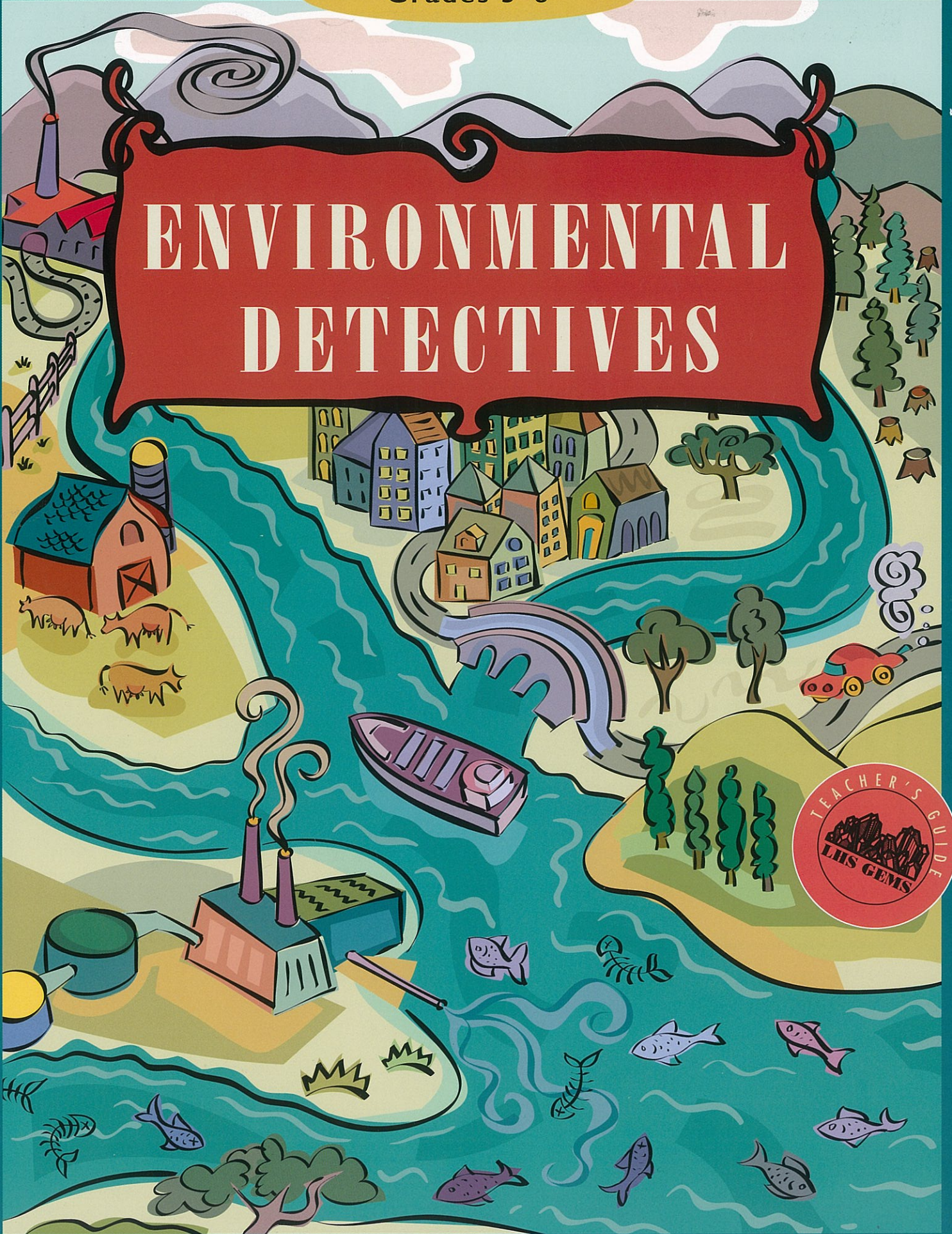


Grades 5-8

ENVIRONMENTAL DETECTIVES



What You Need for the Whole Unit

The quantities below are based on a class size of 32 students. Depending on the number of students in your class, you may, of course, need different amounts of materials.

This list gives you a concise “shopping list” for the entire unit. Please refer to the “Getting Ready” sections for each activity. They contain more specific information about the materials needed for the class and for each team of students.

Many photocopies are necessary for this unit. You may want to enlist a volunteer to do the copying. Also, the copying could be done as needed for each activity, or all the necessary pages could be copied at one time. Further, the copied pages could be organized by using color paper. For example, the clue cards, discussion cards, and files for an activity could all be copied on one color paper. This would make it easier to return any stray papers to their proper location.

Non-Consumables

- 4 copies of the record of the Meeting of the Gray Area Board of Supervisors (master on pages 43–44)
- 1 copy of the Water Flea Diagram (master on page 42)
- 9 plastic cups (8–10 oz. size)
- a cottage cheese type or other container (about 2 cup size)
- 3 copies of the pH Scale (master on page 77)
- 2 two-liter clear plastic soda bottles
- a chalkboard, butcher paper, or overhead transparency copy of the Acid Rain Questions (master on page 80)
- several small paper bags or garbage cans
- 1 or 2 sponges for cleaning up spills
- 1 *transparent* glass or plastic tray or pan at least 9" x 12" and at least 2" deep. (A sturdy container is preferable. If you use a lightweight container, such as a flat deli-style salad container, be sure to test it before class to make certain it doesn't leak or tip over easily.)
- 2 plastic flat-bottomed cups (about 8 or 9 oz. size)

- a small bowl or cup for extra water
- 1 tablespoon measuring spoon or a graduated cylinder (15 ml or more)
- 8 large washers
- 8 one-foot pieces of white string
- 8 milk cartons (half-gallon or quart size)
- spoon or ruler
- 3 reaction trays with at least 3 compartments
OR 3 sets of 3 plastic cups
- 3 medicine droppers OR plastic straws cut in half to use as droppers (see "Getting Ready," page 145)
- access to a sink, or a dishtub with a squirt bottle of water and a sponge
- 1 copy of the What Happens in an Algal Bloom? pages (masters on pages 161–164)
- 4 copies of James Pond (master on page 167)
- 4 copies of the Water Life Identification Key (master on page 168)
- 8 copies of the Bird Identification Card (master on page 170)
- 16 copies of the Birdwatching at James Pond sheets (masters on pages 171–172)
- 6 copies of the record of the Emergency Meeting of the Gray Area Board of Supervisors (master on pages 197–198)

An overhead transparency of each of the following:

- Map of the Gray Area (master on page 25)
- Gray Area History Timeline (master on page 26)
- Deer and Mountain Lion Populations in Parallel Park (master on page 134)
- Oil Chromatography Test Data (master on page 195)
- Fish Autopsy Results (master on page 196)

One copy of each of the following pictures/statements:

- Juan Tunó's picture and Introductory statement (master on page 27)
- Don Juan Tunó's picture and Introductory statement (master on page 28)
- Avery Wun's picture and Introductory statement (master on page 29)
- Juan Tunó's Chlorine statement (master on page 40)
- Ken Unballe's picture and Chlorine statement (master on page 41)
- LaToya Faktorie's picture and Acid Rain statement (master on page 72)
- Juan Tunó's Acid Rain statement (master on page 71)

- Don Juan Tunó's Acid Rain statement (master on page 73)
- Anton Alogue's picture and Sediment statement (master on page 104)
- Elmo Skeeto's picture and Sediment statement (master on page 105)
- Juan Tunó's Sediment statement (master on page 103)
- Juan Tunó's Deer Lion statement (master on page 131)
- Bo Vyne's picture and James Pond statement (master on page 159)
- Sandy Trapp's picture and James Pond statement (master on page 160)
- Juan Tunó's James Pond statement (master on page 157)
- Don Juan Tunó's James Pond statement (master on page 158)
- Final Suspect Statements (masters on pages 199–201)
- Mandy Lyfbotes' picture and Oil statement (master on page 194)

Eight sets of the following clue cards:

- Timeline Clue Cards (masters on pages 30–31)
- Acid Rain Clue Cards (masters on pages 82–85)

Eight copies of the following files:

- Chlorine Files (masters on pages 45–49)
- Acid Rain Files (masters on pages 86–88)
- Sediment Files (masters on pages 107–110)
- Deer Lion Files (masters on pages 134–138)
- James Pond Files (masters on pages 177–181)

Eight each of the following discussion cards:

- Chlorine Discussion Card (master on page 50)
- Deer Lion Discussion Card (master on page 139)
- James Pond Discussion Card (master on page 182)

The following procedure sheets:

- 8 copies of the pH Procedure Sheet (master on page 74)
- 1 copy of the Fo and Missterssippi River Soil Run-off Procedure Sheet (master on page 75)
- 1 copy of the Rafta River Soil Run-off Procedure Sheet (master on page 76)
- 8 copies of the Sediment Test Procedure Sheet (master on page 106)
- 2 copies of the Phosphate Test Procedure Sheet (master on page 165)

- 4 copies of the Water Life Procedure Sheet (master on page 166)
- 16 copies of the Birdwatching Procedure Sheet (master on page 169)

Additional material for dice version of Population Game in Activity 5:

- 1 overhead transparency of the Random Attack Board (master on page 133)
- 320 dice (see note about dice on page 115)
- 16 small plastic bags for storing dice
- 1 spray bottle of water for “plumping” dice (only needed for sponge dice)
- 16 copies of the Random Attack Board (master on page 133)

Optional:

- live daphnia and three cups (see “Sources” on page 222 for more information)
- 12 name badges: Ken Unballe, Juan Tunó, Chairperson, Chemist, Mandy Lyfbotes, Avery Wun, Don Juan Tunó, LaToya Faktorie, Anton Alogue, Elmo Skeeto, Sandy Trapp, and Bo Vyne
- a shoebox in which to toss dice (only for dice version of Population Game in Activity 5)
- 8 sets of James Pond Clue Cards (masters on pages 173–176)

Consumables

- 32 copies of the Map of the Gray Area (master on page 25)
- 32 copies of the Gray Area History Timeline (master on page 26)
- about 200 ml white vinegar (2 cups)
- several cups of distilled water
- 1–2 rolls of pH paper
- about 1 cup of soil
- about 2 tablespoons baking soda
- 2 coffee filter papers about 10" in diameter, flat or cone-shaped (paper towels may be substituted)
- 32 copies of the Test Results student data sheet (masters on pages 78–79)
- 32 copies of the Newspaper Interview (master on page 81)
- paper towels
- 4 or more tablespoons of soil (You need soil that will run off when “rained” on. Use any plain soil that isn’t too rocky, clay-like, or too full of organic

- material like roots and leaves. Avoid potting soil.)
- a handful of one or more of the following: pencil sharpener shavings, grass clippings, moss, dried weeds, or cut up pieces of paper towel
 - 1 half-pint of chocolate milk
 - 32 copies of the Sediments: What Do You Think? student sheet (master on page 111)
 - a chalkboard, butcher paper, or overhead transparency copy of the Population Game Graph (master on page 132) and the Birdwatching graph (master on the Test Results data sheet, page 79)
 - 1 small squeeze bottle of bromothymol blue (BTB)

Additional material for dice version of Population Game in Activity 5:

- 16 copies of the Population Game Graph (master on page 132)

Optional:

- for class work or homework: 32 copies of the
 - Chlorine: What Do You Think? worksheet (master on page 51)
 - Acid Rain: What Do You Think? worksheet (master on page 89)
 - Deer Lion: What Do You Think? worksheet (master on page 140)
 - James Pond: What Do You Think? worksheet (master on page 183)

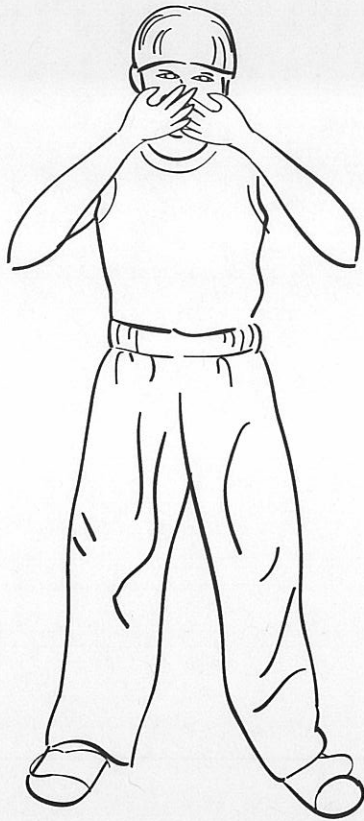
General Supplies

- scissors or a paper cutter
- a 3-hole punch
- an overhead projector
- 1 large black marker
- a permanent marker to write on masking tape
- 1 black permanent marker
- 8 large markers
- a meter stick or yardstick
- 1 piece of butcher paper for a large class map
- 1 piece of butcher paper about 8' x 4' for Suspect Chart (or equivalent chalkboard space)
- masking tape, or (for Activity 4 only) light-colored labeling tape (preferably white)
- paper clips
- 32 3-ring binders or 3-pronged folders for an Environmental Detective Notebook
- several sheets of lined paper for notes

- 40 9" x 12" envelopes or file folders
- a selection of crayons or colored pencils
- 2 packages large (2" square or larger) post-its
- 8 unsharpened pencils
- 2 colors of chalk, marker, or transparency pen
- 32 or more sheets of 8 ½" x 11" paper

Additional material for dice version of Population
Game in Activity 5:

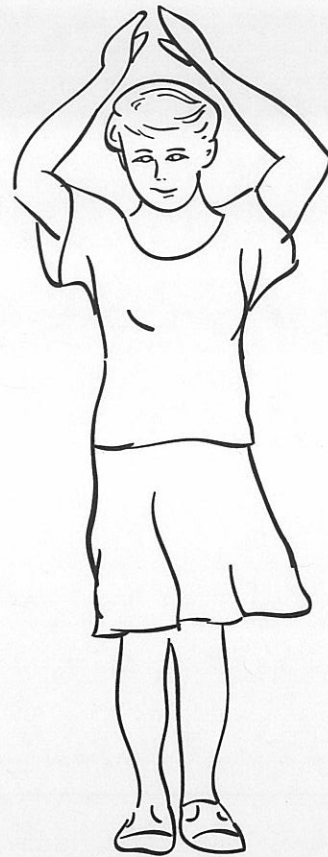
- 16 sheets of scratch paper
- 16 pens each of two different colors, or 16 pens and 16 pencils



water



food



shelter