

Materials List

Quantity	Materials	Vendor
----------	-----------	--------

Welcome to Hydroville - students work in groups of four		
Hydroville Science Journal		
1/student	Three-ringed binder with dividers and notebook paper	
Teamwork Skills		
1/group	10-foot diameter circle	
	Two coffee cans, one half-filled with popcorn	
	Three pieces of rope (7 feet long each)	
	One bicycle inner tube	
Pesticide Spill Video		
1	Pesticide Spill Scenario Video	Hydroville Curriculum Project, www.hydroville.org
1	TV and VCR or DVD player	
	Post-it Notes	
	Markers	
	Poster board or paper	

Background Activities

1 Reading Household Product Labels - students work in pairs		
25-30	Examples of hazardous household products: oven and drain cleaners, pesticides (ant and wasp killer), solvents (thinner), adhesives (rubber cement, carpet glue), etc.	
5	Examples of non-hazardous household products: toothpaste, shampoo, multi-purpose glue, etc.	

2 Toxicity Testing-"Dose Makes the Poison" - students work in groups of three or four		
For Chemical Dilutions		
1/group	Chemicals to be tested: salt, water-soluble plant fertilizer, insect repellent, window cleaner, coffee, all-purpose cleaner, vinegar	
1/group	50 mL of chemical (in a 100 mL beaker)	
6/group	50 mL beakers	
1/group	25 mL graduated cylinder	
1/group	10 mL graduated cylinder	
1/group	100 mL distilled water	
1/group	Eyedropper	
Activity - Toxicity Testing on Seeds		
6/group	Petri dishes or resealable plastic sandwich bags (heavy duty so that don't break)	
6/group	Sheets 2-ply paper towel	
6/group	Beakers containing 20 mL of solution of chemical to be tested (in concentrations 0% to 100%)	
1 tsp/group	Radish seeds (60 seeds = 1 tsp)	
1/group	Masking tape	
1/group	Permanent marker	
1/group	Safety glasses	
1/group	Latex gloves	



Materials List (continued)

Quantity	Materials	Vendor
----------	-----------	--------

3 Pump It Up! - Part I: Analyzing Pumps - students work in pairs		
	Examples of piston pumps: squirt guns, hand pumps, bike pumps, trigger pump sprayers, etc.	Bring from home
1/group	Squirt gun or hand pump	
1/group	Flathead screwdriver (for use as a prying tool)	
1/group	Safety glasses	
1/group	Beaker or dish tub filled with water (to test pump)	
Class Materials on Tool Table		
	Assorted pumps (hand lotion bottles, bike pumps, spray bottles, etc.)	
	Paper towels	
	Disassembled squirt gun or hand pump with all the functional parts on display (optional)	
4 Pump It Up! - Part II: Designing a Super Soaker - students work in groups of two or three		
	Drill and 17/64" drill bit (for drilling holes in soda bottle lids)	
	Super Soaker-type squirt gun (for demonstration)	
Activity		
2/group	Tubing (shut-off) clamps	Fisher Scientific
1/group	60cc syringe	Fisher Scientific
1/group	1/8" Y-connector (fits 1/8" ID tubing)	Fisher Scientific or irrigation equipment
3 feet/group	1/8" inner diameter vinyl tubing	Fisher Scientific or hardware store
1/group	20-oz. plastic bottle (e.g. a Coke bottle) WITH LID	Bottling plant or students bring from home
Class Materials on Tool Table		
	Scissors	
	Paper towels	
	Waterproof tape, duct tape, or electrical tape	
	Hot glue gun with glue sticks	
Additional Supplies		
	Extra shut-off clamps	
	1/8" Y-connectors	Fisher Scientific or irrigation equipment
	Lids with two holes drilled	
	1/8" T-connectors (fits 1/8" ID tubing)	Fisher Scientific or irrigation equipment
	Various nozzles to attach to end of tubing	
5 Constructing and Analyzing Graphs-Circumference and Diameter - students work in pairs		
1/group	Round objects	
	Rulers	
	Tape measures (or string)	
	Calculators	
	Calipers (optional)	

Materials List (continued)

Quantity	Materials	Vendor
----------	-----------	--------

6 Using Paper Chromatography - students work in groups of three or four		
1/group	Strip of chromatography paper (1 cm x 16 cm) with crime scene ink	
1/group	A: Sanford Sharpie permanent marker, fine point	Office supply store
	B: Paper Mate Write Bros. stick ballpoint pen, fine point	Office supply store
	C: Sanford Uni-Ball Vision Rollerball, micropoint	Office supply store
	D: Sanford Uni-Ball Vision waterproof, fine point	Office supply store
	E: Pentel Rolling Writer Rollerball, medium point	Office supply store
1/student	F: Paper Mate Flexgrip Ultra, fine point	Office supply store
	Pencil	
	Ruler	
	Calculator	
4/group	Safety glasses	
	Test tubes (20 mm x 150 mm) in a test tube rack or large plastic cup	
3/group	Strips of chromatography paper (1 cm x 16 cm)	Fisher Scientific
1/group	50 mL isopropyl alcohol	
1/group	Non-permanent marking pen or wax pencil	
	Paper towels	
	Colored pencils	

7 Soil Texture - students work in groups of two or three		
Demonstration		
	M&Ms® plain chocolate candies in three colors (brown, red, yellow)	
	250 mL beaker	
Activity		
1/group	Source of water (or wash bottle filled with water)	
	Aluminum pie plate or disposable plastic dinner plate	
	Resealable plastic sandwich bags or containers with lids	
	Permanent marker	
	Overhead transparency pen (optional)	
Class Materials on Tool Table		
500 grams/class	"Sand" - coarse sand (Industrial Quartz - 20 mesh)	Building supplies
350 grams/class	"Silt" - fine sand (Industrial Quartz - 70 mesh)	Building supplies
275 grams/class	Clay - powdered (Ball Clay Kentucky - OM4)	Ceramics supply store
	Balance (weighs up to 100 grams)	

Materials List (continued)

Quantity	Materials	Vendor
8 Soil Permeability - students work in groups of two or three		
Demonstration: Permeability of Clay		
1/class	300 grams powdered clay (Ball Clay Kentucky - OM4) Same materials listed for activity	Ceramics supply store
Activity		
1/group	Soil column: 4" (diameter) x 6" thin-walled PVC pipe	Hardware store or plumbing supplies
4/group	Basket-style coffee filters	
	Duct tape or masking tape	
1/group	800 or 1000 mL beaker	
	250 mL graduated cylinder	
	Ring stand with 4"ring	
	Non-permanent marker or pencil	
	Stopwatch or a wall clock with second hand	
Class Materials on Tool Table		
	Balances (can weigh up to 300 grams)	
300 grams/group	"Sand" - coarse sand (Industrial Quartz - 20 mesh)	Building supplies
300 grams/group	"Silt" - fine sand (Industrial Quartz - 70 mesh)	Building supplies
	Buckets for disposal of waste water and soils	
9 Decision Analysis		
	None	
10 Siting Yoretown's Landfill		
	Rulers	

Materials List (continued)

Data Collection		
1	<i>Emergency Response Guide</i> (get most current available)	JJ Keller & Assoc
Part I: Building a 3-D Model of the Spill Site - students work in their Southerville EnviroClean teams (4-6/team); each team builds one model		
	Paper cutter	
13/team	11" X 11" copies of <i>Topographic Map of Spill Site</i> enlarged (150%) and photocopied on 11" X 17" paper	
3/team	20" x 30" foam core or cardboard	
2/team	Cardboard for cutting surface	
1/team	Highlighters	
2/team	Utility or Exacto® knives	Dollar store
	Multi-purpose glue	
	Scissors	
	Ruler	
	Colored markers or pencils	
Data Analysis		
Environmental Toxicologists - students work in groups of two or three		
	Colored markers	
	Poster board (for cue cards and visual props)	
	Video camera, tripod	
	Screen, backdrop material, or clear wall for filming	

Materials List (continued)

Quantity	Materials	Vendor
Mechanical Engineers - students work in groups of two or three		
Spill Site Setup		
1/set-up	Masking tape	
	Tape measure or meter stick	
	Draw organizer (3" x 12") to represent ditch	
	500 mL colored water	
	250 mL graduated cylinder	
Transport Vehicle		
4/vehicle	Blue steel tacks (#4 - 7/16")	
1/vehicle	1" x 4" x 8" wood block (for base of vehicle)	Building supplies
1/vehicle	1/4" x 3/4" x 12" screen molding (can be used as a boom or crane)	Building supplies
1/vehicle	1/4" X 1 5/16" x 8" lattice	Building supplies
2/vehicle	1/4" x 6" wooden dowel (for wheel axles)	Building supplies
4/vehicle	Wood wheels with 1/4" hole	American Woodcrafters Supply Company
4/vehicle	Poly clamps (1/4"), "pillow block brackets" (to attach axles to base of vehicle)	Electrical supplies
	1/8" X 12" steel rod (optional)	Building supplies
	20' nylon string	Hardware store
Pump		
1/pump	60cc syringe	Fisher Scientific
	20cc syringe (optional)	Fisher Scientific
10 feet/pump	1/4" inner diameter vinyl tubing	Fisher Scientific or hardware store
	1/8" inner diameter vinyl tubing (optional)	Fisher Scientific or hardware store
1/pump	1/4" T-connector (fits 1/4" tubing)	Fisher Scientific or irrigation equipment
	1/8" T-connector (fits 1/8" tubing) (optional)	Fisher Scientific or irrigation equipment
2/pump	Tubing (shut-off) clamps	Fisher Scientific
1/pump	20 oz. plastic soda bottle (to hold 400 mL of pesticide)	
	Rubber stoppers (with one hole, two holes, or no hole)	
	Rubber bands	
Class Materials on Tool Table		
	Hammer	
	Hot glue gun and glue sticks	
	Scissors	
	Extra parts: washers, paper clips, staples, rubber bands, rubber stoppers, etc.	
	Leftover materials from Background Activity 4	
	Duct tape or masking tape	



Materials List (continued)

Quantity	Materials	Vendor
----------	-----------	--------

Analytical Chemists - students work in groups of two or three

	3-D model of spill site	
	Rulers	
	Colored paper or Post-It® Notes	
	Toothpicks	
	Colored markers or pencils	

Soil Scientists - students work in groups of two or three

	Calculators	
--	-------------	--

Soil Permeability Test

125 grams/group	"Sand" - coarse sand (Industrial Quartz - 20 mesh)	Building supplies
120 grams/group	"Silt" - fine sand (Industrial Quartz - 70 mesh)	Building supplies
5 grams/group	Clay - powdered (Ball Clay Kentucky - OM4)	Ceramics supply store
	Balance that can weigh 5 - 250 grams	
1/group	Soil column: 4" (diameter) x 6" thin-walled PVC pipe	Hardware store or plumbing supplies
2/group	Basket-style coffee filters	
	Duct tape or masking tape	
1/group	800 or 1000 mL beakers	
1/group	250 mL graduated cylinder	
	Non-permanent marker	
	Stopwatch or a wall clock with second hand	

Pesticide Plume Demonstration - build one plume demo per class

2/plume	1/4" x 12" x 12" Plexiglass	Glass supplies
2/plume	1/4" x 3/8" strips of thick, non-compressible foam (cut up blue foam pad for camping)	Foam supplies or outdoor sports store
6/plume	2" binder clips	Boise Cascade
	Clear packing tape	
1 Liter	"Silt" - fine sand (Industrial Quartz - 70 mesh)	
	Food coloring	
	Wash bottle	
1/plume	Transparency with 1" grid	
	Overhead transparency marker	

IV Data Synthesis

	Computers with PowerPoint	
	Blank transparencies and overhead pens	
	Flip chart paper or poster board	
	Colored markers and pencils	

V Solution Presentation

	Infocus projector, computer	
	Overhead projector	

