



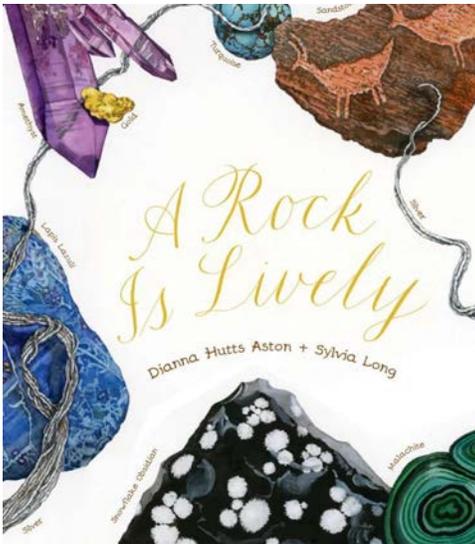
Science (S.T.E.A.M.)



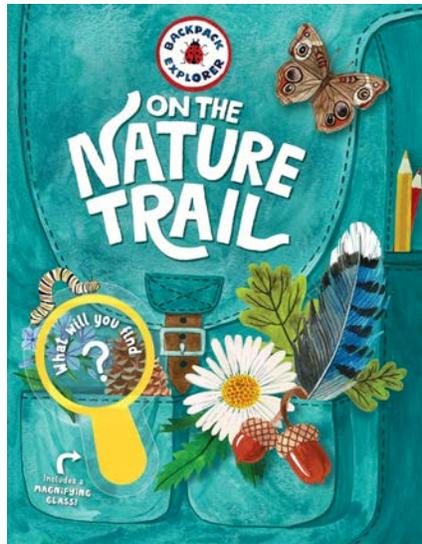
Science

Exploring science benefits children by nurturing their curiosity and fostering critical thinking skills. Through hands-on experimentation and observation, children learn to ask questions, make predictions, and analyze results, developing a deeper understanding of the world around them while honing problem-solving abilities. This not only encourages a lifelong love of learning but also prepares them to tackle future challenges with confidence and ingenuity.

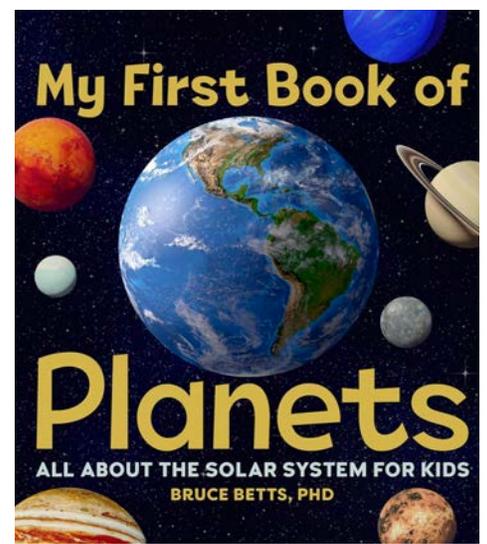
Books We Love That Support Scientific Concepts:



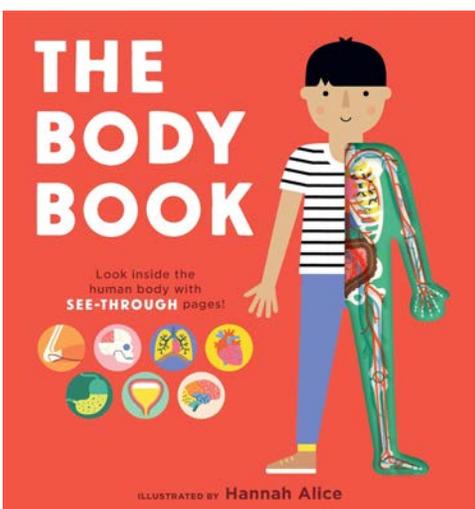
A Rock Is Lively
by Dianna Hutts Aston
and Sylvia Long



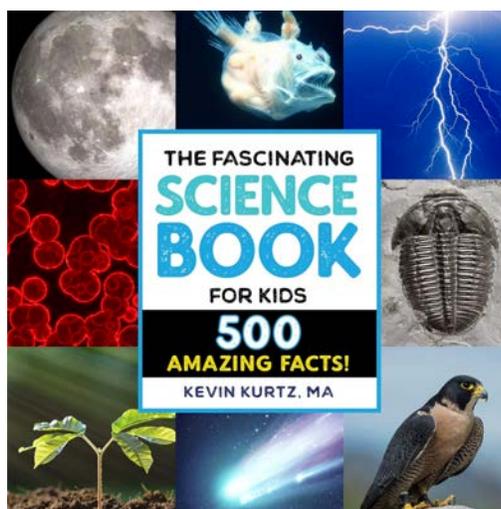
On The Nature Train
by Editors of Storey
Publishing



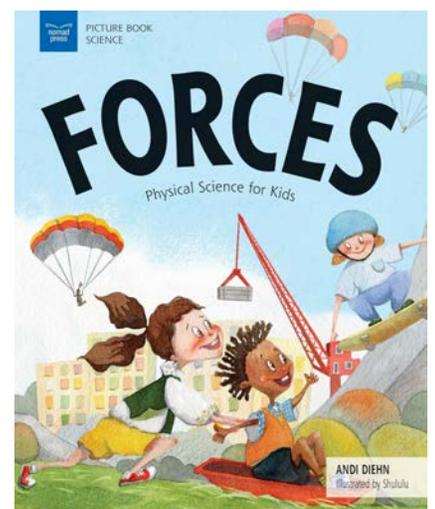
My First Book of Planets,
by Bruce Betts, PHD



The Body Book,
by Hannah Alice



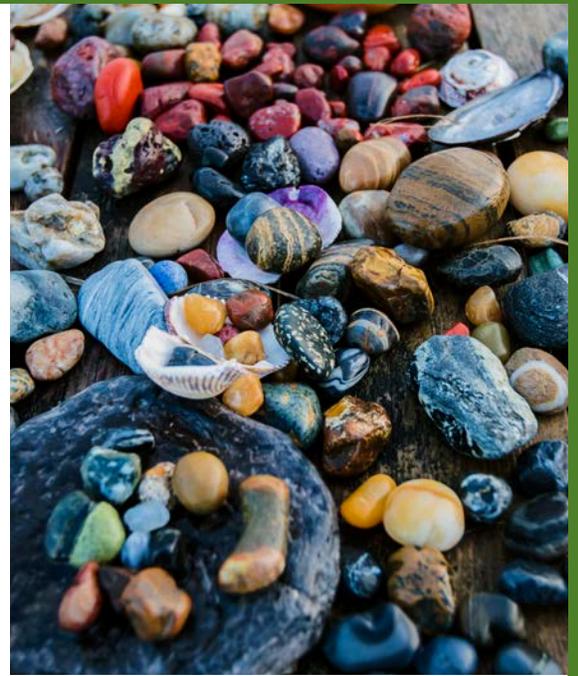
**The Fascinating Science Book
for Kids (500 Amazing Facts!)**
by Kevin Kurtz, MA



**Forces, Physical Science
for Kids**
by Andi Diehn

20 Materials to Support Science Exploration

1. Magnifying glasses
2. Microscopes
3. Thermometers
4. Measuring cups and spoons
5. Test tubes
6. Petri dishes
7. Magnet sets
8. Binoculars
9. Compasses
10. Plant identification guides
11. Butterfly nets
12. Bird watching field guides
13. Animal figurines
14. Sensory table with sand, water, soil, etc.
15. Balloons (for studying air pressure)
16. Bubble solution and wands
17. Flashlights
18. Solar system model kit
19. Pet: Hermit crab, fish, ant farm
20. Natural materials: Rocks, minerals, seeds, shells, leaves, pinecones, sticks, dried flowers, etc.





Rock Investigation

MATERIALS

- Various rocks to investigate
 - Ideally a diverse assortment to compare and contrast properties, colors, textures
- Optional items to consider:
 - Balance scale
 - Magnifying glasses
 - Paper
 - Pencil, paint, markers, etc.
 - Book: A Rock is Lively, by Dianna Hutts Aston

DIRECTIONS

- Organize a provocation that inspires rock exploration, including the materials noted.
- Provide various mediums for extended exploration (e.g. note pad for sketching, and/or scale and magnifying glasses for investigation of properties).

LEARNING OBJECTIVES

- Engaging in rock exploration **promotes scientific observation skills** as children use magnifying glasses to examine the details of rocks and record their observations in a sketch pad.
- Using a scale to measure the weight or size of rocks **introduces children to basic measurement concepts and encourages quantitative reasoning skills.**
- Children will **investigate the physical properties of rocks**, including hardness, density, and porosity, through hands-on exploration and experimentation.
- Engaging in rock exploration **encourages scientific inquiry as children ask questions, make predictions, and conduct investigations** to explore the properties and characteristics of rocks.



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.**



I SPY In My Environment . . .

MATERIALS

- Seek and Find Cards
 - You can buy or create your own by printing about various images with the appropriate text over/under the image.
- If you make your own cards, consider these adjectives: bumpy, rough, smooth, soft, hard, spiky, gigantic, enormous, teeny, tiny, small, striped, spotted, red, yellow, blue, etc.
- Optional: Magnifying glass, binoculars, notepad (to document their observations).

DIRECTIONS

- Head outside with your deck of seek-and-find cards for a fun game of "I SPY."
- Have children pick a card from the top and journey to find something that has the suggested characteristic (e.g. bumpy, smooth, green, striped, cracked, etc.).
- You can go for as long as children shows interest and engagement.
- Optional: Offer children magnifying glass, binoculars, or notepad to document.

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**.
- As children search for objects that match the given adjective, they **engage in classifying and categorizing**. They learn to group objects based on shared characteristics, which is a fundamental concept in scientific classification.
- **"I Spy" promotes vocabulary expansion** as children encounter and describe various adjectives related to nature, learning new words and understanding their meanings.



DIY Bug Hotel

MATERIALS

- Recycled shoe box, small cardboard box, or empty shadow box
- Recycled paper materials such as empty paper towel rolls/toilet paper rolls
- Natural materials such as leaves, sticks, pinecones, rocks, wood slices, etc.
- Scissors and glue (if needed)
- Toy bugs & insects
- Paper and coloring utensil to label "bug hotel" or write name of the "hotel."
- Optional: Pair the experience with a book about bugs (e.g. The Big Book of Bugs)

DIRECTIONS

- Ideally children can create and keep their bug hotel somewhere outside for real bugs to explore. However, if this is not possible, have them use it indoors with toys bugs for small world play.
- Invite children to fill different sections of the bug hotel with materials like twigs, leaves, pinecones, etc. These will serve as hiding spots and shelter for insects.
- Optional: Have them write out a sign saying "bug hotel" or the name of their hotel.

LEARNING OBJECTIVES

- Involves **scientific inquiry and observation as children can study different insects, their habitats, and their needs.** They develop critical thinking skills by identifying the materials and features that attract specific bugs.
- Designing and constructing a bug hotel **requires creativity and problem-solving.** Children must repurpose materials, plan the structure, and create suitable environments for various insects, **which stimulates imagination innovative thinking.**
- **Cultivates responsibility and empathy** as children learn to provide suitable habitats and nourishment for bugs and insects, fostering a sense of empathy and understanding for the needs of living beings.



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.**



Identifying and Creating Animal Tracks

MATERIALS

- Animal track cards (printed or drawn, or bought)
- Toy animal figures
- Clay or playdough
- Tray or flat surface for play
- Optional: Markers and paper for labeling

DIRECTIONS

- Create, print, or purchase animal track cards and lay them out on a designated play surface. Ensure easy access to the cards.
- Offer the animal figures and a portion of clay or playdough for creating animal tracks.
- Encourage children to match toy animals with their corresponding track cards. Then, invite them to press the animals' feet into the clay or playdough to create imprints.
- **Optional Addition:** Depending on your child's stage of development, invite them to write/label the names of each animal "bear," "fox," "deer," etc.
 - You can write the name out first to provide a visual model.
- Engage in conversations about the animals and their tracks. When finished, involve children in cleaning up and storing the materials.

LEARNING OBJECTIVES

Observation Skills: Children will develop keen observation skills as they closely examine the unique characteristics of animal tracks, including shape, size, and texture, to accurately recreate them with clay.

Scientific Inquiry: Children will engage in scientific inquiry by exploring questions such as "How do different animals' tracks vary?" and "What factors influence the appearance of animal tracks?" as they investigate and create their own tracks.

Animal Identification: Children will learn to identify different animal tracks and match them to corresponding animal track cards, deepening their understanding of animal behavior, habitats, and ecosystems.

Critical Thinking: Children will exercise critical thinking skills as they analyze and compare the tracks they create with the images on the animal track cards, making connections between physical evidence and scientific concepts.

Fine Motor Development: Children will refine their fine motor skills as they manipulate clay to create detailed impressions of animal tracks, promoting hand-eye coordination, finger dexterity, and tactile sensitivity.