

Summer/Fall 2018

Headline Discoveries



Sea Diving for Medicine

Exploring Untapped Biodiversity

Global Tourism Takes Environmental Toll

Light Helps Yeast Produce Fuel

A Volcano's Good Deeds

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Welcome Back!

In this issue of *Headline Discoveries*, you'll find the informative articles you've come to expect. In addition, we've chosen products from our portfolio that are available to assist you with teaching and reinforcing the science concepts discussed in the articles, bringing real-world science directly to your classroom.

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Sea Diving for Medicine

By Iva Fedorka

With the number of infectious diseases escalating, scientists are searching everywhere for cures, including in our oceans. Although water covers 70% of the earth's surface, only five percent of this environment has been explored. This huge unexplored resource may be a key to the discovery of new antibiotics and other medicines.

Natural Medicines

Nearly half of the medications introduced during the past 30 years are derived from natural products or their derivatives. Plant-derived compounds have a long history of clinical use, may be more easily tolerated and accepted, and are typically used in ways similar to their original ethnopharmacological purposes.

To date, between 35,000 and 70,000 plant species have been screened for medicinal use, and more than 10% of the World Health Organization's list of "basic and essential" drugs come from flowering plants. But opportunities exist in the biodiversity of ocean organisms for scientists to discover and develop new medicines. Drugs derived from ocean-dwelling organisms are already helping to combat cancer, HIV, tuberculosis, dengue fever, and malaria.

Ocean Exploration

Innovations like modern snorkeling, SCUBA gear, manned submersibles, and remotely operated vehicles have increased our access to the marine world and have led to the isolation and identification of thousands of unique and bioactive products. The current global marine pharmaceutical pipeline includes drugs approved by the U.S. Food and Drug Administration (FDA), EU-registered drugs, natural products or derivatives, and a number of other marine chemicals still in development.

Scientists from the U.S. National Oceanic and Atmospheric Administration (NOAA) are collecting and studying sponges, corals, and other marine organisms. They have discovered a chemical that breaks down the shield that protects bacteria from antibiotics, which could be a useful helper drug for antibiotics that have become ineffective. These NOAA researchers have also extracted antimicrobial chemicals from corals and sponges and are developing methods to replicate those chemicals, which will reduce the negative environmental impact of continued marine harvesting.

Other Discoveries

Sponges, or Porifera, lack nervous, digestive, and circulatory systems and are filter feeders: they get food and oxygen and remove wastes by maintaining a constant flow of water through their bodies. With a limited ability to defend themselves against predators, they produce fish-deterrent C-nucleosides, compounds that also possess antiviral and anticancer properties.

The term algae describes at least 30,000 species that supply food for fish and humans, oxygen for the biosphere, medicine for the healthcare industry, and fertilizers for agricultural purposes. A rich source of structurally unique natural products, green, brown, and red algae have been intensively assessed for antibacterial and antifungal activity.

Agricultural productivity has been increased by advances in pest

control with synthetic chemical pesticides (SCPs), but new pesticides are needed due to the significant rise in the resistance to current agents. Considerable research has focused on the isolation of insecticidal leads from Chilean red algae and other varieties from which more than 40 active constituents have been isolated.

Sea squirts, cone snails, sharks, horseshoe crabs, and toadfish have also been the subject of studies that have led to potential treatments for conditions including nerve damage, cardiomyopathy, and cancer.

Limitless Potential

Natural products have played a vital role in improving human health and have been the drugs of choice despite newer compounds that have been created through computational and combinatorial chemistry. This world of biology offers a range of structural diversity that is still largely untapped.

Although this renewed interest in natural medicinal products and treatments brings challenges like quality control, standardization, and cost effectiveness, the new opportunities it offers scientists for research and development in various areas of science are vast.

And, if the oceans are key to the discovery of new medicines, scientists remind us that protecting the quality of our planet's water and its inhabitants may be more important than ever.



SAVE on Safety for Your Classroom

For a limited time, enjoy savings on the safety products you need as you head back to class.



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Restrictions: Offer valid until September 30, 2018.

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[DISCUSSION QUESTIONS]

What are some of the risks associated with sea explorations?

Can you name other discoveries that scientists have found in the seas?

[VOCABULARY]

DETERRENT

PHARMACOLOGY

SCUBA

Education on a broad spectrum



- High-quality teaching tools for all levels of education
- Hand-painted, vibrant colors distinguish the various structures
- Cleverly placed removable parts reveal the internal anatomy
- Made in Germany

Catalog No.	Description	Price
S17153C	Heart Model	\$92.00
S17108	Brain Model	\$225.00
S17118	Eye Model	\$234.00

Shop 3B Scientific on fisheredu.com



3B Scientific™ Five-Part Classic Human Brain

An excellent tool for teaching the human nervous system and anatomy of the brain.

This midsagittally sectioned model is an original anatomic cast of a real human brain.

- Comes on a removable base for easy display in the classroom
- Compatible with skull models S17135, S171351, S17135X, S17135A
- Magnetic closures
- Dimensions: 5.1 x 5.5 x 6.9 in. (13 x 14 x 17.5cm)
- Weight: 1.98 lb. (0.9kg)



Components of the brain's left half:

- Frontal and parietal lobe, temporal and occipital lobe, encephalic trunk, cerebellum

Cat. No.	Description	Price
S98679	5-part Classic Human Brain	285.00/Each

3B Scientific™ Advanced Manual Inflate Large Cuff Blood Pressure Monitor

Fast and accurate blood pressure measurement.



- Offers two innovative features, the Pressure Rating Indicator™ and Irregular Heartbeat feature
- Pressure Rating Indicator provides a snapshot of your blood pressure classification based on your measurements and eliminates the guesswork
- Includes (1) AA battery, carrying case, four-week log book and quick-start direction in English, French and Spanish

Cat. No.	Description	Price
S37585	Advanced Manual Inflate Large Cuff Blood Pressure Monitor	52.25/Each

3B Scientific™ Intramuscular Injection Pad

Simple trainer that simulates muscle tissue.

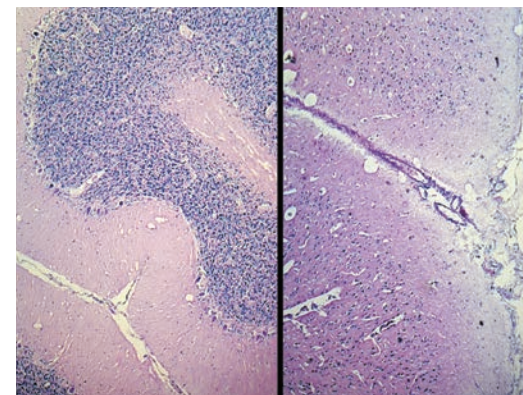
- Injection made to a depth of 50mm
- Has lifelike skin
- Will absorb fluid
- 50mm depth



Cat. No.	Description	Price
S06805	Intramuscular Injection Pad	108.00/Each

GSC Go Science Crazy Mammal Brain Composite Microscope Slide

Choose GSC prepared slides for your science classroom studies.



- Mammal brain composite H&E stain section

Cat. No.	Mounting Type	Description	Price
S99072PS	Section	Mammal Brain Composite; H&E stain	3.50/Each

Edvotek™ What Is an Epidemic and How Does an Infection Spread?

Students develop skills for accurately transferring solutions using pipets.

This experiment contains solutions to demonstrate how an infection is spread in a population through contact with simulated body fluids.

- Learn how infections are spread from one person to many others
- Transfer solutions from one tube to another
- Test a solution for the presence of an acid or a base



ORDERING INFORMATION:

Class size: 10 groups.

INCLUDES:

- Sodium hydroxide pellets
- 1N HCl
- Color indicator
- Test tubes and caps
- Large transfer pipets
- Complete instructions, background information and study questions

REQUIRES:

- Gloves
- Safety goggles
- Lab coats or protective clothing

⚠️ ALERTS:
This kit contains chemical(s) that may be harmful if used improperly. This kit is to be used by students only with teacher supervision.

Cat. No.	Description	Price
S94602	What is an Epidemic and How Does An Infection Spread? Kit	72.25/Each

How Does a Doctor Test for Lyme Disease?

Learn about the ELISA Test.

The objective of this experiment is to learn basic concepts related to Lyme disease, the immune system and the ELISA test.

- Experiment is a simulation of an ELISA test to detect circulating antibodies in a hypothetical patient's serum
- ELISA test is the initial screening test for the presence of antibodies against the bacterium responsible for causing Lyme disease

ORDERING INFORMATION:

Contains reagents and components to do 6 experiments

INCLUDES:

- Lyme Antigen
- Negative Control
- Positive Control
- Donor 1 Sample
- Donor 2 Sample
- Secondary Antibody (2° Ab)
- Substrate
- Plastic strips of Microtiter wells
- Microtip transfer pipets

REQUIRES:

- Distilled or deionized water
- Small cup
- Permanent Marker
- Timer or clock

Cat. No.	Description	Price
S94903	How Does a Doctor Test for Lyme Disease?	67.08/Each



fisherbrand Reusable Glass Media Bottles with Cap

Convenient wide opening

- Ideal for general use.
- Enhanced graduations
- Permanent white enamel marking spot
- GL 45 screw thread
- Clear (natural), drip-free, replaceable polypropylene pour ring Linerless
- Autoclavable (to 140°C)
- Borosilicate glass
- Polypropylene cap



Cat. No.	Capacity (Metric)	Price
S35833	100mL	94.00/Case
S35831	250mL	105.00/Case
S35832	500mL	117.00/Case
S35830	1000mL	155.00/Case

Eel-Inspired Power Source Has Potential

By Kylie Wolfe

Scientists have spent hundreds of years trying to mimic the way electric eels generate electricity. Using plastic sheets similar to bubble wrap to imitate the eels' mechanism, graduate students at the University of Fribourg in Switzerland have done just that.

positive and negative charges throughout the body. This creates a charge difference that triggers the movement of electricity through the eel's cells, collectively producing an electric charge.

Imitation is Flattery

To replicate this natural process, researchers developed an artificial organ out of two flexible sheets of clear plastic similar to bubble wrap. Each "bubble" contains a different color-coded gel. One sheet has red bubbles that contain salt water and blue bubbles with freshwater. A second sheet has yellow bubbles containing positive ions and green bubbles with negative ions.

When pressed together, the bubbles settle between each other, which allows the red and blue dots to act like channels that let

charged particles flow between the green and yellow dots. Again, this movement of ions is what produces a charge difference and ultimately generates electricity.

Unique Applications

Scientists tested the strength of these artificial power sources and found that they can generate up to 100 volts, which is similar to an electric current in a U.S. wall outlet. These colorful sheets are also cost effective and convenient. The charged gels can be printed using a 3D printer, and they can generate electricity with a simple squeeze.

What makes these power sources even more useful is their ability to produce a strong, but small amount of power, even when exposed to water. This gives them the potential to power pacemakers or soft robots

that explore harsh environments underwater, like along the ocean floor or near a volcano.

[DISCUSSION QUESTIONS]

Compare and contrast the natural process and the synthetic process of generating electricity in eels versus an artificial organ.

What other applications could this power source have in the future?

Discuss the pros and cons of this artificial power source and others like it.

[VOCABULARY]

- ELECTROCYTE
- ION
- ION CHANNEL
- ELECTRIC CURRENT

Eisco Water Turbine with Dynamo/Hydroelectrical Station

Convert mechanical energy into electrical energy.



- Consists of transparent cover, inlet and outlet tubes directly connected to a dynamo
- Fitted on base
- L: 13.77 in.
- 4.34 lb.

Eisco Basic Electricity Kit

Electricity kits for a range of student skills.

The Basic Electricity Kit has been designed as a low-cost, attractive and flexible alternative to the "circuit board" approach to investigations into simple circuits.

Each component such as a switch, rheostat, bulb holder, etc., is mounted on its own individual plastic panel with 4mm sockets. The panels are then formed into circuits by connecting them using 4mm stackable leads. Because this is "real circuit making," the equipment will find users throughout secondary school science curricula.

INCLUDES:

20 Replacement bulbs, four variable resistors, three motors, three buzzers, two electrode holders, three diodes, three fixed resistors, four universal clips with eight crocodile clips, six steel rods, six carbon rods, reel of plastic-coated wire; supplied in a robust polystyrene box, six cell holders, six bulb holders, six bulbs, three ON/OFF switches, two two-way switches, buzzer, motor, reel of Nichrome wire, 10 crocodile leads



Cat. No.	Description	Price
S05837	Hydroelectrical Station - water turbine with dynamo	153.00/Each

Cat. No.	Product Type	Price
S05849	Basic Electricity Kit	333.00/Each

Microscopes

Swift™ M3601C-USB Compound Microscope Digital Camera Package

Features cordless, energy-efficient LED illumination and a student-friendly design.

Microscope Features:

- **Condenser Type:** Built-in N.A. 0.65 with iris
- **Eyepiece:** W10XD, 18mm with Pointmaster
- **Magnification Power:** 4X, 10XD, 40XRD Achromat
- **Lighting Type:** Variable, Cordless, LED
- **Head Style:** Monocular

Camera Features:

- **Model:** D-Moticam 2
- 2.0 MP (1600 X 1200) resolution
- Live, digital output
- Detachable USB cable
- Feature-packed Motic Images Plus software



Cat. No.	Description	Price
S43541	M3601C-USB Compound Microscope Digital Camera Package	775.00/Each

Swift™ M3601C-WF2 Compound Microscope Digital Camera Package

Features cordless, energy-efficient LED illumination and a student-friendly design.

Includes Moticam X2 WiFi digital camera, with built-in RJ45 port, turns digital bundle package into full classroom solution

Microscope Features:

- **Condenser Type:** Built-in N.A. 0.65 with iris
- **Eyepiece:** W10XD, 18mm with Pointmaster
- **Magnification Power:** 4X, 10XD, 40XRD Achromat
- **Lighting Type:** Variable, Cordless, LED
- **Head Style:** Monocular

Camera Features:

- **Model:** D-Moticam X2
- Digital Interface: WiFi RJ45 Port
- Generates own WiFi signal
- Can be viewed on IOS and Android devices
- 1.3 MP (1280 X 1024 (WiFi)) live resolution
- Feature-packed Motic Images Plus software



Cat. No.	Description	Price
S43542	M3601C-WF2 Compound Microscope Digital Camera Package	899.00/Each

Swift™ SM105T-C-USB Zoom Stereo Microscope Digital Camera Package

Features microscope with variable zoom magnification range of 10X to 30X and Moticam 2.0 MP digital camera.

Microscope Features:

- Energy-efficient variable, cordless, rechargeable illumination
- One-touch spring loaded stage clips
- Right eyepiece diopter focusing adjustment
- **Eyepiece:** W 10X, 20mm
- **Magnification Power:** 1X to 3X
- **Lighting Type:** 6 Turret variable (0.06w) LED (Top variable: 0.05w, Bottom: 0.05w LED Cordless)
- **Head Style:** Trinocular

Camera Features:

- **Model:** D-Moticam 2
- **Digital Interface:** USB
- 2.0 MP (1600 X 1200) resolution
- Live, digital output
- Detachable USB cable
- Feature-packed Motic Images Plus software

Cat. No.	Description	Price
S43540	Zoom Stereo Microscope Digital Camera Package	1075.00/Each



Swift™ M10T-BTW1 Series Digital Tablet Compound Microscopes

Combination of compound microscope with Integrated digital tablet.

- Tablet screen to view and share images live on screen
- Optical and mechanical precision allows for easy use, viewing and durability
- Trinocular head
- LED lighting
- Abbe 1.25 N.A. condenser
- Pre-loaded Motic Apps
- Ergonomic Siedentopf binocular head
- Coaxial focusing
- Integrated carry handle
- Built-in low-drive mechanical stage
- LCD touch tablet screen (8 in.)
- Built-in camera, HDMI output, Wifi interface
- Micro SD card slot and mini HDMI outputs
- USB resolution: 1280x720/1280x1024 preview mode, 2592x1944 (5MP) still image
- Wifi resolution: 1280x960 preview mode, 1280x960 (1.3MP) still image
- For 120V 60Hz

Cat. No.	Description	Price
S22236	Digital tablet compound microscope	2059.00/Each



Swift™ M3600 Series Compound Monocular Microscopes

New look and “student proof” design with curved handle, variable LED illumination and rounded stage.

Ideal for high schools and other grade levels.

- One-piece eyetube and illuminator are tamperproof
- Locked-on eyepieces, objectives and spring loaded “one touch” stage clips
- Plastic iris diaphragm shield protects iris
- Slip clutch system protects against over-focusing
- Unique “C-wrench” gives teachers control of focus tension
- Separate coarse and fine focus for easy use, simple servicing and teaching
- Cord holder on corded models provides a neat and easy method of cord containment
- Inward-facing (reversed) nosepiece allows user clear access to stage for slide manipulation
- All-metal internal parts assure long-term durability
- Energy efficient, variable LED provides white light with virtually no heat
- Extra bright LED lasts up to 50,000 hours between replacements for minimum maintenance and downtime
- Rechargeable cordless models allow up to 50 hours of use on a single 8-hour charge
- Optional add-on mechanical stage available for models with standard stage clips
- Lead-free objectives



Specifications	
Axis Type	Coarse and fine
Diaphragm	Iris
Eyepiece	10X, 18mm widefield
Grade	High school and other
Head Style	Monocular

WARRANTY:

Limited lifetime warranty on microscopes.
One-year limited warranty on camera.

Cat. No.	Condenser Type	Magnification Power	Voltage	Weight	Price
S19617A	Built-in 0.65 N.A.	4xD, 10xD, 40xRD achromatic	110V	9.8 lb. (21.6kg)	258.61/Each
S19617G	1.25 N.A. Abbe spiral	4xD, 10xD, 40xRD achromatic	110/220V	10.8 (23.8kg)	459.00/Each

Swift™ M29TZ-SM99CL-BTW1 Digital Screen Stereo Zoom Microscope

Representing the latest in educational, laboratory and research technology, the Swift™ Digital Screen Stereo Zoom Microscope can be used as a conventional stereo microscope or to share live images with your students or colleagues using WiFi tablets, WiFi enabled laptops and HD-ready LCD monitors or projectors through HDMI.

Microscope Features:

- Trinocular head
- Eyepiece: WF10X
- Viewing head rotates 360°
- Zoom 1X-4X
- Achromatic, color-corrected lenses
- Tension adjustment eliminates focus drift
- Working distance: 80mm
- Large dual focusing knobs with slip clutch to prevent damage to mechanism
- Top and bottom LED illumination
- For 120V 60Hz

Tablet Features:

- Attached camera bracket includes built-in camera to capture still and video clips
- Pre-loaded MotiConnect Apps allow for image capture, annotation and sharing

- USB and WiFi Interfaces
- Built-in MoticHub allows for wireless sharing

Tablet Specifications:

- Screen Size: 20.3cm (8 in.)
- Screen Resolution: 800 x 1280
- Camera Resolution: 5.0MP
- WiFi: 802.11b/g/n
- Ports: CD 5V Power Input, Mini HDMI, Micro SD Card Slot, 3.5 mm Audio
- HDMI Output: 1080
- Battery: Rechargeable

WARRANTY:

Swift Limited Lifetime Warranty, 1-year limited on the tablet screen

Cat. No.	Description	Price
S23870	Digital Screen Stereo Zoom Microscope; Model: M29TZ-SM99CL-BTW1	1540.00/Each



Swift™ SM100 LED Stereo Microscopes

Durable, versatile design is ideal for high school and college instruction.

A new look to the Swift Stereo line, the SM100 series offers an affordable stereo microscope with three different binocular head options with varying magnification. A variety of student-proof features make it perfect for teaching applications.

- Energy-efficient variable LED illumination with five light-setting options
- Right eyepiece diopter focusing adjustment
- “One-touch” spring-loaded stage clip
- Built-in handle encourages proper handling
- “Slip-clutch” focusing system protects against over-focusing
- Locked-on eyepieces and stage clips assure that the parts remain on the scope
- Unique C-wrench gives teacher sole control over focus tension
- Cord-hanger allows for safe and hassle-free cord storage
- Reversible black-and-white and frosted stage plates are included
- Interlocked eyepiece tubes with diopter for increased focus acuity
- Side magnification changer
- Eyeshields can be used on eyepieces to reduce ambient light

- Synthetic gear lubricant ensures smooth operation of all gears over a wide range of temperatures
- Light settings: turret, top, bottom, simultaneous turret and bottom or simultaneous top and bottom
- Corded or cordless stand
- Eyepieces: W10X, 20mm
- For 120V 60Hz

INCLUDES:

Reversible black and white and frosted stage plates, Vinyl dust cover, eyeshields and Instruction manual

ORDERING INFORMATION:

Dimensions: 12L x 8W x 13 in.H (30.5 x 20.3 x 33cm)

WARRANTY:

Limited lifetime on all defective parts and workmanship



Cat. No.	Description	Objective Types	Magnification Power	Head Style	Price
S01977B	LED Stereo Microscope	2X and 4X	20X and 40X	Binocular	400.00/Each

Fisher Science Education™ Intermediate Compound Microscopes

Microscopes that set the standard for middle/high school instruction and include all the most commonly specified features.

Optical System

- Widefield 10X eyepiece with revolving pointer
- Viewing head rotates 360° for easy repositioning of eyepiece and sharing by more than one student
- DIN 4X, 10X, and 40XR, objectives are achromatic, parfocalled, parcentered, and color coded
- 3-hole nosepiece is ball-bearing mounted for more precise alignment, has positive click stops

Focusing

- Separate low position coarse and fine focusing controls
- Slip clutch prevents damage to focusing system
- Tension adjustment eliminates stage drift
- Safety rack stop prevents damage to slides and objective lenses

Stage

- Stage moves up or down, eyepiece and body remain fixed

Frame

- Rugged cast metal, gray enamel finish

Monocular Optical System

- 45° Inclined head

LED Illumination Option

- LED light rated up to 10,000 hours life
- Cool burning illumination equal to a 20W tungsten bulb
- Base-mounted on/off switch
- Heavy duty 3-wire cord
- Convenient “grabber” clip on plug lets you wrap the cord around microscope and secure in place by pushing cord into clip for easy storage
- No bulky cord hanger needed

Fixed Stage Option

- Large stage, with locked-on, spring mounted stage clips, drilled and tapped to accept optional mechanical stage
- Built-in 0.65N.A. condenser lens; Calibrated 5-hole disc diaphragm

Mechanical Stage Option

- Large stage, with professional quality, low profile mechanical specimen holder with low- position coaxial x-y controls
- Built-in 1.25 N.A. Abbe condenser with iris diaphragm

INCLUDES:

Vinyl dustcover, battery charger, three AA NiMH batteries (batteries come with only S71001D)



WARRANTY:

Lifetime limited warranty, excluding bulb, batteries, cord, accessory mechanical stage

Cat. No.	Description	Price
S71001B	Intermediate Compound Microscope	276.00/Each

Fisher Science Education™ BTW1-169 Series Digital Tablet Compound Microscope

An advanced digital compound microscope combined with detachable LCD tablet technology for high school, university and laboratory use.

Microscope Features:

- Trinocular head
- **Magnification Power:** 40X, 100X, 400X, 1000X
- **Objective Types:** Semi-plan
- **Condenser Type:** 1.25 Abbe N.A.
- Energy-efficient LED illumination
- New rackless stage for ease of operation
- Upgraded objectives for image clarity with your choice of ASC, Semi-plan, plan or plan phase options

Tablet Features:

- Pre-loaded with Motic Apps to connect, view, and share live images
- LCD Android tablet, 20.3cm (8 in.) with 1280 X800 screen resolution
- Built-in camera captures still and video clips
- Mini HDMI output for high-resolution large screen viewing
- Micro-SD card
- USB and wifi interface allow for direct or wireless connection
- Built-in Motic Hub for wireless sharing
- Coaxial focus control

INCLUDES:

Motic Imaging software, vinyl dustcover, cables, 4GB micro SD card

WARRANTY:

Limited lifetime on the microscope, 1 year limited on the tablet



Cat. No.	Description	Price
S23888	Digital Tablet Compound Microscope Model: BTW1-169- SP	1733.00/Each

Fisher Science Education™ Advanced Stereomicroscopes

A real workhorse for high school and college education, as well as industry.

Precise optical alignment assures a three-dimensional, upright, unreversed image that is unsurpassed for everything from dissecting work to examining circuit boards.

Optical System

- Binocular head
- Magnification Power: 10X, 30X
- Objective Types: Parfocalled, Parcentered, and Achromatic
- Eyepiece: Paired 10X wide-field
- Paired widefield eyepieces are 45° inclined, with diopter adjustment
- Interpupillary adjustment from 55mm to 75mm
- Accepts optional eyepiece reticle
- Viewing head rotates 360°, locks in place by tightening set screw
- Paired objectives are parfocalled and parcentered
- Magnification is changed by rotating objective turret 90° to positive click stops

Illumination

- High intensity, 12V 10W incidental (top) light and 110V 15W transmitted (bottom) light
- 4-position switch: top only, bottom only, top/bottom, off

Focusing

- Rack and pinion focusing with slip clutch and tension adjustment

Stage

- 80mm reversible black/white plastic contrast plate and 80mm frosted glass stage plate
- Blue filter for transmitted light
- Locked-on stage clips

Frame

- Rugged, cast metal frame, gray enamel finish
- Height: 340mm (13 in.) extends to 370mm (14 in.) for larger objects
- Base width: 153mm (6 in.), Base depth: 218mm (8 in.)
- Net weight: 4.1kg (9 lb.)
- For 120V 60Hz

WARRANTY:

Lifetime limited warranty, excluding bulb, cord and fuse



Cat. No.	Description	Price
S71007	Advanced Stereo Microscope	373.00/Each

Fisher Science Education™ 420 Series Zoom Stereoscopic Microscope

For viewing large images at 10X magnification, Fisherbrand™ 420 Series Zoom Stereoscopic Microscope zooms continuously to close-up detail at 40X magnification.

- Upright, unreversed three-dimensional image remains in focus throughout zoom range
- Optional eyepieces and auxiliary objectives expand magnification range and working distances

Optical System

- Paired widefield 10X/20mm eyepieces are 45° inclined, with dual diopter adjustments, interpupillary adjustment from 55 to 75mm
- Accepts 23mm eyepiece reticle
- Viewing head rotates 360°
- Achromatic, color corrected lenses
- Continuous magnification from 10X through 40X
- Objective Classification: Achromatic, color corrected

Focusing

- Rack and pinion focusing with large dual focusing knobs with slip clutch to prevents damage to mechanism
- Tension adjustment eliminates focus 'drift'

INCLUDES:

Dustcover, rubber eyeshields, glass stage plate, black and white contrast stage plate

ORDERING INFORMATION:

Dimensions: 6.7W x 13.3 in. (171 x 340mm)

WARRANTY:

5 year limited warranty, excluding bulbs, cords, and fuses



Cat. No.	Description	Eyepiece	Magnification Power	Lighting Type	Head Style	Voltage	Weight	Price
S71008C	Zoom Stereoscopic Microscope; 420 Series	Paired widefield 45° inclined 10X 20mm	1X to 4X Zoom	Top 12V 15w halogen, bottom 110V 5w fluorescent	Binocular	110V	11.6 lb. (5.3kg)	707.00/Each

Fisher Science Education™ Advanced Compound Microscopes

Ideal for teaching microscopy to students of varying education levels.

Advanced Biological binocular microscope with precision optics. For use by students or professionals. This model has a Seidentopf head for comfortable viewing, coaxial focusing, low drive mechanical stage and LED illumination with intensity control. LED rated.

S71002

- Ideal for teaching microscopy to primary levels
- Cordless
- Monocular - supports 18mm field of view
- Low position focusing controls
- Separate coarse and fine focus
- Inward facing nosepiece
- Easy-grip design
- Floating stage with one touch stage clips
- Widefield 10x /18mm eyepieces
- 45° inclined monocular eyepiece
- 4X, 10X and 40X objectives
- 70mW/3.5v rechargeable LED illumination with intensity control

S71002G

- Advanced Biological binocular microscope with precision optics
- For use by students or professionals
- Seidentopf head for comfortable viewing
- Coaxial focusing and low drive mechanical stage
- LED illumination with intensity control
- LED rated for 50,000 hours.

ORDERING INFORMATION:

Replacement bulb for all models: S74018

INCLUDES:

Battery charger, 3 AA NiMH batteries (S71002B, S71002D, S71002F and S71002G only), vinyl dustcover

WARRANTY:

Microscope Warranty Option (S71002): 5 year limited warranty; Microscope Warranty Option (S71002A, S71002B, S71002C, S71002D, S71002E, S71002F, S71002G): Lifetime limited warranty, excluding bulb, cord, fuse and accessory mechanical stage, if any.



Cat. No.	Description	Eyepiece	Objective Types	Magnification Power	Lighting Type	Head Style	Base Style	Design Type	Diaphragm	Includes	Price
S71002	Model 205RLED	10X	DIN Achromat	40X, 100X, 400X	LED	Monocular	Fixed stage	Cordless	Disc (0.65 N.A.)	3 Objective Turret	230.00/Each
S71002B	Model 210RLED	10X	DIN Achromat	40X, 100X, 400X	LED	Monocular with built-in camera port head	Mechanical stage	Cordless	Iris	Pointer; 4 Hole Objective Turret	377.00/Each

Fisher Science Education™ 160-Series University/Laboratory Compound Microscopes

Designed for university and laboratory use. Fisherbrand™ 160-Series University/Laboratory Compound Microscope has good optical clarity and reliable mechanical engineering assure years of top performance.

- Remarkable optical clarity
- Choice of objective lenses: ASC, semi-plan, plan and phase
- LED energy-efficient illumination
- Large, built-in, low-profile, rackless stage
- Coaxial focusing
- Magnification: 40X, 100X, 400X, and 1000X

WARRANTY:

Lifetime limited warranty, excluding bulb, cord and fuse

Cat. No.	Condenser Type	Objective Types	Magnification Power	Head Style	Lighting Type	Price
S23876	Abbe 1.25 N.A	Semi-Plan	40X, 100X, 400X, 1000X	Binocular	LED	832.00/Each
S23883	Abbe 1.25 N.A	Plan phase	40X, 100X, 400X, 1000X	Trinocular	LED	2182.00/Each



fisherbrand Optical Lens Cleaner

Excellent for removing oil and smudges from objectives or any optical surface.

- Regular cleaning helps extend the life of your objective by removing surface debris that could cause scratching
- Cleans gently — will not affect a coated optic or soften the mounting that holds the objective in place
- Laboratory safe
- Nonflammable

ORDERING INFORMATION:

Supplied in 2 oz. (59mL) bottles



Cat. No.	Description	Price
S66878	Optical Lens Cleaner	55.08/Pack

Fisher Science Education™ Microscope: Dustcovers

- Heavy vinyl material with stitched seams

Cat. No.	For Use With (Equipment)	Size	Price
S74032	Model 114-LED compound microscopes	33 x 28cm	3.45/Each
S74033	Model 130, 131, 132, 138 and 139 compound microscopes	40.6 x 33cm	8.35/Each
S74034	Model 130, 131, 132, 138 and 139 compound microscopes	45.7 x 40.6cm	8.90/Each

FISHER SCIENCE EDUCATION NURSING AND CTE EDUCATION PROGRAMS

Career and Technical Education (CTE) gives students a head start on a future career in a STEM field. The Fisher Science Education™ brand offers the tools educators need to get them ready.

Visit fisheredu.com/nursingcte for a full list of products available to support your nursing, medical technology and other CTE programs.



fisher science education
part of Thermo Fisher Scientific

Moticam™ Digital Microscope Cameras

Transform a compound or stereo microscope into a digital microscope.

- Fit the eyepiece tube of most standard microscopes
- Come complete with Motic Images plus 2.0 Software for use with PC or Mac for still image or video capture, annotation, editing and measuring

Moticam 2 (S02359A)

Two megapixel live imaging for large display crisp imaging

Moticam 3+ (S22240)

Ideal for live imaging and documentation

Moticam 5+ (S22241)

Ideal for high-resolution live imaging and documentation

Moticam 10+ (S22242)

Create high-resolution still images and videos

Moticam 1080 (S22243)

Multi-output HDMI camera can be used with or without a computer

Moticam X2 (S02359H)

Built in battery, can run for 2 hours when charged, and has a network port.

WARRANTY:

One year limited (all models)

Specifications and Ordering Information

Cat. No.	S02359A	S22240	S22241	S22242	S22243	S02359H
Description	Moticam 2	Moticam 3+	Moticam 5+	Moticam 10+	Moticam 1080	Moticam X2
Price	356.00	713.00	917.00	1121.00	1019.00	458.00
Sensor	CMOS					
Active Resolution (through USB)	1600 × 1200 (2MP) @ 5 fps*	2048 × 1536 (3MP) @ 6 fps*	2592 × 1944 (5MP) @ 4 fps*	3664 × 2748 (10MP) @ 2.2 fps*	1920 × 1080 (2.0MP) @ 15 fps*	1280 × 1024 (1.3MP) (Wi-Fi only)
Interface Connection	USB	USB 3.0	USB 3.0	USB 3.0	HDMI (1080), AV and USB	Wi-Fi
Application	Use with white boards, compound or stereo microscopes, independently, PC, Mac	Ideal for live imaging, printed images, LCD projectors, live streaming video, PC, Mac	High-quality printed images, publishing and viewing on LCD screens, PC, Mac	High-quality printed images, publishing, and viewing on LCD screens, PC, Mac	For use with HDMI direct output or capture to SD card	For viewing on Android and iOS devices with MotiConnect App
Supported OS	Microsoft Windows 7 or higher; Apple macOS					Android (ICS & higher) iOS (5 & higher) Web browser (HTML5)
Warranty	1 year					

* Frames per second under optimal illumination conditions

Fisher Science Education™ Moticam™ Digital Microscope Camera

Use your own microscope to capture high-resolution still or video images with the Moticam Digital Microscope Camera.

- High-resolution camera permits you to use your own microscope to create still or moving microscope images on your PC
- Lightweight digital camera mounts over almost any microscope eyepiece (stereo or compound) with supplied C ring adapter and microscope eyepiece adapters
- Included Motic Images Plus software allows user to view, enhance, label, measure, print, and store the images all with one program
- Required Accessories: Processor: 2 Ghz or Above, USB 2.0 (minimum requirement), USB 3.0 (highly recommended), RAM: 2 GB, Hard disk: 1 GB (free space), Video card: 128 MB video memory

INCLUDES:

CS Ring Adaptor, Focusable Lens, 30mm and 38mm Eyepiece Adapters, USB3.0 Cable, Calibration Slide, Macro Tube, Motic Images Plus 3.0 for PC and OSX

Cat. No.	Resolution	Price
S02359A	2 MP digital signal @ 1600x1200 maximum resolution	356.00/Each



Fisher Science Education™ Advanced Digital Stereomicroscopes

Extra-rugged stereomicroscopes have a built-in high-resolution digital camera.

College/University Level

- Versatile stereomicroscope permits user to change from a widefield image at 10X magnification to close-up detail simply by rotating the objective turret
- Microscope is fully functional, independent of the camera
- S71013 features a 3.0 MP live image

INCLUDES:

Motic™ Images software, which allows the user to view, capture, label, manipulate and measure images; vinyl dustcover; rubber eyeshields

WARRANTY:

Lifetime limited warranty on microscope portion, excluding bulbs, camera and cords; Camera warranty: one year

Cat. No.	Description	Objective Types	Magnification Power	Lighting Type	Head Style	Price
S71013	Digital Stereo Microscope	Zoom	10X to 40X	Incidental/Transmitted	Binocular (Inclined/Rotating)	1648.00/Each



Fisher Science Education™ 416 Series Stereoscopic Microscopes

Provides dual magnification (Full size)

- Precise optical alignment assures three-dimensional, upright, unreversed image that is unsurpassed for everything from dissecting work to examining circuit boards
- Change between two magnifications simply by turning objective turret
- Both transmitted and incidental fluorescent illumination provide cool, efficient lighting (110V, 5w)
- Base mounted light controls permit choice of top only, bottom only, or dual illumination
- Magnification: 2X and 4X
- Paired widefield 10x eyepieces are 45° inclined, with diopter adjustment on left eyepiece
- Interpupillary adjustment from 55mm to 75mm
- Reticle holder accepts eyepiece reticle with 23mm O.D.
- Viewing head rotates 360°
- Heavy-duty rack and pinion focusing with slip clutch and tension adjustment

Stage:

- Includes two 80mm stage plates, frosted glass and reversible black/white plastic
- Blue filter for transmitted light
- Locked on stage clips

Frame:

- Cast metal frame, gray enamel finish.
- Height: 343mm (13.5 in.) extends to 375mm (14.6 in.) for larger objects.
- Base width: 171mm (6.75 in.), Base depth: 242mm (9.5 in.)
- Net wt. 9.2 lb. (4.2 kg)

Packing:

- Molded styrofoam container with rubber eyeshields and vinyl dustcover
- Individual: Ship wt. 14 lb. (6.4kg), Dimensions 550 x 375 x 375mm (22 x 15 x 15 in.)
- Master carton pack 2 each: Ship wt. 30 lb. (13.6 kg), Dimensions 475 x 375 x 475mm (19 x 15 x 19 in.)



WARRANTY AND SERVICES

Lifetime limited warranty, excluding bulb, cord, and fuse

Cat. No.	Description	Price
S71007B	Stereoscopic Microscopes	459.00/Each



Cat. No.	Description	Price
S02359A	Moticam 2	356.00/Each
S22240	Moticam 3+	713.00/Each
S22241	Moticam 5+	917.00/Each
S22242	Moticam 10+	1121.00 /Each
S22243	Moticam 1080	1019.00/Each
S02359H	Moticam X2	458.00/Each

Global Tourism Takes Environmental Toll

By Mae Pyer

Globetrotting tourists who travel the world for vacations, honeymoons, and business may be boosting the global economy, but they're also releasing more and more carbon dioxide into the atmosphere — giving staycations new green appeal.

Tourism Takeover

With global tourism on the rise, our carbon footprints are growing. A new study reported in *Nature Climate Change* revealed that global travel accounts for about 8% of overall greenhouse gas emissions and impacts the environment three to four times more than previously recorded.

Earlier studies have documented the environmental impact of only air travel, but there's much more to the story. The current study considers

how the tourism industry as a whole contributes to our greenhouse gas emissions. This includes shopping, dining, hotel hopping, travel, and the construction and maintenance of corresponding establishments.

Data collected from 160 countries showed that the tourism industry is responsible for releasing 4.5 billion tons of carbon dioxide into the air annually. Of that total, only 12% came from air travel. When the data was compiled in 2013, global tourism accounted for \$4.7 trillion in spending, almost twice the amount reported in 2009.

As a huge source of and destination for tourists, the United States proved to have the largest tourism industry, therefore contributing the most to the global carbon footprint. Of total global emissions, 2.7% come solely from Canadian and

Mexican tourists traveling to the United States. Other countries like Germany and China also contribute significantly to global emissions.

The Future of the Industry

If these trends continue, tourism-related emissions will increase to 6.5 billion tons by 2025 — an expansion of our carbon footprint by more than 40%.

To reduce current emissions and to prevent these levels from increasing, the United Nations World Tourism Organization has suggested that travelers choose destinations that are closer to home. Opting for public transportation in these instances can also help to decrease travel-related emissions. Additionally, they recommend that governments create incentives to increase

energy efficiency in tourist-related businesses.

[DISCUSSION QUESTIONS]

In what ways can tourists decrease their environmental impact?

Discuss how greenhouse gases contribute to climate change and why this dynamic concerns scientists.

How can you minimize your environmental impact when you're at home and not traveling?

[VOCABULARY]

CARBON FOOTPRINT

EMISSION

GREENHOUSE GAS

TOURISM

Data Collection

LAB-AIDS™ Qualitative Introduction to Water Pollution Kit

See how water's natural color doesn't accurately indicate its degree of purity or pollution.



- Identify the pH level of natural or treated water
- Test for the presence of 10 pollutants
- Detect pollutants through color changes — the depth of color that results during testing signals the degree of pollution
- Identifiable pollutants include: ammonia, chlorine, chromium, copper, cyanide, iron, nitrate, phosphate, silica and sulfide
- Bottles are unbreakable, spillproof and designed for drop control

ORDERING INFORMATION:

Class size: 50 students.

INCLUDES:

Instructions and background information

Cat. No.	Description	Price
S19348	Water Pollution Kit	221.00/Each

LAB-AIDS™ Modeling and Comparing Fossil Fuel and Biofuel Combustion Kit

"Combust" and evaluate fossil fuels.



Leads students into discussions about energy issues and impacts.

- Students model chemical combustion processes with methane, octane and ethanol, plus oxygen
- Determine the combustion reactions and CO₂ released
- Calculate energy released and compare fuels

INCLUDES:

Materials for 12 students in teams of two or three each

Cat. No.	Description	Price
S95927	Fossil/Biofuel Combustion Kit	139.00/Each

fisherbrand

Simultaneously displays time, temperature, and humidity.



Fisherbrand™ Traceable™ Thermometer/Clock/Humidity Monitor

- Memory recalls MIN and MAX temperature and humidity readings
- Features: MIN/MAX memory, memory clear, 12/24-hour clock, °F/°C temperatures
- Internal sensors make it ideal for use in classrooms, libraries, storerooms, incubators, and drying or environmental cabinets
- On demand readings — sits on desk or lab bench for convenience
- Dimensions: 4.25 x 2.25 x 0.5", weight: 2.5 ounces
- Includes: stand, wall mount, AAA batteries, Traceable Certificate

Range	Resolution	Accuracy	Cat. No.	Price
Time: 12/24-hour clock	1 minute	0.01%	S66279	\$54.00
Temperature: 32.0 to 122.0°F (0.0 to 50.0°C)	0.1°	±1°C		
Humidity: 20 to 90% RH	1%	±5% RH Midrange Otherwise ±8% RH		

fisher scientific
part of Thermo Fisher Scientific

fisherbrand Traceable™ Lollipop™ Shock/Waterproof Thermometer

Offers minimum/maximum temperature readings. Fisherbrand Traceable Lollipop Shock/Waterproof Thermometer is water-resistant and is ideal for wet labs, wash-down areas, and all field applications.



- Stainless-steel probe is resistant to most laboratory chemicals
- Shockproof in drop tests up to 5 ft.
- Memory recalls highest and lowest temperature readings which are updated every second
- Solid-state construction eliminates dangers inherent in breakable glass
- Bright and easy to view 0.25 in. high display
- Traceable to NIST for accuracy
- Temperature range: -50 to +300°C (-58° to +572°F)
- Resolution: 0.1° from -20° to 200°; 1° outside this range
- Accuracy: ±1°C between 0 and 100°C
- Stem diameter: 3.5mm (0.14 in.)
- Stem length: 203mm (8 in.)
- Overall length: 260mm (10.25 in.)
- Width: 44.4mm (1.75 in.)
- Depth: 12.7mm (0.5 in.)
- Weight: 0.87 oz.

CERTIFICATIONS:

Individually serial-numbered Traceable™ Certificate is provided from an ISO 17025 calibration laboratory accredited by A2LA™. It indicates traceability to standards provided by NIST™.

Cat. No.	Description	Price
S04823	Lollipop Traceable waterproof thermometer	33.00/Each

fisherbrand Traceable™ Digital Humidity/Temperature/Dew Point Meter

Convenient triple memories recall minimum/maximum readouts for relative humidity, dew point and temperature.

- Audible and visual LED alarm may be set to trigger at three different humidity readings (55%, 60% or 65%)
- Solid state sensors deliver response times of less than 30 seconds, °F/°C switchable
- Supplied: wall mount, batteries, Traceable™ Certificate

- Dew Point: 14 to 140°F (-10 to 60°C)

Traceable™ to NIST for Accuracy An individually-numbered Traceable Certificate is provided which assures accuracy from an ISO/IEC 17025 (1750.01) calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST (National Institute of Standards and Technology).

CERTIFICATIONS:

Individually serial-numbered Traceable™ Certificate is provided from an ISO 17025 calibration laboratory accredited by A2LA™. It indicates traceability to standards provided by NIST™.



Cat. No.	Description	Price
S04709	Digital Humidity Temperature/Dew Point Meter	52.00/Each

fisherbrand Traceable™ Big-Digit Timer/Stopwatch

Set four separate channels from 99 hours, 59 minutes, 59 seconds to one second.

- Giant 0.75 in. (19mm) display for greater readability
- Features include count down, count up (stopwatch), time-out and time of day
- When zero is reached, alarm sounds and timer starts counting up
- All four channels may be used simultaneously in any combination of count down/count up
- Equivalent battery replacements are: RAYOVAC RW42, DURACELL D357, and EVEREADY 357.



ORDERING INFORMATION:

Dimensions: 2.75L x 2.5W x 0.5 in. H (7.0 x 6.4 x 1.3cm).

INCLUDES:

Silver Oxide battery

CERTIFICATIONS:

Individually serial-numbered Traceable™ Certificate is provided from an ISO 17025 calibration laboratory accredited by A2LA™. It indicates traceability to standards provided by NIST™.

Cat. No.	Description	Price
S407992	Big-Digit Timer/Stopwatch	36.00/Each

Vernier Mini GC Plus Gas Chromatograph

Portable instrument for separating, analyzing and identifying polar substances contained in a volatile liquid or gaseous sample.

- Maximum temperature of column is 160°C, which offers more flexibility in designing temperature profiles
- Standard sensitivity mode works well for polar compounds; High sensitivity mode for compounds such as halogenated alkanes and substituted aromatics
- Uses room air as the carrier gas
- Pressure regulation from 1 to 21kPa above ambient
- Temperature regulation from 30° to 160°C
- Comes with 1µL glass syringe, 2.8 in. stainless needle with non-coring beveled tip and needle guard, 1.5 in. injectable length; Injection is direct from syringe to column
- With either Logger Pro™ or the LabQuest™ App, peak integration analysis and retention-time determination are built right into the software
- Requires software for Mini GC Plus (sold separately)
- Warranty: Two years on unit only



Cat. No.	Description	Price
S16007ND	Mini GC Plus Gas Chromatograph	2022.00/Each

Vernier Anemometer

Measures wind speed in a variety of experiments.

Hold the sensor in hand to measure wind speed in dynamic environments or use the accessory rod to position it in front of wind tunnels or fans.

- Impeller-type anemometer with the axis of rotation parallel to the direction of the wind
- Uses magnet located in the impeller and an inductor
- With standard camera mount on the back and accessory rod
- Range: range of 0.5 to 30m/s (1 to 67 mph)
- Resolution: 1.2×10^2 m/s



Cat. No.	Description	Price
S15963ND	Anemometer	90.00/Each

Vernier Infrared Thermometer

Non-contact, fast-responding temperature measuring device.

- Measures infrared radiation emissions by objects
- Simply point the sensor at an object and read its temperature
- Features automatic backlighting, simple on/off operation and laser circle sighting
- Recommended for all grades
- Compatible Interfaces: LabQuest™ 2, Original LabQuest, LabQuest Mini, Go!Link™, SensorDAQ™, LabPro™, EasyLink™, CBL2™, TI-Nspire Lab Cradle™



Specifications:

- Temperature range: -20° to +400°C
- Operating Temperature Range: 0° to 50°C at <70% relative humidity
- Display Resolution: 1°C
- Accuracy: ±2% of reading or ±3°C, whichever is greater at 18° to 28°C ambient operating temperature
- Response time: 1 second
- Display Resolution on the Meter: 1°C
- Spectral Response: 6 to 14µm nominal
- Emissivity: preset 0.95
- Detection Element: Thermopile
- Field of View: 65mm diameter circle at 1000mm range
- Average Battery Life: 100 hours

ORDERING INFORMATION:

Interface and software sold separately.

INCLUDES:

Infrared Thermometer, interface cable, four AAA batteries, Omega Infrared thermometer Manual, user manual

REQUIRES:

Compatible interface and software to collect data.

WARRANTY:

Five years (limited).

Cat. No.	Description	Price
S15984ND	Infrared Thermometer	199.00/Each

Vernier EKG Sensor

Measures electrical signals produced during muscle contractions.



- Measures cardiac electrical potential waveforms (voltages produced during the contraction of the heart)
- Can be used to make standard 3-lead EKG tracings to record electrical activity in the heart, or to collect surface EMG recordings to study contractions in muscles in your arm, leg or jaw

Specifications:

- Offset: ~1.00 V (±0.3V)
- Gain: 1mV body potential / 1V sensor output
- Includes user manual

Data Collection: This sensor can be used with the following interfaces to collect data:

- Vernier LabQuest™ 2 or original LabQuest™ as a standalone device or with a computer
- Vernier LabQuest™ Mini with a computer
- Vernier LabPro™ with a computer or TI graphing calculator
- Vernier Go!Link™
- Vernier EasyLink™
- Vernier SensorDAQ™
- CBL 2™
- TI-Nspire™ Lab Cradle

REQUIRES:

An interface and software, sold separately

Cat. No.	Description	Price
S16142ND	EKG Sensor	149.00/Each

Vernier Chemical Polarimeter

Used for measuring rotation of plane-polarized light caused by optically active substances such as organic, inorganic, or biological compounds.

- Used to measure chiral properties of optically active samples without chemically modifying or destroying sample
- Is vertical polarimeter that uses 589nm LED, fixed polarizer, and manually rotated polarizer to detect changes in rotation of plane-polarized light in presence of optically active compound
- Compatible with LabQuest 2, Original LabQuest, LabQuest Mini, SensorDAQ, LabPro, TI-Nspire Lab Cradle interfaces
- Optical Encoder: Bidirectional, quadrature encoder, 360 cycle per revolution



INCLUDES:

Chemical Polarimeter, One Chemical Polarimeter Sample Cell, User manual

Cat. No.	Description	Price
S16121ND	Chemical Polarimeter	510.00/Each

Vernier pH Electrode with BNC Connector

A general-purpose pH electrode that connects to a Vernier electrode amplifier.



- For use with Electrode Amplifier, Go Wireless Electrode Amplifier and Go Wireless™ pH
- Gel-filled combination pH electrode (Ag/AgCl)
- Sealed gel-filled reference half cell
- Epoxy body extends below glass sensing bulb of the electrode
- Ideal for use in middle school, high school, or university level science class or for making measurements in the environment

Specifications:

- pH range: 0 to 14
- Accuracy: ±0.2 pH units
- Isopotential pH: 7
- Response Time: 90% of final reading in 1 second
- Temperature Range: 5° to 80°C
- Shaft Outer Diameter: 12mm

INCLUDES:

pH Electrode with BNC terminated cable, pH storage solution bottle with pH storage solution (pH 4 KCl solution)

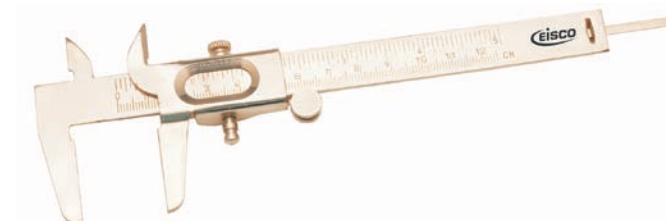
WARRANTY:

Five years (limited).

Cat. No.	Description	Price
S16237ND	pH Electrode BNC	41.00/Each

Eisco Vernier Caliper

Plated steel, columbus type calliper enables the user to read either inside, outside or depth measurements.



- Dual scale 0 to 12.5cm x 0.1mm
- Imperial scale graduated to 5 x 0.0078 in. provided with thumb wheel for easy motion of jaws, in plastic case

Cat. No.	Description	Price
S99340	0 to 12.5cm x 0.1mm dual scale; Graduated to 5 x 0.0078 in.	6.70/Each

K'NEX Education™ Forces, Energy and Motion Set

Powerful and dynamic tools for creative learning.



- Hands-on investigation of potential energy and motion, inertia, speed and friction
- Students will build and experiment with 11 models powered by flywheel, spring and battery motors and wind power
- Uses rubber band spring motor-powered vehicles to investigate potential and kinetic energy
- Builds 11 curriculum-related models; builds up to four models at a time
- Grades 5 to 9

Key Concepts Include:

- Potential Energy (Gravitational and Elastic)
- Speed/Velocity
- Kinetic Energy
- Friction
- Inertia
- Motion and Force

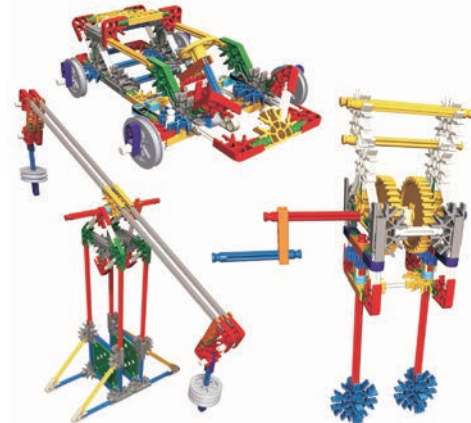
INCLUDES:

- 442 K'NEX™ pieces
- Color-coded building instructions
- Two battery motors
- Two flywheel motors
- Four transparent spring motors
- Comprehensive teacher's guide with seven inquiry-based lessons

Cat. No.	Description	Price
S94282	Racer Energy Set	157.00/Each

K'NEX Education™ Introduction to Simple Machines Building Sets

Bring STEM concepts to life as your students build fully functioning replicas of real-world machines, one at a time.



- Each set includes instructions to build seven or more replicas of real-world machines, one model at a time
- Sets include K'NEX™ parts, building instructions, key facts and photos of actual machines
- Packs of four
- Grades 3 to 5

Key Concepts Include:

- Making Work Easier
- W=Fd (Work equals force times distance)
- Changing the Direction of Force
- Ideal Mechanical Advantage
- Actual Mechanical Advantage
- Wedge Screw
- Gear Ratios
- Mechanical Systems
- Gear Types
- Lever Classes
- Pulley Systems

Gears Set Includes:

- 198 K'NEX pieces per set
- Building instructions for seven replicas of real-world machines
- Demonstrates gear configurations, including spur and crown gears, mechanical advantage, gear ratios, how gears are used to change the amount of applied force to an object and more

Levers and Pulleys Set Includes:

- 178 K'NEX pieces per set
- Building instructions for eight replicas of real-world machines
- Demonstrates lever classes and pulley systems, showing how and why simple machines make work easier

Wheels/Axles and Inclined Planes Set Includes:

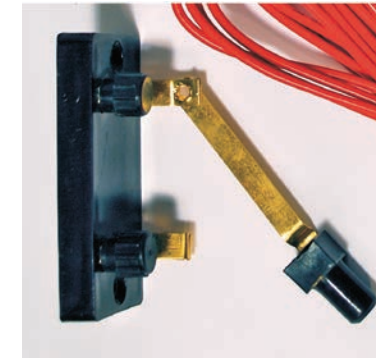
- 221 K'NEX pieces per set
- Building instructions for seven replicas of real-world machines
- Explore examples of wheels and axles and identify the differences between an inclined plane, wedge and screw

Cat. No.	Description	Price
S67347	Gears Set	43.00/Each
S67348	Levers and Pulleys Set	43.00/Each
S67349	Wheel and Axle Set	43.00/Each

Eisco Basic Circuits Kit

An inventive way to teach series-parallel circuits.

- Contains everything required to study series-parallel circuits and batteries
- Battery holders, knife switches and lamp holders feature clip or screw contacts for easy assembly and disassembly



INCLUDES:

Single-pole, single-throw switch; five miniature lamps; two lamp sockets; two D batteries and battery holders; 10 ft. (3m) of wire

Cat. No.	Description	Price
S63323A	Basic Circuits Kit	26.00/Each

Soldering Station

Electronic control.

- Ideal for students
- Provides 5 to 40 watts
- ON/OFF indicator light



INCLUDES:

Soldering iron, holder funnel and sponge pad

Cat. No.	Description	Price
S65269	Soldering Station	49.71/Each

Alfa Aesar™ Liquid Soldering Flux

For general soldering.

- UN1840
- 100mL

Cat. No.	Description	Price
AA45581AE	Liquid Soldering Flux	14.07/Each

Soldering Assist Tools

For use with soldering equipment.

Lead Free Solder Tube

- Includes: Rosin core
- Tin, Copper material
- 60 in.(150cm.)



Desoldering Pump

- Includes: Anti static tip



Cat. No.	Description	Price
S97692	Lead Free Solder Tube	5.64/Each
S97693	Desoldering Pump	8.51/Each

Multicore Solder

On a convenient spool

- Five cores of noncorrosive flux
- 180 ft. (55cm)
- Each 159 oz. (454g) spool is 18-gauge with 60/40 tin/lead mixture
- Perfect for classroom demonstrations and projects



Cat. No.	Description	Price
S50342	Lead Free Solder Tube	61.00/Each

United Scientific™ Seven-Piece Tool Kit

Drop-forged tool kit is perfect for classroom projects. Comes in a recloseable polybag.



INCLUDES:

- Adjustable crescent wrench, 152mm
- Slip-joint pliers, 152mm
- Long-nose side-cutter pliers, 140mm
- Unbreakable plastic screwdriver handle with four blades (mechanic, Phillips and electrician types)

Cat. No.	Description	Price
S47246	Seven-Piece Tool Kit	57.50/Each

Diversified Woodcrafts™ Drawer Base Drawing Table

Constructed of solid maple and maple veneers and coated with a chemical resistant, earth-friendly UV finish.

- Plywood cabinet and solid maple apron and legs
- Includes separately master-keyed six locking drawers (19.75D x 10.5W x 3.25 in.H)
- Drawers are completely finished and dovetailed on all four sides
- Top is 0.75 in. almond colored plastic laminate
- Choose from one-piece fully adjustable top or two-piece top model with a 24 x 24 in. adjustable side and 12 x 24 in. flat, fixed side
- MAS Certified Green, SEFA-compliant
- Features pencil stop and include soft-close feature
- Top adjusts from 0 to 30°
- Limited lifetime warranty



Cat. No.	Description	Price
S42658	One-piece fully adjustable model	2194.00/Each
S47321	2-piece model with one fixed and one adjustable side	2219.00/Each

Texas Instruments™ TI-Nspire™ CX Handheld — Teacher's Pack

The perfect solution for the classroom, lab and field.

Explore dynamic simulations and collect data with Vernier™ sensors. A virtual and real-world way to explore science.

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- Instantly turn the TI-Nspire CX handheld into a data collection device by attaching a Vernier EasyLink™ USB interface and sensor
- For advanced data collection, use the TI-Nspire Lab Cradle (sold separately); supports simultaneous use of up to five Vernier sensors
- Use digital images or your own photos to connect science concepts with real-world scenarios
- Touchpad navigation works more like a laptop computer
- Approved for standardized tests — SAT™, PSAT/NMSQT™, ACT™, IB and AP exams
- Screen size: 320 × 240 pixels (3.2 in. [8.1cm] diagonal)
- Screen resolution: 125 dpi; 16-bit color
- Memory: 100MB storage memory/64MB operating memory

ORDERING INFORMATION:

Handhelds powered by the TI-Nspire rechargeable battery (included) that lasts up to two weeks of normal use on a single charge. No alkaline batteries needed.

INCLUDES:

Teacher Pack: Ten handhelds with rechargeable batteries installed, 90-day trial of TI-Nspire and CAS Teacher Software, ten USB cables, five unit-to-unit cables, one manual, docking station and poster



Cat. No.	Product Type	Price
S02280ND	TI-Nspire — CX Handheld Teacher Pack	2020.00/Each

Life Science

Scratching the Surface of Severe Itching

By Kylie Wolfe

What if all it took to cause an intolerable itching sensation was a gentle touch? Some people experience this problem daily. Unfortunately, there are no existing medications or anti-itch creams that can relieve this discomfort.

What should feel like an ordinary physical sensation is instead perceived as an itch, making normal day-to-day interactions and activities uncomfortable. Some types of clothing can even trigger this response, making it impossible to wear certain fabrics.

Itching for a Cure

Itching is linked to the number of mechanoreceptors in a person's skin, according to a recent study conducted by researchers at Washington University School of Medicine in St Louis, Missouri.

These receptors are formed by an interaction between nerve endings and tactile epithelial cells called Merkel cells near the skin's surface. As people age, they may experience a decrease in the number of these cells, causing them to lose their ability to block itching sensations.

In this study, scientists used a thin, nylon tool to spark a sensory response in mice. As mice age, the number of Merkel cells in their skin decreases, causing an increased itch response. Mice with dry skin experience this problem as well because they also lack the proper number of these cells.

Researchers also tested mice whose Merkel cells were genetically engineered to react to a chemical compound. When treated with the compound, the Merkel

cells became activated, which decreased the animal's desire to scratch when touched with the nylon tool.

Another focus of this study was Piezo2, a protein on the membranes of Merkel cells. Researchers found that this protein helps control Merkel cells, minimizing their response to an itch. This conclusion may lend itself to future treatment discoveries.

Future Studies

To further their understanding, researchers are now examining skin samples from patients who suffer from this problem. If the number of Merkel cells is fewer than normal, activating those cells might serve as a potential solution.

Researchers believe that having

the ability to control these cells can help control touch-related itching and lead to more effective treatments in the future.

[DISCUSSION QUESTIONS]

Discuss and draw the sensory pathway your body uses to understand messages from stimuli. Include the words stimulus, mechanoreceptor, Merkel cell, nerve ending, neuron, and central nervous system. How is this pathway interrupted as we age? What are the other kinds of sensory receptors and what do they help us detect?

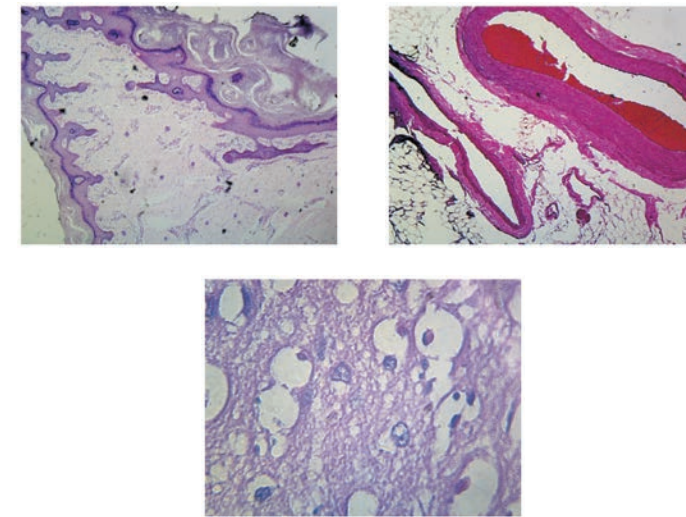
[VOCABULARY]

- STIMULUS
- MECHANORECEPTOR
- NERVE ENDING

Biology

GSC Go Science Crazy Microscope Slides

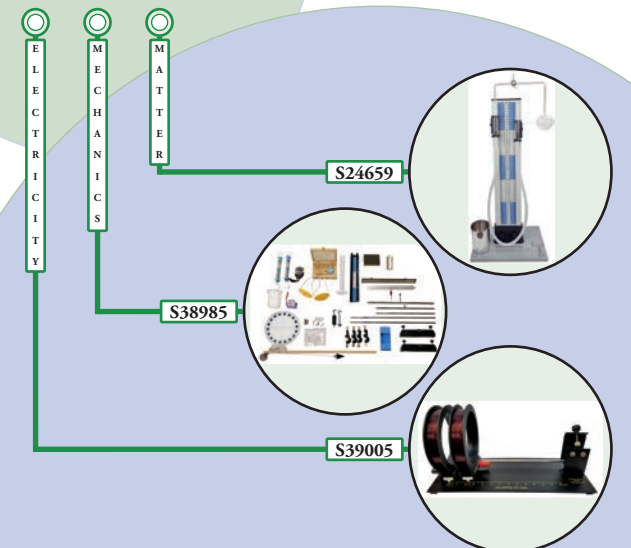
- Prepared slide for use with classroom science studies
- Pre-cleaned glass slides with smooth ground edges
- Cross sections



Cat. No.	Description	Price
S06228PS	Human artery, vein and nerve	8.40/Each
S06214PS	Human cerebral cortex	6.30/Each
S06081PS	Human skin	8.45/Each



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CAT. NO.	DESCRIPTION	PRICE
S24659	Charles' Law Apparatus, Deluxe	\$166.00
S38985	Mechanics Kit	\$352.00
S39005	Helmholtz Coil	\$136.00

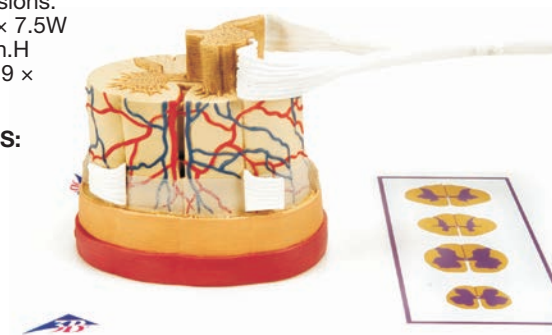
3B Scientific™ Spinal Cord Model with Nerve Endings

Magnified to a scale of about 5:1.

The spinal cord is formed by a central channel surrounded by "gray matter" with an outer layer of "white matter." The base features illustrations of various cross sections through the white and gray matter at the neck, torso and lumbar and sacral regions.

- Dimensions: 10.2L × 7.5W × 5.2 in.H (26 × 19 × 13cm)

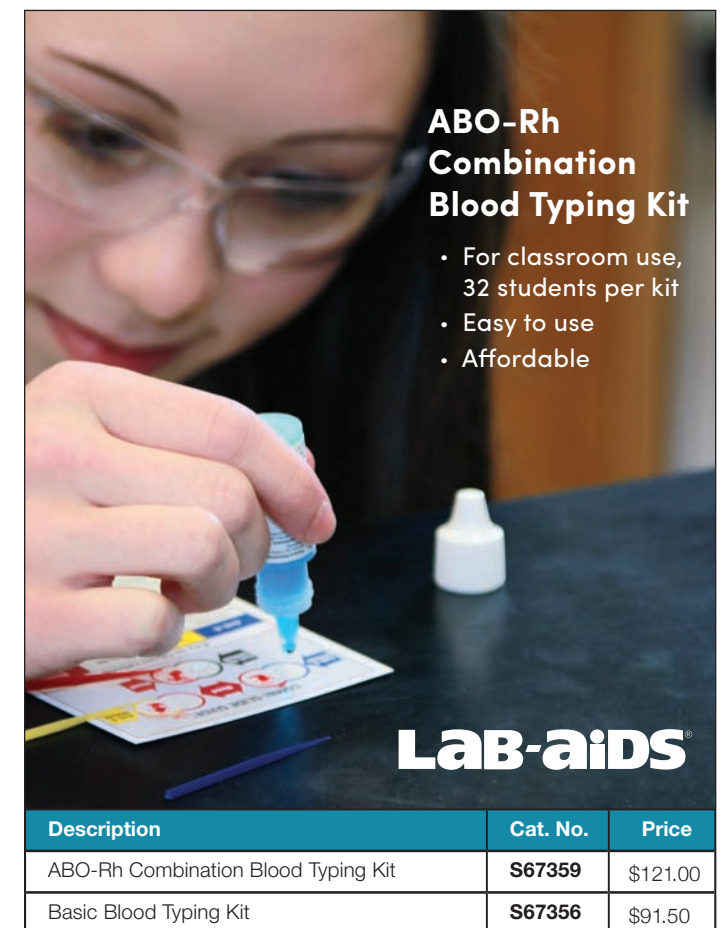
INCLUDES:
Base



Cat. No.	Description	Price
S96427	Spinal Cord Model with Nerve Endings	378.00/Each

ABO-Rh Combination Blood Typing Kit

- For classroom use, 32 students per kit
- Easy to use
- Affordable



Lab-aids

Description	Cat. No.	Price
ABO-Rh Combination Blood Typing Kit	S67359	\$121.00
Basic Blood Typing Kit	S67356	\$91.50

LAB-AIDS™ Human Senses Experiment Kit

Our most complete kit on the human senses.

- Thoroughly explore the human sensory system
- Identify response areas
- Become aware of sensory perceptions
- Class size: 30 students



INCLUDES:

- Two bottles each of sweet solution, salty solution, bitter solution and sour solution
- 120 cotton applicators, 8mm
- 30 plastic taste solution dishes
- 30 taste “maps”
- Two vials of perfume, two vials of peppermint oil
- 30 plastic inhalers
- Pack of bristles
- Pack of straight pins
- 30 metal probes
- 15 Styrofoam™ holders

- 30 cotton-tipped applicators, 15mm
- 30 individual blind spot determiners
- Student worksheets
- Detailed instructions and full background information

Cat. No.	Description	Price
S19342	Human Senses Experiment	125.00/Each

3B Scientific™ Skin Model

Represents sections of human skin with magnification of 80X.

Consists of three individual parts on a common stand. Anatomical differences of skin sections are didactically represented in a clear, easily understandable manner. Microscopic structures such as nerve, vessels and tactile corpuscles have been accurately and spatially represented on model.



Microanatomical representation of:

- Papillary layer (e.g., localized in the palm of hand)
- Reticular layer (e.g., localized at the back of hand) Longitudinal section through the human scalp with hair follicle and root sheath

Cat. No.	Description	Price
S06780	Skin Model	285.00/Each

Biotechnology

Bacteria-Killing Plastic Could Reduce Infections

By Mike Howie

When you're sick and go to the hospital, you expect to get better — not pick up yet another infection. But that's what happens to about one out of every 10 hospital patients around the world.

The many surfaces in hospitals — from phones and keyboards to bedrails and doorknobs — are touched by hospital staff and patients every day. If these surfaces become contaminated with pathogenic bacteria, the microbes can be unintentionally spread, along with the risk of infection, to other surfaces, co-workers, or patients.

Although this can happen anywhere, it's especially dangerous in hospitals, where a large population of people are already

sick or otherwise compromised. That's why doctors and researchers are always looking for new ways to keep hospital surfaces cleaner, and why Ethel Koranteng, a chemist at University College London in England, has worked to develop a new type of surface that can kill bacteria.

Fighting Germs with Light

Koranteng and her team made the new surface from common polyurethane plastic, but the important part is what's inside. The plastic is embedded with tiny semiconductor nanobits called quantum dots and a light-sensitive dye called crystal violet. Together, they use light to create a high-energy oxygen molecule that works as a potent antibiotic.

Engineers in Asia created a similar surface decades ago, but it required UV light, which can be hazardous to the skin and eyes. Koranteng's surface works with ambient lighting, which is much safer and far more practical.

The team tested their new surface against common bacteria with impressive results. It killed a complete strain of *Staphylococcus aureus*, 99.99 percent of *Escherichia coli*, and 99.97 percent of methicillin-resistant *S. aureus* (a strain of *S. aureus* that's immune to many antibiotics).

In addition to being effective, the surface is also versatile. It can be made into a flexible film that could be used to cover keyboards and instrument panels, or molded into

rigid casings that could protect phones, bedrails, doorknobs, and more.

The team's invention could potentially play a part in helping to reduce the risk and frequency of infections acquired in hospitals, which would make a meaningful difference in the lives of patients and doctors around the world.

[DISCUSSION QUESTIONS]

Where else might the use of a surface like this prove beneficial?

How else can hospitals reduce the risk of hospital-acquired infections?

[VOCABULARY]

- ANTIBIOTIC
- BACTERIA



CORNING

Corning™ Stripettor™ Ultra Pipet Controller

Fast, precise, and safe liquid transfer

A light, ergonomic, motorized pipet controller designed for use with glass and plastic serological pipets from 0.5 to 100mL. When fully charged, the batteries enable up to eight hours of continuous use. The large LCD display clearly indicates battery status, pipetting mode, and speed.



Description	Cat. No.	Price
Corning Stripettor Ultra Pipet Controller, with Universal Power Supply, Three 0.2µm Filters, Three Colored Nose Pieces, and Wall Hanger	S72302	\$425.00

LAB-AIDS™ Natural Selection and Antibiotic-Resistant Bacteria

Antibiotics are effective against many bacterial infections, but not against viral infections.



- Model the effects of antibiotics on the population of disease-causing bacteria during an infection
- Some groups will model the full course of antibiotics, while others will miss doses
- Graph populations of more-resistant and less-resistant bacteria
- Demonstrates how more-resistant bacteria forms when treatments are intermittent or discontinued prematurely

Cat. No.	Description	Price
S94501	Natural Selection and Antibiotic-Resistant Bacteria Kit	86.25/Each

LAB-AIDS™ Tracking the Spread of Infectious Diseases

The activity in this kit simulates the transmission of a contagious disease. LAB-AIDS™ Tracking the Spread of Infectious Diseases simulates the steps epidemiologists take to try to determine its source and limit its spread.



Contagious diseases can spread quickly through a population. If an infected individual mingles with healthy individuals, random contact can cause many more to become infected. This activity simulates the transmission of a contagious disease and the steps epidemiologists take to try to determine its source and limit its spread. Two scenarios are provided, one for an infection spreading among humans and another among livestock. If desired, the kit materials also can be used to simulate different “trackable” spreading event scenarios such as an invasive species or an outbreak of food poisoning.

- Maximum 24 students
- 1-2 50 minute class periods
- Student worksheets incorporate literacy skills

Concepts Illustrated:

- Disease is a breakdown in structures or functions of an organism
- Scientific explanations emphasize evidence, have logically consistent arguments, and use scientific principles, models and theories
- Safe living involves the development and use of safety precautions and recognition of risk in personal decisions
- Important personal and social decisions are made based on perceptions of benefits and risks

INCLUDES:

Teacher's guide; 28 student worksheets and guides; 24 100mL plastic cups; 15mL drop control bottle of 2% sodium carbonate solution; 30mL drop control bottle of “Infection Test Solution”; Transparency: Class Infection History; SDS packet

Cat. No.	Description	Price
S20956	Kit: Tracking the Spread of Infectious Diseases	34.50/Each

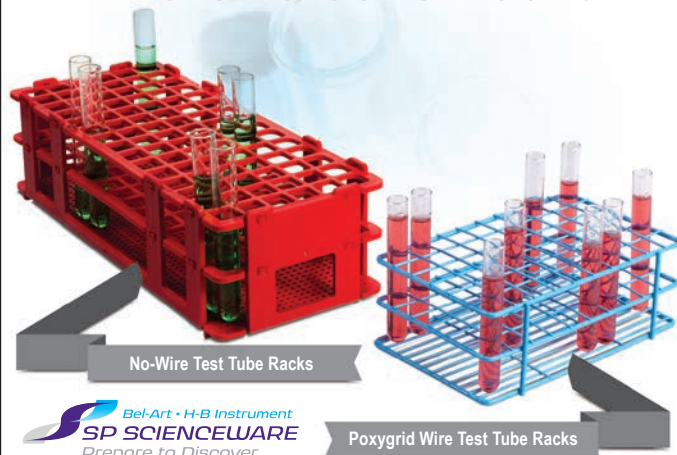
Chemicals for Education

- ✓ Value
- ✓ Quality
- ✓ Safety



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Plastic or Wire The Choice is Yours



Bel-Art • H-B Instrument
SP SCIENCEWARE
Prepare to Discover

Description	Cat. No.	Price
Bel-Art™ SP Scienceware™ No-Wire™ Autoclavable Test Tube Racks, 10 to 13mm Tubes	S43072	\$20.25/Each
Bel-Art™ SP Scienceware™ Poxygrid™ Wire Test Tube Racks, 10 to 13mm Tubes	S43521	\$48.00/Each

Visit fisheredu.com for more details and additional rack sizes.

Light Helps Yeast Produce Fuel

By Eleanor Jennings

Science-based learning has been fundamental to major breakthroughs and discoveries. Using light to control cells is yet another example. Through genetic engineering, neuroscientists have learned how to use light to control neurons, leading to huge opportunities for better understanding the human brain and its function. Now scientists are applying similar methods and using the theories of optogenetics, or the study of light to control genes, to modify the metabolism of yeast so it produces chemicals that could one day be used commercially.

Not Just for Bread and Wine

Yeast are simple, single-celled microorganisms instrumental in the creation of everyday foods and beverages. Through fermentation, normal yeast cells transform sugar into carbon dioxide. It's what

makes bread rise. Yeast cells can also transform sugar into ethanol, which is what produces the alcohol in wine and beer. Simultaneously, they produce miniscule amounts of isobutanol, a chemical that can be used to fuel vehicles.

Optogeneticist Jose Avalos and fellow team members at Princeton University have figured out that it is possible to genetically engineer yeast cells to produce large quantities of valuable isobutanol, without drowning them in it. As every good detective knows, the solution to an investigation is often the simplest one. In their case study, the team of researchers demonstrated the use of light as an on-off switch to control the type of alcohol produced by yeast. By alternating exposure of the yeast between blue light and darkness, they determined the right balance to keep the yeast alive while also



producing more isobutanol than normal.

This is a brand new approach that avoids chemicals and further reliance on genetic engineering. Once a light-responsive bacterium gene is inserted into yeast DNA, turning on the light encourages ethanol production in cells while darkness stimulates the creation of isobutanol.

This may become a targeted, efficient, and inexpensive way to create valuable chemicals for use in fuel without a huge amount of effort. It needs more study, but it's an interesting twist in the use of a simple light switch to solve a complex problem.

[DISCUSSION QUESTIONS]

- How is isobutanol used in fuel?
- What are other sources of isobutanol?
- How does a scientist insert a gene into DNA?
- Discuss other forms of genetic engineering that you've heard of lately.
- Can you think of any future benefits or problems that may be a result of genetic engineering?

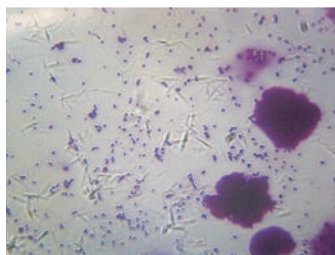
[VOCABULARY]

- MINISCULE
- NEURON
- METABOLISM
- FERMENTATION

GSC Go Science Crazy Human Mouth Bacteria Microscope Slide

Shows different types of bacteria

- Prepared slide for use with classroom science studies



Cat. No.	Description	Price
S06339PS	Bacteria from Human Mouth; Smear	3.00/Each

Crystal Violet, 0.5% Solution

- Gentian violet
- Gram stain solution
- Education grade
- Density: 1g/mL
- 500mL



Cat. No.	Description	Price
S25275B	Crystal Violet, 0.5% Solution	25.00/Each

This product is an Educational Grade Chemical — no C of A is available.

Fisher Science Education™ Bacteria Culture Kit

Complete kit is ideal for middle and high school students.



KIT INCLUDES:

- Three polystyrene Petri dishes, 100 x 15mm
- Nutrient Agar powder to create 120cc of Agar
- Plastic stir rod to aid in mixing, 6 in. (15.2cm)
- Instruction sheet for preparing Agar

Note: Cultures are not included.

Cat. No.	Description	Price
S01970	Bacteria Culture Kit	8.85/Each

Bel-Art™ Bench-Top Biohazard Bag Holder Kit

For collecting pipette tips, microcentrifuge tubes and more, during daily use.

- Rectangular steel wire frame to hold one polyethylene bag of dimensions 8.5 x 11 in. (22 x 28cm)
- Available with epoxy coat in orange color
- Comes with snug fitting polypropylene plastic cover to hold bag securely in place
- Reusable and allows cleaning by hand or in automated dish washers
- Autoclavable
- Also used with Clavies Autoclavable Bags H13182-0812

Bench Top Biohazard Disposal Bags

- Bright red
- Features one long flap for easy opening
- Printed with biohazard symbol and sterilization indicator patch
- Made from high molecular weight high-density polyethylene
- Pass ASTM 1922 Tear Resistance and ASTM 1709 Dart Impact Tests
- Size allows bag to be inverted over hand to safely pick up waste
- Steam autoclavable at 121°C (250°F)

KIT INCLUDES:

Cover, Bag Holder, and 100 Bench Top Biohazard Bags, made of high molecular weight, high-density (HMHD) Polyethylene and printed with Biohazard symbol and sterilization indicator patch that darkens when exposed to steam sterilization.

COMPLIANCE:

When used with lid, provides compliance with 29 CFR 1910.1030(d) (2)(xiii) (A), which requires a cover on any container used to store, transport or ship biohazardous wastes.



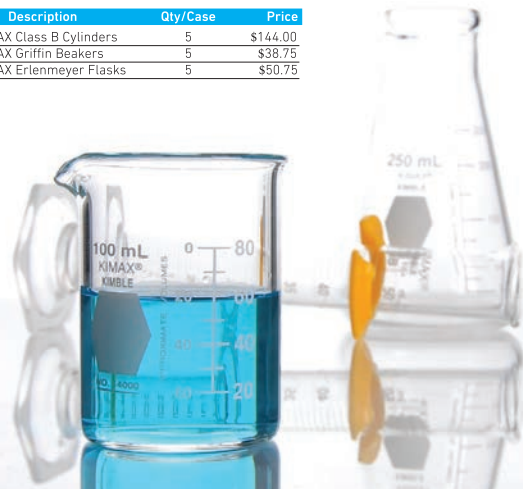
Cat. No.	Description	Price
S04788A	Biohazard Bag	24.00/Pack
S04788	Bag Holder Cover	11.50/Each
S04788B	Bag Holder Kit	49.00/Each

KIMBLE Lab Start-Up Packs

With a long history of perfecting glassware for research and industry, DWK Life Sciences puts as much care and diligence into our glassware as you put into your school and students.

And when setting up your classroom, KIMBLE™ Lab Start-Up Packs allow you to order precisely what you need — saving you money and storage space.

Cat. No.	Description	Qty/Case	Price
S32139	KIMAX Class B Cylinders	5	\$144.00
S30731	KIMAX Griffin Beakers	5	\$38.75
S43013	KIMAX Erlenmeyer Flasks	5	\$50.75



Visit fisheredu.com/kimble to learn more about the KIMBLE brand.



Dry Active Brewers Yeast

- Powder
- ZnCl
- Density 1.0g/mL at 20°C

Cat. No.	Quantity	Packaging	Price
S25632	100g	Powder	10.25/Each
S25632A	500g	Powder	20.25/Each

This product is an Educational Grade Chemical — no C of A is available.

DWK Life Sciences™ Graduated Fermentation Tube

- 13 x 100mm
- White ceramic enamel graduations start at 0.3mL
- Vertical tube O.D. x L: 13 x 100mm
- Approx. O.D. of bulb: 30mm



Cat. No.	Description	Price
S72301	Graduated Fermentation Tube	64.00/Case

LAB-AIDS™ Molecules of Metabolism Kit: Understanding Digestion and Respiration

3-D approach to the study of glycolysis and the Krebs Cycle.

Construct a diorama of anaerobic respiration (glycolysis) and aerobic respiration (the Krebs Cycle) in a step-by-step evolution.

- See how large molecules convert to smaller molecules that the body can use
- Addresses cellular respiration by illustrating adenosine triphosphate (ATP) formation
- Observe molecules and understand the role of individual atoms and enzymes
- Reusable kit is teacher developed with a station approach in mind

Expansion Kit

- Allows more students to work on this activity at the same time
- Contains eight additional molecular model packages

INCLUDES:

- 120 hydrogen atoms (white)
- 60 carbon atoms (black)
- 60 oxygen atoms, double bond (blue)
- 220 bonds (white tubes)



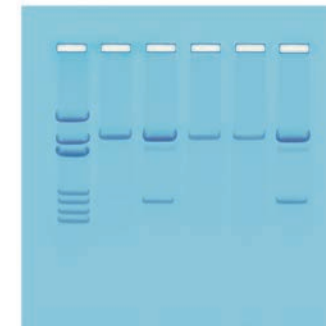
- Set of labels and arrows
- Mitochondrion poster
- 30 student worksheets and guides
- Instruction manual

Cat. No.	Product Type	Price
S90185	Molecules Of Metabolism Kit	73.50/Each
S90185A	Molecules Of Metabolism Expansion Kit for additional group of 4 students	51.50/Each

Edvotek™ Detection of Genetically Modified Organisms Kit

Use of agarose gel electrophoresis to explore molecular methods used by scientists to identify genetically modified organisms.

- No thermal cycler is required
- Students are encouraged to explore controversy surrounding use of genetically modified organisms
- For 8 gels
- Completes in 60 minutes
- **Includes:** Instructions, Ready-to-Load™ QuickStrip™ DNA samples, UltraSpec-Agarose™ powder, practice gel loading solution, electrophoresis buffer, InstaStain™ Blue and FlashBlue™ stain, calibrated pipette, and microtipped transfer pipettes



- **Materials needed:** Electrophoresis apparatus, power supply, automatic micropipet and tips, balance, microwave or hot plate, white light visualization system

- **Storage:** Stable at room temperature. Recommended to store Ready-to-Load QuickStrip™ samples in refrigerator

Cat. No.	Description	Price
S21121	Detection of Genetically Modified Organisms Kit	101.00/Each

Edvotek™ PCR-Based Identification of Genetically Modified Foods

Certain foodstuffs, such as tofu and soy milk, contain raw materials from genetically modified organisms (GMOs).

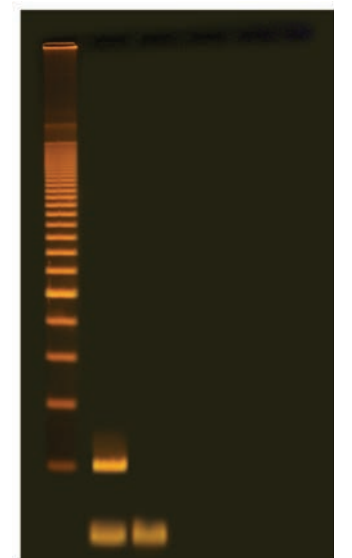
- The U.S. does not require food to be labeled to indicate that the product contains raw materials obtained from GMOs
- Includes FlashBlue™ Stain
- Class size: 10 groups.

INCLUDES:

- DNA extraction reagents
- PCR beads (*Taq* polymerase, dNTPs, buffer, MgCl₂)
- DNA size ladder
- Ultrapure water
- Wax beads
- 10X gel-loading solution
- UltraSpec-Agarose™ powder
- Electrophoresis buffer (50X)
- InstaStain™ Ethidium Bromide
- Instructions and study questions

REQUIRES:

- Thermal cycler or three water baths
- Horizontal gel apparatus
- DC power supply
- Microcentrifuge
- Balance
- Microwave oven or hotplate
- UV transilluminator
- Pipetter



Cat. No.	Description	Price
S68638	PCR-based Identification of Foodstuffs from Genetically Modified Organisms Kit	247.00/Each

Cutting-Edge Technology with EDVOTEK's Classroom PCR Discovery LabStation



Classroom PCR Discovery LabStation™ Includes:

- M12 Complete™ Electrophoresis Package (6)
- DuoSource™ 150 Power Supply (3)
- Variable Micropipet, 5 - 50 µl (6)
- EdvoCycler™ (1)
- Piccolo™ Microcentrifuge (2)
- TruBlu™ Blue Light Transilluminator (1)
- 1.8 L Digital Water Bath (1)



Bringing your students cutting-edge technology has never been easier with the Classroom PCR Discovery LabStation™! Supports up to 25 students and offers an immersive introduction to the exciting world of biotechnology!

Classroom PCR Discovery LabStation™ #572164

MiniAmp Thermal Cycler

A reliable, intuitive PCR device for the teaching lab.

Applied Biosystems™ MiniAmp™ Thermal Cyclers maximize the impact of your PCR lessons at an affordable price.

- Intuitive touchscreen interface for easy experiment setup
- Standard two-year warranty
- Minimal footprint, 7.5 in. wide



Ordering information

Product	Cat. No.	Price
MiniAmp Thermal Cycler	A37834	\$2,995.00

Visit fisheredu.com to purchase a MiniAmp Thermal Cycler.



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E-Gel Power Snap Electrophoresis System Starter Kit

Teaching DNA electrophoresis in the classroom has never been easier.

- Load, run, and analyze DNA samples in 15 minutes
- Track samples in real time with the intuitive interface
- Eliminate hazardous chemical handling with Invitrogen™ E-Gel™ Precast Gel Cassettes



Ordering information

Product	Cat. No.	Price
E-Gel Power Snap Electrophoresis System Starter Kit, SYBR Safe 1.2%	G8351ST	\$2,570.00
E-Gel Power Snap Electrophoresis Device Starter Kit, SYBR Safe 1.2%	G8151ST	\$1,434.00

Includes electrophoresis device and camera, 18 agarose gels, and DNA ladder with loading buffer.

Visit fishersci.com/powersnap to find out more.



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SureCast Gel Handcast System

Innovative design ideal for educational settings offers 100% leak-proof format for pour-your-own gels.

- Leak-free design — less wasted class time
- Unique tilt feature — minimize spillage and confidently load acrylamide solutions
- Superior glass plate durability — ensures safe handling and sample integrity



Product	Price	Cat. No.
Invitrogen SureCast Handcast Bundle A (Includes Hardware and Reagents)	\$453.00	HC1000SR
Invitrogen SureCast Handcast Bundle B (Includes Hardware Only)	\$331.00	HC1000S

Visit fisheredu.com to find out more.



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Perform the essential functions needed for routine measurements without complicated features or processes at a budget-friendly price.

Fisherbrand™ FE150 pH Benchtop STEM Kits are designed with teaching in mind. The kits include everything needed to demonstrate routine pH measurements, including a protocol for standardizing and testing.

Ordering Information

Product	Cat. No.
Fisherbrand FE150 STEM Teaching pH Benchtop Meter Kit with Double-Junction Gel pH Electrode, ATC Temperature Probe, Buffers, Beakers and Wash Bottles, Stand, Universal Power Adapter, and Testing Protocol	S43609
Included in STEM Kit	
Thermo Scientific™ Buffer, pH 4.01, 10 Pouches	S04959
Thermo Scientific Buffer, pH 7.00, 10 Pouches	S04969
Thermo Scientific Buffer, pH 10.01, 10 Pouches	S04972
Thermo Scientific™ Nalgene™ Plastic Beakers, 50mL, 12/Pack	02-591-10A
Fisherbrand Double-Junction Gel pH Electrode	S35932
Temperature Probe, Length: 120mm	S35933

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fisherbrand Plastic Petri Dishes

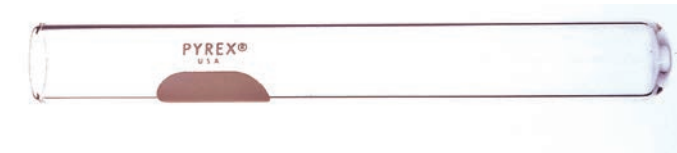
Ideal plastic Petri dishes for lab use.



- Dimensions: 100 x 15mm
- Sterile
- Polystyrene
- Stacked
- 500 per case

Cat. No.	Description	Price
S33580A	Size: 100 X 15mm; Box of 500	136.71/Case

PYREX™ Culture Tubes



- Rimless tops for greater convenience in plugging and rack storage
- Reusable with walls and bottoms with uniform thickness
- Ends are fire polished

Cat. No.	Capacity (Metric)	Diameter (Metric) Outer	Length (Metric)	Label Type		Price
S63293	0.5mL	6mm	50mm	None	31.25/Pack	321.07/Case
S63294	3mL	10mm	75mm	White Marking Spot	33.50/Pack	344.60/Case

Environmental Science



A Volcano's Good Deeds

By Lynne Lescott

It's hard to imagine something good coming out of Hawaii's recent Kilauea volcano eruptions after seeing dramatic video of its lava streams swallowing roads, homes, and beaches. Yet despite their destructive force, volcanoes actually help to restore the ecosystem.

Destructive Power

The eruption of any volcano involves lava flows and the release of gases and volcanic ash. In Hawaii, lava streams from Kilauea's eruption have ruined acres of agricultural land, wildlife habitat, and neighborhoods. The volcano also released toxic gases that can injure the lungs of people and wildlife.

Eruptions like Kilauea's also eject volcanic ash miles high into the

atmosphere, where it can form clouds that drift for thousands of miles with air currents. Air carries ash, but the ash carries harmful gases and jagged mineral particles. One gas in particular — sulfur dioxide — can combine with water to create sulfuric acid droplets. If the droplets are small, they can block the sun's energy, which cools the Earth's temperatures. If they are large, the sulfuric acid droplets can trap heat on the Earth's surface.

Eventually, all volcanic ash falls back down to earth and coats its surroundings like sooty snow. The ash doesn't stay where it falls, but is shifted around by the breeze. When the particles settle again they can slither their way into buildings, water, and food supplies, and even into the bodies of animals and people. Volcanic ash can

contaminate water, clog electronic and mechanical systems, and takes years to clean up.

Rising from the Ashes

Destruction isn't the only chapter in a volcano's eruption story. Scientists worldwide have learned that volcanic ash contains nutrients that help plants grow. When the ash breaks down into smaller pieces it mixes easily into the soil and acts like a fertilizer that enriches the soil. Depending on rainfall and other climate conditions, new plants can grow and flourish within a few years, and the wildlife population rebounds because of the availability of new plants and suitable habitat. Eventually, these areas can be redeveloped for farming because of the soil's fertility.

History teaches us that the destruction caused by volcanic eruptions can be the beginning of a healthy new cycle, which we can witness by following the activity of Kilauea and other active volcanoes.

[DISCUSSION QUESTIONS]

What minerals are found in volcanic ash, and how do they enrich soil?

How does sulfur acid affect earth's climate?

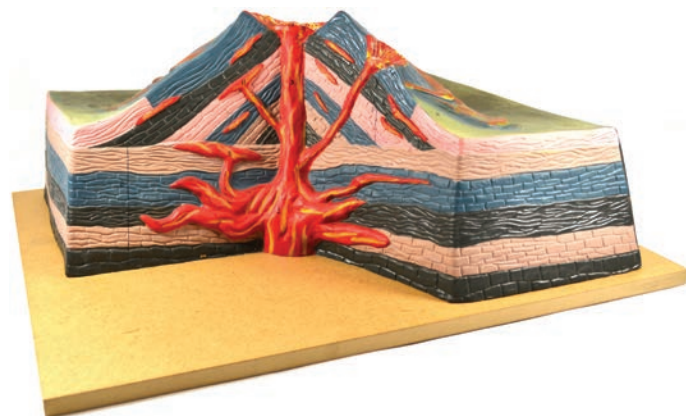
[VOCABULARY]

- LAVA
- VOLCANIC ASH
- SULFUR DIOXIDE
- SULFURIC ACID



Eisco Colored Volcano Model

Displays vertical section for students to view path of magma on its upward course of the volcano.



- Made from unbreakable material
- Section displays flow of magma
- Base-mounted
- Includes English key card

Cat. No.	Description	Price
S24458	Colored Volcano Model	153.00/Each

Stay Connected with the Fisher Science Education Team

Follow us on



Diversified Woodcrafts™ Augmented Reality Sandbox

This Augmented Reality Sandbox allows users to create topography models by shaping real sand, which is then augmented in real time by an elevation color map, topographic contour lines, and simulated water and lava.

This amazing sandbox uses 3D visualization applications and a hands-on exhibit combining a real sandbox, virtual topography and water created using a closed loop of a Microsoft Kinect 3D camera, powerful simulation and visualization software, and a data projector. The system teaches geographic, geologic, and hydro-logic concepts such as how to read a topography map, the meaning of contour lines, watersheds, catchment areas, levees, and much more.

- 48W x 30D x 36H in.
- Comes complete with the box, camera, projector, wire management, and laptop loaded with visualization software
- Solid oak and oak veneer construction with heavy duty locking casters
- SEFA compliant and MAS Certified Green—Finished with a durable UV earth-friendly finish
- Includes detailed instructions for calibrating the software and running the program
- Features a shelf for laptop with wire management system
- Kit includes Microsoft Kinect 3D camera, powerful simulation and visualization software, and a data projector
- Made in the USA

Note: Sand not included (we recommend 250 lbs. of Sandastik™ sparkling white play sand)

WARRANTY:
Limited Lifetime



Cat. No.	Description	Price
S37563	Augmented Reality Sandbox	7851.00/Each

Eisco Igneous Rock Specimens

- For use in classroom identification labs and exercises
- Correlates well to Next Generation Science Standards Evidence Statements

Obsidian Specimen

Also known as volcanic glass, forms from lava that cools almost immediately upon eruption, usually into water.

- Volcanic glass formed through nearly instantaneous quenching of lava
- Obsidian shares many physical properties with its major chemical component, quartz, despite looking dissimilar



Scoria Specimen

Forms as spatter from bubbly, mafic lava is thrown into air and cooled quickly.

- Erupted from spatter cone as large air bubbles made their way through magma to surface
- Crystallization happens so quickly that large air pockets are trapped within rock, often giving samples jagged, sharp appearance



Volcanic Tuff Specimen

Formed by ash and dust deposited during explosive volcanic eruptions that eventually become compacted and lithified, forming large packages of tuff.

- Distinct layers within tuff indicate separate eruption pulses or events



Cat. No.	Description	Price
S24762	Obsidian	2.35/Each
S24770	Scoria	2.35/Each
S24772	Volcanic Tuff	2.35/Each

Kemtec™ Resources of the Living Ocean

Designed to show importance of fish and algae as living resources of ocean.



- Study relationship of form and function in fish by examining fin shapes and sizes, body shapes, mouth size and shape, color and camouflage
- Predict habitats and behaviors by observing structures on fresh fish
- Use dichotomous key to identify fish by genus species
- Study oxygen production through photosynthesis in elodea
- Grades 9-12
- Class size: 24 students

REQUIRES:

Microscopes, fresh whole fish, elodea, lamps or sockets with bulbs, a cooler with ice and glassware

Cat. No.	Description	Price
S94961	Resources of the Living Ocean Kit; Grades 9 - 12	86.00/Each

Kemtec™ Volcanic Eruption Kit

A hands-on volcano model building project complete with safe, simulated lava eruptions.



Students learn the strength of Mother Nature and the good that can come from natural disasters.

- Learn volcano types, volcano parts, how volcanoes function, and about precious gems volcanoes make
- Building materials appropriate for elementary and middle school classrooms
- Investigate underwater volcanoes with the included demonstration
- Grades 3-8
- Class size: 24 students

REQUIRES: Baking soda and vinegar

Cat. No.	Description	Price
S02084	Volcanic Eruption Kit	101.00/Each

fisherbrand FE150 Benchtop pH Meters

Designed for convenient routine pH measurement in the lab: user-friendly, stores data sets in non-volatile memory and meter-attachable electrode stand. Efficient sample reading and recording with flexible display options: display both pH and temperature or mV and temperature simultaneously.

The essential functions needed for routine measurements

- One to five point pH calibration
- Automatic buffer recognition with selection of two pH buffer sets
- pH slope and offset display
- One point mV calibration
- One point ATC temperature probe calibration
- Automatic or manual temperature compensation
- Ready icon to indicate measurement stability
- Electrode condition icon to indicate status
- 100 data set storage with non-volatile memory

Choose Your Model:

- Benchtop meter and stand
- Bio set with meter, double junction gel pH electrode, ATC probe and stand
- 3-in-1 meter set with 3-in-1 single-junction gel pH/ATC electrode and stand

Cat. No.	Description	Price
S35922	FE150 pH benchtop meter and stand	345.00/Each
S35924	FE150 pH benchtop meter bio set with double junction gel pH electrode	443.00/Each
S35925	Fisherbrand FE150 pH benchtop meter 3-in-1 set with 3-in-1 single junction gel pH/ATC electrode and stand	450.00/Each



Student-Friendly Spectrophotometer

The Thermo Scientific™ SPECTRONIC™ 200 Visible Spectrophotometer brings new possibilities to student education:

- Trusted live display supports current experiments
- Full-spectrum scan mode finds peaks in seconds
- Removable sample compartment for easy clean-up
- Measure in square or test tube cuvettes

Visit thermofisher.com/spec200freeunit to request a free trial unit for your classroom.



Cat. No.	Price
S06240	\$1,490.00

thermoscientific

fisherbrand pH Pen

pH measurement is easier than ever with the Fisherbrand pH Pen – an economical range pocket-size tester designed for on-the-go pH measurements.

Accurate and easy to use, these testers are ideal for quick pH measurements in hydroponic gardening, aquaculture, agriculture, pools, simple lab work and other water/wastewater applications.

- ±0.1% accuracy across full pH range
- Auto-buffer recognition and auto-calibration functions – quick, easy calibrations at the press of a button
- Long-lasting sensor – large volume of polymer gel reference gives longer sensor lifespan, while single Kynar® reference junction prevents clogging
- Automatic temperature compensation and up to three calibration points for broadened accuracy throughout the pH range



Cat. No.	Description	Price
S35927	Fisherbrand pH Pen	50.75/Each

Thermo Scientific™ GENESYS™ 30 Visible Spectrophotometer

Perform both basic and complex analyses with the Thermo Scientific GENESYS 30 Visible Spectrophotometer, an intuitive, reliable solution for education or in the lab.

Get high precision and functionality in a simple yet sophisticated visible spectrophotometer. The Thermo Scientific GENESYS 30 Visible Spectrophotometer performs both basic and complex analyses for educational or industrial use. Its intuitive design allows students and teachers to focus on scientific data and concepts rather than on learning how to use the instrument. In the lab, technicians of all levels working in routine QA/QC applications can easily obtain credible results to confirm quality or inform next steps. Results can be reported quickly as digital or printed data.

The GENESYS 30 visible spectrophotometer brings you intuitive design, a high definition color screen, fast and accurate measurements, and convenient data reporting. It is the ideal instrument for any user, whether a novice student or an experienced lab associate.

Product Features:

- Entirely new industrial design for better usability
- High definition 5-inch color screen with rubberized push-button keypad for easy navigation
- Single cell measurement with removable, washable sample compartment liner
- Cell holders for standard cell types including test-tubes
- New onboard software UI; Thermo Scientific™ VISIONlite PC software is optional
- Data any way you want it
- USB data export in a text format that's easy to read and process
- Excellent snap-on thermal printer
- Three-year warranty and skilled technical support

Educator Benefits:

- Meets curriculum requirements for:
- Single wavelength
- Scanning
- Beer's Law
- Colorimetry/ colorimetric analysis
- Quantitative analysis

Lab Associate Benefits:

- Higher data confidence with 6-point quant plus concentration mode
- Multiple local language choices



Cat. No.	Description	Price
S28454	GENESYS 30 Visible Spectrophotometer	2421.00/Each

Thermo Scientific™ SPECTRONIC™ 200 Spectrophotometer

The new standard for rugged, simple-to-use visible spectrophotometers for teaching and routine applications.

Delivering quick, convenient measurements in the hands of novice users, the SPECTRONIC 200 spectrophotometer is the perfect fit for the teaching lab.

- Modern on-board software provides total control without a computer
- Coarse/fine wavelength setting
- Adjustable tilt screen
- Sealed keys
- Classroom-friendly, adaptable sample compartment
- Convenient cuvet rack compartments
- Sloping surfaces discourage balancing of samples on unit



Cat. No.	Description	Price
S06240	SPECTRONIC 200 Spectrophotometer	1490.00/Each

Thermo Scientific™ GENESYS™ 40/50 Vis/UV-Vis Spectrophotometers

For teaching labs or quality control experts who require ruggedness, ease-of-use and software capability in UV-Vis spectrophotometry.

Perform routine measurements in the chemistry classroom. Offered in a single cell configuration, these instruments are designed with a sloping surface to shed spills and a washable sampling compartment for easy clean up. A 7-inch touchscreen interface, local control software (no PC needed) and Wi-Fi-ready networking make the GENESYS 50 UV-Vis or GENESYS 40 Vis Spectrophotometer the ideal choice for daily sampling purposes.

The GENESYS 50 is a dual beam UV-Vis spectrophotometer in a single-cell configuration that meets all of the specifications for critical quality control applications and precise chemical measurements.

The GENESYS 40 Dual Beam Vis Spectrophotometer is a visible spectral region version in this instrumental class. Both feature data resolution from 0.2 nm to 5 nm.

Features:

- 7-inch high-resolution touchscreen user interface
- Local control for speed and reliability
- Networking capable (Wi-Fi ready)
- Large sample compartment with front access

Designed for:

- Chemistry labs
- Routine measurements
- Moderate throughput requirements



Cat. No.	Description	Price
S72303	GENESYS 40 Vis/UV-Vis Spectrophotometer	3800.00/Each
S72304	GENESYS 50 Vis/UV-Vis Spectrophotometer	5450.00/Each

The Sonic Mystery of Knuckle Cracking

By Nancy H. Pitts

For more than a century, scientists have been investigating, and debating, why your knuckles make that sound when you crack them. (Or maybe you don't, but a family member or friend does; some can, while others cannot.) What scientists agree on is that the sound comes from the articular release of

the metacarpophalangeal joint, or the snapping of a tendon over the bone in your finger's joint. But they disagree about why the cracking sound is so loud.

In the 1970s, scientist Anthony Unsworth (University of Durham, U.K.) and his colleagues revealed that the synovial fluid in the joint was involved in the sound. In fact, they attributed the sound to the collapse of bubbles that form in that fluid when the tendon snaps over the joint, like when a balloon pops. This formation of tiny bubbles between two submerged surfaces when those surfaces are suddenly pulled apart is called tribonucleation.

POP!

Three years ago, however, scientist Gregory Kawchuk (University of Alberta) challenged this theory after observing the presence of bubbles after the joint had cracked. Kawchuk didn't deny that tribonucleation was taking place, but he theorized that it was the sudden growth of the bubble that caused the cracking sound: that's why the bubbles are still there after the knuckle cracks, he asserted. And virtually all researchers accepted this new bubble theory.

But scientists V. Chandran Suja (Stanford University) and A. I. Barakat still questioned why the cracking sound is so loud that it can be heard from across a room, so they published a mathematical proof in March 2018 that they believe explains it. Although they accept that bubbles in the synovial fluid during the release of the joint account for the noise, they believe it's the collapse of those bubbles — not their expansion — that creates the sound.

The bubble is actually a void or absence of material. When that void is formed in the knuckle by the pulling apart of the surfaces in the synovial fluid — again, what

scientists call tribonucleation — low pressure, known as cavitation, occurs. And when that void starts to collapse, the resulting shock wave caused by the interaction of low pressure with the fluid releases a tremendous amount of energy, which produces the loud cracking sound.

So tribonucleation in the finger joints' synovial fluid followed by the almost immediate collapse of the subsequent cavitation bubble is what makes the big noise when someone cracks their knuckle. Or, at least, that's the latest theory.

[DISCUSSION QUESTIONS]

Can you explain tribonucleation in simple terms?

Research cavitation videos on YouTube, then try to describe cavitation to someone unfamiliar with the term.

[VOCABULARY]

THEORIZE

SYNOVIAL FLUID

METACARPOPHALANGEAL JOINT




CAVITATION

TRIBONUCLEATION







Features:

- High-quality glassware at affordable prices
- Made from borosilicate 3.3 glass
- Superior chemical durability
- Autoclavable at 121°C
- Easy-to-read graduations
- Manufactured and calibrated to quality standards

Complete Glassware Line



A full line of ELABGlass from Eisco Scientific is available through the Fisher Science Education channel.

Description	Cat. No.	Price
Beaker, 50ml	S15437	\$2.40
Beaker, 100ml	S15438	\$2.85
Beaker, 250ml	S15439	\$2.85
Beaker, 500ml	S15441	\$4.75
Beaker, 1000ml	S15442	\$8.65

Eisco NeuLog™ Panda

The Eisco NeuLog Panda is a multi-sensor module with 9 built-in sensors. It is ideal for younger scientists and students that wish to seamlessly and easily collect data.

- Sensors built into unit: Ambient Temperature, Light Intensity, Sound, Barometer, Altitude, Humidity, Dew-Point, Acceleration, Magnetic Field
- 4 Color Touch Screen with USB Connectivity and built in battery, system can fully integrate with any NeuLog sensor
- USB connecting cable included, Panda can connect to PC or Mac
- Software is free to download at NeuLog
- Temperature (12 bit): -13 to 140 F (can read Celsius or Fahrenheit), Light (16 bit): 1000 to 240,000 lux, Barometer (24 bit): 80 to 110 kPa (Can Read Kpa, atm, Hg, mmHg), Altitude (24 bit): -722 to 2000m, Sounds (12 bit): 40 to 110 dB, Humidity (16 bit): 0 to 100 percent, Dew-Point (12 bit): 114 to 109 Celsius, Acceleration (16 bit): 3 Axis -20 to 20 meters per second squared, Magnetic Field (16 bit): 3 Axis -200 to 200 micro Tesla
- Panda WIFI module enables the PANDA to connect to PC/ Mac without the use of a USB Cable



Cat. No.	Description	Price
S13941	Panda	299.00/Each
S13942	WiFi Panda Module	161.00/Each

Eisco NeuLog™ Sound Logger Sensor

Measures sound pressure in decibels and waveforms.



- Two modes of operation
- Duration: 25 milliseconds to 31 days
- Range: 40 to 110dB (level); 0 to 1024 (signal)
- Resolution: 0.1dB; 1
- Rate: 100 S/sec.; 10,000 S/sec.
- Requires connection hardware, sold separately

Cat. No.	Description	Price
S98243-22ND	Sound Sensor	92.00/Each

Eisco NeuLog™ Sound Kit

The Eisco NeuLog Sound Kit contains equipment to produce sound and measure it through a sound sensor. It is difficult for students to grasp the relation between generated sound and wave's propagation. With this kit, students measure sound waves generated by tuning forks and a recorder and also isolate sound using different materials



- Study sound isolation through various materials
- Observe 'beat' sounds
- Study sound level
- Study sound waves
- NeuLog Sound Logger Sensor NOT included

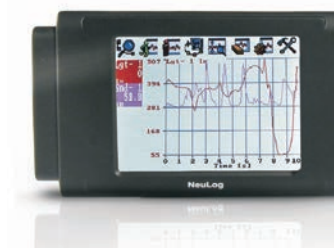
Cat. No.	Description	Price
S23767	Sound Kit	44.25/Each

Eisco NeuLog™ Neuron Sensor Digital Graphic Display Module

Use to run experiments without a PC—displays the sensor's measurements in digital and graphical forms.

Description

- User-friendly design with a color graphic display and touch screen
- Program the sensor setup as well as view the input from up to five sensors at a time
- Can be connected to a chain of sensors ending with the battery module connected to the last sensor of the chain



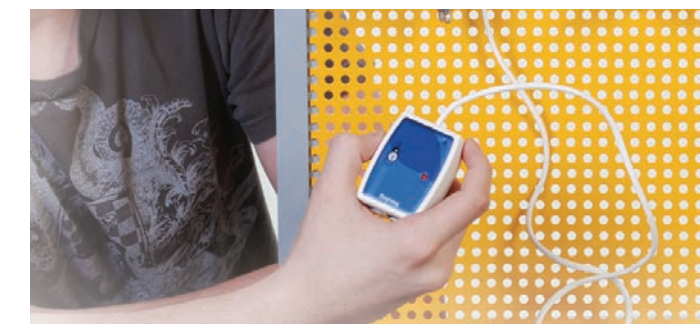
Features:

- Automatically recognizes sensors
- Uses preset experiment parameters for easy initiation
- Communicates with all the sensors or one at a time
- Controls each sensor range and measurement units
- Incorporates internal charging circuit
- Automatic Power-Off for longer battery life
- Setup and Operation
- Sensors connect to the graphical display unit via its USB (A) socket
- Remote connection also possible by plugging an RF Communication module into graphical display unit and another into the sensor or sensor chain—enables both setting up and analyzing the collected data
- When the graphical display unit receives power, it starts scanning and identifies the connected sensors
- Located sensors are displayed on the left side of the screen

Cat. No.	Description	Price
S98243-43ND	Neuron Sensor Digital Graphic Display Module	151.00/Each

Eisco NeuLog™ Force Logger Sensor

Measures the mass-to-weight relationship and push/pull forces and impacts.



- User-friendly design with a color graphic display and Single and dual range available.
- Study how different pulley systems affect force needed to lift weights
- Duration: 50 milliseconds to 31 days
- Range: ±10N; ±50N
- Resolution: 0.01N
- Rate: 3000 S/sec.
- Requires connection hardware, sold separately

Cat. No.	Description	Price
S98243-9ND	Force Logger Sensor	129.00/Each

Add some power to STEM labs



Building and Designing Batteries STEM Kit

The United series of STEM-based curriculum kits accents the scientific method and independent inquiry using hands-on learning materials and exciting interactive digital content. This kit contains eight investigative activities that teach students how to construct batteries, assemble electrical circuits, use a multimeter to measure voltage and amplitude, calculate electrical resistance and electrode potentials, and evaluate battery performance.

Description	Cat. No.	Price
Building and Designing Batteries STEM Kit	S13123	\$251.00

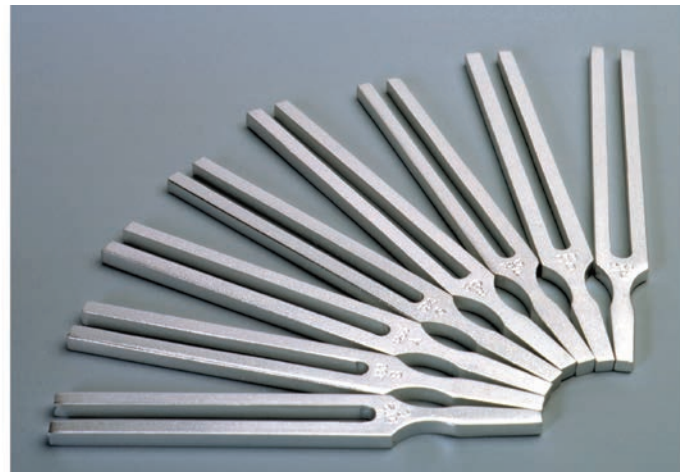
Contact your Fisher Science Education sales representative to order this kit and other United Scientific Supplies hands-on STEM items.

Manufactured by:



United Scientific™ Tuning Forks

Frequency and scale letter are stamped on each fork.



- Made of aluminum alloy
- Frequency: 256Hz
- Scale letter: C'

Cat. No.	Description	Price
S63122	Tuning Forks	3.95/Each

United Scientific™ Wave Demonstrator Set

Includes two helical springs and a length of cotton string.



- Long, narrow spring measures 0.75 x 72 in., and can be extended to 5m
- Larger spring measures 3 x 4 in. and can be extended many times its length without distortion

ORDERING INFORMATION:

Weight: 2.5 lb. (1.1kg).

INCLUDES:

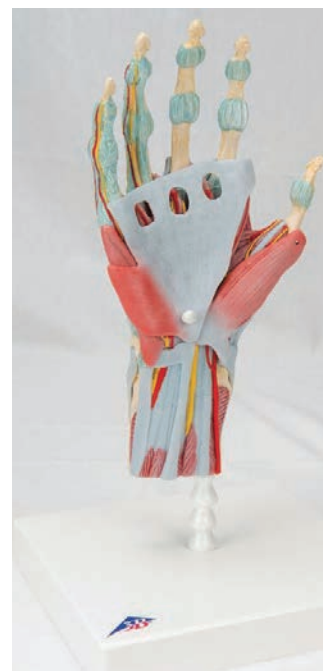
Teacher activity guide

Cat. No.	Description	Price
S06685	Wave Demonstrator Set	22.00/Each

3B Scientific™ Hand Skeleton Model

See bones, muscles, tendons, ligaments, nerves, arteries, and veins in this four-part model of the hand and lower forearm

- Dorsal side shows extensor muscles and portions of wrist tendons as they pass under extensor retinaculum
- Palmar face represented in three layers; two remove for detailed study
- Median nerve and superficial palmar arterial arch can be explored
- Deepest anatomical layer shows intrinsic muscles and deep palmar arterial arch
- L x W x H: 13 x 4.7 x 4.7 in. (33 x 12 x 12cm)



Cat. No.	Description	Price
S96422	Hand Skeleton	448.00/Each

Bright Stars in Galaxies Far, Far Away

By Nancy H. Pitts

Surely you've looked up at the clear night sky and, many nights, thought to yourself, "The stars are especially bright tonight." Scientists are thinking about the stars, too. For decades they have also been interested in the nebula a star leaves behind when it "goes out," or dies.

A planetary nebula is a hazy cloud that surrounds a dying star after it sheds its protective outer layer of gas. Unprotected, the "stellar core" of the dead star heats up fast and pumps radiation into the gas layer it is shedding, creating a beautiful, brightly colored nebula, or shimmering three-dimensional halo, around itself. Its color is dependent on the type of gas that is set aglow. It can be so bright that it can be seen from Earth, such as the nebula

in the constellation Orion about 1,400 light years away.

Scientists wonder why they are seeing nebulae where they are least expected. Some nebulae in galaxies that are 7 billion years old are as bright as those in galaxies that have only been around for a billion years. Previously, it was thought that the mass of a star dictated what sort of nebula it produced, implying that the nebula from a low mass star would not be bright enough to be seen from one galaxy to another. However, there are nebulae in ancient galaxies where no high-mass stars exist.

A New Theory

In May 2018, astrophysicist Albert Zijlstra and his colleagues at

University of Manchester in the U.K. released results of simulations that show that even small stars can heat up enough to form very bright, very colorful planetary nebula. Zijlstra now theorizes that smaller stars can produce nebulae as bright as stars three times their size. This could help explain why bright nebulae are seen in ancient galaxies as well as in youthful galaxies.

We know that 90% of stars end up as planetary nebulae. Their indescribable beauty invites lively and imaginative thoughts about nebula and their ancestors, the stars. Are those dead stars really just degenerate white dwarfs, as they are sometimes referred to, or are they displaying a glorious, valuable, secret staying power that

shines across galaxies for a reason we have yet to understand?

[DISCUSSION QUESTIONS]

Calculate the mileage to the Orion nebula named Messier 42.

Do stars ever disappear completely? Research the evolution of a star.

[VOCABULARY]

- GALAXY
- CONSTELLATION
- NEBULA
- SIMULATION
- STELLAR

Earth and Space

CELESTRON
COMETRON
TELESCOPES AND BINOCULARS

Cometron telescopes and binoculars offer a wide field of view that makes them ideal for observing open star clusters, nebulae, the Milky Way galaxy, and geographical features of the Moon.

Cometron 7x50 Binoculars
Feature 7-to-1 exit pupil to magnification ratio for extraordinary views of even dim objects in low-light conditions.

Cat. No.	Price
S72021	\$34.95

Cometron FirstScope 76
A lightweight, portable tabletop model that's a great grab-and-go telescope.

Cat. No.	Price
S72019	\$59.95

114AZ Newtonian Reflector
Offers a parabolic mirror to capture the sharpest views of even dim objects.

Cat. No.	Price
S72020	\$179.95

COMETRON BY CELESTRON
Full size telescope, tabletop telescope, or binocular – the choice is yours.
Visit fisheredu.com/celestron to discover more.

Celestron™ Cometron™ FirstScope Telescope

Cometron FirstScope is a compact, lightweight telescope ideal for beginner astronomers looking to experience a comet, planet, or nebula. This tabletop, Dobsonian-style telescope includes a spherical mirror with 76 mm of aperture.

- Fast focal ratio offers a wide field of view, perfect for observing comets, star clusters, galaxies and more
- Lightweight and portable, a great grab-and-go telescope
- Simple design makes it easy for beginners to use
- No-tool setup means you are up and observing in no time

INCLUDES:

5 x 24 finderscope and 2 Kellner eyepieces



Cat. No.	Description	Price
S72019	Celestron Cometron FirstScope Telescope	60.00/Each

Celestron™ Cometron™ 114AZ Telescope

Celestron's Cometron 114AZ is designed for viewing all types of celestial objects. Features a parabolic mirror to capture the sharpest views of even dim comets. Ideal for even beginner stargazers.

- Quality optical design--parabolic mirror provides sharp image and eliminates spherical aberration
- Fast focal ratio offers a wide field of view, perfect for observing comets, star clusters, galaxies and more
- No-tool setup means you are up and observing in no time
- Lightweight and portable, a great grab-and-go telescope
- Large aperture collects more light and provides more detail

INCLUDES:

Optical tube, tripod with altazimuth mount, accessory tray, red-dot finderscope, and TheSkyX DVD-ROM astronomy software.

WARRANTY:

2 Year Limited warranty



Cat. No.	Description	Price
S72020	Celestron Cometron 114AZ Telescope	180.00/Each

Celestron™ Cometron™ 7x50 Binoculars

Celestron Cometron sleek, portable binoculars feature large objective lenses and multi-coated optics for optimal light-gathering capabilities to bring celestial objects into bright, sharp focus. Ideal for comet watching, stargazing, and viewing craters on the moon.

- Wide field of view reveals a larger portion of the night sky, allowing you to view more of the comet's tail
- Large 50 mm objective lenses have tremendous light-gathering ability, ideal for astronomical use
- Multi-coated optics dramatically increase light transmission for brighter images with increased contrast and resolution
- Large exit pupil provides maximum light during nighttime and low-light viewing sessions
- Strong and durable aluminum housing

INCLUDES:

Neck strap, carrying case, objective lens caps, eyepiece caps, lens cloth, instruction manual

WARRANTY:

Limited Lifetime



Cat. No.	Description	Price
S72021	Celestron Cometron 7x50 Binoculars	35.00/Each

Celestron™ NexStar™ 102SLT Computerized Telescope

A large and powerful 4 in. telescope that offers a 63% increase in image brightness over 80mm models.

General Features

- High quality 90mm Maksutov-Cassegrain
- Fully computerized Altazimuth mount
- StarPointer finderscope to help with alignment and accurately locating objects
- Quick-release fork arm mount, optical tube and accessory tray for quick no tool set up
- Sturdy stainless steel tripod and accessory tray included
- Good for terrestrial and celestial observing
- "TheSkyX – First Light Edition" astronomy software with a 10,000 object database, printable sky maps and 75 enhanced images

Computerized Features

- Proven NexStar computer control technology
- Database allows telescope to locate over 4,000 celestial objects
- SkyAlign allows you to align on any three bright celestial objects, making for a fast and easy alignment process
- Flash upgradeable hand control software and motor control units for downloading product updates over the Internet Internal battery compartment to prevent cord wrap during use

- Auxiliary port for additional accessories such as GPS accessory
- Includes NSOL telescope control software for basic control of your telescope via computer (with optional RS-232 cable)
- Compatible with optional NexRemote telescope control software (not included), for advanced control of your telescope via computer



Cat. No.	Description	Price
S28079	102mm Aperture; Refractor; Focal length: 660mm; Focal ratio: 6.47; Magnification Eyepiece 1/2: 26x/73x	762.00/Each

Celestron™ NexStar™ Evolution 6

Control your telescope wirelessly via your smartphone or tablet

- Compact, portable 6-inch Schmidt-Cassegrain optical tube with StarBright XLT optical coatings and Fastar compatibility
- Computerized GoTo mount with high-performance worm gears and motors for improved tracking accuracy, along with reduced gear backlash
- Rechargeable lithium-iron battery with enough power for 10 hours of continuous observing
- Improved industrial design with manual clutches and integrated carry handles, plus the added convenience of two accessory trays and a USB charge port for your smart device
- 4 auxiliary ports: 2 on top of the fork and 2 on the bottom
- A classic NexStar+ hand control is included, but is not necessary when using NexStar Evolution with the mobile app
- Includes a StarPointer finderscope, two 1.25 in. Plossl eyepieces, a 1.25 in. star diagonal, and an AC adapter



Cat. No.	Description	Price
S28076	Focal length Eyepiece 1/2: 40/13mm; Aperture: 150mm; Focal ratio: 10; Magnification Eyepiece 1/2: 38x/115x	1285.00/Each

Celestron™ NexStar™ Evolution 9.25

Controlled wirelessly from smartphone or tablet.

- Portable 9.25-inch Schmidt-Cassegrain optical tube with StarBright XLT optical coatings and Fastar compatibility
- Computerized GoTo mount with high-performance worm gears and motors for improved tracking accuracy, along with reduced gear backlash
- Rechargeable lithium-iron battery with enough power for 10 hours of continuous observing
- Improved industrial design with manual clutches and integrated carry handles, plus the added convenience of two accessory trays and a USB charge port for your smart device
- A classic NexStar+ hand control is included, but is not necessary when using NexStar Evolution with the mobile app
- Includes a StarPointer finderscope, two 1.25 in. Plossl eyepieces, a 1.25 in. star diagonal, and an AC adapter



Cat. No.	Description	Price
S28078	Focal length Eyepiece 1/2: 40/13mm; Aperture: 235mm; Focal ratio: 10; Magnification Eyepiece 1/2: 59x/180x	2205.00/Each

Celestron™ NexStar™ Evolution 8

Control your telescope wirelessly via your smartphone or tablet.

- Compact, portable 8-inch Schmidt-Cassegrain optical tube with StarBright XLT optical coatings and Fastar compatibility
- Computerized GoTo mount with high-performance worm gears and motors for improved tracking accuracy, along with reduced gear backlash
- Rechargeable lithium-iron battery with enough power for 10 hours of continuous observing
- Improved industrial design with manual clutches and integrated carry handles, plus the added convenience of two accessory trays and a USB charge port for your smart device
- 4 auxiliary ports: 2 on top of the fork and 2 on the bottom
- A classic NexStar+ hand control is included, but is not necessary when using NexStar Evolution with the mobile app
- Includes a StarPointer finderscope, two 1.25 in. Plossl eyepieces, a 1.25 in. star diagonal, and an AC adapter



Cat. No.	Description	Price
S28077	Focal length Eyepiece 1/2: 40/13mm; Aperture: 203.2mm; Focal ratio: 10; Magnification Eyepiece 1/2: 51x/156x	1701.00/Each

Celestron™ NexStar™ 8SE Computerized Telescope

Ideal for observing and photographing the wonders of space.

StarBright XLT high-transmission coatings come standard on each model along with the StarPointer finderscope to help with alignment and accurately locating objects.

- Internal flip mirror for convenient viewing straight through (with optional diagonal) or at 90° (4 in. model only)
- Quick-release fork arm mount, optical tube and accessory tray for no-tool setup
- Sturdy computerized altazimuth mount
- Internal battery compartment to prevent cord wrap during use
- Ultra-sturdy steel tripod features built-in wedge allowing 4 in. model to be used for astrophotography
- Nearly 40,000-object database with 200 user-definable objects and expanded information on over 200 objects
- SkyAlign allows you to align on any three bright celestial objects, making for a fast and easy alignment process
- 20.32cm (8 in.) aperture



INCLUDES:

CD-ROM "The Sky" Astronomy Software, which provides education about the sky and printable sky maps

Cat. No.	Description	Price
S93983A	20.32cm 8SE Computerized Telescope	1211.00/Each

Celestron™ NexStar™ 127SLT Computerized Telescope

Designed to be an affordable entry level to mid-level computerized GoTo telescope.

General Features

- High quality 127mm Maksutov-Cassegrain
- Fully computerized Altazimuth mount
- StarPointer finderscope to help with alignment and accurately locating objects
- Quick-release fork arm mount, optical tube and accessory tray for quick no tool set up
- Sturdy stainless steel tripod and accessory tray included
- Good for terrestrial and celestial observing
- "TheSkyX – First Light Edition" astronomy software with a 10,000 object database, printable sky maps and 75 enhanced images



Computerized Features

- Database allows telescope to locate over 4,000 celestial objects
- SkyAlign allows you to align on any three bright celestial objects, making for a fast and easy alignment process
- Flash upgradeable hand control software and motor control units for downloading product updates over the Internet
- Internal battery compartment to prevent cord wrap during use
- Auxiliary port for additional accessories such as GPS accessory
- Includes NSOL telescope control software for basic control of your telescope via computer (with optional RS-232 cable)
- Compatible with optional NexRemote telescope control software (not included), for advanced control of your telescope via computer

Cat. No.	Description	Price
S28080	127mm Maksutov-Cassegrain; Focal length: 1500mm; Focal ratio: 12; Magnification Eyepiece 1/2: 60x/167x	850.00/Each

Celestron™ NexStar™ 4SE Computerized Telescope

Ideal for observing and photographing the wonders of space.

StarBright XLT high-transmission coatings come standard on each model along with the StarPointer finderscope to help with alignment and accurately locating objects.

- Internal flip mirror for convenient viewing straight through (with optional diagonal) or at 90° (4 in. model only)
- Quick-release fork arm mount, optical tube and accessory tray for no-tool setup
- Sturdy computerized altazimuth mount
- Internal battery compartment to prevent cord wrap during use
- Ultra-sturdy steel tripod features built-in wedge allowing 4 in. model to be used for astrophotography
- Nearly 40,000-object database with 200 user-definable objects and expanded information on over 200 objects
- SkyAlign allows you to align on any three bright celestial objects, making for a fast and easy alignment process
- Aperture 102mm (4 in.)



INCLUDES:

CD-ROM "The Sky" Astronomy Software, which provides education about the sky and printable sky maps

Cat. No.	Description	Price
S93982	4 in. Maksutov-Cassegrain telescope	504.00/Each

Celestron™ NexStar™ 90SLT Computerized Telescope

Designed to be an affordable entry level to mid-level computerized GoTo telescope.

General Features

- High quality 90mm Maksutov-Cassegrain
- Fully computerized Altazimuth mount
- StarPointer finderscope to help with alignment and accurately locating objects
- Quick-release fork arm mount, optical tube and accessory tray for quick no tool set up
- Sturdy stainless steel tripod and accessory tray included
- Good for terrestrial and celestial observing
- "TheSkyX – First Light Edition" astronomy software with a 10,000 object database, printable sky maps and 75 enhanced images



Computerized Features

- Database allows telescope to locate over 4,000 celestial objects
- SkyAlign allows you to align on any three bright celestial objects, making for a fast and easy alignment process
- Flash upgradeable hand control software and motor control units for downloading product updates over the Internet
- Internal battery compartment to prevent cord wrap during use
- Auxiliary port for additional accessories such as GPS accessory
- Includes NSOL telescope control software for basic control of your telescope via computer (with optional RS-232 cable)
- Compatible with optional NexRemote telescope control software (not included), for advanced control of your telescope via computer

Cat. No.	Description	Price
S28081	90mm Maksutov-Cassegrain; Focal length: 1250mm; Focal ratio: 14; Magnification Eyepiece 1/2: 50x/139x	627.00/Each

Celestron™ NexStar™ SLT Computerized Telescopes

With a fully computerized hand control and a database of over 40,000 celestial objects.

- Fully computerized Altazimuth mount
- StarPointer finderscope to help with alignment and accurately locating objects
- Quick-release fork arm mount, optical tube, and accessory tray for quick, no-tool setup
- Sturdy stainless-steel tripod and accessory tray included
- Good for terrestrial and celestial observing
- SkyAlign allows you to align on any three bright celestial objects, making for a fast and easy alignment process



INCLUDES:

CD-ROM "The Sky" Astronomy Software, which provides education about the sky and printable sky maps

Cat. No.	Description	Price
S93981A	130 SLT Computerized Telescope	505.00/Each

New Tech Takes Self-Driving Cars Off Road

By Mike Howie

Self-driving cars are rapidly becoming more capable and more common, thanks to high-profile efforts from the likes of Tesla, Uber, and other companies. But they're far from perfect: many of them struggle with faded lane lines, especially in rainy conditions, and can't navigate in areas that aren't thoroughly mapped. And after a self-driving Uber vehicle tragically struck and killed a pedestrian in Arizona in March, it's clear that obstacle detection and avoidance technology must significantly improve as well before these cars are ready for wide-spread adoption.

A team from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) has been

working to create a framework that would allow self-driving cars to drive on unfamiliar and even unpaved roads without the advanced 3D maps that most driverless cars depend on. It's called MapLite, and it uses GPS data similar to what's widely available on Google Maps paired with sensors that evaluate road conditions. Together, they can reliably detect the road more than 100 feet in advance.

Navigating with Digital Eyes

While most self-driving cars rely heavily on maps to navigate and only use sensors to avoid cars, pedestrians, and other objects, MapLite relies on sensors for all

aspects of navigation and only uses GPS to estimate the location of the car relative to its destination. The sensors generate a path, and a LIDAR system estimates where the edges of the road are.

The team tested their car on unpaved roads in Devens, Massachusetts, but they still have more work to do. The system isn't reliable enough to tackle mountain roads yet because it doesn't account for dramatic changes in elevation. Their next challenge is to utilize more diverse test routes, because their ultimate goal is to prove that MapLite-equipped cars can equal or improve upon the navigation performance of mapped systems but across a greater variety of roads and road conditions than

is currently possible.

Because MapLite is significantly less complex than other systems and doesn't require advanced maps, it could make self-driving cars more viable in smaller cities and even unmapped rural areas.

[DISCUSSION QUESTIONS]

What other technology might make self-driving cars safer? How would it work?

How could self-driving cars be useful off road?

[VOCABULARY]

GPS

LIDAR



Nothing Stacks Up to the OHAUS Scout!

- Superior Overload Protection and Practical Stackable Design for Convenient Storage
- Improved Functionality with Bright Backlit LCD and Four-Button Operation
- Multiple Connectivity Options Available for Data Logging and Communication
- Geared for Classroom Use with Education-Specific Software Applications

Cat. No.	Model	Capacity	Readability	Price
S14529	SKX123	120g	0.001g	\$589.00
S14530	SKX222	220g	0.01g	\$425.00
S14531	SKX422	420g	0.01g	\$606.00
S14532	SKX622	620g	0.01g	\$711.00
S14533	SKX1202	1200g	0.01g	\$814.00
S14534	SKX2202	2200g	0.01g	\$709.00
S14535	SKX421	420g	0.1g	\$247.00
S14536	SKX621	620g	0.1g	\$345.00
S14537	SKX2201	2200g	0.1g	\$440.00
S14538	SKX6201	6200g	0.1g	\$739.00
S14539	SKX8200	8200g	1g	\$362.00

Visit fisheredu.com/ohaus to learn more.



OHAUS™ Digital Light Duty Orbital Shaker

Units can be run in coldrooms, incubators and CO₂ environments



Tray includes a non-skid rubber mat. Remove mat to mount a variety of optional flask clamps or test tube racks directly onto the tray.

- Low-profile design so that shaker takes up less space and easily fits into most fume hoods and incubators
- Cast-aluminum base offers durability and added stability
- Variable-speed control provides consistent uniform shaking action
- Brushless motor
- LED display touchpad controls with easy-to-read, independent LED displays for speed and time enable operator to view both settings at once
- Display provides repeatable and accurate results every time and is easily visible across lab benches
- Timer will display elapsed time, or when programmed to user-defined limit will shut off unit when time reaches zero
- Display retains last used settings
- Electrical requirements: 120V 50/60Hz, 5A, 25w

WARRANTY: 2-Year

Cat. No.	Dimensions (LxW) Platform	Capacity	Speed Range	Orbit	Price
S38793	27.9 x 20cm (11 x 7.75 in.)	Holds up to 4 microplates or 2 micro-tube racks	100 to 1200rpm	1.1 in. (3mm)	1393.00/Each
S38769	29.9 x 22.2cm (11.75 x 8.75 in.)	8 lb. (3.6kg)	100 to 1200rpm	0.1 in. (3mm)	1721.00/Each
S38768	29.9 x 22.2cm (11.75 x 8.75 in.)	8 lb. (3.6kg)	40 to 300rpm	0.59 in. (1.5cm)	1831.00/Each

OHAUS™ Scout™ STX Portable Balances with Touchscreen Display

The all new Ohaus Scout with intuitive color touchscreen interface offers superior overload protection in a sleek, low profile and stackable design.

- Fast response time and repeatable weighing results
- Rapid stabilization and high resolution
- Five major connectivity options
- Additional software application modes and added weighing units complement the balance and set a new standard in portable weighing technology
- Available with or without draftshield
- Stackable design
- Leveling bubble with adjustable feet
- Kensington security slot cable sold separately
- Calibration mass included(all models up to 620g)
- 12 different weighing units: g,mg,kg,lb:oz,N,ct,Grn, dwt, ozt, custom unit
- Powered by AC adapter (included) or 4 AA batteries (not included)
- Integrated weigh-below hook
- Transportation/storage lock



APPLICATIONS

Weighing, density determination, molar mass

Cat. No.	Model	Capacity	Readability	Stabilization Time	Price
S14505	STX123	120 g	0.001 g	1.5 sec.	750.00/Each
S14506	STX223	220 g	0.001 g	1.5 sec.	839.00/Each
S14507	STX222	220 g	0.01 g	1 sec.	551.00/Each
S14508	STX422	420 g	0.01 g	1 sec.	770.00/Each
S14512	STX421	420 g	0.1 g	1 sec.	311.00/Each
S14509	STX622	620 g	0.01 g	1 sec.	751.00/Each
S14513	STX621	620 g	0.1 g	1 sec.	460.00/Each
S14510	STX1202	1200 g	0.01 g	1.5 sec.	858.00/Each
S14511	STX2202	2.2 kg	0.01 g	1.5 sec.	1158.00/Each
S14514	STX2201	2.2 kg	0.1 g	1 sec.	485.00/Each
S14516	STX8200	8.2 kg	1 g	1 sec.	403.00/Each

OHAUS™ Pioneer™ Analytical and Precision Balances

Designed for basic, routine weighing in laboratory or educational applications.

- External calibration (Excal) model
- Bright backlit LCD
- Stainless-steel bottom
- RS-232 interface
- Easy-to-clean analytical draftshield with easy-to-remove-and-replace glass panels, including three sliding doors
- Selectable environmental settings: Three filter modes and adjustable zero tracking adjust balance sensitivity to environmental disturbances, or application requirements
- Design features: Stability Indicator, Auto tare, Manual calibration lock, Software lockout menu, Software reset menu, User selectable communication and printing settings, Auto standby, Mechanical and software overload/underload protection, Up-front level bubble indicator, Integral weigh below hook, Security bracket

NOTE

Cat. No. S05025 through S05030 come with a draft shield.

INCLUDES:

- AC adapter
- In-use cover



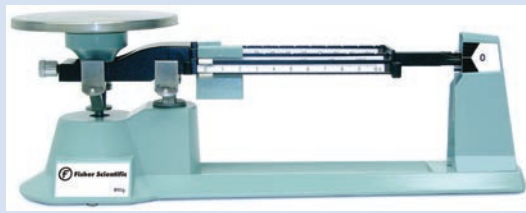
SPECIFICATIONS

- **Application Modes:** Weighing, Parts Counting, Percent, Density Determination, Dynamic Weighing
- **Weighing Units:** mg, g, ct, oz, dwt, tical, tola, mommes, baht, grain, mesghal, Newton, ozt, custom unit
- **Platform Size:** 9cm (3.54 in.) diameter
- **Operating Conditions:** 50°F/ 10°C to 104°F/40°C at 10% to 80% relative humidity, non-condensing, up to 4000m above sea level
- **Storage Temperature:** -40°F/-40°C to 158°F/ 70°C at 10% to 80% relative humidity, non-condensing
- **Taring Time:** One second
- **Stabilization Time:** Three second
- **Display:** Backlit LCD

Cat. No.	Model	Capacity (Metric)	Readability	Stabilization Time	Price
S05025	PA84	85 g	0.1 mg	3 sec.	1730.00/Each
S05026	PA124	120 g	0.1 mg	3 sec.	2075.00/Each
S05028	PA163	160 g	1 mg	3 sec.	1039.00/Each
S05027	PA224	220 g	0.1 mg	3 sec.	2306.00/Each
S05029	PA323	320g	1 mg	3 sec.	1210.00/Each
S05030	PA523	520 g	1 mg	3 sec.	1645.00/Each
S05031	PA1602	1.6 kg	10 mg	3 sec.	934.00/Each
S05035	PA2201	2.2 kg	100 mg	3 sec.	906.00/Each
S05032	PA2202	2.2 kg	10 mg	3 sec.	1004.00/Each
S05033	PA3202	3.2 kg	10 mg	3 sec.	1329.00/Each
S05034	PA4202	4.2 kg	10 mg	3 sec.	1500.00/Each
S05036	PA4201	4.2 kg	100 mg	3 sec.	1062.00/Each

fisherbrand Triple-Beam Balance

Accurate, durable and easy to use. OHAUS Triple-Beam Balances are designed to demonstrate mass measurement concepts in the classroom and for everyday weighing.



- Stainless-steel pan
- Security loop for lock-down capabilities
- Zero adjust knob
- Magnetic damping
- Designed to stay accurate with everyday use
- Capacity: 21.5 oz. (610g)
- Readability: 0.1g

WARRANTY:
One year

Cat. No.	Description	Price
S97280	Triple-Beam Balance	121.00/Each

Troemner Stainless-Steel Weight Sets



Weights are adjusted to tolerances specified by ANSI™/ASTM™ Class 7. Each set comes complete with a plastic storage container.

- 303 stainless steel
- Fractional masses of 200mg and over are made of stainless steel
- Fractional masses below 200mg are made of aluminum
- Sets with fractional masses include forceps

Cat. No.	Description	Price
S40244A	Set of 8	24.00/Each
S40215A	Set of 13	93.00/Each
S40208A	Set of 17	50.25/Each
S40202A	Set of 20	53.00/Each
S40203A	Set of 21	60.25/Each

Fisher Science Education™ Precision™ Balances

Dependable measurements and reliable performance.

- Simple three-button operation
- Weighing units: Grams and Newtons
- Large 7 in. (22.9cm) high weighing chamber and three-door draft shield included with 200g and 400/100g models
- Sealed front panel and molded spill ring for fast, easy cleanup
- Integrated security bracket
- Large, single-line LCD display (not backlit)
- Stainless-steel weighing pan
- RS-232 interface

INCLUDES:
AC adapter

WARRANTY:
Two years

COMPLIANCE:
UL and CSA approved.



Cat. No.	Model	Capacity	Readability	Stabilization Time	Price
S94791A	AMF203 AM	200 g	0.001 g	3 sec.	1333.00/Each
S94791B	AMF402 AM	400 g	0.01 g	3 sec.	975.00/Each
S94791C	AMF602	600 g	0.01 g	3 sec.	1066.00/Each
S94791D	AMF1202	1200 g	0.01 g	3 sec.	1270.00/Each
S94791E	AMF2002	2 kg (72 oz.)	0.01 g	3 sec.	1374.00/Each

Fisher Science Education™ Portable Balances

Superior performance in an affordable, portable balance.

- Excellent shock resistance and overload protection
- Three-button operation
- Draft shield flip top with integrated sample tray, standard for all models
- Integral weigh-below hook, critical for density or specific gravity determination Security bracket RS-232 or optional USB snap-in module allows data connection to PC or printer Stackable design
- Shipping load cell lock (overload protection up to 200 lb.)
- 50-hour battery life with auto shutoff

INCLUDES:
AC adapter

REQUIRES:
Three AA batteries, Security bracket cable

WARRANTY:
One year



Cat. No.	Model	Capacity	Readability	Stabilization Time	Price
S94792A	SLF103	100 g, 0.22 lb	0.001 g	3 sec.	514.00/Each
S94792B	SLF152	150 g	0.01 g	3 sec.	340.00/Each
S94792C	SLF302	300 g	0.01 g	3 sec.	467.00/Each
S94792D	SLF301	300 g	0.1 g	3 sec.	190.00/Each
S94792K	SLF303	300 g	0.001 g	3 sec.	669.00/Each
S94792E	SLF501	500 g, 18 oz.	0.1 g	3 sec.	222.00/Each
S94792F	SLF901	900 g	0.1 g	3 sec.	295.00/Each
S94792G	SLF1501	1.5 kg	0.1 g	3 sec.	191.43/Each
S94792H	SLF3001	3 kg	0.1 g	3 sec.	458.00/Each
S94792J	SLF5000	5 kg, 11.02 lb.	1 g	3 sec.	225.00/Each

Fisher Science Education™ Compact Balances

Economical, dependable and portable.

Rugged housing design provides best overall overload protection and durability in its class. Uniquely designed for a wide variety of applications, these balances feature easy operation, long battery life and great performance.

- Sleek, low-profile design
- Large, high-contrast LCD
- Energy-saving auto shut-off feature
- Two-button keypad
- Stackable, for storage with molded stack ring
- Load cell lock
- Three AA batteries (included) or optional AC adapter
- Over- and underload indicators
- Digital calibration from keypad
- Low-battery indicator

WARRANTY:
One year



Cat. No.	Capacity (Metric)	Readability	Repeatability	Price
S94793A	200g	0.1g	0.1g	119.00/Each
S94793B	2000g	1g	1g	119.00/Each
S94793C	5000g	2g	2g	136.00/Each

fisherbrand Isotemp™ Hotplate

Experience precise stirring control, exceptional safety and temperature performance for your routine protocols.

- Heats to 540°C
- For 110-120V 60Hz
- Strong magnetic coupling
- Temperature adjustable in 1 degree increments
- HOT TOP warning system designed to protect from accidental burns with prominent display when heating surface is above 50°C (122°F)
- Automatic over-temperature protection
- Top plate choices in ceramic or aluminum
- Raised display design protects electronics from spills
- Optional temperature probe and splash guard protection shield
- Variable sizes for different sample volumes



CERTIFICATIONS:

RoHS compliant; cCSAus (100-120V models), CE (230V models)

Cat. No.	Surface Area (English) Heating	Price
S43492	4.25 x 4.25 in.	301.00/Each
S43496	7.25 x 7.25 in.	308.00/Each

Fisherbrand™ RT Basic Stirrers

- Analog speeds from 150 to 2500rpm
- Low profile and lightweight
- Extremely durable
- Chemical-resistant polypropylene top and body
- Detachable plug
- Two-year warranty



Cat. No.	Surface Diameter	Stirring Capacity	Max Load	Price
S05260	4.7 in. (120mm)	2L	33 lb.	\$171.00
S05261	6.7 in. (170mm)	4L	44 lb.	\$205.00
S05262	8.7 in. (220mm)	5L	55 lb.	\$282.00



Fisher Scientific™ Isotemp™ Digital Dry Baths/Block Heaters

Offers a range of configurations with interchangeable modular blocks for a variety of application needs

- Digital controls and display of time and temperature
- Advanced internal temperature sensing probe for outstanding temperature accuracy and control
- Precise temperature control with PID circuit
- Temperature calibration enables to offset the temperature to desired value
- Timer allows the user to accurately monitor the heating time
- Wide range of interchangeable aluminum alloy heat blocks provide versatility and allow for easy cleaning and disinfecting
- Powder-coated steel body construction ensures durability
- Built-in over-temperature protection device warrants sample and user safety
- Temperature deviation adjustment
- For 120V 50/60Hz

APPLICATIONS: Sample preparation, enzyme preservation, enzyme-substrate reactions, DNA amplification, electrophoresis gel degeneration and serum coagulation

WARRANTY:

2-year Thermo Fisher Scientific™ standard, limited warranty. Contact your sales representative for details.



Cat. No.	Description	Price
S28681	Single Block	431.00/Each
S28682	Dual Block	479.00/Each
S28683	4 blocks	578.00/Each

fisherbrand Isotemp™ Microbiological Incubators

Precise, repeatable, thriving incubation

- Outstanding temperature uniformity and stability to keep samples at desired condition&
- Wide temperature range: ambient +5°/10° to 75°C
- Intuitive and easy-to-use microprocessor controller
- Automatic over temperature alarm—no operator settings required
- Low air exchange provides minimal drying out of samples—ideal for long experiments
- On/off timer
- Corrosion resistant stainless steel interior with smooth corners for easy cleaning†
- Easy-to-clean rounded interior edges, designed to reduce contamination risks
- Flexible shelving with no tools required to set up, adjust or remove
- Small external dimensions per chamber size reduce required bench space

Construction Features:

- Stainless-steel exterior provides a clean professional look with surface that avoids fingerprint smudges
- Readily stackable same-size units without the need for tools or kits

- Access port with silicone plug for independent data logging or for using small equipment inside the unit
- Flexible shelving system with different positions to optimize chamber space
- Large easy-to-view fluorescent display with intuitive microprocessor controller
- Internal glass door for undisturbed sample viewing



Cat. No.	Description	Price
S28666	60L, gravity convection	1725.00/Each
S28667	100L, gravity convection	2075.00/Each
S28671	180L, forced air	2985.00/Each

fisherbrand Blocks for Isotemp™ Digital Dry Baths/Block Heaters



- For use with digital and touch screen dry baths/block heaters

Cat. No.	Description	Price
S28694	1 x 96-Well Elisa	76.00/Each
S28697	3 Places, 6mm, 13mm and 22mm Dia.	146.00/Each
S28700	4 x 50mL Flat Bottom	176.00/Each
S28692	6 x 25mm	82.00/Each
S28691	8 x 20mm	82.00/Each
S28701	15 x 15mL Conical	354.00/Each
S28696	18 Places, 1.5 and 2.0mL	107.00/Each
S28687	28 x 2.0mL	76.00/Each
S28698	30 Places, 0.2mL and 0.5mL	147.00/Each
S28695	Mixed Block, 6mm and 10mm Dia.	106.00/Each

Protector™ ClassMate™ Fume Hoods



- High-performance fume hood, per SEFA 1
- 360° visibility
- Low-profile, ADA-compliant air foil
- Vertical-rising or combination sash models

Cat. No.	Description	Price (ea)
S71807	4' Hood, Vertical-Rising Sash, 115V	\$8,252.00
S71817	5' Hood, Vertical-Rising Sash, 115V	\$8,854.00
S71841	6' Hood, Vertical-Rising Sash, 115V	\$9,134.00



Labconco™ Protector™ ClassMate Laboratory Hood

Designed to meet the needs of instructional laboratories. Labconco 4 ft. Protector ClassMate Laboratory Hood is a fully-featured benchtop hood with clear back and sides for enhanced visibility for conducting demonstrations or observing students.

Clear back and sides and taller front viewing window provide enhanced visibility for conducting chemistry demonstrations or observing students using the hood. The clear back also does not obstruct visibility when hoods are placed back-to-back in an island configuration.

Fully-featured with baffle and air foil, this high-performance by-pass hood maintains safe airflow while conserving energy.

- SEFA 1 High Performance Hood
- Patented design
- By-pass airflow design
- Glacier white powder-coated steel frame
- Ergonomic air foil with aerodynamic Clean-Sweep airflow openings
- Low-profile, ADA-compliant spill trough
- Clear, 1/4 in. thick, tempered safety glass sides, back and removable baffle
- 5° angled, 1/4 in. thick tempered safety glass stationary viewing panel and 3/16 in. thick chain-driven sash with anti-racking shaft and powder-coated steel frame that provides 37.5 in. high visibility
- Powder-coated sash handle with aerodynamic Clean-Sweep airflow openings
- High-performance, 3-piece glass baffle that pivots for cleaning

- Cord-Keeper slots on left and right side of air foil
- Pre-wired LED lighting, light switch and blower switch
- Powder-coated stainless steel tissue screen located directly below exhaust outlet
- Removable front panel, side panels and interior cover plates for access to plumbing and electrical wiring
- Powder-coated stainless steel 12.81in. ID exhaust connection



Combination Sash Models Feature

- Combination horizontal-sliding/vertical-rising sashes that allow the operator to use the hood with the sashes half open either horizontally or vertically.
- Sash stop at 14 in. height from work surface (50% vertical opening). Can be field modified to 18 in. from work surface. Fully open sash is 28 in. from work surface

REQUIRES:

Remote blower, Ductwork, Work surface, Base cabinet or stand

4 ft. Widths

Cat. No.	Includes	Voltage	Amperage	Description	Price
S71814	Two pre-plumbed service fixtures, 1 electrical duplex	100 to 115V	10A	Combination Sash	9685.00/Each
S71813	Two pre-plumbed service fixtures	100 to 115V	10A	Combination Sash	9497.00/Each
S71812	No service fixtures or duplex	100 to 115V	10A	Combination Sash	8951.00/Each
S71809	Two pre-plumbed service fixtures, 1 electrical duplex	100 to 115V	10A	Vertical-Rising Sash	8987.00/Each
S71808	Two pre-plumbed service fixtures	100 to 115V	10A	Vertical-Rising Sash	8798.00/Each
S71807	No service fixtures or duplex	100 to 115V	10A	Vertical-Rising Sash	8252.00/Each
S71811	Two pre-plumbed service fixtures	208 to 230V	5A	Vertical-Rising Sash	8798.00/Each
S71810	No service fixtures or duplex	208 to 230V	5A	Vertical-Rising Sash	8252.00/Each

5 ft. Widths

Cat. No.	Includes	Voltage	Amperage	Description	Price
S71838	Two pre-plumbed service fixtures, 1 electrical duplex	100 to 115V		Combination Sash	10374.00/Each
S71837	Two pre-plumbed service fixtures	100 to 115V		Combination Sash	10185.00/Each
S71836	No service fixtures or duplex	100 to 115V		Combination Sash	9639.00/Each
S71831	Two pre-plumbed service fixtures, 1 electrical duplex	100 to 115V		Vertical-Rising Sash	9588.00/Each
S71818	Two pre-plumbed service fixtures	100 to 115V		Vertical-Rising Sash	9400.00/Each
S71817	No service fixtures or duplex	100 to 115V		Vertical-Rising Sash	8854.00/Each
S71835	Two pre-plumbed service fixtures	208 to 230V		Vertical-Rising Sash	9400.00/Each
S71832	No service fixtures or duplex	208 to 230V		Vertical-Rising Sash	8854.00/Each

6 ft. Widths

Cat. No.	Includes	Voltage	Amperage	Description	Price
S71847	Two pre-plumbed service fixtures	100 to 115V		Combination Sash	10466.00/Each
S71846	No service fixtures or duplex	100 to 115V		Combination Sash	9920.00/Each
S71843	Two pre-plumbed service fixtures, 1 electrical duplex	100 to 115V		Vertical-Rising Sash	9869.00/Each
S71842	Two pre-plumbed service fixtures	100 to 115V		Vertical-Rising Sash	9680.00/Each
S71841	No service fixtures or duplex	100 to 115V		Vertical-Rising Sash	9134.00/Each
S71845	Two pre-plumbed service fixtures	208 to 230V		Vertical-Rising Sash	9680.00/Each
S71844	No service fixtures or duplex	208 to 230V		Vertical-Rising Sash	9134.00/Each

Labconco™ Basic™ Laboratory Hoods

Basic Laboratory Hoods are designed specifically for laboratories, classrooms and light duty applications where safe ventilation is required. Basic Hoods have smaller overall height and depth than traditional hoods so they fit in areas with low ceilings or narrow aisles.

- By-pass airflow design
- Curved air foil that lifts off for cleaning
- Glacier white powder-coated, 16 gauge steel exterior and interior
- Vapor-proof incandescent lights
- Two-piece adjustable baffle
- Thick tempered safety glass 4.7mm (0.187 in.)
- Vertical-rising sash with epoxy-coated aluminum sash handle
- Removable front panel for access to electrical wiring
- Factory-prepared right side fixture panel for up to three service fixtures, one duplex electrical receptacle and one airflow monitor (fixtures, receptacle and monitor not included)
- Factory-prepared right interior wall for one cupsink and turret (cupsink and turret not included)
- Powder-coated steel 26.1cm (10.3 in.) OD exhaust connection



Cat. No.	Model	Dimensions (L x W x H)	Description	Price
S28126	Basic 47	63.5 x 119.4 x 121.9cm (25 x 47 x 48 in.)	With sash full open, exhausts 720 CFM, static pressure loss does not exceed 0.35" H2O (at 100 fpm)	4346.00/Each
S51259MF	Basic 47 with Built-in Blower	63.5 x 119.4 x 134.6cm (25 x 47 x 53 in.)	With sash full open, exhausts 720 CFM, static pressure loss does not exceed 0.35" H2O (at 100 fpm)	5601.00/Each
S28127	Basic 70	63.5 x 177.8 x 121.9cm (25 x 70 x 48 in.)	With sash full open, exhausts 720 CFM, blower is capable of overcoming a maximum external static pressure of 0.25" H2O (at 100 fpm)	5455.00/Each
S28128	Basic 70 with Built-in Blower	63.5 x 177.8 x 121.9cm (25 x 70 x 48 in.)	With sash full open, exhausts 1120 CFM, blower is capable of overcoming a maximum external static pressure of 0.23" H2O (at 100 fpm)	7370.00/Each

Labconco™ Paramount™ Ductless Enclosure

For use with Paramount Ductless Enclosures.

- Used with carbon-based and HEPA filters in variety of Labconco enclosures which require periodic replacement
- Select the right filters to fit your Labconco product

ORDERING INFORMATION:

Acid gas detector tubes available. (See Cat. No. 10-030-241)



Cat. No.	For Use With (Application)	Weight (Metric)	Price
S28167	Acid-Sulfur	5.4kg	400.00/Each
S28168	Ammonia-Amine	5.9kg	350.00/Each
S28169	Formaldehyde-Formalin	5.4kg	425.00/Each
S15406	Mixed - organic vapor, acid-sulfur, ammonia-amine, and formaldehyde fumes	Carbon: 4.5kg	370.00/Each
S28166	Organic-vapor	4.5kg	264.00/Each

Diversified Woodcrafts™ Maple Base Cabinets

Diversified Woodcrafts™ Maple Base Cabinets can be ganged together to create a wall of base cabinets



- Can be ganged together
- Constructed of solid maple and maple veneers
- Natural with chemical resistant UV finish
- Top and rubber base molding sold separately

COMPLIANCE: SEFA

Cat. No.	Product Type	Includes	Price
S37792	Door/Drawer Base Cabinet	Two lockable drawers over two lockable doors	1363.00/Each



Robotic Workbench

Maple workbench has storage for three robots.

- Three 18 x 18 in. compartments with roll-out shelves
- Each lockable compartment includes a tool drawer with a customizable foam insert
- A folding shelf can be used to add eight inches of surface space
- Includes six heavy-duty, locking casters



PRODUCT DESCRIPTION	CAT. NO.	PRICE
Robotic Workbench	S28776	\$1,864.00
Robotic Workbench	S28777	\$1,864.00

Diversified Woodcrafts™ Mobile Demonstration Table with Drawers

Self-contained unit with its own water supply, waste container and four drawers mounted on epoxy-coated nylon bearing glides.

- Constructed of solid oak and oak hardwood veneers
- Non-emitting, chemical resistant UV finish
- GFI protected AC duplex electrical outlet with a 25 ft. extension cord
- Unbreakable aluminum sliding door glides and lock and conceal drawer and storage compartment
- Unit includes four drawers which are dovetailed and mounted on epoxy coated glides
- Unit rolls easily on 4 in. ball bearing locking swivel casters
- Upright set and mirror sold separately

COMPLIANCE:
SEFA



Cat. No.	Product Type	Price
S38012	Mobile Demonstration Table with flat top and rod sockets	2304.00/Each
S38011	Mobile Demonstration Table with with flat top	2232.00/Each
S38010	Mobile Demonstration Table with sink and rod sockets	2804.00/Each

Diversified Woodcrafts™ Open-Style Wood Workbench

Features large work surface and plenty of open storage space on the maple plywood lower shelf.

- Constructed from solid maple and maple veneer
- 5.715cm (2.25 in.) thick maple top
- Can be ordered with or without black vises
- Vises need on site installation
- SEFA compliant and MAS Certified Green
- Finished with durable chemical resistant non-emitting UV finish



Cat. No.	Dimensions (D x W x H)	Includes	Product Type	Price
S42469	162.56 x 137.16 x 79.37cm (64 x 54 x 31.25 in.)	Two vises	Open-Style Wood Workbench- Four-Station	4162.00/Each
S42470	162.56 x 137.16 x 79.37cm (64 x 54 x 31.25 in.)	Four vises	Open-Style Wood Workbench- Four-Station	5422.00/Each
S42462	162.56 x 71.12 x 79.37cm (64 x 28 x 31.25 in.)	No vises	Open-Style Wood Workbench- Two-Station	2155.00/Each

Diversified Woodcrafts™ Four-Station Steel Workbench with Two Door Units

Double-faced heavy gauged steel workbench having double swing doors with or without vises available in gray or black colors.

- Base consists of double-faced 20 gauge steel unit, welded and riveted throughout
- Double swing doors with cylinder lock mounted in chrome handle
- Two-point locking device
- Includes one adjustable shelf
- Steel lockers with gray baked-enamel finish

- Maple top with 5.715cm (2.25 in.) thickness
- SEFA compliant and MAS Certified Green



Cat. No.	Color	Includes	Price
S42637	Black	No vises	4249.00/Each
S42421	Black	Four vises	6597.00/Each
S42419	Gray	Four vises	6597.00/Each
S42418	Gray	No vises	4238.00/Each

Diversified Woodcrafts™ Oak Table with Plain Apron and Plastic Laminate Top

Offers an excellent work surface that wears exceptionally well under normal use. Diversified Woodcrafts Oak Tables with Plastic Laminate Tops are widely used for student science tables.

- 1.25 in. Plastic Laminate Table Surface
- 2.25in. solid square legs, with 5/16 in. hanger bolts installed, supplied nuts and washers
- Aprons are 13/16 in. D x 4.5 in.H with heavy-duty 13 gauge steel corner braces
- Diversified Woodcrafts Inc. is SEFA compliant and MAS Certified Green
- Equipped with non-skid adjustable glides for precise leveling and rubber leg boots

- Limited Lifetime Warranty
- Made in the USA
- Minimal assembly required; legs need to be attached
- Solid Oak Construction



Cat. No.	Size (English)	Height (English)	Price
S48201	21 x 54 in.	36 in.	871.00/Each
S47446	24 x 48 in.	34 in.	769.00/Each
S42040	24 x 60 in.	36 in.	840.00/Each
S47584	30 x 48 in.	34 in.	835.00/Each
S47655	30 x 54 in.	36 in.	929.00/Each
S42729	30 x 60 in.	34 in.	938.00/Each
S47902	30 x 72 in.	34 in.	1027.00/Each

Diversified Woodcrafts™ Stainless-Steel Tables

Diversified Stainless-Steel Table features a top with integrally welded C channels to prevent sagging.

- Stainless-steel top with two sound deadened integrally welded 12.7cm (5 in.) channels to reinforce and maintain level working surface (prevents sags)
- Material: T-430 18-gauge stainless-steel
- Galvanized legs (4.1cm dia.) with adjustable high impact corrosion resistant feet
- Adjustable under-shelf with two pins per corner provides strength and stability



Cat. No.	Width (Metric)	Price
S14188	91.4cm	482.00/Each
S14189	122cm	288.00/Each
S14190	152.4cm	619.00/Each
S14191	182.8cm	683.00/Each

Diversified Woodcrafts™ Flammable Liquid Storage Cabinet

Used for storage of flammable materials.

- Constructed of red oak hardwood and oak veneers
- Thick exterior grade plywood (Dia.: 1 in.)
- Hard wood strips dadoed into interiors (1 in.) to create seal (Size: 1.5 x 0.75 in.)
- Adjustable metal shelf
- Drip pan to prevent leakages (Height: 3 in.)
- Chemical resistant, earth-friendly UV finish

COMPLIANCE:
SEFA

CERTIFICATIONS:
MAS Certified Green



Cat. No.	Width (Metric) Exterior	Door Style	No. of Doors	Price
S37972	60.96cm	Locking Right-hinged	1	3213.00/Each
S37971	60.96cm	Locking Left-hinged	2	3213.00/Each
S37970	91.44cm	Locking	2	4137.00/Each

fisherbrand Education Wood Chair with Round Tube Base

Fisherbrand™ Education Wood Chair for Medium Bench features 7-Ply Contoured Furniture-Grade Plywood with natural finish, powder coated steel base, fixed foot ring and stationary glides. For use at a 36 inch (91.44cm) work surface.



- Ergonomic wood chairs are durable making them ideal for almost any environment
- Our wood FisherBrand chairs are constructed with seven-ply furniture grade hardwood
- These medium bench height FisherBrand chairs feature a black powder-coated steel base with fixed foot ring
- Optional casters available and add 2-inches of height to the chair
- Each ergonomic FisherBrand chair is backed by our 15-year warranty, lifetime on the pneumatic lift

ORDERING INFORMATION:

Seat: 15.75D x 17.5 in. W (40 x 44cm). Back: 14.75W x 10 in. H (37.5 x 25.4cm).

Cat. No.	Description	Price
S68906	w/Black fixed footing; Seat height: 20 to 28 in. (50.80 to 71.12cm)	258.00/Each

fisherbrand Metal Stool

These Fisherbrand 4-legged metal stools are made of 11-gauge steel and finished with a gray durable powder coating.

- Each stool features a fixed foot ring for added comfort, a 13-inch diameter seat top, and non-marring glides suitable for hard floors
- These stools are not adjustable, but are available in 18-inch, 24-inch, and 30-inch heights to fit just about any work surface
- Each 4-legged stool is covered by our 3-year warranty.



Cat. No.	Description	Price
S68908B	Four-leg base; Seat height: 24 in. (61cm)	69.00/Each

fisherbrand Pneumatic Vinyl Chair With Standard Tilt and Casters, Medium Bench Height

Armless ergonomic chair with chrome-hooded casters and a forward seat tilt option for work that requires leaning forward. Fisher Science Education Pneumatic Vinyl Chair With Standard Tilt and Casters, Medium Bench Height provide mobility on both hard and carpeted floors.



- Armless chair with chrome hooded, rolling, non-marring casters are suitable for both hard and carpeted floors
- Seat tilt provides ° forward and 3° backward locking tilt for ergonomic posture support
- Contoured waterfall seat cushion and an adjustable back rest with lumbar support for increased comfort during extended sitting durations
- Vinyl chrome chairs are constructed of highly durable molded polyurethane foam cushioning covered with easily cleaned antibacterial/antimicrobial vinyl
- Seat height controlled by fingertip pneumatic lift
- 360° swivel

WARRANTY:

15 year parts, lifetime on pneumatic lift

Cat. No.	Description	Footrest Size (English)	Price
S36646	Vinyl Chair	20 in.	343.00/Each

fisherbrand

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fisherbrand Pneumatic Shell Chair

- Withstand heavy use
- One-piece molded polypropylene shell with powder-coated base
- Easy to clean
- Bucket seat
- 3-year warranty



Cat. No.	Description	Price
S90502	Pneumatic Shell Chair	190.00/Each

fisherbrand Mini-Stool, Medium Bench Height, Nylon-Reinforced Fiberglass Base

Choose a Fisherbrand Mini-Stool for a compact seating addition to your classroom laboratory.

- Built for special purposes and feature a 360° all-around adjustment ring that can be operated from any position
- Height adjusts from 20.5 to 28 inches
- Nylon-reinforced fiberglass frame
- Blue vinyl upholstered foam seat
- Standard lift
- Casters

WARRANTY:
15-year warranty (lifetime on the pneumatic cylinder).



Cat. No.	Color	Price
S98301	Mini-Stool	150.00/Each

Safety

fisherbrand Powder-Free Nitrile Exam Gloves

Choose a latex-free glove with exceptional durability and puncture resistance. Fisherbrand™ Powder-Free Nitrile Exam Gloves provide a superior fit, comfort, tactile sensitivity and dexterity.



- Provide superior fit, comfort, tactile sensitivity and dexterity
- Contains no latex proteins that can cause allergic reactions
- Textured surface for solid grip in wet or dry conditions
- 4mil thick at palm, 4.7mil at fingertip

Cat. No.	Size	Price
S79585XS	X-Small	29.00/Pack 250.00/Case
S79585S	Small	29.00/Pack 250.00/Case
S79585M	Medium	29.00/Pack 250.00/Case
S79585L	Large	29.00/Pack 250.00/Case
S79585XL	X-Large	29.00/Pack 250.00/Case
S79585XXL	2X-Large	29.00/Pack 250.00/Case

fisherbrand Economy Chemical-Resistant Goggles

Affordable chemical-resistant goggles.



- Clear polycarbonate lens
- Soft, flexible PVC body molds to facial contours for a comfortable fit
- Adjustable headstrap ensures custom fit
- Resist a broad range of chemicals
- Circular vents allow air to flow freely through goggle body

COMPLIANCE:
Meet ANSI™ Z87.1-2003 and CSA standards.

Cat. No.	Description	Price
S68660A	Chemical Splash Goggles	5.00/Each 54.00/Pack

fisherbrand Racer Series Qualifier Eyewear



- Scratch-resistant, clear polycarbonate lenses block >99.9% of harmful UV radiation
- Wraparound design offers superior side coverage
- Lightweight frames are durable and comfortable
- Flared single-lens design provides sleek protection
- A soft nose bridge and soft, bayonet-style side arms grip the face and temples lightly but firmly for a comfortable fit
- Choose from black or red nylon frames

Cat. No.	Frame Color	Lens Tint	Price
S98423	Red	Clear	75.00/Pack of 12 675.00/Case
S98420	Black	Clear	75.00/Pack of 12 675.00/Case

North Bulk First Aid Kits

Designed for large facilities.



- Contain economical bulk supplies that can be readily accessed when needed
- Latex-free
- Weatherproof
- Supplies housed in waterproof metal or plastic case

ORDERING INFORMATION:
Rapid refill kits available separately. For complete lists of kit contents, visit www.fisheredu.com.

COMPLIANCE:
ANSI™ Z308.1-2003 compliant.

Cat. No.	Includes	Sufficient For	Price
S98414B	Metal	25 Persons	72.50/Each
S98413C	Plastic	50 Persons	81.24/Each

Disposable Anatomical Aprons

Heavyweight, 3mil polyethylene.



- **Gutsy Apron** features major organs of the respiratory, circulatory and digestive systems
- **Bony Apron** features the skeletal system

ORDERING INFORMATION:

Perforated roll of 100.

⚠️ ALERTS: Not chemical resistant.

Cat. No.	Description	Price
S43196	Gutsy Aprons	65.75/Pack
S43197	Bony Aprons	65.75/Pack

Kimberly-Clark™ Professional Kimwipes™ Delicate Task Wipers

Clean and polish delicate surfaces without scratching or leaving residue. Single-ply Kimwipes EX-L wipers are made of a finely textured tissue. Come in a convenient Pop-U™ box with antistatic Lintguard™ polyshield



- Disposable white tissue Ideal for surfaces, parts, instruments and lens cleaning in laboratories and research environment

Cat. No.	Description	Price
S47299	23.11 x 11.17cm	4.95/Pack 308.00/Case
S47299A	42 x 37.33cm	15.50/Pack 241.00/Case

Zoll AED Pro Simulator



- Real CPR Help™ provides real-time feedback on both rate and depth of chest compressions to enhance CPR resuscitation quality
- Bar graph, along with metronome, helps to achieve optimal compression levels
- See-Through CPR

Cat. No.	Description	Price
S38762	Pro Simulator	3570.00/Each
S38763	Non-Rechargeable Battery Pack	204.00/Each
S38764	Multifunction Electrode	75.00/Each

Fisher Scientific™ Universal Spill Kit

Small enough to fit on a lab bench.

- Universal sorbent eliminates guesswork — safe for use on all chemicals except hydrofluoric acid
- Kit absorbs 2.5 gal. (10L)
- Contains 2.5 lb. (1.1kg) carton of universal sorbent
- Each 4 x 14 x 1 in. (10.2 x 35.6 x 2.5cm) lab pillow (also available separately) absorbs 0.22 gal. (750mL)



INCLUDES:

One carton of super sorbent; six pillows; two pads; one pair each of goggles, nitrile gloves and latex boots; one disposal bag; universal instruction sheet.

⚠️ ALERTS:

These products contain natural rubber latex, a component of which may cause allergic reaction in some users. Use only as directed and in accordance with manufacturer instructions and warnings. Please consult your institution's policies regarding use of these products.

Sorbent and pillows not suitable for use with hydrofluoric acid.

Cat. No.	Capacity	Product Type	Price
S47441	2.5 gal., 10L	Universal Spill Kit	94.00/Each
S47440	0.22 gal., 0.83L	Lab Pillow	78.00/Pack

Justrite™ Sure-Grip™ EX™ Safety Cabinets With Handles, For Flammables

Nonslip gripper allows fingertip opening.

- Sure-Grip EX flush-mounted door handle with two keys for security
- Handle can be padlocked (padlock not included), no interference with traffic
- Exclusive self-latching feature ensures safe closing of cabinet doors without manually engaging door handle
- Double-wall construction provides 1.5 in. (3.8cm) of insulating air space to help prevent spread of flames
- High-visibility Haz-Alert™ reflective warning labels offer added safety during power outages or fires
- Dual vents with flame arresters at top and opposite bottom allow hazardous vapors to be piped away
- Easy-closing, self-latching doors facilitate fire protection of the cabinet
- Self-latch engages critical three-point latching system for protection under fire conditions
- Two-door models hinged left and right with self-closing mechanism ensures proper closing sequence
- Fusible links hold self-closing doors wide open, flush with front of cabinet for easy access and resupply; automatically release and slam doors shut at 165°F (74°C)
- Concealed self-close mechanism provides optimum storage space and obstruction-free access to contents
- SpillSlope™ safety shelves direct incidental spills to the back and bottom of leakproof sump

- Adjustable leveling feet ensure solid positioning and alignment for tight door closure
- Exterior side panel has built-in grounding connector for easy grounding
- Finished inside and out with durable lead-free powder paint
- Meet OSHA and NFPA requirements
- Color: Yellow

WARRANTY:

10 years

COMPLIANCE:

Meet NFPA Code 30 and OSHA regulations; models with self-close doors also comply with the International Fire Code and NFPA1, FIRE CODE™.

CERTIFICATIONS:

FM-approved



Cat. No.	Capacity	Door Style	No. of Doors	No. of Shelves	Price
S04760MF	30 gal.	Manual-close	2	1	675.00/Each
S04761MF	45 gal.	Manual-close	2	2	823.00/Each
S04762MF	45 gal.	Self-closing	1	2	1059.00/Each
S04763MF	45 gal.	Self-closing	2	2	899.00/Each

Justrite™ Sure-Grip™ EX Countertop Corrosives/Acid Steel Safety Cabinet

Stores corrosives safely in minimal available space.

- Double-wall construction, dual vents, grounding wire connections, adjustable shelves, leakproof sills, three-point self-latching doors and leveling feet
- Opens to full 180 degrees and self-latches when pushed closed
- Includes polyethylene trays attached to galvanized steel shelves, separate polyethylene liner for bottom sump resist aggressive chemicals
- Easily remove liner for quick cleaning of drips and leaks
- All epoxy baked-on powder-coat finish, inside and out, provides increased chemical resistance

INCLUDES:

Polyethylene trays, polyethylene liner

WARRANTY:

10 years

COMPLIANCE:

Meets OSHA and NFPA 30 requirements.



Cat. No.	Description	Price
S15221MF	Sure-Grip EX Countertop Corrosives/Acid Steel Safety Cabinet	415.00/Each



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