**Main Problem #8**

Topic: *Dividing a Whole Number by a Fraction*

Problem: Your friend Justin is a military veteran who worked with doctors and soldiers overseas. In the Marines, he was well known for his knowledge of medical equipments which helped him saved many lives. In the Marines, he developed an efficient and cost-saving method of curing wounds. By using a special tape and $\frac{3}{8}$of a cup of vinegar he was able to both sanitize and cure a severe wound. His new method earned him his place and recognition in the medical branch of the Marines.

Q1. How many wounds can Justin cure with 3 cups of vinegar? Model the answer.

Q2. How many wounds can Justin cure with 9 cups of vinegar? 12 cups? 24 cups?

Q2. If Justin cured a total of 240 wounds, how many cups of vinegar did he have to use?

A1. This question is a warm up for the next question. $\frac{3}{8}$of a cup of vinegar cures 1 wound. Therefore, to determine how many wounds Justin can cure with *x* amount of cups, we need to divide *x* cups by $\frac{3}{8}$. We do not divide $\frac{3}{8}$by *x* because the value of the resulting answer will be less than the fraction itself, which does not make sense in this scenario. Therefore, $3÷\frac{3}{8}=3⋅\frac{8}{3}=8$wounds.

Model:

A2. Using the procedure from the last question, we simply divide the number of cups by the fraction.

* $9÷\frac{3}{8}=9⋅\frac{8}{3}=\frac{72}{3}=24$wounds.
* $12÷\frac{3}{8}=12⋅\frac{8}{3}=\frac{96}{3}=32$wounds.
* $24÷\frac{3}{8}=24⋅\frac{8}{3}=\frac{192}{3}=64$wounds.

A3. For this question, student need to think about the equation they have used to solve the previous questions. We divide the cups of vinegar (*x*, whole number) by the fraction of a cup of vinegar used to cure a wound (*y*, fraction) in order to determine the number of wounds cured (*z*)*.* The equations looks like: $x÷y=z$. Since this particular question requires us to solve for *x,* we simply multiply both sides of the equation by *y* to isolate *x*. Therefore, $x=z⋅y$. Plugging in our values, we get:

$x=240⋅\frac{3}{8}=\frac{720}{8}=90$cups.