



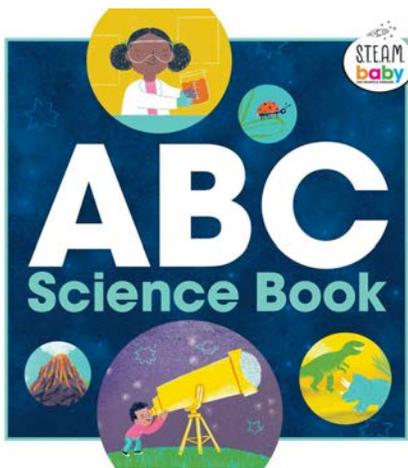
Science (S.T.E.A.M.)



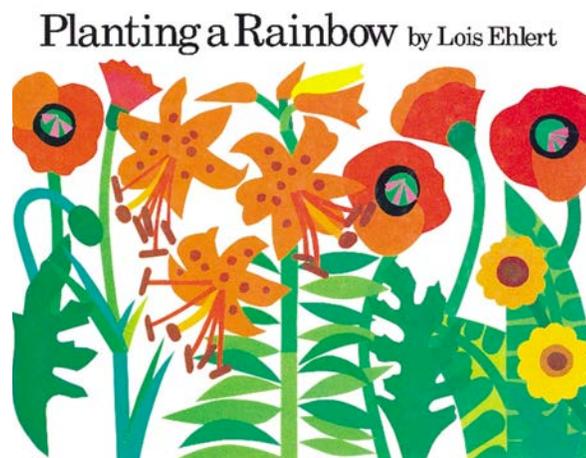
Science

Exploring science with children sparks their natural curiosity and nurtures their budding critical thinking skills. By engaging in hands-on experiments and observing the world around them, children learn to explore, investigate, and discover. These experiences help them develop a deeper understanding of their environment while honing problem-solving abilities. Encouraging this exploration not only fosters a lifelong love of learning but also equips children with the confidence and creativity to tackle future challenges.

Books We Love That Support Scientific Concepts:



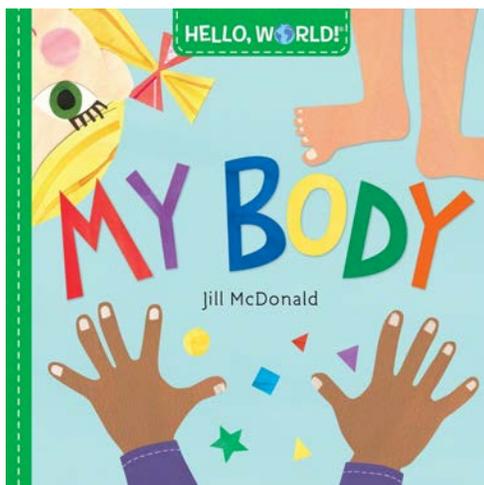
ABC Science Book
by Anjali Joshi



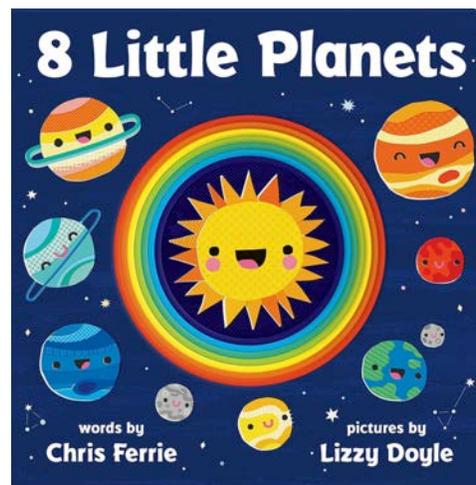
Planting a Rainbow,
by Lois Ehlert



Some Bugs,
by Angela Diterlizzi



My Body,
by Jill McDonald



8 Little Planets
by Chris Ferrie



First Big Book of Animals
by Catherine D. Hughes

20 Materials to Support Science Exploration

1. Magnifying glasses
2. Measuring cups and spoons
3. Water
4. Sand
5. Rocks
6. Leaves
7. Sticks
8. Shells
9. Pine Bark
10. Pinecones
11. Ice Cubes
12. Sponges
13. Tunnels
14. Sweetgum Balls
15. Magnet sets
16. Animal figurines
17. Balloons (for studying air pressure)
18. Bubble solution and wands
19. Flashlights
20. Pet: Hermit crab, fish, ant farm





Baking Soda & Vinegar Sensory Station

MATERIALS

- A Small bowl or cup with baking soda
- Spoon
- Small jars or sectional tray for colors
- Food coloring (about 2-3 colors)
- Droppers or pipettes
- One large container or bowl
- Optional: A large baking pan or sensory table (to contain all materials and mess)

DIRECTIONS

- Arrange a sectional tray filled with different colors of vinegar. Place a bowl or container of baking soda next to the tray.
- Using a spoon or scoop, add baking soda to a bowl, allowing space for the reaction to occur.
- Using a pipette or dropper, welcome children to drop different colors of vinegar from the sectional tray into the bowl of baking soda.

LEARNING OBJECTIVES

- Understand the chemical reaction between baking soda and vinegar, observing the release of carbon dioxide gas and the visual effects produced by different colors of vinegar. This exploration **helps children grasp fundamental principles of chemistry in a hands-on manner.**
- **Develop fine motor skills and hand-eye coordination** by engaging in tasks such as scooping baking soda into a bowl and using a pipette to add precise drops of colored vinegar. These activities **promote dexterity and control over small movements**, crucial for various everyday tasks and future learning endeavors.
- **Predict reaction outcomes based on prior observations and knowledge**, analyzing how factors such as color combinations or vinegar concentration might influence the results. This encourages children to think critically, form hypotheses, and evaluate their findings, **fostering essential problem-solving skills applicable across various contexts.**



I SPY In My Environment . . .

MATERIALS

- Magnifying glass
- Optional:
 - Binoculars
 - Basket or bag to collect special findings (e.g. leaves, sticks, flowers, etc.)

DIRECTIONS

- Encourage children to explore their surroundings, using the magnifying glasses or binoculars to look closely at plants, insects, rocks, and other objects of interest.
- Allow children to explore at their own pace, following their interests and curiosities as they discover the wonders of the natural world.
 - Please keep in mind that toddlers have very short attention spans, therefore it is more likely they're be interested in directing their exploration freely. While you can invite them to engage and model a "search," we do not expect young children to stick with this for very long

LEARNING OBJECTIVES

- **"I Spy" encourages children to closely observe their natural surroundings** and explore different elements within. They learn to notice and identify specific attributes of objects, such as colors, textures, shapes, or patterns, promoting the **development of observation skills**.
- **"I Spy" promotes vocabulary expansion** as children encounter and describe various adjectives related to nature, learning new words and understanding their meanings.
- **Gross and fine motor development** is enhanced as children explore the outside environment; walking running, jumping, crawling, reaching, and bending which strengthens muscle, balance and coordination. Exploring smaller artifacts such as leaves, sticks, and flowers supports hand dexterity and depth perception.



Homemade Slime (Non-toxic)

MATERIALS

- 1/2 cup of clear or white school glue
- 1/2 cup of water
- 1/2 tsp baking soda
- 1 tbsp of contact lens solution (make sure it contains boric acid and sodium borate)
- Food coloring (optional)
- Glitter (optional)

DIRECTIONS

- In a mixing bowl, combine the glue and water and stir until they are fully mixed.
- Add the baking soda to the glue mixture and mix until combined.
- Add a few drops of food coloring to the glue mixture and stir.
- Add the contact lens solution to the glue mixture and stir until it starts to thicken.
- Knead the slime with hands until it is smooth and stretchy.
- If the slime is too sticky, you can add a small amount of contact lens solution until it reaches the desired consistency.

LEARNING OBJECTIVES

- Children **will explore the properties of basic ingredients** like glue and saline solution, discovering how these substances combine to create slime. They'll observe how mixing them together initiates chemical reactions, leading to changes in texture and consistency.
- Through hands-on experimentation, **children will observe the transformation of slime from a liquid state to a more solid one**, while internalizing how these processes contribute to the formation of slime's stretchy and moldable properties.
- Sensory-rich activities like playing with slime **engage multiple senses, allowing children to experience various tactile sensations.**



Sensory-rich Sand Exploration

MATERIALS

- Sand (fine play sand or beach sand)
- Alternatives or "switch-ups"
 - Kinetic sand, moon sand, colored play sand, magic sand.
- Optional additions: Natural material (sea shells, stones, sticks), plastic sand/beach related animal toys (crabs, turtles, starfish), bucket + pail, sifters, funnels, cups, trucks, plastic/wooden numbers or letters, etc.

DIRECTIONS

- Provide a designated play area: Set up a specific space for sand play, either outdoors or indoors, with a sandbox or a large container filled with clean, safe sand.
- If a beach is accessible, pack any of the recommended materials up for a sensory-rich day at the beach!
- Allow your children to freely explore the sand and materials. Let them dig, scoop, pour, and feel the texture of the sand using their hands or provided tools.

LEARNING OBJECTIVES

- **Stimulates children's cognitive abilities** by encouraging problem-solving, spatial reasoning, and imaginative thinking. They can experiment with cause and effect, explore concepts of volume and weight, and engage in planning and construction.
- Sand play offers a **tactile sensory experience**, allowing children to explore different textures, temperatures, and sensations. It enhances sensory processing, body awareness, and sensory integration skills.
- **Children develop fine motor skills** as they scoop, pour, and manipulate the sand using their hands or tools. It also promotes hand-eye coordination and muscle strength.
- **Gross motor skills** such as balance, coordination, and strength are enhanced by children balancing, bending, scooping, and reaching for materials.



Magnetic Exploration

MATERIALS

- Magnets
 - Consider Magnetic numbers or letters, magnetic wand, Magnetic tiles,
- Magnet exploration tray or table
 - Alternative choice: Refrigerator
- Optional: Non-magnetic objects (soft toys, wooden blocks, fabric pieces, etc.)

DIRECTIONS

- Set up a magnet exploration area with the materials arranged on a low table or board.
- Encourage children to explore the magnets and objects, using their hands and senses to touch, move, and experiment.
- Encourage children to explore the magnetic and non-magnetic objects, noticing which ones stick to the magnets and which ones do not.

LEARNING OBJECTIVES

- **Foster fine motor skills and hand-eye coordination:** Manipulating magnets and objects requires precise movements and coordination. Children will strengthen their fine motor skills as they pick up, move, and place objects during magnet exploration activities.
- **Promote sensory exploration:** Magnet exploration provides children with tactile experiences as they touch and manipulate different materials. Sensory exploration supports development by stimulating the senses and helping children make sense of the world around them.
- **Develop an awareness of the properties of magnets and magnetic materials:** Children will begin to understand that magnets have the unique ability to attract certain materials, while others are not affected. They will explore the concept of magnetic force and how it differs from other types of interactions.



Colored Pasta Play

(PAGE 1/2)

MATERIALS

- 1 box of spaghetti
- Food coloring (artificial or natural)
 - **Artificial Coloring:** (red, yellow, and blue food coloring + a few drops of oil for each color)
 - **Natural Food Coloring:**
 - **Yellow Coloring:** 2-3 tablespoons of sliced turmeric
 - **Red Coloring:** 1 large beet
 - **Blue Coloring:** Half a head of chopped purple cabbage + 1/2 teaspoon of baking soda
- 1 -3 pots to boil the different colors (if opting for natural food coloring)
- 5 bowls, containers, or bags (to separate pasta for coloring; red, orange, yellow, green, blue)
- Large bin, table, or surface to play

DIRECTIONS

(ARTIFICIAL FOOD COLORING)

- Cook pasta until al dente and rinse under cold water.
- Divide pasta into separate zip-top plastic bags.
- Add a few drops of food coloring to each bag, adjusting the amount for desired color intensity.
- Seal the bags and shake them gently to distribute the coloring evenly over the pasta.
- Let the colored pasta sit in the bags for about 15-20 minutes to allow the color to fully adhere.
- Spread the pasta on a tray or parchment paper to dry. Optionally, toss the pasta with a little cooking oil to prevent sticking.

DIRECTIONS

(NATURAL FOOD COLORING)

- Cook pasta until al dente and rinse under cold water.
- Prepare separate bowls of boiling water, adding the natural coloring ingredients to each one (e.g., grated beet for red/pink, turmeric for yellow, chopped purple cabbage for blue/purple).
- Allow the natural ingredients to steep in the boiling water for about 15-20 minutes to release their color.
- Remove the natural coloring ingredients from the water, leaving behind the colored liquid.
- Mix the cooked pasta with each colored liquid in separate bowls, stirring to ensure even coloring.
- Let the pasta sit in the colored liquid for an additional 15-20 minutes to absorb the color.
- Spread the colored pasta on a tray or parchment paper to dry. Optionally, toss the pasta with a little cooking oil to prevent sticking.



(PAGE 2 / 2)

DIRECTIONS (CONT'D)

- Once the pasta is cooled and the colors have been fully absorbed, add the pasta to a large sensory bin, table, container, or open surface for children to explore and play.
- Ideally you can **have your children be involved in the process!** They can make observations to steps and sequence, while participate in the experience by adding and mixing colors.

LEARNING OBJECTIVES

- **Science Concepts:** introduces children to **concepts such as states of matter, absorption, and color mixing.** They **observe changes** in color and texture, learn about **absorption and saturation by experimenting** with colored liquids, and explore color theory by mixing different colored pasta.
- **Sensory Integration:** Engaging in sensory play with colored pasta provides children with opportunities to integrate sensory input from multiple sources, helping them **regulate their sensory systems and promoting overall sensory processing skills.**
- **Motor Development:** By picking up, squeezing, and manipulating the colored pasta, children will enhance their fine and gross motor skills, as well as hand-eye coordination.