

Intermediate Lentil Science Quick Start Guide

This guide is designed to help homeschoolers manage the set-up of this program. On page 2 is a materials page which shows all items needed for the entire program, and which items are included in the support kit. On pages 3-9, there is one page for each chapter to help organize the set-up process.

Purchasing the support kit is highly recommended, so this is listed as our default purchase option on our website. It cuts down on a lot of gathering and preparing the more difficult-to-find materials. To make things easy, we recommend preparing Chapter A/Compare to start out. That will give you 7 lessons for your student to work on. Once you are ahead, you can pick your next chapter and start collecting and preparing materials listed in advance. This keeps the program moving without an overwhelming set-up time.

We ALWAYS encourage improvisation, and if teachers or kids think of a substitute material, or an original or better way to do something, that is the essence of great science exploration. (Even if it doesn't work as well!)

Step 1: Prepare a lentil workstation. These items will be used for most of the lessons in the book.:

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| *Job box (see p. 8) | *Cleaning screen (1/8 inch mesh hardware cloth, six inches square p. 6), |
| *Scoop (made out of the bottom of a pint or quart milk carton p.9) | Funnel (made from the top of a liter bottle p. 7) |
| 3 one-liter bottles filled with lentils | Paper and pencil |
- *included in Intermediate Lentil Science support kit – under the Quick Ordering tab, choose “Order Books and Kits”*

Step 2: Make sure to have the following items available:

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|-----------------------------|------------------------------|
| Clear packing tape | Scissors |
| Electrical tape | Fine-tipped permanent marker |
| Masking tape | Stapler |
| Clear tape | Hole punch |
| White glue | Crayons and colored pencils |
| Index cards (4x6) | Ruler |
| *Paper clips | Calculator (optional) |
| *Assortment of rubber bands | |

**items are available through TOPS – under the Quick Ordering tab, choose “Order Supplies”. Most of these items are teacher supplies used for preparing student materials.*

Step 3: Pick a chapter to prepare in advance:

Pages 3-9 contain one sheet for each chapter with a materials list, assembly instructions, and a lesson-by-lesson list of materials needed. Some of the set-up is for making and labeling containers to store other items. These are marked as optional. If you are not planning to store your Intermediate Lentil Science kit, these items can be collected for the lessons and put in a sandwich baggie or other convenient container.

Intermediate Lentil Science Materials

Recyclables and special materials to collect:

Not included in support kit:	TOPS support kit materials:
<p>4 pounds lentils Bag of pinto beans, or sort 75 pintos out of bean mix Bag of bean mix (15-or 16-bean variety soup mix) Medium can (15-16 oz.) Quart milk carton 2 half-liter bottles with lids 5 one-liter bottles with lids 3 one-pound margarine tubs Medium jar lid – like you find on a quart mayonnaise jar 2 paper towel tubes or other cardboard tube about 11 inches long 10 pennies Brad (also called a brass fastener or split pin) Straight pin Hand lens Butcher paper – 3 foot by 5 foot section 2 wood blocks (2x4's cut to 15" long, or substitute with 4 bricks or other prop) Three rocks and cardboard templates (see p. 62) *12 clear plastic cups (10 oz, tall, tapered cups) *10 Clothespins *Paper plate *Canning ring *4 film containers (3 are optional – for storage of smaller items) Quart jar (optional – for storing bean mix) 5 one-gallon jugs (optional – used for storage)</p>	<p>8 oz. mayonnaise jar 6 oz. baby food jar 4 oz. baby food jar 2½ oz. baby food jar 8 T-60 dram I-O plastic vials 1 T-40 dram I-O plastic vial 3 T-30 dram I-O plastic vials 1 T-20 dram I-O plastic vial 9 T-16 dram I-O plastic vials 1 T-13 dram I-O plastic vials 5 T-8½ dram I-O plastic vials Test tube 40 bottle caps 6 x 6 inch piece of ¼ inch hardware cloth (wire screen) 6 x 6 inch piece of ⅛ inch hardware cloth (wire screen) 4 magnets 30 BB's 60 craft sticks Double lid Cardboard job box 19 x 14.5 x 3 inches Scoop (made out of a quart or pint milk carton) Counting grid (3x3 section of ¼ inch hardware cloth mounted on a ceramic tile, instructions to make your own on p. 122)</p>
<p><i>* items can be ordered through TOPS</i></p>	

Intermediate Lentil Science Chapter A: Pour

Lentil workstation, paper and pencil

Chapter A/Compare Materials	<p>Set of 10 jars and vials: 8 oz mayo jar 6 oz baby food jar 4 oz baby food jar 2½ oz baby food jar T-60 dram I-O vial T-40 dram I-O vial T-30 dram I-O vial T-16 dram I-O vial T-13 dram I-O vial T-8½ dram I-O vial</p> <p>+Masking tape +one-pound margarine tub Equation tags (copied and assembled from book) Set of 4 puzzle books (copied and assembled from book) +Plastic cup (optional for storage) +Gallon storage jug, plastic (optional)</p>
+items not included in support kit	
Chapter A/Compare Assembly	<p>Copy and fold job cards Copy labels on p. 19 Copy and assemble puzzle books p. 23, 26, 28, 29 Copy and assemble equation tags p. 24 Apply labels to containers (instructions on p. 18) Optional storage: gallon jug for jars and vials, plastic cup for equation tags</p>

Chapter A/Pour – Materials needed in addition to lentil workstation, by lesson:

Lesson 1	Jars and vials
Lesson 2	Jars and vials, notebook paper, no lentil workstation needed
Lesson 3	Compare 3 puzzle book, equation tags, jars and vials
Lesson 4	Compare 4 puzzle book, equation tags, jars and vials
Lesson 5	(2) Compare 5 puzzle books, equation tags, jars and vials
Lesson 6	Masking tape, tub, jars and vials, equation tags
Lesson 7	Students request materials to experiment

Intermediate Lentil Science Chapter B: Search

Lentil workstation, paper and pencil

Chapter B/Search Materials	<ul style="list-style-type: none"> +Paper plate +3 one-pound margarine tubs +Bag of pinto beans or sort 75 pintos out of bean mix +2 bags of bean mix (15 or 16 bean variety soup mix) +3 film containers (optional) +Quart jar for storing bean mix(optional) 6 x 6 inch piece of ¼ inch hardware cloth (wire screen) +10 pennies plus 10 pintos and 10 red beans from bean mix 4 magnets +Brad +Paper clips +Two wood blocks (2 x 4's cut to 15" long) 30 BB's 2 bottle lids (from a one or two liter bottle) 1 bottle cap +Medium jar lid – like you would find on a quart of mayonnaise +Hand lens +9 clothespins
+items not included in support kit	<ul style="list-style-type: none"> 11 craft sticks +2 clear cups – one for storing clothespins (optional)
Chapter B/Search Assembly	<ul style="list-style-type: none"> Copy and fold job cards, job sheets Prepare screen out of hardware cloth (directions on p. 33) From bean mix, 75 pintos, 10 pintos, and 10 red beans Prepare magnets (masking tape, string and brad – instructions on p. 33) Cut two 2 x 4's to 15 inches long (or use bricks or some other substitute to prop job box up off the table) Label one bottle lid like a compass N,S,E,W (p. 33) Label clothespins 1-4 and 0-4 Make a bottle cap spoon out of a craft stick and a bottle cap (p. 6) Optional: Copy labels (p. 34), label film canisters for storing small items, label clear cup for storing clothespin grid markers

Chapter B/Search – Materials needed in addition to lentil workstation, by lesson:

Lesson 1	Screen, pinto beans, paper plate
Lesson 2	Screen, pinto beans, paper plate
Lesson 3	10 pintos, 10 pennies, 10 red beans, paper plate, screen
Lesson 4	Paper plate, bottle cap spoon, 3 tubs, screen, bean mix, job sheet, empty job box
Lesson 5	Wood blocks, magnets, clear cup, jar lid, 30 bb's and 1 bottle cap
Lesson 6	Grid markers, a few paper clips, magnets
Lesson 7	Compass lid, magnets, paper clip, 10 craft sticks
Lesson 8	Students request materials to experiment

Intermediate Lentil Science Chapter C: Measure

Lentil workstation, paper and pencil

Chapter C/Measure Materials	<p>Five 60 dram plastic vials (extra cups) +Paper clips +Liter bottle (bottle used for storing lentils is fine) Set of 6 cup measures (cutting instructions on p. 45) 20 dram plastic vial Two 60 dram plastic vials +Half liter bottle +One-pound margarine tub +Liter bottle +2 gallon storage jugs, plastic (optional) 3 craft sticks Bottle cap spoon from Chapter B Grid paper (p. 52-54) +Calculator (optional) +Blunt scissors</p>
+items not included in support kit	<p>+Masking tape +Clear tape</p>
Chapter C/Measure Assembly	<p>Copy and fold job cards, job sheets, stick ruler templates and graph paper (7 copies of each) Cut set of 6 cup measures according to directions on p. 45 Assemble stick rulers (instructions p. 51) Attach paper clips to extra cups (see p. 7) Store 6 cup measures and extra cups in gallon jugs (optional)</p>

Chapter C/Measure – Materials needed in addition to lentil workstation, by lesson:

Lesson 1	5 extra cups, liter bottle
Lesson 2	Set of 6 cup measures
Lesson 3	Set of 6 cup measures, liter bottle, masking tape
Lesson 4	Stick rulers, 2 copies each grid papers, empty job box
Lesson 5	4 copies each grid papers, stick rulers, calculator (optional), empty job box
Lesson 6	1 copy grid papers, stick rulers, scissors, clear tape, calculator (optional), empty job box
Lesson 7	Job sheets, stick rulers, bottle cap spoon, liter bottle of lentils, empty job box
Lesson 8	Students request materials to experiment

Intermediate Lentil Science Chapter D: Design

Lentil workstation, paper and pencil

Chapter D/Design Materials	+One-pound margarine tub +Clothespin labeled N 22 bottle caps 50 craft sticks +3 rocks and 3 cardboard templates (instructions p. 62) +Butcher paper – 3 x 5 foot section +Meter stick or yard stick +Blunt scissors Double lid (see p. 62) +Straight pin +Canning ring +Masking tape Bottle cap compass from Ch. B
+items not included in support kit	+Stapler +Gallon storage jug (optional)
Chapter D/Design Assembly	Copy and fold job cards and job sheets Copy labels p. 63 (optional) Copy and assemble landforms booklet p. 65 Copy and assemble landscape and townscape props p. 67 (instructions on p. 62) store in labeled plastic cups Copy and assemble street sticks p. 70-71 (instructions on p. 62) rubber band together Three rocks and cardboard rock shapes (instructions p. 62) Make a double lid (included in support kit) instructions p. 62 Store in gallon jug (optional)

Chapter D/Design – Materials needed in addition to lentil workstation, by lesson:

Lesson 1	Landforms books, rocks and cards
Lesson 2	Rocks and cards, landscape props
Lesson 3	Landscape props, bottle cap compass, rocks and cards
Lesson 4	Townscape props, street sticks
Lesson 5	Townscape props, street sticks, craft sticks, job sheet, masking tape
Lesson 6	Butcher paper (3 ft. x 5 ft.) craft sticks, yard or meter stick, D5 completed job sheet
Lesson 7	Empty job box, liter bottle full of lentils, scissors, job sheet, stapler
Lesson 8	Two empty liter bottles, double lid, straight pin
Lesson 9	Students request materials to experiment

Intermediate Lentil Science Chapter E: Divide

Lentil workstation, paper and pencil

Chapter E/Divide Materials	Set of 10 fraction cups (instruction p. 81) Two 60-dram plastic vials 20-dram plastic vial Three 16-dram plastic vials Four 8½ dram plastic vials Set of extra cups from previous chapters +2 cardboard tubes from paper towel or aluminum roll +Blunt scissors Circle protractor (copy from p. 100) Set of fraction labels (instructions p. 81) Medium can 8 craft sticks, +Thick rubber band Copy of fraction labels pages 102-104 +Liter bottle +Rubber band +Gallon jug (optional)
+items not included in support kit	
Chapter E/Divide Assembly	Copy and fold job cards and job sheets Assemble and label fraction cups (instructions p. 81 – labels p. 80, 83) Store in plastic gallon jug (optional) Copy and assemble four puzzle books Label one paper towel or aluminum tube “prediction tube” Copy and assemble protractor p. 100 (instructions p. 81) Prepare fraction labels p. 102-104 (instructions p. 81) Prepare measuring bottle (instructions p. 81) Prepare a tube ruler p. 100 (instructions p. 81)

Chapter E/Divide – Materials needed in addition to lentil workstation, by lesson:

Lesson 1	Job sheet, fraction cups
Lesson 2	Fraction cups, Divide 2 puzzle books A and B
Lesson 3	Fraction cups, Divide 3 puzzle books A and B
Lesson 4	Fraction cups, prediction tube
Lesson 5	Two job sheets, Fraction containers
Lesson 6	Fraction containers, scissors, job sheet
Lesson 7	Job sheet, circle protractor, craft stick
Lesson 8	Fraction labels, scratch paper, measuring bottle with rubber band, extra cups, fraction cups
Lesson 9	Tube ruler, fraction cups
Lesson 10	Students request materials to experiment

Intermediate Lentil Science Chapter F: Calibrate

Lentil workstation, paper and pencil

Chapter F/Calibrate Materials	<p><i>Set of 10 Fraction cups from Ch. E/Divide</i></p> <p>+3 one-pound margarine tubs</p> <p>+8 clear cups (10 oz plastic cups)</p> <p>Set of extra cups (use set from Chapter C/Measure)</p> <p>+Masking tape</p> <p>+Clear tape</p> <p>+Blunt scissors</p> <p>+Half-liter bottle</p> <p>+Colored pencils, crayons or markers</p> <p>+Ruler</p> <p>Baby food jars</p> <p style="padding-left: 20px;">2½ oz, label small</p> <p style="padding-left: 20px;">4 oz, label medium</p> <p style="padding-left: 20px;">6 oz, label large</p> <p>+variety of containers for ruled cups (suggestions and instructions p. 108)</p>
+items not included in support kit	<p>+three cups of different shapes with centimeter ruler (p. 109) attached</p> <p>+film can</p>
Chapter F/Calibrate Assembly	<p>Copy and fold job cards and job sheets</p> <p>Prepare ruled cups p. 108</p>

Chapter F/Calibrate – Materials needed in addition to lentil workstation, by lesson:

Lesson 1	Job sheet, 3 tubs, 8 clear cups, scissors, liter bottle filled with lentils
Lesson 2	Job sheet, liter bottle, half liter bottle filled with lentils, 4 clear cups, scissors
Lesson 3	Liter bottle, cup, and half cup from set of extra cups, colored pencils, crayons or markers, clear tape, scissors
Lesson 4	Job sheets, ruler, masking tape, liter bottle, small/med/large baby food jars, scissors
Lesson 5	Job sheets, S/M/L baby food jars, ruler, set of extra cups, scissors, masking tape
Lesson 6	Job sheet, film can, ruler, ruled cups (p. 108)
Lesson 7	Students request materials to experiment

Intermediate Lentil Science Chapter G: Estimate

Lentil workstation, paper and pencil

Chapter G/Estimate Materials	Bottle-cap spoon +One-pound margarine tub +Masking tape 1 extra cup (60 dram vial) 1 craft stick +Clear tape Spreader (craft stick and index card – instructions on p. 122) Counting grid (¼ inch hardware cloth, 3 x 3 inch piece, and a ceramic tile) Test tube +Cardboard cut to same height and width as job box +Short quart carton (4 cm tall) +Blunt scissors +Calculator (optional) <i>Items from previous chapters:</i> <i>Set of 10 fraction cups from E/Divide</i> <i>Stick rulers from C/Measure</i> <i>Set of 6 measuring cups from C/Measure</i> <i>Set of 3 rocks and 3 cards from D/Design</i>
+items not included in support kit	
Chapter G/Estimate Assembly	Copy and fold job cards Copy halving pattern and cross patterns Cut a cardboard dam from a rectangle of corrugated cardboard to the same size as the short side of the job box Make a spreader out of a craft stick and index card (p. 122) Prepare counting grid if you didn't order the Support Kit Cut a quart carton to 4 cm tall

Chapter G/Calibrate – Materials needed in addition to lentil workstation, by lesson:

Lesson 1	Spreader, bottle cap spoon, counting grid
Lesson 2	Masking tape, tub, test tube, counting grid, spreader, pencil and pen
Lesson 3	Masking tape, spreader, test tube, extra cup, counting grid, bottle cap spoon
Lesson 4	10 fraction cups, 6 measure containers, spreader, counting grid
Lesson 5	Spreader, counting grid, Divide containers
Lesson 6	Halving pattern sheet, craft stick
Lesson 7	Stick rulers, cardboard dam, 3 rocks and 3 cards, fraction cups from Divide
Lesson 8	Students request materials to experiment