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Skill-Building Through Engaging Activities

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*All activities work well in pairs

American Billions

https://nrich.maths.org/796

Play this game after your lesson on divisibility rules. This game can be used to practice the rules.

Materials:

- 0-9 digit cards (I use playing cards and call the "10" a "0")
- A mini whiteboard, marker, and eraser for recording purposes

Round 1: Playing against each other

Lay the 10 cards out in front of you. Take turns choosing one of the cards to play down, such that:

- The first card played can be anything (divisible by 1)
- After the 2nd card is played, the 2-digit resulting number must be divisible by 2
- After the 3rd card is played, the 3-digit resulting number must be divisible by 3
- After the 4th card is played, the 4-digit resulting number must be divisible by 4
- Continue in this manner, taking turns, until you get stuck. The person who is stuck loses! Play a few games, think of strategies.

Round 2: Playing collaboratively

Now players are working together to make the longest possible number that satisfies the rules of the game.

What is the longest number you can make that satisfies the game?

Is it possible to use all ten digits to create a ten-digit number?

Is there more than one solution?

Tic Tac Toe

https://www.youcubed.org/tasks/tic-tac-toe-products/

Play this game to build proficiency with the times tables. I have also included a game board to practice division. Feel free to create your own game board for addition, subtraction, exponent rules, other? Even if a handful of students are already proficient, there is enough strategy in this game to keep them engaged as well.

Materials:

- double sided counters
- Game board

Rules:

- Each player chooses a number, 1 – 9 at the bottom of the page and places a counter on that factor. (They may choose the same number)
- Player 1 chooses one of the two counters to move to a new factor. Player 1 then places their coloured counter on the grid covering the product of the two factors.
- Player 2 then chooses one of the two counters to move to make a new product and place their coloured counter on the grid. The markers can both be placed on the same factor. For example 6 x 6 = 36.
- Players alternate moving one factor counter at a time and continue placing their markers on the grid until a player has marked three products in a row.
- Optional: Instead of 3 in a row, players could try to get 4 in a row instead.

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Tic-Tac-Toe Products

1	2	3	4	5	6
7	8	9	10	12	14
15	16	18	20	21	24
25	27	28	30	32	35
36	40	42	45	48	49
54	56	63	64	72	81

1 2 3 4 5 6 7 8 9

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Tic-Tac-Toe Products 2

81	16	63	12	45	8	27	4
32	63	24	49	16	35	8	21
72	24	18	40	12	24	6	56
40	54	30	42	20	30	10	18
45	48	35	36	25	24	15	12
64	27	48	21	32	15	16	9
36	56	28	42	20	28	12	14
72	18	54	14	36	10	18	6

1 2 3 4 5 6 7 8 9

Divide Tac Toe

	8	6	10	2	12
QUOTIENTS	3	30	16	24	4
	6	18	15	40	3
	5	48	20	36	8
	10	4	9	12	5

QUOTIENTS

dividends: 20 24 30 36 40 48

divisors: 1 2 3 4 5 6 8 10 12

Factors and Multiples Puzzle

https://nrich.maths.org/5448

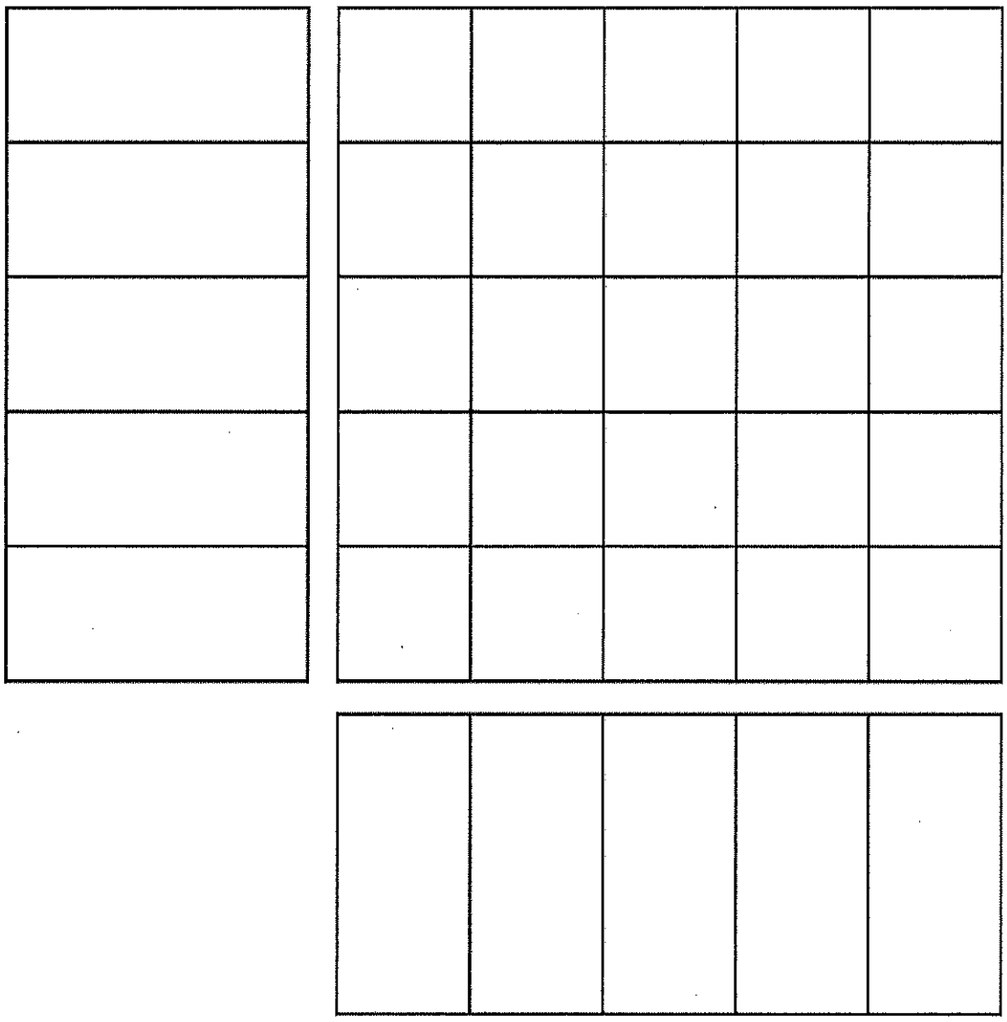
• Cut out the 10 heading cards and put one in each of the 10 spaces round the playing board.
• Cut out the 25 number cards and place each one in a different square on the playing board so that the number satisfies the condition given by the heading card for that row *and* the condition given by the heading card for that column.
• By rearranging the heading cards and the number cards, try to fill as many squares on the playing board as possible. Can you fill them all?

Cut out the 10 heading cards and put one in each of the 10 spaces round the playing board.

Cut out the 25 number cards and place each one in a different square on the playing board so that the number satisfies the condition given by the heading card for that row *and* the condition given by the heading card for that column.

By rearranging the heading cards and the number cards, try to fill as many squares on the playing board as possible.

Is it possible to fill all the squares at once?



Number cards

1	2	3	4	5
6	7	9	10	11
12	15	16	18	20
21	23	24	25	30
35	36	45	55	60

Heading cards

PRIME NUMBERS	TRIANGULAR NUMBERS
SQUARE NUMBERS	FACTORS OF 60
NUMBERS LESS THAN 20	MULTIPLES OF 3
NUMBERS MORE THAN 20	MULTIPLES OF 5
ODD NUMBERS	EVEN NUMBERS

Juniper Green

https://nrich.maths.org/5468

- Two players versus two players
- Each team takes turns covering one number from the playing board.
- After the first move, each number must either be a factor or multiple of the previous team's choice.
- The first player who cannot place a marker on the board loses. The other team gets one point.

Player A records and verifies each move. Player B places tokens each move.

Question: What is the winning strategy?

Extension: Play as a team of 4. Can you cover off the whole board? Be sure to record your steps.

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

Factors in a Line

https://nrich.maths.org/1138

Arrange the four number cards (1, 2, 3 and 21) on the grid above to make a diagonal, vertical or horizontal line.
You can put a number card on a square with

- a multiple of that number
- a factor of that number.

In how many different ways can you do it?

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

1	2	3	21