



# Maths

## Multiplication and Division

# The Sieve of Eratosthenes



# Aim

- I can find all of the prime numbers up to 100.

# Success Criteria

- I can explain what a prime number is.
- I can use The Sieve of Eratosthenes to identify prime numbers.

# What Am I ?



Split into pairs, one person will be the Thinker and the other will be the Guesser.



# What Is a Prime Number?



What is a prime number?

A prime number is a whole number greater than 1 that is only divisible by itself and 1.

Numbers that can be divided evenly by numbers other than themselves and 1 are called composite numbers.

Except for 0 and 1, all whole numbers are either prime numbers or composite numbers.



# Who Was Eratosthenes?

Eratosthenes was an Ancient Greek mathematician who lived between 276 and 194 BC.

He was not only a mathematician but also an astronomer, geographer and poet.

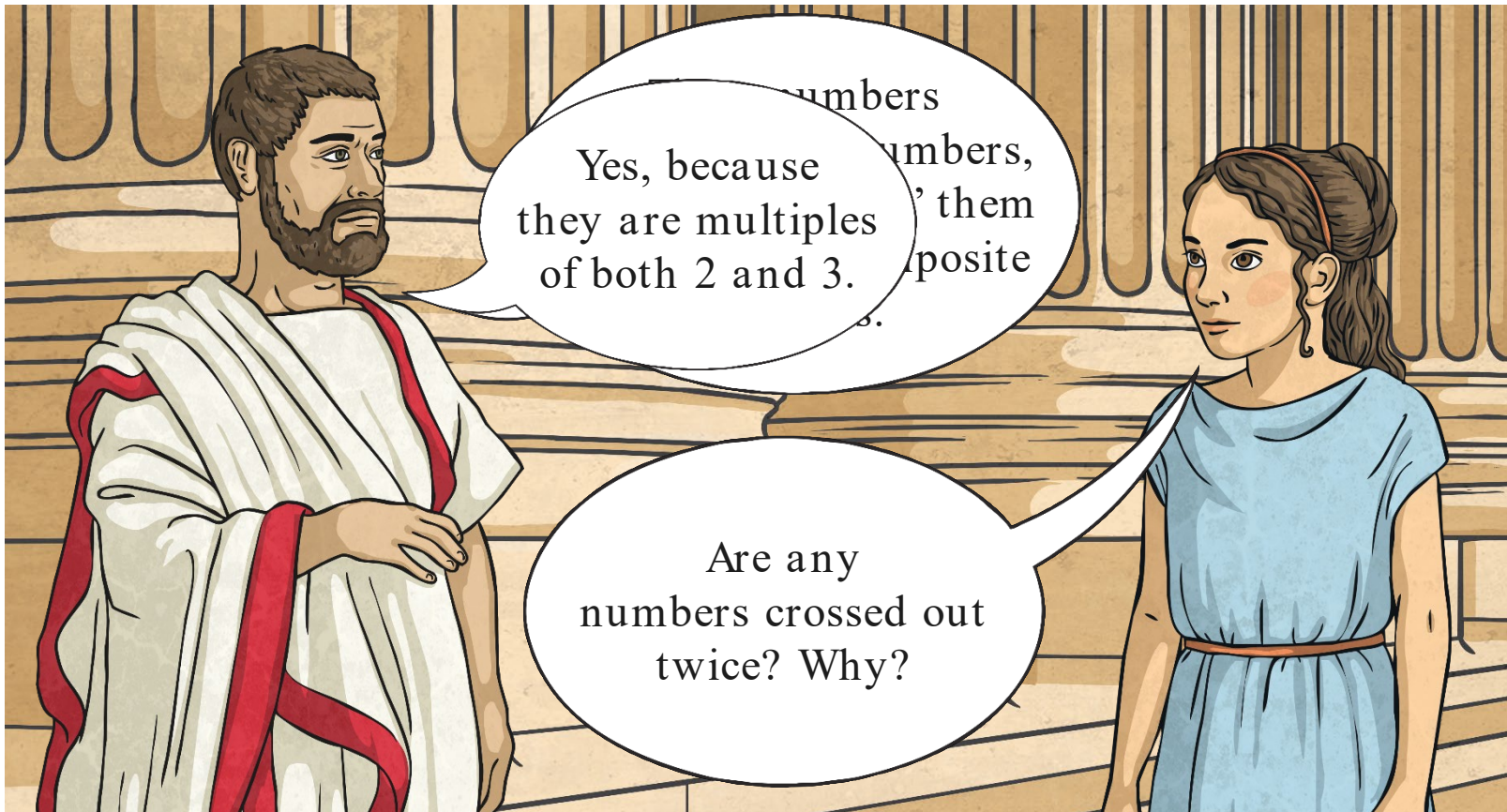
— Eratosthenes was particularly interested in prime numbers and developed a way of identifying them by 'sieving' out the multiples of other numbers. He also worked out a calendar that included leap years, measured the tilt of the Earth's axis and the distance from the Earth to the Moon and Sun.



# The Sieve of Eratosthenes

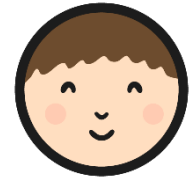


What is a sieve? What might we use a sieve for?





# The Sieve of Eratosthenes Activities



Use your marvellous maths skills to complete these activity sheets:

## The Sieve of Eratosthenes

I can find all of the prime numbers up to 100.

On this hundred square, we are going to 'sieve' out all of the numbers that are composite so that we are left with just the prime numbers.

- Start by highlighting or circling 2 and 3 because they are the first prime numbers.
- Cross out all of the multiples of 2 in pencil like this:
- Next, cross out all of the multiples of 3. Are any multiples of 3 already crossed out? If so, do this:
- Now, go through all of your multiplication tables one by one and cross off any composite numbers.
- Once you have 'sieved' out all of the composite numbers, you should be left only with the prime numbers. Circle or highlight them and write them out below.
- What would the next 5 prime numbers be after 200?

	2	3	4	5	6	7	8
11	12	13	14	15	16	17	18
21	22	23	24	25	26	27	28
31	32	33	34	35	36	37	38
41	42	43	44	45	46	47	48
51	52	53	54	55	56	57	58
61	62	63	64	65	66	67	68
71	72	73	74	75	76	77	78
81	82	83	84	85	86	87	88
91	92	93	94	95	96	97	98
101	102	103	104	105	106	107	108
111	112	113	114	115	116	117	118
121	122	123	124	125	126	127	128
131	132	133	134	135	136	137	138
141	142	143	144	145	146	147	148
151	152	153	154	155	156	157	158
161	162	163	164	165	166	167	168
171	172	173	174	175	176	177	178
181	182	183	184	185	186	187	188
191	192	193	194	195	196	197	198

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41	42	43	44	45	46	47	48
51	52	53	54	55	56	57	58
61	62	63	64	65	66	67	68
71	72	73	74	75	76	77	78
81	82	83	84	85	86	87	88
91	92	93	94	95	96	97	98



## The Sieve of Eratosthenes

I can find all of the prime numbers up to 100.

On this hundred square, we are going to 'sieve' out all of the numbers that are composite so that we are left with just the prime numbers.

- Start by highlighting or circling 2 and 3 because they are the first prime numbers.
- Cross out all of the multiples of 2 in pencil like this:
- Next, cross out all of the multiples of 3. Are any multiples of 3 already crossed out? If so, do this:
- Now, cross out the multiples of 5.
- Now, cross out the multiples of 10.
- Now, cross out the multiples of 4.
- Now, cross out the multiples of 6.
- Now, cross out the multiples of 7.
- Now, cross out the multiples of 8.
- Now, cross out the multiples of 9.
- Finally, now that you have 'sieved' out all of the composite numbers, you should be left only with the prime numbers. Circle or highlight them and write them out below:

	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





# Are These Numbers Prime Numbers?



Turn over your [The Sieve of Eratosthenes Activity Sheet](#).

No peeking allowed!

Prime			
24	2	13	23
32	61	72	96

If a number you mark the

Are there any even prime numbers? Can you explain your answer?

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