Workshop: Imperial Units and Calculating Body Indices

UEA LEARNING ENANCEMENT TEAM – MATHEMATICS & STATISTICS

Imperial and Metric Units for Volumes

For this section you should use:

$$1 \text{ pint } \approx 500 \text{ ml}$$
$$1 \text{ gallon} = 8 \text{ pints}$$

1. Convert the following volumes into ml:

    a. 3 pints
    b. 0.5 pints
    c. 3 gallons

2. Convert the following volumes into pints:

    a. 2000 ml
    b. 3.5 l
    c. 4 gallons
    d. 125 ml

Imperial and Metric Units for Mass

For this section you should use:

$$1 \text{ kg} \approx 2 \text{ lbs (pounds)}$$
$$1 \text{ lb} = 16 \text{ oz (ounces)}$$
$$1 \text{ stone} = 14 \text{ lbs}$$

3. Convert the following masses into lbs (pounds):

a. 5 kg
b. 500 g
c. 3500 g
d. 32 oz
e. 8 oz
f. 2 stone
g. 10 stone 4 lbs
h. 12 stone 12 lbs

4. Convert the following into stone:

   a. 280 lbs
   b. 84 lbs
   c. 70 kg

5. Convert the following masses into stone and lbs (e.g. 12 stone 5 lbs):

   a. 150 lbs
   b. 200 lbs
   c. 55 kg
   d. 82 kg

Imperial and Metric Units for Length

For this section you should use:

$$1 \text{ inch } \approx 2.5 \text{ cm}$$
$$1 \text{ ft (foot)} = 12 \text{ inches}$$

6. Convert the following lengths into cm:

   a. 10 inches
   b. 1 ft
   c. 5 ft 3 inches
   d. 6 ft 6 inches

7. Convert the following lengths into ft and inches (e.g. 5 ft 8 inches):

    a. 240 inches
    b. 100 inches
    c. 75 inches
    d. 50 cm
    e. 2 m

Body Mass Index

The formula for body mass index (BMI):

$$\text{BMI} = \frac{\text{Mass (kg)}}{(\text{Height (m)})^2}$$

8. What are the units of the BMI measurement?

9. Find the BMI of the following people:

    a. Mass = 90 kg, Height = 2 m
    b. Mass = 64 kg, Height = 1.6 m
    c. Mass = 64.8 kg, Height = 180 cm

Body Surface Area

The formula for body surface area (BSA):

$$\text{BSA } (\text{m}^2) = \sqrt{\frac{\text{Height (cm)} \times \text{Mass (Kg)}}{3600}}$$

The following information may be useful:

$$\sqrt{2} \approx 1.41 \quad \sqrt{3} \approx 1.73 \quad \sqrt{5} \approx 2.24 \quad \sqrt{6} \approx 2.45$$

10. Find the BSA of the following people:
    a. Height = 180 cm, Mass = 60 kg
    b. Height = 144 cm, Mass = 50 kg
    c. Height = 1.92 m, Mass = 112.5 kg

Ideal Body Weight (IBW)

The formula for IBW is:

$$\text{Female: IBW (kg)} = \text{Height (cm)} \times 0.9 - 92$$
$$\text{Male: IBW (kg)} = \text{Height (cm)} \times 0.9 - 88$$

11. What is the IBW for the following:

    a. Male, Height = 1.7 m
    b. Female, Height = 1.8 m

Mixed Question

12. For a person who is:

    Male; Height = 6 ft; Mass = 14 stone 4 lbs

    Find:

    a. BSA
    b. IBW