Massachusetts State Preschool Learning Experiences Science and Technology/Engineering Module

Created by UMass Boston EECIS faculty

Please press the play button to move to the next slide.
Overarching Principles

These principles should be kept in mind at all times when thinking about preschool curriculum and working with young children.

1. All children are capable of learning
2. Children show individual differences in development
3. Knowledge of child growth and development is essential for program development and implementation
4. Children’s language skills are the best indicators of academic success
5. Developmental domains are highly interrelated
6. Young children learn by doing
7. Families are the primary caregivers and educators of their young children
Overview of the Science and Technology/Engineering Preschool Learning Experiences

★ Inquiry Skills
★ Earth and Space Sciences
★ Life Sciences
★ Living Things & Their Environment
★ The Physical Sciences
★ Technology & Engineering

Review the Overview of the Science and Technology/Engineering document before continuing this module.
Inquiry Skills 1

1. Ask and seek out answers to questions about objects and events with the assistance of interested adults

How Can You Solve That? Video

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Inquiry Skills 2

2. Make predictions about changes in materials or objects based on past experience.

Guess the Tool Video

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Inquiry Skills 3

3. Identify and use simple tools appropriately to extend observations

I Love Science! Video

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Inquiry Skills 4

4. Record observations and share ideas through simple forms of representation such as drawings.

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5. Compare and contrast natural materials such as water, rocks, soil, and living organisms using descriptive language.

Exploring Water Video

Image courtesy of flickr by dckf $êr@pH!nX http://farm1.static.flickr.com/15/20670724_b112cb9320_z.jpg?zz=1 (2010) CC BY-NC-SA 2.0
6. Explore and discuss what air is or does (air takes up space inside bubbles and beach balls; air can move things; air can support things such as parachutes and kites).

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Earth and Space Sciences 7

7. Identify the characteristics of local weather based on first-hand observations.

Weather Graph Video

Weather Books

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Earth and Space Sciences 8

8. Explore sunlight and shadows and describe the effects of the sun or sunlight.

Ideas to Learn about Shadows and Sun

★ Measuring your shadow
★ Tracing your shadow
★ Observing how the shadow changes with movement
★ Observing colors creating by a prism
★ Watching plants grow toward sun

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9. Observe and describe or represent scientific phenomena meaningful to children's lives that have a repeating pattern (e.g., day and night)

Ideas for Teaching Night and Day

- Books - Creatures of the Night by Stephen Brooks or Good Night Gorilla by Peggy Rathmann or Goodnight Moon by Margaret Wise Brown
- Plant grass seeds in cups and give one sunlight and one grows in darkness
- Pictures of the sky with different media at night and day
- Scavenger hunt composed of items from their morning or nighttime routines

Image courtesy of flickr by brajan
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10. Observe and identify the characteristics and needs of living things: humans, animals, and plants.

Birds have beaks.

Birds have wings.

Birds have feathers.

Is this a bird?
11. Investigate, describe, and compare the characteristics that differentiate living from non-living things.

Using a Microscope Video
12. Observe and describe plants, insects, and animals as they go through predictable life cycles.

**Life Cycle of a Frog Thematic Unit**

Image courtesy of ourclassweb.com
http://thm-a01.yimg.com/nimage/32234a4ada19ee08
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13. Observe and describe ways in which many plants and animals closely resemble their parents in observed appearance.

Image courtesy of flickr by vanRijn
http://farm4.static.flickr.com/3331/3431272771_89404a8daf_z.jpg
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14. Describe or represent living things that inhabited the earth years ago, as children express interest.

Dinosaur Lesson Ideas

Extinct Animals Lesson Ideas

Image courtesy of flickr by Dyslopos
http://farm4.static.flickr.com/3632/3497831704_452770461c_z.jpg
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15. Use their senses of sight, hearing, touch, smell, and taste to explore their environment using sensory vocabulary.
Living Things & Their Environment 16

16. Observe and describe seasonal changes in plants, animals and their personal lives.

Image courtesy of flickr by Gary Lerude http://farm4.static.flickr.com/3651/3374786701_f0dbf7e940_z.jpg (2010) CC BY-NC-SA 2.0
17. Observe and describe how natural habitats provide for the basic needs of plants and animals with respect to shelter, food, water, air, and light.
18. Manipulate a wide variety of familiar and unfamiliar objects to observe, describe, and compare their properties using appropriate language.

What Will Happen to the Egg Video

Image courtesy of flickr by courosa
19. Explore, describe, and compare the properties of liquids and solids found in children's daily environment.

Sand Exploration

Oobleck Recipe
20. Investigate and describe or demonstrate various ways that objects can move.

Gravity Activities

Image courtesy of flickr by jessicafm http://farm1.static.flickr.com/128/351394649_dbc1b133c3_z.jpg (2010) CC BY-NC-SA 2.0
21. Explore and describe various actions that can change an object's motion such as pulling, pushing, twisting, rolling, and throwing.
22. Experiment with a variety of objects to determine when the objects can stand and ways that objects can be balanced.

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http://farm1.static.flickr.com/83/238482899_abdb081c35_z.jpg?zz=1
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23. Explore and describe a wide variety of natural and man-made materials through sensory experiences.

What Will Happen to the Egg
Video

Image courtesy of flickr by d.k.peterson http://farm5.static.flickr.com/4055/4471911338_cc118001c3.jpg (2010) CC BY-NC-SA 2.0
24. Demonstrate and explain the safe and proper use of tools and materials.

<table>
<thead>
<tr>
<th>Safety Rules</th>
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<tbody>
<tr>
<td>Always have an adult present when working with tools</td>
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<tr>
<td>Use child sized tools when possible</td>
</tr>
<tr>
<td>Only put out tools and materials as needed</td>
</tr>
<tr>
<td>Work in small groups</td>
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<tr>
<td>Explain directions before starting work and review safety procedures</td>
</tr>
</tbody>
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25. Explore and identify simple machines such as ramps, gears, wheels, pulleys, and levers through play experiences.

Simple Machines Review
26. Observe and describe ways that animals, birds, and insects use various parts of their bodies to accomplish certain tasks and compare them to ways people would accomplish a similar task.
Next Steps

* Read the articles included below that support why these standards are being taught and the best ways to teach them.

* Look over the Science scope and sequence checklist and inventory for meeting Science standards and keeping track of how you meet them. This is also a tool that can be used to plan progress monitoring for students. Remember you can work on multiple standards simultaneously.

* Complete the Science module quiz.

* Complete and turn in your Science module assignment via Blackboard.

Congratulations!! You have completed the Science Module.