

IWP Skills 1-3

1. Convert each of the following into meters using correct scientific notation:

A) 530mm $5.30 \times 10^2 \times 10^{-3} \text{ m} = 5.3 \times 10^{-1} \text{ m}$

B) 0.8 km $8 \times 10^{-1} \times 10^3 \text{ m} = 8 \times 10^2 \text{ m}$

C) 45 cm $4.5 \times 10^1 \times 10^{-2} \text{ m} = 4.5 \times 10^{-1} \text{ m}$

D) 636 nm $6.36 \times 10^2 \times 10^{-9} \text{ m} = 6.36 \times 10^{-7} \text{ m}$

E) 520 micro-meters $5.2 \times 10^2 \times 10^{-6} \text{ m} = 5.2 \times 10^{-4} \text{ m}$

2. For each of the following:

1. Write the value in correct scientific notation using the given unit of measurement
2. Write the value using the most logical metric prefix

For example: 0.003 m = $3 \times 10^{-3} \text{ m}$ = 3 mm

A) 16000 m $1.6 \times 10^4 \text{ m} = 1.6 \times 10^1 \text{ km}$

B) 0.065m $6.5 \times 10^{-2} \text{ m} = 6.5 \text{ cm}$

C) 0.0000007 m $7 \times 10^{-7} \text{ m} = 7 \times 10^2 \text{ nm}$

D) 0.0004m $4 \times 10^{-4} \text{ m} = 4 \times 10^2 \text{ }\mu\text{m}$

E) 3500m $3.5 \times 10^3 \text{ m} = 3.5 \text{ km}$

3. Dimensional analysis is a method of changing the unit of measurement for a quantity without changing the value. This allows us to translate between measurement systems or perspectives. For each of these questions state the conversion you would need to know in order to solve the problem (you do not need to actually solve)

A) How much does it cost to purchase 10 lbs of jelly beans?
 $\text{cost per lb} = 10 \text{ lbs} \times \frac{\$}{\text{lb}}$

B) How much time does it take Ironman to travel 1500km?

C) What is the mass of 3m³ of skittles?
 $\text{time} = 1500 \text{ km} \times \frac{\text{hr}}{\text{km}}$

Density $? \text{ kg} = \text{m}^3$

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4. $450\mu\text{m}$ is equivalent to $4.5 \times 10^{-2} \times 10^{-6} \text{m} = 4.5 \times 10^{-8} \text{m}$

- ☒ A) $4.5 \times 10^{-4} \text{m}$
- ☐ B) $4.5 \times 10^{-6} \text{m}$
- ☐ C) $4.5 \times 10^{-8} \text{m}$
- ☐ D) $4.5 \times 10^2 \text{m}$

5. Which of the following is a correct expression for 0.02 mm

- ☒ A) $2 \times 10^{-5} \text{m}$ $2 \times 10^{-2} \times 10^{-3} = 2 \times 10^{-5}$
- ☐ B) $2 \times 10^{-3} \text{m}$
- ☐ C) $2 \times 10^{-2} \text{m}$
- ☐ D) $2 \times 10^1 \text{m}$

6. Which of the following correctly expresses the result of $(A \times 10^5)$ divided by 1000

- ☐ A) .001A
 - ☐ B) $A \times 10^{15}$
 - ☐ C) $A \times 10^8$
 - ☒ D) $A \times 10^2$
- $$\frac{A \times 10^5}{1 \times 10^3} = \frac{A}{1} \times \frac{10^5}{10^3} = A \times 10^2$$

7. Which of the following correctly expresses the product of $(A \times 10^3)$ and $(B \times 10^{-7})$

- ☐ A) $AB \times 10^{-21}$
 - ☐ B) $A/B \times 10^{10}$
 - ☒ C) $AB \times 10^{-4}$
 - ☐ D) $AB \times 10^{10}$
- $$AB \times 10^{-4}$$

8. $2.67 \times 10^{-4} \text{m}$ is equal to

- ☐ A) $2.67 \times 10^{-7} \text{mm}$
- ☐ B) $2.67 \times 10^{-1} \text{km}$
- ☒ C) $2.67 \times 10^{-1} \text{mm}$ $2.67 \times 10^{-1} \times 10^{-3} \text{m}$
- ☐ D) $2.67 \times 10^{-4} \text{km}$