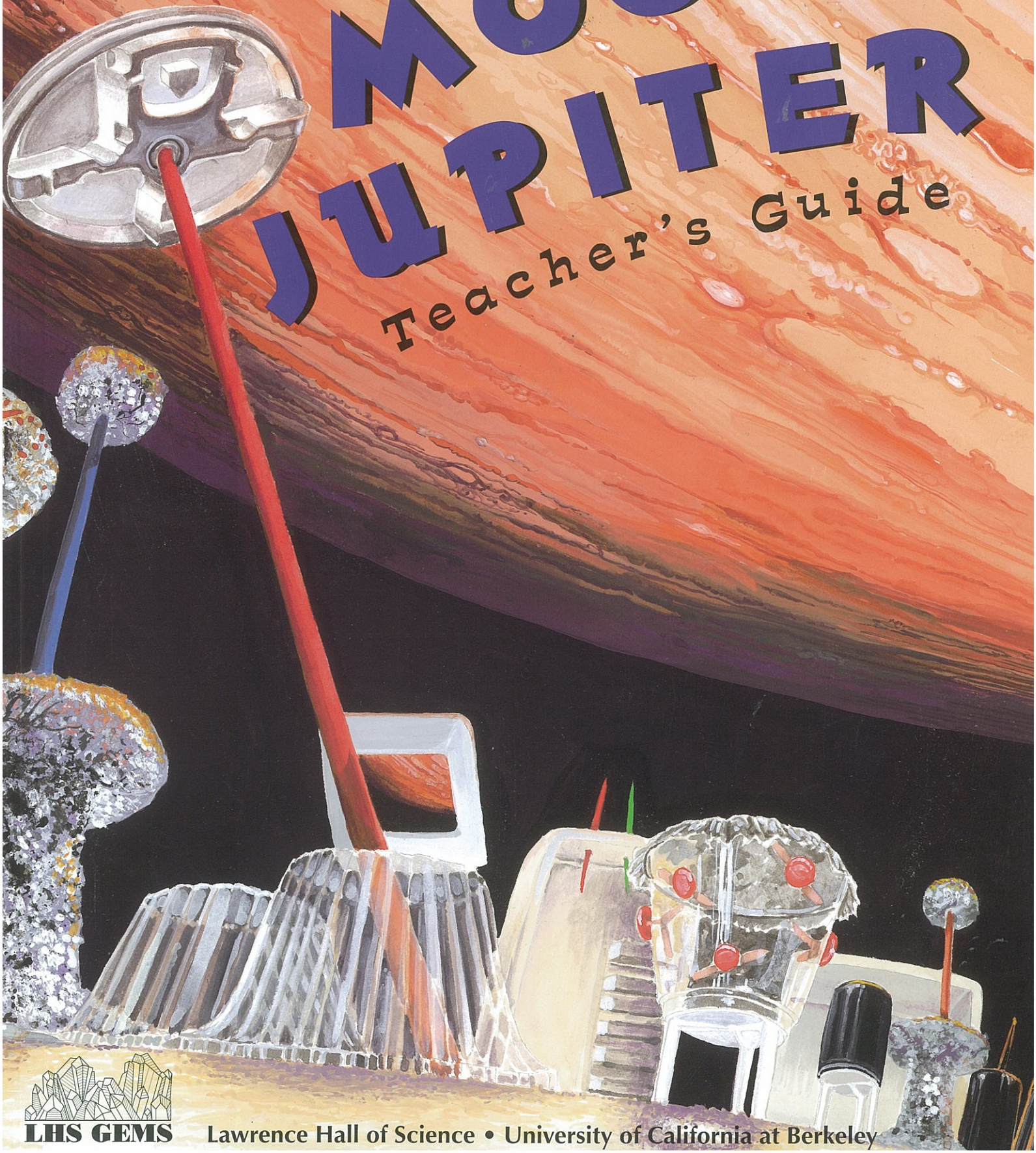
Grades 4–8

MOONS of JUPITER

Teacher's Guide



LHS GEMS

Lawrence Hall of Science • University of California at Berkeley

Activity 1

What You Need

For the class:

- ❑ Overheads #1, #2, and #3. Additional sets are available for purchase from Carolina Biological Supply, the authorized GEMS Kits® distributor.
- ❑ 2 balls, one much larger than the other, for example: a softball and a ping pong ball, or a tennis ball and a marble.
- ❑ 1 slide projector and screen
- ❑ (optional) 1 overhead projector
- ❑ (optional) 1 set of overhead projector pens
- ❑ (optional) 4 transparencies of the "Tracking Jupiter's Moons" data sheet (master on page 16)

For each student:

- ❑ 1 copy of "Tracking Jupiter's Moons" data sheet (page 16
- ❑ 1 pencil

Activity 2

What You Need

For the class:

- ❑ Overheads, including
  - #4 Earth's Moon
  - #5 Close-Up of Large Crater
- ❑ 1 slide projector and screen
- ❑ 1 or more brooms or whisk brooms to clean up spills
- ❑ 1 pair of scissors or a paper cutter (to cut the centimeter rulers off the student data sheets)
- ❑ one container instant chocolate milk powder. (Note: Real cocoa has also been used, but it tends to clump and to over-darken the flour too quickly.)
- ❑ three or four 5-pound packages of white flour

For each team of 4 students:

- ❑ 1 shallow basin (to be filled with about 3 to 5 inches of flour) Examples: a dishpan, a heavy aluminum roasting pan, or cardboard box. To be sure to have enough, you may want to ask a student from each group to bring in a dishpan from home for the day of the activity. They don't all have to be the same size.
- ❑ 1 cup or small plastic container (to be filled about one-third full with powdered instant chocolate milk mix)
- ❑ an old newspaper
- ❑ three rocks: small, medium, and large with diameters **about:** .5 cm ($\frac{1}{4}$ inch), 2 cm ($\frac{3}{4}$ inch) and 4 cm (about $1\frac{1}{2}$ inches)
- ❑ 1 spoon (plastic or metal)

For each student:

- ❑ 1 pencil
- ❑ 1 "Craters" activity sheet (master on page 28)

Activity 3

What You Need

For the class:

- ❑ 1 meter stick
- ❑ 1 roll of tape (masking or clear)
- ❑ an Earth globe (or blue balloon, or ball) about 25 cm, or 10 inches in diameter
- ❑ 2 white balloons or balls (about 7 cm, or 3 inches in diameter, inflated)
- ❑ a model car or any other example of a *scale model*
- ❑ a piece of chalk
- ❑ a pair of scissors
- ❑ a length of string 1.5 meters (5 feet) long
- ❑ a thick black felt pen and assorted crayons
- ❑ 4 manila file folders
- ❑ 1 copy of the data sheets for Session 4 (master on pages 49, 50), used as described in Getting Ready for the Jupiter Scale Model, #5, below.

Activity 4

What You Need

For the Class:

- ❑ 1 slide projector
- ❑ The Teacher Fact Sheets, pages 45–48
- ❑ Overheads, including:
  - # 6
  - # 7
  - # 8
  - # 9
  - # 10
  - # 11
  - # 12

For each team of 4–5 students:

- ❑ 1 box of crayons

For each student:

- ❑ 1 pencil
- ❑ data sheets (masters on pages 49, 50)
  - Callisto and Ganymede
  - Io and Europa with the US map for scale

Activity 5

What You Need

For the class:

- ❑ 1 or 2 boxes of raw material or "doo-dads" for settlement building. "Doo-dad" suggestions include: plastic or paper cups, small containers (such as empty yogurt or orange juice containers), packaging material (such as plastic casings on small items, clear "bubble-wrap" and styrofoam "peanuts" and other packing materials), egg cartons, styrofoam meat trays, cardboard tubes, corks, straws, film canisters, scrap wood, colored paper or poster board, assorted stickers—**YOU NAME IT!**

  Note: To reduce clean-up time, limit the amount of styrofoam peanuts to about four cups.

- ❑ 1 or 2 skeins of color yarn or string
- ❑ 1 or 2 rolls of aluminum foil
- ❑ 1 roll of plastic wrap
- ❑ 1 box of toothpicks
- ❑ 1 box of straws
- ❑ 1 package of blank stick-on labels (masking tape can also be used)
- ❑ chalk and chalkboard, or overhead projector, unused transparency, and pens
- ❑ Optional: tools for use by teacher or under direct supervision, such as pliers for bending wire, utility knife for cutting tubes or styrofoam, etc.

For each group of 4–5 students:

- ❑ 1 posterboard, about 30 cm x 60 cm (about 1 ft. x 2 ft.) These serve as the base for each team's settlement (size can be adjusted to your preference)
- ❑ 1 or 2 glue bottles or glue sticks
- ❑ 1 or 2 scissors
- ❑ assorted color marking pens
- ❑ 1 roll of masking or cellophane tape
- ❑ Appropriate "Scientific Mission" data sheet **for each student** (masters on pages 60-63)