**Drill Rig**

**Task:** A water well drilling rig has dug to a height of -60 feet after one full day of continuous use. Assuming the rig drilled at a constant rate, what was the height of the drill after 15 hours? If the rig has been running constantly and is currently at a height of -143.6 feet, for how long has the rig been running?

**Pre-Requisite(s):**

* 7.EE.B.3 – Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form.
* 7.EE.B.4 – Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities.
* 7.RP.A.3 – Use proportional relationships to solve multi-step ration and percent problems.

**Instruction:**

Activate prior knowledge: Show a picture or a video of a drill rig, search online. Discuss why the height is a negative number and how negative numbers are used in a real-world scenario. Such as, in golf that birdies are -1, eagles are -2, and double eagles are -3. Ask students what other scenarios can they think of that use negative numbers.

Have students read the task. List the facts of the task on the board. Consider a pictorial representation to help students better conceptualize the task. Ask students the possible ways to find the solution (write an equation, set up a proportion, draw a picture).

Some examples of solving the problem:

1. Drawing a picture and discussing how many feet does the drill rig drill in an hour? ($\frac{-60}{24}=-2.5 $ft.) Then discuss how could we figure out how many feet in 15 hours? And how could we figure out how long if given -143.6 feet.
2. Set up an equation: $y=-2.5x$
3. Set up a proportion: $\frac{hours}{feet}$ or $\frac{feet}{hours}$.

Summarize the lesson by connecting the how long the rig has been running to hours and days. Depending on how the problem is solved, students could determine the number of hours or the number of days the rig has been running. The use of units is critical throughout this task.