

# Changes in Materials for *Land and Water*



Since publication of the *Land and Water* Teacher's Guide a change in materials has been made to the *Land and Water* unit that affects Lesson 4. Previously, the *Land and Water* unit provided diatomaceous earth for use in Lesson 4 to help create a crisp streambed. Due to possible inhalation and skin contact hazards related to the use of diatomaceous earth, white fine-grain sand has replaced diatomaceous earth as the crisping ingredient to the streambed. In addition, the quantity of white fine-grain sand provided in the materials for the *Land and Water* unit has increased.

This errata set includes the following:

- For the *Land and Water* Teacher's Guide—revised pages 6 (Materials List), 8, 12, and 53.

Photocopy and distribute these new instruction pages as needed.

If you have questions about these changes or about the module in general, call Carolina's product information staff at 800-227-1150 (8 am–5 pm ET, M–F), or email [stc@carolina.com](mailto:stc@carolina.com).

## Materials List

Below is a list of the materials needed for the *Land and Water* unit. Please note that the metric and English equivalents in this unit are approximate.

- |     |  |      |   |
|-----|--|------|---|
| 1   | <i>Land and Water</i> Teacher's Guide  | 60   | self-stick labels, 2.3 × 8 cm (7/8 × 3 1/4 in)  |
| 15  | <i>Land and Water</i> Student Activity Books   | 1    | roll of 3-mil, clear plastic sheeting, to provide up to 32 sheets, each 45 × 60 cm (18 × 24 in) |
| 72  | photo cards  | 8    | sets of water-erase, broad-tip markers (brown, orange, blue, green)                             |
| 8   | clear plastic boxes (e.g., Rubbermaid® Keepers™), 40 × 28 × 15 cm (16 × 11 × 6 in), with lid and 13-mm (1/2-in) drain hole | 250  | craft sticks, 11 cm (4 1/2 in)  |
| 8   | rubber stoppers, size 00   | 16   | jumbo straws  |
| 16  | small absorbent pads, 58.4 × 61 cm (23 × 24 in)  | 48   | plastic centimeter cubes (12 each of 4 different colors)  |
| 16  | large absorbent pads, 58.4 × 91.4 cm (23 × 36 in)  | 8    | resealable plastic bags, 30 × 38 cm (12 × 15 in)  |
| 8   | plastic plaster spreaders, 10 cm (4 in) wide   |      | Mustard seed, 300 ml (10 oz)  |
| 8   | plastic spoons   |      | Ryegrass seed, 300 ml (10 oz)   |
| 16  | hand lenses  | 1    | plant mister or spray bottle  |
| 10  | buckets, 3.8 liters (1 gal)  | **9  | plastic 2-liter soda bottles  |
| 1   | roll of extra-wide plastic wrap, 35 cm (14 in) wide  | **   | Transparent tape  |
| 8   | large rubber bands, 17.5 cm × 0.3 cm (7 × 1/8 in)  | **   | Newspaper   |
| 8   | Rubbermaid® Blue Ice® packs, 7 × 3.5 × 12 cm (2 3/4 × 1 3/8 × 4 3/4 in)  | **   | Newsprint   |
|     | Humus, 7.5 liters, (2 gal)   | **   | Masking tape  |
|     | Aquarium gravel, 9 liters or about 14.3 kg (31 1/2 lb)   | **   | Assorted water-based markers  |
|     | Clay, 4.5 liters (4 3/4 qt)  | **8  | metric rulers   |
| *   | All-purpose sand, 18 liters or about 25 kg (55 lb)   | **8  | sample models (for example, toy cars, globe)  |
|     | Marine sand, 250 ml or about 400 g (1 lb)  | **   | Bucket of ice or cooler   |
| 4   | bags of white fine-grain sand, 1.4 kg (3 lb)   | **   | Cleanup supplies: trash can, trash bags, broom, sponges, dustpan                                |
| 1   | pair large, clear polyethylene disposable gloves   | **   | Paper towels  |
| 8   | clear plastic cups (squat), 270 ml (9 oz)  | **24 | rocks, about 5 × 8 cm (2 × 3 in)  |
| 8   | plastic cups (squat), 270 ml (9 oz), with small (5/32-in) hole (size of 16-d nail)   | **8  | large paper clips   |
| 8   | blue self-stick dots, 17 mm (3/4 in) diameter  | **50 | sheets of white drawing paper, about 30 × 45 cm (12 × 18 in)                                    |
| 8   | plastic cups (squat), 270 ml (9 oz), with large (3/16-in) hole (size of 30-d nail)   | **   | White paper, 22 × 28 cm (8 1/2 × 11 in) (can be scrap paper with one clean side)                |
| 8   | red self-stick dots, 17 mm (3/4 in) diameter   | **   | Loose-leaf paper, 22 × 28 cm (8 1/2 × 11 in)  |
| 8   | plastic cups (squat), 270 ml (9 oz), with three small (5/32-in) holes (size of 16-d nail)                                  | **   | Hole punch  |
| 1   | graduated beaker, 1 liter (1 qt)   | **   | Yarn  |
| 8   | sprinkler heads  | **   | Index cards   |
| 1   | roll of electrical tape  | **   | Post-it™ notepads, 7.6 × 12.7 cm (3 × 5 in)   |
| 40  | graduated cylinders, 50 ml (1 3/4 oz)  | **   | Pencils   |
| 1   | bottle brush   | **8  | boxes, bags, or other containers to store each group's stream table materials                   |
| 8   | black china markers  | **3  | containers, boxes, or bags to hold extra soil components  |
| 1   | roll of string, 10 m (33 ft)   | **1  | large metal spoon   |
|     | Ultra Velcro®:   | **8  | scissors  |
|     | loop type, 5 × 75 cm (2 × 30 in)   | **1  | bottle of blue food coloring, 7.5 ml (1/4 oz) (optional)  |
|     | hook type, 5 × 30 cm (2 × 12 in)   | **8  | droppers (optional)   |
| 9   | permanent black markers  |      |   |
| 1   | plastic funnel   |      |   |
| 50  | graduated cups, 30 ml (1 oz)   |      |   |
| 8   | chopsticks   |      |   |
| 8   | sets of crayons (orange, black, gold, brown, blue, green)  |      |   |
| 400 | toothpicks   |      |   |

**\*Note:** The all-purpose sand is not included in the kit since it would greatly increase the shipping cost. You may purchase the sand from Carolina Biological Supply Company or from a local home-improvement center or hardware store.

**\*\*Note:** These items are not included in the kit. They are commonly available in most schools or can be brought from home.

table station contains the group's box of soil (set on a desk, table, wide window sill, or other elevated, level area) and the storage container that holds all the other stream table items (stored underneath or near the desk or table). These materials remain at each work station for the duration of the unit. Students go to their stream table stations to conduct each lesson's investigation. They can return to their group's desk or table area, which remains unsoiled, to perform their written work. This saves time because students do not have to set up and take down their stream tables in each lesson. If you feel this method will work in your classroom, prepare the stream table stations before beginning Lesson 2 or Lesson 3.

**Soil consistency.** Dampening the sand with water before beginning the unit is important. The soil should not be too dry or dusty. Students will achieve better results if the soil is *slightly* moist; however, it should not be so moist that it cannot hold its shape. The temperature of the classroom and whether the lids are on or off the stream tables between lessons may influence the soil moisture. Decide how you will keep the soil at the right consistency. You may have to test the soil in the stream tables at the beginning of each lesson.

- **Soil too dry:** Have students use a bottle of water and a sprinkler head to *slightly* moisten the soil. Then have students mix the soil. Ask them to keep the lids on the stream tables at the end of each lesson (or day). You may want to stack the closed stream tables on top of each other at the end of each lesson (or day) as a space-saving measure.
- **Soil too moist:** Before each lesson and when directed, have students mix the soil and soak up the extra water by blotting the soil surface with newspaper. Or you may need to mix in more sand. Also, make certain you remove the lids at the end of each lesson (or day). If you stack the stream tables as a space-saving measure, stack the opened stream tables in a crisscross fashion so the soil is exposed to the air.

**Using dry earth materials.** At the end of Lesson 3, you will be directed to add two 270-ml (9-oz) cups of white fine-grain sand to each group's stream table and mix it into the soil. Previously, the *Land and Water* unit kit provided diatomaceous earth to use in Lesson 4. This material helped to create a crisp streambed. Due to possible hazards related to diatomaceous earth, white fine-grain

sand is replacing diatomaceous earth as the crisping ingredient to the streambed. This sand provides the same amount of crispness to the streambeds without the possible inhalation and skin contact hazards of diatomaceous earth. However, caution your students that care should be taken with all dry earth materials to prevent an excessive amount of dust from entering the air around their workspace.

**Disposal of soil-water mixtures.** Students will catch the runoff from their stream tables in a plastic bucket. Dispose of this runoff outside. *Never* pour soil-water mixtures into a sink or any other plumbing drain, since soil will clog the drain.

### Aerial Drawing Tips

Students learn to create aerial drawings of their stream tables in Lesson 8. Using a rubber band, they attach plastic sheeting to their stream tables and draw their stream table results on the plastic from a "bird's-eye view." This helps students see their entire stream system and identify some of its parts. In Lessons 9 and 11, it is suggested that students create an aerial drawing of their results. When you post the group drawings on newsprint in these two lessons, students can easily compare results. At the close of the unit, each group (or the entire class) will bind its aerial drawings and create a "Big Book of Streams."

After Lesson 8, the materials needed to complete the aerial drawings are not relisted. Instead, the term "aerial drawing materials" will indicate that students need to use the following items:

#### Aerial drawing materials for each group

- 1 large rubber band, 17.5 × 0.3 cm (7 × 1/8 in)
- 1 sheet of 3-mil, clear plastic sheeting, 45 × 60 cm (18 × 24 in)
- 1 set of water-erase broad-tip markers (brown, orange, blue, green)
- 1 sheet of white drawing paper, about 30 × 45 cm (12 × 18 in)
- Scissors
- 1 large paper clip
- 1 sheet of loose-leaf paper, 22 × 28 cm (8 1/2 × 11 in)

**Note:** The Carolina Biological Supply Company kit contains two types of plastic. Be careful that you do not confuse them. Plastic wrap is used for modeling the water cycle in Lesson 2. Plastic sheeting is used for the aerial drawings in Lessons 8 and 9 and is optional in Lesson 11.

**Brainstorming:** Brainstorming is a whole-class exercise in which students contribute their thoughts about a particular idea or problem. When used to introduce a new science topic, it can be a stimulating and productive exercise. It also is a useful and efficient way for the teacher to find out what students know and think about a topic. As students learn the rules for brainstorming, they will become increasingly adept in their participation.

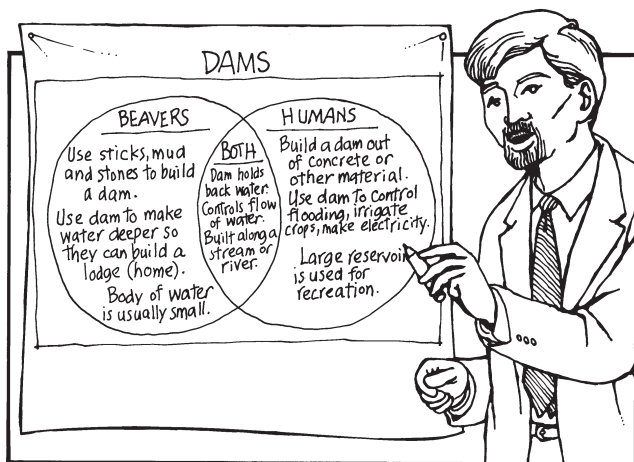
To begin a brainstorming session, define for students the topics about which they will share ideas. Tell students the following rules:

- Accept all ideas without judgment.
- Do not criticize or make unnecessary comments about the contributions of others.
- Try to connect your ideas to the ideas of others.

**Venn Diagrams:** Venn diagrams are useful tools for recording information to be compared. Venn diagrams use two or more intersecting circles to represent different sets of information. Information that relates to one idea is written inside one of the circles. Information about a similar yet different idea is written inside another circle. Information common to both ideas is written in the area of intersection.

**Figure T-1**

*Venn diagram*



**Cooperative Learning Groups:** One of the best ways to teach hands-on science is to arrange students in small groups. There are several advantages to this organization. It provides a small forum for students to express their ideas and get

feedback. It also offers students a chance to learn from one another by sharing ideas, discoveries, and skills. With coaching, students can develop important interpersonal skills that will serve them well in all aspects of life. As students work, they will often find it productive to talk about what they are doing, resulting in a steady hum of conversation. If you or others in the school are accustomed to a quiet room, this new, busy atmosphere may require some adjustment.

**Learning Centers:** You can give supplemental science materials a permanent home in the classroom in a spot designated as the learning center. Students can use the center in a number of ways: as an “on your own” project center, as an observation post, as a reading nook for trade books, or simply as a place to spend unscheduled time when assignments are done. To keep interest in the center high, change the learning center or add to it often. Here are a few suggestions of items to include:

- Science trade books about land and water.
- Audiovisual materials on related subjects.
- Items contributed by students for sharing.
- Additional hands-on activities for investigation.

## Materials

**Safety Notes:** This unit does not contain anything of a highly toxic nature, but common sense dictates that nothing be put in the mouth. It is good practice to tell your students that, in science class, materials are never tasted.

**Organization of Materials:** To help ensure an orderly progression through the unit, you will need to establish a system for storing and distributing materials. Being prepared is the key to success. Here are a few suggestions:

- Read through the **Materials List** on pg. 6. Begin to collect the items you will need that are not provided in the kit.
- Review the section Important Information on Materials on pgs. 7–10. It provides an overview of preparing and using the materials in this unit.
- Organize your students so they are involved in distributing and returning materials. If you have an existing network of cooperative groups, delegate the responsibility to one member of each group.

## Extensions

### SCIENCE

1. Pour one group's bucket of runoff into the 1-liter beaker. Set the beaker of runoff in an observation area and encourage students to conduct various investigations with it. For example, students can study the settling of suspended particles (particles that do not dissolve) by predicting how the contents of the beaker will change overnight. Or students can study the processes of the water cycle by covering the beaker with plastic wrap for several days to observe condensation, then uncovering the beaker for a week or two to observe changes in the level of water.

### ART

### LANGUAGE ARTS

2. Have students research time-lapse photography, which can capture on film the effects of erosion over time. Have students create their own time-lapse sequences by drawing the changes that took place in their land models today. Students can also use other topics for their time-lapse sequences.

### SCIENCE

3. Have students place a flat rock in the center of their land models and ask them to rain on the rock. Have students observe and record their observations. How did the rock affect the results? Compare these results with those from today's investigation.

### SOCIAL STUDIES

### LANGUAGE ARTS

4. Invite students to research rain forests. Where are they located? How do they contribute to or hinder the effects of rain on land?

### Preparation for Lesson 4

- Prior to Lesson 4, add two 270-ml (9-oz) cups of white fine-grain sand to each group's box of soil and mix it in. This will help create a crisp streambed.
- Prepare the plastic cups for Lesson 4 a day in advance. Color code the plastic cups with holes as described in step 4 of the **Preparation** section of Lesson 4.
- At least 12 hours prior to Lesson 4, cut and attach Ultra Velcro® to all of the cups with holes and to the boxes of soil as described in steps 5 through 7 of the Preparation section of Lesson 4. The adhesive on the Ultra Velcro® needs to set overnight.
- Make certain you have an extra 2-liter soda bottle, preferably a clear one, for Lesson 4.