Vignette 1. Calvin (Adapted from Berry, 2008)

Calvin is a sixth grade Black boy who considers himself to be smart with a little "swagger." He attends school in an urban school division located in a southeastern state. As an elementary school student, Calvin earned the highest level of achievement on the third, fourth, and fifth grade state standardized mathematics tests. On all objective measures in mathematics, Calvin has performed well and in most cases has excelled. In addition, he has earned good grades in mathematics by earning primarily A's with an occasional B. Calvin stated that mathematics is his favorite subject and that mathematics comes naturally to him and is easy. He loves challenging mathematics problems and mathematics puzzles.

Calvin's mother acknowledges that her son a "busy body" and is in need of a variety of stimulation in order to prevent boredom. She also stated that Calvin needs to feel that his teachers are interested and cares about him in order for him to be productive in class. Both Calvin and his mother admit that he can be a handful in class. Occasionally, he speaks out or is not in his seat at the appropriate time. His behavior is not always that of a model student; however, they believe his behavior is well within acceptable classroom norms.

At the end of fifth grade, Calvin was excited about going to middle school. At that time, teachers identified students to take a mathematics placement test to gain entry into an upper-level pre-algebra mathematics course for sixth graders. Calvin was upset because he was not selected and there were students selected to take the test who he considered were not as "good at math." Calvin's mother inquired about the criteria for selection of taking the placement test and discovered that Calvin met all criteria except one, teacher recommendation. Calvin's fifth grade teacher indicated that although Calvin scored well on assessments, his behavior and his inability to sit still would not make him a good candidate for pre-algebra in sixth grade. In a conference with the sixth-grade guidance counselor, Calvin's mother inquired about placement in pre-algebra. The guidance counselor responded that she would not want to place Calvin in a class he would not do well. Calvin's mother felt that the counselor did not consider Calvin's previous mathematics performance and focused on other things. The principal at the middle school evaluated Calvin's situation and argued that pre-algebra is a rigorous course for sixth grade students and only disciplined students are capable of passing this course. Even though Calvin had performed well in mathematics throughout his schooling, school personnel focused their attention on behavior rather than academics when evaluating his potential. When the sixth grade school year began, the pre-algebra class had no Black male students.

Calvin's school district is concerned about the achievement gap. In fact the school division has a goal statement focused on the achievement gap stating "it seeks to understand the causes of this gap in order to devise solutions to reverse it." Calvin's story raises questions about beliefs that school districts hold for Black boys. Fortunately, Calvin had a persistent mother who advocated for her son and challenged the school division and Calvin gained entry into the pre-algebra class the second week of the new school year. Unfortunately, Calvin's story is not unique; Black boys are often confronted with lowered expectations even when they have shown that they are capable of achieving. If school districts are serious about understanding the needs of all students, then they should critically assess possible structural and systemic factors that contribute to access issues that impact Black boys.

Orange Problem

A grocer was asked how many oranges he had sold that day. He replied:

> "My first customer said I'll buy half your oranges and half an orange more."
> He then said, "My second customer said the same thing… I'll buy half your oranges and half an orange more."
> Then he stated, "My third customers said the same thing... I'll buy half your oranges and half an orange more."
> Finally, he stated, "When I had filled all three orders I was sold out and I did not have to cut a single orange all day."

How many oranges had the grocer sold in all?

What if there were four customers? Five customers? Ten customers? Any number of customers?

1. Solve this set of multiplication equations. Each time you solve a new equation, try to use the previous equation to help you solve it. Note your reasoning for each step.

8 x 4 = ____
8 x 8 = ____
8 x 16 = ____
8 x 32 = ____
8 x 64 = ____

8 Reflect on the sequence of equations. What are some patterns you notice? Why might these patterns occur?

9 To solve 8 x 8, Nicholas, a third grade student, explained that he knew that 8 times 4 would be 32 so he just added 32 and 32 to get the answer. Show how you, as the teacher, might represent his reasoning with an area model. How does his strategy utilize properties of the operations?

(Adapted from *NCTM Principles to Actions Professional Learning Toolkit: Teaching and Learning*)