Patterns and Numbers

Mid-Valley
STEM-CTE HUB

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Patterns and Numbers

The Patterns and Numbers STEAM Kit offers a hands-on approach to understanding number relationships, sorting, and pattern recognition. The kit includes sorting trays, sorting manipulatives, and graph paper, providing students with the tools to explore mathematical concepts such as sorting, sequencing, and identifying patterns. This kit encourages critical thinking, problem-solving, and collaborative learning through engaging activities that build a solid foundation in early math concepts.

Grade Level

PreK - 3rd

Group Size

1 - 3

Time Duration

10 - 30 minutes

Content of Kits

Components

- 8 sorting trays
- 3 bins of plastic figure manipulatives

Consumables

- Graph paper

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Usage

Getting Started

1. **Unbox and Inspect Components -** Begin by unboxing the Patterns and Numbers kit and verifying that all components are present and undamaged. This includes the sorting trays, sorting manipulatives, and graph paper.

2. **Organize the Sorting Trays -** Lay out the sorting trays for each group of students. These trays will be used for organizing and sorting the manipulatives into different categories, such as colors, shapes, or numbers.

3. **Sort the Manipulatives -** Divide the sorting manipulatives into different categories based on their attributes (e.g., color, shape, number, size). Students will use these manipulatives to sort, group, and identify patterns during the activities.

4. **Prepare the Graph Paper -** Hand out the graph paper to each student or group. They will use it for recording patterns, creating charts, and visualizing relationships between numbers and shapes as they work through the activities. We recommend making copies of the graph paper to help the provided resource stretch as far as possible.

Storage

- Please ensure that all manipulatives return to their original category bins which are organized by type. (Bugs, Fruits, etc.)
- Wipe down the sorting trays with a dry cloth or a gentle cleaning solution

Troubleshooting

- N/A

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Activity Guide

Beginner

Sort and Match
Students will begin by sorting the manipulatives into categories based on attributes like color, shape, or number. They will place each type of manipulative into the corresponding sorting tray. After sorting, they will compare their groupings and discuss why they made their choices. This activity helps students develop an understanding of sorting and classifying, which are foundational skills in early math education.

Intermediate

Pattern Creation
Students will use the sorting manipulatives to create and extend patterns. For example, they might create a pattern using alternating shapes or colors (e.g., red circle, blue square, red circle, blue square). Once they create their own pattern, students will ask their peers to identify the next elements in the pattern. This activity reinforces pattern recognition and helps students understand the concept of repeating sequences.

Advanced

Number Patterns
Students will use the sorting manipulatives to explore number patterns. Using the graph paper, they will record their findings and create numerical patterns (e.g., counting by twos, fives, or tens). Students will identify how the numbers progress and create their own number patterns, which can then be visualized on the graph paper. This helps students connect the concept of numbers with their visual representation, deepening their understanding of number relationships.

Extension Activities:

Pattern Graphing
For a more advanced challenge, students will use the graph paper to plot patterns they have created with the sorting manipulatives. They will draw and label their patterns on the graph, connecting mathematical concepts like sequences, number patterns, and coordinate plotting. This activity strengthens the connection between physical manipulatives and abstract mathematical concepts, giving students a concrete method to visualize and analyze patterns.

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Learning Extensions

STEAM Connections: Math

Learning Objectives:

- Develop sorting and classification skills.
- Enhance pattern recognition and sequencing abilities.
- Reinforce understanding of numbers and their relationships through visual aids.
- Foster problem-solving and critical thinking skills through hands-on activities.
- Apply mathematical reasoning to create and extend number and shape patterns.

Career Connections:

- **Mathematician -** Uses patterns and number relationships to solve complex problems.
- **Engineer -** Applies concepts of sorting, sequencing, and pattern recognition in design and construction.
- **Data Scientist -** Analyzes patterns in data and uses mathematical principles to make predictions and solve problems.
- **Educator -** Teaches foundational mathematical concepts using hands-on learning tools to enhance student understanding.

Essential Employability Skills:

- Critical Thinking
- Collaboration
- Communication
- Creativity
- Attention to Detail

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Resources and Accessibility

Safety Guidelines

- Handle sorting manipulatives gently to prevent loss or damage.
- Supervise students during activities to prevent choking hazards.
- Supervise students during activities to ensure the sorting trays and manipulatives are used appropriately.

Accessibility

- Use tactile markers for sorting trays and manipulatives to help students identify and classify items.
- Allow extended time for activities and offer assistance with manipulating small objects.
- Provide simplified instructions and offer additional practice opportunities.
- Use visual cues and written instructions to support understanding.

Library Catalog

Library Resources

Feedback

QR to feedback survey