

Numeracy in Construction

Calculating Volume

| Suggested Responses

Worksheet

1. $V = L \times W \times D$

$$V = 16 \times 10 \times 6$$

$$V = 960 \text{ cm}^3$$

2. a) $A = L \times W \times D$

$$A = 14 \times 6.5 \times 0.1$$

$$A = 9.1 \text{ m}^3$$

b) $B = L \times W \times D$

$$B = 13.5 \times 6.5 \times 0.1$$

$$B = 8.775 \text{ m}^3$$

c) $C = L \times W \times D$

$$C = 8 \times 3 \times 0.1$$

$$C = 2.4 \text{ m}^3$$

d) $D = L \times W \times D$

$$D = 6 \times 5 \times 0.1$$

$$D = 3 \text{ m}^3$$

e) $E = L \times W \times D$

$$E = 5 \times 0.5 \times 0.1$$

$$E = 0.25 \text{ m}^3$$

f) Total volume = $A + B + C + D + E$

$$\text{Total volume} = 9.1 + 8.775 + 2.4 + 3 + 0.25$$

$$\text{Total volume} = 23.525 \text{ m}^3$$

The 24 cubic metres which have been ordered will be enough.

Pouring Concrete

1. Student responses will vary, but should explain that area is a two-dimensional measurement calculated by multiplying length by width, while volume is a three-dimensional measurement calculated by multiplying length by width by depth (or height). Since the area of the path and the depth of concrete are known, the volume can be calculated by multiplying the area ($L \times W$) by the depth.

2. Since the final answer needs to be in m^3 , convert the depth of concrete to m:

$$15 \div 100 = 0.15 \text{ m}$$

$$A = 52.5 \text{ m}^2, d = 0.15 \text{ m}$$

$$V = A \times d$$

$$V = 52.5 \times 0.15$$

$$V = 7.875 \text{ m}^3$$

Soil and Screenings: Extension

1. a) $H(\text{screenings}) = \frac{1}{3} \times 60$

$$H(\text{screenings}) = 20 \text{ cm}$$

Since the answer needs to be in m^3 , we must convert the height to m:

$$20 \div 100 = 0.2$$

$$H(\text{screenings}) = 0.2 \text{ m}$$

$$V(\text{screenings}) = 3.5 \times 1.7 \times 0.2$$

$$V(\text{screenings}) = 1.19 \text{ m}^3$$

There are two boxes:

$$\text{Total } V(\text{screenings}) = 1.19 \times 2$$

$$\text{Total } V(\text{screenings}) = 2.38 \text{ m}^3$$

- b) $H(\text{soil}) = \frac{2}{3} \times 60 - 5$

$$H(\text{soil}) = 35 \text{ cm}$$

Since the answer needs to be in m^3 , we must convert the height to m:

$$35 \div 100 = 0.35 \text{ m}$$

$$H(\text{soil}) = 0.35 \text{ m}$$

$$V(\text{soil}) = 3.5 \times 1.7 \times 0.35$$

$$V(\text{soil}) = 2.0825 \text{ m}^3$$

There are two boxes:

$$\text{Total } V(\text{soil}) = 2.0825 \times 2$$

$$\text{Total } V(\text{soil}) = 4.165 \text{ m}^3$$

2. a) 2.38 m^3 of screenings are needed, so 2.5 m^3 will need to be ordered:

$$2.5 - 2.38 = 0.12 \text{ m}^3$$

0.12 m^3 of screenings will be left over

- b) 4.165 m^3 of soil are needed, so 4.5 m^3 will need to be ordered:

$$4.5 - 4.165 = 0.335 \text{ m}^3$$

0.335 m^3 of soil will be left over

Transcript – For student and teacher use.