Exploring Numbers

with Miss Maths

Today's online lesson will look at:

▶ Square numbers
▶ A Square number Investigation
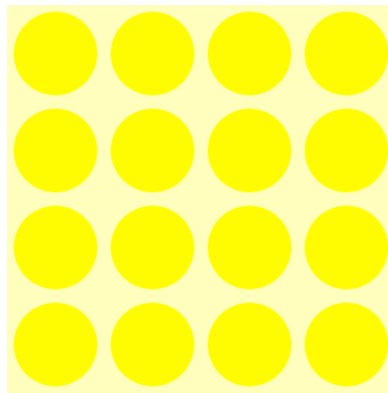
Let's get talking...

► What is a prime number?

► What is a composite number?

► What is a square number?

Square numbers

- A square number is a number multiplied by itself.
- 4x4=16
- So 16 is a square number
- The symbol for 'squared' is a little number ^{2}
- $4^2 = 16$
- 4^2=4x4=4 lots of 4=
- 4+4+4+4=16
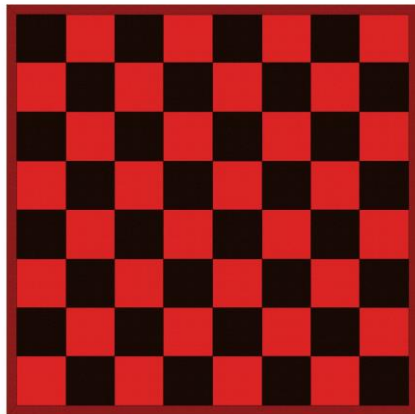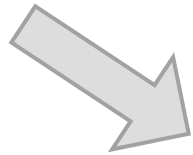
Choose a square number to explore.
Look at my example and do your own:

▶ $8^2 = 8 \times 8 = 64$

▶ $8^2 = 8$ lots of $8 = 64$

▶ $8+8+8+8+8+8+8+8=64$

▶ An array

Prime numbers

▶ A prime number is only divisible by itself and 1

▶ A prime number has only 2 factors

▶ 2 is the only even prime number

▶ 7 is a prime number

▶ It has only 2 factors , 1 and 7

▶ 9 is **not a prime number** because it has 3 factors: 1,9 and 3

Prime numbers are numbers that are only divisible by themselves and by 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
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150

A composite number

► A composite number is a number with more than 2 factors.

► 6 is a composite number because 1,2,3,and 6 'fit into' 6 It has 4 factors.

						6 =	6x1
6 =	3x2
6 =	2x3
6 =	1x6

Our Nrich investigation is called
Two Primes make one square

Flora had a challenge for her friends.
She asked, "Can you make square numbers by adding two prime numbers together?"

Any ideas?

What do you think?

Ollie had a think.
"Well, let me see... I know that 4 = 2 + 2.
That's a good start! So 4 is a square number made with prime numbers."

Have a go yourself. Try with the squares of the numbers from 3 to 20.

> Once you have had some initial ideas, take a look at how three more of Flora's friends started the problem:

Bailey

I made the square numbers out of cubes. I took a prime number of cubes away and saw if a prime number was also left.

Dina

2 is the only even prime number. I wonder if this fact is important for this investigation....

Shameen

I listed all the prime numbers up to 100 and all the square numbers up to 100. I needed to start with these facts first. I wanted to be organised and work systematically.

Let's look at the skills you are developing:

▶ Independent thinking

Q What do I have to do?

Q How do I go about this? How can I organise this?

▶ Which maths facts do I need to know?

▶ Which arithmetic skills might I need to use?

▶ Exploring numbers ('playing around with them')

▶ Making observations

▶ Making a rule and proving it

▶ Finding all possibilities

▶ Creative thinking

▶ Resilience

▶ Communicating ideas

Continue your investigation.

You could use one of the approaches the children used.

▶ Did you find any square numbers that cannot be made from adding 2 prime numbers?

Yesterday's Nrich investigation was called Penta primes

Here are ten cards numbered 0 to 9:

Using all ten cards, rearrange them to make five prime numbers.
Can you find a way of doing it with five two-digit numbers?
How about using one one-digit number, one three-digit number and three two-digit numbers? ..

We will share the solution at the end of today's online session.
I know you needed just a little more time in yesterday's session and there is a prize. I can't share the solution yet!

Well done this week!
You have really impressed me with your problem solving skills.

Remember there is no online session tomorrow so you can use this time to continue with your Dragon's Den Maths.

Have a lovely weekend! ☺