

Discussion points and activities to help parents and educators use
Baby Loves: Aerospace Engineering!
to introduce STEM to infants, toddlers,
preschoolers and kindergarteners
Developed by Marcie Colleen

About the Book

Big, brainy science for the littlest listeners.

Accurate enough to satisfy an expert, yet simple enough for baby, this book explores the basics of flight—from birds to planes and rockets—and ties it all to baby’s world. Beautiful, visually-stimulating illustrations complement age-appropriate language to encourage baby’s sense of wonder. Parents and caregivers may learn a thing or two, as well!



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Ages 0-3



About the Author



Ruth Spiro is an award-winning children’s book author and freelance writer whose articles, essays, and stories have appeared in magazines and anthologies. Her debut picture book, *Lester Fizz, Bubble-Gum Artist* (Dutton), won awards from *Writer’s Digest* and Willamette Writers and was a Bank Street College of Education Best Book of the Year.



Hello!

As author of the Baby Loves Science books, my goal is to help make complex science concepts both accessible and meaningful, and also share ideas about how parents and caregivers can turn everyday experiences into fun learning opportunities for their little ones.

Aren't babies and toddlers too young to understand science?

Surprisingly, no. In a recent study at Johns Hopkins, researchers showed 11-month-old babies “tricks” in which a toy seemed to defy gravity. The babies showed a keen interest—their surprise and extended attention was an indication they already have an understanding of basic physics.

According to Roberto J. Rodriguez, Deputy Assistant to the President for Education, “Research indicates that as early as infancy, young children start developing and testing hypotheses for how the world around them works. They understand probability and make predictions. They take in information from trusted sources around them, and use that information to guide their behavior. And all that begins in the first year of life.”

But there's no need for flash cards or formal instruction—and especially not for babies! Instead, focus on having fun while adding some beneficial activities to playtime:

- Talk—Name objects, gesture, and describe what you're doing to grow vocabulary
- Sing and clap—A sense of rhythm helps with language acquisition
- Count, match, and sort—These lay the foundation for early math

Most importantly, model a love of learning by sharing observations and asking questions about things you see every day—in other words, think like a scientist. Explore the world along with your child, and have fun making discoveries together!

A handwritten signature in black ink that reads "Ruth Spiro".

Ruth Spiro, Author



Activity Guide for Infants (0-1 Year)



Infants love to hear your voice, and it's never too early to begin reading together! At this stage, a book is less about the story and more about the tone of your voice, the rhythm of your speech, and the visual stimulation of the pictures.

What Do We See?

Point to the illustrations on each page as you read, naming the objects and colors.

For example:

| <u>Nature</u> | <u>Shapes</u> | <u>Colors</u> | <u>Technology</u> |
|---------------|---------------|---------------|-------------------|
| Bird | Circle | Yellow | Rocket |
| Tree stump | Square | Blue | Buildings |
| Clouds | Triangle | Red | Airplane |
| Mountains | Star | Green | Boats |

Act it Out!

Play a hand game with aerospace engineering concepts. Sing to the tune of "Wheels on the Bus."

| | |
|--|--|
| The wings on the bird go flap, flap, flap. Flap, flap, flap. Flap, flap, flap. The bottom of the wing is flat, flat, flat. Swoosh! Fly away little bird. | <i>(Flap your hands like a bird)</i> <i>(Show "flat" with your hands)</i> <i>(Wave good-bye to the bird)</i> |
| The engine on the plane goes fast, fast, fast. Fast, fast, fast. Fast, fast, fast. The wings on the plane don't flap, flap, flap. Whoosh! Fly away little plane. | <i>("Fast running" motion hands)</i> <i>(Do airplane arms)</i> <i>(Wave good-bye to the plane)</i> |
| The gas in the rocket goes vroom, vroom, vroom. Vroom, vroom, vroom. Vromm, vroom, vroom The gas in the rocket goes zoom, zoom, zoom. 3, 2, 1—BLAST OFF! | <i>("Rocket launching" hands)</i> |

Jump Start on STEM



Research shows that early introduction to STEM activities helps develop motor skills, reasoning ability, and even problem solving. Observing nature and encouraging a sense of curiosity provide excellent foundations. At this stage, an infant cannot focus on watching actual birds or airplanes. To help develop this ability, move a rattle slowly back and forth a few inches from his face so he can practice tracking it with his eyes.

Activity Guide for Toddlers (1-2 Years)



Many toddlers are ready to take a more active role in story time. They can repeat words, count along with you, and begin to identify shapes and colors.

Reading Comprehension

As you read, ask, “Where is the...?” Your toddler can respond by pointing to the correct illustration.

| <u>Nature</u> | <u>Shapes</u> | <u>Colors</u> | <u>Technology</u> |
|---------------|---------------|---------------|-------------------|
| Bird | Circle | Yellow | Rocket |
| Tree stump | Square | Blue | Buildings |
| Clouds | Triangle | Red | Airplane |
| Mountains | Star | Green | Boats |

Practice more shape and color recognition. Say, “I spy something _____.” Fill in the blank with any color or shape in the room. Your child can then guess what you spy.

Counting to the Moon

Create hopscotch boxes using masking tape, or sidewalk chalk if you are outdoors.

Number ten index cards one through ten. Place a beanbag or small rock in one of the squares.

Each child will draw a card to know how many boxes they must hop to. The child then hops their way through, counting as they go. If they land on the box with the beanbag, they have made it to the moon! If they overshoot or fall short they must start all over again.

Play continues until the moon is reached or everyone has had a turn.

I’m a Bird! I’m a Plane!

When you say the following “command” words, your child can perform the action.

| <u>Command</u> | <u>Action</u> |
|----------------|--|
| Bird | Flap wings and fly about. Make sure you can feel the air in your wings as you move. |
| Airplane | Making airplane arms, say “vroom!” as the engine lifts you high and fast. |
| Rocket | Raise your arms and clasp your hands in a point to make a rocket. Jump high and zoom to outer space. |



Jump Start on STEM

Research shows that early introduction to STEM activities helps develop motor skills, reasoning ability, and even problem solving. Observing nature and encouraging a sense of curiosity provide excellent foundations. Look for places to watch birds and describe how they take off, fly, and land. What else can fly?



Reading Comprehension

Ask questions throughout the exploration of the book. Encourage your preschooler to help tell the story.

- Baby sees a bird. Have you ever seen a bird? Where do you usually see birds?
- Airplanes fly through the air and take people places. Would you like to fly in an airplane? Where would you like to fly?

Make a Paper Airplane

Fold a sheet of 8½ x 11 paper in half lengthways and open it out flat again.

Next, fold the left-hand side to the center line, then the right-hand side to the center line, and open flat.

Fold the top left corner down to the center crease, then the top right corner.

Take the left side and fold it to the center crease to make a steeper diagonal angle.

Do the same on the right.

Fold the left-hand side to the center again, for an even steeper diagonal.

Do the same on the right.

Flip it over so that the flat side is facing up.

Fold it in half lengthways—so that the two mirror images match up.

BONUS: Try different kinds of paper or other folding techniques. Then measure the distance each plane flies. How do they compare? Why do you think some paper airplanes fly faster or further?

Spatial Thinking & Mapping

Spatial thinking is an important skill that is linked to success in math and science. Younger children will need help at first, and may find the activity easier to do using blocks rather than paper cutouts.

Pretend you are a bird flying over your bedroom. What would it look like from above?

- Draw a rectangle to represent the room.
- Cut shapes to represent a bed, dresser, desk, chair, or other furniture.
- Arrange the “furniture” as a bird would see it from above.

Jump Start on STEM



Research shows that early introduction to STEM activities helps develop motor skills, reasoning ability, and even problem solving. Observing nature and encouraging a sense of curiosity provide excellent foundations. Look for places to watch birds and describe how they take off, fly, and land. Talk about all the things that can fly—bees, butterflies, bats—as well as things that don't. Can a turtle fly? Why not?