



## Materials and Tools for Pump It Up! Invention Kit

This materials and tools list is sufficient for 20 students to complete the activities in teams of five students. This list can be used to purchase and/or supply materials and tools *without* purchasing the kit.

Materials and tools that are not supplied in the kit are listed separately and identified as *required* or *optional* to complete the activities.

All activities require safety items: safety glasses, disposable latex-free gloves, and dust masks.

Materials and Tools (required; supplied in the purchased kit)	Size and Quantity	Notes
Shipping tape, clear	2 small rolls	Suggest rolls of 1.88 inch x 22.2 yard
Cardstock	25 sheets of 8 1/2 x 11-inch	Suggest 110 lb. weight
Duct tape	3 rolls	
Rope	100-feet, 3/16-inch, braided	
Wooden dowel, 3/4-inch diameter x 22-24-inch length	10	
Natural cork bottle stopper	10, Size 7	
Bicycle pump	10	<a href="#">Amazon</a> , example with screw tighteners



Tire/ball inflation needle	10	
Cardboard boxes, corrugated	10, 8-inch x 8-inch x 10-inch	
Plastic pipe and tubing cutters, 1/8 – 2-inch	3	
Food coloring	4 bottles of one color, 1 fluid ounce total	
Masking tape	3 rolls	
Plastic cup	30, 8 or 10-ounce	
Clear vinyl tubing, 1/4-inch ID x 3/8-inch OD	10, 75-inch lengths (63-feet)	
Clear vinyl tubing, 1/8-inch ID x 1/4-inch OD	10, 30-inch lengths (25-feet)	
Clear vinyl tubing, 1/2-inch ID x 3/4-inch OD	10, 30-inch lengths (25-feet)	
1-inch diameter PVC pipe	20, 2-foot lengths (40-feet)	
3/4-inch diameter PVC pipe	5, 2-foot lengths (10-feet)	
3/4-inch male PVC slip adaptors	20	



1 1/2-inch rubber washer	5	
1 1/4 x 3/4-inch PVC bushing	5	
3/4-inch PVC close rider	5	
3/4-inch PVC tee, threaded	5	
1-inch PVC tee, not threaded	5	
3/4-inch PVC plug	5	
1 1/4-inch PVC coupling	5	
1-inch PVC slip cap	10	
1 1/4-inch diameter PVC pipe	5, 2-foot lengths	
Petroleum jelly	1, 13-ounce jar	
Pipe sealant tape, 1/2-inch x 100-feet	1 roll	
Large balloons, 12-inch	5	Not latex-free; color not important



Mini bouncy balls, 3/4-inch size	10	Rubber, hard
#18 O-Rings	10	
Washer, 3/8-inch	10	
Large paper clips	10	
Quick-cure epoxy, 2-part	1, 2-ounce tube set	
64-ounce rectangular deli containers	20	
Small craft sticks	110	
Jumbo craft sticks	50	
Milkshake straw, extra wide diameter	50	
10-cc plastic syringe, disposable	20	Available on Amazon
Pipe cleaners	20	
PVC cement	3 cans	



Miter box with saw	5	
6-inch Quick Grip clamps	10	
<b>Safety Items (required; supplied in the purchased kit)</b>	<b>Description</b>	<b>Notes</b>
Latex-free disposable gloves	1 box of 100; medium	
Safety glasses	22 regular	
Safety glasses	3 over prescription safety glasses	
Dust masks, disposable		

<b>Materials and Tools (required; <i>not</i> supplied in the purchased kit)</b>	<b>Size and Quantity</b>	<b>Notes</b>
Cardboard and scrap materials		Commonly found in recycling bins
Scissors, sharp	1 pair for each class member	
Yardsticks	1 for each team	Must include metric and U.S. standard notations
2-liter plastic bottle with cap	10	Recycling bin

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Calculators	1 for each team	Can use calculators on smart phones
Newspaper	As needed	For keeping surfaces clean
Paper towels	As needed	For cleaning-up water spills
Phillips head screwdrivers	5 for class	
Pliers	5 for class	
Permanent markers	5 for class	
Hammer	3 for class	
Large bucket	10	Plastic trash cans or other substitutions that would hold water
Battery-operated drill	2	
1/16-inch drill bit	2 plus extras to allow for breakage	

<b>Materials and Tools (optional; <i>not</i> supplied in the purchased kit)</b>	<b>Size and Quantity</b>	<b>Notes</b>
3/4-inch PVC tees, threaded	2	For optional redesign of pump



1-inch PVC tees, not threaded	2	For optional redesign of pump
1 1/4-inch PVC coupling	2	For optional redesign of pump
1-inch 3-way PVC elbow tees	4	For optional redesign of pump
1 1/4-inch diameter PVC pipe	4, 2-foot lengths	For optional redesign of pump
1-inch diameter PVC pipe	4, 2-foot lengths	For optional redesign of pump