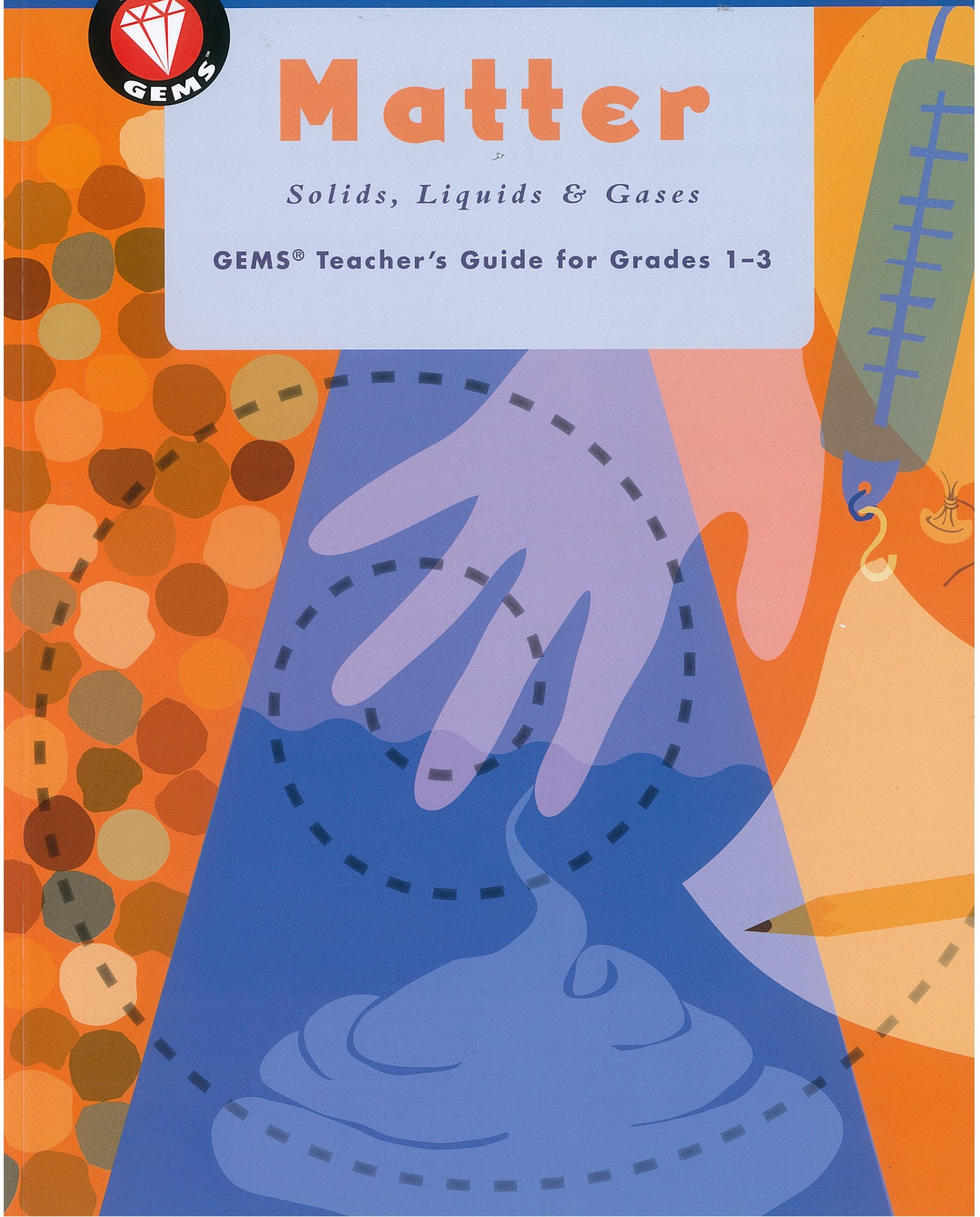




Matter

Solids, Liquids & Gases

GEMS® Teacher's Guide for Grades 1-3



WHAT YOU NEED FOR THE WHOLE UNIT

The list of materials for this unit is long, but most items are fairly easy to obtain. Many of the materials can be donated by parents. A “Sample Letter to Parents” to use in asking for donations of materials is provided on page 9. Alternatively, a commercial kit containing everything you need, including harder-to-find items, such as spring scales, is available. Please see “Resources” on page 113, for additional tips on how to obtain and prepare materials.

The quantities below are based on a class size of 32 students. You may, of course, require different amounts for smaller or larger classes. This list gives you a concrete “shopping list” for the entire unit. Please also refer to the “What You Need” and “Getting Ready” sections for each individual activity, which contain more specific information about the materials needed for the class and for each group of students, and exactly how the materials are used.

Nonconsumables

- 1 plastic spoon
- 1 rock (big enough for the class to see)
- 1 piece of fabric at least a few inches square
- 3 transparent containers of different shapes (one with a lid)
- 1 cafeteria tray or plate
- 1 copy of Solids and Liquids signs
- about 150 pushpins (optionally, masking tape)
- 8 clear plastic bags to hold collections of solid and liquid items
- 32 clear plastic vials with tight-fitting lids
- 8 or more small glass beads or marbles
- 1 bag of cotton balls
- 8 or more small rocks or pebbles
- 2 boxes of wooden toothpicks
- 1 small box of metal paper clips (or 8 screws, nuts, bolts, washers, or coins)
- 8 small pieces of fabric
- about 150 sealable, clear plastic snack-size bags
- 4 cafeteria trays (to contain mess at some learning stations)
- 2 tweezers
- 2 plastic serrated knives
- 4 rolling pins (or mortars and pestles, or wooden hammers)
- 2 collecting devices for liquid (medicine droppers, turkey basters, etc.)
- 2 clear plastic cups
- 4 trash containers
- 6 wide-mouth plastic cups
- 4 dishtubs
- 1 one-teaspoon measuring spoon

- 1 one-tablespoon measuring spoon
- 1 stirrer
- 1 spring scale (calibrated, for teacher)
- 16 spring scales (for students)
- 16 paper clips (or binder clips)
- a large sign that says Gases
- 2 copies Making Gas procedure sign
- 1 vial or pill bottle
- 2 funnels
- 1 piece of wood
- 1 large, lightweight object (such as piece of Styrofoam)
- 1 small, heavy object (such as a fishing weight)
- 1 piece of plastic
- 1 small rock
- 1 piece of glass (not sharp)
- a pan and hot plate (or a shallow container or plate)
- 1 lightweight object (such as a pencil)
- 1 heavy object (such as a ring of keys)
- 1 very heavy object (such as a large rock)
- 8 hand magnifying lenses (or handheld microscopes)
- 1 copy of photo of helium balloon in a vacuum
- 4 film canisters with lids (or squeeze bottles)
- a few Styrofoam packing peanuts
- 1 air pump
- 1 hand-operated juicer
- (optional) 1 syringe without needle
- (optional) dissecting microscopes

Consumables

- water
- 1 16 oz. bottle of white vinegar
- 1 16 oz. box baking soda
- 4 squeeze bottles
- 4 graduated cylinders
- 12 plastic vials (no lids)
- 32 **Solids** student sheets (page 24)
- 32 **Liquids** student sheets (page 25)
- 32 **Solid or Liquid?** student sheets (page 54)
- 32 **What's the Matter?** student sheets (page 67)
- 32 **Gases** student sheets (page 86)
- 32 binders, clipboards, or folders (to keep journals in)
- 1 cup thick, clear liquid (such as shampoo or dishwashing detergent)
- 1 cup thick, opaque liquid (such as hair conditioner)
- 1 oz. red food coloring
- 1 oz. blue food coloring
- 20 sentence strips

- 1 roll of masking tape (or two sheets of address labels)
- 7 large plastic trash bags (to cover tables or desks)
- 16 plastic teaspoons
- several sheets aluminum foil
- 21 cotton balls
- 1 candle or chunk of wax
- 1 box of chalk
- 5 drops of food coloring (any color)
- 2 cups of dry cereal (that can be ground into a powder)
- 3 oranges
- a small amount of baking soda (in clear plastic cup)
- 1 cup of shaving cream
- 1/2 tube of toothpaste
- 1 cup of sand
- 2 sealable plastic bags or other airtight containers
- 4 teaspoons of Borax powder
- 8 tablespoons of white glue
- 1 tablespoon vinegar (for making CO₂)
- 1 teaspoon baking soda (for making CO₂)
- about 20 balloons
- 2 identical balloons
- 1 tethered helium balloon
- 16 fold-top plastic sandwich bags
- a few drops of 4 scents, extracts, or perfumes
- 1 tablespoon peppermint extract (in closed bottle)
- about 5 lightweight plastic grocery bags
- scratch paper to make into paper fans
- 32 straws

General Supplies

- 32 pencils
- 6 black fine-tip permanent markers
- 2 black wide-tip felt markers
- chart paper
- several sheets of paper
- two 3 x 5 index cards
- paper towels
- 1 trash can
- 2 dustpans and brooms
- (optional) several rolls of masking tape (if pushpins not used for display)
- (optional) colored pencils or crayons
- (optional) 2–4 pairs of scissors
- (optional) 2 craft sticks
- (optional) a small container of glue (to seal lids on containers, if needed)
- (optional) 1 electric fan or hair dryer