Participant Name: Jan Barnes  
Broad Topic: Linear Equations

Subtopic: Forming equations based on number patterns

Aim:
To discover the equation of a line.

Specific Objective(s):
- Students will accurately record data collected from the game, “You're On A Roll.” See page 3.
- Students will create number sentences by rolling dice.
- Students will be able to choose their own values for the multiplication and addition steps and collect data.

Materials/Supplies:
Student:
- Dice (1 per child)
- Recording sheet for “You're On A Roll”. Pencil

Teacher:
- Colored markers
- Chart paper with sample recording sheets that are given to students.
- Chart paper with directions on how to play the game

Lesson:
- Introduction: 6 minutes
  - Guided discovery of dice (part of “Responsive Classroom”).
  - Discuss what “we’re on a roll” means? (Brief discussion). "We're going to play a game to generate number patterns."
- Activity: 20 minutes
  - Teacher explains and shows on chart paper a copy of the student-recording sheet for “You're On A Roll.”
  - Teacher reviews rules for game and displays steps on chart paper for reference. Teacher models how to play game with one round and records data on chart paper.
  - Check for questions to clarify how to play.
  - Pass out student copy of recording sheet, “You're On A Roll,” and one die per student. (They are in pairs for Part I, the top table.)
  - Whole group, play one round and all record data.
  - Students take turns rolling die and recording until all numbers on the die are used. (This is Part I of the game.)
  - Students then use the bottom chart to create their own values for "X" and " +". (This is Part II of the game.)
  - Students play; teacher monitors groups to make sure everyone is playing correctly.
  - Game is over and students keep recording sheet, but turn in dice.
Directions for The Game:

Part I:
1. Partner A = Roll die (1 x)
2. Partner B = record results on recording sheet
3. Switch turns
4. Complete chart until all numbers on die are used.

Part II:
1. On a new table, create a new game with new variables for "x" (x) and " + " by rolling the die.
2. Individually, play the game by rolling a die and recording results.
3. Extra blank tables are available for extended play.

o Closure: 4 minutes
  o Regroup as a whole class and teacher guides students to help them discover an equation from their data. Examples:

    \[ x \times \square + \square = y \quad 4 \times 2 + 3 = 11 \quad \square \times 2 + 3 = \square \]

o Possible Extensions:
  o Create an equation with fractions.
  o Create number sentences with subtraction rather than addition.
  o Create a NON-line equation...of: \( x \times 2 + x = y \). Discuss/discover the difference.

Text or Website References:
  o “You’re On A Roll” game was created as an enrichment activity growing out of completion of “What’s my Rule” tables in Everyday Math, Grade 5. It does not use Everyday Math materials.
## YOU'RE ON A ROLL

<table>
<thead>
<tr>
<th>DICE ROLL</th>
<th>* 2</th>
<th>+3</th>
<th>=</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DICE ROLL</th>
<th></th>
<th></th>
<th>=</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=</td>
<td></td>
</tr>
</tbody>
</table>