
Professional Certificate in Play-Based Learning

Mathematics and Science in Play-Based Learning

Alphabetical Glossary of Terms for Mathematics and Science in Play-Based Learning:

1. Addition:

- Related Terms: Sum, Addend, Plus, Total
- Explanation: Addition is a mathematical operation that combines two or more numbers to find their total. In play-based learning, children can use blocks, counters, or other manipulatives to physically add quantities together. For example, if a child has 2 blocks and adds 3 more, they can physically count the blocks to see the total of 5.

2. Balance:

- Related Terms: Equilibrium, Scale, Weight
- Explanation: Balance refers to the state of equilibrium where two sides or objects are equal in weight or force. In play-based learning, children can explore balance by using a balance scale to compare the weight of different objects or quantities. For example, they can place blocks on each side of the scale to see when it is balanced.

3. Counting:

- Related Terms: Numbers, Sequence, Tally, Numerals
- Explanation: Counting involves assigning numbers to objects in a specific order to determine quantity. In play-based learning, children can practice counting by counting objects in their environment, such as toys, blocks, or books. They can also use number cards or number lines to practice counting sequentially.

4. Decomposition:

- Related Terms: Break apart, Split, Partition
- Explanation: Decomposition is the process of breaking a number into smaller parts or components. In play-based learning, children can decompose numbers by using manipulatives like counters or blocks. For example, to decompose the number 6, a child can use 4 counters and 2 counters to show the parts that make up 6.

5. Experiment:

- Related Terms: Test, Trial, Hypothesis, Observation
- Explanation: An experiment is a scientific procedure carried out to investigate a hypothesis, test a theory, or demonstrate a known fact. In play-based learning, children can conduct simple experiments to explore scientific concepts such as cause and effect, gravity, or buoyancy. For example, they can test which materials float or sink in water.

6. Fractions:

- Related Terms: Part, Whole, Numerator, Denominator
- Explanation: Fractions represent a part of a whole or a ratio of two numbers. In play-based learning,

children can explore fractions using manipulatives like fraction bars or circles. For example, they can divide a pizza into equal parts to understand the concept of fractions and how they relate to the whole.

7. Geometry:

- Related Terms: Shapes, Angles, Symmetry, Area
- Explanation: Geometry is the branch of mathematics that deals with the properties and relationships of points, lines, angles, surfaces, and solids. In play-based learning, children can explore geometry by identifying and creating shapes, measuring angles, and understanding symmetry. For example, they can build shapes using blocks or draw shapes in sand.

8. Hypothesis:

- Related Terms: Prediction, Guess, Experiment, Theory
- Explanation: A hypothesis is a proposed explanation based on limited evidence as a starting point for further investigation. In play-based learning, children can develop hypotheses about scientific phenomena and test them through experiments or observations. For example, they can hypothesize that plants need sunlight to grow and conduct an experiment to test their hypothesis.

9. Inquiry:

- Related Terms: Investigation, Question, Research, Curiosity
- Explanation: Inquiry refers to the process of asking questions, seeking information, and investigating a topic to gain understanding. In play-based learning, children can engage in inquiry-based activities to explore scientific concepts, such as observing insects in a garden or conducting simple experiments. Inquiry-based learning encourages children to ask questions, make predictions, and seek answers through exploration.

10. Juxtaposition:

- Related Terms: Side by side, Compare, Contrast
- Explanation: Juxtaposition is the act of placing two or more things close together or side by side for comparison or contrast. In play-based learning, children can use juxtaposition to compare and contrast objects, shapes, colors, or sizes. For example, they can line up blocks of different colors to compare their lengths or stack blocks in different ways to see how they balance.

11. Kinesthetic Learning:

- Related Terms: Tactile, Hands-on, Physical, Movement
- Explanation: Kinesthetic learning involves learning through physical activities, movement, and hands-on experiences. In play-based learning, children can engage in kinesthetic learning by using their bodies to explore mathematical and scientific concepts. For example, they can use their hands to manipulate objects, build structures, or conduct experiments to understand concepts like balance, force, or measurement.

12. Logic:

- Related Terms: Reasoning, Deduction, Puzzle, Thinking
- Explanation: Logic refers to the process of reasoning, making inferences, and drawing conclusions based on evidence or rules. In play-based learning, children can develop logical thinking skills by solving puzzles, riddles, or mathematical problems. For example, they can use logic to sequence numbers, solve patterns, or

identify relationships between objects.

13. Measurement:

- Related Terms: Length, Weight, Capacity, Units
- Explanation: Measurement is the process of determining the size, length, weight, or capacity of an object or quantity using standard units. In play-based learning, children can practice measurement by comparing objects, using non-standard units like blocks or paper clips, or exploring concepts like length, weight, or volume. For example, they can measure the length of a table using blocks or compare the weight of different objects using a balance scale.

14. Numeracy:

- Related Terms: Number sense, Counting, Operations, Patterns
- Explanation: Numeracy refers to the ability to understand and work with numbers, mathematical concepts, and operations. In play-based learning, children can develop numeracy skills by exploring numbers, patterns, and relationships through hands-on activities. For example, they can practice counting, addition, subtraction, and other mathematical operations using manipulatives like counters, number lines, or math games.

15. Observation:

- Related Terms: Watch, Look, Notice, Record
- Explanation: Observation is the act of watching, noticing, and recording information about objects, events, or phenomena. In play-based learning, children can practice observation skills by using their senses to explore the environment, make predictions, and record their findings. For example, they can observe changes in plants, animals, or materials over time and document their observations in a journal or notebook.

16. Patterns:

- Related Terms: Sequence, Repetition, Rule, Symmetry
- Explanation: Patterns are recurring sequences or arrangements of objects, shapes, numbers, or events. In play-based learning, children can identify, create, and extend patterns using different materials or manipulatives. For example, they can create patterns with blocks, beads, or colors to practice recognizing and predicting patterns in mathematics and science.

17. Quantity:

- Related Terms: Amount, Number, Measure, Total
- Explanation: Quantity refers to the amount or number of something, such as objects, units, or measurements. In play-based learning, children can explore quantity by counting objects, comparing amounts, or measuring quantities using different tools. For example, they can use blocks to represent quantities, compare the number of objects in two sets, or measure the length of a line using non-standard units.

18. Ratio:

- Related Terms: Proportion, Fraction, Comparison, Rate
- Explanation: A ratio is a comparison of two quantities or numbers using division or a fraction. In play-

based learning, children can explore ratios by comparing the sizes, quantities, or proportions of objects using manipulatives like blocks, counters, or measuring tools. For example, they can compare the number of red and blue blocks in a set to create a ratio or use fraction bars to represent ratios visually.

19. Sorting:

- Related Terms: Categorize, Classify, Group, Organize
- Explanation: Sorting involves arranging objects or items into groups or categories based on common attributes, characteristics, or properties. In play-based learning, children can practice sorting by organizing objects by color, shape, size, or other criteria. For example, they can sort blocks by color, group animals by type, or classify shapes based on the number of sides.

20. Transformation:

- Related Terms: Change, Rotate, Reflect, Translate
- Explanation: Transformation refers to the act of changing the position, orientation, or shape of an object through rotation, reflection, translation, or other operations. In play-based learning, children can explore transformations by manipulating shapes, objects, or patterns to understand how they change. For example, they can rotate a shape, reflect an image, or translate a pattern to see how it transforms.