

Appendix II: Engineering Inspired by Nature - Upper Elementary Unit
MATERIALS LIST

	<i>LP1: Introduction to Engineering Inspired by Nature</i>
	140 pieces dry spaghetti (20 pieces of dry spaghetti for every group of 4 students)
	21 yards of masking tape (3 yards of masking tape for every group of 4 students)
	21 yards of string (3 yards of string for every group of 4 students)
	1 balloon
	1 sewing needle
	8 large marshmallows (1 large marshmallow for every 4 students)
	1 small writing journal for each student (20 pages is fine)
	<i>LP2: Cool Curves</i>
	15 polarized glasses (one per 2-3 students), linear 90/90 degrees
	1 linear polarized plastic sheet, 6" square (computer or cell phone screens can substitute for this, if available)
	45 swatches of clear PETE (#1) plastic (three ~4 square inch swatches per 2-4 student)
	1 large plastic trash bag
	1 piece of chalk
	Black felt tip pens (1 per 3 students)
	Straight edge (1 per 3 students)
	Small circular object for tracing, such as a nickel (1 per 3 students)
	Scissors (1 per 3 students)
	1-2 trash bags
	1 piece of chalk
	2 dozen eggs
	1 bag of marshmallow to eat (<i>optional, recommended</i>)
	Fish scale and hole punch (<i>optional</i>)
	Various clear plastic objects (#1 or #6) (<i>optional, recommended</i>)
	<i>LP3: Magical Mucus</i>
	1 Slinky (metal preferred; regular size)
	32 ounces corn starch to make oobleck. The recipe is 1.5 - 2 cups of corn starch for each cup of water (makes about 6 cups of oobleck)
	2 clear bowls, in order to make it easier to see from the side (1 for water and the other for oobleck). The diameter of these bowls should accommodate your flattened hand.
	1 small bowl of any color (for ketchup).
	Glass bottle of ketchup (doesn't have to be full)
	Flat knife (e.g., butter knife)
	2 wooden stir sticks
	Glue stick
	1 piece of dark construction paper
	1 rectangular tray, approximately 9" x 13" and 4" deep (the size of a lasagna pan or larger) (<i>optional</i>),
	<i>LP4: Fastest Fastener</i>
	Shirt closed with VELCRO® strip (Use sew-on or iron-on VELCRO® strip, approximately 2' long)
	2-3 shirts closed with other different fasteners (e.g., buttons, zippers, snaps, etc.)
	Samples of VELCRO®, optional (1 per 1-2 students)
	Hand lenses (1 per student team) (<i>optional</i>)
	<i>LP5: Gallivanting Gliders</i>

	1 measuring tape
	Any and all assorted materials for prototyping designs, including paper of different weights and cotton balls
	Paperclips (1 per student); lighter is better
	Scotch tape for students to use in making gliders
	15 pieces of 8.5 x 11" card stock (1 piece for each 1-2 students)
	Scissors (1 per 3 students) (also used in LP2)
	A floor fan
	Graph paper (<i>optional</i>)
	Large pieces of cardboard (for tumbleweed gliders; e.g., two feet square; 1 per 1-3 student)
	15 pages of phone book paper (for tumbleweed gliders; 1 page per 1-3 students) (<i>optional</i> ,
	<i>LP6: Indomitable Drops</i>
	15 eyedroppers (one per group of 2-4 students)
	15 microscope slides (one per group)
	15 coarse sandpaper swatches for each group of students (60-grit or less).
	15 untreated white cotton fabric swatches (one for each group)
	15 specially treated white cotton fabric swatches (one for each group), treated with spray-on hydrophobic fabric coating (see text)
	15 swatches of wax paper (one per group)
	2 magnets
	A small variety of plants (e.g., 4 or more kinds), e.g., in the schoolyard or, if in a classroom, potted plants
	Ground black pepper
	Tape of any kind (one small piece per group)
	10 small plastic containers for water (one for each student group)
	Food coloring (1-2 drops per student group) (also used in LP7)
	Fresh green kale (one leaf for each group), unwetted (i.e., surfaces should be completely dry)
	Hand lenses (1 per student team) (<i>optional; also optional in LP4</i>)
	Protractor (<i>optional</i>)
	<i>LP7: Beetle Boats</i>
	1 fine mesh screen lid for large-mouth mason jar ("sprouting" lid)
	Large-mouth mason jar
	3-4 small, elongate tubs for boat races
	1 small metal paper clip, size #3
	3 rubber bands
	Plastic for boat making (also used in LP2), 2-3 square inches per student
	1 sewing needle (also used in LP1)
	Large tubs for floating boats, to accommodate all students' boats
	Penny (1 per 2-3 students)
	Liquid dish soap
	1-2 bottles of rubbing alcohol (70% isopropyl)
	Toothpicks (to apply dish soap; 1 per 2-3 students)
	Waterproof markers to decorate boats
	Food coloring (several different colors is ideal); also used in LP6
	Pepper flakes (pinch, for a demonstration); also used in LP6
	Milk (about 1 cup) (preferred to water, which may also be used)
	<i>LP8: Creature Feature</i>
	Nature's Abilities cards (provided in the Creature Feature lesson)

	<i>Materials provided at www.LearningWithNature.org</i>
	Teachers guide (digital version available online through www.LearningWithNature.org)
	Media slides (available online through www.LearningWithNature.org)
	Printable materials (available online through www.LearningWithNature.org)
	Training videos (available online through www.LearningWithNature.org)

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