

Science: 3-5 Years

Children explore and demonstrate curiosity about the world around them. ¹

a Observe and investigate their environment using scientific thinking, scientific vocabulary, and the scientific method. ^{1A}

1a. 3 Years ^{3.1A}

- 1 Notice snow on the ground and say, “It’s cold!” ^{3.1A.1}
- 2 Build a snowman by stacking lumps of snow. ^{3.1A.2}
- 3 Observe and discuss the movement of worms in the sensory table. Say, “That bug is going over the other one!” ^{3.1A.3}
- 4 Wheel around the room with a magnet wand, testing different objects to find out if they stick (are magnetic), and announce, “The toy car sticks, but the blocks don’t.” ^{3.1A.4}
- 5 Mix paint colors and notice the new color they create, saying, “I put yellow in my blue – now it’s green!” ^{3.1A.5}

1a. 4 Years ^{4.1A}

- 1 Notice which side is lower/heavier when weighing rocks on a balance scale. ^{4.1A.1}
- 2 Take a nature walk around the outside of the building with an adult and ask them to identify things. ^{4.1A.2}
- 3 Taste several varieties of apples and describe the differences in flavor, color, and texture. ^{4.1A.3}

1a. 5 Years ^{5.1A}

- 1 Draw their observations of a seedling’s growth over time in their science journal. ^{5.1A.1}
- 2 Notice the different colors of the birds on the playground. ^{5.1A.2}
- 3 Use magnifying glasses to observe plants and insects on the playground and record their observations in a science journal, such as drawing a picture of a grasshopper and writing, “The grasshopper has long spikey legs.” ^{5.1A.3}
- 4 Label the parts of a flower in a drawing, such as stem, petal, roots, and leaves. ^{5.1A.4}

b Explore cause-and-effect relationships. 1B

1b. 3 Years 3.1B

- 1 Mix playdough colors together. 3.1B.1
- 2 Melt ice cubes in their hands. 3.1B.2

1b. 4 Years 4.1B

- 1 Use a flashlight to make shadows with their hands. 4.1B.1
- 2 On a light table, stack a blue translucent square on top of a red one to make purple. 4.1B.2

1b. 5 Years 5.1B

- 1 With adult support, mix vinegar into baking soda to make it fizz over the edges of the container like a volcano erupting. 5.1B.1

c Observe, compare, and classify objects and information. 1C

1c. 3 Years 3.1C

- 1 Sort blocks by material (plastic/wooden) during clean-up time. 3.1C.1
- 2 Talk about cats and dogs and demonstrate an understanding that they are different. 3.1C.2
- 3 Sort animals by habitat (farm or forest, for example). 3.1C.3

1c. 4 Years 4.1C

- 1 Make marks in their journal as they count how many children have yellow shirts and green shirts, then compare how many there are of each color. 4.1C.1
- 2 Chart different kinds of weather with their group over the course of a week or a month. 4.1C.2
- 3 Sort buttons by feel, into piles of fabric-covered buttons and buttons with holes. 4.1C.3
- 4 Sort manipulatives into separate containers during clean up time. 4.1C.4

1c. 5 Years 5.1C

- 1 Measure the growth of their seedling every day. 5.1C.1
- 2 Classify items by their similarities, such as “all of these animals have fur, and these ones over here have scales!” 5.1C.2
- 3 Collect leaves and sort by type of tree and/or leaf shapes. 5.1C.3

d Communicate and/or record observations, questions, and predictions about their environment. 1D

1d. 3 Years 3.1D

- 1 Ask to feed the classroom fish when they come to school in the morning because “it’s breakfast time!” or the fish usually gets fed in the mornings. 3.1D.1
- 2 Say, “It’s sunny—we can go outside!” or look out the window at the rain and grumble, “But I wanted to go outside.” 3.1D.2
- 3 Chart their predictions about what color flower will grow from the seeds they planted. 3.1D.3

1d. 4 Years 4.1D

- 1 Point out the squirrels gathering nuts and ask why they need so many. 4.1D.1
- 2 Tell stories about the squirrels in their neighborhood eating the jack-o'-lanterns and playing with the decorations. 4.1D.2
- 3 Chart different kinds of weather with their group over the course of a week or a month. 4.1D.3
- 4 Point out the tiny buds beginning to form on trees and plants in the spring. 4.1D.4

1d. 5 Years 5.1D

- 1 Notice that the classroom fish comes to the surface of the water when people stand near the tank, and ask, “Why is he doing that?” 5.1D.1
 - 2 After being taught that a plant needs moist soil, touch the soil in a potted plant and ask to water it because it’s dry. 5.1D.2
 - 3 Notice that the clouds are getting darker and say, “I think it’s going to rain.” 5.1D.3
 - 4 Use a bar graph to chart favorite colors in the group and discuss the results using terms like more, less, and equal. 5.1D.4
 - 5 Record the height of their seedling in their science journal each day. 5.1D.5
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Children show a growing understanding of the scientific principles of physical science. 2

a Explore and compare the ways objects move, including their speed, direction, and duration of movement. 2A

2a. 3 Years 3.2A

- 1 Build ramps for toy cars and experiment to see which car goes faster down the ramp. 3.2A.1

2a. 4 Years 4.2A

- 1 Build a marble run and make predictions about what pieces they can add to make the marble move faster or slower. 4.2A.1

2a. 5 Years 5.2A

- 1 Drop a feather and a baseball from the same height and notice that the feather falls slower. 5.2A.1
- 2 Explore using a small pulley system to raise and lower toy cars. 5.2A.2

b Explore and observe the states of matter (liquids, solids, gasses) in their environment. 2B

2b. 3 Years 3.2B

- 1 Notice that snow is melting into water, while playing with snow outdoors or in the sensory table. 3.2B.1
- 2 Paint with ice cubes that have been made with drops of food coloring. 3.2B.2
- 3 Use their hands to melt ice cubes in the sensory table. 3.2B.3

2b. 4 Years 4.2B

- 1 Breathe onto a cold window so they can write their name in the condensation. 4.2B.1
- 2 Participate in group discussions to identify items that fit into the categories of solids, liquids, and gasses. 4.2B.2
- 3 Explain that when ice and snow melt, they both turn into water. 4.2B.3

2b. 5 Years 5.2B

- 1 Work with a group to shake a jar of heavy cream until it turns to butter. 5.2B.1
- 2 With adult support, sort and classify items such as a block, a cup of water, and the air as solids, liquids, or gasses. 5.2B.2
- 3 Notice that when rain freezes in cold weather, it turns into ice. 5.2B.3

c Observe and explore light and sound. 2C

2c. 3 Years 3.2C

- 1 Use the light switch to turn lights on and off. 3.2C.1
- 2 Build with translucent colored blocks on the light table. 3.2C.2
- 3 Play with toy drums or egg shakers. 3.2C.3

2c. 4 Years 4.2C

- 1 Play with a child-size piano or keyboard. 4.2C.1
- 2 Use a variety of objects as drums. 4.2C.2
- 3 Ask for sunglasses to shield their eyes from the sunlight. 4.2C.3
- 4 Layer red and blue translucent panels over each other on the light table to make purple. 4.2C.4

2c. 5 Years 5.2C

- 1 Tap different things around the room using rhythm sticks to see how the sound varies. 5.2C.1
- 2 Use a desk lamp to make shadow puppets. 5.2C.2
- 3 Play an electronic Simon Says game and match the light patterns, sometimes. 5.2C.3

Children show a growing understanding of the scientific principles related to the earth. 3

a Explore and recognize a variety of earth materials in their community (soil, rocks, water, etc.) and their observable properties. 3A

3a. 3 Years 3.3A

- 1 Match color swatches with the different colors of soil and rocks they find on the playground. 3.3A.1
- 2 Participate in a group activity to identify differences between a collection of rocks. 3.3A.2
- 3 Sort rocks by size, color, shape, or texture. 3.3A.3

3a. 4 Years 4.3A

- 1 Use a magnifying glass to look closely at the dirt to see and identify grains of soil, as well as tiny twigs, rocks, and sometimes insects. 4.3A.1
- 2 Match color swatches with the different colors of soil and rocks they find on the playground. 4.3A.2

3a. 5 Years 5.3A

- 1 Shake several different kinds of rock in a container until the rocks begin to grind together and produce new sand and soil, then discuss what happened. 5.3A.1
- 2 Experiment with using soil, water, and other natural materials such as straw and broken leaves to create mud bricks in an ice cube tray, then build with them once they dry. 5.3A.2

b Recognize and identify different weather conditions and the ways weather can impact their lives. 3B

3b. 3 Years 3.3B

- 1 Ask for sunglasses when it is sunny out. 3.3B.1
- 2 Laugh and dance in the rain. 3.3B.2
- 3 Express disappointment when rain means they won't be able to play on the playground. 3.3B.3
- 4 Participate in a group activity to make a snowman. 3.3B.4

3b. 4 Years 4.3B

- 1 Identify appropriate clothes for different kinds of weather (shorts for sunny days, rain jacket for rainy days, heavy coat for cold winter days, etc.). 4.3B.1
- 2 Participate in a group routine to identify and record the daily weather. 4.3B.2

3b. 5 Years 5.3B

- 1 Describe the weather using more detail, such as "It's only raining a little bit," or "It's sunny now, but my momma says it's going to snow later." 5.3B.1
- 2 Use a weathervane or windsock to figure out which way the wind is blowing. 5.3B.2
- 3 Participate in a group routine to chart how many days each type of weather has happened. 5.3B.3

c Recognize and make connections between the seasons and their observable characteristics. 3C

3c. 3 Years 3.3C

- 1 Notice snow on the ground and say, "It's cold!" 3.3C.1
- 2 Point out the leaves falling in autumn and new buds and sprouts in spring. 3.3C.2

3c. 4 Years 4.3C

- 1 Notice leaves falling from the trees and say that soon it will be time to go to the apple orchard or pumpkin patch. 4.3C.1
- 2 Point out that the leaves change color before they fall off the tree. 4.3C.2

3c. 5 Years 5.3C

- 1 Participate in a group routine to chart the changing temperatures. 5.3C.1
 - 2 Categorize types of weather by the seasons they typically happen in. 5.3C.2
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Children show a growing understanding of scientific knowledge related to living and non-living things. 4

a Explore, observe, notice, and describe a variety of plants and animals in their community, and their life cycles. 4A

4a. 3 Years 3.4A

- 1 Point at a bird on the playground and announce, “Birds eat worms!” 3.4A.1
- 2 After an adult explains that a tree’s roots help it drink water, pour a cup of water at the bottom of a tree to “help it drink.” 3.4A.2
- 3 With guidance and support, use their fingers to poke holes in soil for planting seeds. 3.4A.3
- 4 Identify more characteristics of animals and plants, such as the color of the leaves and flowers of a particular plant, a dog’s ear shape, etc. 3.4A.4
- 5 Show interest in caring for the environment, such as asking to care for plants or animals in the learning environment. 3.4A.5

4a. 4 Years 4.4A

- 1 Tell a familiar adult, “The tree’s leaves are red, but they were green before,” and ask why. 4.4A.1
- 2 When drawing a picture of themselves at Halloween, draw trees with orange and brown leaves. 4.4A.2
- 3 Ask about different kinds of flowers, and compare different characteristics of their seeds (size, color, shape, etc.). 4.4A.3
- 4 Begin to recognize and discuss the life cycles of different kinds of animals, such as recognizing that a bird hatches from an egg, but cats give birth to kittens. 4.4A.4

4a. 5 Years 5.4A

- 1 Describe a caterpillar they saw outside and ask what kind of butterfly it will turn into. 5.4A.1
- 2 Describe or identify more details around the characteristics of plants and animals, such as the breed of a familiar type of dog, the shape of a flower petal or leaf, more detail around the colors in a butterfly’s wings, etc. 5.4A.2
- 3 Watch a deer run through a field and notice that it gallops like a horse. 5.4A.3

b Observe and explore the habitats of a variety of plants and animals in their community (such as wooded areas, parks, lakes, and streams). 4B

4b. 3 Years 3.4B

- 1 Compare and describe features of the environment, such as identifying one lake as bigger than another. 3.4B.1
- 2 Explain that the park they like best is the one where they go to watch the big fish in the pond. 3.4B.2
- 3 Identify the basic needs of animals (food, water, air, and shelter). 3.4B.3

4b. 4 Years 4.4B

- 1 Tell about the frogs they saw during their visit to the lake. 4.4B.1
- 2 Participate in a group discussion about where they have seen deer in their community. 4.4B.2
- 3 Identify the basic needs of plants (water, air, sunlight, and nutrients). 4.4B.3

4b. 5 Years 5.4B

- 1 Point out a bush on the playground that is the same kind as one in their aunt's backyard. 5.4B.1
- 2 Participate in a group project to draw pictures of animals that live in their community, to paste where they have been seen on a map of their community. 5.4B.2
- 3 Watch for animal tracks during an outdoor walk. 5.4B.3

c Observe, describe, and compare the differences between living and non-living things. 4C

4c. 3 Years 3.4C

- 1 Participate in a group activity to categorize things as "alive" and "not alive." 3.4C.1
- 2 Sort rocks or leaves by size, color, shape, or texture. 3.4C.2
- 3 Categorize things as "alive" and "not alive," sometimes. For example, recognizing that a dog is a living thing, and a toy car is not. 3.4C.3
- 4 Mis-identify a dead plant as a "non-living" thing. 3.4C.4

4c. 4 Years 4.4C

- 1 Sort pictures of plants, animals, and other objects into "living" and "nonliving" categories. 4.4C.1
- 2 Mis-identify seeds or coral as "non-living" things. 4.4C.2

4c. 5 Years 5.4C

- 1 Ask a familiar adult if a caterpillar's chrysalis is a living or non-living thing. 5.4C.1
- 2 Explain that plants and animals need food and water, but non-living things like rocks and toy cars do not. 5.4C.2