



Homeschool Science Lab Journals

Elementary (Gr 2–6, 30 Experiments)

Life Science

Physical Science

Earth Science

Chemistry

A complete hands-on science curriculum covering Life, Physical, Earth, and Chemistry.
Includes 30 lab journal pages, supply lists, safety guide, and glossary.



UM Printables

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Science Safety Guide

Before starting any experiment, review these safety rules with your student. Science is fun, but safety always comes first!

Adult Supervision Required

All experiments in this resource must be conducted under adult supervision. An adult should handle hot water, sharp objects (scissors, knives), and any steps noted with a warning.

Do Not Eat or Drink Experiments

Never taste any experiment materials unless the instructions specifically say it is safe to do so. Keep all experiment supplies away from your mouth.

Wash Your Hands

Always wash your hands with soap and water after completing an experiment, especially when handling soil, mold, or chemicals like vinegar and baking soda.

Protect Your Eyes

If an experiment involves splashing (like the volcano or acid-base reactions), consider wearing safety goggles to protect your eyes.

Protect Your Workspace

Perform experiments on a surface that can get wet or dirty. Use a tray, old tablecloth, or newspapers to protect tables and countertops.

Read All Instructions First

Before you begin, read the entire experiment procedure. Make sure you understand every step and have all your supplies ready.

Clean Up Properly

When you are finished, clean up your workspace. Dispose of waste materials properly (do not pour large amounts of baking soda or flour down the sink — put them in the trash).

Respect Living Things

When observing plants and insects outdoors, treat them gently. Return any insects you move to their original location. Do not pull leaves off living plants unnecessarily.

Experiment 1: Seed Germination

Big Question: What do seeds need to begin growing?

Supplies Needed:

- 3 zip-top bags
- 6 lima bean seeds (dry)
- 3 paper towels
- Water
- Marker for labeling
- Tape

Procedure:

1. Dampen one paper towel and place it in Bag 1 with 2 seeds. Seal and label 'Damp + Light.' Tape to a sunny window.
2. Place a dry paper towel in Bag 2 with 2 seeds. Seal and label 'Dry + Light.' Tape next to Bag 1.
3. Dampen a paper towel, place in Bag 3 with 2 seeds, seal, and label 'Damp + Dark.' Put it inside a closed cupboard.
4. Check all three bags every day for 7 days. Record what you see.

Key Vocabulary:

Germination: The process by which a seed begins to grow into a new plant.

Sprout: A young shoot that emerges from a seed.

Concept Connection:

Seeds need moisture and warmth to germinate. Light affects the direction of growth but is not required for germination itself.

Lab Journal: Exp 1 — Seed Germination

1. Hypothesis

Which bag do you think will sprout first? Why?

2. Predict

Draw or describe what you think the seeds will look like on Day 7 in each bag.

Draw your prediction:

3. Observe

What did you see each day? Record changes in size, color, or shape of the seeds.

Draw your observations:

4. Conclude

Which conditions helped seeds germinate? Was your hypothesis correct?

Try It Different Ways:

Try the experiment again using different types of seeds (radish, sunflower, pea). Do all seeds sprout at the same speed under the same conditions?

Experiment 11: Friction Slide

Big Question: How does surface type affect how far an object slides?

Supplies Needed:

- A small, smooth block or eraser
- 3 surfaces: smooth table, carpet/towel, sandpaper
- Ruler or measuring tape
- Book (as a ramp)

Procedure:

1. Prop the book up at an angle to create a small ramp.
2. Place the smooth surface (table) at the bottom of the ramp. Slide the block down and measure how far it travels after leaving the ramp.
3. Repeat on the carpet/towel surface, and then on the sandpaper.
4. Each surface: test 3 times and record the average distance.

Key Vocabulary:

Friction: A force that opposes motion when two surfaces rub against each other.

Force: A push or pull that can change an object's speed or direction.

Concept Connection:

Rougher surfaces create more friction, which slows objects down more quickly. Smoother surfaces produce less friction, so objects slide farther.

Experiment 20: Erosion Investigation

Big Question: How does water change the shape of land?

Supplies Needed:

- A large aluminum tray or baking dish
- Sand or soil
- A watering can or cup with small holes
- Water
- Small rocks or pebbles
- Ruler

Procedure:

1. Pile sand or soil on one end of the tray to create a hill or mountain shape.
2. Gently pour water over the hill using the watering can. Observe how the water moves the soil.
3. Add small rocks or pebbles to the hill. Pour water again.
4. Compare how the hill changed with and without rocks.

Key Vocabulary:

Erosion: The process by which water, wind, or ice wears away and moves soil and rock.

Sediment: Bits of rock, soil, and sand carried by water, wind, or ice and deposited elsewhere.

Concept Connection:

Water is a powerful force of erosion. It carries sediment downhill, carving channels and reshaping land. Rocks and plant roots help slow erosion by holding soil in place.

Experiment 24: Baking Soda & Vinegar Reaction

Big Question: What happens when you mix an acid and a base?

Supplies Needed:

- Baking soda (2 tablespoons)
- White vinegar (1/2 cup)
- A tall clear glass or vase
- A spoon
- Red cabbage juice indicator (optional — see Exp 27)
- Timer

Procedure:

1. Place 2 tablespoons of baking soda in the glass.
2. Pour in 1/2 cup of vinegar. Observe immediately.
3. Watch for bubbles and listen for fizzing.
4. Optional: After the reaction stops, test the remaining liquid with cabbage juice. Has it changed?

Key Vocabulary:

Acid: A substance with a pH below 7 (like vinegar). Tastes sour and reacts with bases.

Base: A substance with a pH above 7 (like baking soda). Feels slippery and reacts with acids.

Chemical reaction: A process where substances change into new substances with different properties.

Concept Connection:

Baking soda (a base) and vinegar (an acid) undergo a chemical reaction that produces carbon dioxide gas (the bubbles), water, and a salt called sodium acetate. This is an acid-base neutralization reaction.

WHAT'S INSIDE

Homeschool Science Lab Journals | Elementary Grades 2-6

30 HANDS-ON SCIENCE INVESTIGATIONS

A structured lab-journal system spanning four science domains - designed for active, at-home learning.

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- Seed Germination
- Celery Capillary Action
- Leaf Transpiration
- Mold Growth
- Yeast Respiration
- Phototropism
- Microhabitat Survey
- Food Chain

PHYSICAL SCIENCE

Experiments 9-16

- Dancing Raisins
- Magnetic Sorting
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EARTH SCIENCE

Experiments 17-23

- Rock Sorting
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CHEMISTRY

Experiments 24-30

- Baking Soda + Vinegar
- Invisible Ink
- Milk Color Swirl
- Cabbage pH Indicator
- Crystallization
- Dissolving Speed
- Oobleck

30 LAB JOURNALS

Hypothesis
Predict • Observe • Conclude

TEACHER / PARENT TOOLS

Supply lists
Safety guide • Prep support

SCIENCE VOCABULARY

Key terms + concept connections in every experiment

FLEXIBLE USE

Homeschool
tutoring • enrichment • science centers