Performance based assessment: The Classic Handshake Problem

NCTM: Algebra
Mathematical Problem Solving

Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-life data and situations within and outside mathematics and then apply appropriate strategies to find acceptable solutions.

Problem Overview:

The problem:

There are 20 people in a room. If everyone shakes hands with everyone else, how many handshakes will take place?

Start by working on the problem. Can you convince a skeptic that your answer is correct? Can you generalize? What if there were 100 people in the room?

Anticipated Students Response and performance	Tools & Technology
Algebraic Habits of Mind (Driscoll, 1999) 　　1. Abstracting from computation 　　2. Doing and undoing 　　3. Building a rule from patterns Signposts for evaluation Did the student use: _____Pictures, charts, graphs, or t-tables with supporting explanation _____ A written explanation with detailed sentences _____ The equation or number sentence _____The answer (Is the answer reasonable? Why or why not?) _____The solution in more than one way or related to other situations	Manipulatives
Questions for probing:	**Real life Connections & Vertical connections**
Related problems:	

GMU COMPLETE: Center for Outreach in Mathematics Professional Learning & Educational Technology

The Classic Handshake Problem

1. *If everyone at your table shakes hands with everyone else, how many handshakes would there be?*

2. *If everyone in your class shakes hands with everyone else, how many handshakes would there be?*

3. *What if there were 100 people in the room?*

4. *At a birthday party, every child shakes hands with every other child. If 190 different handshakes take place, how many children were at the party?*

Please show your work. Check (x) off each one as you use it. Be sure to include the following:	**Teacher Use Only**
___ Pictures, charts, graphs, or t-tables that support your explanation ___ A written explanation with detailed sentences ___ The equation or number sentence ___ The answer (Ask yourself: Is my answer reasonable? Why or why not?) ___ The solution in more than one way or related to other situations	Analytical Score: Understanding - N A P E Computation- N A P E Strategy- N A P E Reasoning & Proof - N A P E Communication- N A P E Holistic Score N A P E