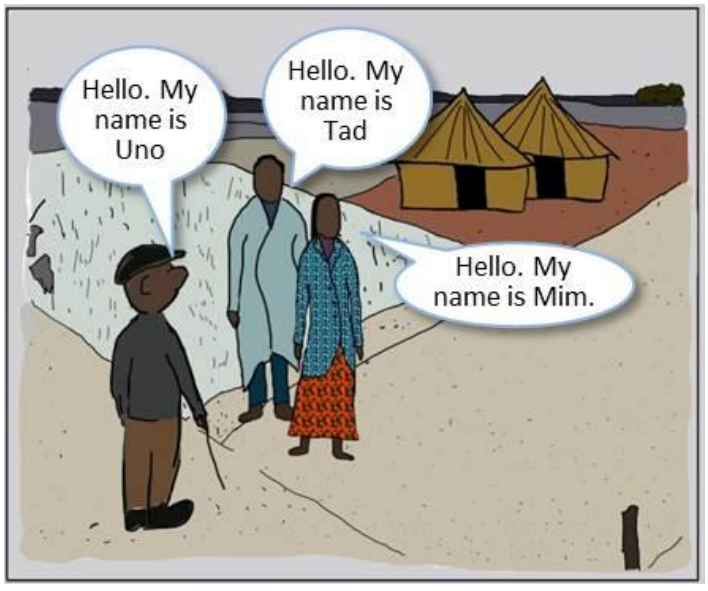
Functional Numeracy for Food Security and Nutrition

Fixed Obligation Grant (FOG) – Award Number 999000442

Field Numeracy
Uno How's Farm Visits™

Module 1



Calculating the area of your farm

Numeracy linked Farm Visits 1-4

Functional Numeracy for Food Security and Nutrition

Fixed Obligation Grant (FOG) – Award Number 999000442

Field Numeracy - Uno How's Farm Visits™

Module 1

Field Visits 1 - 4

Calculating the area of your farm

William Ian Robinson
Lisa Osborne (graphics)
Heather Pitcher

November 2014

ISBN 978-0-9560807-9-0

Introduction

Uno How's Farm Visits are a custom-built series of farm numeracy classes, based on farm visits undertaken by a virtual extension agent called *"Uno How".*

Module 1 - Calculating Area consists of 4 farm visits to farmers Tad and Mim.

Visit 1 – Measuring your fields
Visit 2 – Calculating the area of your fields
Visit 3 – Calculating the area of irregular fields
Visit 4 – Estimating the area of your farm

The visits are represented by a series of visual graphics which introduce the topic. Each topic is then followed by an explanation with illustrations, examples and exercises (the answers to which are given at the end of this booklet).

Module 2 – Estimating Seed Inputs, Fertiliser and Spray requirements

This module is available as a separate booklet and continues the series of farm visits from Uno How.

Visit 5 – Amount of seed required
Visit 6 – Cost of seed required
Visit 7 – Estimating the amount of fertiliser
Visit 8 – Amount of spray required

The modules are available to view and download online at:

http://www.agritechtalk.org/Uno How Introduction.html

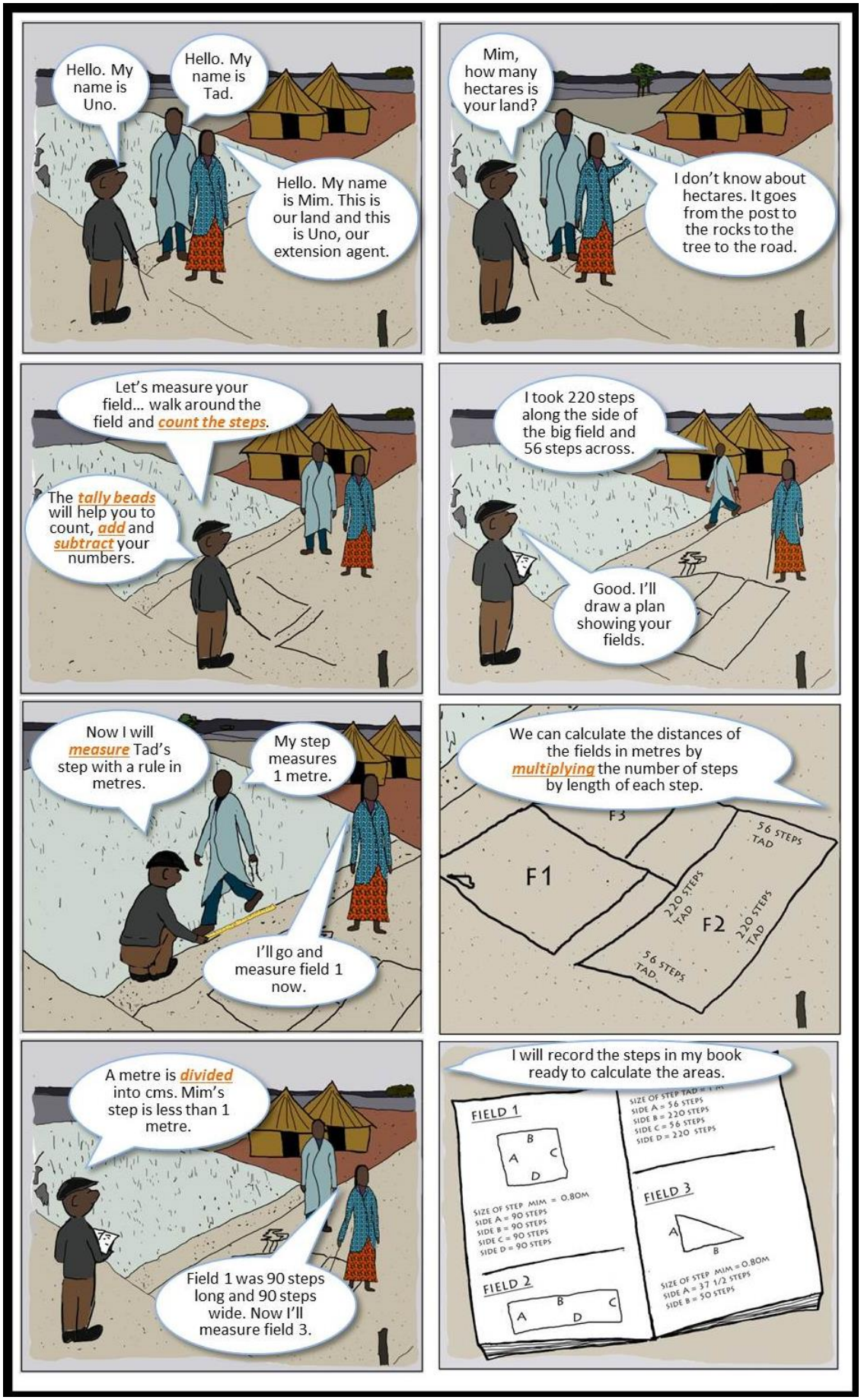
A series of factsheets to accompany the modules are also available online.

Functional Numeracy for Food Security and Nutrition is made possible with a grant from the USAID Technical and Operational Performance Support (TOPS) program. The TOPS Micro Grants Program is made possible by the generous support and contribution of the American people, delivered through the U.S Agency for International Development (USAID). The contents of the materials produced through the TOPS Micro Grants Program do not necessarily reflect the views of TOPS, USAID or the United States Government.

Uno How's Farm Visits...

Contents page

Uno How's Farm Visit 1 (part 1)... Measuring your fields



Completed Uno How Farm Visit 1 (part 1) - Continue to Uno How Farm Visit 1 (part 2)

Uno How's Farm Visit 1

Measuring your fields – Basic Skills

Counting Steps

When we count things like steps we use numbers.

A number describes the **quantity** of something. We could describe quantity as 'a few' or 'a lot' but using a number gives us a better idea of exactly how many things there are.

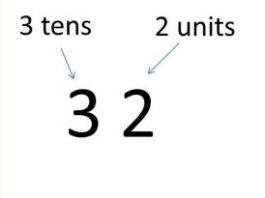
All numbers (big and small) are represented using **digits** 0,1,2,3,4,5,6,7,8 and 9.

The chart below shows the sequence of numbers from one (1) to a hundred (100), in ten rows of ten units.

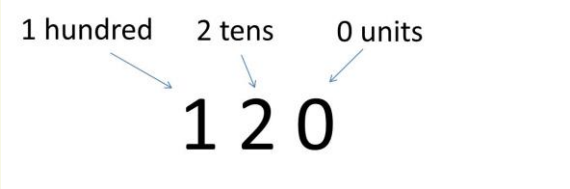
1	2	3	4	5	6	7	8	9	10 → Ten
11	12	13	14	15	16	17	18	19	20 → Twenty
21	22	23	24	25	26	27	28	29	30 → Thirty
31	32	33	34	35	36	37	38	39	40 → Forty
41	42	43	44	45	46	47	48	49	50 → Fifty
51	52	53	54	55	56	57	58	59	60 → Sixty
61	62	63	64	65	66	67	68	69	70 → Seventy
71	72	73	74	75	76	77	78	79	80 → Eighty
81	82	83	84	85	86	87	88	89	90 → Ninety
91	92	93	94	95	96	97	98	99	100 → Hundred

Numbers less than ten are known as units and can be represented by just one digit, for example 2.

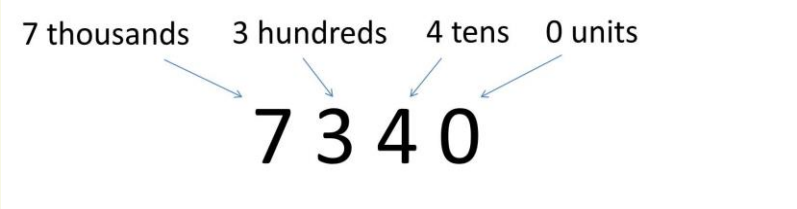
If a number is ten (10) or greater, but less than a hundred (100), then we need two digits to represent it, for example 32. The digit on the left tells us how many sets of ten that number contains and the digit on the right tells us how many units (numbers less than ten) there are.



If a number is a hundred (100) or greater, but less than a thousand (1000), then we need three digits to represent it, for example 120.



If a number is a thousand (1000) or greater then we need four digits to represent it, for example 7340, and so on.



In visit 1 **Uno How** is helping Tad and Mim work out the size of their fields. He asks them to measure the distances along the edge of each field.

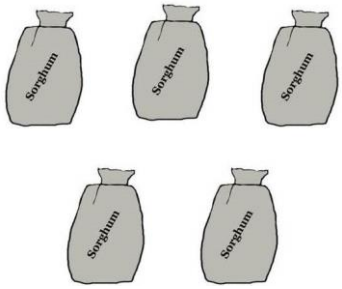
To do this, Tad begins at one corner of the field and takes evenly sized steps in a straight line, along the edge of the field, until he reaches the next corner. As he does this, he **counts** the **number** of steps that he takes.

Using a chart can help you to count. You just move your finger (or pencil) from left to right, one square at a time with each new unit. When you reach the end of the first row, you move to the beginning of the second row.

Instead of using a chart and a pencil, Tad is using **tally-beads** to help him count the number of steps he takes from place to place.

Quick Test 1 – Counting

1 How many bags?



2 Write these numbers in order

36 18 9 73 21

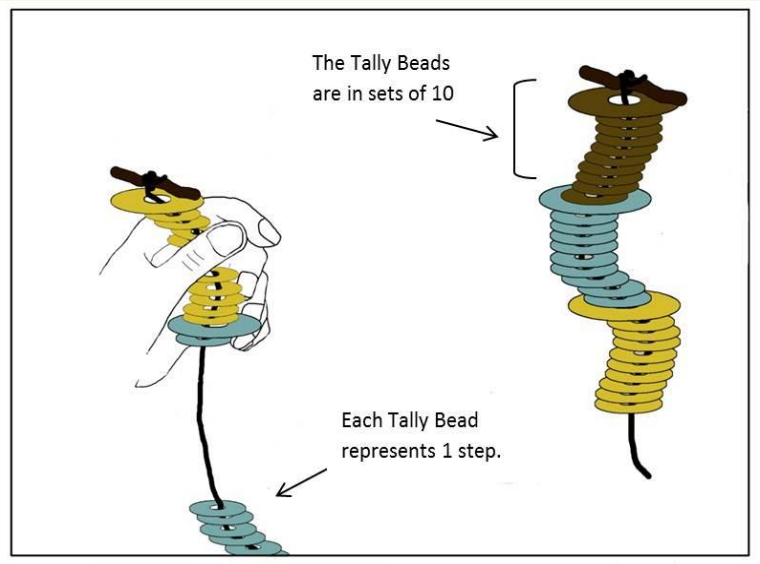
smallest largest

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 1

Counting Steps using Tally Beads

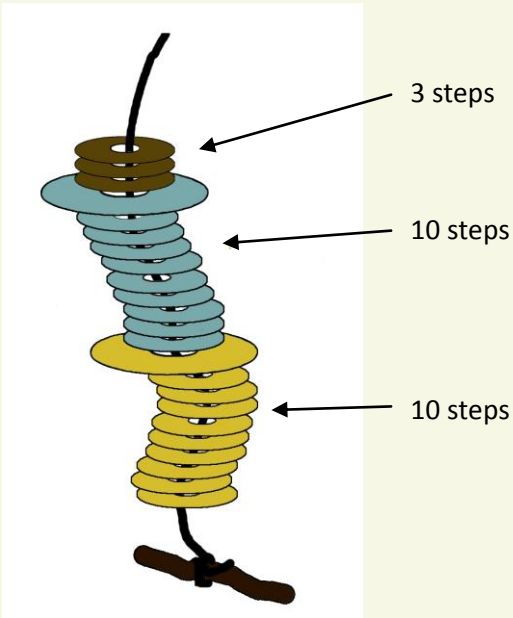
Tally Beads are a string of beads or rings that can represent the steps you take, with extra-large beads marking every 10th bead or ring.



As you walk from place to place, let the beads (or rings) pass through your fingers, moving one bead with each step.

Because each big bead marks the tenth bead, counting every big bead at the end of your walk will give you the number of groups (or rows) of ten steps you have taken, which is easier than trying to remember the number of single steps you have walked.

In the example below the farmer has counted 23 steps.



We combine these three numbers by adding, 10 steps added to 10 steps makes 20 steps. Add on another 3 steps. This makes 23 steps in all.

We look more at adding in the next unit.

Back to Uno How Farm Visit 1

Uno How's Farm Visit 1

Measuring your fields – Basic Skills

Adding

Adding (or addition) means combining two or more numbers to make a bigger number which is called the **total** (or **sum**). It is recognised by the **plus** sign **+**

The example below illustrates this simple addition with bags of grain.

If we had 5 bags of grain, and we wanted to add another 2 bags of grain, how many bags of grain would we have in total?

The sum is written as 5 + 2 = ?

We could use several different ways to find the total.

1. Addition - Counting physical objects

For the sum 5 + 2, you would start with **5** bags, add on another **2** bags and then count the total number of bags. Here we have used drawings to indicate each object.

We have 5 bags of grain.

We want to add another 2.

Counting all of the bags gives you a total of 7 bags of grain.

2. Addition - Using a number chart

In this case the sum is 5 + 2 = ? Find **5** on the number chart and then count on **2** places. The number in this square is the answer, in this example **7**, as shown below.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

Therefore 5 + 2 = 7

Now try 45 + 33 = ?

Find **45** on the number chart. Now count on another **33** squares. 33 is equal to 10 + 10 + 10 +3

As each row is equal to 10 you can add on 33 by moving straight down 3 rows and then counting on another 3.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

← 45 + 10 = 55

← 55 + 10 = 65

← 65 + 10 = 75 + 3 = 78

The answer is **78.**

3. Addition - Writing down the sum on paper

This technique is generally used for larger numbers, for example when adding numbers of more than one digit together.

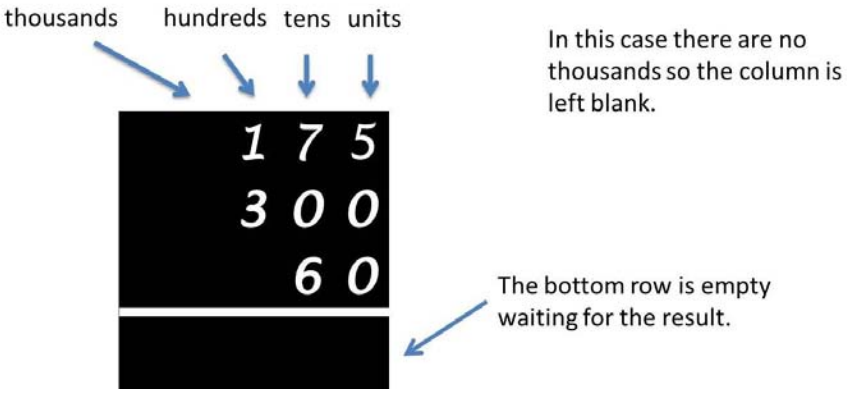
The numbers to be added are written in rows. The total will go underneath. You must always be sure that you keep the units, tens and hundreds in the same columns within the rows.

In the example below, we want to know how much sorghum seed we need to buy if we were to sow 175 kg of sorghum seed in field one, 300 kg of sorghum seed in field two, and 60 kg in field three.

The sum is to add 175 + 300 + 60 to give us a total number of kgs.

Writing down the sum

Write the figures in rows, keeping the units, tens, hundreds and thousands columns in line, starting on the right, with the units.



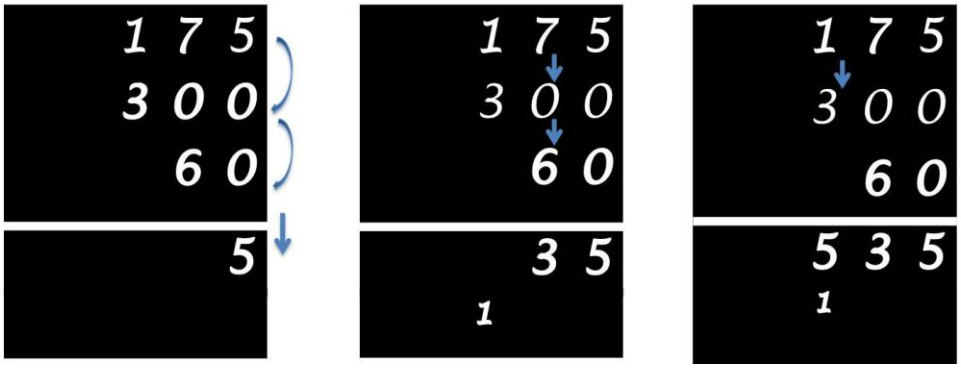
Addition 175 + 300 + 60

Starting with the right hand column (the units), add the numbers together

So 5 + 0 + 0 = 5

Now add the numbers in the tens column.
7 + 0 + 6 = 13. The 1 (the ten) is carried over into the next column (the hundreds column) .

Now add the numbers in the hundreds column.
1 + 3 = 4 plus the 1 which was carried over = 5.



Therefore 175 + 300 + 60 = 535

Remember: This method may be used for very large numbers and also for adding together lots of numbers. **The important thing to remember is that the numbers must be lined up in the units, tens, hundreds and thousands columns AND that addition begins in the UNITs column on the right.**

Quick Test 2 – Adding

1 You have 3 bags of seed. The first bag weighs 50 g, the second weighs 415 g and the third weighs 1180 g. How many grams of seed do you have altogether?

2 You have 135 chickens, 210 goats, 50 sheep and 314 cows. How many livestock do you have in total?

3 Calculate these totals:
a) 67 + 325 + 935
b) 578 + 988 + 1267
c) 679 + 3786 + 10540
d) 356 + 14788 + 21000 + 4500

4 Find out your total income from livestock for the last 4 months if income from month one is $355; income from month two is $600; income from month three is $20; income from month four is $217

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 1

Uno How's Farm Visit 1

Measuring your fields – Basic Skills

Subtracting

Subtraction is the opposite of addition. Subtraction (subtracting or taking away) means taking away a number (or numbers) from another number (which is normally larger) and working out what is left.

Subtraction is recognised by the **minus** sign **-**

The example below illustrates a simple subtraction using goats.

If we had 10 goats, and we sold seven, how many would we have left?

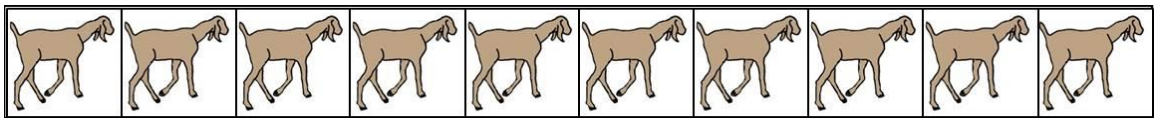
The sum is written as 10 **-** 7 = ?

Subtracting may be done in three different ways:

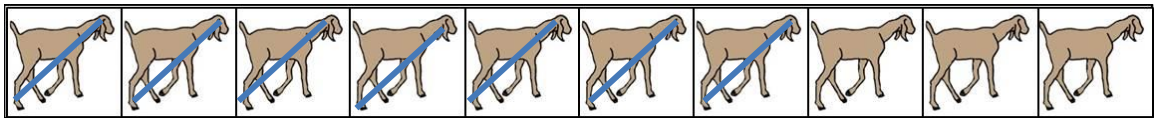
1. Subtraction - Counting the goats

For the sum 10 - 7, you would start with 10 goats; then take away 7 goats and count how many you have left.

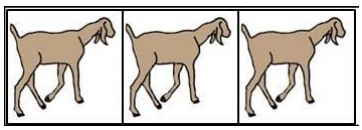
We have 10 goats in the field



If we take 7 goats out of the field and put them in the yard...



We only have 3 goats left in the field



So 10 – 7 = 3

2. Subtraction - Using a number chart

As with addition, a **number chart** can also be used when taking numbers away.

If we wanted to find the answer to the sum 10 – 7, we would find **10** on the number chart and then, count off **7** numbers backwards (including the number 10). The number in the *next* square is the answer. In this example, the answer is **3,** as shown below.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

If we wanted to find the answer to the sum 22 – 12 we would find 22 on the number chart and then, moving backwards, count off 12 numbers (including the number 22). The number in the *next* square is the answer. In this example, the answer is 10, as shown below.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Therefore 22 - 12 = 10

If we wanted to find the answer to the sum 58 - 23 = ?
In this case find the 58 on the number chart. Now, moving backwards, count off 23 (including the number 58). Because each row is equal to 10, you may find it easier to count off the 20 by moving straight up 2 rows to 38, and then to count off another 3 (remember to include the 38). The answer is 35.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

48 - 10 = 38 - 3 = 35

58 - 10 = 48

Therefore 58 – 23 = 35

3. Subtraction - Writing the sum down on paper

Whereas simple sums may be done in your head, larger numbers and more difficult sums should be written down, to avoid making mistakes.

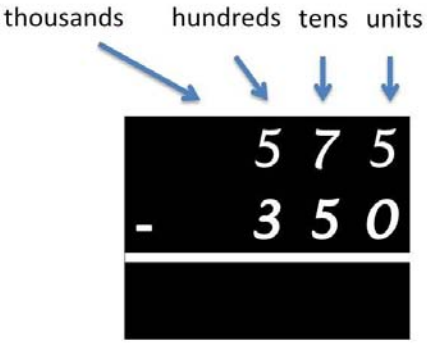
In subtraction, as with addition, the numbers are written in rows beneath each other, keeping the units, tens and hundreds in the same columns, with the largest number (from which the smaller number is to be subtracted) on top.

For example, you have 575 kg of sorghum and are going to sell 350 kg. You want to work out how much you will have left.

Write the number you start with (in this case, 575) on the top row. Write the number you are taking away from it (350) beneath it. You should have an empty row underneath in which to write your answer.

Writing down the sum

Write the figures in rows, keeping the units, tens, hundreds and thousands columns in line, starting on the right, with the units.



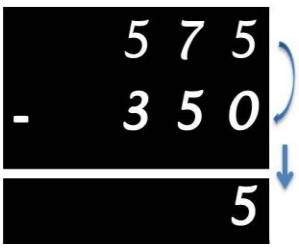
In this case there are no thousands so the column is left blank.

Make sure the number you start with is on the top row, and the number you are taking away is underneath. Your third row is empty waiting for the result

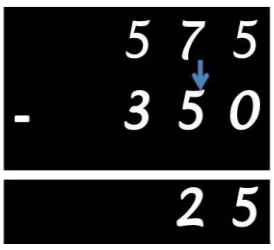
Subtract 575 - 350

Starting with the right hand column (the units) take the bottom number away from the top number.

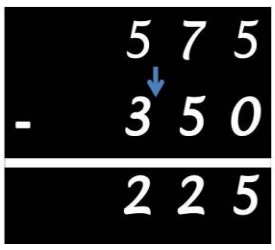
So 5 – 0 = 5



7 – 5 = 2



5 – 3 = 2



So 575 – 350 = 225

Remember the rows must be lined up in the columns for units, tens, hundreds, thousands, tens of thousands etc. starting on the right with the units.

The following example involves a more complicated sum **865 – 438 = ?**

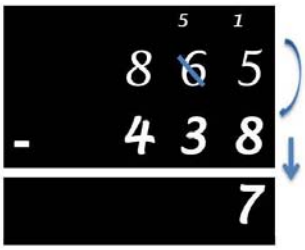
Subtract 865 - 438

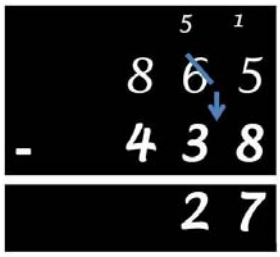
Starting with the right hand column (the units) take the bottom number away from the top number.

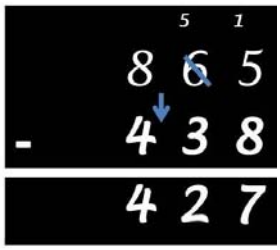
5-8 Because the units in the bottom row (8) are larger than those in the top row (5), you have to borrow a ten from the top row of the tens column and add it to top row of the units column. The 5 becomes a 15. The top number in the tens column is reduced by 1, so becomes 5

The 6 in the tens column has become a 5, so 5 – 3 = 2

8 – 4 = 4







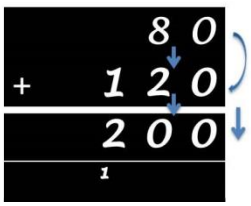
Therefore 865 – 438 = 427

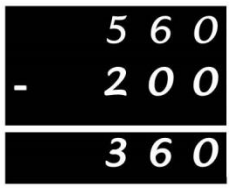
When you use this method of subtracting, you can only take away one number at a time. But you may want to take away more than one number, for example:

You have 560 cattle and want to know how many you will have left if you sell 80 in the first month and 120 in the second month. There are two methods you could use.

Method 1: You could first add up all the cattle sold (80 + 120) and take this number away from the amount of stock you had at the beginning (560).

Add 80 + 120 and take this away from 560



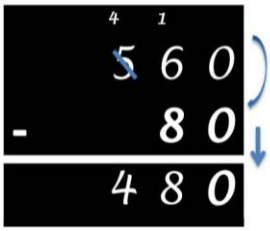


So you would have 360 cattle left.

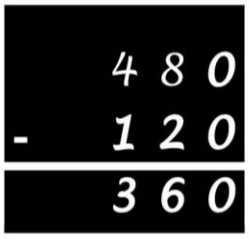
Method 2: You take away one month at a time:
560 – 80 = y (amount left after 1st month) and then y – 120 = z (amount left after 2nd month)

Subtract 560 – 80 and then subtract 120

560 – 80 = 480



480 – 120 = 360



Quick Test 3 - Subtraction

1 You have 175 kg of sorghum seeds. You use 35 kg for the first field, 25 kg for the second field and 60 kg on the third field. How many kg of sorghum seeds will you have left?

2 You have 550 sheep. You sell 75 sheep in the first month, 43 in the second and 65 in the third. How many sheep will you have left?

3 Calculate these sums:
a) 1238 - 987
b) 3458 - 765
c) 9870 – 3225
d) 10450 - 354

Note down the answers and check them with the answers at the back of this book

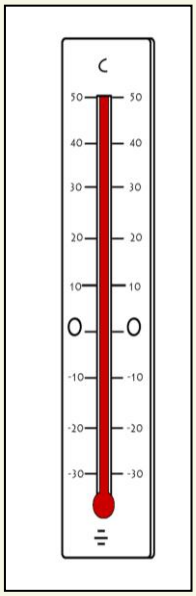
Different ways of writing numbers

Numbers written with a decimal point.

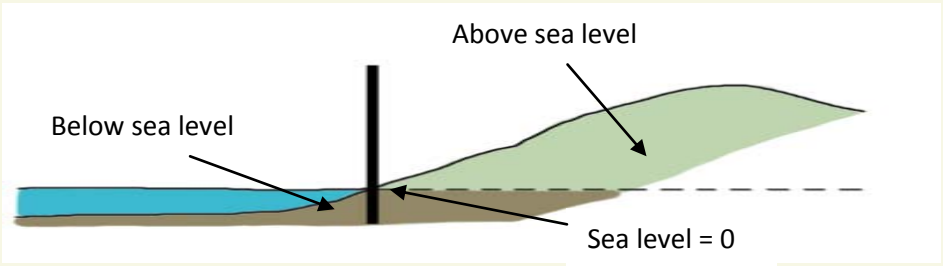
Decimal points are used when a number has parts that are smaller than 1 in value. The digits after (to the right of) the decimal point show the parts that are less than 1. If only zeros (0) are written after the decimal point, there is no value less than 1 at all. For example 6 is the same as 6.0 which is the same as 6.00 We will cover decimals in more detail later.

Positive and Negative Numbers

Most numbers we deal with in everyday life relate to physical things that can be seen, counted and measured, so are greater than (above) zero "0". Numbers greater than zero are called positive numbers. Positive numbers can be represented by the + symbol.



Zero usually signifies that there is nothing present. However it is often used to indicate a level on a scale, e.g. zero temperature is the freezing point of water on the Celsius (c) scale or zero metres is depicted as sea level.



Therefore numbers less than zero can exist, although they are also used theoretically for analytical purposes. For instance if you withdraw too much money from your account you will be left with a negative balance.

Negative numbers are represented by the – symbol. For example, a balance of -$100 in your bank account tells you that you are $100 in debt.

Back to Uno How Farm Visit 1

Uno How's Farm Visit 1

Measuring your fields – Basic Skills

Measuring Length

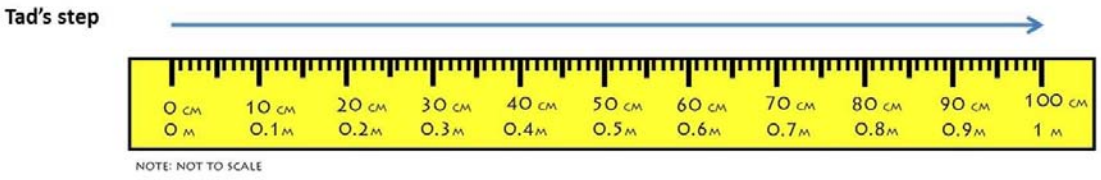
Measurements of length (or distance) are generally made using a **standard measure** that everyone understands.

The most commonly used international standard measure of length is the **metre**. A metre is very close to the natural walking step of a tall, fit, adult man like Tad.

A metre is made up of 100 equal parts called centimetres. Using centimetres allows us to measure things more accurately.

The photograph above shows how to measure a step with a metre rule from front toe to back heel.

1 metre (m) is made up of 100cm



As Tad's step is 1m, the distance he has walked is equal to the number of steps he has taken. For example, 5 of Tad's steps will be a distance of 5 m.

Of course, adding things together many times can be very slow. An easier way of doing a calculation like this is to MULTIPLY the size of the step by the number of steps taken.

Back to Uno How Farm Visit 1

Uno How's Farm Visit 1

Measuring your fields – Basic Skills

Multiplying

Multiplying (multiplication) is a quick way of adding the same number up many times.

It is recognised by the **X** sign.

1. Simple Multiplication – Using counting

This method could be used for multiplying any number by numbers 1 to 9.

Multiplying numbers means adding the same number together a certain number of times.. For example:

1 x 2 = 2 (this is only 1 lot of 2 so there is nothing to add)
2 x 2 = 4 (which equals 2 lots of 2 = 2 + 2)
3 x 2 = 6 (which equals 3 lots of 2 = 2 + 2 + 2) .... etc.

or
2 x 9 = 18 (which equals 2 lots of 9 = 9 + 9)
3 x 9 = 27 (which equals 3 lots of 9 = 9 + 9 + 9) .... etc.

Note: When you do multiplication, it does not matter in which order you write the numbers. For example, 1 x 3 is the same as 3 x 1.

2. Simple Multiplication – Using a multiplication table

A multiplication table, shown below, can be used for multiplying any number from 1 to 12 by another from 1 to 12.

It is always helpful to learn multiplication tables by heart (see **Uno How's Basic Factsheet** for individual tables which are easier to learn from).

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

The diagram below shows part of a multiplication table and demonstrates how it can be used for solving simple multiplication problems.

For instance 5 people have 6 buckets each. What would be the total number of buckets?

Find the number 5 on one side and number 6 on the other. Then follow the two lines until they meet. This is your total.

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72

The total number of buckets will be 5 x 6 = 30 buckets.

Quick Test 4 – Simple Multiplication – Using the multiplication table

1 7 x 1 =	2 3 x 3 =	3 9 x 5 =
4 2 x 6 =	5 8 x 3 =	6 3 x 8 =
7 4 x 4 =	8 6 x 7 =	9 9 x 9 =

Note down the answers and check them with the answers at the back of this book

3. Simple Multiplication – Writing the sum down on paper

Multiplying by 10, 100 or a 1000

When you multiply by **10**, simply add a zero, **or** if there is a decimal point, move the decimal point one place to the right.

For example 6 x 10 = 60
Add one zero to the right of 6

Or, remembering that 6 is the same as 6.0, move the decimal point one place to the right

6.0 becomes 60

For example 3.6 x 10
Move the decimal point one place to the right

3.6 becomes 36

When you multiply by a hundred **100**, add two zeros, **or** if there is a decimal point, move the decimal point two places to the right.

For example 6 x 100 = 600
Add two zeros to the right of 6

Or, remembering that 6 is the same as 6.00, move the decimal point two places to the right

6.00 becomes 600

When you multiply by a thousand **1000**, add three zeros, **or** if there is a decimal point, move the decimal point three places to the right.

For example 5.6 x 1000
Remembering that 5.6 equals 5.600 move the decimal point three places to the right

5.600 becomes 5600

Quick Test 5 – Simple Multiplication – Multiplying by 10, 100 and 1000

1a) 1 x 10		b) 1 x 100		c) 1 x 1000	
2a) 132 x 10		b) 132 x 100		c) 132 x 1000	
3a) 70.00 x 10		b) 70.00 x 100		c) 70.00 x 1000	
4a) 103.11 x 10		b) 103.11 x 100		c) 103.11 x 1000	
5a) 0.07 x 10		b) 0.07 x 100		c) 0.07 x 1000	

Note down the answers and check them with the answers at the back of this book

When multiplying by multiples of 10 (e.g. 20, 30 etc.), 100 (e.g. 200, 300 etc.) or 1000 it is easier to split the sum up and multiply in parts.

For example, a farmer has 3 boxes, each with 40 bananas in each. How many bananas does he have in total?

40 x 3 — Split the 40 into 4 x 10 — 4 x 10 x 3

Multiply 4 x 3 — 4 x 3 x 10 = 12 x 10

As there is no decimal point add a 0 on the end — 12 x 10 = 120

The farmer has a total of **120 bananas**

If you were multiplying multiples of 100, for example 600 x7

600 x 7 — Split the 600 into 6 x 100 — 6 x 100 x 7

Multiply 6 x 7 — 6 x 7 x 100 = 42 x 100

As there is no decimal point add two 0s on the end — 42 x 100 = 4200

600 x 7 = **4200**

Similarly if you were multiplying by multiples of 1000, for example 8000 x 5

8000 x 5 — Split the 8000 into 8 x 1000 — 8 x 1000 x 5

Multiply 8 x 5 — 8 x 5 x 1000 = 40 x 1000

As there is no decimal point add three 0s on the end — 40 x 1000 = 40000

8000 x 5 = **40000**

Quick Test 6 – Simple Multiplication – Multiplying by Multiples of 10

1	40 x 4 =	2	90 x 8 =
3	60 x 3 =	4	70 x 2 =
5	3 x 800 =	6	8 x 500 =
7	7 x 700 =	8	6 x 5000 =
9	4 x 8000 =	10	5 x 12000 =

Note down the answers and check them with the answers at the back of this book

Multiplying by larger numbers which are not multiples of 10, 100 or 1000

This is more complicated. We need to write these sums down. This can be done by writing out the sum carefully in rows and columns, as before:

A farmer wanted to buy 4 camels which cost $185 each. How much would they cost in total?

Multiply 185 x 4

Step 1: Multiply the 5 in the top row by the 4 in the second row.

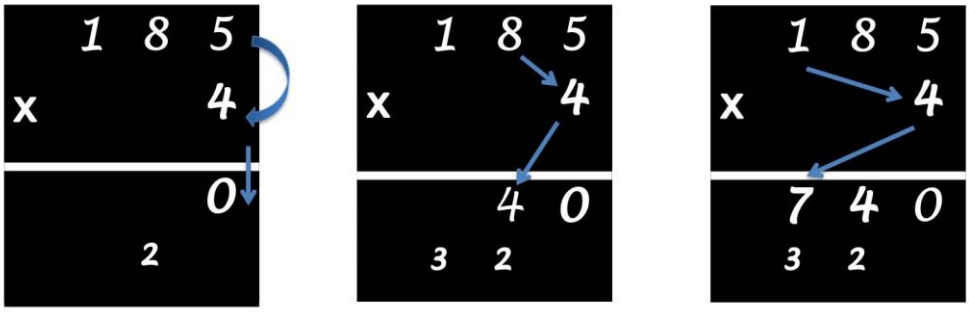
5 x 4 = 20
The 2 is carried over into the tens column.

Step 2: Multiply the 8 in the top row by the 4 in the second row.

8 x 4 = 32 + 2 (which was carried over in Step 1) = 34
The 3 is carried over into the hundreds column

Step 3: Multiply the 1 in the top row by the 4 in the second row.

1 x 4 = 4 + 3 (which was carried over in Step 2) = 7

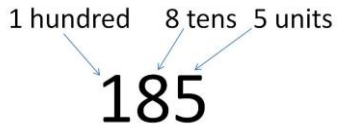


185 x 4 = 740

Note: We could also break the sum down and multiply in parts like we did when we multiplied by multiples of 10.

Our sum is 185 x 4:

Firstly split 185 into hundreds, tens and units and then multiply each of these by 4. Add up the totals of these to get the overall total.



Therefore 4 x 185 is the same as: 4 x 100 plus 4 x 80 plus 4 x 5 = 400 + 320 + 20 = **740**

Quick Test 7 – Simple Multiplication – Multiplying by larger numbers

1	236 x 3 =		2	785 x 7 =	
3	832 x 2 =		4	623 x 5 =	
5	921 x 6 =		6	341 x 4 =	
7	182 x 9 =		8	295 x 5 =	

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 1

Uno How's Farm Visit 1

Measuring your fields – Basic Skills

Dividing

Dividing is the opposite of multiplication. When dividing we are finding out how many times one number "goes into" another.

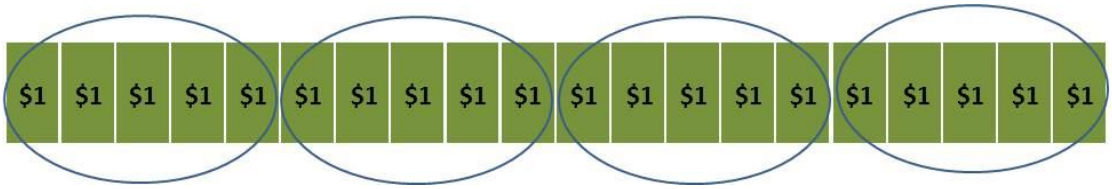
Division is recognised by the **÷** sign **or** the **/** sign.

The **/** sign is always used in fractions (covered in later units).

1. Division - Counting the clusters

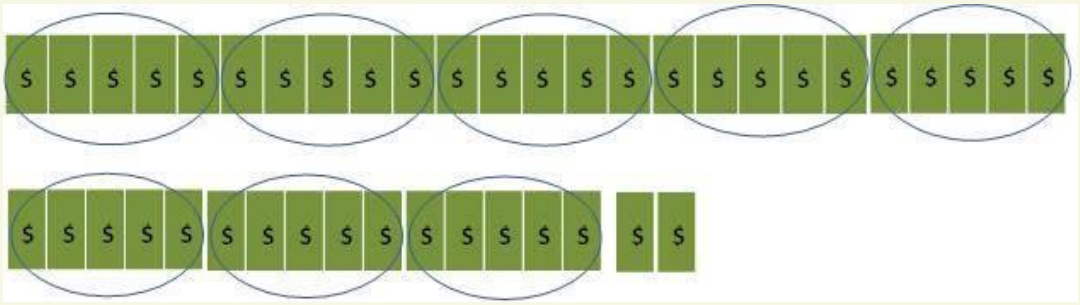
When you divide a number, for instance 20, by another number, say 5, you are finding out how many 5s there are in 20. This can be written as 20 ÷ 5 = ? or 20/5 = ?

For example, if you have $20 and want to buy bags of seed which are $5 each, you may physically count out clusters of $5 lots until the $20 are used up. The answer is 4, as shown in the diagram.



Some numbers you divide will not divide equally. There will be a *remainder*, or some left over.

If for example you had $42 dollars and you wanted to know how many bags of seed, at $5 a bag, you could buy, you could once again physically count out your dollars.



You can see that there are 8 groups of 5 with 2 left over (the **remainder**), so you would be able to buy 8 sacks of seed for $40 and have $2 left over.

2. Dividing - Using a multiplication table

Because division is the opposite of multiplication you can use the multiplication table to help you with your calculation.

In our example, 20 ÷ 5, you are finding how many times 5 goes into 20. On the multiplication table find the 5 in the top row and follow the column down until you reach 20. Then follow that row across. In this case the number is 4. So 20 divided by 5 is 4.

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72

Dividing using the multiplication table – what to do if there is a remainder

You have $77. Fertiliser is $8 a sack. How many sacks could you buy?

Using the multiplication table find 8 in the top row, and follow the rows down until you reach 77, or the next lowest number, in this case 72 (do not choose the next largest number, in this case 80, as this is more money than you have).

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

72 is the next lowest number.

This means that with your $77 you will be able to buy 9 sacks of fertiliser and will have $5 ($77 - $72) left over.

Quick Test 8 – Dividing using the number chart

1a) 45 ÷ 9		b) 36 ÷ 3		c) 56 ÷ 8	
2a) 58 ÷ 5		b) 98 ÷ 8		c) 120 ÷ 11	
3a) 144 ÷ 12		b) 92 ÷ 10		c) 72 ÷ 6	

Note down the answers and check them with the answers at the back of this book

3. Dividing - Writing the sum down on paper

Dividing by 10, 100 or a 1000

When you divide by 10, simply take off a zero from the right hand end of the number **or**, if there is a decimal point, move the decimal point one place to the **left.**

If there is no decimal point remember that 3.0 is the same as 3 and 36.0 is the same as 36 and so on.

For example 60.00 ÷ 10 = 6

Move the decimal point one place to the left

60.00 becomes 6.000 which is the same as 6

For example 73 ÷ 10 = 7.3

Remembering that 73 is equal to 73.00 move the decimal point one place to the left

73.00 becomes 7.300 which is the same as 7.3

When you divide by 100, simply take two zeros from the right hand end of the number **or**, if there is a decimal point, move the decimal point two places to the **left.**

For example 60.00 ÷ 100 = 0.60

Move the decimal point two places to the left

60.00 becomes 0.6000 which is the same as 0.60 or 0.6

When you divide by 1000, simply take off three zeros from the right hand end of the number **or** if there is a decimal point, move the decimal point three places to the **left.**

For example 94 ÷ 1000 = 0.094

Remembering that 94 is equal to 94.00 move the decimal point three places to the left

094.00 becomes 0.09400 which is the same as 0.094

because there are not enough digits before the decimal point a 0 is added

Quick Test 9 – Dividing by 10, 100, 1000

1a) 70 ÷ 10		b) 70 ÷ 100		c) 70 ÷ 1000	
2a) 135 ÷ 10		b) 135 ÷ 100		c) 135 ÷ 1000	
3a) 735 ÷ 10		b) 735 ÷ 100		c) 735 ÷ 1000	

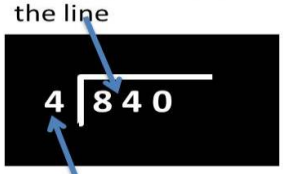
Note down the answers and check them with the answers at the back of this book

Dividing larger numbers

When dividing larger numbers or doing more complicated divisions, the sum is commonly worked out as shown below.

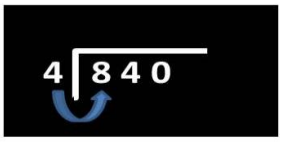
A farmer wishes to plant an orchard. If one tree costs $4, how many trees could the farmer buy if he had $840? The sum would be written as 840 ÷ 4 = ?

Step 1: Put the amount you are starting with under the line

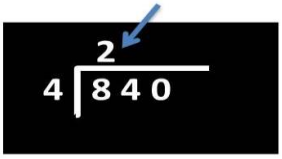


Put the number you are dividing by here

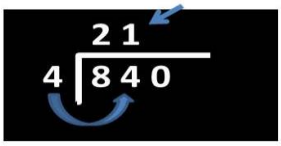
Step 2: Divide the first number by 4



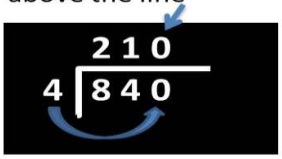
8 ÷ 4 = 2. The 2 goes above the line.



Step 3: Divide the second number by 4. 4 ÷ 4 = 1. The 1 goes above the line



Step 4: Divide the third number by 4. 0 ÷ 4 = 0. The 0 goes above the line



Therefore, 840 ÷ 4 = 210. This means that the farmer would be able to buy 210 trees, which would cost $840. There is no remainder, so the farmer would have no dollars left.

You can crosscheck your results by multiplying (because remember division is the reverse of multiplying).

We have calculated that 840 ÷ 4 = 210
To crosscheck we would multiply 210 by 4. If our calculation was correct the answer should be 840.

	2	1	0
x			4
	8	**4**	**0**

210 x 4 = 840. This proves our calculation is correct.

Quick Test 10 – Dividing

1 A farmer has $770. Bananas are $7 a kilo. How many kilos can he buy?

2a) 462 ÷ 2 ____ b) 88 ÷ 8 ____ c) 696 ÷ 3 ____

3a) 996 ÷ 3 ____ b) 848 ÷ 4 ____ c) 486 ÷ 2 ____

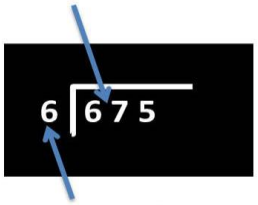
Note down the answers and check them with the answers at the back of this book

Dividing using the written method – what to do if there is a remainder

If a farmer had $675 and wanted to buy seeds at $6 per kg, how many kgs of seed could the farmer buy?

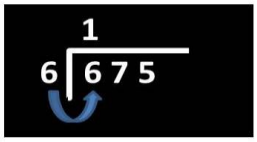
The sum would be written as 675 ÷ 6 = ?

Step 1: The amount you start with goes under the line

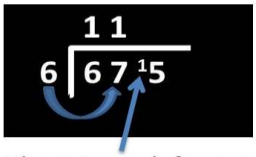


Put the number you are dividing by here

Step 2: Divide the first number by 6. 6 ÷ 6 = 1

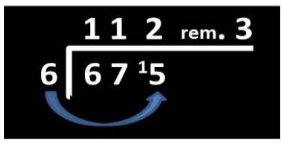


Step 3: Divide the second number by 6. 7 ÷ 6 = 1. The 1 goes above the line.



There is one left over so this goes in front of the next number, to make 15

Step 4: Divide 15 by 6. 15 ÷ 6 = 2 remainder 3 The 2 goes above the line. The 3 is the remainder



675 ÷ 6 = 112 remainder 3

Therefore, the farmer could buy 112 kgs of seed and would have $3 left over.

To crosscheck we would multiply 112 by 6

	1	1	2
x			6
	6	**7**	**2**
		1	

112 x 6 = 672 plus the 3 left over = 675, so our calculation is correct.

Quick Test 11 – Dividing with remainders

1 A farmer has $685. Fertiliser is $6 a kilo. How many kilos of fertiliser could he buy?

2 A farmer has $981. Seed is $8 a kilo. How many kilos of seed could he buy?

3a) 847 ÷ 6 ☐ b) 789 ÷ 7 ☐ c) 658 ÷ 3 ☐

Note down the answers and check them with the answers at the back of this book

Dividing by larger numbers

A farmer has $1425. He wishes to buy some sheep which are $40 each. How many sheep can he buy?

The sum would be written as 1425 ÷ 40 = ?

Step 1: Divide the first number by 40. 1 divided by 40 doesn't go as 40 is larger than 1, so carry the 1 over.

Step 2: 14 ÷ 40 doesn't go as 40 is larger than 14, so carry the 14 over.

Step 3: 142 ÷ 40 = 3 rem 22. The 3 goes above the line and 22 goes in front of the next number.

To work out what 142 divided by 40 is, you will need to multiply 40 by different numbers as follows:

1 x 40 = 40
2 x 40 = 80
3 x 40 = 120
4 x 40 = 160

Therefore, 40 goes into 142 **3** times, with a remainder of 142 – 120 which is 22

Step 4: 225 ÷ 40 = 5 remainder 25

1425 ÷ 40 = 35 remainder 25

To work out what 225 divided by 40 is, you will need to carry on multiplying 40 by different numbers:

1 x 40 = 40
2 x 40 = 80
3 x 40 = 120
4 x 40 = 160
5 x 40 = 200
6 x 40 = 240

Therefore, 40 goes into 225 **5** times, with a remainder of 225 – 200 which is 25

Therefore, the farmer could buy 35 sheep with $25 left over.

To crosscheck we would multiply 35 by 40.

Crosscheck: 35 x 40
Split the sum into parts 35 x 4 x 10

		3	5
x			4
	1	4 2	0

140 x 10 = 1400 plus the 25 left over = 1425

Quick Test 12 - Dividing by larger numbers

1 A farmer wants to sell his bananas in 25kg boxes. The farmer has 3370 kg of bananas. How many boxes can he fill?

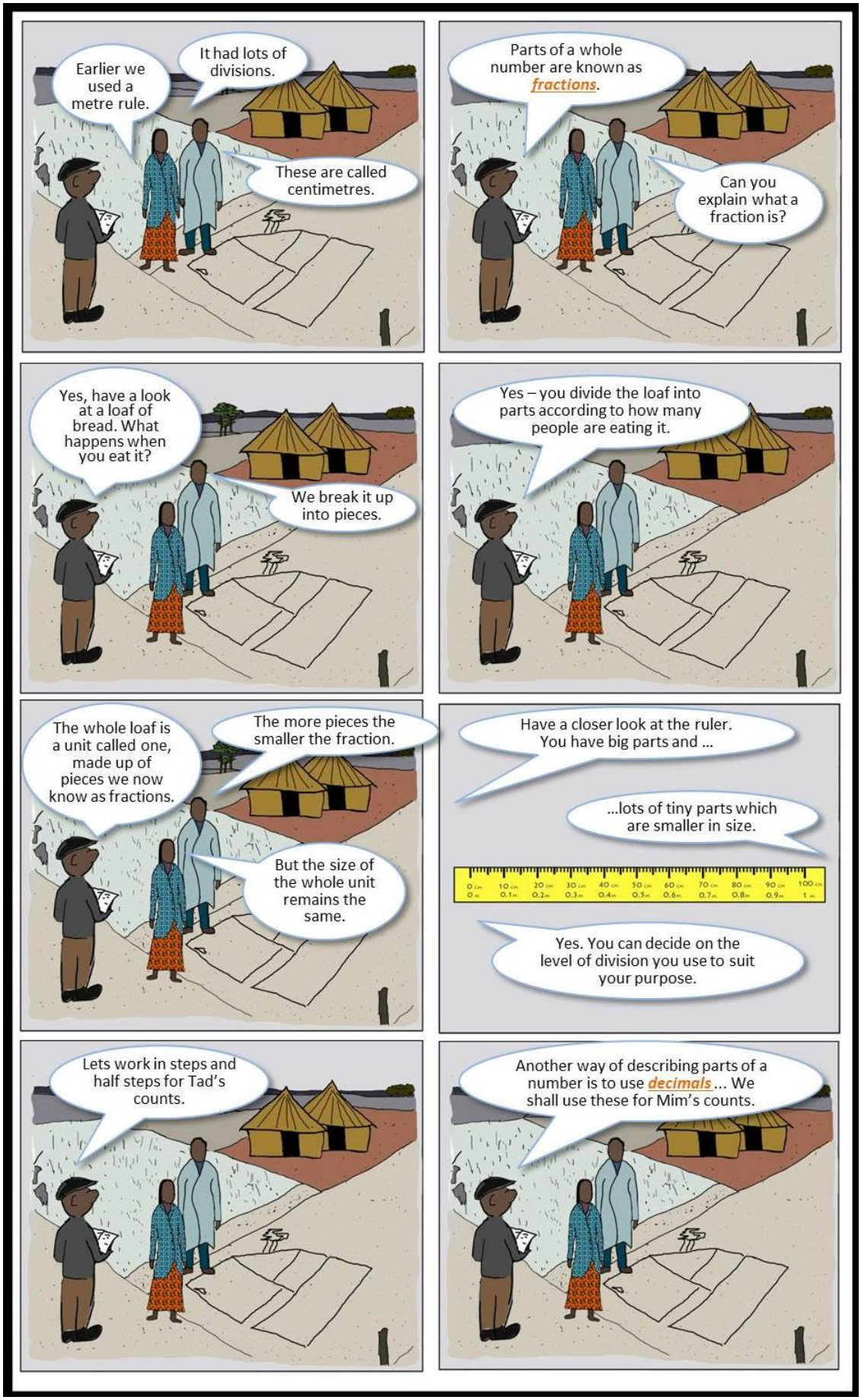
2 Fertiliser is $36 a bag. A farmer has $2300 dollars. How many bags of fertiliser can he afford?

3a) 1370 ÷ 56 _____ b) 4982 ÷ 41 _____ c) 3977 ÷ 132 _____

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 1

Uno How's Farm Visit 1 (part 2)... Measuring your fields



Completed Uno How Farm Visit 1 – Continue to Uno How Farm Visit 2

Uno How's Farm Visit 1 (part 2)

Measuring your fields – Basic Skills

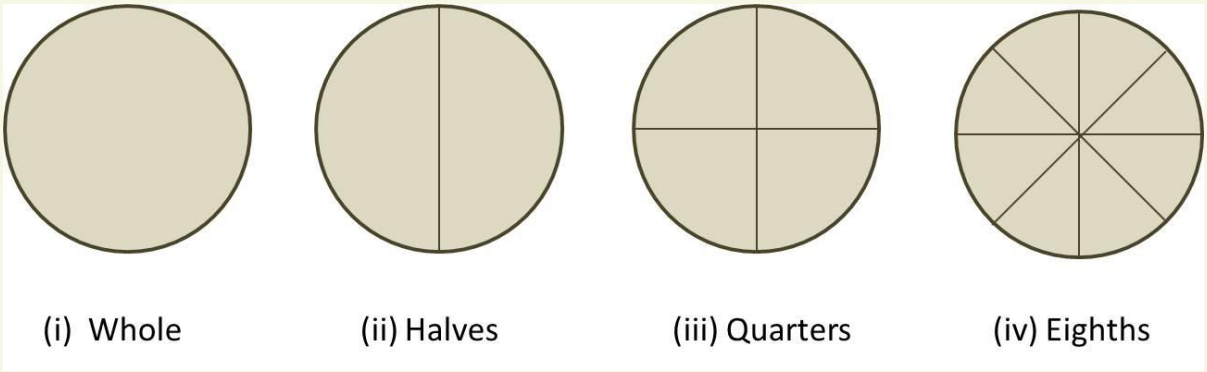
Fractions

Earlier in this visit we used a metre rule and saw that the metre is made up of parts. Parts of a whole number can be represented by those parts known as **fractions.**

A fraction is a part of a whole. We can learn about *fractions* by looking at everyday things such as a loaf of bread.

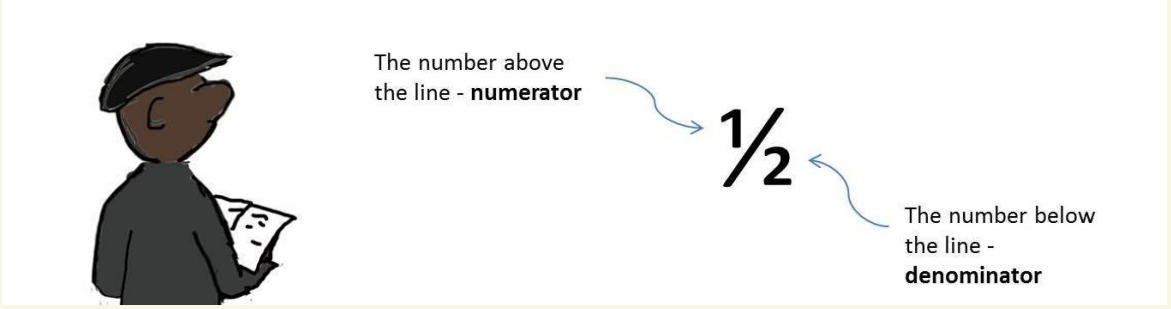
Below are four drawings of a round loaf of bread. Each loaf of bread is one whole and may be written as 1. In the drawings, we have divided the loaf into parts according to how many people are eating the loaf, ranging from 1 person to eight people.

In (i) one person is eating the whole loaf. In (ii) it has been divided into two equal halves for two people. In (iii) four people are eating a quarter each, and in (iv) eight people have each one eighth of the whole loaf to eat.



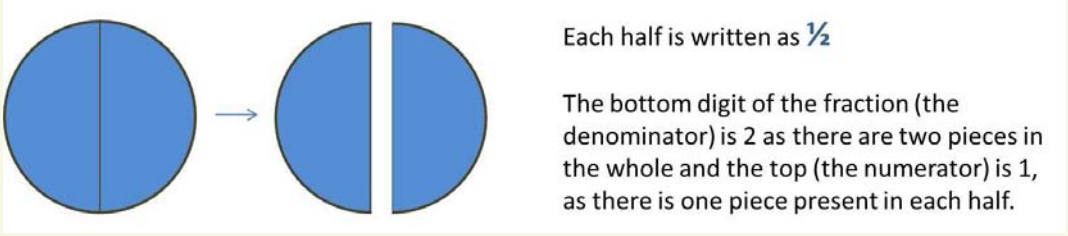
Notice that when you divide into more and more parts, the size of the whole unit remains the same but the parts become smaller. The whole loaf is a unit called one, made up of pieces we now know as *fractions*.

All fractions are represented by two numbers, a number above the line (the **numerator**) and a number below the line (the **denominator**) as shown below.

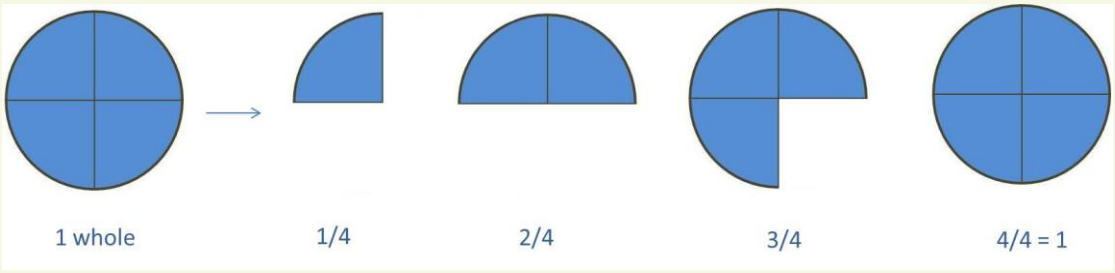


The denominator describes how many equal sized pieces the whole has been divided into. The numerator describes the number of those pieces that are actually present.

- For example, in the diagram below the circle has been cut into 2 evenly sized pieces (called halves).



- Following on, if the circle was cut into 4 pieces (quarters) they are represented by the fractions shown below.

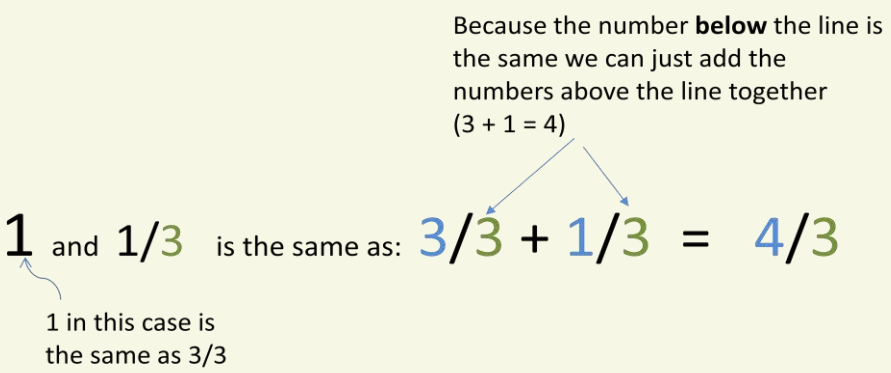


- If the numbers above and below the line are the same this fraction has a value of 1. For example, 4/4 = 1 which is the same as one whole.

Mixed Fractions

We may see numbers that contain a whole number and a fraction, for example 1⅓. This is called a ***mixed fraction***.

In the box below, Uno explains how a whole number (1) and a fraction (1/3) are combined to create a mixed fraction, and that this is the same as 4/3.



In a similar way: **1 and 1/2 is the same as 2/2 + 1/2 = 3/2**
1 and a 1/4 is the same as 4/4 + 1/4 = 5/4
1 and an 1/8 is the same as 8/8 + 1/8 = 9/8

Sometimes fractions need "tidying up" – this is called **simplifying.**

Simplifying fractions

To simplify fractions, look to see if there is a number that fits into the numerator and denominator a whole number of times (with no remainder).

For example, simplify **4/8**:

4/8 Both 4 and 8 can be divided by 4:

4÷4 = 1 and 8÷4 = 2

Therefore 4/8 is the same as 1/2

This means that if we have 4/8 of a loaf of bread that is the same as having 1/2 of it.

Some fractions cannot be simplified, for example 3/8, because there is no number that goes into 3 and 8 a whole number of times.

If the top number of a fraction is bigger than the bottom number, its value is bigger than 1.

These fractions can also be **simplified**.

For example, what is 6/2 simplified? In this case, simply divide the top number by the bottom: 6 ÷ 2 = 3.

6 is bigger than 2

6÷2 = 3

Therefore 6/2 is the same as 3

What is 7/2 simplified? In this case, there is a remainder when the top number is divided by the bottom:

7 is bigger than 2

7÷2 = 3 remainder 1

Therefore 7/2 is the same as 3 with ½ left over, which is 3½ .

Simple multiplication of fractions

When you want to find out what a half, third or quarter (etc.) of a number is, you multiply the number by the fraction to find the answer.

For simple fractions that have the top number (numerator) with the value **1**, you can simply perform this sum by dividing the number by the bottom number of the fraction (denominator).

So for example, to work out half of 70 (which is ½ x 70), you simply divide 70/2 = 35.

To work out a third of 60 (1/3 x 60), you simply divide 60/3 = 20.

More about multiplication, division, addition and subtraction of fractions is covered in our factsheets.

Quick Test 13 – Simplifying and multiplying fraction

1 Simplify the fractions.

a) 6/3 b) 15/5 c) 10/3 d) 16/5

2 Can you simplify the fractions and then pick out the ones that are of equal value?

2/4	3/9	4/16	8/10	8/16	6/10	25/25	12/4	17/23	16/26

3 Multiply the following.

a) 10 x ½ b) 8 x ¼ c) 12 x ⅓ d) 18 x ½

e) 80 x ½ f) 66 x ⅓ g) 25 x ¼ h) 71 x ½

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 1 part 2

Uno How's Farm Visit 1 (part 2)

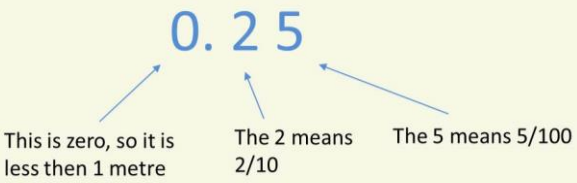
Measuring your fields – Basic Skills

Decimals

Another way of representing parts of a whole number is to use **decimals**.

Whole numbers are written to the left of the decimal point and parts of numbers are written to the right of the decimal point. These parts are fractions of ten, a hundred and so on...

For example a field is 0.25 ha in size:



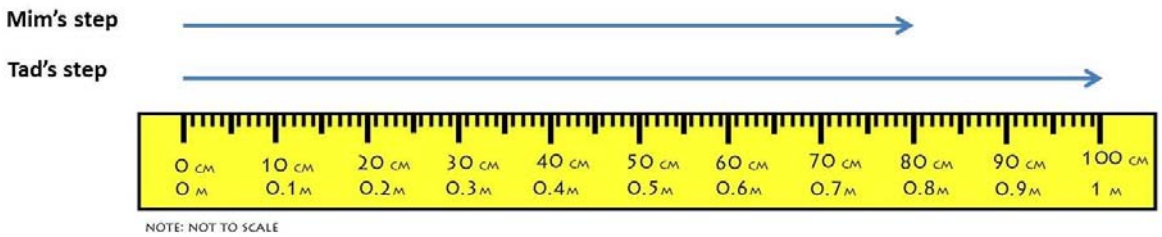
Using the decimal system, the number 1 is written as 1.00 which describes 1 as a whole number and confirms that there are no extra parts of a number attached. In the same way 2 is written as 2.00

Decimals and fractions allow the same number to be written in a different way. Some examples are shown below.

1/2	=	0.5
1/3	=	0.33
1/4	=	0.25
1/5	=	0.2
1/10	=	0.1

Often numbers are only written to the first decimal place after the decimal point. eg. 1.0 or 2.0 or 2.5 However, for many calculations more than one decimal place is needed to express the value of the fraction properly for greater accuracy.

Mim's step measures 80 cm or 0.8 (or 0.80) metres.



Because there is a zero to the left of the decimal point, this tells us that 0.80 m is less than one metre. The 80 to the right of the point represents 80 centimetres (cm) of the 100 cm that are in 1 m. Because her step is less than a metre, the distance Mim walks in metres is less than the number of steps she takes.

To find the distance Mim walked in metres you must add together the length of all the steps she has taken, or multiply the number of steps by the length of Mim's step.

For example, to find the distance walked by Mim if she took 5 steps, you will need to multiply 0.8 by 5

Multiplying decimals

Multiplying decimals is like multiplying whole numbers. The numbers should be lined up along the right hand edge. Do **NOT** line them up by the decimal point.

For example, Mim's step measures 0.8 m. Field 1 is 90 steps wide and 90 steps long.

To calculate the length of the field we multiply the number of steps by 0.8 m.

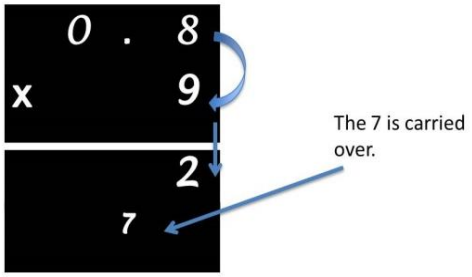
As 90 is a multiple of 10 this can be split up and done in parts. So 0.8 x 90 = 0.8 x 9 x 10.

It can be written as follows:

Firstly multiply 0.8 x 9

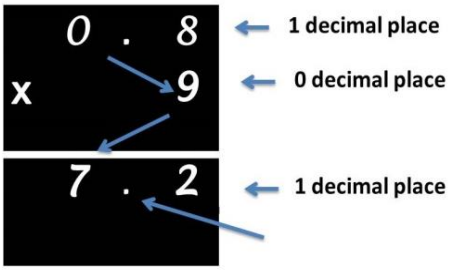
Step 1: Multiply the 8 in the top row by the 9 in the second row.

So 8 x 9 = 72



Step 2: Multiply the 0 in the top row by the 9 in the second row

So 0 x 9 = 0. Add the 7 that was carried over .



Replace the decimal point To work out where to put the decimal point add up the decimal places – in this case 0.8 has one decimal place and 9 has no decimal places, so replace the decimal point to 1 decimal place.

0.8 x 9 = 7.2

Now multiply 7.2 by 10

So move the decimal point one place to the right.

0.8 x 90 = 72

So the length of Field 1 = 72 m. Because the width is the same as the length, it is also 72 m wide.

Quick Test 14 – Multiplying decimals

1 A farmer's step is 1.2 m. He takes 8 steps across the width of his field. How wide is the field?

2 A farmer's step is 0.9 m. He takes 40 steps across the width of his field. How wide is the field?

3a) 20 x 0.6 ☐ b) 70 x 0.7 ☐ c) 50 x 0.4 ☐

Note down the answers and check them with the answers at the back of this book

Multiplying larger decimals by long multiplication

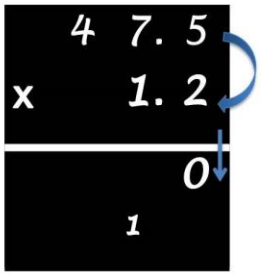
When multiplying decimals by large numbers which are not multiples of 10, long multiplication should be carried out. For example, if we wanted to multiply 47.5 by 1.2

Multiply 47.5 x 1.2

Write the sums out as before. Line the numbers up along the right hand edge, regardless of where the decimal point is.

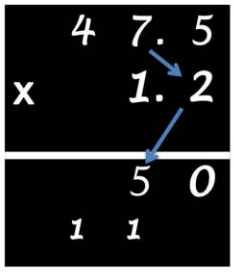
Step 1: Multiply the 5 in the top row by the 2 in the second row.

5 x 2 = 10
The 1 is carried over into the next column on the left.



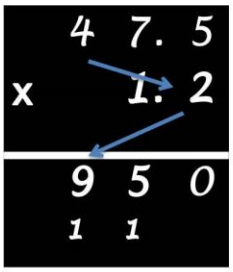
Step 2: Multiply the 7 in the top row by the 2 in the second row.

7 x 2 = 14 + 1 (which was carried over in Step 1) = 15
The 1 is carried over into the next column on the left

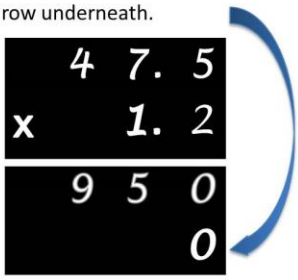


Step 3: Multiply the 4 in the top row by the 2 in the second row.

4 x 2 = 8 + 1 (which was carried over in Step 2) = 9

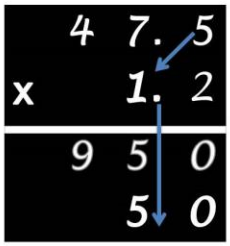


Step 4: Multiply the "tens" in the second row (1) by the 47.5 in the top row. Because when multiplying by 10 we add a zero, put a zero at the end of the new row underneath.



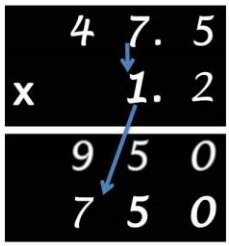
Step 5: Multiply 5 in the top row by the 1 in the second row.

5 x 1 = 5



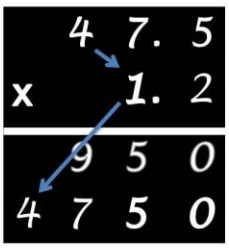
Step 6: Multiply 7 in the top row by the 1 in the second row.

7 x 1 = 7

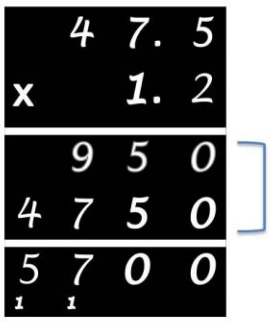


Step 7: Multiply 4 in the top row by the 1 in the second row.

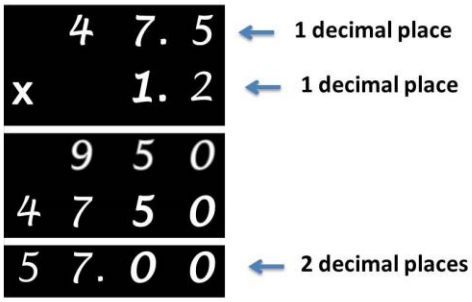
4 x 1 = 4



Step 8: Add up the two totals



Step 9: **REPLACE THE DECIMAL POINT**
To work out where to put the decimal point add up the decimal places – in this case 47.5 has one decimal place and 1.2 has one decimal place

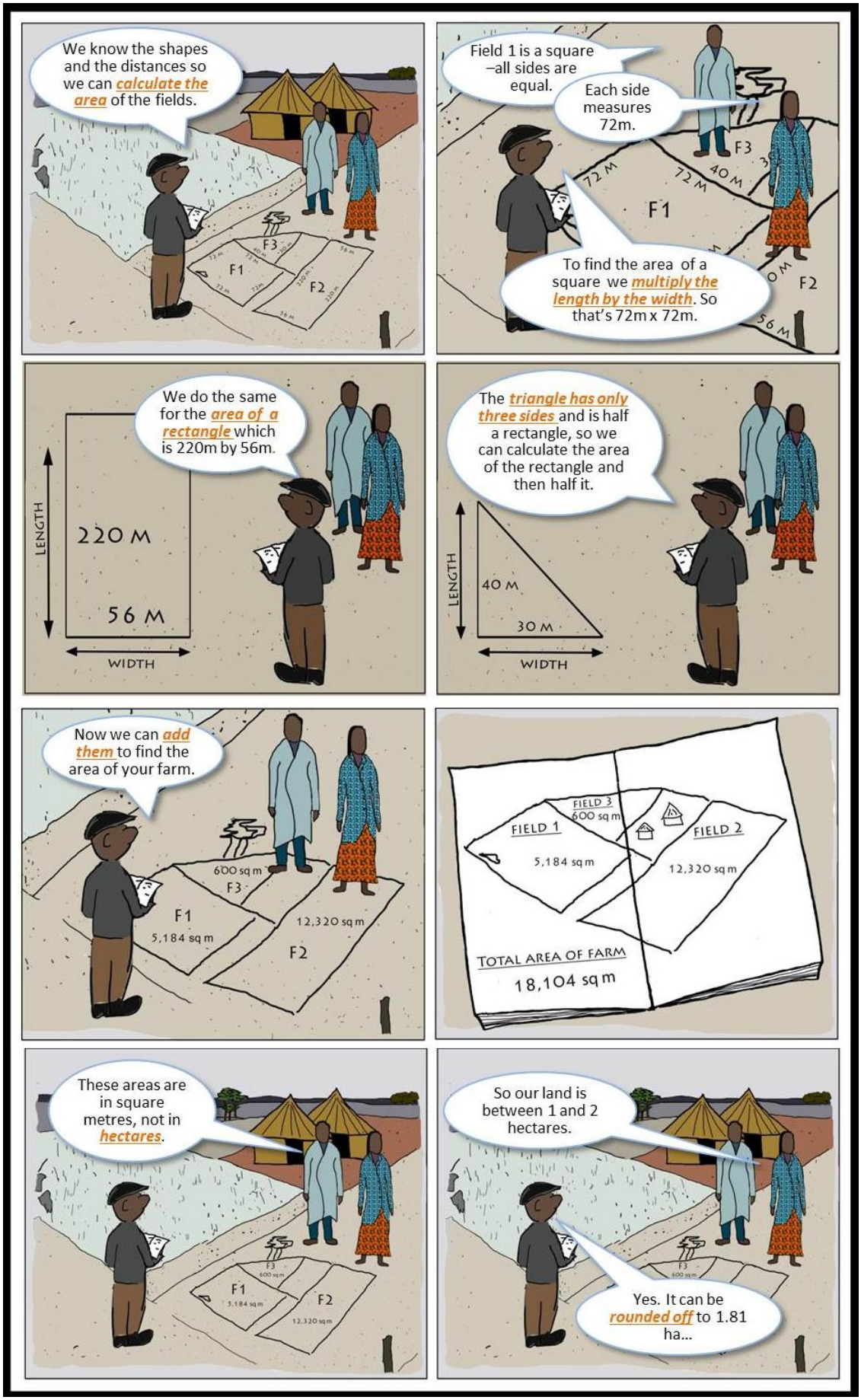


47.5 x 1.2 = 57.00

So 47.5 x 1.2 = 57

Back to Uno How Farm Visit 1 part 2

Uno How's Farm Visit 2... Calculating the area of your fields



Completed Uno How Farm Visit 2 - Continue to Uno How Farm Visit 3

Uno How's Farm Visit 2

Calculating the area of your fields

Areas – dimensions, shapes and formula

So far, Tad and Mim have been measuring the length and width of their fields. These distances, measured along the field edge, describe the dimensions of the field.

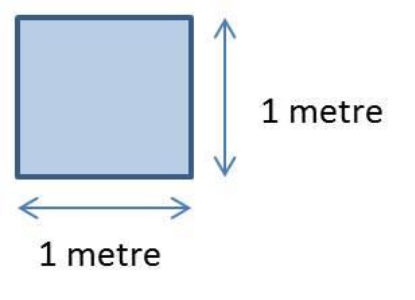
Tad and Mim may know how long and wide their fields are, but these measurements alone do not tell them how much land they have to farm.

Together, the sides of the field enclose an **area** that has both length and width. Therefore, if we want to work out how big this **area** is, we need to use both of these dimensions in our calculations – that is, length and width.

Square metre

The first new unit we shall use for measuring area is the **square metre (sq m** or **m^2)**.

A **square metre** can be used to describe the area of any shape and is the area enclosed by a square with sides 1m.



The area is of the square metre above = 1m x 1m = **1 square metre (**1 **sq m** or 1 **m^2**).

There are different formulae for working out the areas of different shapes, some of those you are likely to find on farms are covered in this and later visits.

The basic shapes of Tad and Mim's fields are: squares, rectangles and triangles.

Back to Uno How Farm Visit 2

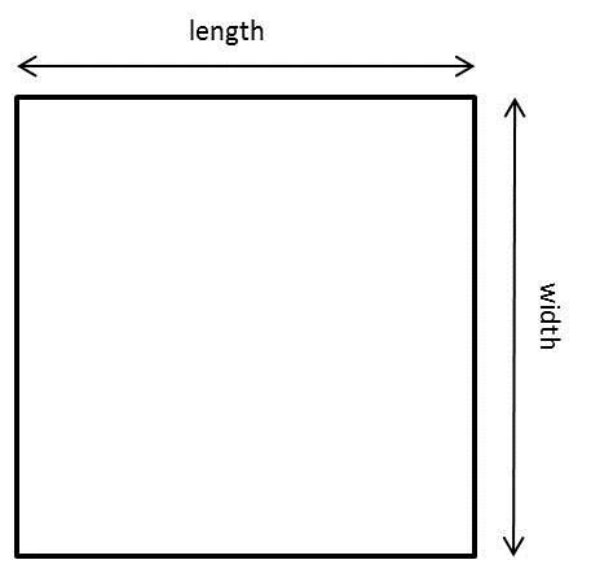
Uno How's Farm Visit 2

Calculating the area of your fields

Square field – calculating the area

Square

Field 1 is a square, meaning the length equals the width.



Area = Length x Width. This can also be written as A = L X W

Because this is a square its length and width are the same, so

Area = Length x Length. The calculation could also be written as A = L x L

Field 1, that Tad and Mim are measuring, is a square. Its length and width measure 90 of Mim's steps. To find the distance in metres, we multiply the number of steps by the length of Mim's step:

Mim's step is 0.8 m so:

Length = 90 x 0.8 m= 72 m (which we calculated in the unit on decimals - page 34)

Width is also 90 x 0.8 m= 72 m

To find the **area** of Field 1 in m^2 we now need to multiply **72m x 72m**

Writing the sum on paper – Long Multiplication

Because the numbers in this calculation are both large (greater than 10), we can use long multiplication for this sum. When doing long multiplications, it is best to write your calculation down.

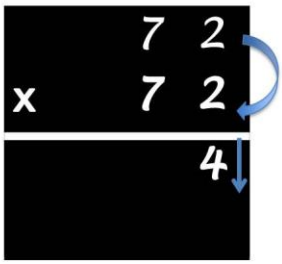
By long multiplication the calculation is as follows:

Multiply 72 x 72

Write the sums out as before.

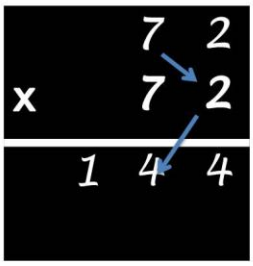
Step 1: Multiply the 2 in the top row by the 2 in the second row.

2 x 2 = 4

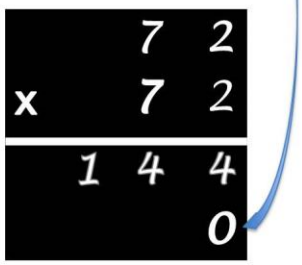


Step 2: Multiply the 7 in the top row by the 2 in the second row.

7 x 2 = 14
The 1 is carried over into the hundreds column

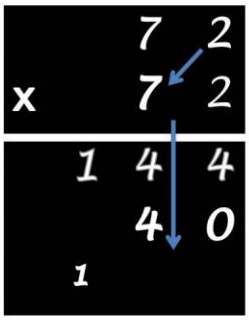


Step 3: Multiply the "tens" in the second row (the 7) with the 72 in the top row. Because, when multiplying by ten, we add a zero, we start by entering a 0 at the end of a new row underneath.



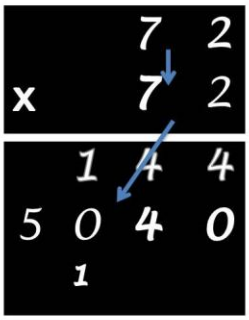
Step 4: Multiply 2 in the top row by the 7 in the second row.

2 x 7 = 14
The 1 is carried over

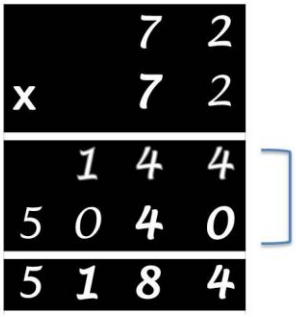


Step 5: Multiply 7 in the top row by the 7 in the second row.

7 x 7 = 49 + 1(that was carried over) = 50
The 5 is carried over



Step 6: Add up the two totals. The 144 row tells us what 2 x 72 is and the 5040 tells us what 70 X 72 is. So adding these two new rows together will give us the answer.



72 x 72 = 5184

The area of Field 1 = 5184 m²

Quick Test 15 – Calculating the area of a square

1 A square field has a length and width equal to 35 m. What is the area of the field?

Find the area of these square fields if the length and width is:

2a)	45 m		b)	52 m		c)	28 m	
3a)	73 m		b)	91 m		c)	33 m	

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 2

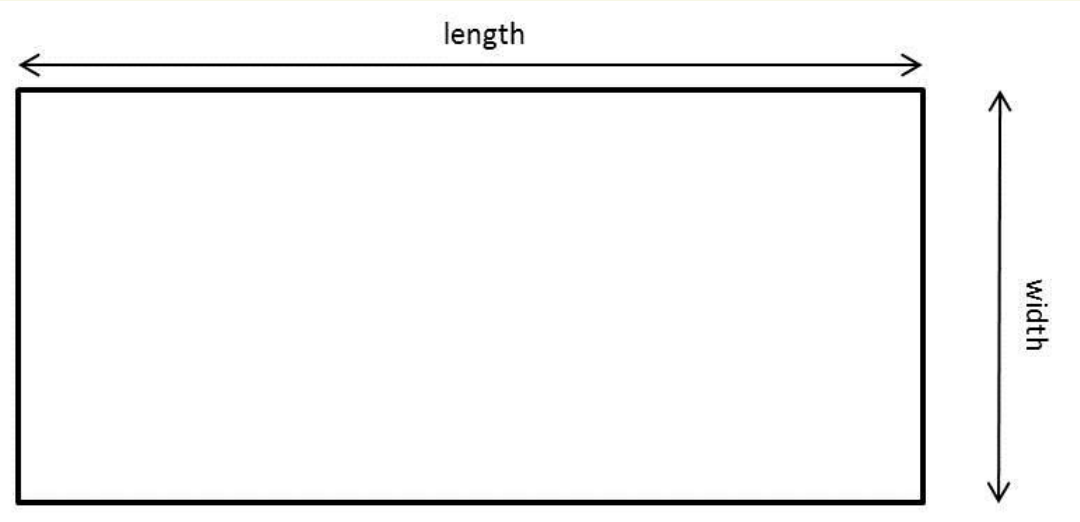
Uno How's Farm Visit 2

Calculating the area of your fields

Rectangular field – calculating the area

Rectangle

Field 2 is a rectangle, meaning the length does not equal the width.



Area = Length x Width

The length of Field 2 is 220 of Tad's steps.

The width is 56 of Tad's steps.

Remember Tad's step measures 1 m so:

Length = 220 x 1 m = 220 m

Width = 56 x 1 m = 56 m

To find the **area** of Field 2 in m^2 we now need to multiply **220 m x 56 m**

This sum can be written down on paper and long multiplication used:

1 Writing the sum on paper – Long Multiplication

Calculation of the area of Field 2 by multiplication is **Area (m^2) = 220 m x 56 m.**

By long multiplication the calculation is as follows:

Multiply 220 x 56

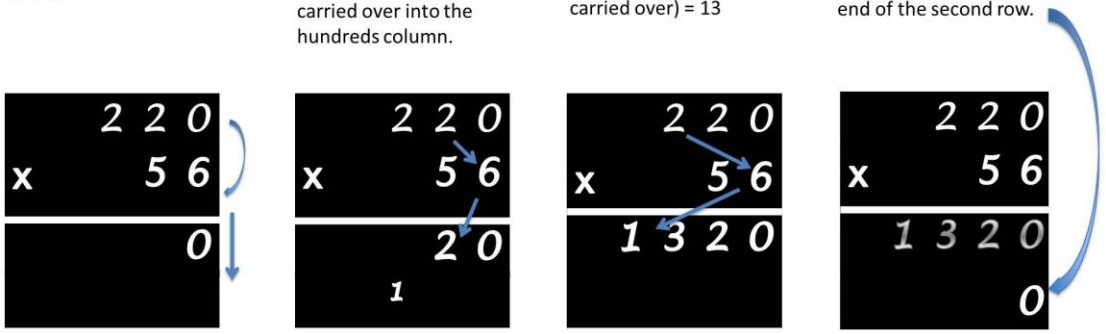
Step 1: Multiply 220 in the top row by the 6 in the second row.

So 0 x 6 =0

2 x 6 = 12. The 1 is carried over into the hundreds column.

2 x 6 = 12 + 1 (which was carried over) = 13

Step 2: Put a 0 at the end of the second row.



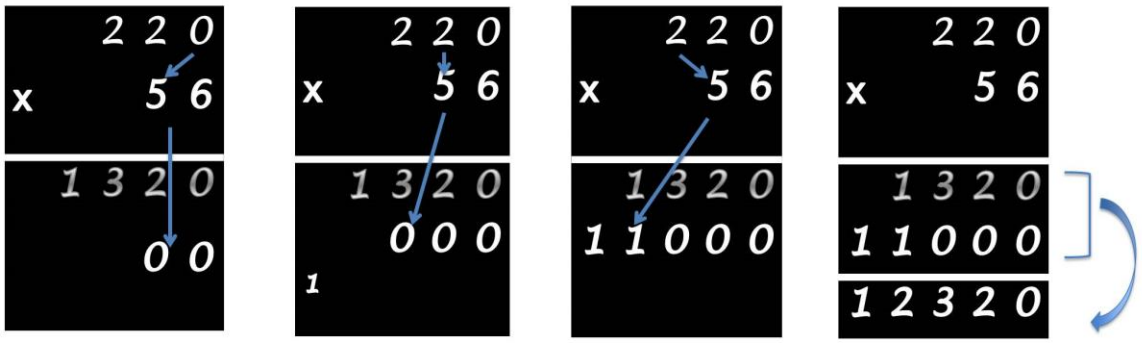
Step 3: Multiply 220 in the top row by the 5 in the second row.

So 0 x 5 = 0

2 x 5 = 10. Carry the 1

2 x 5 = 10 + 1 = 11

Step 4: Add the two new rows together to get the answer.



220 x 56 = 12320

The area of Field 2 = 12320 m²

Quick Test 16 – Calculating the area of a rectangle

1 A field has a length (L) of 42 m and a width (W) of 122 m. What is the area of the field?

Find the area of these fields:

2a) L = 34 m W = 321 m

b) L = 52 m W = 114 m

3a) L = 164 m W = 19 m

b) L = 282 m W = 42 m

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 2

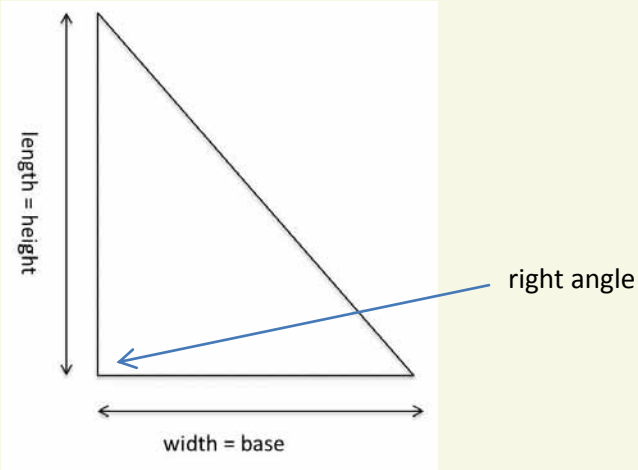
Uno How's Farm Visit 2

Calculating the area of your fields

Triangular field – calculating the area

Triangle

Field 3 is a triangle, meaning the shape has three straight sides. In the triangle shown below, two of the sides are a right-angle to each other, so it is a **right angled triangle**.



If the area of the triangle was to be doubled, it would make a rectangle with equal sides length (or height) H and width (or base), B.

Therefore, the formula for the area of the triangle is half of a rectangle with length (or height) H and width (or base) B

Area of triangle = ½ x Height x Base

This is the same as Area of triangle = Height x ½ Base.

Or (remembering what was covered on page 32), **Area = H x B/2**

The length (height) of Field 3 measures 50 of Mim's steps and the width (base) of the field measures 37½ of her steps.

As before, we first need to calculate the length and width of the field in metres:

Mim's step is 0.8 m so:

Height (length) = 50 x 0.8 m = 40 m

Base (width) = 37.5 x 0.8 m = 30 m

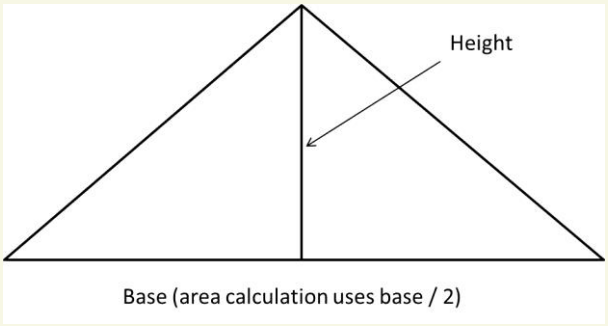
For this **triangular** field, Area = Height x ½ Base (or Area = Height x Base/2):

Area = **40 x (30/2) = 40 x 15 = 600**

The area of Field 3 is 600m^2

If your field is not a right angled triangle:

For a triangular shaped field without a right angle, the distances we use to calculate area are shown in the diagram below.



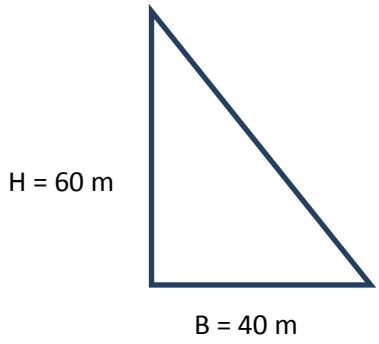
Notice here how the height of the triangle is not the length of one of its sides, but how tall it is.

The formula is still the same: **Area = Height x ½ Base or (A= H x B/2)**

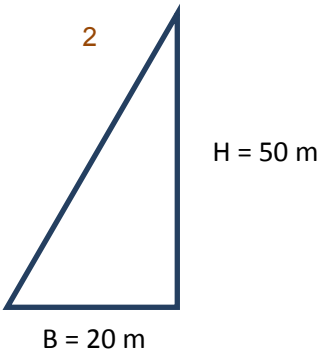
Quick Test 17 – Calculating the area of right angled and non right angled triangles

Find the area of these triangles (to the nearest m^2)

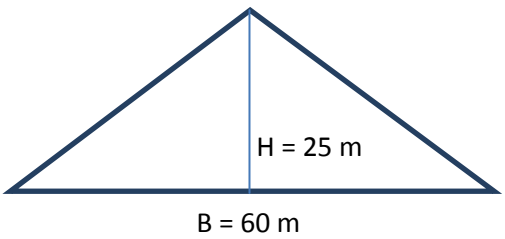
1



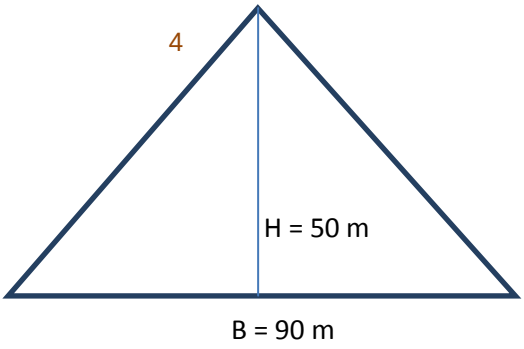
2



3



4



Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 2

Uno How's Farm Visit 2

Calculating the area of your fields

Adding the areas of your fields

Now we know the area of all three fields. We can add these areas up to give us the total area of farm land.

	Steps	Metres	Area in m²
Field 1 - a square	90 (L) x 0.80 m (Mim) 90 (W) x 0.80 m (Mim)	72 m (L) x 72 m (W)	**5184 m²**
Field 2 - a rectangle	220 (L) x 1.00 m (Tad) 56 (W) x 1.00 m (Tad)	220 m (L) x 56 m (W)	**12320 m²**
Field 3 - a triangle	50 (H) x 0.80 m (Mim) 37.5 (B/2) x 0.80 m (Mim)	40m (H) x 15 m (B/2)	**600 m²**
Farmland		**Total Area =**	**18104 m²**

The total area of Tad and Mim's Farm is 18104 m²

Quick Test 18 – Adding the areas of fields

1 Field 1 is 3200 m², Field 2 is 450 m² and Field 3 is 800 m². What is the total area (m²) of the three fields?

Find the total area (m²) of these fields:

2) Field 1 = 568 m², Field 2 = 932 m² and Field 3 = 78 m²

3) Field 1 = 1342 m², Field 2 = 200 m² and Field 3 = 80 m²

4) Field 1 = 67 m², Field 2 = 450 m², Field 3 = 32 m² and Field 4 = 130 m²

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 2

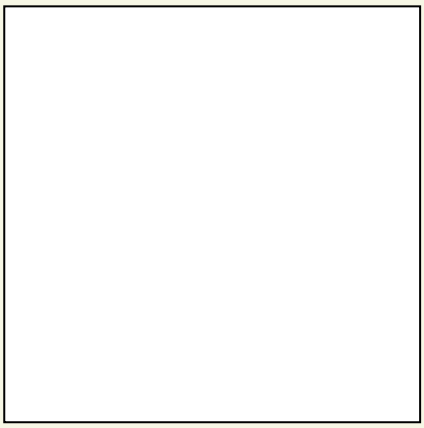
Uno How's Farm Visit 2

Calculating the area of your fields

Hectares

The first unit we used to measure area was the square metre (m²), but that is too small for us to use when considering farms. Farm area is measured in multiples of metres such as *hectares.*

A hectare (ha) is the name given to an area of land of any shape whose area is ten thousand square metres (written as 10000 m² or 10000 sq m).



For example, the area above = 100m x 100m = 10000m^2 = 1 hectare (ha)

Remember, the area does not have to be square. As long as the area equals 10000m^2, it is equal to 1 ha.

To change an area that is written in m^2 into hectares, you divide it by 10000.

Tad and Mim's farmland is 18104 m². It is bigger than 1 hectare but smaller than 2 hectares.

To find the size in hectares they divide 18104 by 10000.

Remember....to divide by multiples of 10 move the decimal point to the left.

10000 is formed by multiplying 10 x 10 x10 x 10 so when dividing by 10000 move the decimal point 4 places to the left.

18104 ÷ 10000

Move the decimal point four places to the left

18104 m^2 = 1.8104 ha

Tad and Mim's farm is therefore 1.8104 ha.

Sometimes you do not need to be precisely accurate and can simplify numbers, so that they are easier to use. This is called 'rounding off' and is the focus of the next unit.

Back to Uno How Farm Visit 2

Uno How's Farm Visit 2

Calculating the area of your fields

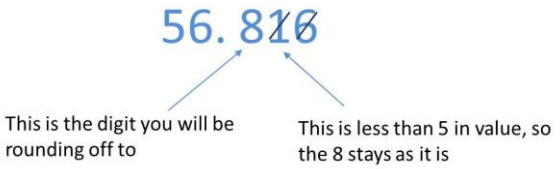
Rounding off

Rounding off means simplifying a number, so that it has fewer digits after the decimal point.

Rounding off to 1 decimal place means there will be one number after the decimal point and so on...

To round off a number, find the digit you are going to round off to. If the digit to its **right** is **5 or more**, then you will need to increase it by one. If the digit to its **right** is **less than 5**, then it will stay the same.

Rounding off to 1 decimal place:



56.816 rounded to 1 decimal place = 56.8

Rounding off to the nearest whole number:

56.8 rounded to a whole number = 57

Tad and Mim's farm is 1.8104 ha

1.8104 can be 'rounded off' to 1.81 ha, **so Tad and Mim's farm is 1.81 ha.**

Quick Test 19 – Hectares and 'Rounding Off'

1 A field has an area of 14789 m². What is this in ha? Now round it to two decimal places.

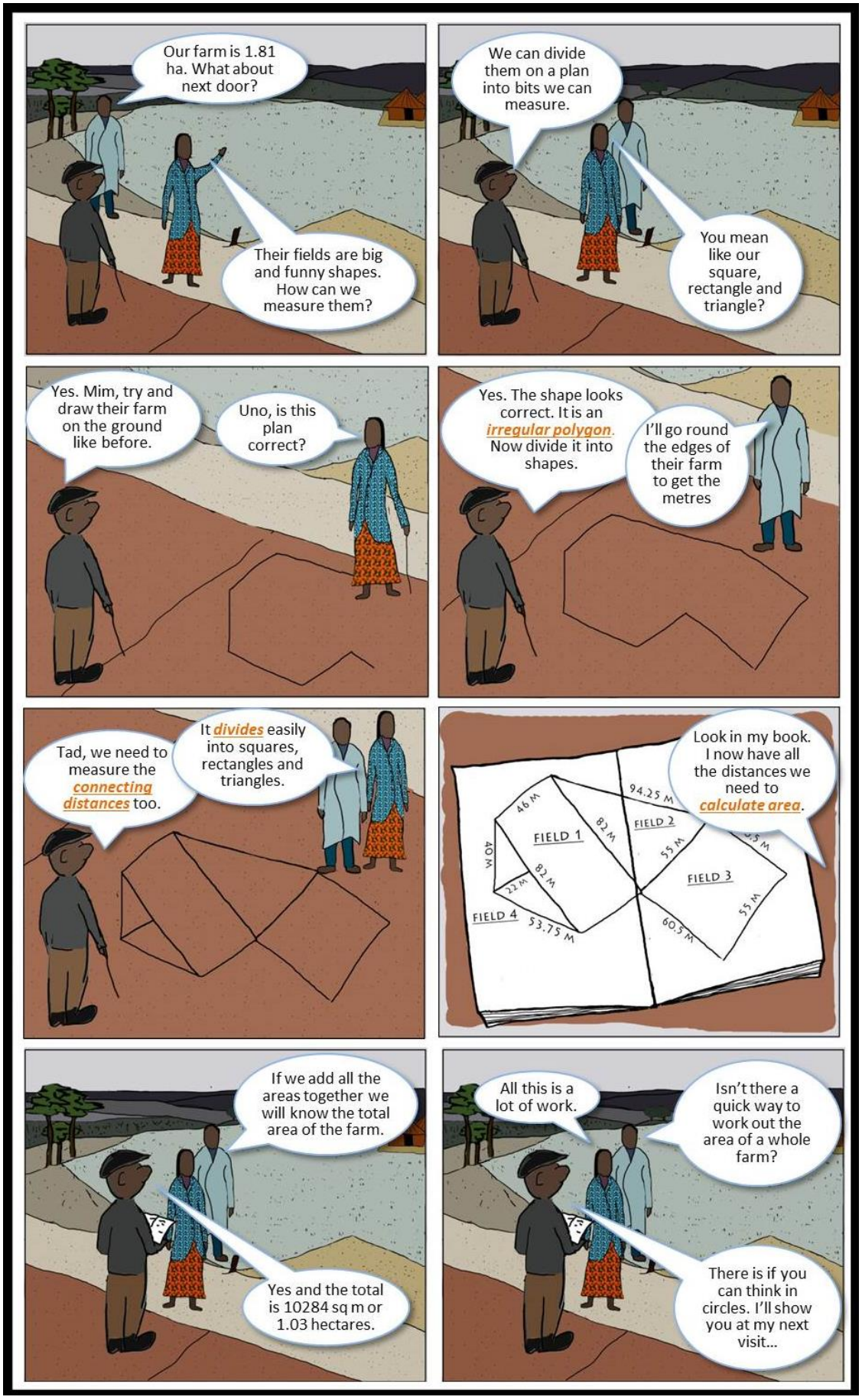
What is the area of these fields in ha (rounded to 2 decimal places)?

2a)	9853 m²		b)	15986 m²	
3a)	15478 m²		b)	678 m²	
4a)	693451 m²		b)	8934 m²	
5a)	783 m²		b)	6719 m²	

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 2

Uno How's Farm Visit 3... Calculating the area of irregular fields



Completed Uno How Farm Visit 3 - Go to Uno How Farm Visit 4

Uno How's Farm Visit 3

Calculating the area of irregular fields

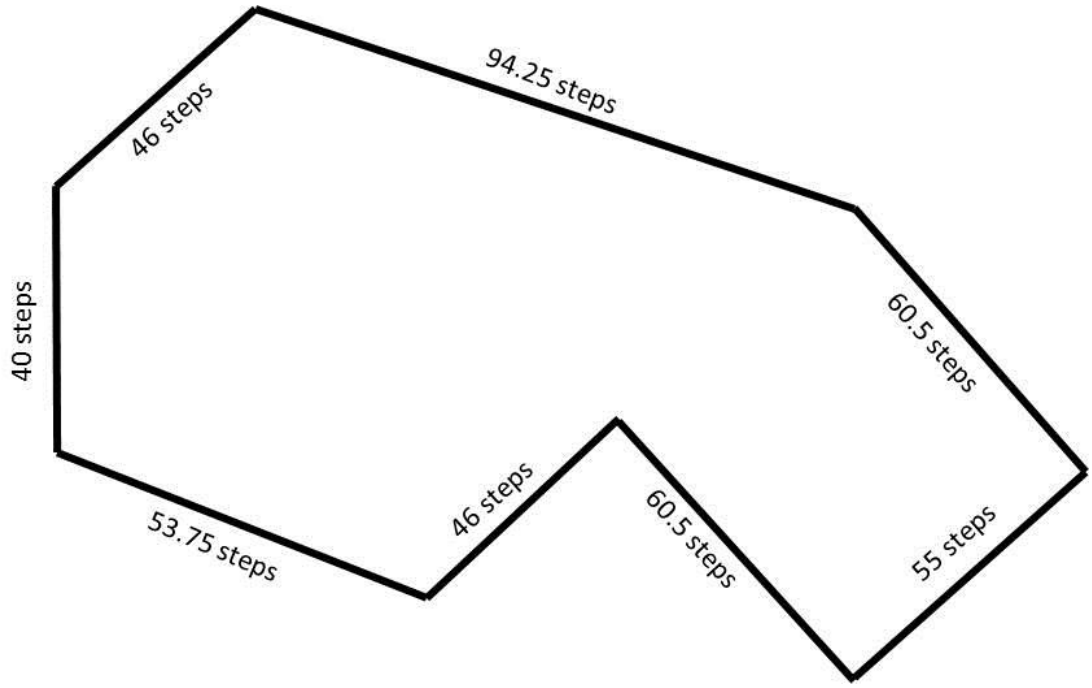
Measuring Irregular Fields

Next door's field is an irregular shape with many straight sides, termed an **irregular polygon**.

Polygons are two-dimensional shapes with straight sides (squares, triangles and rectangles are **regular polygons**).

The plan below illustrates the next door field.

Tad walked the edges and counted the steps as shown in the plan, but he is not sure how to measure the area, as it is neither a square, a rectangle or a triangle.



Back to Uno How Farm Visit 3

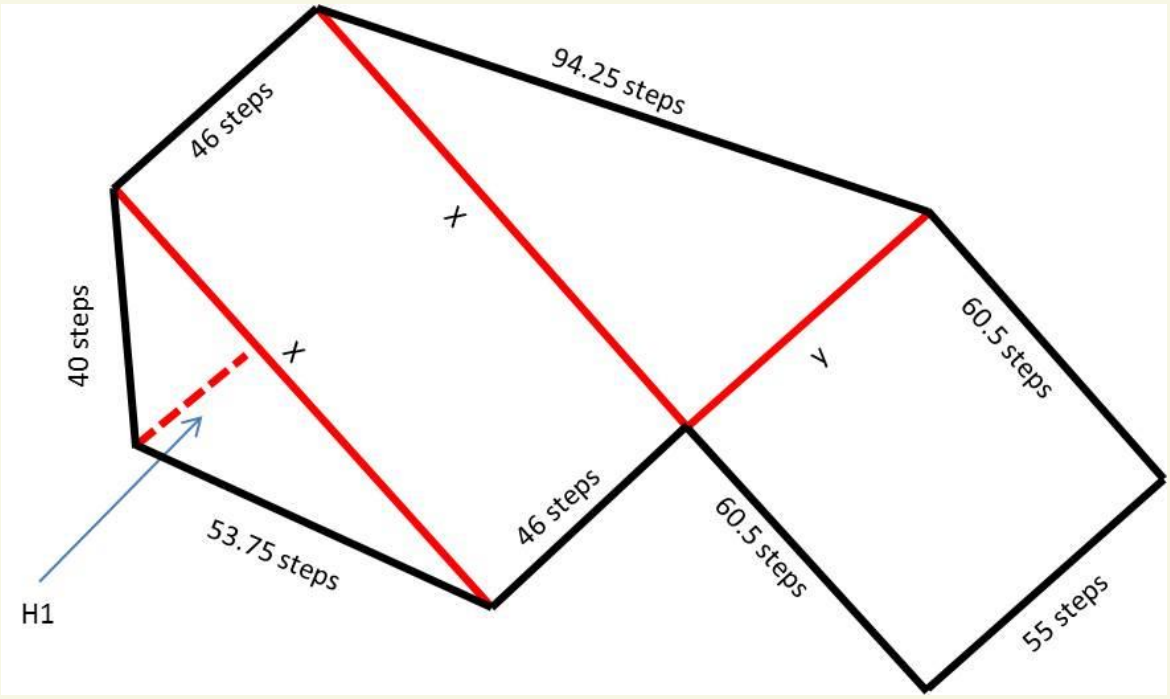
Uno How's Farm Visit 3

Calculating the area of irregular fields

Dividing Irregular Fields

We are familiar with the formula of three shapes: squares, rectangles and triangles. So, to measure the area of this irregular field, I have divided it into pieces made up of 2 triangles and 2 rectangles (no squares this time). Tad and Mim need to walk a few more distances to give us the dimensions (sizes) of the new shapes within the irregular field.

The diagram below shows us the new shapes that Uno How has divided the field into. To calculate the area of the 4 shapes, we need 3 more distances (X, Y and H1, noted in red).



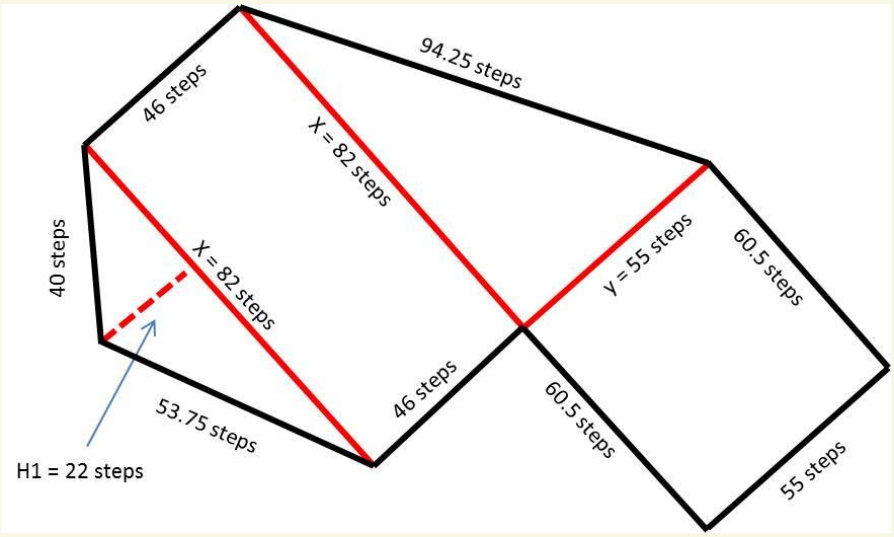
Back to Uno How Farm Visit 3

Uno How's Farm Visit 3

Calculating the area of irregular fields

Measuring the connecting distances and rounding them

Tad has measured the distances X, Y and H1.



Some of the boundaries do not measure an exact number of Tad's steps, so he has to include fractions of steps. Quarter steps are as accurate as he can measure.

Uno converts these fractions of steps into decimals so he can multiply them by the length of Tad's step (1.00 m). These are shown in the table below. Please check the calculations.

You will see that the distances are **rounded off** to the nearest metre (shown in the conversion column), which is accurate enough for the estimate. **Remember rounding to the nearest** metre means that if the sum ends in a value of 0.5 or above, the distance in metres goes up by 1 (for example 45.5m becomes 46m). If it ends below 0.5, the distance in metres stays the same (e.g. 7.25m becomes 7m).

Steps	Decimals	Length of Step	Distance	Conversion
46	46 x	1.00 m	46	46 m
94 1/4	94.25 x	1.00 m	94.25 m	94 m
60 1/2	60.5 x	1.00 m	60.5 m	61 m
55	55 x	1.00 m	55 m	55 m
60 1/2	60.5 x	1.00 m	60.5 m	61 m
46	46 x	1.00 m	46 m	46 m
53 3/4	53.75 x	1.00 m	53.75 m	54 m
40	40	1.00 m	40 m	40 m
82 (=X)	82 x	1.00 m	82 m	82 m
55 (=Y)	55 x	1.00 m	55 m	55 m
22 (=H1)	22	1.00 m	22 m	22 m

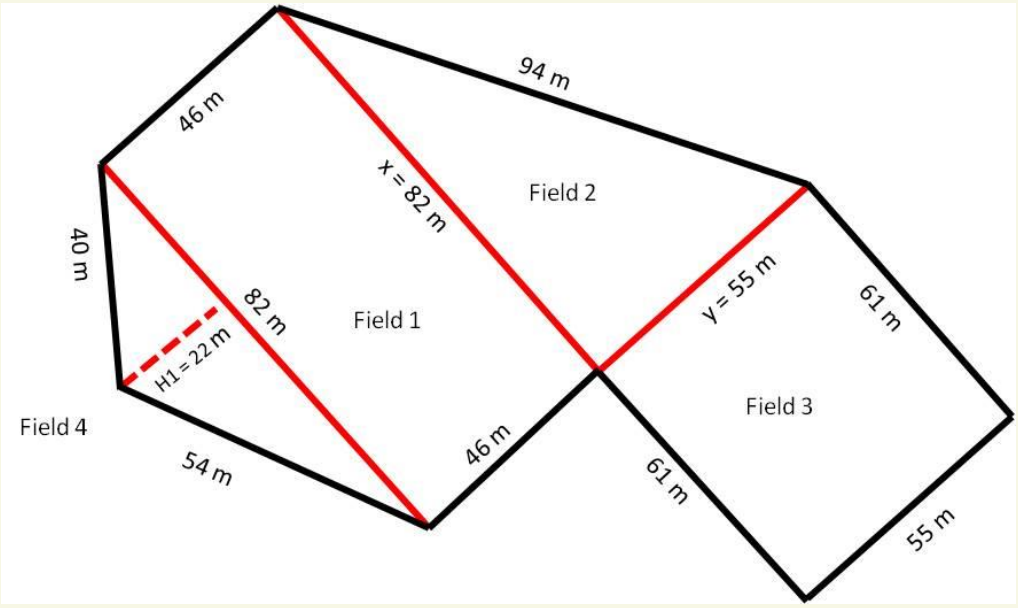
Back to Uno How Farm Visit 3

Uno How's Farm Visit 3

Calculating the area of irregular fields

Calculating the area of the irregular fields

Using the distances provided in metres the calculation of the four areas is shown in the table below, rounded to the nearest metre.

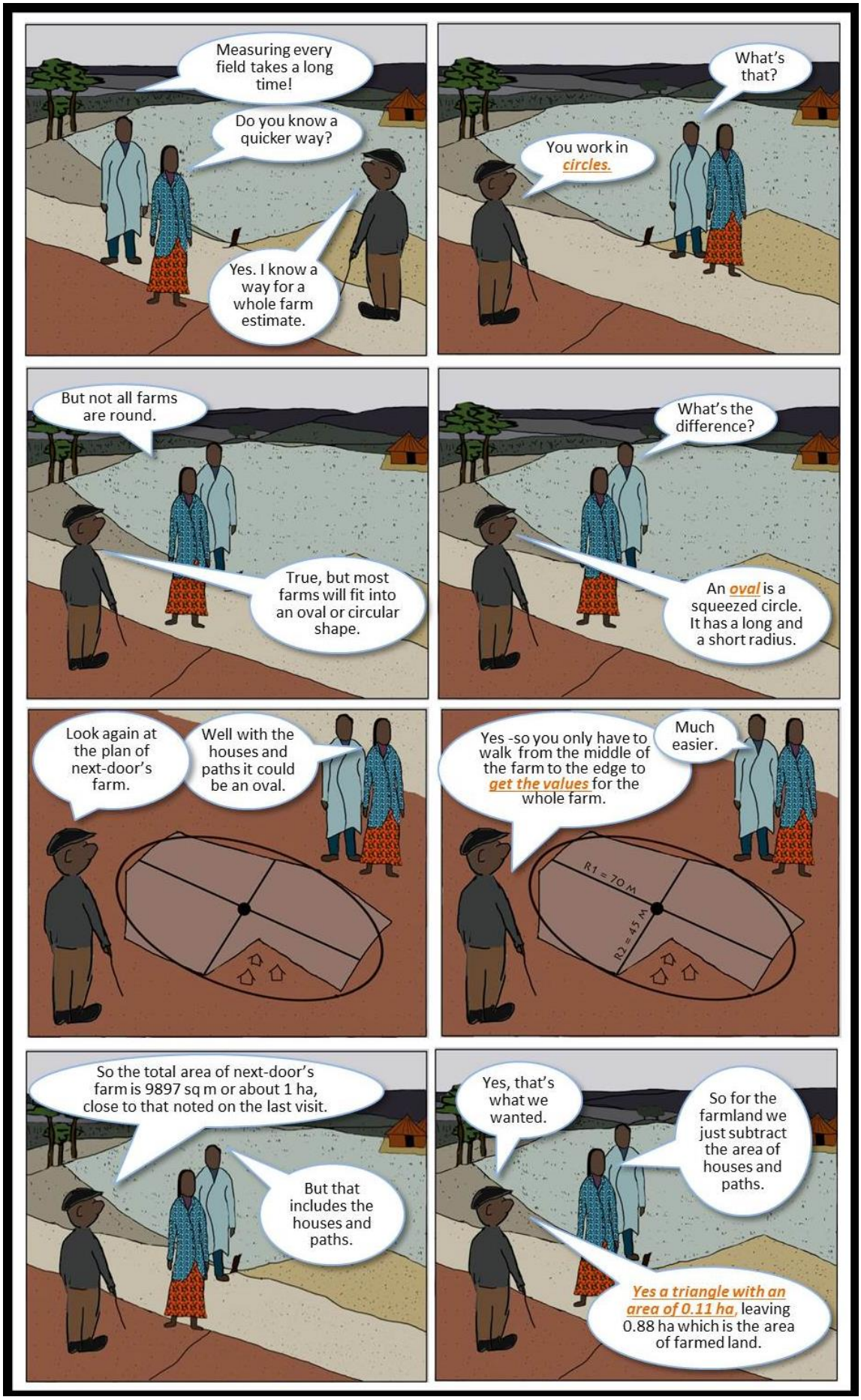


Field	Area Formula	Area formula with m²	Area m²
Field 1 - rectangle	A = L x W	A = L x W L=82 and W = 46; A = 82 x 46	3772
Field 2 - a right angled triangle	A = H x B/2	A = H x B/2 H = Y = 55 and B = X =82; A = 55 x 41	2255
Field 3 - a rectangle	A = L x W	A = L x W L = 61 and W = 55; A = 61 x 55	3355
Field 4 - a right angled triangle	A = H x B/2	A = H x B/2 H = H1 = 22 and B = 82; A = 22 x 41	902
Total area	**Four fields**		**10284**

The farm next door is 10284 m^2 which is 1.03 ha

Back to Uno How Farm Visit 3

Uno How's Farm Visit 4... Quick estimate of whole farm area



Uno How's Farm Visit 4

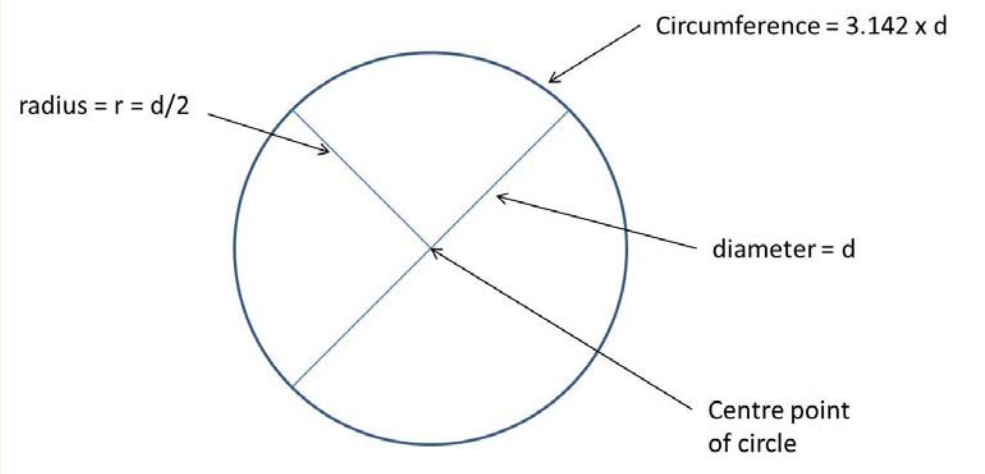
Quick estimation of whole farm area

Circles

Walking around the whole field and all the shapes inside takes a long time. Sometimes we can make a quick estimate of the approximate area of all the holding, including land and buildings, by considering the whole farm to be a circle.

We have learned the formula for working out the area of square, rectangles and triangles. There is a different formula for working out the area of a circle. First, it helps to understand some mathematical terms used for describing circles:

As the circle drawn below shows, the line drawn from its centre point to the outside is called the **radius** (**r**). A line drawn across the whole circle through this centre point is called the **diameter** (**d**). The radius is equal to half the diameter (**radius = diameter/2**). The outside of the circle is called its **circumference**.



It is a fact that the circumference of any circle is always 3.142 times greater than the diameter. This value of **3.142** is a constant (it never changes) called pi and written as **π**. Pi can also be used to work out the area of a circle using the following formula:

Area = π x radius x radius or A = 3.142 x radius x radius or A = 3.142 x r x r

If the radius is measured in metres then, as for other shapes, the area of the circle will also be calculated in m^2.

Note: When a number is multiplied by itself we say that the number is **squared**. This is shown by the symbol ^{2} e.g $3^2 = 3 \times 3 = 9$. Therefore, **A = 3.142 x r x r** can also be written **A = 3.142 x r^2.**

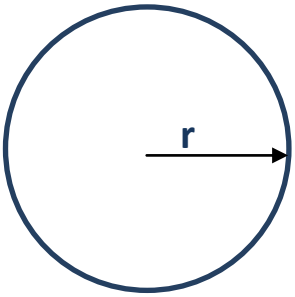
Note: it is common in mathematics to leave out the multiplication sign when using symbols and letters in formulae, so this could also be written as **A = 3.142 r^2**

Quick Test 20 – Circles

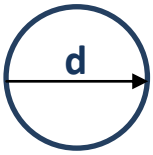
Here are four circles. Calculate the areas of each one (rounded to the nearest m^2)

1 r = 10 m
2 d= 10 m
3 d= 25 m
4 r= 20m

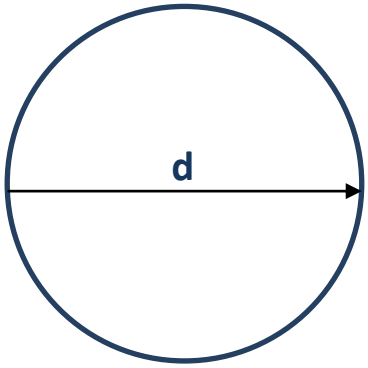
1



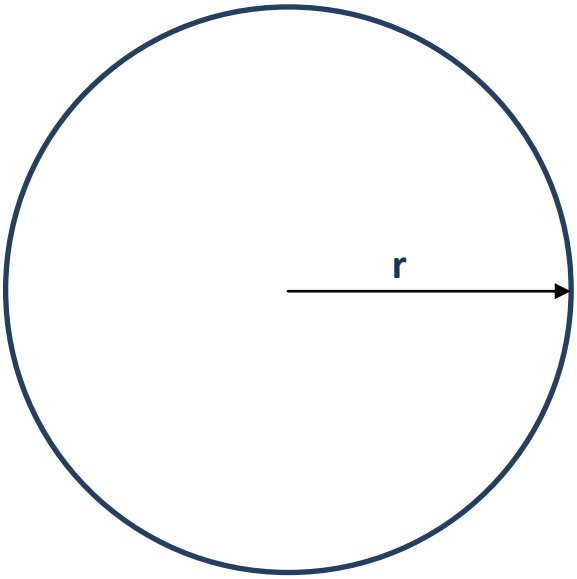
2



3



4



Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 4

Uno How's Farm Visit 4

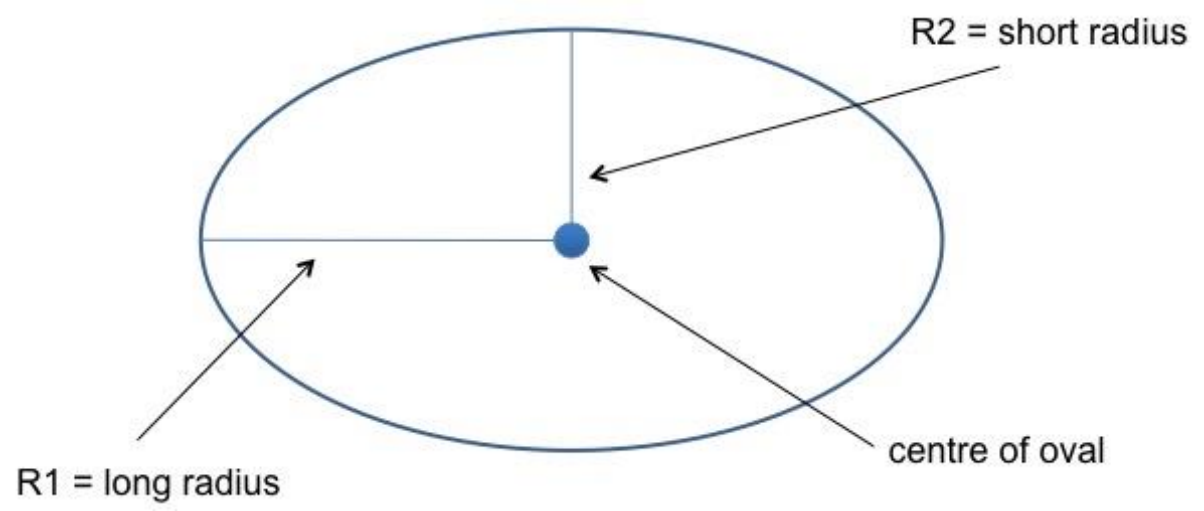
Quick estimation of whole farm area

Ovals

If the farm area is not a circle but an oval, the formula changes to account for the short radius and the long radius. **Area = π x long radius x short radius**

If **A** = area (in this case measured in m²), **R1** = the long radius and **R2** = the short radius, this means that the formula for the area of an oval **is:**

A= π R1 x R2 or A= π R1R2



Quick Test 21 – Ovals

Calculate the area of these ovals to the nearest sq metre:	
1 R1 = 20 m R2 = 8 m	2 R1 = 50 m R2 = 10 m
3 R1 = 38 m R2 = 5 m	4 R1 = 60 m R2 = 25 m

Note down the answers and check them with the answers at the back of this book

Back to Uno How Farm Visit 4

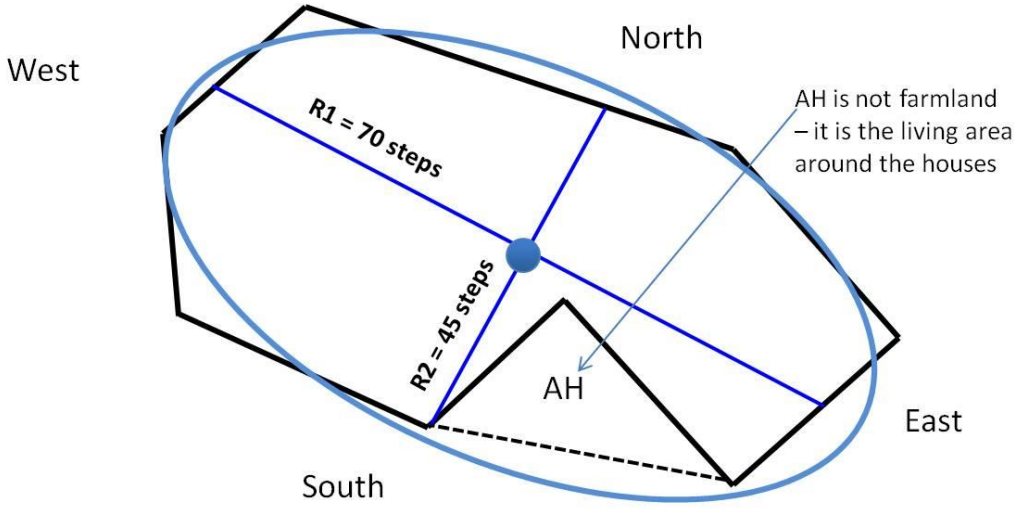
Uno How's Farm Visit 4

Quick estimation of whole farm area

Radii of Oval Farmstead

Let us see how it works in practice taking the neighbours farm, with all his irregular fields as an example. The farm is almost an oval when the house area is included.

The plan below shows what next door's farm looks like.



R1 - The Long Radius

The distance from the centre of the neighbour's farm to the western edge (long radius) is 70 of Tad's steps which makes the long radius:-

R1 = 70 x 1.00 = 70 m

R2 - Short Radius

The distance from the centre of the neighbour's farm to the southern edge (short radius) is 45 of Tad's steps which makes the short radius:-

R2 = 45 x 1.00 = 45 m

The **area** of the **whole holding** is, therefore:

Area = 3.142 x 70 m x 45 m = 9897 m²

Back to Uno How Farm Visit 4

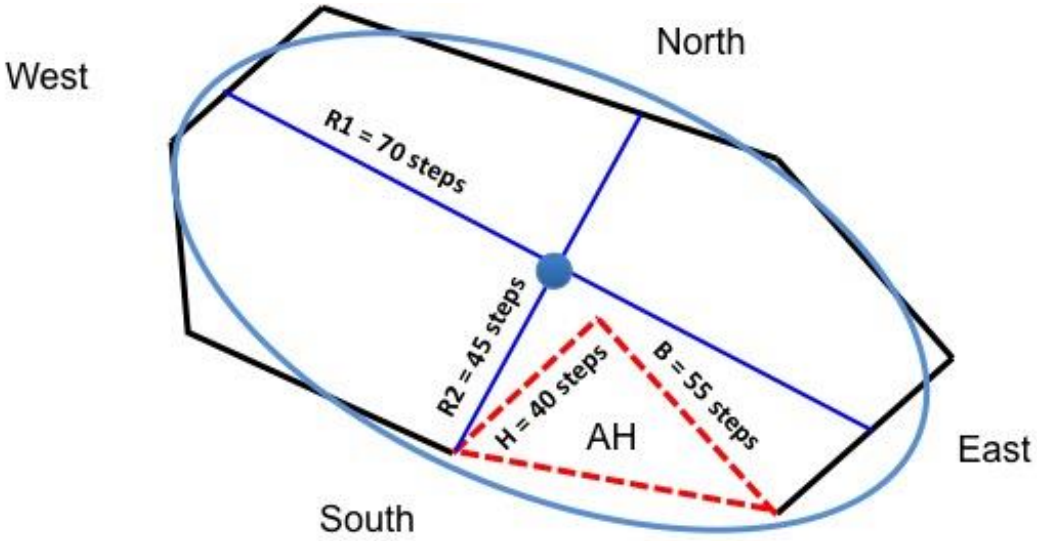
Uno How's Farm Visit 4

Quick estimation of whole farm area

Area of Huts, Houses and Roads

In this case, the houses are in one corner of the neighbours' farm and are included in our calculation of the area of the whole holding. To get an estimate of the area of farmed land, we need to subtract the living area around the houses (AH) from the area of the whole holding.

The area enclosed by the dotted line is the area around the houses.



AH is roughly equivalent to a triangle with height (H) approximately 40 steps and with a base (B) of 55 steps. Tad's steps are 1m so H = 40 m and B = 55 m so:

Area of houses and paths = AH = H x B/2 = 40 x 55/2 = 1100 m²

The approximate area of the farmed land is therefore:

Area of whole holding - Area of houses and paths

9897 m² - 1100 m² = 8797 m² = 0.88 ha

The area of next doors farmed land is 0.88 ha. For most assessment purposes this approximation is good enough.

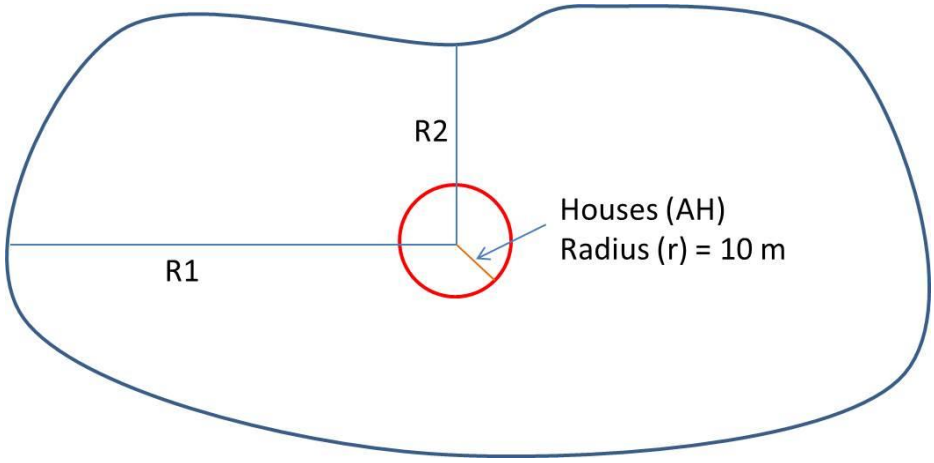
More generally, houses are in the middle of the farm, which in the case below is almost an oval. In this example, to estimate the farmed area, we need to subtract the living area including the houses (AH) from the whole farm area.

The plan below explains what this might look like.

A typical small farm:

Long radius (**R1**) **= 77 m**; Short radius (**R2**) **= 33 m**;

The houses sit in a circle of land (**AH**) where **radius = 10 m**



The approximate area of the farm is:
π x R1 x R2 = 3.142 x 33 x 77 = 7984 m²

The living area (AH) is:
π x r x r or **π r²** = 3.142 x 10 x 10 = 314 m²

Area of farmed land = 7984 m² - 314 m² = 7670 m² = 0.77 ha

Quick Test 22 – Area of farmed land

1 Estimate the area (to the nearest m^2) of farm land of a whole farm that is roughly oval in shape, with a Long Radius of 85 m and a Short Radius of 54 m, and with a living area that sits on a circular area of land of radius 15 metres.

2 Estimate the area of farm land of a whole farm that is roughly oblong in shape, with a Long Radius of 97 m and a Short Radius of 62 m, and with a living area that sits on a circular area of land of radius 8 metres. Give you answer in hectares to 2 decimal places.

Note down the answers and check them with the answers at the back of this book

You have now completed Module 1 - Back to Uno How Farm Visit 4

Answers and Explanations to Quick Tests

Quick Test 1 – Counting

1 ***5***

2 ***9, 18, 21, 36, 73***

back

Quick Test 2 – Adding

1 1645 g
2 709
3 a) 1327; b) 2833; c) 15005; d) 40644
4 $1192

Explanation

1 50 + 415 + 1180 = 1645
Written out the sum looks like this:

		5	0
	4	1	5
1	1	8	0
1	**6**	**4**	**5**
	1		

2 135 + 210 + 50 + 314 = 709
Written out the sum looks like this:

	1	3	5
	2	1	0
		5	0
	3	1	4
	7	**0**	**9**
	1		

3a) 67 + 325 + 935 = 1327
Written out the sum looks like this:

		6	7
	3	2	5
	9	3	5
1	**3**	**2**	**7**
	1	1	

3b) 578 + 988 + 1267 = 2883
Written out the sum looks like this:

	5	7	8
	9	8	8
1	2	6	7
2	**8**	**3**	**3**
1	2	2	

3c) 679 + 3786 + 10540 = 15005
Written out the sum looks like this:

		6	7	9
	3	7	8	6
1	0	5	4	0
1	**5**	**0**	**0**	**5**
	2	2	1	

3d) 356 + 14788 + 21000 + 4500 = 40644
Written out the sum looks like this:

		3	5	6
1	4	7	8	8
2	1	0	0	0
	4	5	0	0
4	**0**	**6**	**4**	**4**
1	1	1	1	

4 355 + 600 + 20 + 217 = 1192
Written out the sum looks like this:

	3	5	5
	6	0	0
		2	0
	2	1	7
1	**1**	**9**	**2**
		1	

back

Quick Test 3 – Subtracting

1 **55 kg**
2 **367 sheep**
3 **3a) 251; b) 2693; c) 6645; d) 10096**

Explanation

1 You have 175 kg of sorghum seeds. You use 35 kg for the first field, 25 kg for the second field and 60 kg on the third field. How many kg of sorghum seeds will you have left? Answer: 55 kg

Method 1: Add up the amount of seed you have used. Take this away from the amount you started with

Add 35 + 25 + 60 = 120

		3	5
+		2	5
+		6	0
	1	**2**	**0**
	1	1	

Subtract 175 - 120

	1	7	5
-	1	2	0
		5	**5**

Method 2: Take away one amount at a time.

Subtract 175 - 35

	1	7	5
-		3	5
	1	**4**	**0**

Subtract 140 - 25

		3	1
	1	~~4~~	0
-		2	5
	1	**1**	**5**

Subtract 115 - 60

		1	
	~~1~~	1	5
-		6	0
		5	**5**

2 You have 550 sheep. You sell 75 sheep in the first month, 43 in the second and 65 in the third. How many sheep do you have left? Answer: 367

Method 1:

Add 75 + 43 + 65 = 183

		7	5
+		4	3
+		6	5
	1	**8**	**3**
	1	1	

Subtract 550 - 183

	4	14	1
	~~5~~	~~5~~	0
-	1	8	3
	3	**6**	**7**

Borrow from the tens column. The 5 in the tens column becomes a 4.

Borrow from the hundreds column (as 4 is less than 8) so the 4 becomes 14. The 5 in the hundreds column becomes a 4.

Method 2: Take away one amount at a time.

Subtract 550 - 75

	4	14	1
	~~5~~	~~5~~	0
-		7	5
	4	**7**	**5**

Borrow from the tens column. The 5 in the tens column becomes a 4.

Borrow from the hundreds column so the 4 becomes 14. The 5 in the hundreds column becomes a 4.

Subtract 475 - 43

	4	7	5
-		4	3
	4	**3**	**2**

Subtract 432 - 65

	3	12	1
	~~4~~	~~3~~	2
-		6	5
	3	**6**	**7**

Borrow from the tens column. The 3 in the tens column becomes a 2.

Borrow from the hundreds column so the 2 becomes 12. The 4 in the hundreds column becomes a 3.

Quick Test 3 – Subtracting Explanations continued…

3a) 1238 - 987 = 251

	11	1	
1	~~2~~	3	8
	9	8	7
	2	**5**	**1**

Borrow from the hundreds column. The 2 in the hundreds column becomes a 1.

Borrow from the thousands column so the hundreds becomes 11.

3b) 3458 - 765 = 2693

2	13	1	
~~3~~	~~4~~	5	8
	7	6	5
2	**6**	**9**	**3**

Borrow from the hundreds column. The 4 in the hundreds column becomes a 3.

Borrow from the thousands column so the hundreds becomes 13. The thousands column becomes 2.

3c) 9870 – 3225 = 6645

		6	1
9	8	~~7~~	0
3	2	2	5
6	**6**	**4**	**5**

Borrow from the tens column. The 7 in the tens column becomes a 6.

3d) 10450 - 354 = 10096

		3	14	1
1	0	~~4~~	~~5~~	0
		3	5	4
1	**0**	**0**	**9**	**6**

Borrow from the tens column. The 5 in the tens column becomes a 4.

Borrow from the hundreds column so 4 becomes 14, and the 4 in the hundreds column becomes a 3.

back

Quick Test 4 – Simple Multiplication – Using the multiplication chart

1	7	2	9	3	45
4	12	5	24	6	24
7	16	8	42	9	81

Explanation

1 7 x 1 = 7

Use the multiplication table. Choose 7 from the top row and 1 from the first column. Follow across and down until they meet. This is the answer.

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	**7**	8	9	10	11	12

Quick Test 4 – Simple Multiplication Explanations continued…

2 3 x 3 = 9

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36

3 9 x 5 = 45

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60

and so on…

back

Quick Test 5 – Simple Multiplication – Multiplying 10, 100 and 1000

1a) 10 b) 100 c) 1000
2a) 1320 b) 13200 c) 132000
3a) 700.00 b) 7000.00 c) 70000.00
4a) 1031.10 b) 10311.00 c) 103110.00
5a) 0.70 b) 7.00 c) 70.00

back

Quick Test 6 – Simple Multiplication – Multiplying by multiples of 10

1	160	4 x 10 x 4
2	720	9 x 10 x 8
3	180	6 x 10 x 3
4	140	7 x 10 x 2
5	2400	3 x 8 x 100
6	4000	8 x 5 x 100
7	4900	7 x 7 x 100
8	30000	6 x 5 x 1000
9	32000	4 x 8 x 1000
10	60000	5 x 12 x 1000

back

Quick Test 7 – Simple Multiplication – Multiplying by larger numbers

1	708	2	5495
3	1664	4	3115
5	5526	6	1364
7	1638	8	1475

Quick Test 7 – Simple Multiplication – Multiplying by larger numbers continued… Explanation

1

	2	3	6
x			3
	7	**0**	**8**
	1	1	

2

	7	8	5
x			7
5	**4**	**9**	**5**
	5	3	

3

	8	3	2
x			2
1	**6**	**6**	**4**

4

	6	2	3
x			5
3	**1**	**1**	**5**
	1	1	

5

	9	2	1
x			6
5	**5**	**2**	**6**
	1		

6

	3	4	1
x			4
1	**3**	**6**	**4**
	1		

7

	1	8	2
x			9
1	**6**	**3**	**8**
	7	1	

8

	2	9	5
x			5
1	**4**	**7**	**5**
	4	2	

back

Quick Test 8 – Dividing using the number chart

1a) 5 b) 12 c) 7
2a) 11 remainder 3 b) 12 remainder 2 c) 10 remainder 10
3a) 12 b) 9 remainder 2 c) 12

back

Quick Test 9 – Division – Dividing by 10, 100 and 1000

1a) 7 b) 0.7 c) 0.07
2a) 13.5 b) 1.35 c) 0.135
3a) 73.5 b) 7.35 c) 0.735

back

Quick Test 10 – Dividing

1 110
2a) 231 b) 11 c) 232
3a) 332 b) 212 c) 243

Explanation

1

$$7\overline{)770} = 110$$

Crosscheck

	1	1	0
x			7
	7	**7**	**0**

2a

$$2\overline{)462} = 231$$

Crosscheck

	2	3	1
x			2
	4	**6**	**2**

2b

$$8\overline{)88} = 11$$

Crosscheck

		1	1
x			8
		8	**8**

2c

$$3\overline{)696} = 232$$

Crosscheck

	2	3	2
x			3
	6	**9**	**6**

3a

$$3\overline{)996} = 332$$

Crosscheck

	3	3	2
x			3
	9	**9**	**6**

3b

$$4\overline{)848} = 212$$

Crosscheck

	2	1	2
x			4
	8	**4**	**8**

3c

$$2\overline{)486} = 243$$

Crosscheck

	2	4	3
x			2
	4	**8**	**6**

back

Quick Test 11 – Dividing with remainders

1 114 remainder 1
2 122 remainder 5
3a) 141 remainder 1 b) 112 remainder 5 c) 219 remainder 1

Explanation

1

$$6\overline{)\,6\ 8\ {}^{2}5}\quad 1\ 1\ 4 \text{ rem } 1$$

Crosscheck

	1	1	4
x			6
	6	**8**	**4**
		2	

Plus the 1 remainder = 685

2

$$8\overline{)\,9\ {}^{1}8\ {}^{2}1}\quad 1\ 2\ 2 \text{ rem } 5$$

Crosscheck

	1	2	2
x			8
	9	**7**	**6**
	1	1	

Plus the 5 remainder = 981

3a

$$6\overline{)\,8\ {}^{2}4\ 7}\quad 1\ 4\ 1 \text{ rem } 1$$

Crosscheck

	1	4	1
x			6
	8	**4**	**6**
	2		

Plus the 1 remainder = 847

3b

$$7\overline{)\,7\ 8\ {}^{1}9}\quad 1\ 1\ 2 \text{ rem } 5$$

Crosscheck

	1	1	2
x			7
	7	**8**	**4**
		1	

Plus the 5 remainder = 789

3c

$$3\overline{)\,6\ 5\ {}^{2}8}\quad 2\ 1\ 9 \text{ rem } 1$$

Crosscheck

	2	1	9
x			3
	6	**5**	**7**
		2	

Plus the 1 remainder = 658

back

Quick Test 12 – Dividing larger numbers

1 134 remainder 20
2 63 remainder 32
3a) 24 remainder 26 b) 121 remainder 21 c) 30 remainder 17

Explanation

1 1 3 4 rem 20 25 | 3 3 8 7 12 0	***Crosscheck*** ***134 x 25. Multiply in parts then add the totals together.*** ***134 x 20 = 134 x 2 x 10 = 2680*** ***134 x 5 = 670*** ***2680 + 670 = 3350 plus the 20 remainder = 3370***
2 6 3 rem 32 36 | 2 2 23 0 14 0	***Crosscheck*** ***63 x 36. Multiply in parts then add the totals together.*** ***63 x 30 = 63 x 3 x 10 = 1890*** ***63 x 6 = 378*** ***1890 + 378 = 2268 plus the 32 remainder = 2300***
3a 2 4 rem 26 56 | 1 13 13 7 25 0	***Crosscheck*** ***24 x 56. Multiply in parts then add the totals together.*** ***24 x 50 = 24 x 5 x 10 = 1200*** ***24 x 6 = 144*** ***1200 + 144 = 1344 plus the 26 remainder = 1370***
3b 1 2 1 rem 21 41 | 4 4 9 8 8 6 2	***Crosscheck*** ***121 x 41. Multiply in parts then add the totals together.*** ***121 x 40 = 121 x 4 x 10 = 4840*** ***121 x 1 = 121*** ***4840 + 121 = 4961 plus the 21 remainder = 4982***
3c 3 0 rem 17 132 | 3 3 39 39 7 1 7	***Crosscheck*** ***30 x 132. Multiply in parts then add the totals together.*** ***3 x 10 x 132 = 132 x 3 x 10 = 3960*** ***Plus the 17 remainder = 3977***

back

Quick Test 13 – Simplifying and multiplying fractions

1a) 6/3 can be simplified to **2** by dividing the numerator and denominator by 3
b) 15/5 can be simplified to **3** by dividing the numerator and denominator by 5
c) 10/3 can be simplified to **3 1/3** by dividing the numerator and denominator by 3
d) 16/5 can be simplified to **3 1/5** by dividing the numerator and denominator by 5

2 2/4 can be simplified to **1/2** by dividing the numerator and denominator by 2
3/9 can be simplified to **1/3** by dividing the numerator and denominator by 3
4/16 can be simplified to **1/4** by dividing the numerator and denominator by 4
8/10 can be simplified to **4/5** by dividing the numerator and denominator by 2
8/16 can be simplified to **1/2** by dividing the numerator and denominator by 8
6/10 can be simplified to **3/5** by dividing the numerator and denominator by 2
25/25 can be simplified to **1** by dividing the numerator and denominator by 25
12/4 can be simplified to **3** by dividing the numerator and denominator by 4
17/23 cannot be simplified because 17 and 23 prime numbers – they can be divided only by 1 and themselves
16/26 can be simplified to **8/13** by dividing the numerator and denominator by 2

2/4 and **8/16** are of equal value and can both be simplified to ½

3a) 10 x ½ = **5** 10 multiplied by ½ is the same as dividing by 2
b) 8 x ¼ = **2** 8 multiplied by ¼ is the same as dividing by 4
c) 12 x 1/3 = **4** 12 multiplied by 1/3 is the same as dividing by 3
d) 18 x ½ = **9** 18 multiplied by ½ is the same as dividing by 2
e) 80 x ½ = **40** 80 multiplied by ½ is the same as dividing by 2
f) 66 x 1/3 = **22** 66 multiplied by 1/3 is the same as dividing by 3
g) 25 x ¼ = **6 ¼** 25 multiplied by ¼ is the same as dividing by 4
h) 71 x ½ = **35 ½** 71 multiplied by ½ is the same as dividing by 2

back

Quick Test 14 – Multiplying decimals

1 9.6 m
2 36 m
3a) 12 b) 49 c) 20

Explanation

1

		1	.	2
X				8
		9	**.**	**6**
		1		

← 1 decimal place
← 0 decimal place
← 1 decimal place

2

Step 1: 40 x 0.9 = 4 x 10 x 0.9

		0	.	9
X				4
		3	**.**	**6**
		3		

← 1 decimal place
← 0 decimal place
← 1 decimal place

Step 2: 3.6 x 10 = 36

3a

Step 1: 20 x 0.6 = 2 x 10 x 0.6

		0	.	6
X				2
		1	**.**	**2**
		1		

← 1 decimal place
← 0 decimal place
← 1 decimal place

Step 2: 1.2 x 10 = 12

3b

Step 1: 70 x 0.7 = 7 x 10 x 0.7

		0	.	7
X				7
		4	**.**	**9**
		4		

← 1 decimal place
← 0 decimal place
← 1 decimal place

Step 2: 4.9 x 10 = 49

3c

Step 1: 50 x 0.4 = 5 x 10 x 0.4

		0	.	4
X				5
		2	**.**	**0**
		2		

← 1 decimal place
← 0 decimal place
← 1 decimal place

Step 2: 2.0 x 10 = 20

back

Quick Test 15 – Area of a square field

1 1225 m^2
2a) 2025 m^2 b) 2704 m^2 c) 784 m^2
3a) 5329 m^2 b) 8281 m^2 c) 1089 m^2

Explanation

1

		3	5
X		3	5
	1	7	5
1	0	5	0
1	2	2	5

2a

		4	5
X		4	5
	2	2	5
1	8	0	0
2	0	2	5

2b

		5	2
X		5	2
	1	0	4
2	6	0	0
2	7	0	4

2c

		2	8
X		2	8
	2	2	4
	5	6	0
	7	8	4

3a

		7	3
X		7	3
	2	1	9
5	1	1	0
5	3	2	9

3b

		9	1
X		9	1
		9	1
8	1	9	0
8	2	8	1

3c

		3	3
X		3	3
		9	9
	9	9	0
1	0	8	9

back

Quick Test 16 – Area of a rectangular field

1 5124 m^2
2a) 10914 b) 5928
3a) 3116 b) 11844

Explanation

1

	1	2	2
X		4	2
	2	4	4
4	8	8	0
5	1	2	4

2a

		3	2	1
	X		3	4
	1	2	8	4
	9	6	3	0
1	0	9	1	4

2b

	1	1	4
X		5	2
	2	2	8
5	7	0	0
5	9	2	8

3a

	1	6	4
X		1	9
1	4	7	6
1	6	4	0
3	1	1	6

3b

		2	8	2
X			4	2
		5	6	4
1	1	2	8	0
1	1	8	4	4

back

Quick Test 17 – Calculating the area of right angled and non right angled triangles

1 1200 m^2 2 500 m^2
3 750 m^2 4 2250 m^2

Explanation

1	H = 60	B/2 = 40/2 = 20	Area = 60 x 20 = 6 x 10 x 2 x 10 = 12 x 100 = 1200
2	H = 50	B/2 = 20/2 = 10	Area = 50 x 10 = 500
3	H = 25	B/2 = 60/2 = 30	Area = 25 x 3 x 10 = 750
4	H = 50	B/2 = 90/2 = 45	Area = 45 x 5 x 10 = 2250

back

Quick Test 18 – Adding the areas of fields

1 4450 m^2 2 1578 m^2
3 1622 m^2 4 679 m^2

Explanation

1

	3	2	0	0
		4	5	0
		8	0	0
	4	**4**	**5**	**0**
	1			

2

		5	6	8
		9	3	2
			7	8
	1	**5**	**7**	**8**
		1	1	

3

	1	3	4	2
		2	0	0
			8	0
	1	**6**	**2**	**2**
		1		

4

			6	7
		4	5	0
			3	2
		1	3	0
		6	**7**	**9**
		1		

back

Quick Test 19 – Hectares and 'Rounding Off'

1 1.4789 ha = 1.48 ha to 2 decimal places
2a) 0.99 ha 2b) 1.60 ha
3a) 1.55 ha 3b) 0.07 ha
4a) 69.35 ha 4b) 0.89 ha
5a) 0.08 ha 5b) 0.67 ha

back

Quick Test 20 – Circles

1 314 m^2 2 79 m^2
3 491 m^2 4 1257 m^2

Explanation

1 r = 10 m r^2 = 10 x 10 = 100 π = 3.142 Area (m^2) = 3.142 x 100 = 314.2 m^2
2 d = 10 m r = d/2 = 10/2 = 5 m r^2 = 5 x 5 = 25 π = 3.142 Area (m^2) = 3.142 x 25 = 78.55 m^2
3 d = 25 m r = d/2 = 25/2 = 12.5 m r^2 = 12.5 x 12.5 = 156.25 π = 3.142
Area (m^2) = 3.142 x 156.25 = 490.94 m^2
4 r = 20 m r^2 = 20 x 20 = 400 π = 3.142 Area (m^2) = 3.142 x 400 = 1256.8 m^2

back

Quick Test 21 – Ovals

1 503 m^2 2 1571 m^2
3 597 m^2 4 4713 m^2

Explanation

1 R1 = 20 m R2 = 8 m π = 3.142 Area (m^2) = 3.142 x 20 x 8 = 502.72 m^2
2 R1 = 50 m R2 = 10 m π = 3.142 Area (m^2) = 3.142 x 50 x 10 = 1571 m^2
3 R1 = 38 m R2 = 5 m π = 3.142 Area (m^2) = 3.142 x 38 x 5 = 596.98 m^2
4 R1 = 60 m R2 = 25 m π = 3.142 Area (m^2) = 3.142 x 60 x 25 = 4713 m^2

back

Quick Test 22 – Quick estimation of the area of farmed land

1 13715 m²
2 1.87 ha

Explanation

1 Long radius (**R1**) **= 85 m**; Short radius (**R2**) **= 54 m**;
The houses sit in a circle of land (**AH**) where **radius = 15 m**

The approximate area of the whole farm is:
π x R1 x R2 = 3.142 x 85 x 54 = 14422 m²

The living area (AH) is:
π x r x r or π r² = 3.142 x 15 x 15 = 707 m²

Therefore, the area of farmed land = 14422 m² - 707m² = 13715 m²

2 Long radius (**R1**) **= 97 m**; Short radius (**R2**) **= 62 m**;
The houses sit in a circle of land (**AH**) where **radius = 8 m**

The approximate area of the whole farm is:
π x R1 x R2 = 3.142 x 97 x 62 = 18896 m²

The living area (AH) is:
π x r x r or π r² = 3.142 x 8 x 8 = 201 m²

Therefore, the area of farmed land = 18896 m² - 201 m² = 18695 m² = 1.8695 ha = 1.87 ha

back

Uno How's Farm Visits...

Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Uno How's Farm Visits...

Multiplication tables

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144