Archway Cicero
Summer Math Challenges

Hello Cicero Families!

We are excited to launch our summer math challenges. There will be two challenge opportunities this summer. Please read on to learn about each one. If you have any questions, please reach out to our Dean of Academics, Mrs. Stefaniak, at tstefaniak@archwaycicero.org.

Math Fluency Drills

Our first summer challenge is focused on practicing math fact fluency and operations-based skills that are appropriate for each rising grade level. The skills contained in each packet are topics that your scholar has already covered in math class at Archway. It is important to practice these skills over the summer so that your scholar has a strong foundation heading into the next school year. Scholars can complete the fluency exercises at their leisure throughout the summer. An additional option is to make copies of the packet and have your scholar time themselves on each worksheet to beat their record throughout the summer! Completed packets – both timed and untimed – will be accepted for a prize upon return to school in August. All scholars received a copy of their appropriate packet during the last week of school. They will also be posted on our school website in June. Scholars should complete the packet for the grade level that they will be starting in August.

Math & Logic Puzzles

Our second summer challenge is full of puzzles and activities that help scholars to practice their math skills and logical reasoning. This challenge may also be turned in for a prize upon our return to school if earnestly completed in its entirety. There will be two options – one packet designed for younger scholars (1-3) and one packet designed for older scholars (3-5). The math & logic puzzle challenges will be posted on the school website in June.

Name _____   #_____

How to Do KenKen

Look at the two KenKen puzzles below. One is blank and one is complete.
What do you notice about the puzzles?

1	36×	8+	
		2−	
2÷			8+
2÷			

1	36×	8+	
1	**3**	**2**	**4**
3	**4**	2− **1**	**2**
2÷ **4**	**2**	**3**	8+ **1**
2÷ **2**	**1**	**4**	**3**

There are 4 rows and 4 columns.

That means this is a 4x4 KenKen puzzle. This means you can only use numbers from 1 to 4 to fill in the boxes.

Some squares have thicker borders.

These groups of squares are called "cages".

There are small numbers in the upper left corner of some squares.

These are called "target" numbers.

There are signs for math operations next to all of them, except the 1 in the upper left cage.
That means you use the operation shown, and numbers from 1 to 4 inside any cage to get the target number as your answer. Cages of only one square don't need operations to get the target number. Just fill in the cage with that number. (Think of these cages as hints. You should always look for them first when you start.)

The numbers 1 to 4 are in each column and row, but only appear once.

That's the most important rule in KenKen. In a 4x4 puzzle, the numbers 1 through 4 can appear only once in any row or column.

There are two cages with the same target number and operation.

Two cages ask you to produce a target number of 2 using division. That means more than one combination using the numbers 1 through 4 will give you that answer. (4 ÷ 2 or 2 ÷ 1) Which one you choose depends on the numbers in the neighboring squares.

The numbers that produce the target can be entered in any order.

Look at the 36X cage. 3 x 4 x 3 will equal 36 just like 4 x 3 x 3 would. The order is determined by the need to use each number only once in a row or column.

Let's solve this puzzle with 4 columns and 4 rows.

Every square in the grid will contain a number 1-4. No number can repeat within any column or row.

Remember, the small number at the upper-left corner of a square is the target number of the that cage.

The squares within a cage must equal the target number by using the operation shown.

3−	3+	6x	
		7+	4
6x	3		2÷
	3−		

A target number that appears in a cage of a single square is the number to be written in that square.

These have no operation sign. They're like free squares, so fill them in first!

Put 3 and 4 in the highlighted cages because they are both cages of single squares.

3−	3+	6x	
		7+	4 **4**
6x	3 **3**		2÷
	3−		

Focus on the red cage. The only combination of two numbers from 1-4 that will multiple to equal 6 is {2,3,}.

Since 3 is in the same row as the 6x square, 2 must be placed in the top square and 3 will go in the bottom square.

You can put the two numbers that give you the target number in any order, left to right, right to left, up and down, down and up.

3−	3+	6x	
		7+	4 **4**
6x **2**	3 **3**		2÷
3	3−		

The only combination of two numbers from 1-4 that will add up to 7 is {3,4}

Because we cannot repeat 3 in any column or row, 3 must go in the top square and 4 in the bottom.

Now that the highlighted row has a 2,3, and 4 in use, the last square must be a 1.

You can use process of elimination to help you find the number that goes in a box as well.

The only combination of two numbers that can divide to equal 2 while using the number 1 is {1,2}. Place a 2 in the remaining square.

The bottom row has two open squares that must subtract to equal 3. The only numbers not used in this row are {4,1}

4 must go in the left square and 1 must go in the right square so the columns will not have a repeating number.

3−	3+	6x	
		7+ 3	4 4
6x 2	3 3	4	2÷ 1
3	3− 4	1	2

Focus on the red cage. The only combination of numbers 1-4 that will multiply to equal 6 is {2,3}.

In order to not repeat a number in any column, 2 must go in the left square and 3 must go in the right square.

3−	3+	6x 2	3
		7+ 3	4 4
6x 2	3 3	4	2÷ 1
3	3− 4	1	2

The orange cage needs two numbers added together to equal 3. The only numbers not used in this column is {1,2}. To avoid repeating numbers 1 must go in the top square and 2 below.

3−	3+ 1	6x 2	3
	2	7+ 3	4 4
6x 2	3 3	4	2÷ 1
3	3− 4	1	2

The last two open squares must be 4 and 1. These are the only numbers not used in the top two rows. Congratulations on solving your first kenken!

3− 4	3+ 1	6× 2	3
1	2	7+ 3	4 4
6× 2	3 3	4	2÷ 1
3	3− 4	1	2

+ −

1−		8+
1		
1−		1

+ −

1	1−	
1−		2−
3+		

2−	3+	2
		2−
1−		

1−		8+
7+		

+ −

8+	4+		13+	
		5+		
3+		9+		8+
9+		2−		
1−				1

+ −

1−		4−		2
6+		9+		4−
	1−		2−	
3−	6+			1−
	3+		3	

Grid 1 clues: 1−, 7+, 4−, 5+, 3, 5+, 4−, 16+, 6+, 9+, 1−

+ −

Grid 2 clues: 3−, 6+, 4, 1−, 5+, 7+, 11+, 9+, 1, 3+, 8+, 2, 1−

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× ÷

2÷	9×	
	2	
3	2÷	

× ÷

3÷		4×
6×		
	3×	

× ÷

6×		3
	6×	2÷
1		

× ÷

2×	3÷	
	3	2×
6×		

+ − × ÷

24×	2÷		2−
		3+	
4+			9+
3−			

+ − × ÷ **Challenging**

6+	3−		2÷
	2÷	2−	
			2−
24×			

+ − × ÷

12×	4+		4
		5+	
3−		5+	
7+		2÷	

+ − × ÷   **Challenging**

7+		5+	6×
1−			
2÷	3−	9+	

+ − × ÷

4−		10+		2÷
120×		5		
	2−		3+	5
	3−			12+
2	2−			

+ − × ÷   **Challenging**

6+			40×	
3−		60×		1−
2−				
2÷	10×		4−	
			1−	

+ − × ÷

30×			1	9+
4	6+			
24×		2−		2
	4−		20×	2−
	2÷			

+ − × ÷

12×		2÷		1−
4−		2÷	2−	
2−				2÷
2÷	7+	1−		
		4−		3

Numbricks Puzzles

Fill the grid with the numbers 1 to 36 to make a non-stop connecting path. You may connect the numbers horizontally and vertically (not diagonally). You must connect all 36 numbers.

Grid 1

	15	10	9	8	
17					6
18		12	3		1
19		25	26		30
20					31
	22	35	34	33	

Grid 2

	28	25	22	19	
	27	26	21	20	
	34	35	12	13	
	3	36	11	10	

Grid 3

35					14
	29	30	31	16	
	28	19	18	17	
	21	20	5	6	
	22	3	4	7	
24					9

Grid 4

25	26	27	28		
23					30
22		14	13		7
21		15	12		6
20					5
	18	1	2	3	

Numbricks Puzzles

Fill the grid with the numbers 1 to 36 to make a non-stop connecting path. You may connect the numbers horizontally and vertically (not diagonally). You must connect all 36 numbers.

Grid 1 (top left):

4					29
	2	33	26	27	
				24	
	36			21	
	11	12	19	18	
9					16

Grid 2 (top right):

11	10			7	6
12		20	21		5
	14			23	
	17			26	
35		31	30		2
36	33			28	1

Grid 3 (bottom left):

	27	28	35	34	
25					2
22		30	31		3
21		15	10		4
20					5
	18	13	12	7	

Grid 4 (bottom right):

		20	21		
	34	23	22	9	
	33	24	25	6	
		27	26		

Numbricks Puzzles

Fill the grid with the numbers 1 to 36 to make a non-stop connecting path. You may connect the numbers horizontally and vertically (not diagonally). You must connect all 36 numbers.

Puzzle 1

	21	24	35	36	
	22			33	
	15			32	
	14	9	6	5	

Puzzle 2

		3		34	
5		7	8		36
	11			32	
	14			29	
20		18			27
	22			25	

Puzzle 3

	18	17			
20			23		
5			36		
		3	34		

Puzzle 4

		13	4		
11				8	
24				33	
		28	27		

Numbricks Puzzles

Fill the grid with the numbers 1 to 36 to make a non-stop connecting path.
You may connect the numbers horizontally and vertically (not diagonally).
You must connect all 36 numbers.

Grid 1

10					1
		5	34		
	7			36	
	14			29	
		16	27		
19					24

Grid 2

		4	3	2	1
		5			36
		6		31	
		27	28	29	30

Grid 3

18		24	25		31
16					33
15					34
5		3	2		36

Grid 4

	27			18	
29					16
		2	21		
		3	8		
36					13
	34			11	

Fubuki Multiplication Puzzles

Place the numbers 1 to 9 in the 3 by 3 grid so that each horizontal and vertical line multiplies to the given product. You can and must use each number only once. Some numbers are already placed for you.

Puzzle 1

(5)	( )	(7)	140
( )	(6)	(2)	96
(1)	(3)	( )	27
40	72	126	

Puzzle 2

(4)	( )	(1)	20
(6)	(3)	( )	144
( )	(9)	(2)	126
168	135	16	

Puzzle 3

(6)	( )	(3)	90
(8)	(1)	( )	56
( )	(4)	(9)	72
96	20	189	

Puzzle 4

(1)	(3)	( )	24
( )	(5)	(6)	120
(2)	(7)	( )	126
8	105	432	

Puzzle 5

(6)	( )	(7)	210
(8)	(4)	( )	96
( )	(2)	(1)	18
432	40	21	

Puzzle 6

(5)	(1)	( )	40
( )	(9)	(2)	126
(3)	( )	(4)	72
105	54	64	

Fubuki Multiplication Puzzles
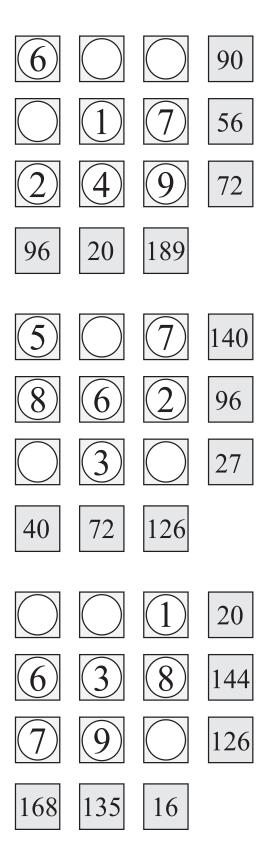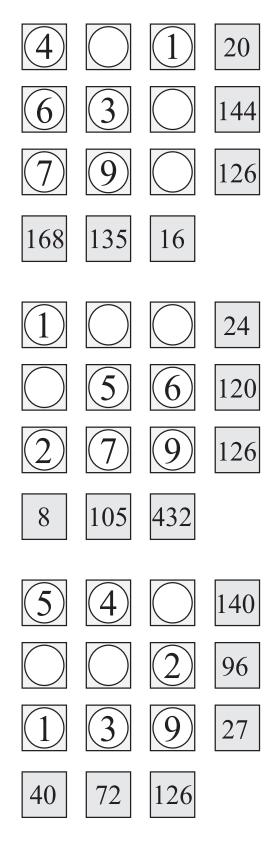
Place the numbers 1 to 9 in the 3 by 3 grid so that each horizontal and vertical line multiplies to the given product. You can and must use each number only once. Some numbers are already placed for you.

Puzzle 1

⑥	◯	◯	90
◯	①	⑦	56
②	④	⑨	72
96	20	189	

Puzzle 2

④	◯	①	20
⑥	③	◯	144
⑦	⑨	◯	126
168	135	16	

Puzzle 3

⑤	◯	⑦	140
⑧	⑥	②	96
◯	③	◯	27
40	72	126	

Puzzle 4

①	◯	◯	24
◯	⑤	⑥	120
②	⑦	⑨	126
8	105	432	

Puzzle 5

◯	◯	①	20
⑥	③	⑧	144
⑦	⑨	◯	126
168	135	16	

Puzzle 6

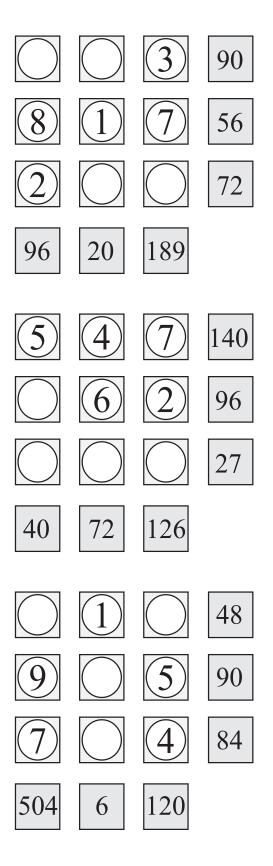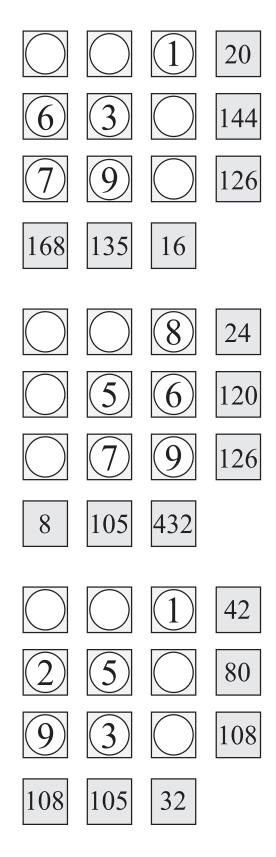| ⑤ | ④ | ◯ | 140 |
◯	◯	②	96
①	③	⑨	27
40	72	126	

Fubuki Multiplication Puzzles

Place the numbers 1 to 9 in the 3 by 3 grid so that each horizontal and vertical line multiplies to the given product. You can and must use each number only once. Some numbers are already placed for you.

Puzzle 1

◯	◯	③	90
⑧	①	⑦	56
②	◯	◯	72
96	20	189	

Puzzle 2

◯	◯	①	20
⑥	③	◯	144
⑦	⑨	◯	126
168	135	16	

Puzzle 3

⑤	④	⑦	140
◯	⑥	②	96
◯	◯	◯	27
40	72	126	

Puzzle 4

◯	◯	⑧	24
◯	⑤	⑥	120
◯	⑦	⑨	126
8	105	432	

Puzzle 5

◯	①	◯	48
⑨	◯	⑤	90
⑦	◯	④	84
504	6	120	

Puzzle 6

◯	◯	①	42
②	⑤	◯	80
⑨	③	◯	108
108	105	32	

Fubuki Multiplication Puzzles

Place the numbers 1 to 9 in the 3 by 3 grid so that each horizontal and vertical line multiplies to the given product. You can and must use each number only once. Some numbers are already placed for you.

Puzzle 1 (top left)

	8	1	40
			72
	9	7	126
30	432	28	

Puzzle 2 (top right)

	2	7	84
8		3	120
			36
432	10	84	

Puzzle 3 (middle left)

7		8	504
4			120
1			6
28	90	144	

Puzzle 4 (middle right)

	2	6	36
9		8	504
			20
135	56	48	

Puzzle 5 (bottom left)

		5	35
3			144
9		4	72
189	16	120	

Puzzle 6 (bottom right)

		1	30
3	7		42
	4		288
162	140	16	