



Inquiry Starters: Life Science

This handout provides examples of ways children of different ages can investigate life science concepts through inquiry experiences. We first provide a section on general strategies that educators can use to support children in investigating life science concepts. Then, we provide specific ideas for ways to support the understanding of different life science concepts. Experiences are clustered by different age groups, however, you might adapt experiences across different ages to meet the needs, abilities, and interests of your learners.

Interact with this handout:

- Make note of the experiences you might try.
- Plan for ways you might adapt the experiences to meet the abilities and interests of children in your setting.

General Strategies for Life Science Investigations

Use authentic examples of living things.

Plan experiences that involve real living things whenever possible. Here are some examples of different living things you might investigate with children in your setting and ideas for different places you might find them.

- **People:** People are living things. Children might notice differences between infants and older children in the learning setting. Or, children can document the way their own bodies grow and change (for example, children might grow taller) across the school year.
- **Plants and animals in the community:** Find examples of living things in your community (for example, pieces of plants, insects, and animals living near or in your learning setting or children's homes). Encourage children and families to notice and document the different plants and animals they might find in their homes or neighborhoods (for example, taking a picture or making a list). Children might also bring in seeds they find in the fruits they eat at home (for example, bell peppers, tomatoes, oranges, apples).





- **Purchasing living things to investigate:** You might purchase inexpensive living things such as mealworms, crickets, and minnows at a local pet store. Find living things (for example, fruits and vegetables) for children to investigate. Or, purchase dry beans or seeds (for example, black beans, pinto beans, chia seeds) to plant and investigate growth.

Use models when direct interaction is not feasible.

- Provide photos or use realistic plastic replicas of real animals for children to explore.
- Create life size replications of different plants and animals to help children understand differences in sizes (for example, mark the height of a giraffe, an elephant, a zebra, and a child using tape on a wall outside).

Use inquiry skills.

- Support children to ask questions and make predictions about the living things they investigate.
- Consider different ways for children to observe living things. For example, using:
 - ◇ Magnifying glasses
 - ◇ Digital microscopes
 - ◇ Measuring tools
- Offer different ways for children to document (for example drawings, writing, sculpting, or taking photographs). Life science concepts might need to be observed first-hand over time. Consider using photos or drawings to capture moments in time and compare changes across several weeks or months.
 - ◇ Science journals are a great way to keep documentation organized for long-term studies. Read the article, *Science Journals in the Preschool Classroom* by Kimberly Brenneman and Ines F. Louro (Brenneman & Louro, 2008) for more information on using science journals in early childhood.





Life Science Concepts to Explore Through Inquiry

Parts and Processes of Living Things

Encourage close observation and documentation of real organisms and physical models.

- **Infant/Toddler:** Support exploration of their own bodies and simple living things. You might talk to children about the different parts of plants as children look and touch. Consider uprooting a plant to allow children to observe the roots or provide safe flowers for children to explore by pulling apart the petals.
- **Preschool/TK:** Provide real plants or safe live animals for children to examine closely. Encourage them to touch, observe, and describe parts. Children might create representations of the different living things. Encourage children to explain the parts they include in their creations and explain what the different parts do.
- **Elementary:** Use real specimens and simple physical models to investigate how parts help an organism survive.
 - ◇ How do animals stay warm? Test different materials (for example, feathers, fur, fat [for example, Crisco]) or just bare hands and notice how different materials can insulate us from the cold.
 - ◇ Why do animals have different feet? Test the way different feet move in water using a small rake to imitate a chicken's foot, or a diving flipper to imitate a duck's foot. In a tub of water, children can notice the way the different feet move in the water. Consider other ways you might use everyday materials to model and test the function of different animal feet.
 - ◇ Why do birds have different beaks? Provide different tools that imitate birds' beaks (for example, tweezers, tongs, straws, and spoons) and different types of foods that can be collected by the different beaks (for example, sprinkles [ants], dry beans [beetles], water [nectar], pipe cleaners [worms]). Encourage children to notice the way the different "beaks" are good at picking up different "foods."

How Living Things Grow and Change

Support children in observing growth and noticing changes firsthand over time.

- **Infant/Toddler:** Provide opportunities to care for and observe living things directly (for example, watering a classroom plant daily or watching sprouts emerge from seeds planted in soil). Invite children to feel, touch, and notice changes (for example, a flower blooms).





- **Preschool/TK:** Encourage children to explore the way plants and people grow and change.
 - ◇ Plant seeds in clear containers or plastic bags so children can observe the way roots emerge from seeds. As plants continue to grow, encourage children to measure growth with nonstandard tools (for example, string or paper clips) and record changes using drawings, charts, and photos.
 - ◇ Children might be interested in exploring differences between themselves and the younger children in their learning setting. Create a Venn diagram with children using illustrations to document similarities (for example, babies and preschoolers both have hair, arms, legs, eyes, noses, and both eat) and differences (preschoolers have longer legs, longer arms, can walk, have teeth, eat crunchy foods).
- **Elementary:** Guide children in setting up an investigation with plants. For example, children might plant different seeds and notice the way different plants grow and change over time. Support children to measure and create graphs to document and compare growth of different plant species.

Life Cycles of Living Things

Encourage children to explore life cycles through living organisms and models.

- **Infant/Toddler:** Observe living things in real time (for example, caterpillars and plants in different stages). Talk to children about the different parts of these plants and animals and how they change through these different stages.
- **Preschool/TK:** Explore life cycles of living things such as butterflies, frogs, or mealworms. These creatures go through interesting metamorphosis. Explore life cycles of plants and other animals that children are familiar with (for example, dogs, cats, fish, and birds). Use photographs to observe and discuss the way different living things grow and change, including themselves.
- **Elementary:** Children can create models of living things at different stages of their life cycle. Consider opportunities for children to creatively represent these changes (for example, using stop-motion film applications, sculptures with clay, or dramatic performances) to showcase the way a living thing changes through the life cycle.





Needs of Living Things

Help children explore needs by caring for living things directly.

- **Infant/Toddler:** Provide real caregiving experiences (for example, watering plants or feeding fish). Talk to children about what they are doing and why. Help children connect the way we care for plants and animals with the way we care for ourselves.
- **Preschool/TK:** Set up simple experiments using real plants (for example, one plant receives sunlight but the other does not). Children can observe and document differences firsthand.
- **Elementary:** Support children to design simple investigations to determine the needs of living things. Explore with children the different variables that affect plant growth (for example, sunlight, soil type, nutrients, and water). Help children choose a variable to investigate and design an experiment to test differences related to this variable (for example, investigate different soil types by planting one seed in dirt, one seed in clay, and one seed in sand). Consider ways to measure and document changes in living things.

Habitats

Support children in exploring real environments and constructing habitat models.

- **Infant/Toddler:** Explore outdoor spaces directly and notice where living things are found. Talk to children about what living things they find and why they like to live in a certain place (for example, the earthworms like to stay underground where it is cool and dark, the birds live up high in the trees so they are safe).
- **Preschool/TK:** Take children outdoors to observe habitats firsthand. Collect natural materials to build simple habitat models indoors (for example, using moss, twigs, and leaves to build a model of a forest habitat). Support children to explain how the habitat they created supports the needs of living things.
- **Elementary:** Provide opportunities to investigate real habitats and create models. Children can explain the way different parts of the habitat work together and why the different environments are well suited for the different plants and animals living in them. Offer different materials for children to create their habitats including natural materials and craft materials.

