CEMC at Home
Grade 4/5/6 - Monday, April 20, 2020
Tag, and That’s It!

In this activity, we will play a game of tag on a graph!

You Will Need:
- Two players
- A piece of paper and a pencil
- Two counters
  A different small object for each player.

How to Play:
1. Choose one of the two game boards shown above (Board 1 or Board 2) for the game. Notice that each board consists of dots and line segments drawn between certain pairs of dots. Larger versions of these game boards are provided on the next page.
2. Players alternate turns. Decide which player will go first (Player 1) and which player will go second (Player 2). Just like a game of tag, Player 1 is “it”, and Player 2 must avoid being caught by Player 1.
3. On the first turn, Player 1 puts their counter on any dot they wish. Next, Player 2 puts their counter on any other dot on the game board.
4. Next, Player 1 can move their counter from their current dot to another dot by following a single line segment on the game board. Player 1 can also choose to “pass”, and not move their counter at all. Player 2 then moves according to the same rules. For example, on Board 2, a player can move from the top left dot to the top middle dot on a single turn, but cannot move from the top left dot to the top right dot, because that means moving across two line segments.
5. On all remaining turns, Player 1 and Player 2 take turns moving their counter following the rules outlined in 4. At all times, Player 1 is trying to catch Player 2, and Player 2 is trying to stay away from Player 1.
6. Player 1 can “catch” Player 2 by occupying the same dot as Player 2. If this happens, then Player 1 wins. If Player 1 is unable to catch Player 2 and gives up, then Player 2 wins.

Play this game a number of times using each of the game boards (Board 1 and Board 2). Alternate who goes first and who goes second. As you play, think about the following questions:
- Who seems to win most often: Player 1 or Player 2? For each of the game boards (Board 1 and Board 2), can you come up with a strategy that will allow you to win every time?
- The game boards for this game are called graphs. A graph is made up of dots (called vertices), along with lines (called edges) that connect certain pairs of vertices. Can you build a new game board (or graph) which gives Player 1 an advantage in the game? What about Player 2?

More Info:
Check the CEMC at Home webpage on Monday, April 27 for a discussion of Tag, and That’s It!