

MATERIALS AND EQUIPMENT

The unit, like all hands-on science, requires a large variety of materials to support various ways of learning (including doing, discussing, listening, watching, reading, and writing). Prepare in advance by collecting the materials and equipment needed for all the demonstrations and hands-on investigations.

- Roll paper, poster board, or a bulletin board should be dedicated at the beginning of the unit to serve as a question board to cumulatively document and return to student questions. The question board is referred to in the materials for lesson segments in which it is used but is not repeated in the materials listed here.
- Internet access and the means to project images/videos for whole-class viewing is also required in many lesson segments but not repeated below.

Unit Opener

- none needed

Lesson 1 Pushing and Pulling

Lesson 1.1

- variety of playground or sports equipment

Lesson 1.2

Day 1

- cubes, such as toy blocks or math manipulatives (1 per student or pair)
- string (12" length per cube)
- smooth surface (access to about 24-inch length on a table or floor for each student or pair)
- rough surface (access to about 24-inch length such as a rug, place mat, or rug sample for each student or pair)

Day 2

- all materials from Day 1
- cubes, spheres, and triangular prisms (1 set per student or pair)
- 24-inch boards (1 per student or pair)
- books or blocks to support one end of the boards (2–3 per student or pair)
- 12-inch pans of water (1 per student or pair)

Lesson 1.3

- cubes, such as toy blocks or math manipulatives (1 per student or pair)
- question board

Lesson 1.4

- playground equipment: large and small bouncy balls

Lesson 1.5

- golf play set including golf club, cup, and ball
- rectangular block
- indoor golf course as shown using interlocking 1-foot square foam tiles or squares numbered 0–7

Lesson 2 Changing Motion of Objects with Pushes and Pulls

Lesson 2.1

- foam balls or soft bouncy balls, such as rubber kick balls (1 per pair)
- arrange for a playground or gym space to run around

Lesson 2.2

- golf play set including golf club, cup, and ball (1 set per pair)
- cardboard boxes, bricks, or blocks to construct the perimeter of the hole
- cardboard boxes to serve as obstacles
- crayons

Lesson 2.3

- none needed

Lesson 2.4

- question board
- golf play set including golf club, cup, and ball (1 set per pair)
- cardboard boxes, bricks, or blocks to construct the perimeter of the hole
- cardboard boxes to serve as obstacles
- modeling clay or removable tape

Lesson 3 Magnetism: A Noncontact Force

Lesson 3.1

- variety of magnets, which can include magnetic screwdriver, refrigerator magnets, magnetic signs, magnetic pickup tool, horseshoe magnet, bar magnet (at least 1 per student)
- variety of magnetic (steel nuts, paper clips, keys, scissors, spoon) and nonmagnetic (wood block, pencil, penny, plastic bricks, marbles, aluminum foil square) objects (at least 1 per student)
- magnetic marbles (5 per student)
- box or plastic container (1 per student)

Lesson 3.2

- magnetic marbles (at least 2 per student)
- bar or horseshoe magnets (2 per student)

Lesson 3.3

- golf play set including golf club, cup, and ball (1 set per pair)
- cardboard boxes, bricks, or blocks to construct the perimeter of the hole
- cardboard boxes to serve as obstacles
- variety of magnets
- metal balls or magnetic marbles

Science in Action

- calculator (1 per group)
- index cards (3 per group)
- marker (1 per group)
- container with lid (1 per group)
- binder clip (1 per group)
- stapler (1 per group)
- handheld hole punch (1 per group)
- tape in a dispenser (1 per group)