



SCIENCE



EARLY LEARNING

AGES 3 to 5





STRATEGIES AND ACTIVITIES

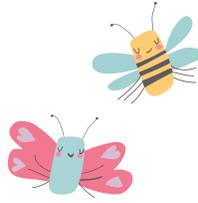
For Early Learning Utah
Core Standards Ages 3 to 5

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INTRODUCTION

These Early Learning Science Standards are aligned to the 2019 Utah's K–12 Science and Engineering Education (SEEd) standards. The Science standards are founded on what science is, how science is learned, and the multiple dimensions of scientific work. Young children are captivated by discovering and exploring their natural world. They insist that teachers and family members answer their questions about the world around them. The questions that children ask about how insects fly, what makes a shadow, or what happens when paint colors are mixed are transformed into hypotheses about their world. They use their senses and scientific tools to observe, collect and interpret data, and draw conclusions. Communicating their findings informally in conversations or through the documentation of results leads children to ask new questions and to continue the cycle of scientific investigation.

By cultivating this sense of wonder, adults can help children to become scientific thinkers. As they learn about the world around them, including weather, light, living things, and matter and motion, young children begin to see patterns and understand the processes that affect their personal environments. Adults can support this learning by planning developmentally appropriate, experiential learning activities that allow children to utilize the Three Dimensions of Science (National Research Council, 2012).

The three dimensions of science learning help us to make sense of all that science does and represents. These include:

1. Science and Engineering Practices (What Students Do)
2. Crosscutting Concepts (How Students Think)
3. Disciplinary Core Ideas (What Students Know)



Taken together, these represent how science is used to make sense of phenomena, and they are most meaningful when learned in concert with one another.

Science and Engineering Practices: These practices refer to the things that scientists and engineers do and how they work. Scientists do much more than make hypotheses and test them with experiments. They engage in wonder, design, modeling, construction, communication, and collaboration.

Crosscutting Concepts: Understanding crosscutting concepts enables us to make connections among different subjects and to utilize science in diverse settings. They reach across disciplines and demonstrate how specific ideas are united into overarching principles, such as planning and carrying out investigations to determine patterns of cause and effect.

Disciplinary Core Ideas: Core ideas are traditionally associated with science knowledge and specific subject areas within science. These core ideas are organized within physical, life, and earth sciences.

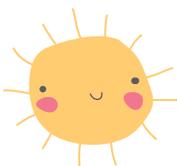
Each standard is framed upon the three dimensions of science to represent a cohesive, multi-faceted science learning outcome. Crosscutting Concepts are underlined throughout the standards.

Many standards contain additional emphasis and example statements. Emphasis statements highlight a required and necessary part of the student learning to satisfy that standard. Example statements help to clarify the meaning of the standard and are not required for instruction.

Early Learning Science Standards are combined into an Early Learning Band for three- and four-year-old students. Individual children's developmental levels need to be considered when planning and implementing science learning activities.

ADULTS SUPPORT LEARNING IN SCIENCE WHEN THEY:

- Allow children to explore their surroundings and ask questions while they are doing so.
- Lead children in discussions of, "What do you think will happen if...?"
- Point out changes in children's environment including the weather, seasons, etc.
- Provide children with language to describe what they see, hear, touch, taste, etc.
- Build ramps, forts, levers, etc. with children and let them discover what will happen when using them.
- Model and support vocabulary associated with the scientific process.
- Support children's curiosity in their exploration of their environment by encouraging problem solving and discovery.



Strategies & Activities for Ages 3 to 5

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STRAND 1: WEATHER

Weather is the combination of sunlight, wind, snow, or rain, and temperature in a particular place at a particular time. Humans can plan and prepare for different weather conditions.

STANDARDS: 3- AND 4-YEAR-OLDS	STRATEGIES & ACTIVITIES
<p>Sci 3–4 yr.1.1: Obtain and communicate information about local, observable weather conditions while exploring and describing <u>patterns</u> found in different seasons. Emphasize the observation and recognition of data. Examples of data may include sunny, cloudy, windy, rainy, snowy, cold, or warm.</p>	<ul style="list-style-type: none"> ■ Sing songs and read books about weather and seasons. ■ Create a weather graph or weather journal tracking local patterns of weather over time.
<p>Sci 3–4 yr.1.2: Obtain and communicate information about human behavior <u>patterns</u> in different weather conditions. Emphasize the observation and recognition of data. Examples of data may include clothing, food, safety, and other preparations for expected weather.</p>	<ul style="list-style-type: none"> ■ Identify appropriate clothing for different types of weather. ■ Add a variety of clothing items for different seasons to the dramatic play area. ■ Discuss seasonal changes in availability of produce and other foods. ■ Discuss safety behaviors in predictable weather such as using sunscreen, drinking water, wearing safe footwear, etc.

STRAND 2: LIGHT

Sunlight has an effect on surfaces. Objects can be seen when light is available to illuminate them. Light is required for plant growth.

STANDARDS: 3- AND 4-YEAR-OLDS	STRATEGIES & ACTIVITIES
<p>Sci 3–4 yr.2.1: Plan and carry out an investigation using the five senses to determine the <u>effect</u> of sunlight on different surfaces and materials. Examples could include determining if the effect is hot or cold or a light or dark surface.</p>	<ul style="list-style-type: none"> ■ Discuss the difference in temperature between sunny or shady areas indoors and outdoors. ■ Trace the shadows of a variety of toys and items. ■ Create a shadow puppet theater, with flashlights and character cutouts. ■ Use a light table and manipulatives to explore light. ■ Explore how prolonged exposure to light can make colors fade and affect the appearance of toys, equipment, wall displays, etc.
<p>Sci 3–4 yr.2.2: Plan and carry out an investigation to show the <u>effect</u> of light in illuminating objects. Emphasize that objects can be seen when light is available to illuminate them. Examples could include observations about light when navigating a room with the lights off compared to the lights on.</p>	<p>Make flashlights available to safely explore dark spaces such as boxes or darkened rooms.</p>
<p>Sci 3–4yr.2.3: Plan and carry out an investigation to determine the <u>effect</u> of sunlight and water on plant growth. Examples could include growing plants in light or dark places.</p>	<p>Grow plants to care for over several months and explore how they grow in different environmental conditions such as light and darkness, as well as moisture levels.</p>

STRAND 3: LIVING THINGS

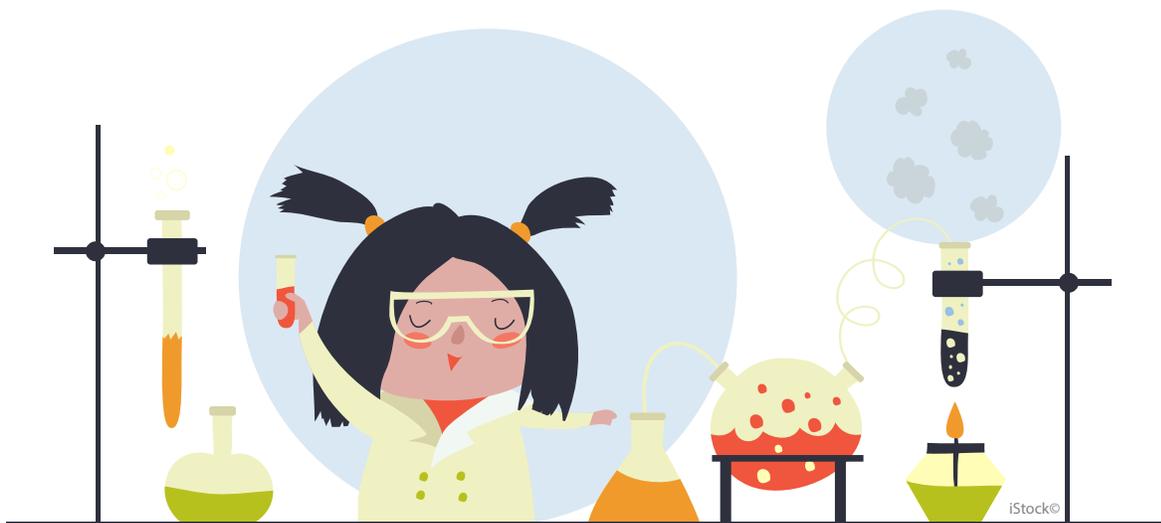
Living things (humans, animals, and plants) depend on their surroundings to get what they need, including food, water, and shelter, to survive. Behavior patterns between parents and offspring can help humans and animals to survive.

STANDARDS: 3- AND 4-YEAR-OLDS	STRATEGIES & ACTIVITIES
<p>Sci 3–4 yr.3.1: Obtain and communicate information about the <u>effect</u> of water and food on living things. Examples could include plants depend on water to live, humans and animals depend on water and food to live.</p>	<ul style="list-style-type: none"> ■ Plant a seed and have the students care for it in the classroom. ■ As students engage in dramatic play with play food and baby dolls, encourage conversations about what humans and animals need to survive. ■ Read stories and sing songs about what living things (including babies, pets and adults) need. ■ Consider incorporating a garden and/or a class pet such as small fish or crab into your program. Allow students to help care for those living things as appropriate. ■ During snack and mealtime, discuss how food and water contribute to the wellness of your body.
<p>Sci 3–4 yr.3.2: Obtain and communicate information about the <u>pattern</u> between living things and the places where they live. Emphasize that living things need water, air, and resources, and they live in places that have the things they need to survive. Examples could include food and shelter.</p>	<ul style="list-style-type: none"> ■ Study various habitats and discuss things that may live there and what may protect them while living in that habitat. ■ Discuss the students' habitat and ask them what resources exist for them to survive (shelter, food, water, family members, etc.).
<p>Sci 3–4 yr.3.3: Obtain and communicate information about the behavior <u>patterns</u> that help humans and animals survive when they are young. Examples of behavior patterns could include parents responding to needs, providing shelter and sustenance, and ensuring the security of their offspring.</p>	<ul style="list-style-type: none"> ■ Plan studies of animals that interest the students and discuss how they are raised from infancy. ■ Ask a parent to bring in a baby or a pet and discuss how they care for them. ■ Provide dramatic play opportunities that allow students to care for baby dolls including feeding, bathing, etc. ■ Encourage students to bring in photos of themselves as babies. Use the photos to compare and contrast how their needs have changed over time.

STRAND 4: MATTER AND MOTION

All things are made of matter. Various kinds of matter, such as wood, metal, and water, have different properties that can be observed, described, and classified. Pushing or pulling on an object can change the speed or direction of an object in motion.

STANDARDS: 3- AND 4-YEAR-OLDS	STRATEGIES & ACTIVITIES
<p>Sci 3–4 yr.4.1: Plan and carry out an investigation to classify different kinds of materials based on <u>patterns</u> in their observable properties. Examples could include sorting materials based on similar properties such as color, hardness, texture, or whether the materials are solids or liquids.</p>	<p>Provide a variety of materials such as balls, rocks, items found in nature, crayons, etc. Sort the objects by various properties such as color, texture, or hardness.</p>
<p>Sci 3–4 yr.4.2: Plan and carry out an investigation to determine the <u>cause and effect</u> of the speed or direction of an object when a push or pull occurs. Examples could include having a marble or other object move a certain distance, follow a particular path, or knock down other objects.</p>	<ul style="list-style-type: none"> ■ Add ramps and balls to the block area. Use items such as books or blocks to make the ramps higher and lower. ■ Add marble runs to learning centers. ■ Roll items down a hill to determine which items are faster or slower such as matchbox cars, blocks, or bouncy balls.



REFERENCE

National Research Council. (2012). *A framework for K–12 science education: Practices, crosscutting concepts, and core ideas*. National Academies Press.

