

# Session 3: Number Diagrams

| Session Title      | Number Diagrams   |
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| Objective          | <ol style="list-style-type: none"><li>1. Understand different ways to represent numbers using diagrams and number sentences.</li><li>2. Explore addition, subtraction, and multiplication patterns for small numbers.</li><li>3. Strengthen visual learning and numerical flexibility using hands-on activities.</li></ol>  |
| Concept            | <p>Number diagrams are visual representations that show the different ways to break down or build a number using operations like addition, subtraction, or multiplication.</p> <p><b>Examples:</b></p> <ul style="list-style-type: none"><li>• <math>4 = 2 + 2</math></li><li>• <math>4 = 2 \times 2</math></li><li>• <math>4 = 1 + 1 + 2</math></li><li>• <math>4 = 5 - 1</math></li><li>• <math>4 = 8 - 4</math></li><li>• <math>4 = 8 \div 2</math></li><li>• <math>4 = 16 \div 4</math></li></ul> |
| Materials Required | <ol style="list-style-type: none"><li>1. Board &amp; Chalk</li><li>2. Number cards</li><li>3. Colored markers</li><li>4. Chart paper</li><li>5. Dice</li><li>6. Counters - Counters means small physical objects used to help students visualize and solve math problems. They can be anything like: (Colored chips, Bottle caps, Beads, Pebbles, Coins, Buttons)</li></ol>   |

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| Methodology      | Activity-based Learning: Drawing diagrams, u<br>counters. Exploratory Learning: Discovering<br>patterns in numbers through multiple operati |
| Session Duration | 90 Minutes  |

## Introduction Activity (15 minutes):

### Number Diagram

Write a number (e.g., 4 or 5) in the center of a chart. Ask students to shout out all the ways they know to make that number using +, -, ×. Write each version as a diagram around the number like a web.

## Main Activity (60 minutes):

### Counter Challenge (20 minutes)

#### **Divide the students into small groups**

1. Children in every group are given 10 counters and a number (e.g. 6).
2. Ask them to use the counters to show different ways to make the number:
3. Grouping (e.g.  $3 + 3$ )
4. Arrays (e.g.  $2 \times 3$ )
5. Removal (e.g.  $10 - 4$ )
6. Students draw diagrams of each representation.

### Diagram Race Game (20 minutes)

(Show one example of how to do it.)

1. Write numbers 1-10 on the board.
2. Divide the class into teams.
3. Each team gets a number and 3 minutes to write or draw as many correct diagrams as possible (e.g.  $6 = 3 + 3$ ,  $2 \times 3$ ,  $7 - 1$ ).

4. Teams present and explain their diagrams.

## Time to Solve (20 Minutes)

1. Match the number diagrams to their values.
2. Complete number webs.
3. Create 3 different diagrams for each of the given numbers: 5, 6, and 8.

## Review Questions (5 minutes):

Ask:

1. How many ways can you show the number 7?
2. Is  $2 \times 3$  the same as  $3 + 3$ ? Why or why not?
3. What's the smallest number you can show using both multiplication and subtraction?

## Follow-up Tasks (10 minutes):

Homework:

1. Choose a number between 5 and 10. Show 4 different ways to make that number using diagrams.
2. Complete a number web for the number 6 using  $+$ ,  $-$ ,  $\times$ .
3. Explain which representation you find easiest and why.

## Expected Learning Outcome:

Knowledge building:

- Deeper understanding of number structure.
- Flexible use of basic operations to express numbers.

Skill Building:

- Visual reasoning
- Creative problem-solving

- Mathematical communication
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