

AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES SCHOOLS ENRICHMENT CENTRE (AIMSSEC)

AIMING HIGH

1	2	3	4	5	6	7	8	9	10	circle the number 2 and make a line $1.4 \le 0.10$
11	12	13	14	15	16	17	18	19	4	times table like this:
21	22	23	24	25	26	27	28	29	30	You do not cross through the first number in the table but it may alr
31	32	33	34	35	36	37	38	39	40	be crossed out.
41	42	43	44	45	46	47	48	49	50	Change colour, circle the number 3 a make a line through 6, 9, 12. 15 and
51	52	53	54	55	56	57	58	59	60	rest of the 3 times table.
61	62	63	64	65	66	67	68	69	70	What do you notice about the multip
71	72	73	74	75	76	77	78	79	80	8, 9 and 10?
81	82	83	84	85	86	87	88	89	90	are not crossed out?
91	92	93	94	95	96	97	98	99	100	The number 4 has 3 factors: 1, 2 and How many factors does 5 have? What

Put a circle around all the other numbers that are not crossed out **except** the number 1. How many factors do they have? What can you say about them?

HELP

Working in pairs to share ideas and support each other.

If you are having trouble with this question you should just colour multiples of 2, on the first grid below then just multiples of 3 on the next grid and multiples of 4, 5, 6, ..., 10 on the other grids. What do you notice about the patterns of these multiples.

Then follow the instructions for How to Shade the Prime Sieve given below on page 2.

1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20	11	12	13	14	15	16	17	18	19	20	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	21	22	23	24	25	26	27	28	29	30	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	31	32	33	34	35	36	37	38	39	40	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50
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61	62	63	64	65	66	67	68	69	70	61	62	63	64	65	66	67	68	69	70	61	62	63	64	65	66	67	68	69	70
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81	82	83	84	85	86	87	88	89	90	81	82	83	84	85	86	87	88	89	90	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	91	92	93	94	95	96	97	98	99	100	91	92	93	94	95	96	97	98	99	100
Multiples of 2								Multiples of 3								Multiples of 4													

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31	32	33	34	35	36	37	38	39	40	31	32	33	34	35	36	37	38	39	40	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50
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61	62	63	64	65	66	67	68	69	70	61	62	63	64	65	66	67	68	69	70	61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80	71	72	73	74	75	76	77	78	79	80	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	81	82	83	84	85	86	87	88	89	90	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	91	92	93	94	95	96	97	98	99	100	91	92	93	94	95	96	97	98	99	100
		Multiples of 5										Ν	lult	tipl	es o	of 6				Multiples of 7									
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41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50
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81	82	83	84	85	86	87	88	89	90	81	82	83	84	85	86	87	88	89	90	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	91	92	93	94	95	96	97	98	99	100	91	92	93	94	95	96	97	98	99	100
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PRIME SIEVE 6. What do you notice about th													~ ~ ~		9														

NEXT

Now do the Further Questions below.

After that, what can you say about making a 1 to 400 sieve? Which multiples will you cross out to be sure that you are left with the primes?"

We're used to working with grids with ten columns, but you might find an interesting result if you use this six-column grid instead. See page 8. Can you **predict** what you will see?

FURTHER QUESTIONS

To get all the prime numbers between 1 and 100, why is only necessary to cross out multiples up to multiples of 7 and not multiples of 11?

If you had to find all the prime numbers up to 200 by the sieve method what multiples would you need to cross out?

Use this grid to find all the prime numbers between 1 and 200.

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1	2	3	4	5	6	7	8	9	10
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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
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121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
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55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
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