

Exploring

The

BUILDING BLOCKS

of

SCIENCE

Book 5

TEACHER'S MANUAL



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Materials at a Glance

Experiment 1	Experiment 3	Experiment 4	Experiment 5	Experiment 6
family photos birth certificate other family documents	food labels, several (students' choice) periodic table of elements from <i>Student Textbook</i> resources (books or online) such as: dictionary encyclopedia	small, colored marshmallows, 1 pkg large marshmallows, 1 pkg (could also use gumdrops and/or jellybeans in place of marshmallows) toothpicks, 1 box	baking soda lemon juice balsamic vinegar salt and water: 15-30 ml salt dissolved in 120 ml water (1-2 tbsp. salt dissolved in 1/2 cup of water) 2 or more egg whites milk small jars, 7 or more measuring cups and spoons eye dropper	pencil and eraser Objects chosen by students, such as: rubber ball cotton ball orange banana apple paper sticks leaves rocks grass Legos building blocks other objects
Experiment 2	Optional computer with internet access	Optional food coloring	Peanut Brittle 360 ml (1 1/2 cups) sugar 240 ml (1 cup) white corn syrup 120 ml (1/2 cup) water 360 ml (1 1/2 cups) raw peanuts (can be omitted) 5 ml (1 teaspoon) baking soda buttered pan	Optional several sheets of paper
imagination				

Experiment 7	Experiment 8	Experiment 9	Experiment 10	Experiment 11
tincture of iodine [VERY POISONOUS—DO NOT ALLOW STUDENTS TO EAT any food items that have iodine on them] bread, 1 slice timer wax paper marking pen cup refrigerator green vegetable, 1 one or more other vegetables	pencil colored pencils or crayons student-selected materials to build a model cell	dehydrated agar powder* distilled water cooking pot measuring spoons measuring cup cup plastic petri dishes (20)** cotton swabs permanent marker oven mitt or pot holder	tennis ball paperclip yarn or string (about 3 meters [10 ft]) marble bouncing ball, 1 (or 2 or more of different sizes) Optional penknife, ice pick, awl, or other sharp tool pliers	Slinky several paperclips 1-2 apples 1-2 lemons or limes 1-2 oranges 1-2 bananas spring balance scale or food scale meterstick, yardstick, or tape measure tape

* <http://www.hometrainingtools.com/nutrient-agar-8-g-dehydrated/p/CH-AGARN08/>

** A stack of 20 can be ordered from: <http://www.hometrainingtools.com/petri-dishes-plastic-20-pk/p/BE-PETRI20/>

Experiment 12	Experiment 13	Experiment 14	Experiment 15	Experiment 16
<p>small to medium size toy car</p> <p>stiff cardboard</p> <p>wooden board, smooth and straight (more than 1 meter [3 feet] long)</p> <p>straight pin or tack, several</p> <p>small scale or balance</p> <p>one banana, sliced</p> <p>10 pennies</p> <p>meterstick, yardstick or tape measure</p> <p>tape</p>	<p>student-selected materials</p> <p>several sheets of paper</p>	<p>pencil, pen, colored pencils</p> <p>small jar</p> <p>trowel or spoon</p> <p>Optional</p> <p>binoculars</p>	<p>known mineral samples:</p> <p>calcite</p> <p>feldspar</p> <p>quartz</p> <p>hematite</p> <p>several rocks from backyard or nearby</p> <p>copper penny</p> <p>steel nail</p> <p>streak plate (unglazed white ceramic tile)</p> <p>paper</p> <p>scissors</p> <p>marking pen</p> <p>tape</p> <p>vinegar (small amount)</p> <p>lemon juice (small amount)</p> <p>eyedropper or spoon</p> <p>* Find minerals at a local rock and mineral store or order online.</p>	<p>Students will select materials and use them to make a model of Earth's layers</p> <p>See Experiment 16 for ingredients for chocolate lava cake</p>

Experiment 17	Experiment 18	Experiment 19	Experiment 21	Experiment 22
<p>student-made brittle candy (see first page of experiment)</p> <p>1 jar smooth peanut butter (for students with allergies to peanuts, whipped cream can be substituted)</p> <p>118 ml (1/2 cup) crushed graham crackers</p> <p>plate or second cookie sheet</p> <p>materials to make a model volcano of student's choice</p>	<p>pencil</p> <p>flashlight</p> <p>compass</p> <p>A clear night sky away from bright lights is needed.</p>	<p>basketball</p> <p>ping-pong ball</p> <p>flashlight</p> <p>empty toilet paper tube</p> <p>tape</p> <p>scissors</p> <p>a dark room</p> <p>student-selected objects</p>	<p>modeling clay in the following colors:</p> <p>gray</p> <p>white</p> <p>brown</p> <p>red</p> <p>blue</p> <p>green</p> <p>orange</p> <p>butter knife or sculptor's knife</p> <p>colored pencils</p>	<p>a video recording device (camcorder, iPad, cell phone)</p>
		<p>Experiment 20</p> <p>modeling clay in the following colors</p> <p>gray</p> <p>white</p> <p>brown</p> <p>red</p> <p>butter knife or sculptor's knife</p> <p>ruler</p> <p>Materials other than clay can be used, such as Styrofoam balls or plaster of Paris and paint.</p>		

* A Mineral Scale of Hardness Set of Minerals is available from Home Science Tools: <http://www.hometrainingtools.com>

Materials

Quantities Needed for All Experiments

Equipment	Foods	Foods (continued)
baking pan ball, bouncing, 1 (or 2 or more of different sizes) ball, ping-pong ball, rubber ball, tennis basketball car, toy, small to medium size compass computer with internet access cookie sheet or plate cup, 1 eye dropper flashlight jars, small, 7 or more knife, butter or sculptor's knife Legos marble, 1 measuring cups and spoons meterstick, yardstick, or tape measure nail, steel oven mitt or pot holder pennies, copper, 10 pot, cooking refrigerator ruler scale, spring balance or food scale scissors Slinky stove streak plate (unglazed white ceramic tile) timer trowel (garden) or spoon video recording device (camcorder, iPad, cell phone) Optional binoculars penknife, ice pick, awl, or other sharp tool pliers	apples, 2-3 baking soda bananas, 3-4 bread, 1 slice brittle candy, student-made (see Experiment 17) corn syrup, white, 240 ml (1 cup) egg whites, 2 or more graham crackers, crushed, 118 ml (1/2 cup) lemon juice lemons or limes, 1-2 oranges, 2-3 marshmallows, small, colored, 1 pkg marshmallows, large, 1 pkg (could also use gumdrops and/or jellybeans in place of marshmallows) milk peanuts, raw, 360 ml (1 1/2 cups) (can be omitted) peanut butter, 1 jar smooth, (for students with allergies to peanuts, whipped cream can be substituted) salt, 15-30 ml (1-2 tbsp.) sugar, 360 ml (1 1/2 cups) vegetables, 1 green and students' choice vinegar vinegar, balsamic water See Experiment 16 for ingredients needed for chocolate lava cake. Optional food coloring	

Materials

Quantities Needed for All Experiments

Materials	Materials (continued)	Other
agar powder* (dehydrated) birth certificate board, wooden, smooth and straight (more than 1 meter [3 feet] long) cardboard, stiff clay, modeling in the following colors blue brown gray green orange red white cotton ball, several cotton swabs documents, family eraser food labels, several (students' choice) grass iodine, tincture of [VERY POISONOUS—DO NOT ALLOW STUDENTS TO EAT any food items that have iodine on them] leaves mineral samples**: calcite feldspar hematite quartz (Find minerals at a local rock and mineral store or order online.) misc. model building materials - students' choice objects, misc. student-chosen	paper, several sheets paperclips, several pen, marking pencil pencils, colored or crayons periodic table of elements from <i>Student Textbook</i> petri dishes, plastic (20)*** photos, family rocks, several sticks straight pin or tack, several tape toilet paper tube, empty toothpicks, 1 box water, distilled wax paper yarn or string (about 3 meters [10 ft])	clear night sky away from bright lights a dark room resources (books or online) such as: dictionary encyclopedia

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