

Preliminary Planning Sheet

Grade 3 – Jugglers Juggling

Domain(s)

Operations and Algebraic Thinking

Standard(s)

3.OA.D.9

Mathematical Practices

MP.1 MP.3 MP.4 MP.5 MP.6 MP.7

Major Underlying Mathematical Concepts

- Patterns/Relationships
- Ordinal numbers
- Addition/Multiplication
- Number sense to 21

Problem Solving Strategies

- Model (manipulatives)
- Diagram/Key
- Table
- Tally chart
- Number line
- Graph
- Array

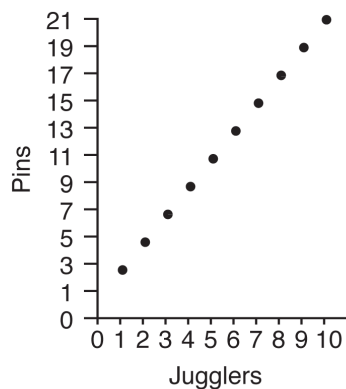
Formal Mathematical Language and Symbolic Notation

- Model
- Diagram/Key
- Table
- Tally chart
- Graph
- Axis
- Pattern
- Per
- Input/Output
- Odd/Even
- Sets
- Rules: $(2j) + 1 = P$
- Variable
- Dozen
- More/Less than
- Ordinal numbers: 1st, 2nd, 3rd ...

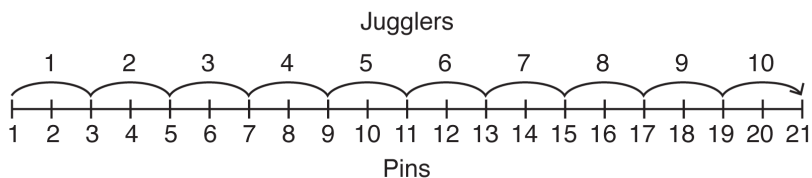
Possible Solution(s)

7 jugglers can juggle 15 pins and 10 jugglers can juggle 21 pins.

Rule
j is juggler
p is pins
 $(2 \cdot j) + 1 = p$



Jugglers	Pins
1	3
2	5
3	7
4	9
5	11
6	13
7	15
8	17
9	19
10	21



Possible Connections

Below are some examples of mathematical connections. Your students may discover some that are not on this list.

- The first juggler juggled 3 pins alone, but each new juggler only adds 2 pins.
- Patterns: Pins +2, Jugglers +1.
- 7 jugglers use a dozen more pins than the first juggler ($15 - 3 = 12$).
- Generalize and prove the rule: $(2j) + 1 = P$.
- Solve more than one way to verify the answer.
- Relate to a similar task and state a math link.
- 10 jugglers juggle 18 more pins than just 1 juggler.