

# SAM Labs' K-5 STEAM Course

## Additional Materials List

### Things to keep in mind when reading this list:

1. Each lesson requires the STEAM Classroom kit. Since each lesson requires it, the kit is not listed on the materials list.
2. Each lesson's quantities are based on a class size of 30 students.
  - a. For kindergarten and first grade, the lessons use a station-rotation model consisting of three groups of ten.
  - b. For grades 2-5, the quantities are based on 10 groups of 3.

## Kindergarten

### Kindergarten Lesson 1 - The Melting Ice Cream

Material	Quantity
Ice cubes	30 (1 per student)
Plastic hoops (i.e. hula hoop)	2
Scissors	10
Roll of tape	1
Paper straws, toothpicks, <b>OR</b> pipe cleaners to create umbrella structure	<ul style="list-style-type: none"> <li>• 30 straws (1 per student cut into quarters)</li> <li>• 120 toothpicks (4 per student)</li> <li>• <b>OR</b> 30 pipe cleaners (1 per student cut into quarters)</li> </ul>
Computer paper, construction paper, aluminum foil, plastic food wrap, craft tissue paper, and/or felt to create umbrella top	Cut into small circles to create top of umbrella: <ul style="list-style-type: none"> <li>• 1 piece of computer paper (create 4 circles)</li> <li>• 1 piece of construction paper (create 4 circles)</li> <li>• 1 piece of aluminum foil (cut into 4 circles)</li> <li>• 1 piece of plastic food wrap (cut into 4 circles)</li> <li>• 1 piece of tissue paper (cut into 4 circles)</li> <li>• 1 piece of felt (cut into 4 circles)</li> </ul>

## Kindergarten Lesson 2 - The Greenhouse

Material	Quantity
Sandwich bag (zip close)	30 (1 per student)
Plant seed packet/Fava bean seeds	30 packets or 30 fava bean seeds (1 per student)
Water	1 cup
Cotton balls	90 (3 per student)
Pieces of plain or construction paper	30 (1 per student)
Scissors	10
Roll of tape	10

## Kindergarten Lesson 3 - The Big Recycle

Material	Quantity
Packs of colored pencils/crayons	10
Construction paper	30 pieces (1 per student)
Sticky putty	1 pack, divided among students
Glue sticks/roll of tape	30 glue sticks (1 per student) or 3 rolls of tape (1 per group)
Objects to “recycle” (or printed images provided)	12 items <b>or</b> 12 printed images (from provided lesson attachments)  Note: items to recycle should be small enough to fit into cube “bin” created from single sheet of construction paper
2 plastic hoops (i.e. hula hoops) <i>*optional</i>	2

## Kindergarten Lesson 4 - The Forest

Material	Quantity
Scissors	10
Glue sticks/roll of tape	10 glue sticks or 1 roll of tape

## Kindergarten Lesson 5 - The Weather Forecast

Material	Quantity
Scissors	10
Glue sticks/roll of tape	10 glue sticks or 1 roll of tape
Round head fasteners	30 (1 per student)
Paper plates	30 (1 per student)
Sticky notes	30 (1 per student)

## Kindergarten Lesson 6 - The Hibernating Bear

Material	Quantity
Packs of colored pencils/crayons	10
Sticky putty	1 pack, divided among students
Paper and other optional craft materials (to create a poster)	30 pieces of paper (1 per student)

## Kindergarten Lesson 7: - The Sunset

Material	Quantity
Globe/beach ball	1
Flashlight	1
Green and blue model-magic/play-doh (or similar)	15 packages of blue ( $\frac{1}{2}$ package of blue per student) 8 packaged of green ( $\frac{1}{4}$ package of green per student) <i>Or enough for each student to create a golf-ball sized model of the Earth</i>
Sticky notes	30 (1 per student)

## Kindergarten Lesson 8: - The Marble Game

Material	Quantity
Marbles	30 (10 per group)
Roll of tape	10 (1 per group)
Scissors	10 (1 per group)
Marble run game (optional) <b>OR</b> cardboard tubes (i.e. toilet paper rolls, paper towel rolls)	1 marble run game <b>OR</b> 12 toilet paper rolls + 12 paper towel rolls (4 each per group)
Dice	15 (1 per student pair)

## Kindergarten Lesson 9 - The Tornado

Material	Quantity
Plastic bottles (i.e. recycled water bottles)	10 (students in groups of 3)
Bottle of glitter	1 (to be divided among the class)
Sticky notes	30 (1 per student)
Water	Enough to fill 10 water bottles $\frac{3}{4}$ of the way up
Bottle of liquid dish soap	1 (to be divided among the class)

## Kindergarten Lesson 10 -The Bird's Nest

Material	Quantity
Paper plates	10 (students in groups of three)
Brown paper <b>AND/OR</b> sticks <b>AND/OR</b> brown pipe cleaners	Enough for each group of three to create a “nest”
Liquid white glue	10
Eggs (hard-boiled or mini chocolate eggs) <b>OR</b> plastic eggs/ping pong balls	30 (3 per group)
Sticky notes	30 (1 per student)

## Grade 1

### Grade 1 Lesson 1 - The Cave

Material	Quantity
Construction paper <b>or</b> toilet paper roll	10 pieces of construction paper OR 10 toilet paper rolls ( <i>students in groups of three</i> )
Crayons, sequins <b>and/or</b> other craft materials	Enough for 10 groups to decorate their “flashlights” (toilet paper tubes)
Sticky putty/roll of tape	3 rolls of tape OR 1 pack, divided among students
Sticky notes	30 (1 per student)
A range of transparent, translucent, and opaque materials (i.e. plastic wrap, wax paper, construction paper)	At 3 examples of each type of material (transparent, translucent, and opaque)

## Grade 1 Lesson 2 - The Sinking Ship

Material	Quantity
Flashlights	15 (1 per pair of students)
Timers	1

## Grade 1 Lesson 3 - The Moon

Material	Quantity
Round sandwich cookies	45 (3 per pair of students)
Sticky notes	30 (1 per student)
Glue sticks/roll of tape	30 glue sticks (1 per student) or 3 rolls of tape (1 per group)
Round head fasteners	30
Black construction paper	30 pieces
Aluminum foil	1 roll per class, divided among students
Scissors	10

## Grade 1 Lesson 4 - The Bicycle

Material	Quantity
Spray bottle filled with water	1
Flashlights	10 (1 per group of students)
Variety of reflection and non-reflective materials (e.g. cardboard, aluminum foil, etc.)	At least 3 of each type of material (reflective/not)
Sticky putty/roll of tape	3 rolls of tape (1 per group) OR 1 pack, divided among students

## Grade 1 Lesson 5 - The Alarm Clock

Material	Quantity
Glue sticks	30 (1 per student)
Scissors	10
Roll of tape	3 (1 per group)

## Grade 1 Lesson 6 - The Solar Panel

Material	Quantity
Construction paper	10 (students in groups of three)
Pack of markers	10
Sticky notes	30 (1 per student)
Roll of tape	3 (1 per group)
Popsicle sticks	20 (2 per group of three)

## Grade 1 Lesson 7 - The Drummer

Material	Quantity
Food wrap	10 pieces (one piece per group of three)
Different sized containers (e.g. reused food containers)	10
Balloons	10
Rubber bands	10
Sticky notes	30 (1 per student)
Small speaker	1
Jello (optional)	1
Drum (optional)	1

## Grade 1 Lesson 8 - The Jungle Adventure

Material	Quantity
iPads/ laptops/ Chromebooks or encyclopedias	10 (1 per group of three)
Poster paper	10 (1 per group of three)
Craft materials (e.g. tissue paper, paint, etc.)	Use what's in your classroom already!
Scissors	10
Glue	10 glue sticks

## Grade 1 Lesson 9 - The Lost Chick

Material	Quantity
Pipe cleaners	10 (1 per group)
Sticky notes	180 (6 per student)
Cardboard, cut into circles	30 (1 per student)
Scissors	10
Glue sticks	10



## Grade 2

### Grade 2 Lesson 1- Compose a Song

No additional materials required!

### Grade 2 Lesson 2 - Light and Shadow

Material	Quantity
Ping-pong ball or equivalent	10 (1 per group)
Large flashlight	1
Pencils	30 (1 per student)
Plain white paper	10 pieces (1 per group)
A range of opaque, transparent, and translucent materials	10 pieces of: <ul style="list-style-type: none"> <li>• tracing paper</li> <li>• tissue paper</li> <li>• sandpaper</li> <li>• black construction paper</li> </ul>

### Grade 2 Lesson 3 - Build it Up, Break it Down

Material	Quantity
Plain white paper	50 pieces (5 per group)
Marshmallows	30 (1 per student)
Sticky putty	1 pack, divided among students
Gummy candy	150 pieces (15 per group)
Tooth sticks	150 (15 per group)
Paper plates	10 (1 per group)

## Grade 2 Lesson 4 - Interactive Story

No additional materials required!

## Grade 2 Lesson 5 - Design a Habitat

Material	Quantity
Markers	10 packs of markers (1 per group)
Sticky notes	30 sticky notes (1 per student)
Colored construction paper	10 pieces of blue construction paper (1 per group)
Glue sticks	10 glue sticks (1 per group)

## Grade 2 Lesson 6 - Smart Lighting System

Material	Quantity
Flashlights	15 flashlights (1 per pair of students)

## Grade 2 Lesson 7 - Earthquake Alert

Material	Quantity
Graham crackers	20 (2 per group)
Red/orange food dye (optional)	1 bottle of red food dye, 1 bottle of orange (a few drops per group)
Shaving foam/Cool Whip	10 cups (1 per group)
Paper bowls	10 (1 per group)
Sticky putty	1 pack, divided among students

## Grade 2 Lesson 8 - Reduce, Reuse, Recycle

Material	Quantity
Ruler	10 (1 per group)
Selection of recyclable materials to sort (e.g. plastic bottles, plastic lids, paper, cardboard)	30 pieces of recyclable materials

## Grade 2 Lesson 9 - Seed Dispersal

Material	Quantity
Sticky notes	10 (1 per group)
Squirrel head print out	10 (1 per group)
Scissors	10 (1 per group)
Sticky putty	1 pack, divided among students
Glue	10 glue sticks (1 per group)
Cardboard and/or popsicle sticks (optional)	10 pieces of cardboard OR 10 popsicle sticks
Plastic cups	10 (1 per group)
Coffee granules, seeds, or similar	1 tablespoon per group
Rulers	10 (1 per group)

## Grade 2 Lesson 10 - Time's Up!

Material	Quantity
Timers	1 per class

## Grade 2 Lesson 11- Smart Safe

Material	Quantity
Black markers	10 (1 per group)
Scissors	10 (1 per group)
Glue sticks	10 (1 per group)
Plain paper	10 pieces of paper

## Grade 2 Lesson 12 - Changing Landscape

Material	Quantity
Water	10 (1 per group)
Food bag/clear plastic bag	10 (1 per group)
Sand	10 cups (1 per group)
Plastic container (e.g. tupperware)	10 (1 per group)

## Grade 2 Lesson 13 - Erosion

Material	Quantity
Sand	10 cups (1 per group)
Rulers	10 (1 per group)
Water	10 cups (1 per group)
Plastic containers (e.g. reused food containers)	10 (1 per group)
Scissors	10 (1 per group)
Pack of markers	10 (1 per group)

## Grade 3

### Grade 3 Lesson 1- Night Light

Material	Quantity
Colander	1
Sticky putty	1 pack, divided among students
Pencils	30 (1 per student)

### Grade 3 Lesson 2 - Music Box

Material	Quantity
Sticky putty	1 pack, divided among students
Small boxes and/or opaque containers with lids	10 (1 per group)
Optional craft items for decoration (e.g. glitter, puff paint, markers, etc.)	Use what's in your classroom already!

### Grade 3 Lesson 3 - Friction

Material	Quantity
Boxes and/or plastic blocks to create ramp	10 (1 per group)
1' x 1' pieces of Sandpaper	10 (1 per group)
1' x 1' pieces of Aluminum foil	10 (1 per group)
1' x 1' pieces of Cardboard	10 (1 per group)

## Grade 3 Lesson 4 - Plant Growth

Material	Quantity
Cup of water	10 (1 per group)
Cotton balls	30 (3 per group)
Sugar	5 teaspoons ( $\frac{1}{2}$ tsp per group)
Seeds (peppergrass/cress seeds)	5 teaspoons ( $\frac{1}{2}$ tsp per group)
Small plastic pot/cup	10 (1 per group)

## Grade 3 Lesson 5 - Smart Doorbell

Material	Quantity
Red yarn or ribbon	1-2 spools per classroom

## Grade 3 Lesson 6- Prime Factors

Material	Quantity
Sticky notes	30 (1 per student)
0-100 grid	1
0-9 die	1

## Grade 3 Lesson 7 - Animal Characteristics

Material	Quantity
6" circle of cardboard to create spinner wheel	10 (1 per group)
Plain/colored paper	10 pieces (1 per group)
Pens	10 (1 per group)
Pipe cleaners	10 (1 per group)

## Grade 3 Lesson 8 - Magnetic Forces

Material	Quantity
Pairs of magnets	10 pairs or 20 total (1 pair per group)
Ruler	10 (1 per group)
Strong magnets	10 pairs or 20 total (1 pair per group)
LEGO® bricks	300 (30 per group)
Container of iron filings for teacher demonstration	1
A range of magnetic and non-magnetic materials (optional)	5 of each kind of material
Paper clips	100 (10 per group)
Sticky putty	1 pack, divided among students

## Grade 3 Lesson 9 - Survival of the Fittest

Material	Quantity
Bowls	20 (2 per group)
Colored sports vest	4
Small food items (e.g. jelly beans)	300 (30 items per group)

## Grade 3 Lesson 10 - Animal Groups

Material	Quantity
Stopwatch	1
Small objects to collect (e.g. stickers, candy)	300

## Grade 3 Lesson 11 - Weather Board

Material	Quantity
Poster board	10 (1 per group)
Sticky putty	1 pack, divided among students
Roll of tape	10 (1 per group)
Pens	10 (1 per group)
Seasonal objects (e.g. hat, scarf, umbrella) (optional - images on slides can be used instead)	20 objects
Rulers	10 (1 per group)
Colored Paper	20 (2 per group)
Round head fasteners	10 (1 per group)

## Grade 4

### Grade 4 Lesson 1 - Energy in Motion

Material	Quantity
Aluminum cans or plastic bottles	50 (5 per group)
Ruler	10 (1 per group)
Chalk	10 pieces (1 per group)
An assortment of materials (e.g. tissue paper, aluminum foil, craft paper, lasagna sheets)	2-3 materials per group
Sticky putty/roll of tape	10 rolls (1 per group) OR 1 pack of putty, divided among students
Soccer balls	10 (1 per group)



## Grade 4 Lesson 2 - Guitar

Material	Quantity
Large pieces of cardboard	10 (1 per group)
Rubber bands of various sizes	50 total: 10 sets of 5 rubber bands of various sizes
Empty tissue box	10 (1 per group)
Sticky putty/roll of tape	10 rolls (1 per group) OR 1 pack of putty, divided among students

## Grade 4 Lesson 3 - Mars Rover

Material	Quantity
Plastic trays (optional)	10 (1 per group)
Crackers/cookies (optional)	30 (3 per group)
Paper	30 pieces (3 per group)
Timers	10 (1 per group)

## Grade 4 Lesson 4 - Rocks and Wind

Material	Quantity
Snack pack of cheesy puffs (e.g. cheetos)	10 (1 per group)
Fast-drying glue (e.g. hot glue)	2 hot glue guns, 10 hot glue sticks
Hair ties/rubber bands	10 (1 per group)
Straws	10 (1 per group)
Sandpaper	10 pieces (1 per group)
Stopwatch	10 (1 per group)

## Grade 4 Lesson 5 - Morse Code

Material	Quantity
Copies of Morse Code A-Z	*Suggested resource: <a href="https://upload.wikimedia.org/wikipedia/commons/1/1f/International_Morse_Code.PNG">https://upload.wikimedia.org/wikipedia/commons/1/1f/International_Morse_Code.PNG</a>

## Grade 4 Lesson 6 - Earthquake Simulator

Material	Quantity
LEGO® baseplates	20 (2 per group)
Sticky putty/roll of tape	10 rolls (1 per group) OR 1 pack of putty, divided among students
4x4" piece of cardboard	20 (2 per group)
Pre-made Jello* *Allow time in advance for the jello to set. Ideally set in a rectangular food container.	10 rectangular pieces of jello (1 per group)
Paper straws	60 (6 per group)
Glue sticks	10 (1 per group)
Piece of parchment Paper (for underneath the jello)	10 (1 per group)

## Grade 4 Lesson 7 - Sensory Spider

Material	Quantity
Chocolate	30 pieces (1 per student)
Sticky Putty	1 package
Pipe cleaners	80 pipe cleaners (8 per student)

## Grade 4 Lesson 8 - Apostrophe

Material	Quantity
Sticky putty	1 pack, divided among students
Scissors	10 (1 per group)
Words on small slips of paper (e.g. sticky notes)	30 sticky notes/pieces of paper

## Grade 4 Lesson 9 -The Lighthouse

Material	Quantity
LEGO® bricks	Approx. 300 lego blocks (30 per group)
Small mirrors	20 small mirrors (2 per group)
White and black card	20 cards (1 white and 1 black per group)
Sticky putty/roll of tape	10 rolls (1 per group) OR 1 pack of putty, divided among students
Flashlights	10 (1 per group)

## Grade 4 Lesson 10 - Prime Numbers

Material	Quantity
Number cards (1-10)	1 set per group
Sticky notes	30 sticky notes (1 per student)

## Grade 4 Lesson 11 - Morse Code Alert

No additional materials required!

## Grade 4 Lesson 12 - Energy Transfer

Material	Quantity
Microwave/pan over the heat source (to melt chocolate bar and observe states of matter)	1 microwave <b>OR</b> 10 pans + hot plates
Ice cubes	30 ice cubes (1 per student)
Chocolate bars	30 (1 per student)

## Grade 4 Lesson 13 - Autonomous Driving

Material	Quantity
White paper	60 pieces of white paper (6 per group)
Black paper	60 pieces of black paper (6 per group)

# Grade 5

## Grade 5 Lesson 1 Monkey Ecosystem

Material	Quantity
Ball of yarn	1 ball of yarn
Sticky notes	30 sticky notes (1 per student)
Scissors	10 (1 per group)
Monkey cut-out (in student handout)	10 (1 per group)
Round head fasteners	30 (3 per group)
Sticky putty	1 pack, divided among students
Pens	10 (1 per group)

## Grade 5 Lesson 2 - Water Cycle

Material	Quantity
Piece of large cardboard (poster board)	10 (1 per group)
Pack of construction paper	1 per class, to be divided among the groups
Collection of objects (e.g. tissue paper, workbook, pencil, eraser)	15 different objects
Scissors	10 (1 per group)
Glue sticks/roll of tape	10 glue sticks or 10 tape (1 per group)
Packs of markers	10 (1 per group)
Ice cubes (for demonstration)	2-3
Piece of plastic wrap (for demonstration)	1
Large container of warm water (for demonstration)	1

## Grade 5 Lesson 3 - The Sun's Energy

Material	Quantity
Sticky notes/labels	30
Yellow ball (to represent the sun)	1

## Grade 5 Lesson 4 - Plant Life

Material	Quantity
Jars of water (lukewarm)* *The leaf-jar experiment to be prepared by students at least 2 hours before the lesson	10 (1 per group)
Fresh leaves	10 (1 per group)
Mint sprigs (optional)	10 sprigs (1 per group)

## Grade 5 Lesson 5 - Solar Power

Material	Quantity
Piece of tissue paper	10 (1 per group)
Sticky putty/roll of tape	10 rolls (1 per group) OR 1 pack of putty, divided among students

## Grade 5 Lesson 6 - Shadow Theater

Material	Quantity
Flashlights	10 (1 per group)
Ping-pong ball	10 (1 per group)
Ruler	10 (1 per group)
Scissors	10 (1 per group)
Glue sticks	10 (1 per group)
Black card	10 (1 per group)
Chalk	10 (1 per group)
Tracing paper	10 (1 per group)
Popsicle sticks	30 (3 per group)

## Grade 5 Lesson 7 - Rocket

Material	Quantity
Colored cardstock paper	30-50 (3-5 pieces per group)
Glue sticks	10 (1 per group)
Chalk	10 (1 per group)
Scissors	10 (1 per group)
Roll of tape	10 (1 per group)
Black card	10 (1 per group)

## Grade 5 Lesson 8 - Seasonal Stars

Material	Quantity
Glow-in-the-dark sticky stars or silver star stickers	100 (10 per group)
Chalk	10 (1 per group)
Black paper/cardstock	10 (1 per group)
Ping-pong balls	10 (1 per group)
Sticky putty	1 pack, divided among students

## Grade 5 Lesson 9 - Mixing Substances

Material	Quantity
Plastic bottle	1
Balloon	1
Oil	10 tablespoons (1 tablespoon per group)
Paper bowls	10 (1 per group)
Large plastic bowl (for teacher demo)	1
Cornstarch	8 oz cornstarch
Water	1 cup
Baking soda	2 tablespoons
Vinegar	½ cup
Sticky putty	1 pack, divided among students

## Grade 5 Lesson 10 - Passcode

No additional materials required!