

## EXPLORATORY LESSONS

Background: our exploratory lessons focused on several aspects of spatial reasoning and geometry. The following tasks focused on:

### Free Play with Manipulatives

- Open-ended exploration of materials (e.g., tangrams, pattern blocks, cubes) was a springboard to developing exploratory lessons and clinical interviews

### Tangrams/Pattern blocks

- Language/gesture of transformations
- Composing/decomposing shapes
- Scaling (fill-in tasks)
- Visualizing

### 4-cube challenge

- Orientation/perspective taking
- Congruent vs. similar
- Comparing

### 2D & 3D mental rotations

- Orienting
- Visualizing
- Comparing
- Transformations
- Composing/recomposing
- Perspective taking



### Inverse Levine

- Symmetry
- Composing and decomposing
- Orientation/transformation

### *Our learning from observations of students:*

- Provided a framework for other exploratory lessons and the public lesson, acted as a spring board for play experiences;
- Demonstrated that prior experience to spatial reasoning tasks improved student perseverance and ability to compose and decompose shapes (which led to our interest in student ability to mentally rotate with pattern blocks/tangrams);
- Provided opportunities for rich talk to describe comparisons of one figure to another (4-cube challenge);
- Demonstrated that in some cases narrative can be distracting from the mathematics and may take away from non-verbal spatial reasoning (2D & 3D mental rotations), and led us to inquire about the context of playing with figures without a narrative as you will see in today's lesson;
- Highlighted the importance of gesture use (teacher and student) to support students' mental rotation abilities (Inverse Levine).

When you have a minute, we invite you to explore the display of tasks, photos, student work, etc. set up in the library.

