

### What is the EMAS?

The Early Mathematics Assessment System (EMAS) is a reliable and valid research-based assessment of early mathematical thinking that draws on modern cognitive science as well as developmental and educational research. Created by Dr. Herb Ginsburg and colleagues at Teachers College, Columbia University,<sup>1</sup> and expanded and adapted by researchers at CASTL, the EMAS is designed to measure a broad range of mathematical content.

### EMAS at a glance

- Teachers administer the assessment to students individually using a flip book and manipulatives.
- The assessment takes approximately 20-25 minutes per student to administer in the fall and spring.
- Items are designed to capture a wide range and variety of early math skills. Students are not expected to get all items correct.
- It uses hands-on materials to engage children and help teachers observe students' thinking.
- It is aligned with the Virginia Foundation Blocks, Virginia Standards of Learning (2016), and Clements and Sarama's Mathematics Learning Trajectories (2009)<sup>2</sup>

### What skills are assessed with the EMAS?

The EMAS is designed to focus on key foundational skills in each mathematics sub-domain that set students on a successful early math trajectory. The EMAS is comprised of the four modules indicated below. The number of items in each module varies from fall to spring, but there is a larger number of numeracy items as compared with other sub-domains because of the strong focus on this area in kindergarten.

Module 1	Module 2	Module 3	Module 4
<b>Geometry</b> 	<b>Patterning</b> 	<b>Numeracy</b> 	<b>Computation</b> 
<ul style="list-style-type: none"> <li>• Shape Matching &amp; Identification</li> <li>• Shape Properties</li> <li>• Composing Shapes</li> </ul>	<ul style="list-style-type: none"> <li>• Recognizing Patterns</li> <li>• Reproducing Patterns</li> <li>• Extending Patterns</li> <li>• Creating Patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Counting and Cardinality</li> <li>• Subitizing</li> <li>• Comparing &amp; Ordering Numbers</li> <li>• Composing &amp; Decomposing Numbers</li> <li>• Recognizing &amp; Writing Numerals</li> <li>• Describing Sets</li> <li>• Ordinal Numbers</li> <li>• Sharing Fairly</li> </ul>	<ul style="list-style-type: none"> <li>• Adding &amp; Subtracting</li> </ul>

<sup>1</sup> Ginsburg, H. P., Pappas, S., & Lee, Y. (2010). Early Mathematics Assessment System. An unpublished assessment measure created as part of the NIH supported project Computer Guided Comprehensive Mathematics Assessment for Young Children (Project number 1 RO1 HD051538-01).

<sup>2</sup> Clements, D. H., & Sarama, J. (2009). *Learning and teaching early math: The learning trajectories approach*. New York: Routledge.

## What is the CBRS?

The Child Behavior Rating Scale (CBRS)<sup>3</sup> measures two areas of students' social-emotional skills:

- **Self-regulation:** The skills to control one's own attention, emotions, and behaviors to cope with the demands of the school environment. Examples include being able to listen to teachers, following rules and multi-step directions, and staying focused on tasks.
- **Social skills:** The skills to navigate interactions and relationships with peers and adults successfully. Examples include cooperating in a group, expressing emotions, and resolving conflicts in a positive way.

VKRP uses the CBRS to measure these two skills because it's reliable and valid across culturally diverse contexts.

## CBRS at a glance

- The CBRS is a short rating scale that teachers complete outside of instructional time.
- It assesses a student's behavior with other children and adults as well as how the student engages with materials and tasks in the classroom.
- It includes a set of 17 items that are assessed with a rating scale from 1 to 5 to determine the frequency of certain behaviors.
- It takes approximately 1 to 3 minutes to complete per student using the online system.
- It is completed twice during the kindergarten school year, in the fall and in the spring.

Items 1-10	Items 11-17
<p style="text-align: center;"><b>Self-Regulation</b></p> <div style="text-align: center;"></div>	<p style="text-align: center;"><b>Social Skills</b></p> <div style="text-align: center;"></div>
<p>The ability to control one's own attention, emotions, and behaviors to cope with the demands of the environment.</p> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• Listening to teachers</li> <li>• Following rules and multi-step directions</li> <li>• Focusing on tasks and attempting new challenges</li> </ul>	<p>The child's ability to navigate teacher and peer interactions successfully.</p> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• Group cooperation</li> <li>• Expressing emotions and needs positively</li> <li>• Resolving conflict and avoiding aggression</li> </ul>

<sup>3</sup> CBRS – July, 2012 Bronson, M. B., Goodson, B. D., Layzer, J. I., & Love, J. M. (1990). Child behavior rating scale. Cambridge, MA: Abt Associates