

Scaffolding Accountable Talk

Before task:

1. If one table seats 4, how would we find out how many seats are available with 8 tables? (Algebraic expression)
2. What is the task asking us to do?
3. What do you know about banquet /tables?
4. If 4 can sit at one table, how many can sit at 4 tables? What if we have to push tables together?
5. What shapes are you familiar with? What makes them different?
6. What is a variable? How is it used?
7. What do you remember about banquet tables? (*Ask follow-up questions focusing on math responses from students*)
8. Can anyone tell me what the word variable means?
9. Show pictures of 2/3 banquet halls. Different set-ups and crowdedness. Compare and contrast. Analyze why. How would you change?
10. Give students 4 manipulatives (triangle, square, etc.) Ask students how many different ways can the pieces be arranged and ask them how does that affect the seating arrangements.
11. How many people can sit at a table?
12. What if two or more tables were placed end-to-end?

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During task:

1. (Focus) How does connecting the tables change the number of seats?
2. (Assessing) Explain your thinking.
3. (Advanced) What would happen if we changed the shape of the table?
4. Can you explain in your own words?
5. Can you represent your answer in a different way?
6. What relationship do you see between the number of seats vs. the number of tables in your chart?
7. What happens when you push the tables together?
8. Is there a way to show me the seats with the pattern blocks?
9. Are the tables all the same? (number of people). Look for patterns/systems. Where are they? Does it mean anything?
10. Have students to try to see a pattern when additional tables are added. Have students to try to come up with some type of mathematical representation.
11. How many seats are eliminated when additional tables are added?
12. How many seats are added with each additional table?

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After task:

1. What are some similarities and/or differences?
2. What are some patterns?
3. Is it possible to have one equation for all the shapes? Why or why not?
4. How did you get from the drawings to your equation?
5. How would you teach your younger sibling or friend what you learned?
6. What are the similarities/differences between the different solutions?
7. The different representations show different ways of expressing the same information. How does this relate to each other.....to the real world banquet? (graph/algebraic)
8. Extension apply to real world experiences. Show students a real banquet hall (i.e. Carson Center) have them tell how the seats can be arranged to maximize occupancy.
9. Do you see a pattern?
10. How do you explain the results?

Mathematics Addressed:

- Mathematical Reasoning
- How to set up equations
- Graph concepts
- Four representations
- Variables
- Discrete graph
- Slope
- Expressing patterns algebraically
- Equating equations
- Use information to go from concrete to abstract
- Using manipulatives to give patterns
- Use addition and multiplication to solve algebra problems
- Meta cognitive thinking
- Being able to discuss what they are doing
- Multiple entry points

Students will walk away with...

- Be able to express numerical, graphical representations
- Making connections between these representations
- Understand algebra concepts represented in lesson through use of manipulatives, review prior learning
- Deductive Reasoning to solve problems

Instructional Strategies

Gifted students – Divide into groups with the different shapes.

- Talk moves – Re-voicing, wait time, agree/disagree
- Use of manipulatives
- Scaffolding
- Modeling
- Graphic organizers
- Realia (cubes)
- Indirect Reciprocal Teaching

Increased Access

- Repetition
- Thinking map to sequence the learning
- By visual

Framer

- Word wall
- Personal dictionary
- Teacher modeling
- Word search
- Graphic organizers
- Pre-teach
- Re-captioning (Repetition)

Differences

- Different intervals
 - The Δ increases by 1
 - The \blacksquare increases by 2
 - The \blacktriangle increases by 3
 - The \blacklozenge increases by 4
- Increases by 2 less than the number of size
- 1 table: The difference between the graph is 1
- Different steepness
- They start at different places

Similarity

- Colored dot
- Linear
- Discrete
- Constant difference b/w dots
- They all are increasing
- Always one more

Cooperative Learning

- Asking clarifying questions
- Division of Labor (i.e. Individual/Group)
- Similarities/differences and their connections to graph
- Selected sharing with a purpose
- Linking the different representations
- Randomly select student work