

Unit 3 Activities



Activity 3.1: Battle at the Beach**Introduction:**

King Kamehameha I (a.k.a Kamehameha the Great) was the first person to unify all of the Hawaiian Islands into a kingdom. To unite a chain of islands, a leader must be skilled at bringing a fleet of war canoes onto an enemy's beach while keeping the enemies' armies away. In this activity, we will use linear equations to defend our beach against our invading classmates.

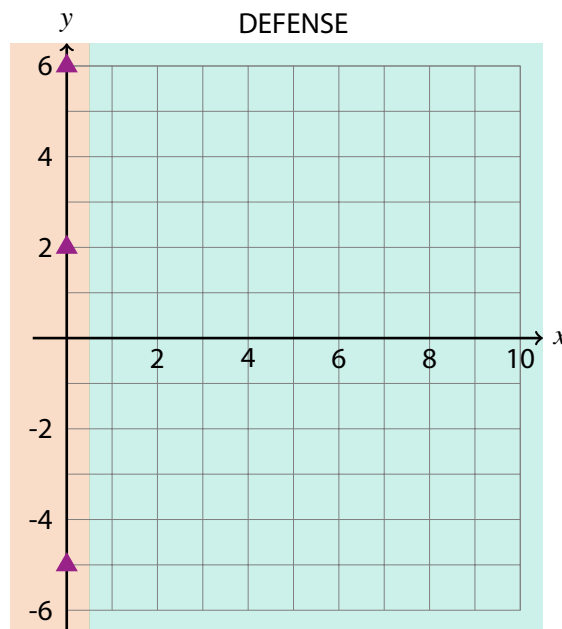
Materials needed:

1. A pen/pencil
2. Scratch paper

Activity:

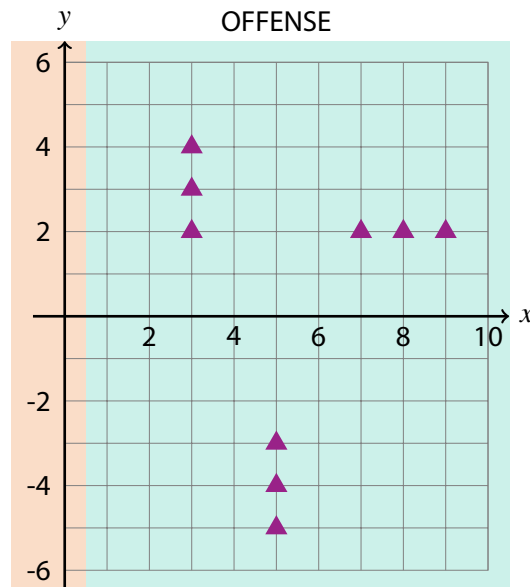
1. Find an opponent and print out two copies of the game board, one for you and one for your opponent. You'll find the game board at the end of these instructions.
2. Sit somewhere so that you cannot see each other's game board. Maybe you need to stand up a big book between you and your opponent.
3. The DEFENSE side shows your beach, with your guards and an ocean that you must defend.
4. On the DEFENSE side, choose three positions along the y -axis to place your guards. Mark these positions with a triangle. Note: only use integer values for your locations (for example, $(0, 2)$ and $(0, -3)$ are okay but $(0, 2.5)$ is not okay).

Example:

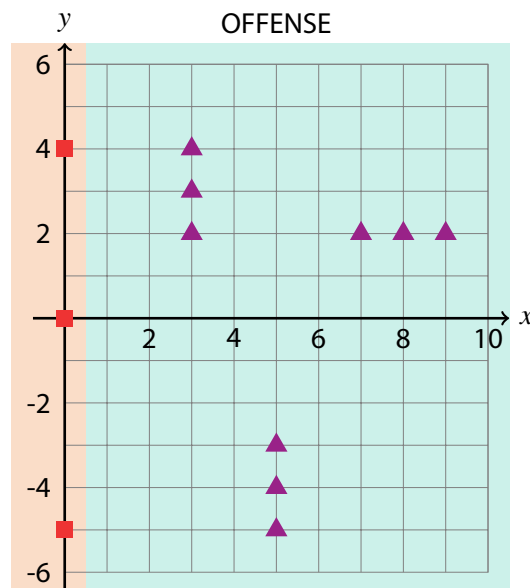


- The OFFENSE side shows your opponent's beach where you must send your war canoes.
- On the OFFENSE side, decide where you'll place your three war canoes. Each war canoe carries three warriors so you need to place them three-in-a-row or three-in-a-column. Mark the positions of your warriors with a triangle. Note: like before, only use integer values.

Example:



- Give your guard locations to your opponent and get their guard locations as well. Mark your opponent's guard locations on your OFFENSE map with a square.
- Example:* If your opponent had guards at $y = -5, 0,$ and 4 then you'd end up with this.



- Use Janken Pon (rock paper scissors) to determine who goes first. Take turns defending your beach by "throwing spears" into the ocean at the attacking warriors.
- The first person to get rid of all of their opponent's warriors wins!**

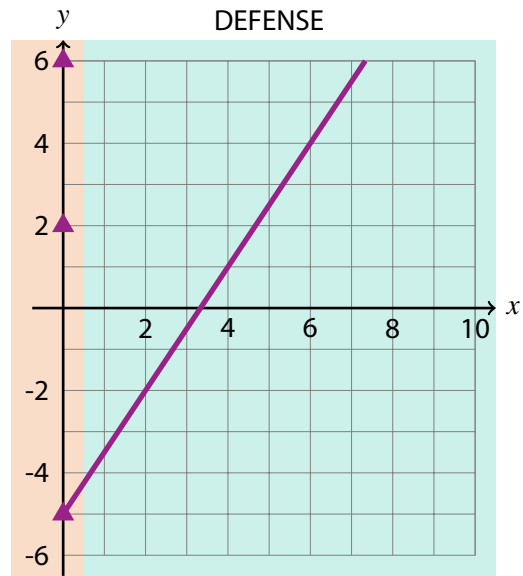
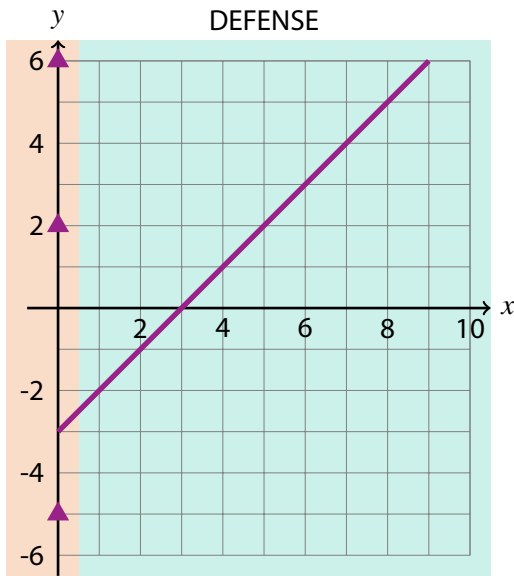
When it is your turn to throw a spear:

1. Give a linear equation that intersects one of your guards. This is where the spear will fly.

Example:

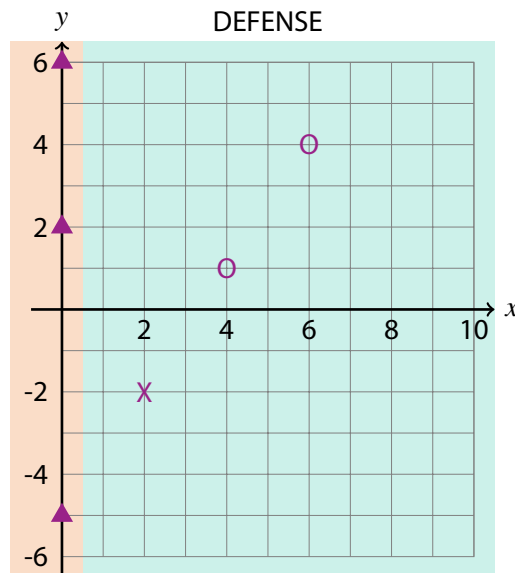
$y = -3 + x$ is not an okay equation because the line does not intersect a guard so a guard cannot throw this spear.

$y = -5 + \frac{3}{2}x$ is an okay equation because it is linear and intersects a guard so a guard can throw this spear.



2. Ask if there are any warriors at the places where the spear intersect the grid. Mark an X on your DEFENSE if there are, and mark an O if there aren't.

Example: $y = -5 + \frac{3}{2}x$ only intersects the grid at $(2, -2)$, $(4, 1)$, and $(6, 4)$. If your opponent tells you that you hit a warrior at $(2, -2)$, but missed at $(4, 1)$ and $(6, 4)$, then you make these marks.



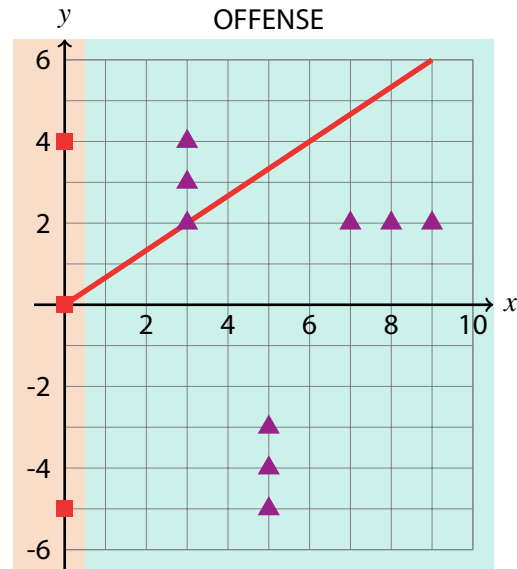
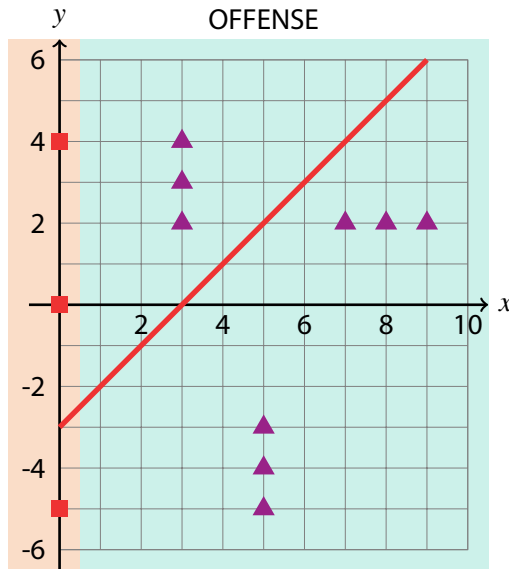
When it is your opponent's turn to throw a spear:

1. First check if their throw is possible. If it is not, then tell them that they lose their turn.

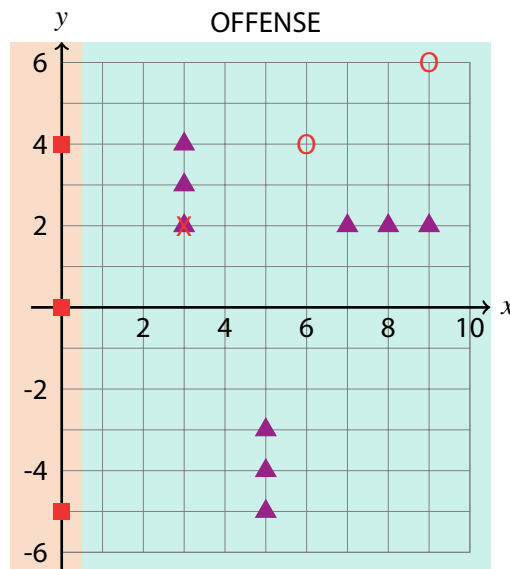
Example:

$y = -3 + x$ is not an okay equation because the line does not intersect a guard so a guard cannot throw this spear. So your opponent loses a turn.

$y = \frac{2}{3}x$ is an okay equation because the it is linear and intersects a guard so a guard can throw this spear. So your opponent's turn continues.



2. Let your opponent know if there are any warriors at the places where the spear intersect the grid. Mark and X on your OFFENSE if there are and mark and O if there aren't. *Example:* $y = \frac{2}{3}x$ only intersects the grid at (3, 2), (6, 4), and (9, 6). Tell your opponent that they hit a warrior at (3, 2), but missed at (6, 4) and (9, 6), then make these marks.



Battle at the Beach: game board

