



Student Background: Liz is a 15-year-old entering the 9th grade. She has Angelman Syndrome, no speech, and walks with difficulty in balance. She has a severe intellectual disability. Liz’s strength is her social skills. She will seek out interaction through walking to someone, showing materials, and vocalizing a calling sound. Liz has emerging literacy and numeracy skills. Neither was emphasized in her school career to date, so she is entering high school with a minimal foundation in academics. Liz has only done math embedded in a daily routine like finding three cups to set a table. She can put one cup with one plate through one-to-one correspondence.

High-Quality Planning and Instruction: Mr. Gomez teaches high school Algebra to Liz. Mr. Gomez wants to find a way to make writing mathematical equations meaningful for her given her limited numeracy skills. He begins with the Eureka lesson used for all students: Algebra 1, Module 1, Lesson 25. In the second exercise of the Eureka lesson, equation formation is taught using the real-world context of work at a printing press and provides a suggested goal for building equations to model simple arithmetic operations. To employ more readily-accessible manipulatives, Mr. Gomez alters the exercise to a vocational activity of working at a hardware store with bags and bolts. Using the [crosswalk](#) documents, he identifies the best Louisiana Connector associated with the Louisiana Student Standard.

Louisiana Student Standard	Louisiana Connector
<p>A1: A-CED.A.1 Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear, quadratic, and exponential functions.</i></p>	<p>LC.A1: A-CED.A.1 Translate a real-world problem into a one variable linear equation.</p>

With the concrete objective of “translate a real-world problem into a one variable linear equation” in place, Mr. Gomez thinks about the ways in which Liz will be able to both learn the content and skills, as well as demonstrate mastery. He finds the instructional [Student Response Mode](#) guide on the Louisiana Believes website which guides his decisions about how Liz will show what she knows during the academic lesson. Mr. Gomez decides that for a student with emerging skills like Liz, he will begin with limited options and have her make selections from physical manipulatives.

He tells Liz that her job is to set up bags of some number of bolts by evenly distributing the total number of bolts to five different bags. In the initial round, he writes $(5b)$ for five bags of bolts. The b means they do not know how many bolts go in each bag yet. Liz knows she has a total of 25 bolts to evenly distribute to five bags. He has Liz help to create the equation by selecting numbers to put on the equation: $5b = 25$.

Mr. Gomez sets up the task of getting the bolts ready to distribute into five different bags. Liz can count with one-to-one correspondence, so Mr. Gomez uses a large number line to help Liz keep track of how many bolts she’s distributed, ensuring she uses all 25 bolts. Liz puts a bolt in each of the five bags, using the number line to help her count the total number of bolts distributed, and she circles the last number counted after giving each bag exactly one bolt (i.e., she circles the number 5 to represent having distributed five bolts total). Liz continues to distribute the bolts one at a time while Mr. Gomez ensures she is utilizing the number line to keep count. When Liz finishes distributing all 25 bolts, Mr. Gomez asks Liz to tell him how many bolts went into each bag. Mr. Gomez then asks Liz to use the number line to defend her answer that each bag received five bolts. Finally, Mr. Gomez brings Liz back to the equation she wrote to connect the concrete activity to solving the equation: If $5b = 25$, then $b = 5$. Moving between the concrete activity of distributing bolts to the abstractness of both the number line and the equation that models the situation, connecting all three helps to bridge Liz’s emerging numeracy understandings and skills to the expectation of the Louisiana Connector.



Mr. Gomez can repeat this process changing the number of bolts, the number of bags, or both, allowing for Liz’s understanding of how equations can be used to model and solve real-world problems. He can ask Liz to select from various cards – each with either a number, a variable, or a symbol on it – in order to engage her more in the process of creating the equation. He can increase the complexity of the problem Liz is trying to solve by asking, “If the store can only sell bags of 5 bolts but has a total of 42 bolts, how many bags can they sell?” Asking this question when the numerical answer to the equation is not a whole number will force Liz to think more deeply about the problem, connecting the need for the algebraic skills to solving real-world problems. In later lessons, Mr. Gomez can alter the way he presents the problem to lead Liz to writing inequalities, such as, “If the store can only sell bags of 5 bolts but has a total 63 bolts, what is the maximum number of bags the store can sell?”

With the right planning and guidance, Liz is able to write a mathematical equation in the context of a real-world problem, all the while increasing her overall numeracy and understanding of the four operations. This mirrors the work of other 9th grade students and provides Liz with access and opportunities for mastery through differentiated materials and scaffolding.