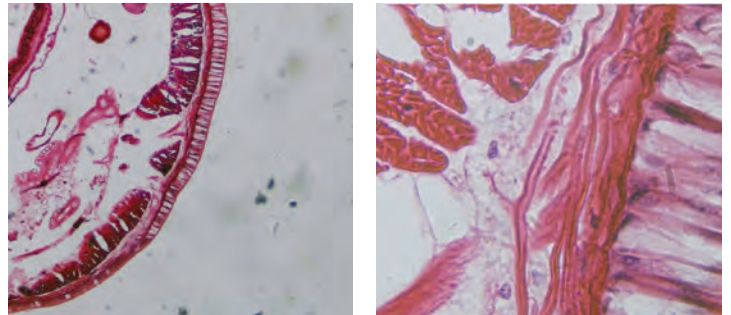Wireless Motion Sensor PS-3219

NEW

Standard Compound Optical Microscope

SE-6213

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

Standard Compound Optical Microscope	SE-6213
Prepared Slide Set, Kingdoms Survey	SE-6214
Microscope Camera (USB)	SE-6216