



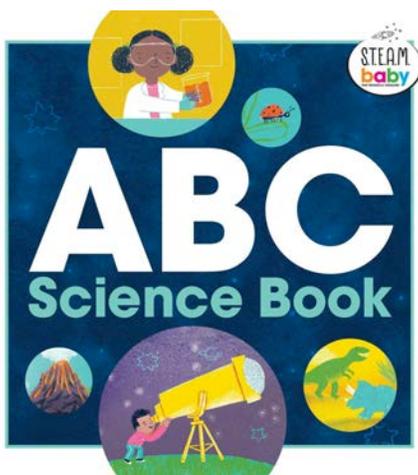
Science (S.T.E.A.M.)



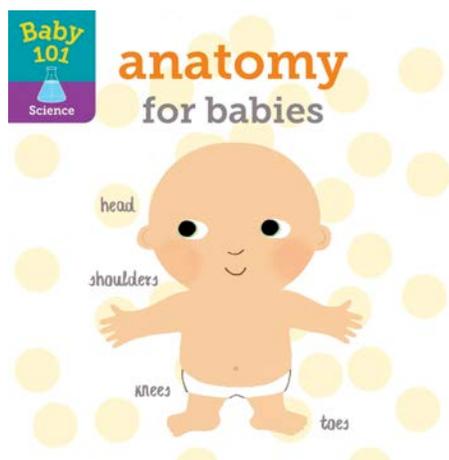
Science

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

Books We Love That Support Scientific Concepts:



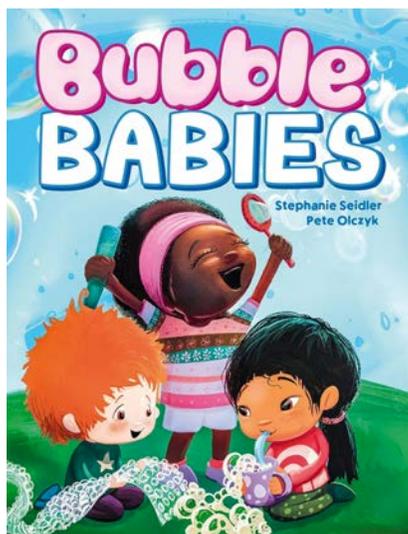
ABC Science Book
by Anjali Joshi



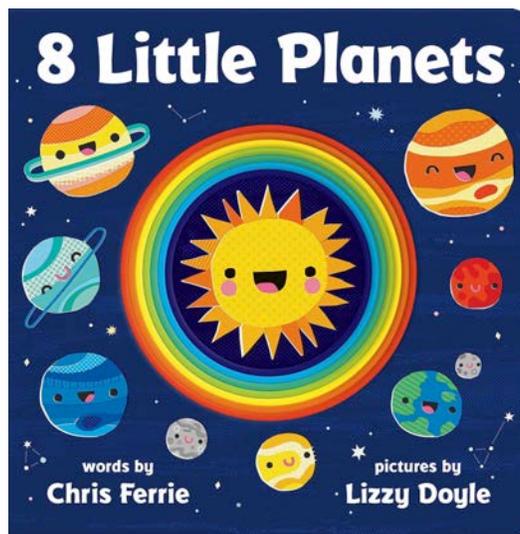
Anatomy for Babies,
by Johnathan Litton



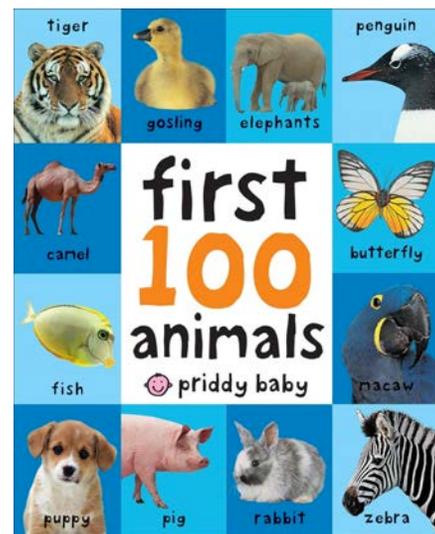
Hello, Garden Bugs
by Duopress Labs



Bubble Babies,
by Stephanie Seidler



8 Little Planets
by Chris Ferrie



First 100 Animals
by Roger Priddy

20 Materials to Support Science Exploration

1. Acrylic mirrors
2. Tube lighting
3. Water
4. Large magnets
5. Water mat
6. Sand
7. Rocks
8. Leaves
9. Sticks
10. Shells
11. Pine Bark
12. Pinecones
13. Ice cubes
14. Sponges
15. Tunnels
16. Textured sensory balls
17. Textured sensory boards
18. Animal figurines (toys)
19. Discovery tubes or bottles
20. Pet: Hermit crab, fish, ant farm





DIY Sensory Bottles

MATERIALS

- **Bottle 1: Sand**
 - Clear plastic bottle with a secure cap
 - Different colors of clean, dry sand
- **Bottle 2: Aquatic Animals**
 - Clear plastic bottle with a secure cap
 - Water (3/4 bottle)
 - Clear glue (1/4 bottle)
 - Blue food coloring (few drops)
 - Shredded cellophane
 - Small aquatic animal toys (fish, turtles, etc.)
- **Bottle 3: Natural Materials**
 - Clear plastic bottle with a secure cap
 - Pine needles/leaves
 - Sticks/twigs
 - Small pinecones
- **Bottle 4: Glitter & Beads**
 - Fill bottle halfway with clear glue.
 - Add water (1/4 bottle)
 - Add 1/4 baby oil
 - Add glitter and small colorful beads.

DIRECTIONS

- Fill your bottle(s) with desired materials and secure the lid. Seal with a glue gun for extra caution.

LEARNING OBJECTIVES

- **Mixing and Separation:** Observing how different substances mix or separate (e.g., oil and water) introduces basic concepts of mixing and immiscibility.
- **Movement and Flow:** Watching how objects like glitter or beads move and flow within the bottle helps babies understand concepts of movement and fluid dynamics.
- **Density and Viscosity:** Experiencing how different liquids with varying densities interact (e.g., water and oil) introduces the idea of density and viscosity in a tangible way.
- **Sensory Exploration:** Engaging with various textures and colors supports understanding of sensory properties and how they change with different interactions.



Nature Mobile

MATERIALS

- One long branch
- Various artifacts from nature (pinecones, leaves that vary in shape and color, sticks, cinnamon sticks, etc.)
- Scissors
- Twine or fishing line
- Optional: Hole-puncher and glue gun
- Optional: Hang family photos around the space for your baby to observe, adding an extra communal and cozy element

DIRECTIONS

- Gather a variety of nature-themed items and select a sturdy tree branch or wooden dowel for the mobile's base. Ensure it's clean and safe.
- Attach fishing line or twine to each item. You can do this by tying the thread around stems, creating loops, punching holes or using hot glue for added security. Leave enough thread at the top to hang from the branch.
- Attach the items to the branch by tying the loose ends of the fishing line or clear thread. If needed, adjust the lengths to ensure the items are at varying heights.
- Find the perfect spot to hang the mobile. It could be above the crib, near a window, or in a cozy corner. Make sure it's securely fastened and out of your baby's reach.



LEARNING OBJECTIVES

- **Movement and Cause-and-Effect:** Observing how the mobile sways and moves in response to air currents introduces basic principles of movement and cause-and-effect.
- **Natural Materials:** Engaging with natural materials such as leaves, twigs, and feathers helps babies learn about different textures, shapes, and the properties of natural objects.
- **Visual Patterns:** The arrangement of various natural elements creates visual patterns and symmetry, supporting early understanding of visual organization and patterns.
- **Nature Awareness:** Introduce basic concepts of nature and the environment by incorporating real or nature-inspired materials into the mobile.
- **Motor Skills:** Develop fine motor skills as the baby reaches for and interacts with the hanging decorations, improving hand-eye coordination.



Nature Inspired Sensory Bin

MATERIALS

- Base of choice:
 - Water, sand, soil, shredded paper.
- Optional add-ons:
 - Toy animals, natural materials, cups (for scooping)

DIRECTIONS

- Choose a base for the sensory bin (sand, water, soil, etc.) and fill a shallow container or bin with the chosen material.
- Arrange the sensory bin on a safe, easily cleanable surface, such as a tray or waterproof mat or take outside if weather permits.
- Scatter the add-on materials (e.g. animal figures, natural materials, cups, etc.)
- Allow babies to explore the materials at hand in their own way. If babies are mouthing the base, try to model different ways they can explore the medium.
- Always supervise babies during play to ensure safety

LEARNING OBJECTIVES

- **Texture and Tactile Exploration:** Interacting with different textures (sand, soil, leaves) helps babies understand various material properties and sensory experiences.
- **Natural Environment:** Engaging with nature-inspired materials such as stones, twigs, and pinecones provides an understanding of natural elements and their characteristics.
- **Cause and Effect:** Exploring how materials interact with each other (e.g., sand shifting, soil crumbling) introduces basic principles of cause-and-effect relationships.
- **Environmental Awareness:** Familiarizing babies with natural objects and materials supports early awareness of the environment and encourages curiosity about nature.
- **Cognitive Development:** Promote cognitive development through the exploration of cause-and-effect relationships, such as how materials interact or change when touched or moved.



Sights, Sounds, and Smells of Nature

MATERIALS

- Baby Carrier or Stroller
- Weather-Appropriate Clothing:
 - Ensure your baby is dressed appropriately for the weather (e.g., hats, jackets, sunscreen).
- Optional: Blanket (For laying your baby down to explore).
- Optional: Small bag to collect interesting natural items (leaves, pinecones, etc.).

DIRECTIONS

- Choose a safe, scenic path with a variety of natural features (trees, flowers, water bodies).
- Point out and name different natural elements to your babies, such as trees, birds, insects, and flowers.
- Stop periodically to let your babies touch and explore natural objects like leaves, rocks, and pinecones.
 - Talk about the items, their textures, and colors.
 - Use simple language to explain basic concepts like rough vs. smooth, heavy vs. light, etc.
- Collect interesting natural items in your small bag for further exploration at home or in the classroom.

LEARNING OBJECTIVES

- **Sensory Exploration:** Enhances sensory experiences by exploring different textures, sounds, and sights in nature. This introduces babies to the variety of sensory inputs in the natural environment, fostering curiosity and sensory development.
- **Observation Skills:** Develops early observation skills by pointing out and examining natural objects. This encourages babies to notice details in their surroundings, such as colors, shapes, and movements, laying the groundwork for scientific observation.
- **Language Development:** Promotes language development by describing natural objects and phenomena. Talking to babies about what they see, hear, and feel in nature enhances their vocabulary and understanding of descriptive language, aiding in early language acquisition.



Shadow Exploration

MATERIALS

- Light Source: Sunlight, flashlight, or lamp with adjustable brightness
- Shadow Objects: The babies bodies', furniture around the room, various toys or everyday objects (e.g., stuffed animals, plastic shapes)
- Blank Wall or Floor: Clear wall or floor space or add a white sheet for casting shadows
- Optional: Colored transparent sheets or prisms to explore colored shadows

DIRECTIONS

- Set up the light source in a dimly lit room.
- Position the baby so they can see the light source and the wall or screen where shadows will be cast.
- Allow the babies to explore and observe the shadows.
- You may also hold or move various objects between the light source and the wall to create different shadow shapes.

LEARNING OBJECTIVES

- **Light and Shadow Formation:** Understanding how objects block light to create shadows introduces basic principles of light behavior and shadow formation.
- **Shape and Size Variation:** Observing how different objects produce various shadow shapes and sizes helps babies learn about the properties of light and objects.
- **Cause and Effect:** Exploring how changes in the position of objects or the light source affect the shadows introduces fundamental cause-and-effect relationships.
- **Light Behavior:** Experimenting with translucent and reflective surfaces provides insight into how light can be filtered, scattered, or redirected, expanding understanding of light behavior.
- **Cognitive Development:** Encourage cognitive development through the observation of abstract concepts like shadow formation and light behavior.



Colored Pasta Play

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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.



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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

- **Color Mixing and Recognition:** Exploring different colors of pasta helps babies learn about color recognition and can also introduce basic concepts of color mixing if combined with clear, colorless pasta.
- **Texture Exploration:** Engaging with pasta of different shapes and textures introduces tactile exploration, enhancing understanding of various material properties.
- **Cause and Effect:** Observing how the pasta behaves when manipulated (e.g., scooped, poured) introduces basic principles of cause-and-effect relationships.
- **Sensory Integration:** Combining visual and tactile experiences supports sensory integration and enhances understanding of how different senses work together.