CEMC at Home features Problem of the Week
Grade 4/5/6 - Thursday, April 9, 2020
Mystery Code

James wants to send an image to a friend. The image is made up of filled in black squares on a grid. The rows of the grid are labelled with numbers from 1 to 9 and the columns of the grid are labelled from A to Z. James encodes the image by providing a series of short codes. Each short code consists of four parts:

- A letter between A and Z followed by a number between 1 and 9 indicating the column and row of the first square to be filled in on the grid,

- followed by an arrow ($\uparrow, \downarrow, \leftarrow, \rightarrow$) indicating the direction to fill,

- followed by a number, indicating the total number of squares to colour.

For example, the short code $B2 \downarrow 7$ tells you to fill in a square at position $B2$ on the grid, and continue filling in 6 more squares directly below that position. And the short code $L6 \rightarrow 1$ tells you to fill in a square at position $L6$ on the grid and no other squares. This code would have you fill in the grid as shown:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2		■																								
3		■																								
4		■																								
5		■																								
6		■										■														
7		■																								
8		■																								
9																										

Using the blank grid on the next page, determine the image that James sent using the following codes:

$$T8 \uparrow 7 \qquad D4 \leftarrow 1 \qquad R2 \leftarrow 5 \qquad I5 \rightarrow 3 \qquad F2 \downarrow 7 \qquad L8 \uparrow 6 \qquad C3 \rightarrow 1$$

$$P3 \downarrow 6 \qquad X2 \downarrow 7 \qquad E3 \uparrow 1 \qquad W5 \leftarrow 3 \qquad H8 \uparrow 6 \qquad K2 \leftarrow 3 \qquad B2 \downarrow 7$$

Use the first blank grid to create the image that James sent using the following codes:

$$T8 \uparrow 7 \qquad D4 \leftarrow 1 \qquad R2 \leftarrow 5 \qquad I5 \rightarrow 3 \qquad F2 \downarrow 7 \qquad L8 \uparrow 6 \qquad C3 \rightarrow 1$$

$$P3 \downarrow 6 \qquad X2 \downarrow 7 \qquad E3 \uparrow 1 \qquad W5 \leftarrow 3 \qquad H8 \uparrow 6 \qquad K2 \leftarrow 3 \qquad B2 \downarrow 7$$

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										

An extra blank grid is provided below. Make your own image and provide a classmate with the code that would be used to create your image.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										

More Info:

Check the CEMC at Home webpage on Thursday, April 16 for the solution to this problem. Alternatively, subscribe to Problem of the Week at the link below and have the solution, along with a new problem, emailed to you on Thursday, April 16.

This CEMC at Home resource is the current grade 3/4 problem from Problem of the Week (POTW). This problem was developed for students in grades 3 and 4, but is also appropriate for students in grades 5 and 6. POTW is a free, weekly resource that the CEMC provides for teachers, parents, and students. Each week, problems from various areas of mathematics are posted on our website and e-mailed to our subscribers. Solutions to the problems are e-mailed one week later, along with a new problem. POTW is available in 5 levels: A (grade 3/4), B (grade 5/6), C (grade 7/8), D (grade 9/10), and E (grade 11/12).

To subscribe to Problem of the Week, to view this week's grade 5/6 problem, and to find many more past problems and their solutions, visit the Problem of the Week webpage.