

Science

at Gretchen's House

Children have an innate curiosity and desire to explore, question, and experiment. We believe the teacher's role is to support the development of scientific reasoning and inquiry with positive interactions in the context of our natural environment and through the process of trial and error.

In our centers, you will find:

- ▶ Classrooms stocked with natural materials that children can feel, study, and manipulate.
- ▶ Teachers who incorporate scientific inquiry into activities across the curriculum.
- ▶ Outdoor learning spaces that encourage an appreciation for nature and awareness of natural resources.
- ▶ Activities that encourage children to study objects, pose questions, and test theories.
- ▶ Real scientific tools such as pipettes, probes, and magnifying glasses.
- ▶ All of our programs recycle, tend their natural environments, and care for living things (plants and/or animals).



The Scientific Method

- ▶ **Observation:** all children notice details about objects in the world around them: distinguishing characteristics and how things behave when acted upon. Adults can help by encouraging exploration and providing vocabulary.
- ▶ **Prediction:** somewhere between 2 and 3 years of age, children begin to ask questions about things that are beyond their concrete experiences and predict how objects might behave under particular circumstances. Adults facilitate by helping children gather information and articulate their questions/predictions.
- ▶ **Hypothesis Testing:** Toddlers use simple *what-if* reasoning to test their hypotheses; preschoolers can pose more complicated questions and test them with assistance; older preschoolers and 4K students can conduct experiments with supervision.
- ▶ **Conclusions/Synthesis:** Toddlers' conclusions are affected by their egocentric perspective. Preschoolers and older children's conclusions often lead them to more sophisticated experiments. They enjoy comparing results and sharing their findings through speech, diagrams, and demonstrations.

Our bottom line: adults may know the answers to children's scientific questions, but if we help them find answers for themselves, we will raise children who are competent, confident investigators.

Our Science Curriculum

We generally focus on earth science and life science with children through preschool, and begin to explore physics and the solar system with older preschoolers & 4K/Kindergarten programs. We plan according to children's actual development rather than expecting them to conform to an age-based standard. Our curriculum is cumulative, so older children might demonstrate many outcomes on this page.

Infants:

- ▶ Go outside every day that weather permits.
- ▶ Explore developmentally safe natural objects: leaves, sand, branches, etc. (Smaller items are placed in clear plastic containers.)
- ▶ Experiment in response to simple questions such as, "Does it roll?"

Toddlers:

- ▶ Read and listen to non-fiction books with developmentally appropriate explanations of natural processes and living things.
- ▶ Use tools to measure, sort, and classify objects by their characteristics.
- ▶ Take walks and field trips to identify plants and animals.
- ▶ Pose scientific questions and find answers with adult assistance.
- ▶ Explore natural materials in the sensory table.



Preschoolers:

- ▶ Do extended projects based on scientific concepts such as the life cycle or weather. These units incorporate inquiry, observation, and synthesis of information.
- ▶ Use tools such as mirrors, magnets, magnifying glasses, rulers, and light boxes so children can measure and quantify real objects.
- ▶ Conduct simple experiments such as "Will it float?", "Which is heavier?" and "Can it fit?"
- ▶ Interact with scientists, naturalists, and animal handlers who visit the classroom.
- ▶ Look for similarities and differences between various objects and living things, and use these to make predictions about how similar things might behave in a given situation.
- ▶ Care for classroom pets and grow vegetables and flowers from seed.

Kindergarten & 4K

- ▶ Do study units on these topics: *All About Me, Food & Nutrition, Communities, The Life Cycle, Health/Bodies, Plants & Animals, Weather & Seasons, Transportation, The Environment, and Space & Our Solar System.*



- ▶ Do inquiry-based projects that allow them to build on existing knowledge and explore topics in depth.
- ▶ Document their learning by using models, drawings with or without text, photos, and simple diagrams with labels.
- ▶ Solve practical problems using the scientific method: identify the problem, propose solutions, test hypotheses, and arrive at a reasonable conclusion.
- ▶ Take apart household items to see how they work and build simple machines using pulleys and levers.