

PASSING CALCULATIONS TESTS IN NURSING

SUSAN STARKINGS
& LARRY KRAUSE

FIFTH EDITION



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Chapter 3

Quantity conversions for nurses

Chapter aims

By the end of this chapter you should be able to:

- convert a given weight, be it of a drug or a person, into a greater or lesser metric unit of weight;
- convert a liquid measure from litres to millilitres and from millilitres to litres;
- convert a given measurement of length into a lesser or greater metric unit of length;
- multiply any amount by 10, 100, 1000.

Introduction

In this chapter you will find examples of the kind of calculations you will need to make in converting units of metric measurement. Throughout your career as a nurse you will need to convert these measures in order to be able to make calculations before administering medications. The patient's prescription could be listed in milligrams, while the drug available at your placement is listed in grams. Before you can accurately calculate the patient's requirement, you will need to convert either the amount needed or the available stock so that they use the same unit of measure.

Hint... The ability to convert metric measures is essential in healthcare; without it, the patient may receive an incorrect dose of medication. Inaccuracy could lead to an accidental overdose of the drug. This could be as much as 1000 times too much. The all-too-frequent mistakes reported as tragedies in the news reinforce the need for accuracy in all your calculations.

Your skill in accurately converting metric measurements will be examined in many formats; for example, in a formative test done without the use of a calculator or as

part of a larger scenario question. Such a question may involve a patient prescribed a number of different drugs, some of which require their measures of strength to be converted prior to calculation of their dosage.

You may need to convert a patient's weight or height in order to compare it with a standardised body mass index chart to check for indications of obesity. As in all chapters, it is suggested that you do the activities without the aid of a calculator in order to become more proficient.

Practising liquid, weight and length conversions will help you, as the future nurse, develop the skills to become more confident with the conversions needed. This chapter will cover the various best-practice methods for the types of conversions that nurses will encounter and perform during their careers.

In Figure 3.1, units of liquid measurement are shown on the left, and units of weight measurement on the right (there is no relationship between liquid measures and weight, except that 1ml of water weighs 1g).

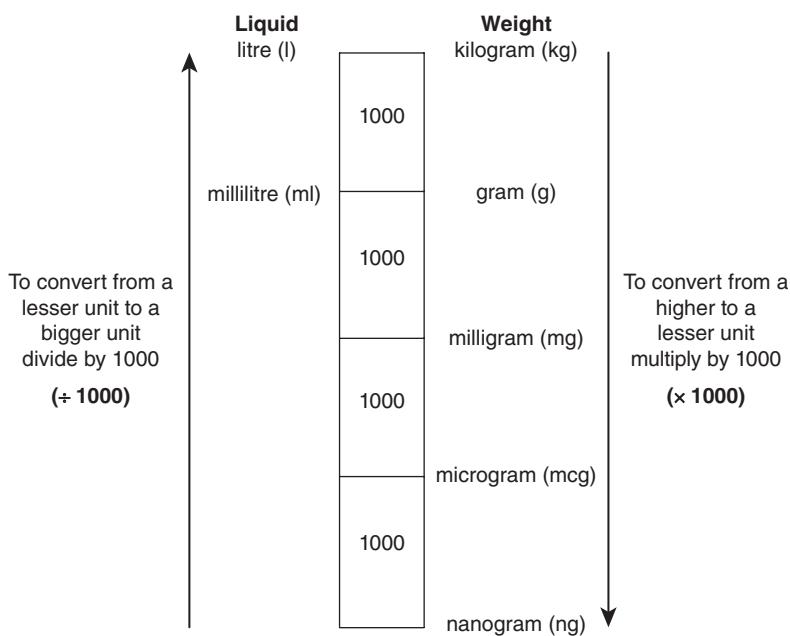


Figure 3.1 Weights and liquids ladder of conversion

Notice that the abbreviation for litre is the small letter l; be careful not to confuse this with the numeral 1.

If you look at the top of the ladder you will see that the largest unit of weight is a kilogram (kg) and the largest commonly used unit for liquids is a litre (l).

The kilogram can be divided up into 1000 units, each of which is known as a gram (g). The gram can then be divided into 1000 units, each being called a milligram (mg).

The milligram can then be divided into 1000 units, each of which is a microgram (mcg). Those studying children's nursing will also need to know that the microgram is also divisible into 1000 units, each of which is known as a nanogram (ng). The nanogram is generally seen only in conjunction with children's medical requirements because of the very small size of the metric unit of weight involved. Chapter 7 (Calculations and children) covers smaller dosages in more detail. Great care should be taken not to confuse similar abbreviations when using abbreviations of measurements. See page 3 for more details.

Each litre can be divided into 1000 parts, each of which is called a millilitre (ml). This is as low as a litre is currently divided in most nursing and healthcare situations.

The distance between each rung on the ladder in Figure 3.1 is 1000 units. So we can say there is a 'factor of 1000' between the metric units most commonly used for liquid and weight measures by nurses. The easiest way to handle conversions between these units is to use this fact and simply multiply or divide by 1000, as shown in Figure 3.1 and in the activities that follow.

Metric units of length are converted differently, and are discussed later in the chapter.

Calculating from one unit to another

Look again at Figure 3.1. On each side of the ladder are instructions about converting between units using either multiplication or division. For example, if you want to convert millilitres to litres, the arrow shows that you have to divide by 1000.

An easy way to do this is to move the decimal point. The number of times the decimal point moves is dictated by the number of zeros in the factor. In the number 1000 there are three zeros, so the point must move three places.

The arrows on either side of the ladder in Figure 3.1 are there to help you remember in which direction to move the decimal point. To convert liquid and weight measures you will always use a factor of 1000, so all you need to decide is whether to move the decimal point to the left or right. Suppose you are required to convert down, from a larger unit to a smaller unit (such as from kilograms to grams); this conversion moves *down* the ladder, and the down arrow is on the *right*. This reminds you to move the decimal point three places to the right.

Multiplying by 1000



You can convert units using this method whether you are changing litres to millilitres or milligrams to micrograms. If the unit you wish to convert from appears above the

unit you wish to convert to in the ladder of conversion, then you need to multiply by 1000. You will move the decimal point three places to the *right*; hence the arrow to remind you is on the *right* of the ladder.

Dividing by 1000

0 · 0 0 0 0

There may be times during your training and later in your career where you are called upon to convert a measure upwards. It could be that a patient's fluid balance is being recorded on their chart. Their drink container is marked in millilitres but the information is to be recorded in litres on the chart. In this scenario you would need to go *up* the ladder and the up arrow is on the *left*. The decimal point must go *left* as you need to divide the amount you have in millilitres to obtain the measurement in litres.

For both multiplication and division by 1000, the decimal point will move three places from its original position.

Should a number have no decimal point, then you would start from behind the last digit. In the number 75 there is currently no decimal point showing. However, you can write in the decimal point directly after the last digit, and add some zeros in readiness for conversion, giving, for example, 75.00. If a number already has a decimal point, you should always start your conversion from there; if there are not enough digits to complete the process, you can always add zeros to the front or back of a number before starting to move the decimal point. This will ensure you have no empty spaces when the conversion is completed.

So far we have been multiplying and dividing by 1000. Later in the chapter you will need to multiply or divide by 10 and 100. The number 10 has one zero and so requires a move of just one place, and 100 has two zeros and so the decimal point will move two places: to the left for division or to the right for multiplication.

Scenario

Oar Sum suffers from gastroesophageal reflux disease and has been ordered 20mg of omeprazole to be given orally. As Oar's nurse you have checked the medication available on the ward (stock on hand) and found that the dispensed dose is 0.04g per tablet. Before you can calculate how many tablets Oar will need to take (covered in Chapter 5, Drug calculations), you must convert the units of either the stock on hand (currently in grams) or the ordered amount (currently in milligrams) so that they are both in the same units.

You need to change the units in 0.04g (the stock tablets) to milligrams (mg), to match the units used for the prescribed amount. Converting to the smaller unit will eliminate the decimal point. Putting both the stock required (need) and the stock on hand (have) in the same units means that when you cancel down, as seen in Chapter 2, the 'need' and 'have' unit measures of the drug calculation will cancel each other, leaving just the stock unit measure for your dosage.

$$\frac{\text{Need mg}}{\text{Have mg}} \times \frac{\text{Stock (Unit Measure)}}{1}$$

Let's use Figure 3.1 to do the conversion. Since milligrams (mg) lie below grams (g) on the ladder, then the conversion is to be done using the down arrow, which is on the right, meaning that we have to move the decimal point to the right. So we start with 0.04 and move the decimal point three places to the right:

0 0 4 0 · 0

Notice that there were insufficient zeros at the end of the number to complete the conversion, and so two extra zeros have been added.

You now know that the omeprazole tablets on hand are of strength 40.0mg and can accurately calculate the number of tablets required. The last zero and the decimal point can be deleted as they serve no purpose; the tablets are 40mg strength.

Scenario

Wily Olfox has ulcerative colitis and has been ordered 0.75mg of mesalamine to be given orally. Stock on hand is 250mcg capsules. You need to find the strength of mesalamine capsules that Willy should be given in mcg.

Since micrograms (mcg) lie below milligrams (mg) on the ladder (Figure 3.1), the conversion will be done using the down arrow, which is on the right, so you need to move the decimal point to the right.

0 7 5 0 . 0

Again, as there were insufficient places into which to move the point, an extra two zeros were added to 0.75 before the conversion was completed. It is now clear that the amount of mesalamine ordered for Mr Olfox is 750.0mcg. Again, the final zero and the decimal point can now be deleted, so the answer is 750mcg.

Now try the following activity to see if you understand how to use the method employed in the scenarios to calculate a conversion. You need to make a conversion so that both stock strength (what you *have*) and stock required (what you *need*) are in the same units. You should try the activities without the aid of a calculator.

Activity 3.1

Commonly used as an anticoagulant, warfarin helps to prevent clots in veins, arteries, the lungs or heart. At the Droopibitz Retirement Day Care and Respite Play Arena it is kept in the medicine cabinet in various stock strength tablets. Patients under your care are being treated with this drug and will be taking their medication daily. At the start of your shift you need to calculate the number of milligrams required for the following patients.

1. Pamela Golder needs to have 0.060g
2. Thomas Flight needs to have 0.013g
3. Herminay Clark needs to have 0.40g

There are many treatments for hypertension, one of which is the drug prazosin. At the Ol Geezer's Rehabilitation Clinic the following clients are being treated with this drug and will be taking their dosage once a day. The clinical supervisor has tasked you with calculating the number of milligrams required for the following clients.

4. Gupta Patel needs to have 375mcg
5. Norma Lot needs to have 0.05g
6. Linda Payne needs to have 1250mcg
7. Ahmed Mohamed needs to have 1.01g
8. Steven Pitt needs to have 850mcg
9. Simon Mather needs to have 0.0204g

Answers to all activities can be found at the end of the chapter.

Converting dosages involving mixtures

In the previous section you learnt how to convert units of weight for tablets or capsules. In this section we will look at the conversion of drug weights found in medications comprising mixtures and syrups.

Scenario

Wattle, a patient under your care on Banksia Cancer Ward, has been prescribed panitumumab 75mg to slow the growth of her cancer cells. The dispensed dose available on the ward is in a liquid mixture containing 0.1g of drug per 5ml, expressed as 0.1g/5ml. As Wattle's nurse, you need to work out how many milligrams there are in each 5ml in order to allow correct calculation of the dosage to be given to Wattle.

To find out how many milligrams of drug there are in 5ml of a mixture with a strength of 0.1g/5ml you will need to refer back to Figure 3.1. You will need to add extra zeros to the number to provide places for the decimal point to move to. According to the ladder, converting grams to milligrams is *down*, so move the decimal point to the *right*.

The strength in milligram per 5ml mixture is:

0 1 0 0 . 0

You have to move the decimal point three places to the right as indicated by the ladder. The panitumumab strength is 100mg per 5ml, expressed as 100mg/5ml.

The ladder shown in Figure 3.1 can be used to convert metric units of measure for any drug, whatever form it comes in.

Hint... A general best-practice rule is to always convert to the smaller unit when dealing with two different weight measures.

If you are dealing with both grams and milligrams, then convert both to milligrams as in the scenario above.

Remember that in a liquid mixture or syrup, only the weight component requires conversion as the liquid volume will always remain the same figure as given.

Activity 3.2

- Julie is under your care and has been ordered 0.085g of penicillin orally. What is the required amount of penicillin in milligrams for Julie's dose?

(Continued)

(Continued)

2. Mark has been prescribed flucloxacillin. The stock suspension is 1.45g/5ml. What is the stock strength of the medication in mg/ml?
3. Sushma has a mild infection and has been ordered benzyl penicillin from an available mixture of 0.25g/5ml. What is this strength in mg/ml?
4. Florence has been ordered paracetamol, and the stock syrup on hand is 0.5g/5ml. What is this strength in mg/ml?

Activity 3.3

Sertraline is an antidepressant, one of a group of drugs called selective serotonin reuptake inhibitors (SSRIs). Your current placement sees you working in a mental health outpatient clinic and as part of their treatment several service users have been prescribed sertraline to ease their symptoms.

Calculate the following amounts in milligrams for these service users.

1. Doris Daydream is prescribed a dose of 0.07g.
2. John Thur is prescribed a dose of 0.075g.
3. Mavis Merry is prescribed a dose of 850mcg.

Pethidine is an analgesic used to ease pain during childbirth. During a placement at a Birthing Centre attached to the regional hospital you are assisting in the care of the following women. They have been prescribed a single dose of pethidine by the Non-Medical Prescribing Nurse in charge at the centre.

Calculate the amount required in micrograms for the following new mothers.

4. April Cat is prescribed a dose of 0.15mg.
5. Sushma Olag is prescribed a dose of 0.610mg.
6. Pearl Baker is prescribed a dose of 0.575mg.

A powerful steroidal anti-inflammatory drug in common use is cortisone. During a placement at Krabbies Retirement and Care Village you will be caring for the following residents, who have mild to severe arthritis and have been prescribed cortisone to ease their pain.

Calculate the amount ordered in milligrams for the following residents.

7. Alan Town is prescribed a dose of 750mcg.
8. Winifred Main is prescribed a dose of 0.025g.
9. Walter Innis is prescribed a dose of 0.3g.

Conversion of body weight

At times drug doses may be ordered based on a patient's body weight; this is often the case with children's doses and will be covered in further detail in Chapter 7. Drugs could be ordered in micrograms, milligrams or grams per kilogram per day, which may then be divided up into a number of single doses. So if your patient's personal chart has their weight recorded in grams, you will need to convert this amount to kilograms prior to commencing any calculations for their medication.

Scenario

Edmund Lilycrapper has been prescribed erythromycin. The dosage prescribed is 4mg/kg/day, four doses daily. Edmund was weighed on Popkorn Ward today and recorded at 16500g. Before you can determine the correct dosage Edmund requires, you must convert his recorded weight to kilograms. This will then allow the calculations to be done (as shown in Chapter 5, Drug calculations and Chapter 7, Calculations and children).

To find out how much Edmund weighs in kilograms you again refer to the ladder in Figure 3.1. The weight is in grams and is required in kilograms, which necessitates going up the ladder, and therefore dividing by 1000. Therefore you need to move the decimal point three places to the left.

16.5 0 0


So Edmund weighs 16.5kg; as the final zeros have no bearing on the number, they can be deleted. From this information it is now possible to calculate the amount of erythromycin Edmund requires.

Activity 3.4

To help treat infection, particularly after an operation, chloramphenicol is at times given to patients. The following patients on Hibiscus Ward have been ordered chloramphenicol and individual doses will be calculated according to the patient's body weight. Express the following patients' weights in kilograms.

(Continued)

(Continued)

1. Digger Whole weighs 71234g
2. Shiz Hum weighs 6200g
3. Jose Zoo weighs 2754g
4. Alfred Boy weighs 21925g
5. Betty Stay weighs 1832g

Express the following patients' weights in grams.

6. Sushma Patel weighs 2.707kg
7. Omar Mohamed weighs 10.245kg
8. Ya Why weighs 68.15kg
9. Lee Food weighs 35.01kg
10. Truly Iwood weighs 4.721kg

Conversion of metric units in length

The basic metric unit of length is the metre which, like all other metric units, can be divided into smaller units such as the centimetre and millimetre.

The units of length most often used by nurses are metres and centimetres. A metre can be divided into 100 parts, each of which is a centimetre. A metre can also be divided into 1000 parts, with each part known as a millimetre. The millimetre is also equivalent to one-tenth of a centimetre. As with the metric measures used for liquid and weight, the easiest way to illustrate the relationship between metric length measures is with a ladder, as shown in Figure 3.2.

Scenario

Sigmund has arrived on the Kornie Ward and as part of the admission process his height was measured at 1.15m. You have been asked to convert his height into centimetres. This height, along with his previously taken weight measure, will then be used on the Body Mass Index and Growth charts currently being used by the paediatric department to chart his development.

In the nursing environment you could come across metric length measures in any of the three units shown in Figure 3.2.

Converting metres to centimetres

To find out how tall Sigmund is in centimetres refer to Figure 3.2. Given a height in metres and requiring it in centimetres means you have to move down the ladder, multiplying by 100. As seen in previous conversion activities, multiplying moves the decimal point to the right. Unlike weight and liquid conversions, where a factor of 1000 was universal, here the factor is 100, so you move the point by only two places.

Hint... Move the decimal point three places for the factor 1000, which has three zeros, only two places for the factor 100 as it has only two zeros, and only one place for 10 as it has only one zero.

1  1 5.

1.15m expressed in centimetres is 115cm.

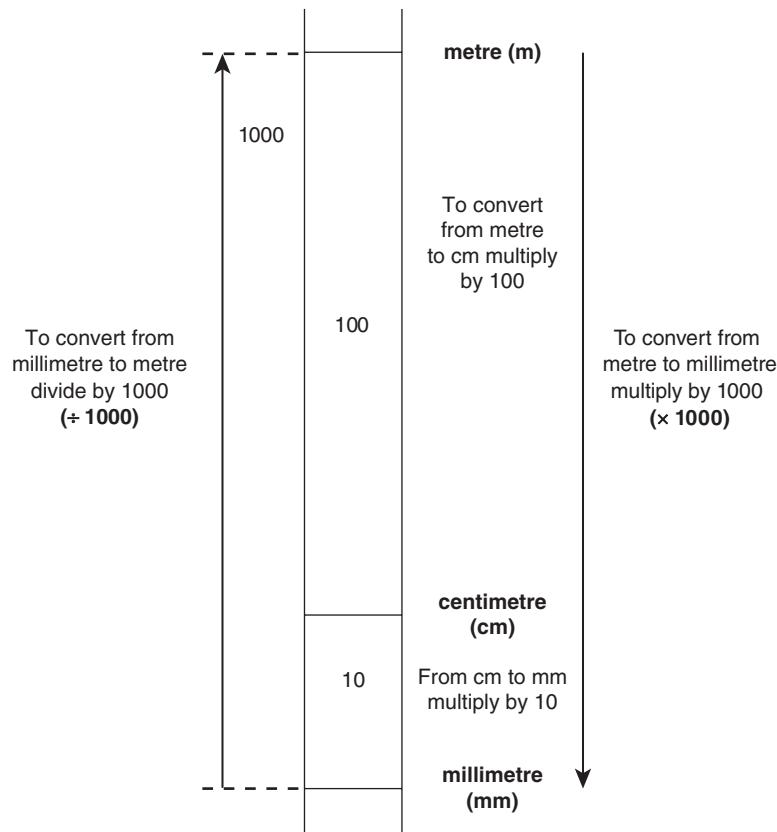


Figure 3.2 Conversion of length in metric units

Converting centimetres to millimetres

If any length given in centimetres is required in millimetres, such as for use on a growth chart, you can again use the ladder for the conversion. The direction is down, as before, but this time only by a factor of 10. The conversion involves moving the decimal point one place to the right, as 10 has only one zero.

1 1 5 0 . 0

In this example, there were insufficient digits in the number to complete the conversion so extra zeros were added to 115. The result is that 115cm is equal to 1150mm.

Converting metres to millimetres

The use of growth charts is extensive in children's nursing and some of these charts will require length measures in millimetres. You can use the ladder (Figure 3.2) to convert Sigmund's height directly from metres to millimetres; the factor is 1000. The conversion therefore involves moving the decimal point three places to the right, as 1000 has three zeros.

1 1 5 0 . 0

This confirms that Sigmund's height in millimetres is 1150mm.

Scenario

Seven Wongs on Norty Ward had her height measured at 1026mm. As an exercise, you have been asked to convert it from millimetres to both centimetres and metres.

Converting from millimetres to metres

To convert Seven's height, given in millimetres, to metres, you need to use the ladder in Figure 3.2, this time going upwards. Converting from a smaller to a larger unit requires you to divide. To convert millimetres to metres, the factor is 1000, so you move the decimal point three places to the left.

1.0 2 6

So Seven's height expressed in metres is 1.026m.

Converting from millimetres to centimetres

To convert from millimetres to centimetres, the factor is 10, so you move the decimal point one place to the left.

1 0 2 . 6

So Seven's height expressed in centimetres is 102.6cm.

Converting from centimetres to metres

If you need to express a measurement in centimetres as metres, you will need to divide by 100 (because there are 100cm in 1m).

1 . 0 2 6

102.6cm converts to 1.026m.

Activity 3.5

The patients on Lankie Ward have all had their heights measured. As an exercise, you have been asked to convert their heights as follows.

Express the heights of these patients in centimetres.

1. Ivy Not is 1814mm
2. Olive Green is 1.61m
3. Merry Stakes is 1425mm
4. Faith Fallen is 1.07m
5. Blessed Fortune is 949mm

Convert the units given in the heights of these patients, as indicated.

6. Jeremiah Blank 1.63m, in cm
7. Maureen Webb 0.918m, in cm
8. Betty Bo 1.25m, in mm
9. Julie Osman 1.10m, in cm
10. Vera Payne 1.101m, in mm

Chapter summary

Accurate conversion is an essential skill that every nurse should acquire during their training. This chapter has covered the elements of conversion of metric measures commonly found in healthcare.

In Chapter 5 (Drug calculations) you will see the conversions you have practised here in Chapter 3 put to use when calculating the dosage of medication for patients and service users. You will also come across conversions in Chapter 6 (Calculating intravenous rates) as some intravenous (IV) fluids may require conversion of their units of measurement from litres to millilitres before the rate can be calculated. The amount to be given intravenously must be in millilitres to enable the correct calculation.

Useful websites

Tests and calculations

The following website is useful for metric conversion practice and is free for six months if you register. Try a free download first and register when you need to.

1. Metric conversions quiz

www.testandcalc.com/quiz/testmet.htm

These free websites offer guides and resources on metric measure conversions.

BBC Bitesize

2. Measures

www.bbc.co.uk/schools/ks2bitesize/mathsshape_space/measures/read1.shtml

OpenLearn

3. Numbers, units and arithmetic

<http://labspace.open.ac.uk/course/view.php?id=3434>

4. Rounding and estimation

<http://labspace.open.ac.uk/course/view.php?id=3586>

Visit the online resources on your computer at <https://study.sagepub.com/starkingskrause5e> or on your smart phone or tablet and gain access to:

- over 500 extra questions to check your learning and gain extra practice;
- links to useful websites that build on the skills introduced in this chapter;
- an interactive glossary of key terms.

Answers to the activities

Activity 3.1

Tablets in the Droopibitz Centre ward medicine cabinet are of various strengths per tablet, so each patient will receive their dosage as a combination of the various strengths making up each dosage in the least number of tablets.

- The strength required is 0.060g.

0 0 6 0 . 0

So the required amount for Pamela Golder is 60mg.

- The strength required is 0.013g

0 0 1 3 . 0

So the required amount for Thomas Flight will be 13mg.

- The strength required is 0.40g.

0 4 0 0 . 0

So the required amount for Herminay Clark will be 400mg.

- The amount required to be converted to mg is 375mcg.

0. 3 7 5

So the required amount for Gupta Patel will be 0.375mg. Notice that in this conversion the requirement was to divide, therefore the decimal point moved left. Since no decimal point was shown in the original number, the conversion was started from the right-hand end of the number.

- The amount required to be converted to mg is 0.05g.

0 0 5 0 . 0

So the required amount for Norma Lot will be 50mg.

- The amount required to be converted to mg is 1250mcg.

1. 2 5 0

So the required amount for Linda Payne will be 1.25mg. Again in this conversion the requirement was to divide, therefore the decimal point moved left. As no decimal point was shown in the original number the conversion was started from the right-hand end of the number.

- The amount required to be converted to mg is 1.01g.

1 0 1 0 . 0

So the required amount for Ahmed Mohamed will be 1010mg.

- The amount required to be converted to mg is 850mcg.

0. 8 5 0

So the required amount for Steven Pitt will be 0.850mg. Notice that in this conversion the requirement was to divide, therefore the decimal point moved left. Since it was not shown in the original number, the conversion was started from the right-hand end of the number.

- The amount required to be converted to mg is 0.0204g.

0 0 2 0 . 4

So the required amount for Simon Mather will be 20.4mg.

Activity 3.2

1. Julie is under your care and has been ordered 0.085g of penicillin, so the required amount of penicillin in mg is 85mg.
2. Mark has been prescribed 1.45g/5ml flucloxacillin, so the required amount of flucloxacillin in mg is 290mg/ml.
3. Sushma has a mild infection and has been ordered benzyl penicillin from an available mixture of 0.25g/5ml. The amount required in mg is 50mg/ml.
4. Florence has been ordered paracetamol, and the stock syrup on hand is 0.5g/5ml, so the required stock strength is 500mg/5ml = 100mg/ml of paracetamol.

Refer back to the ladder and the scenario if you are in any doubt about how to carry out the required conversions.

Activity 3.3

1. Doris Daydream is prescribed a dose of 0.07g, equal to 70mg.
2. John Thur is prescribed a dose of 0.075g, equal to 75mg.
3. Mavis Merry is prescribed a dose of 850mcg, equal to 0.850mg.
4. April Cat is prescribed a dose of 0.15mg, equal to 150mcg.
5. Sushma Olag is prescribed a dose of 0.610mg, equal to 610mcg.
6. Pearl Baker is prescribed a dose of 0.575mg, equal to 575mcg.
7. Alan Town is prescribed a dose of 750mcg, equal to 0.750mg.
8. Winifred Main is prescribed a dose of 0.025g, equal to 25mg.
9. Walter Innis is prescribed a dose of 0.3g, equal to 300mg.

Refer back to the ladder and the scenario if you are in any doubt about how to carry out the required conversions.

Activity 3.4

Convert the patients' weights in grams to kilograms.

1. Digger Whole weighs $71234g \div 1000 = 71.234kg$
2. Shiz Hum weighs $6200g \div 1000 = 6.2kg$
3. Jose Zoo weighs $2754g \div 1000 = 2.754kg$
4. Alfred Boy weighs $21\ 925g \div 1000 = 21.925kg$
5. Betty Stay weighs $1832g \div 1000 = 1.832kg$

Convert the patients' weights in kilograms to grams.

6. Sushma Patel weighs $2.707kg \times 1000 = 2707g$
7. Omar Mohamed weighs $10.245kg \times 1000 = 10\ 245g$
8. Ya Why weighs $68.15kg \times 1000 = 68\ 150g$

9. Lee Food weighs $35.01\text{kg} \times 1000 = 35\ 010\text{g}$
10. Truly Iwood weighs $4.721\text{kg} \times 1000 = 4721\text{g}$

Refer back to the ladder and the scenario if you are in any doubt about how to carry out the required conversions.

Activity 3.5

Convert the patient's height in millimetres or metres to centimetres.

1. Ivy Not is $1814\text{mm} \div 10 = 181.4\text{cm}$
2. Olive Green is $1.61\text{m} \times 100 = 161\text{cm}$
3. Merry Stakes is $1425\text{mm} \div 10 = 142.5\text{cm}$
4. Faith Fallen is $1.07\text{m} \times 100 = 107\text{cm}$
5. Blessed Fortune is $949\text{mm} \div 10 = 94.9\text{cm}$

Convert the patients' height in metres to the required unit.

6. Jeremiah Blank $1.63\text{m} \times 100 = 163\text{cm}$
7. Maureen Webb $0.918\text{m} \times 100 = 91.8\text{cm}$
8. Betty Bo $1.25\text{m} \times 1000 = 1250\text{mm}$
9. Julie Osman $1.10\text{m} \times 100 = 110\text{cm}$
10. Vera Payne $1.101\text{m} \times 1000 = 1101\text{mm}$

Refer back to the ladder and the scenario if you are in any doubt about how to carry out the required conversions.