

Active, Hands-On, 3D Learning for Pre-K Science

▪ Social-Emotional ▪ Physical ▪ Cognitive



Hands-On, 3D Learning for Pre-K Science

Research shows that children who participate in a pre-kindergarten program are better prepared for kindergarten than children who do not.¹ Research also shows that a high-quality early education program that supports teachers and students can lead to positive results.²

Elements of high-quality early education programs include	Building Blocks of Science for Pre-K
Lessons based on early learning standards that address multiple domains of development—academic, social-emotional, and physical	<ul style="list-style-type: none"> Age-appropriate, engaging lessons captivate children’s curiosity while introducing them to three-dimensional learning. Through playful, hands-on experiences students build skills that prepare them for the new rigor of kindergarten. Group interactions provide students with opportunities to communicate their emotions and feelings using self-confident, healthy behaviors. Units incorporate movement education (such as running, jumping, and balancing) that uses large muscle groups.
Developmentally appropriate guided learning opportunities that are language-rich and hands-on	<ul style="list-style-type: none"> Lessons incorporate rich whole-class or small-group discussions in which students learn to solve problems by asking questions, making predictions and observations, and comparing and classifying objects. Developmentally appropriate manipulatives and science tools give students opportunities to use their gross motor skills and begin to master fine muscle development.
Strong pre-service teacher preparation and in-class coaching for teachers	<ul style="list-style-type: none"> In addition to virtual and face-to-face professional learning opportunities, Building Blocks of Science Teacher’s Guides provide built-in professional learning and background information to help teachers feel comfortable with the science content and how to implement lessons in the pre-kindergarten classroom.
Support for the needs of all students, including ELs and students with special needs	<ul style="list-style-type: none"> The hands-on approach to learning science naturally lends itself to supporting students’ diverse learning styles and abilities. Investigations offer students a variety of ways to build and demonstrate understanding and teachers a variety of ways to monitor the progress and understanding of all students.
Opportunities for meaningful family engagement (Positive family-program connections have been linked to greater academic motivation, grade promotion, and socio-emotional skills across all types of young children, including those from diverse ethnic and socioeconomic backgrounds. ²)	<ul style="list-style-type: none"> Family Science Activities are included in each Building Blocks of Science unit. A letter to the family provides background information and directions for a science activity that uses everyday items to engage the whole family.

¹ Manship, K., Quick, H., Ogut, B., Holod, A., Brodziak de los Reyes, I., & Anthony, J. (2017) *The Impact of Transitional Kindergarten on California Students* (research brief). San Mateo, CA: American Institutes For Research.

² Wechsler, M., Melnick, H., Maier, A., & Bishop, J. (2016). *The Building Blocks of High-Quality Early Childhood Education Programs* (policy brief). Palo Alto, CA: Learning Policy Institute.

Kits for Pre-K Units Include:

- Printed Teacher's Guide
- Access to CarolinaScienceOnline.com
 - ◆ Teacher's Guide eBook
 - ◆ Student Reader eBook in English and Spanish
 - ◆ Student Investigation Sheets in English and Spanish
- Printed Student Literacy Reader
- Hands-on materials kit for a class of 24 students

Patterns All Around

Bright blocks, natural shells, white clouds, moon shapes—what's the connection? Build on students' intuitive sense of patterns with lessons developed for today's young scientist. Students sort a collection of natural shells, investigate patterns outdoors, create colorful patterns with geometric shapes, discover patterns in everyday activities, and explore patterns that repeat in longer cycles of time. Students explore patterns in the daytime and nighttime skies, consider apparent changes in the shape of the Moon, and design a drip-drop "star" map with far too many stars in the "sky" to count.



Discovering Plants

From seed, to sprout, to leaves and flowers, students discover what plants need to live and grow. Each young scientist plants a bean seed and the entire class plants and tends a garden. Throughout the unit students carefully observe the plants' life cycles and parts, focusing on similarities and differences. Learning opportunities grow like weeds as students compare sprouting seeds, count emerging leaves, measure stem growth, and watch flowers unfold, and seedpods develop. Students set up simple experiments in the class garden to find out how light, water, and other growing conditions can affect plant growth and health.

Discovering Animals

Pond snails, redworms, and pill bugs, oh my! Students explore, sort, compare, and experience the similarities, differences, and basic needs of animals. Live organisms encourage students to observe carefully, look closer with a hand lens, draw what they see, mimic movement, compare parents and offspring, and build on their intuitive ideas about the basic needs of animals. Sorting a selection of colorful toy models provides multiple opportunities for students to compare themselves both to the model animals and to the animals taking up residence in their classroom. Living materials were chosen because of their high interest and easy maintenance in today's classroom.



Learning Framework for Pre-K

Pre-K	Patterns All Around	Discovering Plants	Discovering Animals
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Learning Framework for K-5

Kindergarten	Push, Pull, Go <i>K-PS2-1; K-PS2-2; K-2-ETS1-1; K-2-ETS1-2</i>	Living Things and Their Needs <i>K-LS1-1; K-ESS2-2; K-ESS3-1; K-ESS3-3; K-2-ETS1-2</i>	Weather and Sky <i>K-PS3-1; K-PS3-2; K-ESS2-1; K-ESS3-2; K-2-ETS1-1; K-2-ETS1-2</i>
1st Grade	Light and Sound Waves <i>1-PS4-1; 1-PS4-2; 1-PS4-3; 1-PS4-4; K-2-ETS1-1; K-2-ETS1-2</i>	Exploring Organisms <i>1-LS1-1; 1-LS1-2; 1-LS3-1; K-2-ETS1-2</i>	Sky Watchers <i>1-ESS1-1; 1-ESS1-2</i>
2nd Grade	Matter <i>2-PS1-1; 2-PS1-2; 2-PS1-3; 2-PS1-4; K-2-ETS1-1; K-2-ETS1-2</i>	Ecosystem Diversity <i>2-LS2-1; 2-LS2-2; 2-LS4-1; K-2-ETS1-2; K-2-ETS1-3</i>	Earth Materials <i>2-PS1-1; 2-ESS1-1; 2-ESS2-1; 2-ESS2-2; 2-ESS2-3; K-2-ETS1-1; K-2-ETS1-2</i>
3rd Grade	Forces and Interactions <i>3-PS2-1; 3-PS2-2; 3-PS2-3; 3-PS2-4; 3-5-ETS1-1; 3-5-ETS1-2</i>	Life in Ecosystems <i>3-LS1-1; 3-LS2-1; 3-LS3-1; 3-LS3-2; 3-LS4-1; 3-LS4-2; 3-LS4-3; 3-LS4-4; 3-5-ETS1-2</i>	Weather and Climate Patterns <i>3-ESS2-1; 3-ESS2-2; 3-ESS3-1; 3-5-ETS1-2</i>
4th Grade	Energy Works <i>4-PS3-1; 4-PS3-2; 4-PS3-3; 4-PS3-4; 4-PS4-1; 4-PS4-3; 4-ESS3-1; 3-5-ETS1-2; 3-5-ETS1-3</i>	Plant and Animal Structures <i>4-LS1-1; 4-LS1-2; 4-PS4-2; 3-5-ETS1-2</i>	Changing Earth <i>4-ESS1-1; 4-ESS2-1; 4-ESS2-2; 4-ESS3-2; 3-5-ETS1-2</i>
5th Grade	Structure and Properties of Matter <i>5-PS1-1; 5-PS1-2; 5-PS1-3; 5-PS1-4; 3-5-ETS1-2</i>	Matter and Energy in Ecosystems <i>5-PS3-1; 5-LS1-1; 5-LS2-1; 5-ESS2-1; 5-ESS3-1; 3-5-ETS1-3</i>	Earth and Space Systems <i>5-PS2-1; 5-ESS1-1; 5-ESS1-2; 5-ESS2-1; 5-ESS2-2; 5-ESS3-1; 3-5-ETS1-2</i>

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