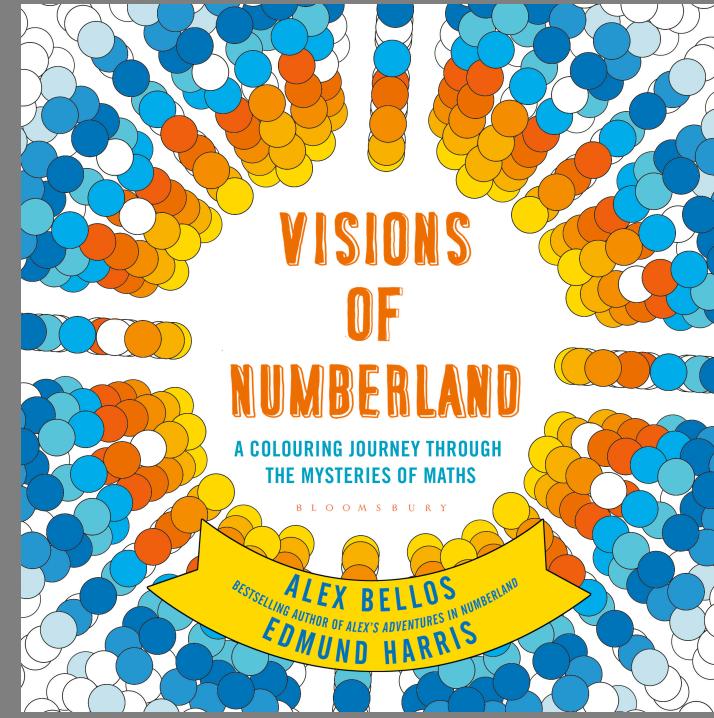
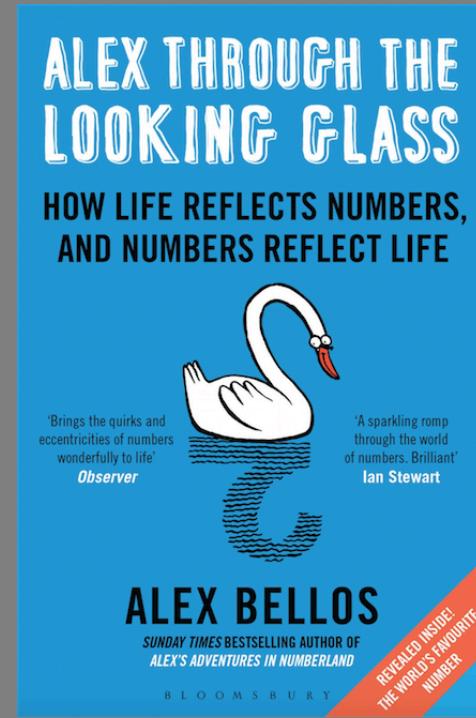
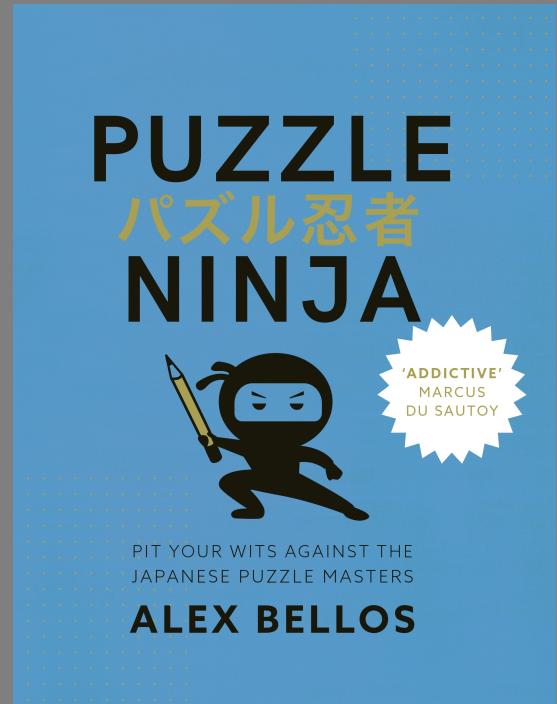
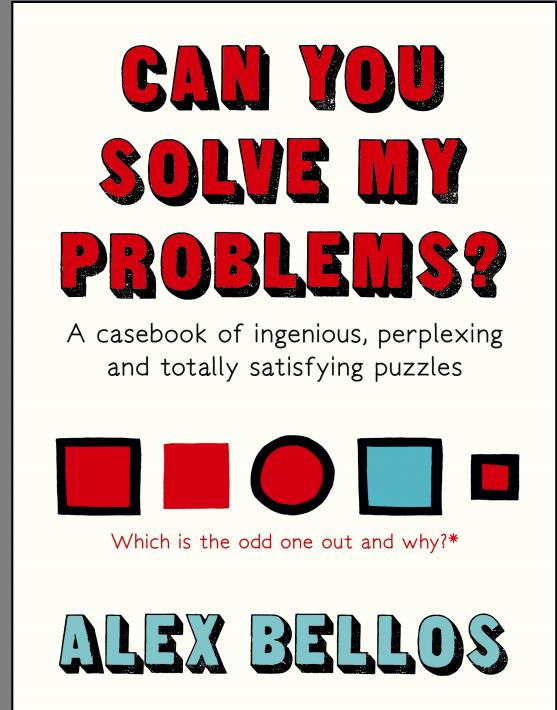
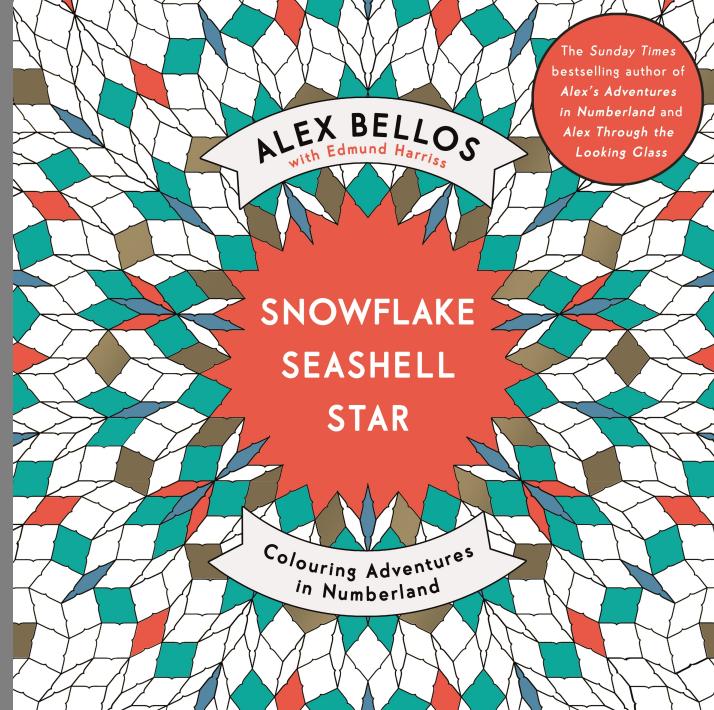
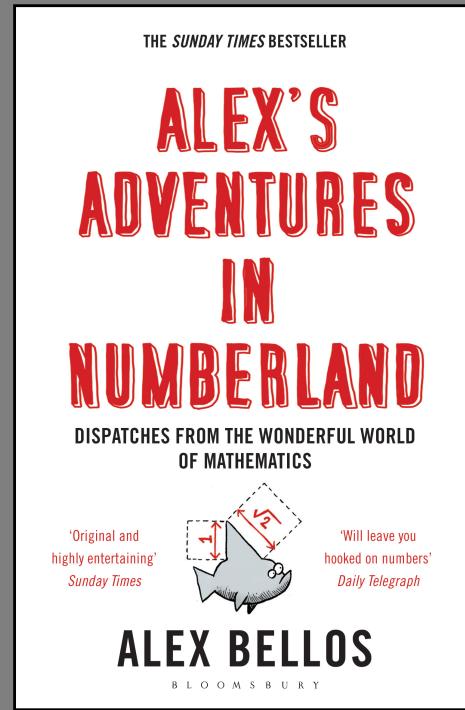


Alex Bellos

Adventures in

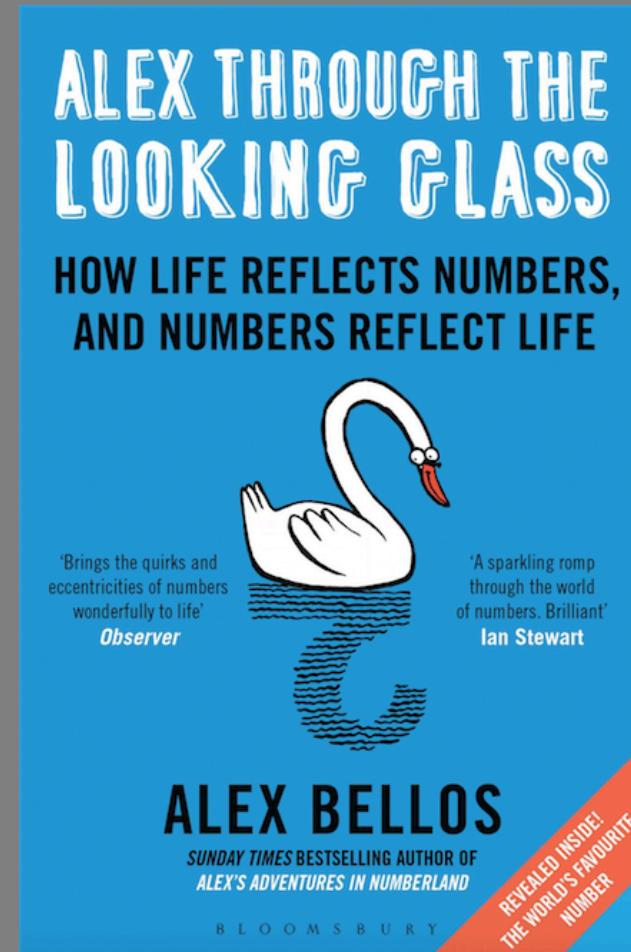
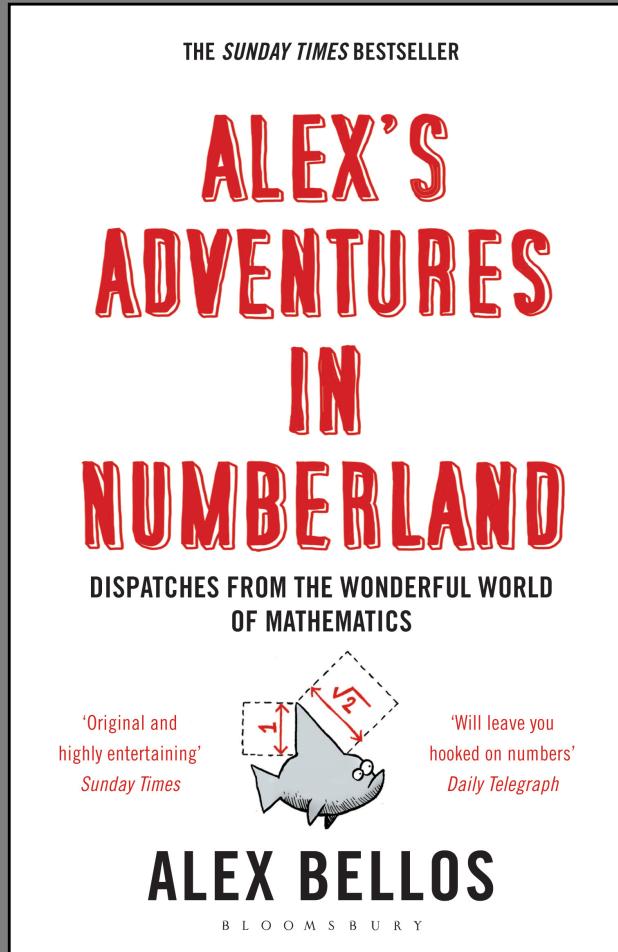
Numberland



How to get students excited by mathematics?

- 1) Stories
- 2) Pictures
- 3) Puzzles

Stories



What's your favourite
number?

www.favouritenumber.net

www.favouritenumber.net

www.favoritenumber.net











13













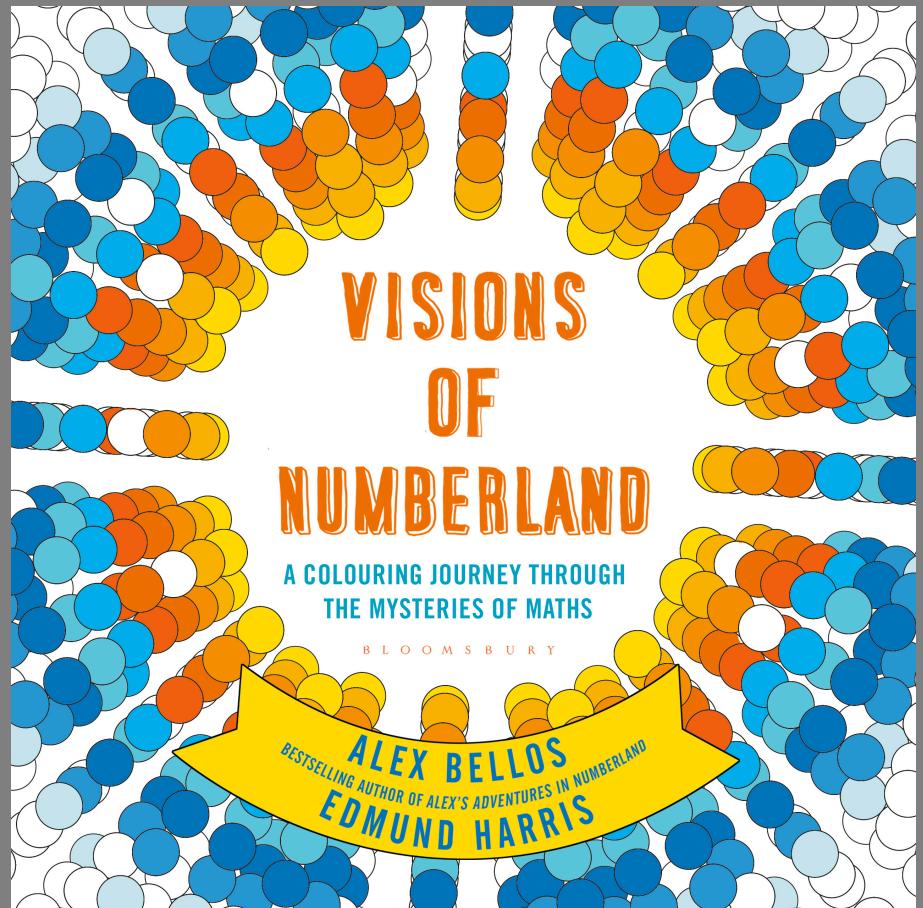
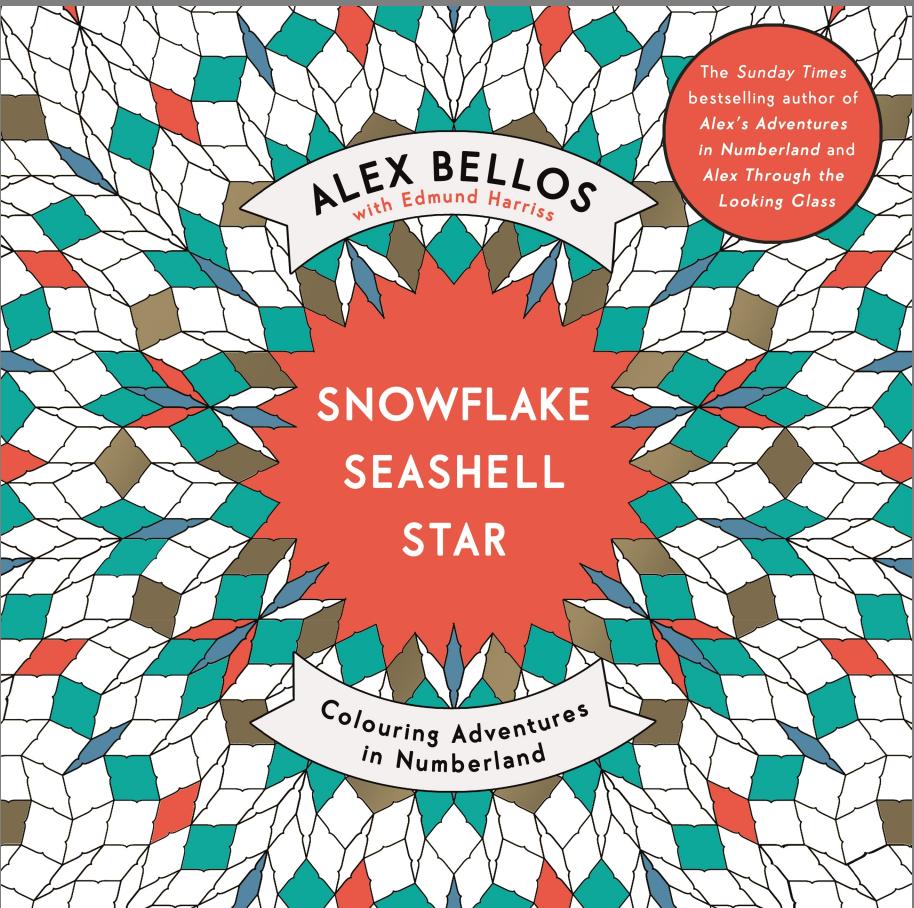
1	7
2	3
3	8
4	4
5	5
6	13
7	9
8	6
9	2
10	11

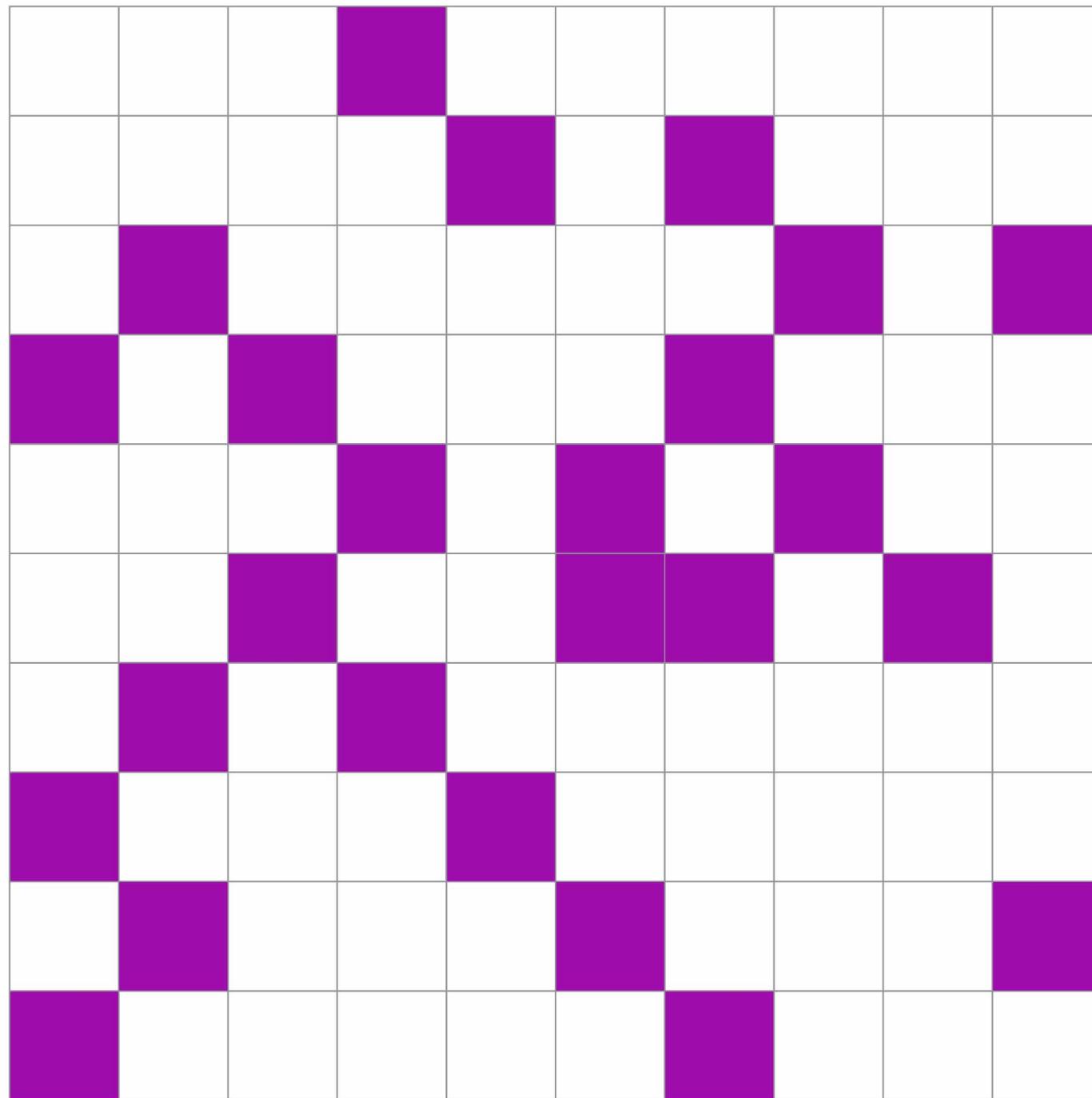
1	7
2	3
3	8
4	4
5	5
6	13
7	9
8	6
9	2
10	11



“most confusing top ten
list ever written”

Pictures





Prime numbers

Whole numbers divisible only by themselves and 1.

2, 3, 5, 7, 11, 13, 17, 19,...

Prime numbers

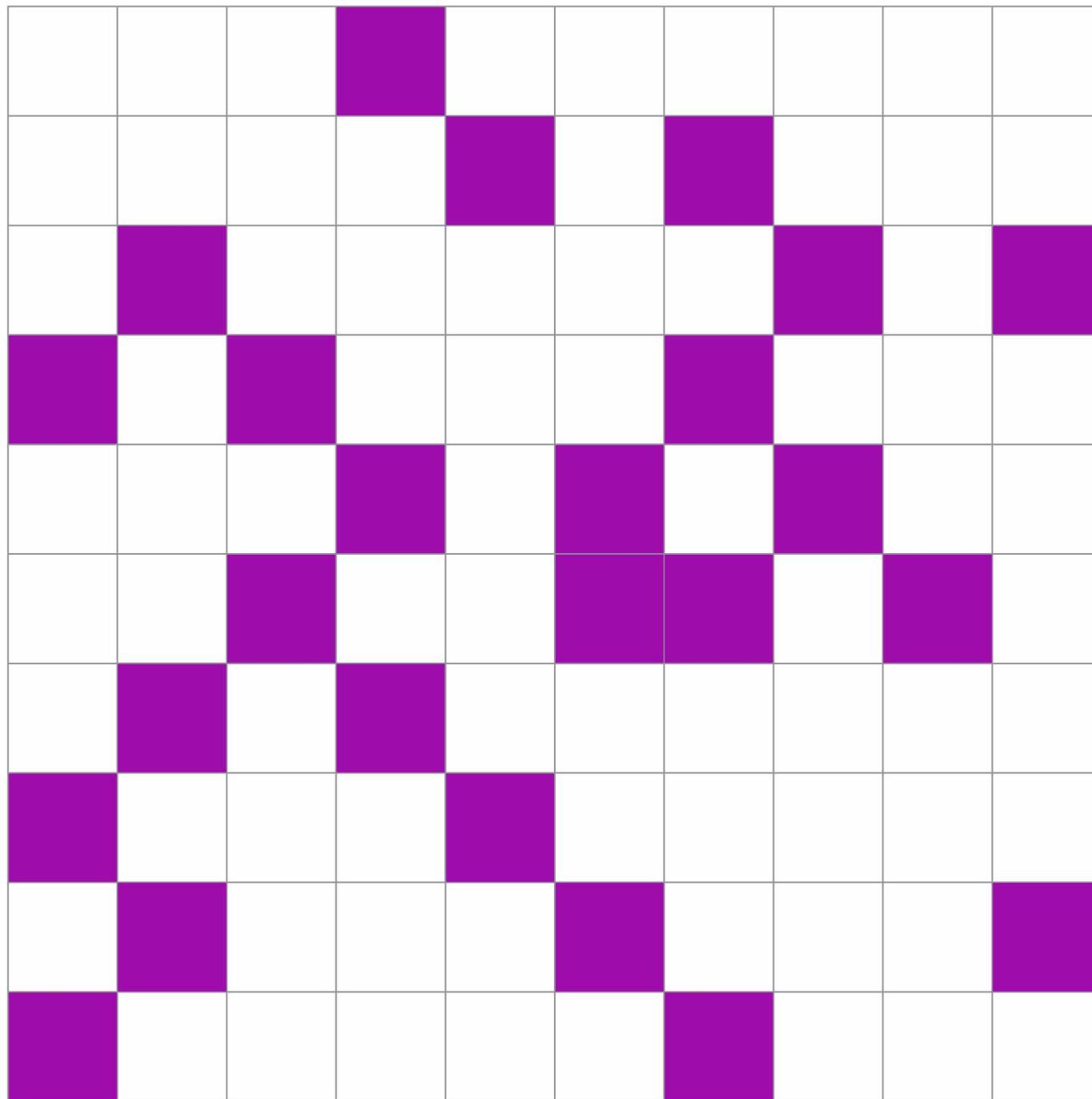
Whole numbers divisible only by themselves and 1.

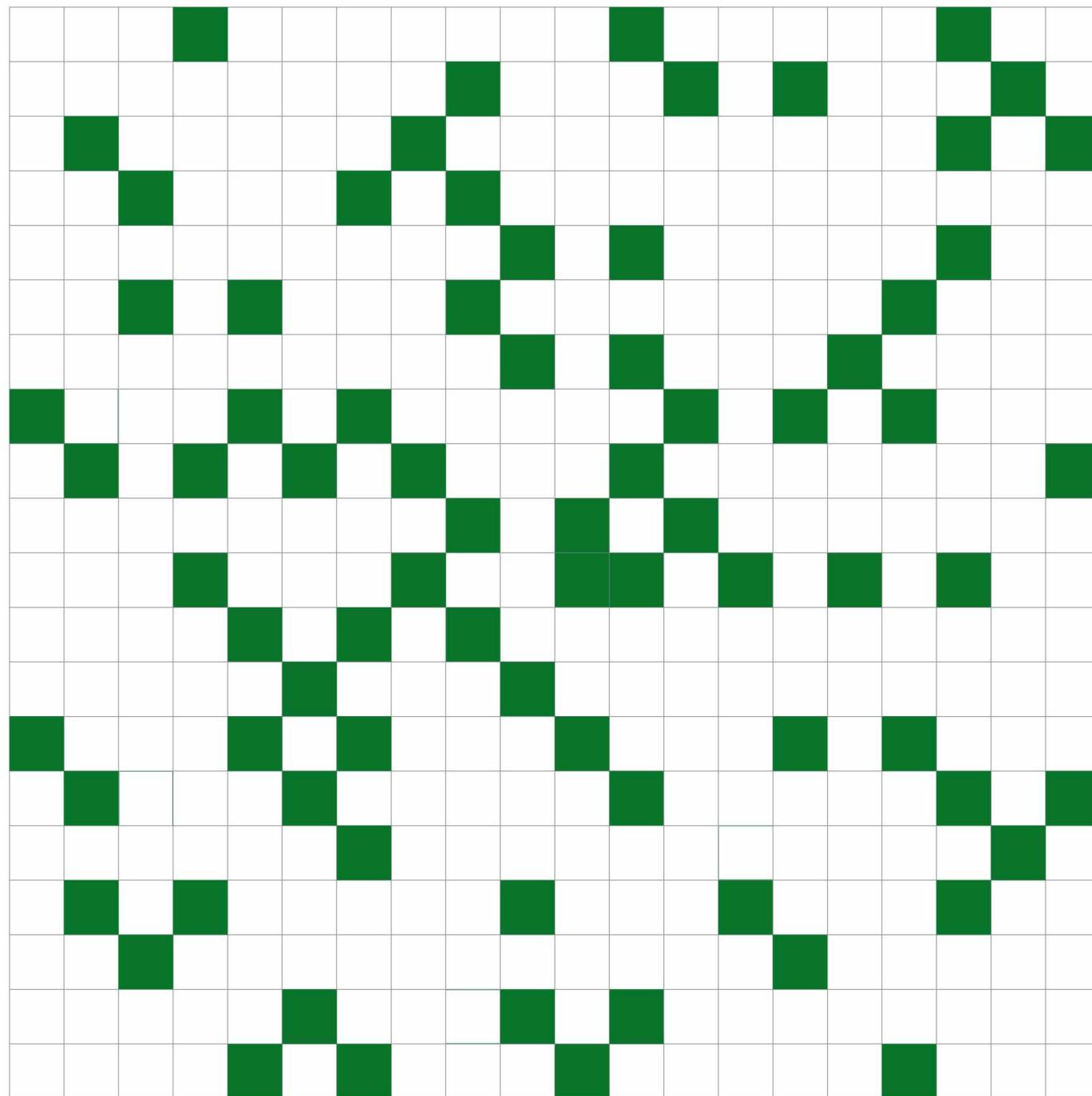
2, 3, 5, 7, 11, 13, 17, 19,...

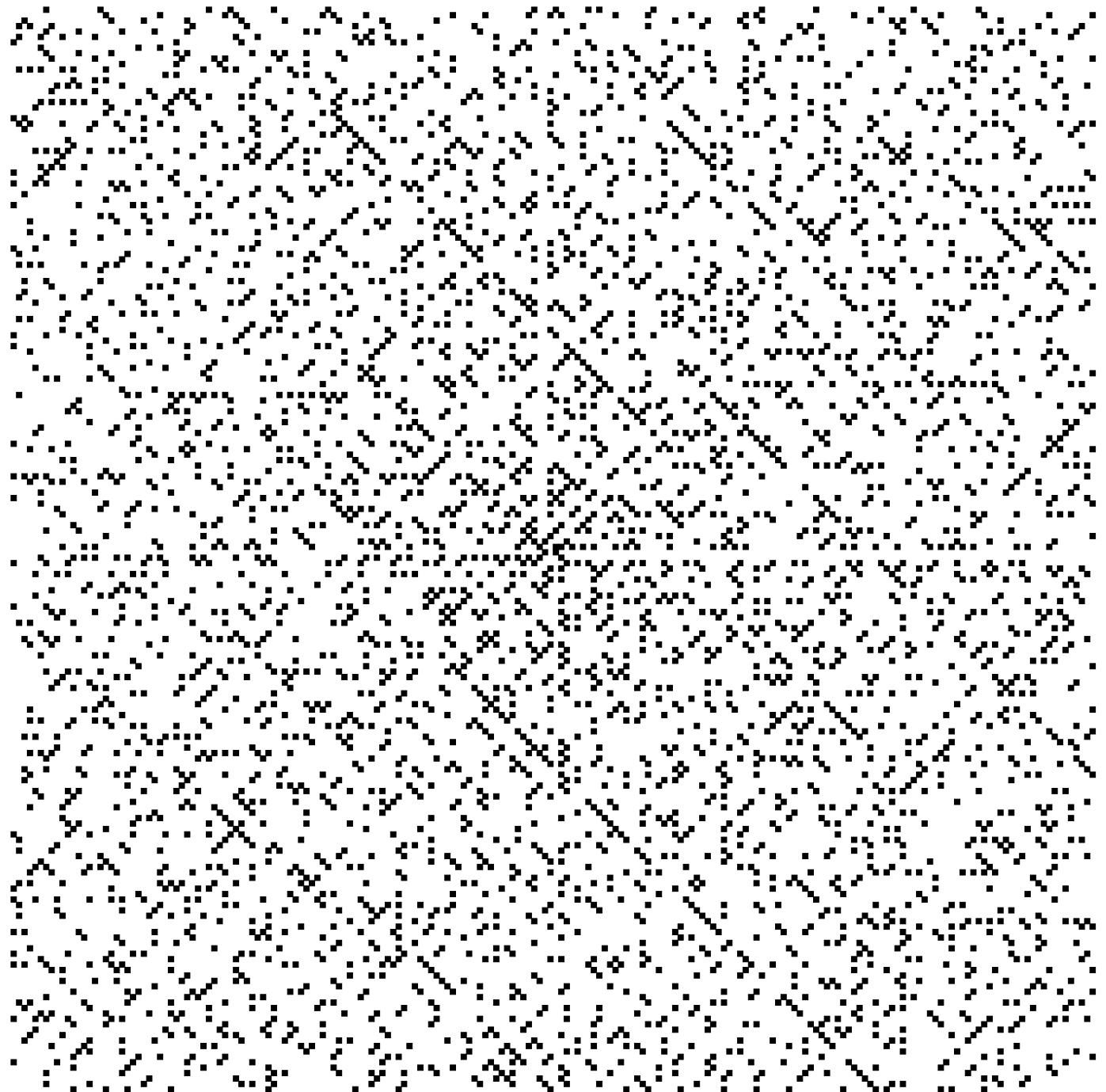
100	99	98	97	96	95	94	93	92	91
65	64	63	62	61	60	59	58	57	90
66	37	36	35	34	33	32	31	56	89
67	38	17	16	15	14	13	30	55	88
68	39	18	5	4	3	12	29	54	87
69	40	19	6	1	2	11	28	53	86
70	41	20	7	8	9	10	27	52	85
71	42	21	22	23	24	25	26	51	84
72	43	44	45	46	47	48	49	50	83
73	74	75	76	77	78	79	80	81	82

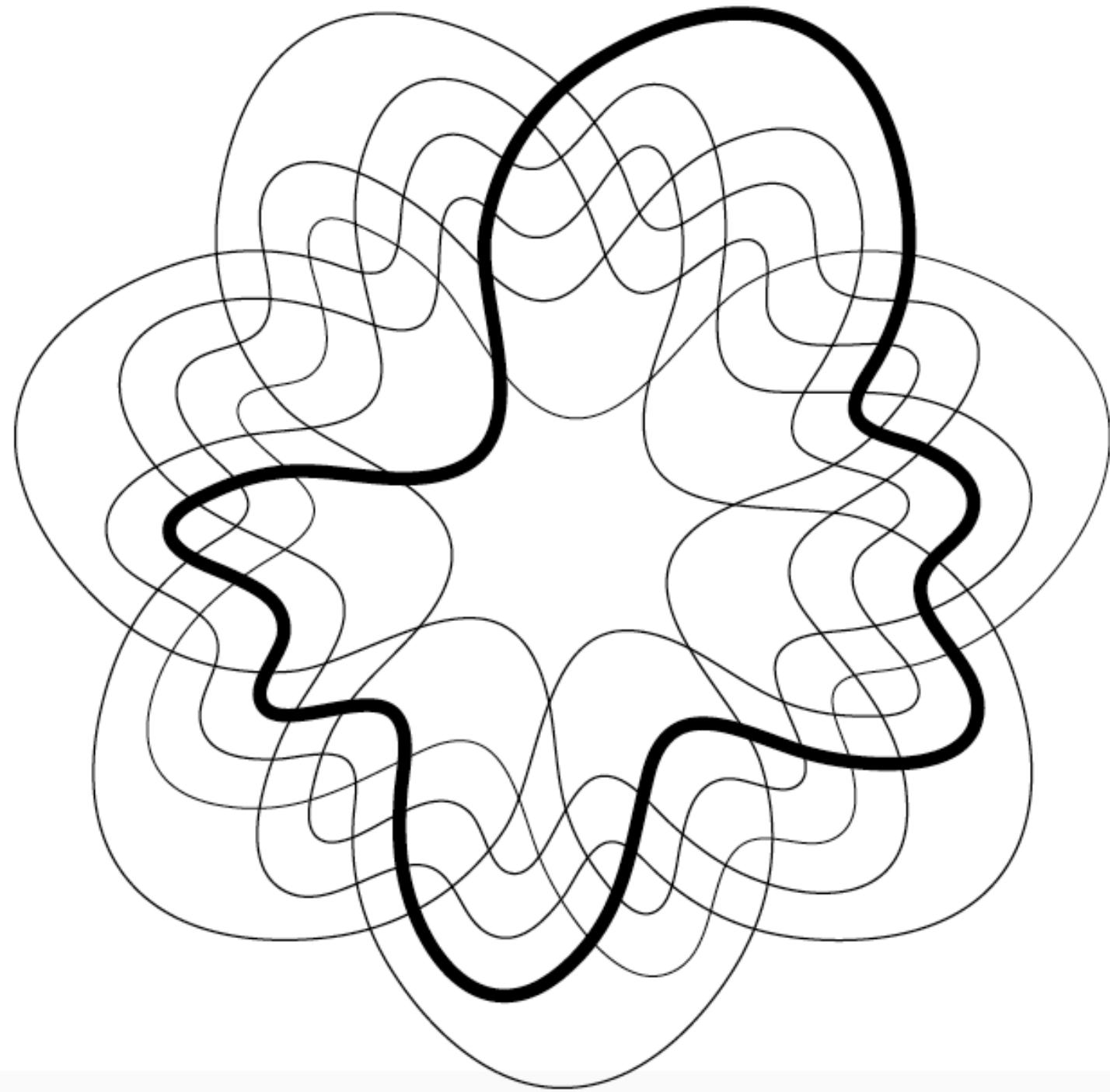
Ulam Spiral 1: Colour the bold numbers in the corresponding squares opposite.

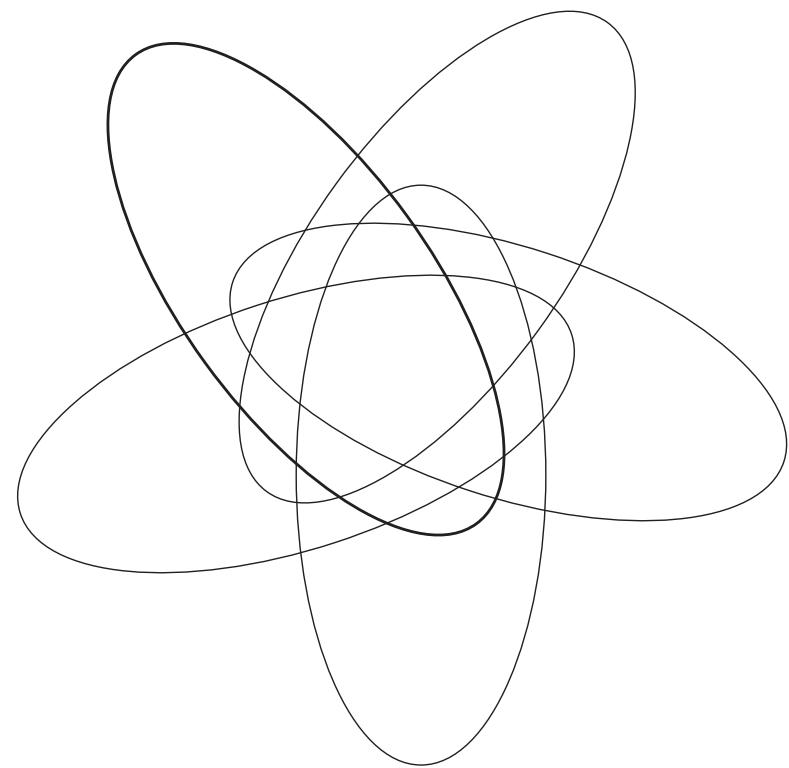
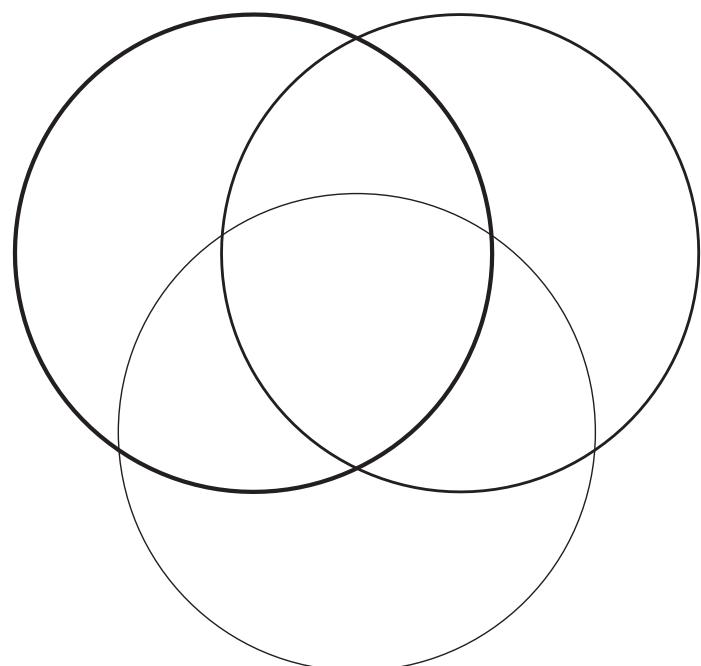
100	99	98	97	96	95	94	93	92	91
65	64	63	62	61	60	59	58	57	90
66	35	36	35	34	33	32	31	56	89
67	38	17	16	15	14	15	30	55	88
68	39	18	5	4	3	12	29	54	87
69	40	10	6	1	2	11	28	53	86
70	41	20	7	8	9	10	27	52	85
71	42	21	22	23	24	25	26	51	84
72	43	44	45	46	47	48	49	50	83
73	74	75	76	77	78	79	80	81	82

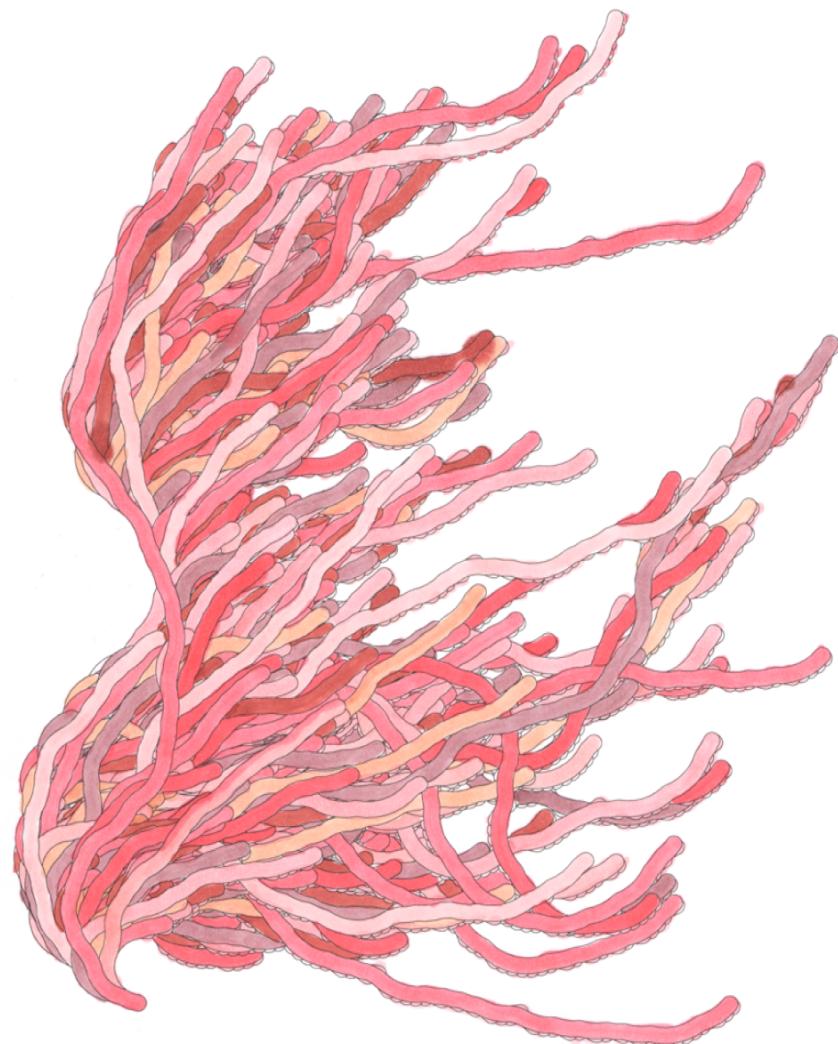


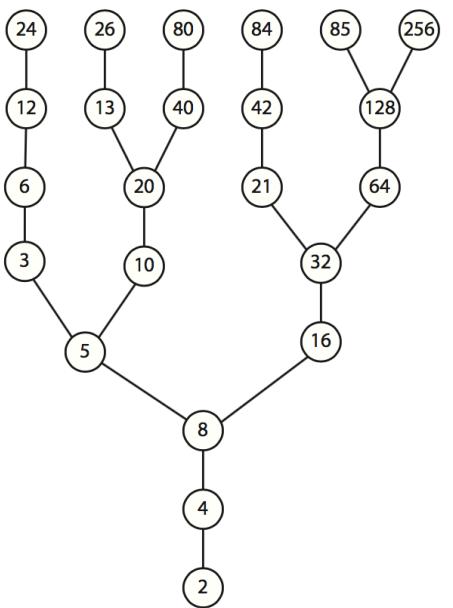


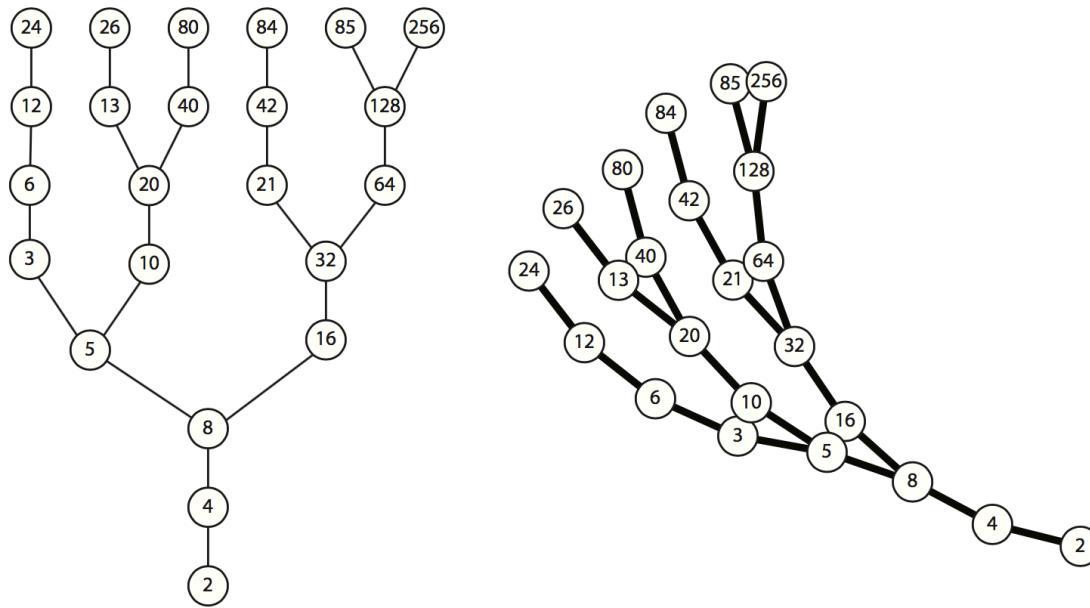


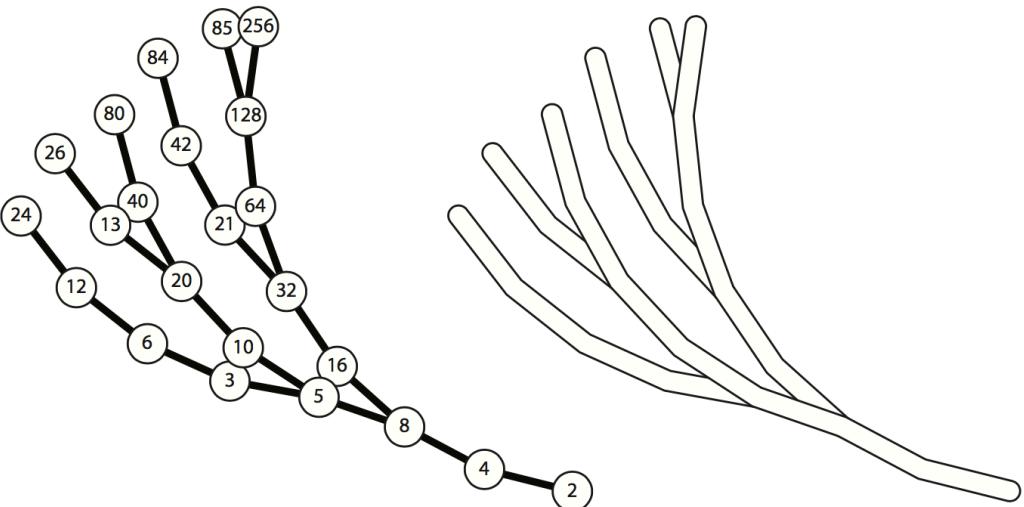
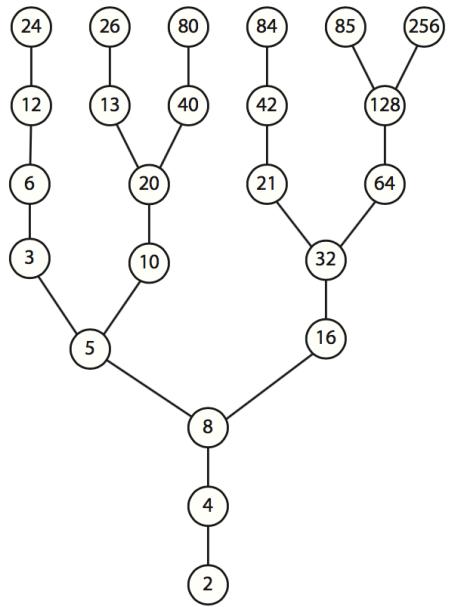


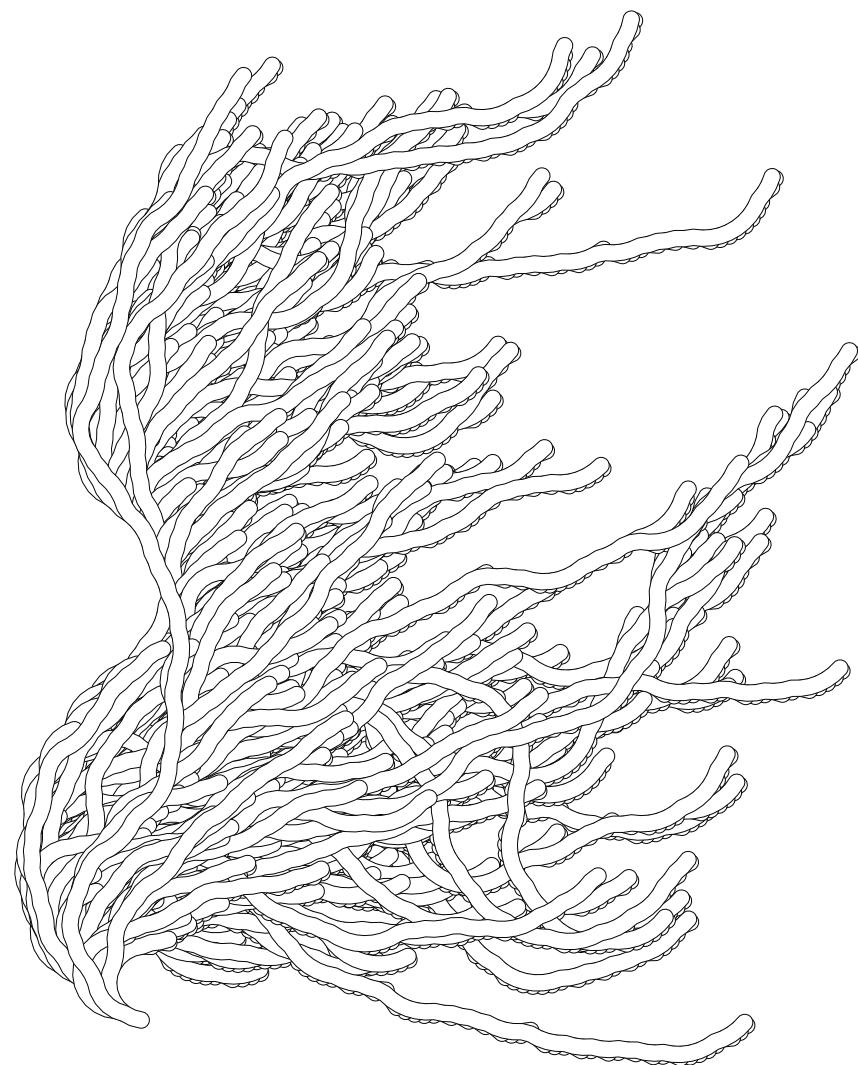


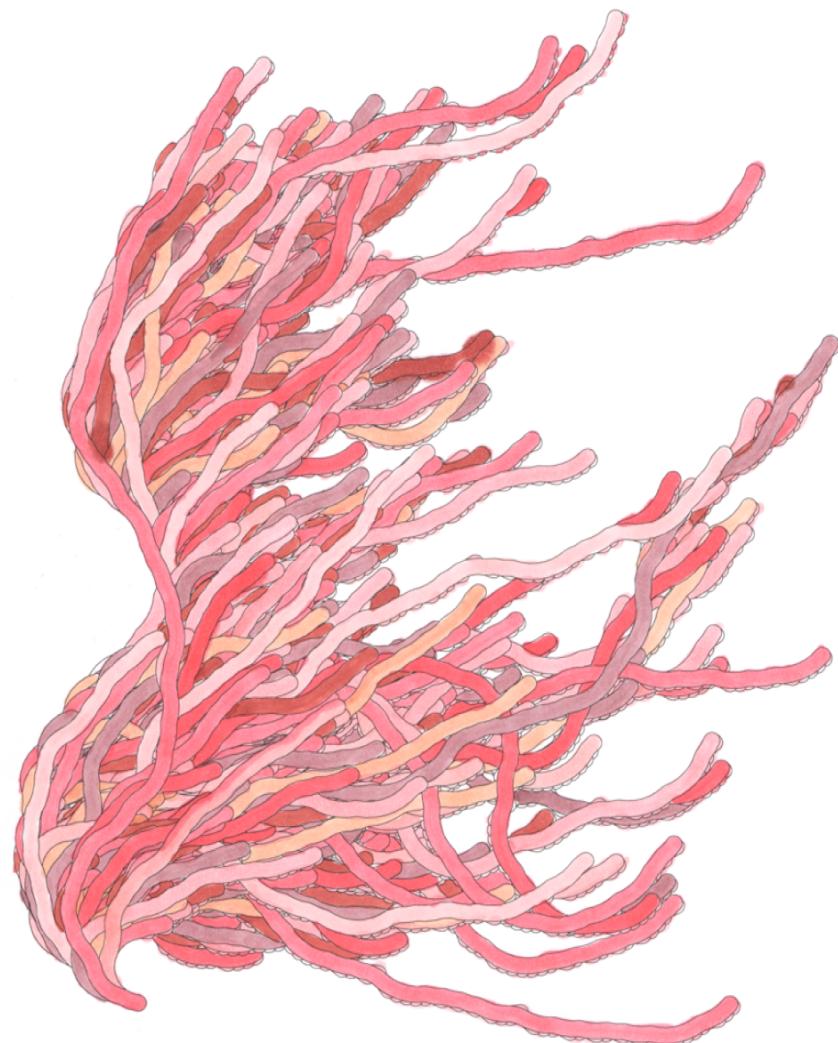




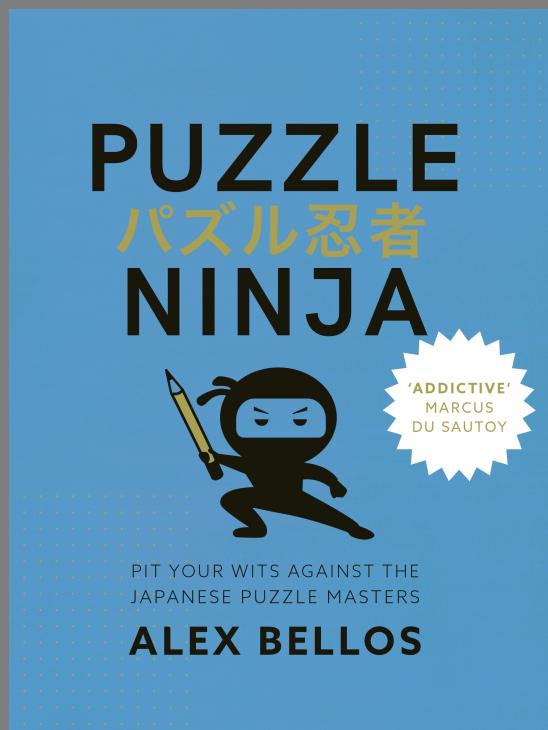
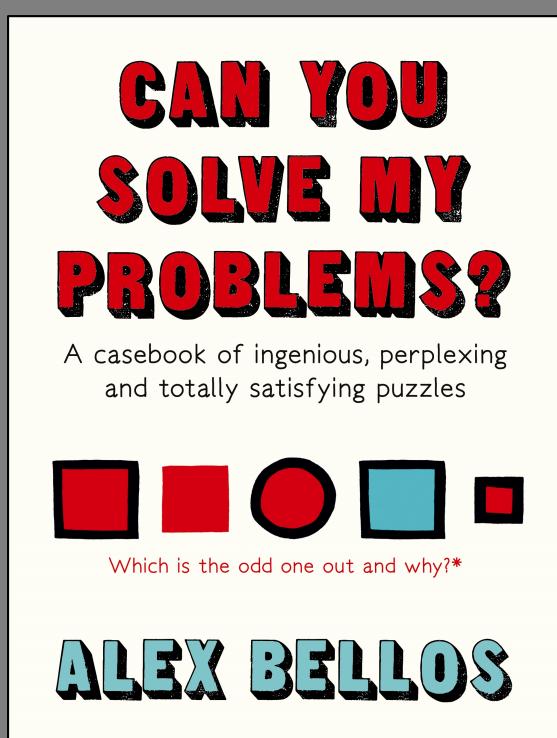




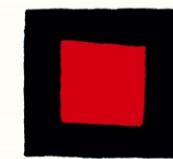
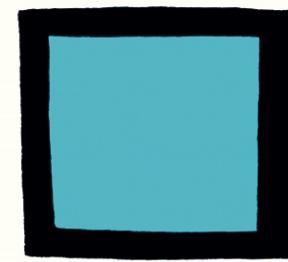
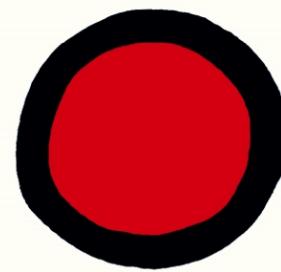
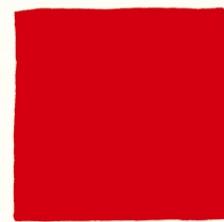
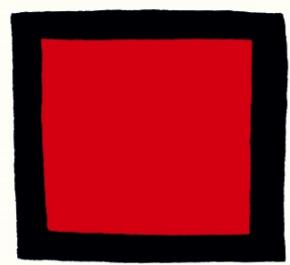




Puzzles



the guardian
Alex Bellos's
Monday puzzle



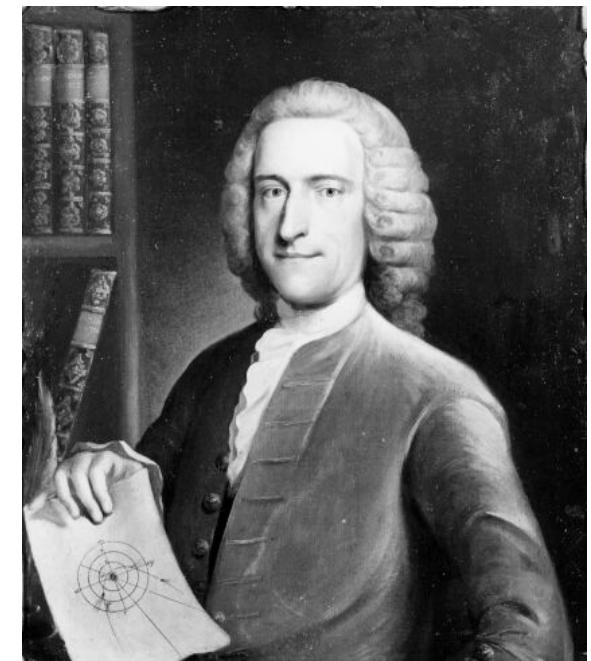
A man walks around the circumference of the world.

How much further does his head travel than his feet?

A man walks around the circumference of the world.

How much further does his head travel than his feet?

William Whiston
1667-1752

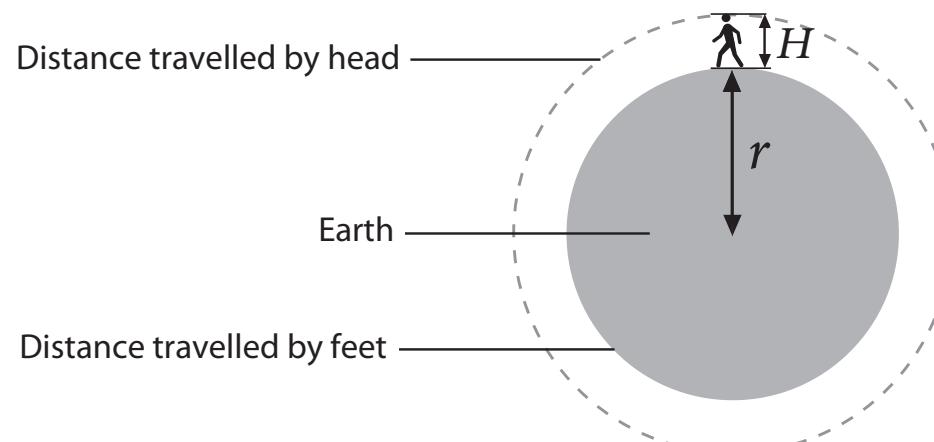


A man walks around the circumference of the world.

How much further does his head travel than his feet?

A man walks around the circumference of the world.

How much further does his head travel than his feet?



Revision notes

The circumference of a circle is

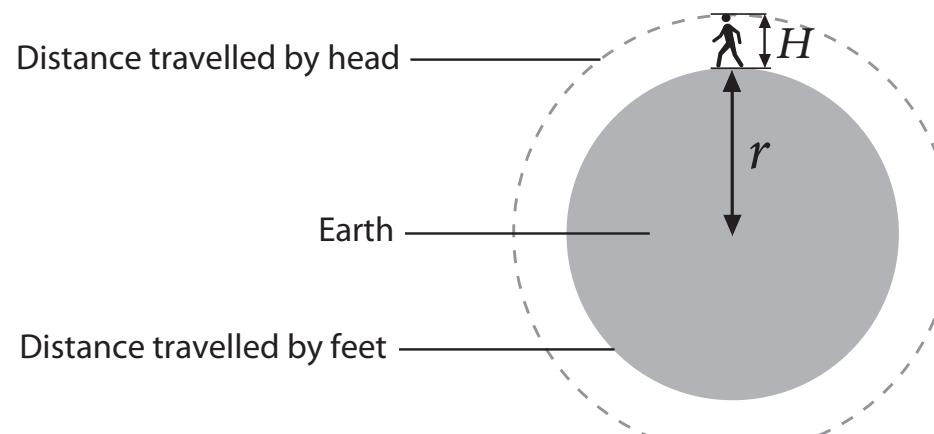
$$2 \times \pi \times \text{radius}$$

=

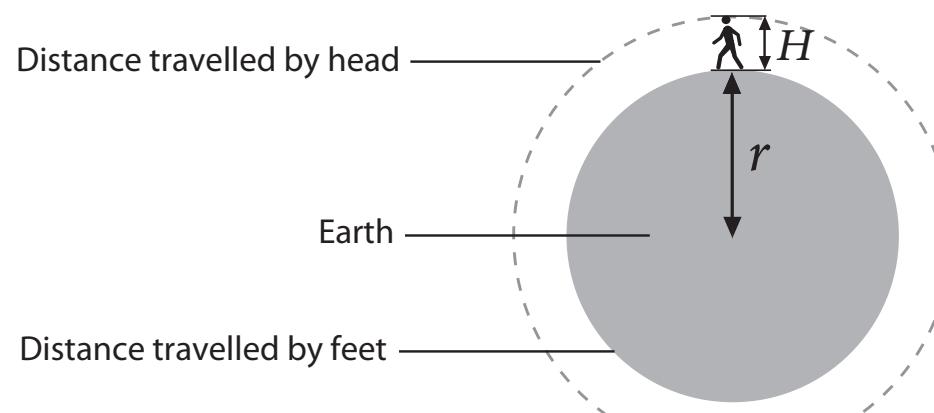
$$2\pi r$$

A man walks around the circumference of the world.

How much further does his head travel than his feet?

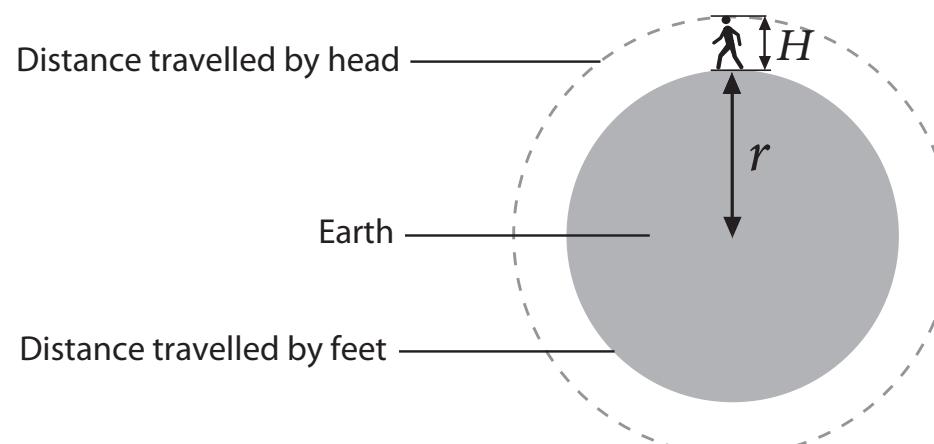


Distance travelled by feet:



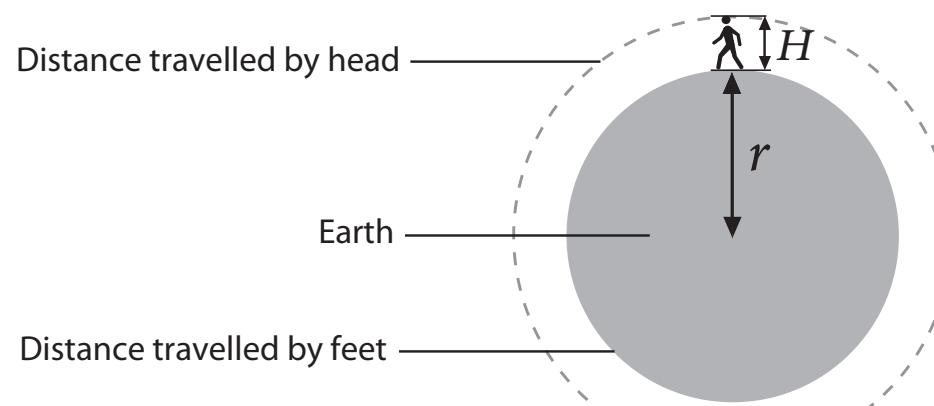
Distance travelled by feet:

$$2\pi r$$



Distance travelled by feet: $2\pi r$

Distance travelled by head:

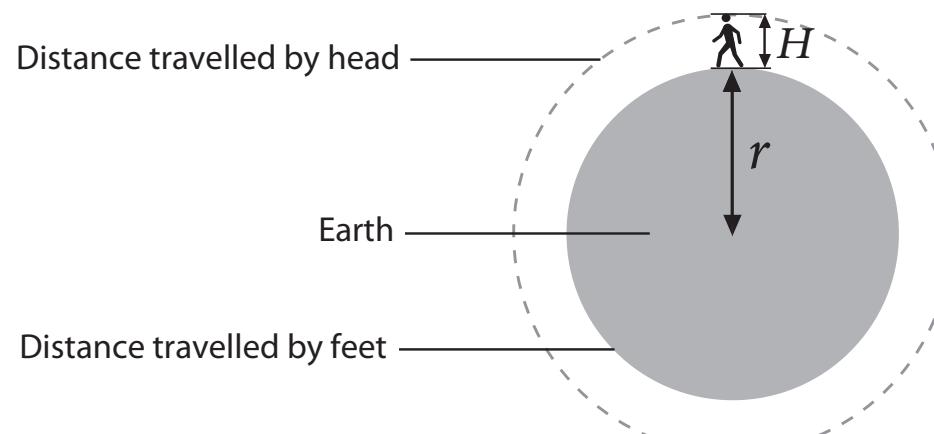


Distance travelled by feet:

$$2\pi r$$

Distance travelled by head:

$$2\pi(r + H) = 2\pi r + 2\pi H$$



Distance travelled by feet:

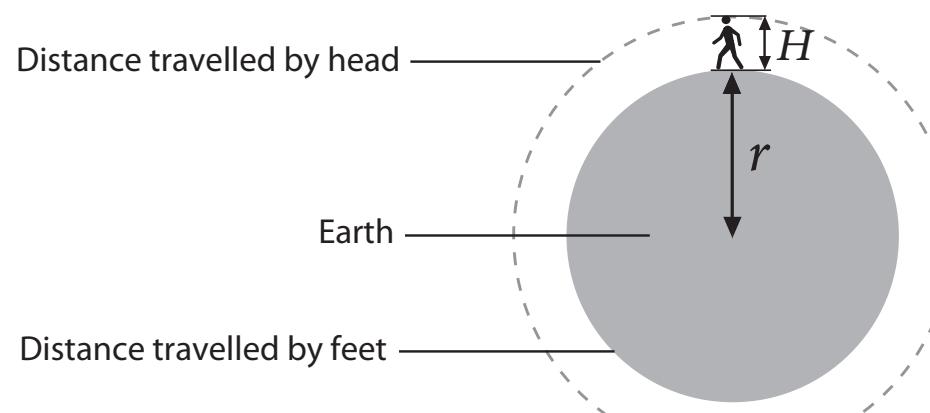
$$2\pi r$$

Distance travelled by head:

$$2\pi(r + H) = 2\pi r + 2\pi H$$

Difference:

$$2\pi H$$



Distance travelled by feet:

$$2\pi r$$

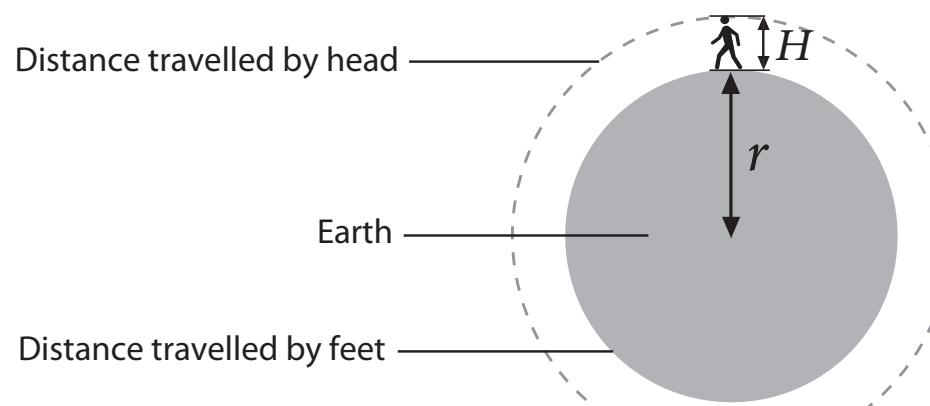
Distance travelled by head:

$$2\pi(r + H) = 2\pi r + 2\pi H$$

Difference:

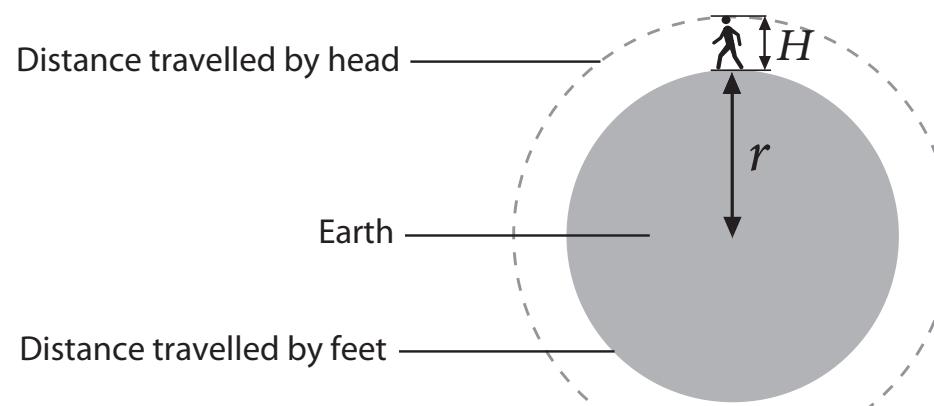
$$2\pi H$$

$$2 \times 3.14 \times 1.8 \approx 11\text{m}$$



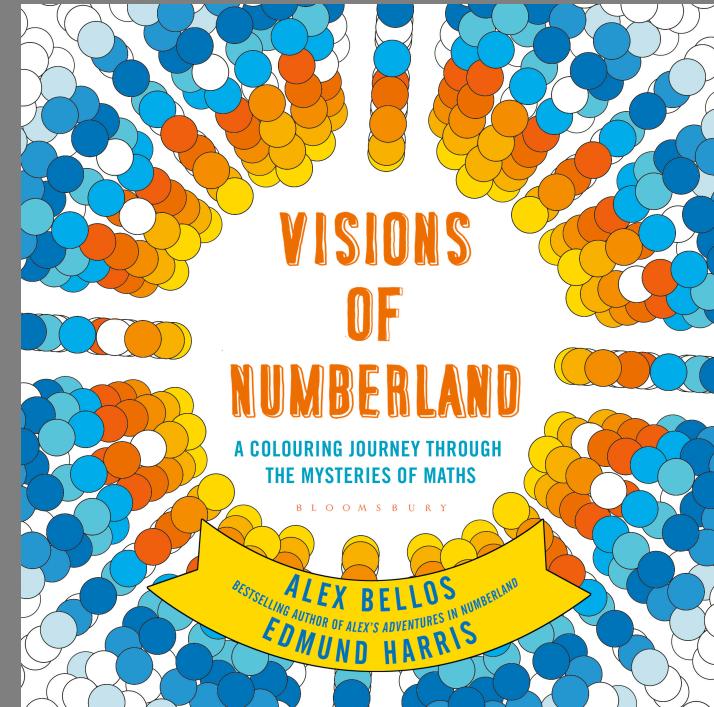
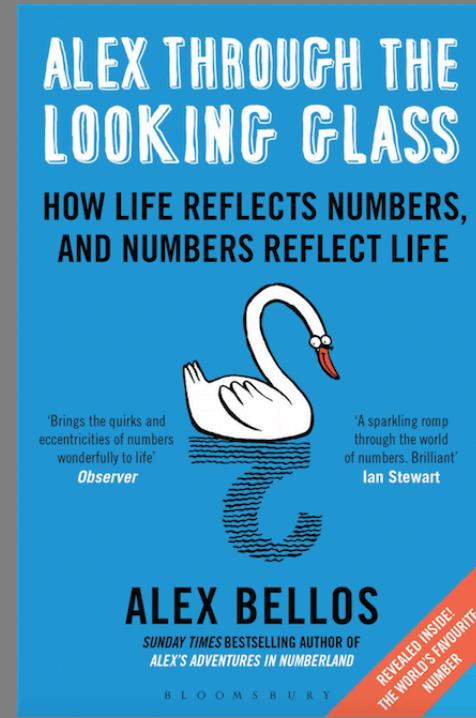
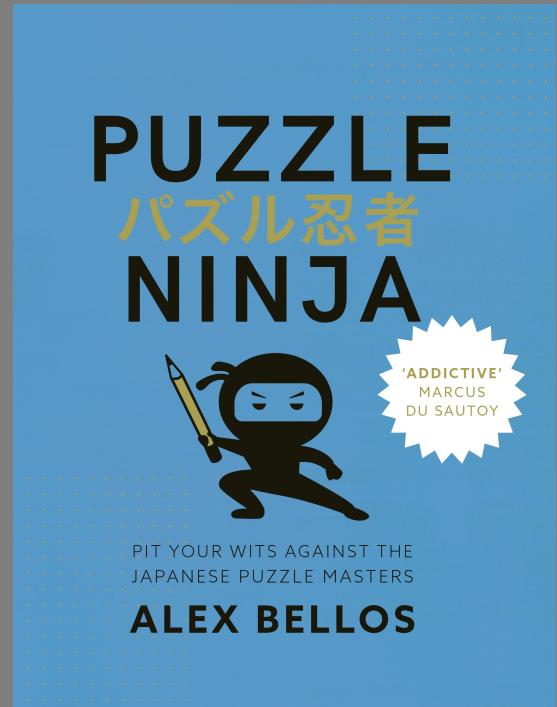
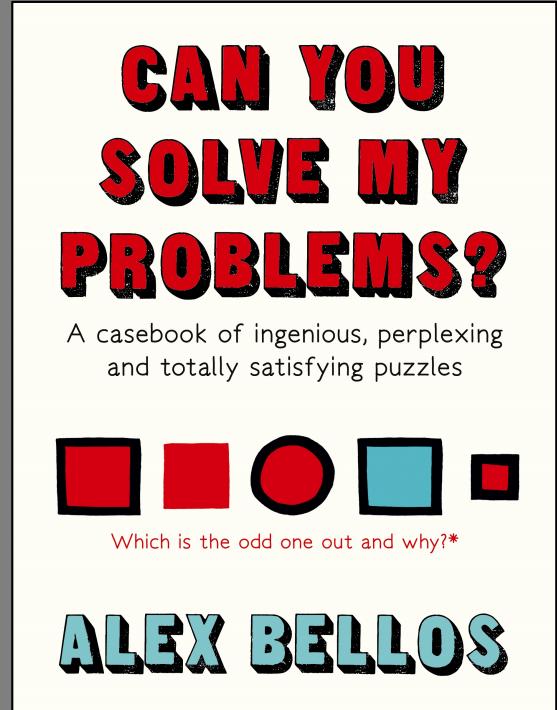
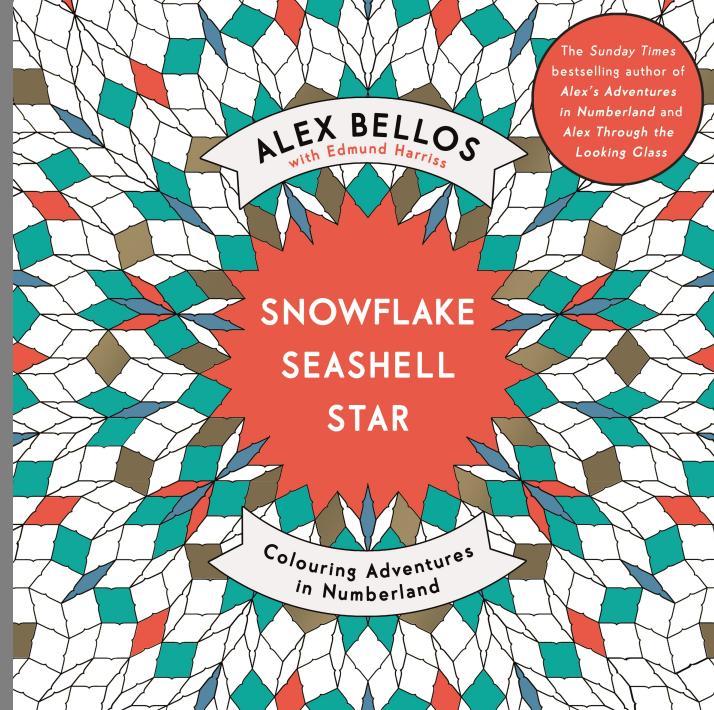
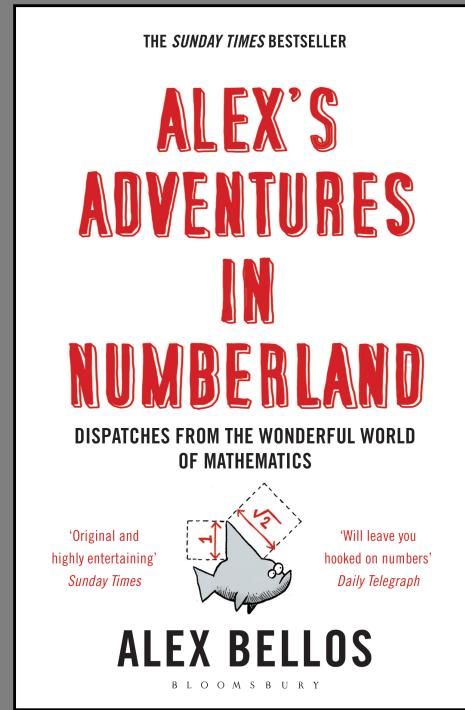
Difference:

$$2\pi H$$



How to get students excited by mathematics?

- 1) Stories
- 2) Pictures
- 3) Puzzles





@alexbellos



Alex Bellos

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Lewis
Carroll



Liars, liars!

Berta says that Greta tells lies.

Greta says that Rosa tells lies.

Rosa says that both Berta and Greta tell lies

Who is telling the truth?