

Units of Measure Levels 1 & 2

Name: _____

Date: _____

Care

Practice Book

Rate how confident you feel about the skills tested in this workbook:

Skill	Not a clue!	I know a little	I feel okay with this	I feel quite confident	I feel very confident
Identify metric units					
Convert between metric units					
Identify imperial units (L2 only)					
Convert between metric and imperial units (L2 only)					

Introduction to Units of Measurement

When we talk about units of measure, we mean what are measuring something in: kg or grams, cm or metres, miles or kilometres? These units appear in all sorts of types of maths question, so it is very important to understand them.

In care, you may have to understand the units of weight and height as this could be relevant to the health of your clients or in calculating medication dosages. If you assist people with their diet by preparing food for them, you may need to understand weight of food to prepare the correct amount. You might need to use millilitres or litres to give medication or prepare drinks correctly.

If you are studying towards L1 maths, you will only need to complete up to question 5.

Metric Conversions

These are the facts you should know as they will be relevant for your exam and might be used in various aspects of your career.

Length

$$10\text{mm} = 1\text{cm}$$

$$100\text{cm} = 1\text{m}$$

$$1000\text{m} = 1\text{km}$$

Weight

$$1000\text{mg} = 1\text{g}$$

$$1000\text{g} = 1\text{kg}$$

$$1000\text{kg} = 1\text{ tonne}$$

Capacity

$$1000\text{ml} = 1\text{L}$$

$$100\text{cl} = 1\text{L}$$

Try it Out

Question One

David works in an operating theatre. He is asked to reorder size 11 blade scalpels.

He has this information about them

Length 41.5 mm

Width 5.9 mm

Material thickness 0.4 mm

Unfortunately, the order system only accepts the values in centimetres. Can you convert each measurement to centimetres?

Question Two

Julie works in paediatric care. She has to ensure the heights and weights of each of her patients is recorded accurately.

Her first patient is an eight-year-old male who has a height of 127cm. Julie needs to record his height in metres. What should she record?

Question Three

Hari works as a care assistant in a care home. Hari is asked to take cups of water to each resident as it is a very hot day. Each cup holds approximately 200ml of water and there are 18 residents. Hari has bottles of water that hold 1.5 L. How many bottles will Hari need to put on the trolley to ensure each resident gets a drink?

Question Four

In Hari's care home, one of the residents takes aspirin daily for angina. The resident tells Hari that they have to take 75g every day. Hari knows this can't be right. How can Hari tell this is wrong without looking at the patient records?



Question Five

Adina is providing end of life care at home for a person with cancer. They have been advised to take Protifar High Protein Powder as they are having trouble eating. They have a tin containing 0.225kg of powder and the scoop size is 2.5g. The patient has 14 scoops per day. How many days will the tin last for?

Metric to Imperial Conversions – L2 Only

Although the UK uses the metric system, some people still work with imperial measures. This means you may need to convert between the two systems.

A client may give you their weight in stones, but you need to record it in kilograms or explain their height in feet and inches and you need it in metres.

If you are reading research from America, you will find they use imperial measures.

For L2, you only need to be able to follow the conversion information rather than remembering it. In your care role, there may be some conversions you use regularly and therefore might want to learn.

Common Conversions

1 inch = 2.5cm

12 inches = 1 foot

1kg = 2.2 lbs

14 pounds = 1 stone

Try it Out

Question Six

Olga is a theatre nurse. She is asked to prepare the equipment and is asked to get ready dressing forceps (tweezers), straight, 4 1/2", medium, serrated, non-sterile, reusable.

When Olga checks the stock, all the forceps are labelled in millimetres and not in inches. What size forceps does Olga need?

Question Seven

Julie works in paediatric care. She has to ensure the heights and weights of each of her patients is recorded accurately. Her nine-year-old male patient weighs 65 pounds. She needs to record his weight in kg. What weight should she record?



Question Eight

a) Fatima is holding annual check-ups for patients with asthma. She asks a patient for their weight, and they tell her it is 10 stone 4 pounds. Fatima needs to record the weight in kg on the system. What is the patient's weight in kg?

b) Fatima also needs to record the patient's height. As the patient is unsure what their height is, Fatima uses the measuring equipment in her consulting room. She finds out the patient is 1.68m. The patient asks Fatima to tell her the height in feet and inches because, "I only understand old school measures!". What should Fatima tell the patient?

c) Fatima finds she is doing a lot of metric to imperial conversions. She decides to make herself a quick reference guide to keep on her desk of common conversions she has to do.

1.5m = 3 feet 75 inches

1.65m = 5ft 5 inches

1.7m = 5ft 8 inches

1.8m = 6 feet

8 stones = 112kg

11 stones = 70kg

12 ½ stones = 80kg

14 stones = 6kg

Can you check Fatima's guide for her and correct any mistakes she has made?

Worked Example

In this example, we use our conversion knowledge but also work with other units noted to calculate a dosage. Notice that we must be very careful about what amounts we are multiplying and dividing.

Tijan works on an acute care ward. They have a patient with shingles, and the doctor has ordered 12mg/kg of Acyclovir. The drug is dispensed as 100mg/2ml. Tijan's patient weighs 130 pounds. How many ml per dose should Tijan administer?

First, change the pounds into kg. $1\text{kg} = 2.2\text{ lbs}$. To change 130 pounds to kg, divide by 2.2 $\rightarrow 130 \div 2.2 = 59\text{kg}$ (to the nearest whole number)

Next, find the total amount of mg needed for that patient.

12mg/kg means for each kg of weight the patient would need 12mg of medicine.

We multiply their weight in kg by 12 to find this $\rightarrow 59 \times 12 = 708\text{mg}$

100mg/2ml means that for every 100mg of the medication, you give 2ml in the IV.

We divide 708 by 100 to get how many lots of 100mg there are $\rightarrow 708 \div 100 = 7.08$

We give ml for each of these lots so multiply this by 2 $\rightarrow 7.08 \times 2 = 14.16$

This is our answer in ml. We could round to the nearest tenth to give **14.2ml per dose**.

Try it Out

Question Nine

Tijan has a second person he is treating for shingles. The doctor has ordered 15mg/kg of Acyclovir. The drug is dispensed as 100mg/2ml. Tijan's patient weighs 145 pounds. How many ml per dose should Tijan administer?