MCC8.EE.3: Using Numbers in Scientific Notation          Name _____KEY_____

1. In September 2013, Instagram had $1.5 \times 10^8$ monthly active users. As of September 2014, Instagram has $2.0 \times 10^8$ monthly active users. How many more people are actively using Instagram as of 2014? **What operation will be used to solve this problem?**

$$\begin{array}{r} 12.0 \times 10^8 \\ - 1.5 \times 10^8 \\ \hline .5 \times 10^{8-1} \end{array}$$

$5 \times 10^7$ more people are actively using instagram in 2014.

2. MTSU's enrollment for the 2014-2015 school year is $2.1162 \times 10^4$. Enrollment for the 2004-2005 school year was $22.322 \times 10^{3+1}$. What was the difference in enrollment in the two years? **What operation will be used to solve this problem?**

$$\begin{array}{r} 2.2\overset{2}{3}22 \times 10^4 \\ - 2.1162 \times 10^4 \\ \hline 0.1160 \times 10^{4-1} \end{array}$$

$1.16 \times 10^3$ is the difference in enrollment.

3. As of March 5, 2014 Yo Gotti's album <u>I Am</u> sold $1.56 \times 10^5$ copies in the United States. Nicki Minaj's 2010 release <u>Pink Friday</u> sold $.914 \times 10^6$ in the United States. How many total albums have the two artists sold? **What operation will be used to solve this problem?**
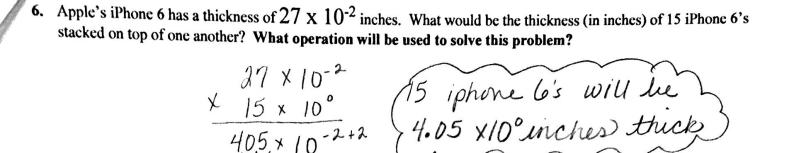
$$\left( .914 \times 10^{6^{-1}} \right) + \left( 1.56 \times 10^5 \right)$$
$$\downarrow$$
$$\left( 9.14 \times 10^5 \right) + \left( 1.56 \times 10^5 \right)$$

$$\begin{array}{r} 9.14 \\ 1.56 \times 10^5 \\ \hline 10.70 \times 10^{5+1} \end{array}$$
$$1.07 \times 10^6$$

The artists sold $1.07 \times 10^6$ albums together.

4. According to state census information, the population of La Vergne, Tennessee in 2012 was $3.3777 \times 10^{4+1}$. The population of Murfreesboro, Tennessee in 2012 was $1.14038 \times 10^5$. What was the combined population of both cities? **What operation will be used to solve this problem?**

$$\begin{array}{r} .33777 \\ + 1.14038 \times 10^5 \\ \hline 1.47815 \times 10^5 \end{array}$$

The combined population of Murfreesboro & La Vergne, Tn is $1.47815 \times 10^5$.

5. The world's top two highest paid athletes in 2014 are Floyd Mayweather and Cristiano Ronaldo. Mayweather's salary is $\$1.05 \times 10^8$. Ronaldo's salary is $\$5.2 \times 10^{7+1}$. How much more money does Mayweather earn in a given year? **What operation will be used to solve this problem?**

$$\begin{array}{r} 1.05 \times 10^8 \\ - .52 \times 10^8 \\ \hline .53 \times 10^{8-1} \end{array}$$

Mayweather makes $\$5.3 \times 10^7$ more money than Ronaldo in a given year.

**6.** Apple's iPhone 6 has a thickness of $27 \times 10^{-2}$ inches. What would be the thickness (in inches) of 15 iPhone 6's stacked on top of one another? **What operation will be used to solve this problem?**

$$
\begin{array}{r}
27 \times 10^{-2} \\
\times \quad 15 \times 10^{0} \\
\hline
405 \times 10^{-2+2}
\end{array}
$$

*15 iphone 6's will be 4.05 ×10⁰ inches thick*

**7.** The approximate distance from LaVergne, Tennessee to San Francisco, California is $2.319 \times 10^3$ miles. The approximate distance from LaVergne, Tennessee to Nicaragua is $2.913 \times 10^3$ miles. About how many more times greater is the distance from LaVergne to Nicaragua than LaVergne to San Francisco? **What operation will be used to solve this problem?**

$$\frac{L \to N}{L \to SF}$$

$$\frac{3 \times 10^3}{2 \times 10^3}$$

$$1.5 \times 10^0$$

*The distance from LaVergne, Tn to Nicaragua is about 1.5 times greater than the distance from LaVergne to San Francisco.*

**8.** Tennessee covers an area of $4.2146 \times 10^4$ square miles. The largest state, Alaska, covers $5.87878 \times 10^5$ square miles. About how many times greater is the area covered by Alaska than by Tennessee? **What operation will be used to solve this problem?**

$$\frac{Alaska}{Tenn}$$

$$\frac{6 \times 10^5}{4 \times 10^4} =$$

*Alaska covers about 15 times more area than covered by Tennessee.*

$$1.5 \times 10^1$$

**9.** For the 2014 season, the cast of The Big Bang Theory will each earn $\$1.0 \times 10^6$ per episode. If the cast films $15$ episodes, how much total salary will be earned? **What operation will be used to solve this problem?**

$$
\begin{array}{r}
\$1 \times 10^{6} \\
\times \quad 15 \times 10^{0} \\
\hline
15 \times 10^{6+1}
\end{array}
$$

*a cast member will earn $1.5 ×10⁷ for 15 episodes.*

$$1.5 \times 10^7$$

**10.** The Roxy Malco Theatre in Smyrna, Tennessee has a capacity of $1.4 \times 10^4$. On average, the theatre has $12$ shows during the same time period. If all seats are full in all theatres, how many people could visit the theatre in one time period? **What operation will be used to solve this problem?**

$$
\begin{array}{r}
1.4 \times 10^{4} \\
\times \quad 12 \times 10^{0} \\
\hline
16.8 \times 10^{4+1}
\end{array}
$$

*1.68×10⁵ people could visit the Roxy Malco theatre in one time period.*