Master Materials and Equipment List

Italicized entries indicate items not available from PASCO. The quantity indicated is per student or group. NOTE: Some activities also require protective gear for each student (for example, safety goggles, gloves, apron, or lab coat).

Teachers can conduct some lab activities with sensors other than those listed here. For assistance with substituting compatible sensors for a lab activity, contact PASCO Teacher Support (800-772-8700 inside the United States or http://www.pasco.com/support).

Act	Title	Materials and Equipment	Qty
1	**Acid Rain and Weathering** Use a pH sensor to test a simulated acid rain's reaction with a variety of materials.		
	Teacher Demonstration	*Bottle of carbonated beverage, unopened*	1
		Funnel	1
		Spoon	1
		White vinegar	50 mL
		Baking soda	~2 tsp
		Bottle, 500-mL (or any clean soda bottle 16 oz. or smaller)	1
		Water	~200 mL
		Balloon, 10" or 12" in diameter	1
	Student or Group	Data Collection System	1
		PASPORT pH Sensor	1
		Bottle, 500-mL (or any clean soda bottle 16 oz or smaller)	1
		Graduated cylinder, 50-mL or 100-mL	1
		Beakers, 150-mL	2
		Pipet or eye dropper	1
		Balloon, 10" or 12" in diameter	1
		Straw	1
		Iron nail	1
		Rock samples, small -marble, limestone , chalk, or similar	1 piece of each sample
		White vinegar	50 mL
		Water	~200 mL
		Spoon	1
		Funnel	1
		Bromothymol Blue indicator solution	20 mL
		Baking soda	1.5 tbsp

Act	Title	Materials and Equipment	Qty
2	**Exploring Environmental Temperatures** Use a temperature sensor to explore temperatures variations in multiple locations in the environment, organize and compare the information in simple tables, and identify relationships the temperature patterns reveal.		
	Teacher Demonstration	Data Collection System PASPORT Temperature Sensor* *Thermometer that measures temperature in degrees Celsius* *Cup of cold water* *Cup of warm water*	1 1 1 1 1
	Student or Group	Mobile Data Collection System PASPORT Temperature Sensor*	1 1
3	**Investigating Evaporation and Condensation** Use a relative humidity sensor to gain an understanding of the water cycle and evaporation.	Data Collection System PASPORT Relative Humidity Sensor PASPORT Sensor Extension Cable *Beaker, glass, 400 mL* *Hand lens or magnifying glass* *Aluminum foil, 10 cm x 10 cm* *Water, cold* *Water, warm* *Cup, paper or plastic, filed with ice* *Tape* *Paper towel*	1 1 1 1 1 1 400 mL 400 mL 1 20 cm 1
4	**Investigating Seismic Waves** Use a light sensor to measure the amplitude and frequency of vibrations during three simulated earthquakes.	Data Collection System PASPORT Light Sensor PASPORT Sensor Extension Cable Meter stick *Lamp stand with clear, incandescent, 60 to 100 watt light bulb* *Table (same height as lamp stand)* *Books (if needed to raise lamp stand to height of table)* *Tape* *Clay*	1 1 1 1 1 1 1 or more 1 roll 60 g
5	**Mapping the Ocean Floor** Use a motion sensor to scan a cross-section of a simulated ocean floor terrain.		
	Teacher Demonstration	Data Collection System PASPORT Motion Sensor *Kabob skewer or similar thin wooden stick* *Shoebox* *Classroom objects for simulated ocean floor (desks, chairs, books, et cetera)*	1 1 1 1 Several
	Student or Group	Data Collection System PASPORT Motion Sensor *Graph paper* *Classroom objects for simulated ocean floor (desks, chairs, books, et cetera)*	1 1 1 Several

* Either the PASPORT Fast Response Temperature Sensor or the PASPORT Stainless Steel Temperature Sensor can be used for this activity.

Act	Title	Materials and Equipment	Qty
6	**Monitoring Weather** Use a weather sensor to monitor weather outdoors at various times in the day and over an extended period of time.	Mobile Data Collection System PASPORT Weather Sensor PASPORT Sensor Extension Cable *Clipboard and pencil*	1 1 1 1
7	**Night and Day** Use a light sensor to measure the light level that falls on a simulated "earth's" surface as it turns through several rotations.		
	Teacher Demonstration	Data Collection System PASPORT Light Sensor *Utility lamp or flashlight*	1 1 1
	Student or Group	Data Collection System PASPORT Light Sensor *Utility lamp or flashlight* *Index card, 3 in x 5 in* *Marker (dark color)* *Tape*	1 1 1 2 1 1 roll
8	**Observing Clouds** Use a weather sensor to measure meteorological conditions over a period of one week or more.		
	Teacher Demonstration	*Gallon glass or plastic jar, wide mouth (such as a pickle jar or sun tea jar)* *Rubber gloves (such as Playtex™ brand cleaning gloves)* *Matches* *Laser pointer (optional)* *Tap water, warm, to cover bottom of jar to depth of 2 cm* *Food dye, blue and green (optional)* *Large rubber band (the type that come on bunches of produce work well)*	1 1 pair Several 1 2 to 3 drops each color 1
	Student or Group	Data Collection System PASPORT Weather Sensor Cloud chart *Digital camera (optional)* *Pencil* *Notebook* *Graph paper* *Calculator (optional)*	1 1 1 1 1 1 1 1

Act	Title	Materials and Equipment	Qty
9	**Seasons** Use a light sensor to investigate the relationship between the earth's tilt on its axis, its revolution around the sun, and the seasons.		
	Teacher Demonstration	Data Collection System PASPORT Light Sensor PASPORT Sensor Extension Cable *Flashlight* *Globe* Meter stick or straightedge *String, to suspend paper model* *Sticky tape* *Marking pens, various colors* *Protractor* *Compass* *Graph paper, 1 sheet* *Scissors* *Sheet of tag board, card stock, or construction paper, 12" x 18"*	1 1 1 1 1 1 ~1 m 1 Several 1 1 1 sheet 1 1
	Student or Group	Data Collection System PASPORT Light Sensor *Flashlight* Meter stick or straightedge *String, to suspend paper model* *Sticky tape* *Marking pens, various colors* *Protractor* *Compass* *Thumbtack or pushpin (optional)* *Scissors* *Sheet of tag board, card stock, or construction paper, 12" x 18"*	1 1 1 1 ~1 m 1 Several 1 1 1 1 1

Act	Title	Materials and Equipment	Qty
10	**Soil Characteristics** Use a pH sensor to investigate the pH of different soil samples.		
	Teacher Demonstration	Data Collection System	1
		PASPORT pH Sensor	1
		Beaker, 250 mL	1
		Small digging tool	1
		Measuring spoons	1 set
		Re-sealable plastic bags	3
		Permanent marker	1
		Soil samples, 60 mL (3 different types)	3
		Different soil mulches (from the garden store)	Several
		Gardening sulfur (from garden store)	~5 g
		Gardening lime (dolomite or dolomitic limestone)	~5 g
		Distilled water	250 mL
		Buffer solution pH 4	25 mL
		Buffer solution pH 10	25 mL
	Student or Group	Data Collection System	1
		PASPORT pH Sensor	1
		Beakers, 250 mL (4)	1
		Balance	1 per class
		Rinse bottle, with distilled water	1
		Stirring rod	1
		Measuring spoons (optional)	1 set
		Re-sealable plastic bags	3
		Permanent marker	1
		Soil samples, 60 mL (3 different types)	3
		Gardening sulfur (from garden store)	~5 g
		Gardening lime (dolomite or dolomitic limestone)	~5 g
		Distilled water (for soil samples)	250 mL

Act	Title	Materials and Equipment	Qty
11	**Soil Salinity** Use a conductivity sensor to measure the level of conductivity of various water and soil samples.		
	Teacher Demonstration	Data Collection System	1
		PASPORT Conductivity Sensor	1
		Test tube	1
		Beaker, 250-mL	1
		Test tube stopper	1
		Soil sample	1
		Salt	2 to 4 Tbsp.
		Radish seeds	1 packet
		Paper towels for seed germination	2 to 4
		Water	250 mL
		Plastic bags	2
		Distilled water	25 mL
		Wash bottle with distilled water	1
	Student or Group	Data Collection System	1
		PASPORT Conductivity Sensor	1
		Graduated cylinder, 25- or 50-mL	1
		Beaker, 250-mL	1
		Test tubes	8
		Test tube stoppers	4
		Water samples from different locations	3
		Soil samples	4
		Distilled water	100 mL
		Paper towels, for spills	3
		Wash bottle with distilled water	1
		Small funnel	1

Act	Title	Materials and Equipment	Qty
12	**Water – The Universal Solvent** Use a conductivity sensor to classify substances based on their ability to dissolve in water and measure the changes in the conductivity of water as substances dissolve in it.		
	Teacher Demonstration	Data Collection System PASPORT Conductivity Sensor *Beaker, glass, 250-mL* *Wash bottle with distilled water* *Spoon or stirring rod* *Sugar cube* *Thread* *Salt* *Pencil* *Powdered drink mix, any flavor* *Pepper* *Baking soda* *Borax* *Epsom salt* *Alum* *Sample papers* *Distilled water*	1 1 1 1 1 1 ~40 cm 1 tsp. 1 1 packet 1 tsp 1 tsp 1 tsp 1 tsp 1 tsp 1 per sample 100 mL
	Student or Group	Data Collection System PASPORT Conductivity Sensor *Beakers, 250-mL* *Wash bottle with distilled water* *Beaker for waste water* *Sugar cube* *Thread* *Pencil* *Solute samples to dissolve and test* *Sample paper* *Distilled water*	1 1 4 1 1 1 ~40 cm 1 3 1 per sample 400 mL

Act	Title	Materials and Equipment	Qty
13	**Water's Role in Climate** Use two stainless steel temperature sensors to investigate how water and land act together to stabilize temperatures.		
	Teacher Demonstration	Data Collection System PASPORT Stainless Steel Temperature Sensor *Small container for water, 50-mL* *Plastic food storage containers with lids, 750 to 1000 mL* *Teaspoon* *Dry sand or white rocks* *Table salt* *Awl* *Water* *100-W lamp (optional)*	1 2 1 2 1 1000 mL (4 cups) 5 g (2 tsp) 1 100 mL 1
	Student or Group	Data Collection System PASPORT Stainless Steel Temperature Sensors *Small container for water, 50-mL* *Plastic food storage containers with lids, 750 to 1000 mL* *Teaspoon* *Dry sand or white rocks* *Table salt* *Water* *Teaspoon*	1 2 1 2 1 1000 mL (4 cups) 5 g (2 tsp) 100 mL 1

Calibration materials

If you want to calibrate various sensors, you will need the following:

pH Sensor

Item	Quantity	Where Used
Buffer solution, pH 4	25 mL	11
Buffer solution, pH 10	25 mL	
Beaker, small	3	
Wash bottle with deionized or distilled water	1	

Activity by PASCO Sensors

This list shows the sensors and other PASCO equipment used in the lab activities.

Items Available from PASCO	Qty	Activity Where Used
Data Collection System	1	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
Mobile Data Collection System	1	2, 6
PASPORT Conductivity Sensor	1	11, 12
PASPORT Light Sensor	1	4, 7, 9
PASPORT Motion Sensor	1	5
PASPORT pH Sensor	1	1, 10
PASPORT Relative Humidity Sensor	1	3
PASPORT Stainless Steel Temperature Sensor	2	13
PASPORT Temperature Sensor*	1	2
PASPORT Weather Sensor	1	6, 8
PASPORT Sensor Extension Cable	1	3, 4, 6, 9

* Either the PASPORT Fast Response Temperature Sensor or the PASPORT Stainless Steel Temperature Sensor can be used for this activity.