

Exploring

The

BUILDING BLOCKS

of

SCIENCE

Book 1

TEACHER'S MANUAL



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Materials at a Glance

Experiment 1	Experiment 3	Experiment 4	Experiment 5	Experiment 6
<p>colored pencils night sky a living thing to observe (frog, ant, plant, or other)</p>	<p>magnifying glass household items such as: cotton balls rubber bands pencil several food items such as: crackers cheese marshmallow beans color-coated candy (such as M&Ms)</p>	<p>Legos marshmallows, small (1 pkg) marshmallows, large (1 pkg) toothpicks</p>	<p>4 or more clear plastic cups or glasses marking pen measuring cup measuring spoons food items-180 ml (3/4 cup) each: lemon juice vinegar milk water baking soda - 90 ml (6 Tbsp.)</p> <p><i>Just For Fun section:</i> baking soda vinegar sugar</p> <p>-Or-</p> <p>2 or more food items chosen by student</p>	<p>non-living object to observe (such as a rock or piece of wood) living thing to observe (such as an ant, frog, bird, cat, or dog) colored pencils</p>
Experiment 2				
<p>watercolor paints water in a container paintbrush paper to paint on, several sheets scissors tape</p>				
Experiment 7	Experiment 8	Experiment 9	Experiment 10	Experiment 11
<p>cotton balls rubber ball tennis ball banana apple rocks Legos other objects colored pencils</p>	<p>internet access and/or reference books colored pencils</p>	<p>milk, .25 l (1 cup) plain yogurt, .5 liter (2 cups) fork spoon cups or small bowls (several) food items such as honey, berries, chopped fruit or vegetables, spices, herbs, cocoa, chocolate chips, etc. (<i>Just For Fun</i> section)</p>	<p>2 tennis balls other objects such as: apple orange rubber ball cotton ball or feather</p>	<p>large marshmallow tennis ball objects such as: rubber ball lemon or lime rock banana pliers</p>

Experiment 12	Experiment 13	Experiment 14	Experiment 15	Experiment 16
toy car stiff cardboard or board (approximately .3 meter wide x 1 meter long [1 foot x 3 feet]) marshmallows (several) Optional pennies tape	2 marbles 3 playing cards shallow jar top vinegar baking soda measuring spoons Suggested dominoes blocks electric car electric train marshmallow tongue depressor steel ball other objects chosen by the student	colored pencils	small shovel or garden trowel small pail or plastic container measuring cup dirt that contains rocks (.25 liter [1 cup]) glass container, tall clear (approx. size: .5 liter [2 cups]) flour (60 ml [1/4 cup]) water cake mix and items needed to make the cake nuts, gumdrops, chocolate chips, and/or M&Ms	baseball or similar hard-centered ball balloon water piece of string to tie balloon closed colored pencils Optional funnel

Experiment 17	Experiment 18	Experiment 19	Experiment 21	Experiment 22
2 liters (8 cups) or more of dirt suitable for making mud pies 1.75 liters (7 cups) or more of water 15 ml (1 Tbsp.) baking soda 15 ml (1 Tbsp.) vinegar measuring cup measuring spoon 3 containers for mixing mud (about 1.75 liter [7 cups] size) spoon or other implement for mixing mud garden trowel bucket paper marking pen pencil colored pencils	clear night sky colored pencils Note: This experiment will take 6 days to complete.	basketball ping-pong ball flashlight empty toilet paper tube glue or tape scissors marking pen a dark room <div style="text-align: center;">Experiment 20</div> colored pencils night sky Note: This experiment will take two weeks to complete.	8 styrofoam balls: 1 - 10 cm (4 in) 1 - 7.5 cm (3 in) 2 - 5 cm (2 in) 2 - 4 cm (1½ in) 2 - 2.5 cm (1 in) water-based craft paint: red, blue, green, orange, brown paintbrush water in a container misc. objects to represent planets (such as fruits, vegetables, candies, baking mixes) for <i>Just For Fun</i> section	ladybug or other small insect or animal to observe magnifying glass Just For Fun section: a second living thing or an object to observe

Materials

Quantities Needed for All Experiments

Equipment	Foods	Foods (continued)
bucket container, glass, tall, clear (approx. size: .5 liter [2 cups]) containers for mixing mud (about 1.75 liter [7 cups] size), 3 cups or small bowls (several) Experiment 13 suggestions: dominoes, blocks, electric car, electric train, tongue depressor, steel ball, other objects flashlight fork garden hose or funnel glass container, tall clear (approx .5 liter [2 cups]) Legos magnifying glass measuring cup measuring spoons pail (small) or plastic container pliers scissors shovel (small) or garden trowel spoon spoon or other implement for mixing mud trowel, garden	apple (2) baking soda (118 ml [8 Tbs]) or more banana (1-2) beans (several) cabbage, red (one head) cake mix and items needed to make the cake nuts, gumdrops, chocolate chips, and/or M&Ms to go in cake (see Experiment 16, Just For Fun) candy, color-coated such as M&Ms (several pieces) cheese (1 piece) crackers (1 or more) Experiment 9 Just For Fun suggestions: food items such as honey, berries, chopped fruit or vegetables, spices, herbs, cocoa, chocolate chips, etc. Experiment 21 Just For Fun: miscellaneous objects to use to represent planets (such as fruits, vegetables, candies, baking mixes, etc.) food items chosen by students	flour (60 ml [$\frac{1}{4}$ cup]) food items chosen by students lemon or lime (1) lemon juice (180 ml [$\frac{3}{4}$ cup]) marshmallows, large (1 pkg) marshmallows, small (1 pkg) milk (480 ml [2 cups]) orange (1) sugar, small quantity vinegar (180 ml [$\frac{3}{4}$ cup]) or more water, tap yogurt, plain (.5 liter [2 cups])

Materials

Quantities Needed for All Experiments

Materials	Materials (continued)	Other
ball, ping-pong ball, rubber ball, tennis (2) balloon baseball or similar hard-centered ball basketball cardboard (stiff) or board (approx .3 meter x 1 meter [1 foot x 3 feet]) cotton balls (several) cups, clear plastic, 12 or more dirt, for mud pies (2 liters [8 cups]) or more dirt that contains rocks (.25 liter [1 cup]) feather (optional) glue or tape jar top, shallow marbles (2) misc. objects to be sorted into categories (see Exper. 7) paint, water-based craft: red blue green orange brown paints, watercolor paintbrush paper, several sheets paper to paint on, several sheets	pen, marking pencil pencils, colored pennies (optional) plastic bag, small playing cards (3) rocks (several) rubber bands string, 1 piece styrofoam balls (8): 1 - 10 cm (4 inch) ball 1 - 7.5 cm (3 inch) ball 2 - 5 cm (2 inch) balls 2 - 4 cm (1½ in) balls 2 - 2.5 cm (1 in) balls substances to test for acidity-basicity (see Exper. 5 Just For Fun) tape toilet paper tube, empty toothpicks, 1 box toy car water water in a container (to use with paints)	dark room internet access and/or reference books ladybug or other small insect or animal to observe living things to observe, such as an ant, frog, bird, cat, plant, or dog night sky, any night sky, clear non-living object to observe, such as a rock or piece of wood