MATHS HOME LEARNING PACK 5/6N

This Maths Pack has two parts.

Part 1 has a rich task for students to help them review topics already covered, such as perimeter, area, multiplication and more. In the task they need to design a farm.

Part 2 has an explanation for 5 different maths concepts and then an activity for each new concept. The topics are: area of triangles, integers (negative numbers), multiples, square numbers and triangular numbers.

Great online resources for continued maths learning are:

- Hit the Button (for practising mental maths)
- Math Antics (maths videos and matching worksheets, just be aware you have to pay to get access to the worksheets)
- Khan Academy (for students who are more confident in maths, it has videos and online practice and is completely free)

DESIGN A FARM

5/6N MATHS CHALLENGE

On the MY FARM! page draw the following. Each square represents 1 square metre ($1m^2$)

1) A sheep pen with an **area** between 20 and 30 square metres. It must be a rectangle.

2) A square pen for the emus. It must have an **area** of more than 80 square metres.

3) A cow pen with a **perimeter** of 30 metres. It cannot be a square or rectangle (for example, you could make it an L shape).

4) A pig pen with a **perimeter** between 20 and 30 metres and an **area** of less than 12 square metres.

5) Any pen of your choice for the alpacas.

6) Write the area (A=) and perimeter (P=) next to each pen. Make sure you use m for perimeter and m^2 for area.

Calculate the following:

7) The turf (grass) for each pen costs $10 per square metre. How much will you have to pay to get each pen covered in new turf?

8) The fence for each pen costs $5 per metre. How much will the fencing cost for the whole farm.

9) What is the total cost to setup your new farm?

Finally:

10) Add details to your farm and decorate it.

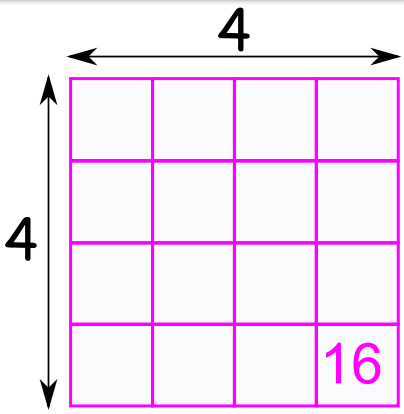
MY FARM!

Definition of

Square Number

more ...

The result of multiplying an integer (not a fraction) by itself.



Example: 4 × 4 = 16, so 16 is a square number.

Here are the first few square numbers:
0 (=0×0)
1 (=1×1)
4 (=2×2)
9 (=3×3)
16 (=4×4)
25 (=5×5)
...

See: Integer

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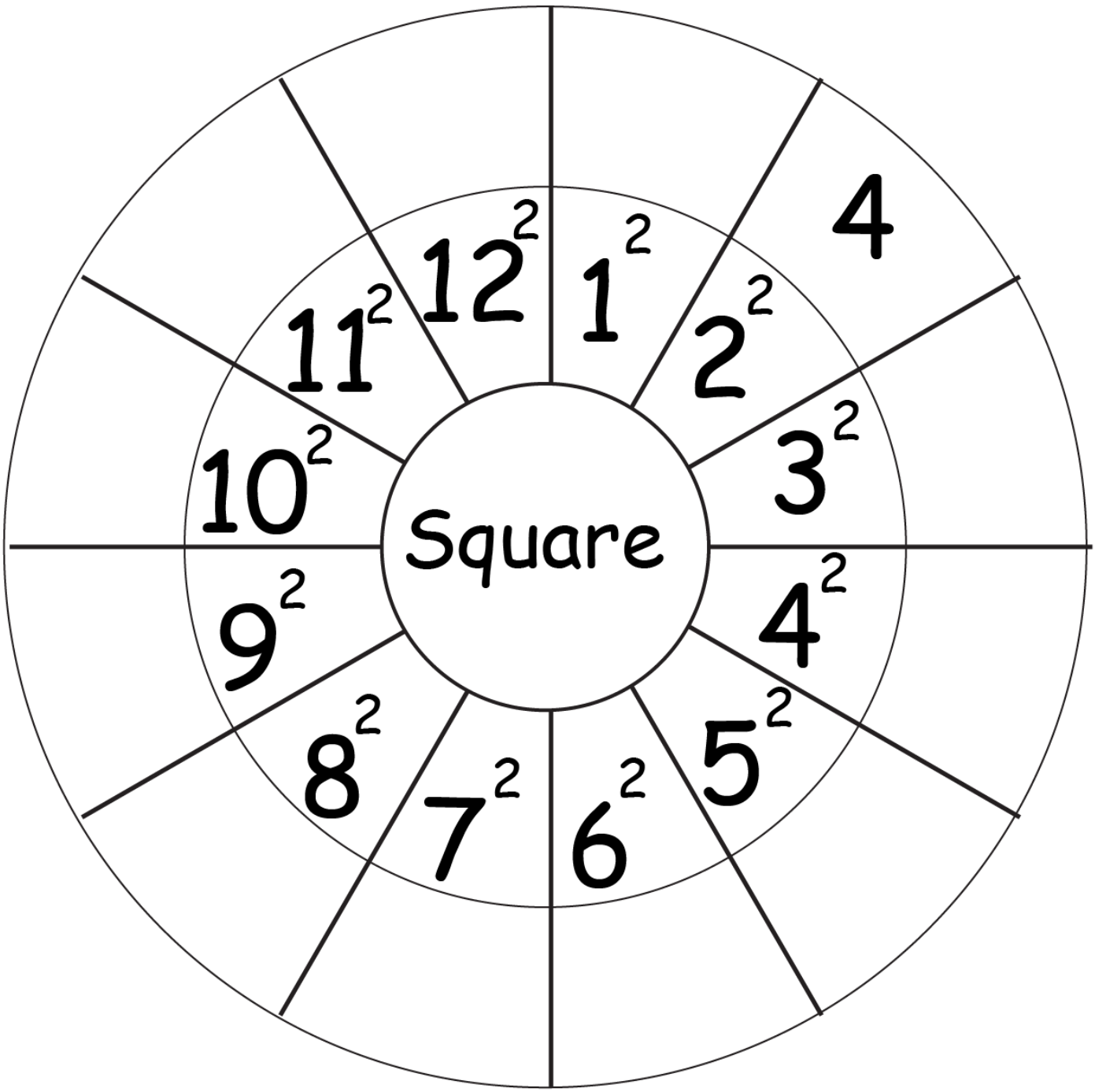
Squares

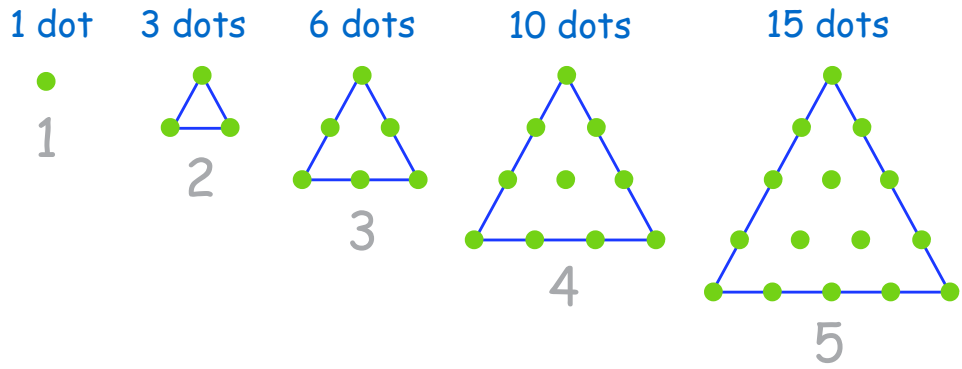


Triangular Number Sequence

This is the Triangular Number Sequence:

1, 3, 6, 10, 15, 21, 28, 36, 45, ...

It is simply the number of dots in each **triangular pattern**:

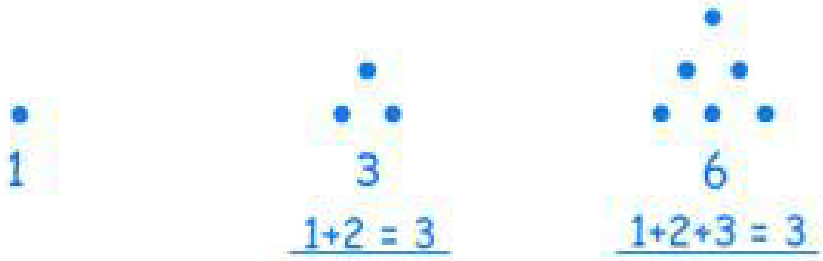


By adding another row of dots and counting all the dots we can find the next number of the sequence.

- The first triangle has just one dot.
- The second triangle has another row with 2 extra dots, making 1 **+ 2** = 3
- The third triangle has another row with 3 extra dots, making 1 + 2 **+ 3** = 6
- The fourth has 1 + 2 + 3 **+ 4** = 10
- etc!

TRIANGULAR NUMBERS

Look at these first 3 triangular numbers:



Now draw the next 6 triangular numbers:

10

15

21

28

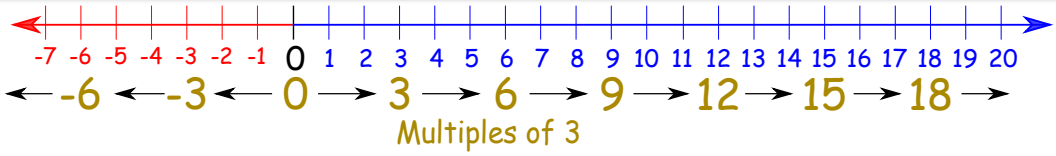
36

45

Definition of

Multiple

more ...



The result of multiplying a number by an integer (not by a fraction).

Examples:

- 12 is a multiple of 3, because 3 × 4 = 12
- −6 is a multiple of 3, because 3 × −2 = −6
- But 7 is NOT a multiple of 3

See: Integer

THE MULTIPLE GAME 1-6

COVER UP ANY MULTIPLE OF THE NUMBER YOU ROLL ON A DICE.

MULTIPLES OF 2 AND 4

0	2	**4**	6	**8**	10	**12**	14	**16**	18	**20**	22	**24**	26	**28**	30	**32**	34	**36**	38	**40**

MULTIPLES OF 3 AND 6

0	3	**6**	9	**12**	15	**18**	21	**24**	27	**30**	33	**36**	39	**42**	45	**48**	51	**54**	57	**60**

12	20	13	25	30	15
27	24	22	14	12	35
40	21	28	45	60	8
27	16	10	32	16	50
4	13	9	36	7	2
17	11	33	6	26	18

IF YOU ROLL A 1, YOU CAN COVER UP ANY NUMBER ON THE BOARD!

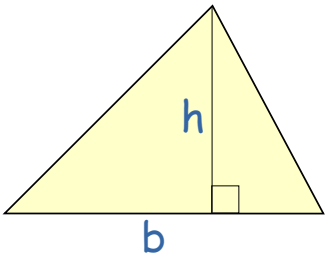
Area of Triangles

Knowing Base and Height

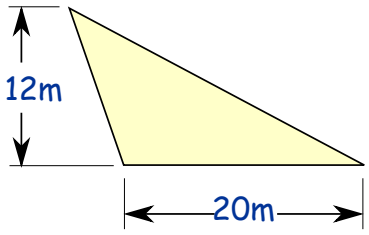
When we know the base and height it is easy.

It is simply **half of b times h**

$$\text{Area} = \frac{1}{2}bh$$



Example: What is the area of this triangle?



*(Note: 12 is the **height**, not the length of the left-hand side)*

Height = h = 12

Base = b = 20

½ of 20 = 10

Area = **½ bh** = (½ × 20) × 12 = 10 x 12 = **120m²**

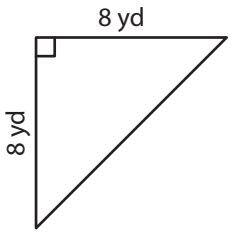
Name : _____

T1L1S1

Area of a Triangle

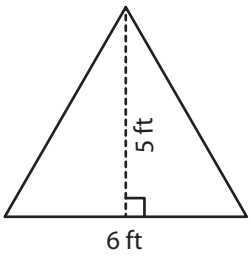
Find the area of each triangle.

1)



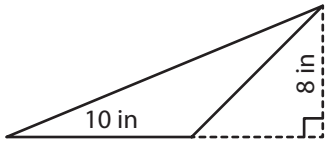
Area = ____

2)



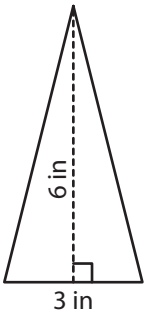
Area = ____

3)



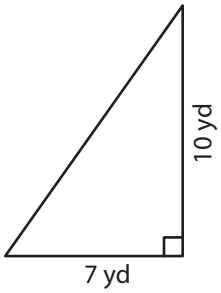
Area = ____

4)



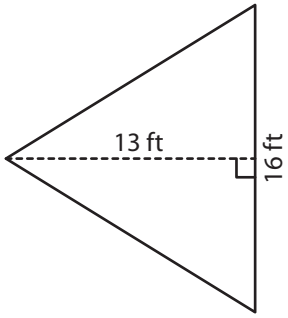
Area = ____

5)



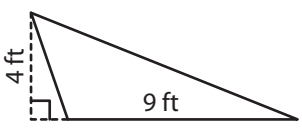
Area = ____

6)



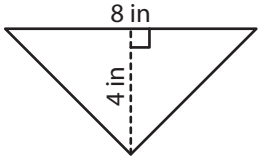
Area = ____

7)



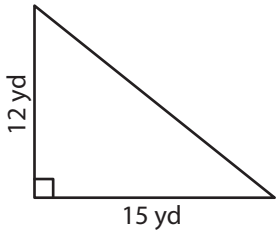
Area = ____

8)



Area = ____

9)

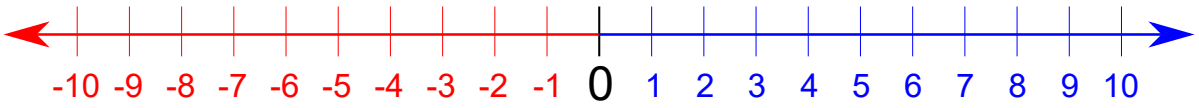


Area = ____

Whole Numbers and Integers

Integers

Integers are like whole numbers, but they **also include negative numbers** ... but still no fractions allowed!



So, integers can be negative {−1, −2,−3, −4, ... }, positive {1, 2, 3, 4, ... }, or zero {0}

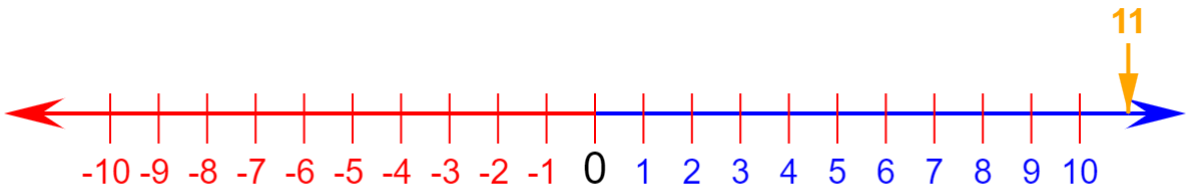
We can put that all together like this:

Integers = { ..., −4, −3, −2, −1, 0, 1, 2, 3, 4, ... }

Examples: −16, −3, 0, 1 and 198 are all integers.

(But numbers like ½, 1.1 and 3.5 are **not** integers)

These are all integers, and they continue left and right infinitely:



Adding Integers (A)

Use an integer strategy to find each answer.

(-2) + (+8) =	(+9) + (+7) =	(+7) + (-1) =
(+3) + (+1) =	(+7) + (+5) =	(-5) + (+9) =
(+2) + (-5) =	(-1) + (+3) =	(+8) + (+4) =
(-7) + (-2) =	(-6) + (-7) =	(+7) + (+8) =
(-4) + (+3) =	(-2) + (-6) =	(+9) + (-4) =
(+7) + (+3) =	(-5) + (-9) =	(-5) + (-6) =
(-9) + (-4) =	(-5) + (+4) =	(-3) + (-9) =
(-7) + (+1) =	(-1) + (-8) =	(-7) + (-4) =
(-1) + (+4) =	(+7) + (-4) =	(-6) + (+9) =
(-4) + (-1) =	(+9) + (+3) =	(+2) + (-5) =