Cognitive Development: Scientific Reasoning

Scientific Practices and Reasoning: planning and carrying out investigations, proposing explanations and solutions, and communicating understanding of concepts in a variety of ways to build the foundation for science learning. 15

a **Exploration** 15.A

1 34-48 months 15.A.1

1 Explores and describes the immediate environment (materials, living things, patterns and cycles in nature). 15.A.1.1

2 Experiments with new materials, technology and equipment. 15.A.1.2

3 Investigates and problem solves through active exploration. 15.A.1.3

4 Explores and describes changes in materials and cause and effect. 15.A.1.4

2 46-60 months End of Preschool Standards 15.A.2

1 Uses new vocabulary when investigating materials, living things, patterns and cycles in nature. 15.A.2.1

2 Uses and/or describes tools and technology that aid in solving a problem or performing a task. 15.A.2.2

3 Plans and cooperatively carries out investigations to answer questions, test ideas and/or solve problems. 15.A.2.3

4 Experiments with materials to change outcomes. 15.A.2.4

b **Application of Science Concepts and Practices** 15.B

1. 34-48 months 15.B.1
    1. Poses questions about objects and events. 15.B.1.1
    2. Seeks answers to questions as children explore through play and projects. 15.B.1.2
    3. Describes or shows how objects and events are the same and different. 15.B.1.3
    4. Observes using senses and simple tools to explore properties of objects and living things safely (color, scent, shape, size, texture, weight). 15.B.1.4
    5. With teacher guidance, participates in science-based explorations. 15.B.1.5
    6. With teacher guidance, shares ideas and discoveries through conversations with peers and adults, simple drawings, dictation, early writing, and symbol charts. 15.B.1.6
2. 46-60 months End of Preschool Standards 15.B.2
    1. Begins to use evidence gathered during play/project work and books/media to answer questions. 15.B.2.1
    2. Begins to classify objects and living things into categories. 15.B.2.2
    3. Describes what can be discovered using different senses and tools. 15.B.2.3
    4. Plans and carries out investigations with others. 15.B.2.4
    5. Makes and tests predictions. 15.B.2.5
    6. Collects and records information through drawing, writing, dictation and taking photographs. 15.B.2.6
    7. Draws conclusions and shares explanations based on evidence, prior knowledge, and the ideas of others. 15.B.2.7

Physical Science and Engineering: Physical Science: the study of how things move and change. Engineering: the application of science and math to solve problems. 16

a **Motion and Stability: Forces and Interactions** 16.A

1 34-48 months 16.A.1

1 Using senses, tools and observation, begins to experiment with objects in motion and pushing/pulling. 16.A.1.1

2 Begins to observe that matter can change state (i.e. solid to liquid, liquid to gas). 16.A.1.2

3 Compares and contrasts light and shadow in outdoor and indoor environments. 16.A.1.3

4 Begins to explore how the size, shape and material of objects impact the sounds they make. 16.A.1.4

2 46-60 months End of Preschool Standards 16.A.2

1 Uses senses and tools (including technology) to observe and describe the strength and direction of forces. 16.A.2.1

2 Plans and carries out comparisons of motion and force using common objects and materials (e.g., which objects move faster or slower, which object goes faster or further when you just let go or give it a push). 16.A.2.2

3 Recognizes different types of matter (e.g., solid, liquid). 16.A.2.3

4 Explores different sources of light, how light reflects, and what happens when light is blocked. 16.A.2.4

5 Creates and describes sounds and what makes them change. 16.A.2.5

b **Engineering** 16.B

1 34-48 months 16.B.1

1 Uses common objects that function as simple machines during play. 16.B.1.1

2 46-60 months End of Preschool Standards 16.B.2

1 Compares tools or solutions and reflects on what works well. 16.B.2.1

2 Uses common objects to build simple machines that solve a problem. 16.B.2.2

Earth Science: the study of how the planet works and why, including the study of weather, rocks, soils, and water. 17

a Earth's Systems 17.A

1 34-48 months 17.A.1

1 Using simple tools, explores differences between soil, sand and water under different conditions. 17.A.1.1

2 Observes, describes, and compares different weather conditions (rainy, cold, warm, snowy, cloudy). 17.A.1.2

3 Suggests how weather affects human activities. 17.A.1.3

2 46-60 months End of Preschool Standards 17.A.2

1 Uses senses and tools (including technology) to describe and discuss how weather changes over time. 17.A.2.1

2 Plans and carries out simple experiments with rocks, sand, water or soil and records observations using drawings, discussions, graphs and technology such as digital microscopes. 17.A.2.2

b The Earth and Human Activity 17.B

1 34-48 months 17.B.1

1 Begins to describe how human activity affects the environment. 17.B.1.1

2 Uses water and energy responsibly (e.g. turning off lights when not in use, not wasting water.) 17.B.1.2

2 46-60 months End of Preschool Standards 17.B.2

1 Demonstrates, through observation and investigation, an understanding that human activity impacts the earth (uses of resources to make products). 17.B.2.1

Life Science: the study of living things and life processes. 18

a **Organisms: Structures and Processes** 18.A

1 34-48 months 18.A.1

1 Uses senses to observe and describe properties of familiar plants and animals. 18.A.1.1

2 Begins to use vocabulary for naming and describing plants and animals moving from general to specific labels. 18.A.1.2

3 Compares properties and needs of similar and different plants and animals. 18.A.1.3

4 Cares for plants and animals in the classroom and surrounding area and describes their needs. 18.A.1.4

2 46-60 months End of Preschool Standards 18.A.2

1 Compares how people and other animals grow and change (life cycles). 18.A.2.1

2 Uses vocabulary for naming plants and animals moving beyond general labels and begins to connect how they look to where and how they live. 18.A.2.2

3 Develops plans, based on observations and guided inquiry, to care for plants and animals in the classroom and surrounding area. 18.A.2.3

4 Begins to describe how animals adapt to weather conditions. 18.A.2.4

5 Identifies problems affecting the lives of plants and animals (including themselves) and generates possible solutions. 18.A.2.5