RIICCM201D - Carry out measurements and calculations

MAPPING AND SOLUTIONS
This Learning Guide covers the unit RIICCM201D Carry out measurements and calculations. The topics covered in this Learning Guide are:

- Types of measurements and calculations
- Types of equipment
- Maintaining equipment
- Length, height, width
- Area
- Volume
- Mass
- Percentages
- Conversions
- Using a calculator

The following table maps the Learning activities, and the Knowledge questions and Practical activities to check your understanding, against the unit of competency.

<table>
<thead>
<tr>
<th>RIICCM201D - Carry out measurements and calculations</th>
<th>Learning activities (LA)</th>
<th>Check your understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LA1. 1.3</td>
<td>KQ1. 1.3</td>
</tr>
<tr>
<td>1. Plan and prepare for measurements and calculations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1. Access, interpret and apply measurements and calculations documentation and ensure the work activity is compliant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2. Obtain, read, interpret, clarify and confirm work requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3. Select, and check for faults, equipment/tools for work activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Perform measurements</td>
<td>LA2. 2.1-2.3</td>
<td>PA1. 2.1-2.3</td>
</tr>
<tr>
<td>RIICCM201D - Carry out measurements and calculations</td>
<td>Learning activities (LA)</td>
<td>Check your understanding Knowledge questions (KQ)</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td><strong>3. Perform calculations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1. Select appropriate calculation method</td>
<td>LA3. 3.1, 3.3</td>
<td>KQ3. 3.1</td>
</tr>
<tr>
<td>3.2. Calculate values for the project using the appropriate factors</td>
<td>LA4. 3.1-3.3</td>
<td>KQ4. 3.1-3.3</td>
</tr>
<tr>
<td>3.3. Confirm and record results</td>
<td>LA5. 3.1-3.3</td>
<td>KQ5. 3.1</td>
</tr>
<tr>
<td></td>
<td>LA6. 3.1</td>
<td>KQ6. 3.2</td>
</tr>
<tr>
<td></td>
<td>LA7. 3.1</td>
<td>KQ7. 3.1</td>
</tr>
<tr>
<td></td>
<td>LA8. 3.1</td>
<td>KQ8. 3.1</td>
</tr>
<tr>
<td></td>
<td>LA9. 3.2</td>
<td></td>
</tr>
<tr>
<td><strong>4. Estimate quantities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1. Take calculations for determining material requirements</td>
<td>LA10. 4.1-4.4</td>
<td>KQ4. 4.1-4.4</td>
</tr>
<tr>
<td>4.2. Make calculations for determining quantities</td>
<td></td>
<td>KQ6. 4.4</td>
</tr>
<tr>
<td>4.3. Estimate quantities from the calculations taken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4. Confirm and record quantities for the project within project tolerances</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Provide four examples of the types of measurements you would be required to perform in the workplace.

Answer:
The answer may include any 4 of the following:
- area
- length
- volume
- mass
- right angles
- depth
- quantities
- grade
- percentages
- conversions
- ratios
- addition
- subtraction
- division
- multiplication
- rounding off

2. Name three types of equipment you would be required to use in the workplace for taking measurements.

Answer:
The answer may include any 3 of the following:
- a calculator
- squares
- a tape measure
- scales
- a depth gauge
- a ruler
3. Calculate the area of the following shapes. In the space provided, record the steps you took to arrive at your answer.

A rectangle

Answer:
290 m²

A triangle

Answer:
8100 cm²

A circle

Answer:
380.182 m²
4. Using the formulas that you have learnt, calculate the volume for the following shapes.

**Answer:**
\[ l \times h \times w = 18 \times 7 \times 2 \]
\[ = 252 \text{ mm}^3 \]

**Answer:**
\[ \pi \times r^2 \times h = 3.142 \times 19 \times 19 \times 37.9 \]
\[ = 42,988.529 \text{ cm}^3 \]

5. Norman owns a truck that has a maximum load capacity of 50 tonnes. From the following four options circle the combined load it could take.

12 tonnes, 16 tonnes, 28 tonnes, 8 tonnes
13 tonnes, 12 tonnes, 11 tonnes, 10, tonnes
8 tonnes, 19, tonnes, 13 tonnes, 14 tonnes
6 tonnes, 14 tonnes, 16 tonnes, 15 tonnes

**Answer:**
13 tonnes, 12 tonnes, 11 tonnes, 10, tonnes
6. Using a calculator, demonstrate you can answer the following questions related to percentage. In the space provided, record the steps you took to arrive at your answer

**What is?**

10% of 160 =

**Answer:**

10% of 160 = 16

25% of 160 =

**Answer:**

25% of 160 = 40

13% of 4597 =

**Answer:**

13% of 4597 = 597.61

19.5% of 564 =

**Answer:**

19.5% of 564 = 109.98

---

7. Why is it essential to be accurate when undertaking measurements and calculations in the workplace? List your reasons in the following space.

**Answer:**

Carrying out measurements and calculations accurately will:

- reduce waste
- save time
- save money
- increase efficiency and quality

---
8. If you were to round up 6.8, what would it become?

**Answer:**

7

9. If you were to round down 6.2, what would it become?

**Answer:**

6
PRACTICAL ACTIVITIES

1. Your assessor will provide you with different shaped containers for you to measure. Use different measuring equipment to obtain these measurements. Your aim is to get these measurements to the nearest millimetre as you are only allowed a 1 mm margin of error.

For each container measure the:
- length
- height
- width
- radius

Answer:
The answer will depend on the containers provided but all measurements should be accurate to within 1 mm.

2. Using the calculations you worked out previously, demonstrate you can calculate the:
- area of the surface
- the volume of its capacity

Record the steps you took to arrive at each equation.

Answer:
The answer will depend on the containers provided but should use the formula provided in the Learning Guide for area and volume.

3. Using the conversion table provided in the Learning Guide, record your answer to the following equations.

How many centimetres in 1.4 metres?

Answer:
140 cm

How many litres in 1400 millilitres?

Answer:
1.4 litres
How many hectares in a square kilometre?

**Answer:**

1 km² = 100 ha

How kilograms does 2700 grams equal?

**Answer:**

2700 grams = 2.7 kg
SkillsDMC Head Office
Tower 1, Level 1,
Suite 2, 475 Victoria Avenue
Chatswood NSW 2067
AUSTRALIA
T +61 (0) 2 9324 8600
F +61 (0) 2 p324 8699
E skillsdmc@skillsdmc.com.au
W www.skillsdmc.com.au

About SkillsDMC
SkillsDMC is the global leader in defining skills competency standards and workforce development strategies for the Resources and Infrastructure Industry.