

Mathematics:

Working With Blocks to Explore the Mathematics Foundations

Strands:	<i>Number Sense</i>	<i>Algebra and Functions</i>	<i>Measurement</i>	<i>Geometry</i>	<i>Mathematical Reasoning</i>
<p>GETTING READY</p> <p>Instructional Component(s): In-Class Activity</p> <p>Strands: This activity can be used to develop familiarity with and deepen understanding of all mathematics strands or of individual strands.</p> <p>Focus: Students engage with the rich possibilities of using blocks to develop math vocabulary, concepts, and skills in young children.</p> <p style="text-align: center;">AFTER PARTICIPATING IN THIS ACTIVITY</p> <p>Students will demonstrate knowledge and skills that are consistent with an increased understanding and application of the concepts addressed in this activity.</p> <p>Students will demonstrate an understanding of:</p> <ul style="list-style-type: none"> • The vocabulary and concepts embedded in the foundations in mathematics, including strands, substrands, foundations, and examples of foundations (introductory understanding) (<i>Standards 1 & 5</i>)* • Where and how children experience mathematics in their early childhood education programs (<i>Standards 4 & 5</i>)* • How blocks can be used to engage young children with math skills and concepts (<i>Standards 1, 4, & 5</i>)* • The relationship of language to developing knowledge and skills in mathematics (<i>Standard 1</i>)* • The foundations for social-emotional development (initial overview) (<i>Standards 1 & 5</i>)* • How aspects of social-emotional development can be related to developing skills and behaviors in mathematics (<i>applies to "Taking it further"</i>) (<i>Standard 1</i>)* • The interrelatedness of domains of development, including examples from all the foundations in the PLF, V1 (social-emotional development, language and literacy, English-language development, and mathematics) (<i>applies to "Taking it further"</i>) (<i>Standard 1</i>)* <p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify how during a typical activity (blocks) in an early childhood setting children engage in and demonstrate skills and behaviors described in the foundations in mathematics (<i>Standards 1, 4, & 5</i>)* • Use the vocabulary and concepts from the foundations in mathematics (<i>Standards 1 & 5</i>)* • Consider how to use activities in the block area to support children who are English learners build vocabulary relating to mathematics (<i>Standards 1, 4, & 5</i>)* • Connect the foundations in social-emotional development to a group block building activity (<i>applies to "Taking it further"</i>) (<i>Standards 1 & 5</i>)* <p>*See Appendix A</p>					

Mathematics: **Working With Blocks to Explore the Mathematics Foundations**

Before you start

Blocks have been seen for many years as a particularly fruitful activity for engaging young children with math skills and concepts. This activity provides students with an opportunity to engage with blocks in the way that young children do, and to discover the language, concepts, and skills that are relevant to the math foundations as children build with blocks. It can also be helpful in demonstrating that language is critical to early engagement with mathematics.

Getting it started

Organize students into small groups of three or four and give each group some blocks. If you are able to give each group a different amount you might get more variety in the results. Give students about ten minutes to build whatever they want with the blocks you have given them.

Keeping it going

If convenient, you also might want to use different sized blocks of differing materials, if convenient. If a preschool classroom is nearby, try this activity after the children are gone, or consider borrowing soft foam blocks, uniform cubes, or other types of building blocks.

Students could also be given patterns to try to replicate, such as building patterns or photographs of other block structures. blocks in wood, plastic, rubber, or other materials [Note – did not understand why these types of blocks are in this sentence – recommend deleting]

Putting it together



Slides 2-3

When students have finished, ask them the following questions:

What vocabulary related to the math foundations do you remember using as you built your structure?

- Number Sense: Did you do any counting and/or comparison of quantity?
- Geometry: Did you name and/or compare shapes?
- Measurement: Did you discuss or compare size, volume or weight?
- Algebra and Functions (Classification and Patterning): Did you put patterns together? Did you talk about symmetry? Did you sort by any characteristics of the blocks?
- Mathematical Reasoning: Did you analyze what would work and what would not?

As they recall the vocabulary words relating to the foundations, record the words for all to see. Keep this list for further work below.

Taking it further

Next ask students to think about what they would do in relation to these vocabulary words if they have children who are English learners. How could they use the block area to build English vocabulary relating to mathematics in all students? For example, it would be important for adults working with the children to know some of these words in the home language of the children.

In addition, some of these words might be posted near the block area in both home language and English so that they could be used and paired as children are working with blocks.

Another way

This activity also can be accomplished by assigning a scribe to each small group so that words are recorded as they are used. While this method might collect more vocabulary words, it also makes students more self-conscious of their conversation and can produce more contrived results

You could also ask students to take about 10-15 minutes in their group and quickly review the social-emotional development foundations. As they do so, ask them to think about which ones apply to their group's building activity.

Ask students to reflect on the implications of this for introducing math concepts to young children.

Targeting individual strands



Slide 4

If students have completed all three phases of this activity, they have touched on all the foundation domains in the *California Preschool Learning Foundations, Volume 1* (language and literacy, social-emotional development, English-language development, and mathematics).

As you look at the math strands, ask these questions:

- Which of the strands from other domains support the development of skills within each math strand?
- Which is co-developing?
- Which is strengthened?