INTRODUCTION

The Materials and Motion kit contains

• **Teacher Toolkit: Materials and Motion**
  1 Investigations Guide: Materials and Motion
  1 Teacher Resources: Materials and Motion
  1 FOSS Science Resources: Materials and Motion
• **FOSS Science Resources: Materials and Motion**
  (1 big book and class set of student books)
• Permanent equipment for one class of 32 students
• Consumable equipment for three classes of 32 students

A new kit contains enough consumable items for at least three classroom uses before you need to restock. Some of the FOSS early-childhood investigations take place at a science center for groups of six to ten students at a time. For whole-class activities, use a materials station for the class materials.

Individual photos of each piece of FOSS equipment are available online for printing. For updates to information on materials used in this module and access to the Safety Data Sheets (SDS), go to www.FOSSweb.com. Links to replacement-part lists and customer service are also available on FOSSweb.

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**NOTE**
To see how all of the materials in the module are set up and used, view the teacher preparation video on FOSSweb.

**NOTE**
Delta Education Customer Service can be reached at 1-800-258-1302.
**MATERIALS AND MOTION — Materials**

**KIT INVENTORY List**

**Drawer 1 of 3**

<table>
<thead>
<tr>
<th>Print Materials</th>
<th>Equipment condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 *Teacher Toolkit: Materials and Motion (1 Investigations Guide, 1 Teacher Resources, and 1 FOSS Science Resources: Materials and Motion <em>)</em></td>
<td></td>
</tr>
<tr>
<td>1 <em>FOSS Science Resources: Materials and Motion, big book</em></td>
<td></td>
</tr>
<tr>
<td>1 Poster, Cedar Tree</td>
<td></td>
</tr>
<tr>
<td>1 Poster, Linden Tree</td>
<td></td>
</tr>
<tr>
<td>1 Poster, Particleboard Production</td>
<td></td>
</tr>
<tr>
<td>1 Poster, Pine Tree</td>
<td></td>
</tr>
<tr>
<td>1 Poster, Plywood Production</td>
<td></td>
</tr>
<tr>
<td>1 Poster set, Conservation, 4/set</td>
<td></td>
</tr>
<tr>
<td>2 Posters, Science Safety and Outdoor Safety</td>
<td></td>
</tr>
</tbody>
</table>

**Shared Items**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32 Containers, plastic, 1/2 L</td>
<td></td>
</tr>
<tr>
<td>25 Cups, plastic, 250 mL (9 oz.)</td>
<td></td>
</tr>
<tr>
<td>36 Droppers, plastic</td>
<td></td>
</tr>
<tr>
<td>70 Plates, paper ✪</td>
<td></td>
</tr>
<tr>
<td>10 Screens</td>
<td></td>
</tr>
<tr>
<td>5 Sponges, large</td>
<td></td>
</tr>
<tr>
<td>1 String, ball ✪</td>
<td></td>
</tr>
<tr>
<td>1 Tape, masking, roll ✪</td>
<td></td>
</tr>
<tr>
<td>5 Tape, transparent, rolls ✪</td>
<td></td>
</tr>
<tr>
<td>36 Wood samples, basswood, 3/4&quot; × 3/4&quot; × 2.5&quot;</td>
<td></td>
</tr>
<tr>
<td>36 Wood samples, cedar, 3/4&quot; × 3/4&quot; × 2.5&quot;</td>
<td></td>
</tr>
<tr>
<td>36 Wood samples, particleboard, 3/4&quot; × 3/4&quot; × 2.5&quot;</td>
<td></td>
</tr>
<tr>
<td>36 Wood samples, pine, 3/4&quot; × 3/4&quot; × 2.5&quot;</td>
<td></td>
</tr>
<tr>
<td>36 Wood samples, plywood, 3/4&quot; × 3/4&quot; × 2.5&quot;</td>
<td></td>
</tr>
<tr>
<td>25 Zip bags, 1 L</td>
<td></td>
</tr>
</tbody>
</table>

**Drawer 2 of 3**

<table>
<thead>
<tr>
<th>Items for Investigation 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Basins, clear plastic, 6 L (1.5 gal.)</td>
<td></td>
</tr>
<tr>
<td>10 Lids for cups</td>
<td></td>
</tr>
<tr>
<td>400 Paper clips, jumbo</td>
<td></td>
</tr>
<tr>
<td>5 Plywood pieces, 1/4&quot; × 3/4&quot; × 2.5&quot;</td>
<td></td>
</tr>
</tbody>
</table>

* The student books, if included in your purchase, are shipped separately.

**NOTE**
The teacher toolkit is shipped separately. However, there is space in drawer 1 to store your toolkit.

✪ These items might occasionally need replacement.

1 The student books, if included in your purchase, are shipped separately.

* The student books, if included in your purchase, are shipped separately.
## Items for Investigation 2
- 14 Bottles, clear plastic, with caps, 120 mL (4 oz.)
- 10 Containers, plastic, fluted, 1 L
- 1 Pen, marking, permanent
- 1 Tape dispenser (for removable tape)
- 1 Tape, removable, roll

## Items for Investigation 3
- 10 Fabric squares, blue, 10 cm (4”), of each of these 10 kinds: burlap, corduroy, denim, fleece, knit, ripstop nylon, satin, seersucker, sparkle organza, terry cloth
- 5 Loupes/magnifying lenses

## Items for Investigation 4
- 1 Balloon pump
- 16 Balls, smooth, soft-plastic, large, 6.5 cm (2.5”) diameter
- 16 Balls, wiffle, small
- 16 Foam runways, 45 cm (1.5’) long
- 10 Zip bags, 4 L

### Drawer 3 of 3

#### Shared Items
- 100 Balloons, oblong
- 1000 Craft sticks
- 100 Fabric squares, burlap, red, 4 cm (1.5”)
- 50 Fabric squares, wool plaid, 4 cm (1.5”)
- 200 Index cards
- 100 Paper samples, 10 cm square (4”), of each of these 6 kinds: chipboard, cardboard, corrugated, kraft, newsprint, tagboard
- 5 Sandpaper, sheets, coarse, #50, 23 × 28 cm
- 2 Sawdust, bags
- 2 Self-stick notes, pads, 100/pad
- 100 Straws, superjumbo
- 1 Waxed paper, roll
- 300 Wood pieces, thin, 1/16” × 3/4” × 2.5”
- 36 Wood samples, basswood, for sanding
- 2 Wood shavings, bags

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**NOTE**

This module includes access to FOSSweb, which includes the streaming videos and online activities used throughout the module.
Materials Supplied by the Teacher

Each part of each investigation has a Materials section that describes the materials required for that part. It lists materials needed for each student or group of students and for the class.

Be aware that you must supply some items. Each of these items is indicated with an asterisk (*) in the materials list for each part of the investigation. Here is a summary list of those items by investigation.

For all investigations
- Chart paper and marking pen
- Computer with Internet access
- Drawing utensils (crayons, pencils, colored pencils, marking pens)
- Glue, white
- Glue sticks
- Newspaper
- Paper towels
- Pitcher or empty 2 L soft-drink bottle
- Projection system
- Science notebooks (composition books)
- Scissors

For outdoor investigations
- Bag for carrying materials
- Collecting bags for carrying materials

Investigation 1: Getting to Know Wood
- Container, large zip bag, or jar
- Cornstarch, 1 or 2 boxes
- Small objects that sink
- Plane (optional)
- Safety goggles
- Saucepan
- Saw (optional)
- Scratch paper
- Spoon, long-handled
- Spoons, plastic
- Sticks, about 20 × 1 cm (8" × 0.5")
- Turkey baster (optional)
Investigation 2: Getting to Know Paper

- Basins or bins, recycling
- Clothesline and clothespins (optional)
- Construction paper, white
- Facial tissue, white
- Flour, 3/4–1 L (3–4 cups)
- Newsprint (plain) or brown paper towels (from school)
- Paper, white, sheet, 22 × 28 cm (8.5’’ × 11’’)
- Screwdriver or mat knife
- Spoon, large, long-handled
- Tissue paper, roll, single ply

Investigation 3: Getting to Know Fabric

- Box cutter
- Cardboard boxes or brown-paper grocery bags
- Clothespins or binder clips
- Clothesline (optional)
- Contact paper (optional)
- Fabric scraps, small
- Hot glue gun
- Mat-board scraps or cardboard scraps (optional)
- Natural materials (leaves, sticks, bark—optional)
- Paper plates or white construction paper, 28 × 45 cm
- Paper scraps
- Magnets
- Materials for recycling center (empty plastic bottles, steel cans, aluminum cans, newspapers, cardboard boxes, scrap wood)
- Scissors
- Stapler (optional)
- Thermometer (optional)
- Wood scraps, small

Investigation 4: Getting Things to Move

- Balls, different sizes (kickball, soccer ball, tennis ball)
- Bath towel or small blanket
- Books
- Bottles, empty, soft-drink, 1–2 L
- Chairs
- Meter tape or stick
- Toy that rolls on wheels
PREPARING a New Kit

If you choose to prepare the materials all at once with a group of volunteers, you can use the following guidelines for organization.

1. **Prepare the center instruction sheets**
   Each investigation part that involves a group of students at a center has a center instruction sheet written for a parent or other adult helper working with students. Each sheet summarizes and abbreviates the information provided to the teacher in the guide (and is not a replacement for the teacher-guide instructions). Use the teacher masters to print or make copies of the center instructions and either laminate the sheets or put them in clear-plastic sheet protectors. Take time to orient your adult volunteers or aides to the overall purposes of the activities, and encourage them to facilitate but not direct student learning at the center. Below are the teacher master numbers for the center instruction sheets.

   No. 6  Center Instructions—Wood and Water
   No. 7  Center Instructions—Testing a Raft A
   No. 8  Center Instructions—Testing a Raft B
   No. 9  Center Instructions—Sanding Wood
   No. 10 Center Instructions—Sawdust and Shavings
   No. 11 Center Instructions—Making Particleboard
   No. 12 Center Instructions—Making Plywood
   No. 16 Center Instructions—Using Paper A
   No. 17 Center Instructions—Using Paper B
   No. 18 Center Instructions—Paper and Water
   No. 19 Center Instructions—Paper Recycling
   No. 20 Center Instructions—Papier-Mâché
   No. 29 Center Instructions—Feely Boxes and Fabric Hunt
   No. 31 Center Instructions—Taking Fabric Apart
   No. 32 Center Instructions—Water and Fabric
   No. 34 Center Instructions—Building Structures
2. **Prepare wood samples**

Six bags of wood samples are included in the kit. Five bags of samples (basswood, particleboard, pine, plywood, and cedar) are permanent materials and should not be sanded. A second bag of basswood is consumable. It should be labeled “FOR SANDING.”

The wood samples are all the same size and shape so that students will focus on the properties of the different kinds of wood. Most of the samples are easily recognized, but you may have trouble distinguishing between pine and basswood. Some of the samples are easily recognized, but you may have trouble distinguishing among pine, basswood, and cedar. If you are the first to use the kit, use a permanent black marking pen to put a tiny dot on one end of each basswood sample for positive identification later. Repeat the action with a red permanent marker on the cedar. These dots are for you to easily identify the wood, not for students.
PREPARING the Kit for Your Classroom

Some preparation is required each time you use the kit. Doing these things before beginning the module will make daily setup quicker and easier.

1. **Inventory materials**
   Before using a kit, conduct a quick inventory of all items in the kit. You can use the list provided in this chapter to keep track of any items that are missing or in need of replacement. Information on ordering replacement items can be found at the end of this chapter. The kit contains enough consumables for at least three classes of 32 students.

2. **Check basswood samples**
   Two bags of basswood samples are in the kit. One is permanent equipment and should not be sanded or modified in any way. A second bag of basswood is consumable, although the samples can be reused several times. Students will change the shape of these by sanding them in Investigation 1. Check the label on the bag to be certain you are using the basswood that is marked “FOR SANDING” when you begin the investigation.

3. **Prepare consumable paper samples**
   Most of the paper samples in the kit are precut into 10-centimeter (cm; 4") squares. There are 100 samples of each kind of paper in the kit—enough for at least three classroom uses. A roll of waxed paper is provided in the kit, and you will need to cut it into 10 cm squares. You will also need to provide construction-paper samples, paper-towel samples, and facial-tissue samples. Cut 50 squares of each paper. This should give you enough samples for the class, plus several extras if needed. All materials can be purchased from local sources, and replacement packages are available from Delta Education.

4. **Check permanent fabric samples**
   All the fabric samples in the kit come precut; samples of each of the ten kinds of blue fabric come in their own zip bags. You will assemble sets of five or ten fabrics, depending on the activity. The Getting Ready section will tell you how to group the samples for each part. The edges of the fabric may become a bit frayed from use, but if you caution students to handle them carefully, the samples will not need to be replaced very often. The ten blue fabrics are considered to be permanent equipment and should not be cut up for fabric projects.
5. **Check consumable fabric samples**
   The small burlap (used by every student) and wool-plaid squares (shared by a pair of students) provided in the kit will be consumed in the course of the activities. These fabrics should be restocked after three classes have used the kit. All these consumable materials can be purchased from local sources, but replacement packages are available from Delta Education.

6. **Care and reuse of materials**
   The items in the kit have been selected for their ease of use and durability. Make sure that items are clean and dry before putting them back in the kit. Small items should be inventoried (a good job for students under your supervision) and put in zip bags for storage.

7. **Identify containers**
   A variety of containers are in the kit. The first time they are used, they are described and illustrated for easy identification. Metric capacities are used to distinguish the containers. We also include the English equivalents for the first time they are described in an investigation. Be sure to use the correct container for each investigation and, if you have questions, check the photo equipment cards.

8. **Plan for drying time**
   In a number of activities, you will need to allow time and space for wood, paper, or fabric to dry. Be sure to read ahead and plan for this time.

   - Investigation 1, Part 2: Wood and Water
   - Investigation 1, Part 3: Testing a Raft
   - Investigation 1, Part 5: Sawdust and Shavings
   - Investigation 2, Part 3: Paper and Water
   - Investigation 3, Part 3: Water and Fabric

   In other activities, you will need to allow time and space for projects to dry before they can go home.

   - Investigation 1, Part 6: Making Particleboard
   - Investigation 1, Part 7: Making Plywood
   - Investigation 2, Part 4: Paper Recycling
   - Investigation 2, Part 5: Papier-Mâché
   - Investigation 3, Part 6: Building Structures
9. **Check balloons**  
The kit has oblong balloons for a balloon-rocket demonstration. There is one balloon pump in the kit. For safety reasons, use the pump to inflate the balloons and make sure students don’t put the balloons in their mouths.

Balloons are made of latex. Students with latex allergies should not handle balloons.

10. **Gather books from library**  
Check your local library for books related to this module. These books are recommended in the Interdisciplinary Extensions.

- *Math in Motion: Origami in the Classroom* by Barbara Pearl (Investigation 2)
- *Pezzettino* by Leo Lionni (Investigation 2)
- *Red Leaf, Yellow Leaf* by Lois Ehlert (Investigation 2)
- *Biggest, Strongest, Fastest* by Steve Jenkins (Investigation 2)
- *Caps for Sale* by Esphyr Slobodkina (Investigation 3)
- *No Roses for Harry!* by Gene Zion (Investigation 3)

11. **Plan for student projects**  
Students produce several projects. Help students keep track of all the projects, so that they have complete collections to take home.

12. **Plan for science notebooks**  
See Getting Ready for Investigation 1, Part 1, for ways to organize the science notebooks for this module.

13. **Plan for the word wall and pocket chart**  
As the module progresses, you will add new vocabulary words to a word wall or pocket chart and model writing and responding to focus questions. Plan how you will do this in your classroom. There are suggestions in Getting Ready for Investigation 1.

14. **Plan for focus-question charts**  
Each part of each investigation has a focus question that you ask students before and after the activity session. You’ll find these questions on teacher masters 2–4, *Focus Questions*. Students will glue each focus question on a page in their science notebooks and respond to it with words or drawings. At the beginning of the module, you will need to scaffold the use of notebooks. Use chart paper to model how to respond to the focus question in writing or drawings. See Getting Ready for Investigation 1, Part 1, for suggestions on how to do this in your classroom.
15. **Plan for letter home and home/school connections**
   Teacher master 1, *Letter to Family*, is a letter you can use to inform families about this module. The letter states the goals of the module and suggests some home experiences that can contribute to students’ learning.

   There is a home/school connection for most investigations. Check the last page of each investigation for details, and plan when to print or make copies and send them home with students.

16. **Plan for safety rules and conservation**
   Two safety posters are included in the kit to post in the room—*Science Safety* and *Outdoor Safety*. The Getting Ready for Investigation 1, Part 1, will offer suggestions for this discussion. Also be aware of any allergies that students in your class might have. Students with latex allergies should not handle the rubber bands or balloons.

   Three investigation parts require special consideration. In Investigation 1, Parts 4, 5, and 6, students are exposed to sawdust and wood shavings. Find out which students have asthmatic conditions, and be sure to accommodate their health needs. Check your district guidelines for use of safety goggles while sanding wood.

   Use the four *Conservation* posters to discuss the importance of conserving natural resources. These are introduced in Investigation 3, Part 5.

17. **Check FOSSweb for resources**
   Go to FOSSweb, register as a FOSS teacher, and review the print and digital resources available for this module, including the eGuide, eBook, Resources by Investigation, and *Teacher Resources* including the grade-level Planning Guide.

**NOTE**

The *Letter to Family* and *Home/School Connections* are available electronically on FOSSweb.
CARE, Reuse, and Recycling

When you finish teaching the module, inventory the kit carefully. Note the items that were used up, lost, or broken, and immediately arrange to replace the items. Use a photocopy of the Kit Inventory List in this chapter, and put your marks in the “Equipment condition” column. Refill packages and replacement parts are available for FOSS by calling Delta Education at 1-800-258-1302 or by using the online replacement-part catalog (www.DeltaEducation.com).

Standard refill packages of consumable items are available from Delta Education. A refill package for a module includes sufficient quantities of all consumable materials (except those provided by the teacher) to use the kit with three classes of 32 students.

Here are a few tips on storing the equipment after use.

- Make sure items are clean and dry before storing them.
- Make sure the posters and print materials are flat on the bottom of the box.
- Return wood samples, paper samples, and fabric samples to their appropriate, labeled bags.
- Inventory and bag up the paper and fabric scraps that can be used for the next class. Extra zip bags are included for this purpose.
- Carefully seal the sawdust and wood-shavings bags.
- Return paper clips and small rubber bands to their bags.
- Label the dispenser of removable tape so it is not confused with regular tape.
- Inventory and bag other small items.

The items in the kit have been selected for their ease of use and durability. Make sure that items are clean and dry before putting them back in the kit. Small items should be inventoried (a good job for students under your supervision) and put into zip bags for storage. Any items that are no longer useful for science should be properly recycled.