12. Each Apollo astronaut ate three meals totaling about 2,800 calories. If a mission crew contained three astronauts, how many total calories did the crew eat each day? [4.0.A.1]

$$2,800 \times 3 = 8,400 \text{ cal/day}$$

a. If the mission lasted for 4 days, how many calories did the three astronauts eat during the entire mission? [4.0.A.1]

$$8,400 \times 4 = 33,600 \text{ cal/mission}$$

13. This model is a 1/3 scale model of the original. Make a line plot of the following fractions (change the fraction to an improper fraction):

$$\frac{1}{3}, \frac{1}{6}, \frac{3}{3}, \frac{3}{7}, \frac{3}{10}, \frac{2}{4}, \frac{4}{3}, \frac{1}{9}, \frac{3}{11}, \frac{9}{3}, \frac{1}{4}, \frac{1}{8}$$

$$\frac{5}{3}, \frac{9}{3}, \frac{6}{3}, \frac{6}{8}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \frac{7}{3}$$

a. Which number occurs most often on the line plot? [4.0.B.3]

$$\frac{4}{3}$$

b. What is the difference between the largest data point and the smallest data point? [4.0.B.1]

$$3 - 0 = 3$$

c. Find the product of the data points 1, 2/3 and 2. [4.0.B.3]

$$\frac{5}{3} \times 2 = \frac{10}{3} = 3 \frac{1}{3}$$

14. ULA employs about 1,800 people in the Decatur/ Huntsville area. How many people would they employ if they had a total of four locations with this same number of employees at each location? [4.0.NBT.5]

$$1,800 \times 4 = 7,200 \text{ employees}$$
APOLLO COURT YARD
1. Apollo 15 astronauts Irwin and Scott spent 18 1/2 hours on the surface of the moon. Rewrite this fraction using an equivalent fraction. [4.NF.1]

\[ \frac{18 \frac{1}{2}}{1} = \frac{37}{2} \]

MERCURY PROJECT
2. Alan Shepard, the first American in space was in orbit for 15 minutes and 28 seconds.

- Convert this time to seconds. [4.MD.1]
  - 15 minutes = 900 seconds
  - 28 seconds

J-2 ENGINE
5. The J-2 Engine had 69 successful flights in a row in 1966. About how many flights did they average each month during that year? [4.NBT.6]

\[ \frac{69}{12} = 5.75 \text{ or } 5 \frac{3}{4} \]

H-1 ENGINE
6. The H-1 engine, used by the Saturn IB, is 8.8 feet high and the J-2 engine, used by the Saturn V engine, is 11.1 feet high. Write a comparison of the height of these two rocket engines using “<”, “>” or “=”. [4.NF.7]

\[ \text{H-1 } 8.8 \text{ ft} < \text{J-2 } 11.1 \text{ ft} \]

ROCKET ENGINES
4. The Saturn V first stage has 5 F-1 engines with a total of 7,500,000 pounds of thrust. The second stage has five J-2 engines each generating 200,000 pounds of thrust. The third stage has one J-2 engine generating 200,000 pounds of thrust. What is the total thrusting power (in pounds) of the combined Saturn V engines? [4.OA.2]

\[ \begin{align*}
&7,500,000 \text{ F-1 x 5} \\
&200,000 \text{ J-2 x 5} \\
&200,000 \text{ J-2 x 1}
\end{align*} \\
&= 7,500,000 + 1,000,000 + 200,000 + 200,000 = 8,900,000 \\
&= 8,700,000 \text{ lbs. of thrust}
\]

\( a. \) Write an equation to represent the total weight of all the Saturn V engines together. [4.OA.3]

\[ 8,700,000 \text{ lbs. of thrust} \]

SATURN V UPRIGHT SCALE MODEL
7. The Saturn V model is 36\( \frac{1}{2} \) feet high. If a 3\( \frac{1}{2} \) foot tall person stood on top of the model, how tall would they be together? [4.NF.3]

\[ 36 \frac{1}{2} \text{ ft x } 1 = 37.5 \text{ ft} \]

- The scale model of the Saturn V is \( 1 \text{ ft} : 10 \text{ ft} \). Write an equivalent fraction with a denominator of 100. [4.NF.5]
  - \( a = \frac{1}{10} = \frac{10}{100} \)
  - \( b = \frac{10}{100} \)
  - \( c = \frac{10}{100} \)
  - \( d = \frac{10}{100} \)

- Write this fraction as a decimal. [4.NF.6]
  - \( .1 \)

- Take the equivalent fraction with a denominator of 100 and add it to the fraction \( 4 \frac{2}{100} \) . What is the sum? [4.NF.3]
  - \( \frac{430}{100} + \frac{440}{100} = \frac{470}{100} \)
  - \( 4.7 \)

THE FORCE (MODEL)
8. Look for the various shapes, objects, and angles on the model. [4.G.2]

LUNAR FLOOR MAP
9. Stand on the landing site for Apollo 16 and orient yourself so that the landing site for Apollo 13 is at 90\( ^\circ \). Record the angles for the other Apollo landing sites, and circle whether it is acute or obtuse and sketch the angle.

- Apollo 11 160° and is acute/obtuse.
- Apollo 12 100° and is acute/obtuse.
- Apollo 14 150° and is acute/obtuse.
- Apollo 17 150° and is acute/obtuse.

APOLLO 16 COMMAND MODULE
3. Fully loaded the Apollo 16 Command Module weighs a total of 13,000 pounds including the crew, supplies and Lunar samples. The astronauts weigh a total of 504 pounds, the moon rocks weigh 298, and the supplies weigh 370 pounds. What is the weight of the Command Module by itself? [4.NBT.3, 4.NBT.4]

\[ \begin{align*}
504 + 298 + 370 &= 11,780 \\
11,780 - 13,000 &= -1,220 \\
-1,220 + 1082 &= 11,918 \text{ lbs.}
\end{align*} \]

- The height of the Apollo Command Module (CM) is 10 feet 7 inches and the height of the Apollo Lunar Module is 22 feet 11 inches. Which of these two modules is taller and by how much? [4.MD.2]
  - 7 ft = 84 inches
  - 1 ft = 12 inches
  - 22 ft 4 in = 272 in less than CM

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