Units Answer Key

1. **C**. First convert the large slab from pounds to ounces: $\left(20\,pounds\right)\times\frac{\left(16\,ounces\right)}{\left(1\,pound\right)}=320\,ounces$. Now we know that there are 320 ounces of chocolate in each large slab. To find how many 2-ounce chocolate chips can be made from this slab, we divide: 320/2 = 160 chocolate chips. Choices A and B are incorrect and are smaller than the number of chocolate chips that can be made from the slab. Choice D is incorrect because it is the number of ounces in the slab of chocolate, and not the number of chocolate chips that can be made from this slab.

2. **C**. First find the Molly's dog age in human years: $7-5.5=1.5$. Therefore, Molly's dog must be 1.5 human years old. Then convert to dog years. $\left(1.5\,human\ years\right)\times\frac{7\,dog\ years}{1\,human\ year}=10.5\,dog\ years$. Molly's dog is 10.5 dog-years-old. Choice A is incorrect because it is the age of Molly's dog in human years. Choice B is incorrect because it is the conversion rate of human years to dog years. Choice D is incorrect because it is older than the dog's actual age.

3. **A**. From the formula $distance=rate\times time$, we can plug in the numbers. $distance=\frac{2\,miles}{1\,hour}\times\left(9\,seconds\right)$. However, we need to convert to units in order to cancel out the time unit, and then convert miles to feet. To do so, we simply multiply by the proper unit conversions: $distance=\frac{2\,miles}{1\,hour}\times\left(9\,seconds\right)\times\frac{1\,hour}{60\,minutes}\times\frac{1\,minute}{60\,seconds}\times\frac{5280\,feet}{1\,mile}=26.4\,feet$. Choices B, C, and D are all incorrect because none of them accurately represent how far Jenny is able to swim in one breath and may come from algebra errors.

4. **B**. The bread on sale costs \$26 for 8 loaves, so it costs: $26/8=\$3.25$ per loaf. The normal price is \$4, so the sale price is $4-3.25=\$0.75$ cheaper. Choices A and C are incorrect and may come from algebra errors. Choice D is incorrect and is the sale cost per loaf. The question is asking for the difference in price.

5. **B**. Cost per ounce is equal to $\frac{cost}{ounce}$. For Honey Bits, $\frac{cost}{ounce}=\frac{3.99}{3.8}=\$1.05$. For Fruity Dots, $\frac{cost}{ounce}=\frac{4.19}{4.5}=\$0.93$. For Berry Wellness, $\frac{cost}{ounce}=\frac{4.89}{5.0}=\$0.98$. For Corn Delight, $\frac{cost}{ounce}=\frac{3.79}{3.7}=\$1.02$. Comparing these values, the cheapest option for Timmy would be Fruity Dots. Choices A, C, and D are incorrect because none of them represent the cheapest option for Timmy as they all have higher cost per ounce than Choice A, Fruity Dots.

6. **D**. To solve this, simply convert units: $\frac{110\,Calories}{1}\times\frac{1000\,calories}{1\,Calorie}\times\frac{4.184\,Joules}{1\,calorie}=460240\,Joules=4.6\times10^{5}\,Joules$. Choices A, B, and C are all incorrect and may result from incorrect unit conversions.

7. **A**. $7.5\,palms\times\frac{22.5\,centimeters}{3\,palms}\times\frac{1\,foot}{30\,centimeters}=1.88\,feet$. Choices B, C, and D are all incorrect and may result from incorrect unit conversions.

8. **D**. There are 4 atoms of hydrogen per 1 molecule of methane. Thus, from the equation $(172\ molecules\ of\ methane)\times\frac{4\ atom\ Hydrogen}{1\ molecules\ methane}=172(4)=43\ atoms\ of\ Hydrogen$

   Choices A, B, and C are all incorrect and may result from incorrect unit conversions.

9. **B**. The volume of the sphere is $v=\frac{4}{3}\pi 3^3=36\pi\approx 113.1\,cm^3$. We know that $density=\frac{mass}{unit\,volume}$, so $mass=\left(density\right)\left(unit\,volume\right)$. Plugging in we get $mass=\frac{0.85\,grams}{cm^3}\times 113.1 cm^3=96.1\,grams$. Choice A is incorrect and is off by a power of ten. Choice C is incorrect and is the approximate volume of the sphere. Choice D is incorrect and is a random number distraction.

10. **D**. In total, it takes Eva 1+3.5 = 4.5 minutes to complete a drink. There are $5\times 60=300$ minutes in her 5-hour shift. With a 10-minute break, Eva can work $300-10=290$ minutes in total. Thus, she can make $290\text{min}\times\frac{1\,drink}{4.5\,min}=64.4\approx 64$ drinks during her shift. Choices A, B, and C are incorrect because none of them are the correct number of drinks that Eva can make within her 5-hour shift. Some errors may occur if the problem was solved without considering the 10-minute break when Eva was not making any drinks.