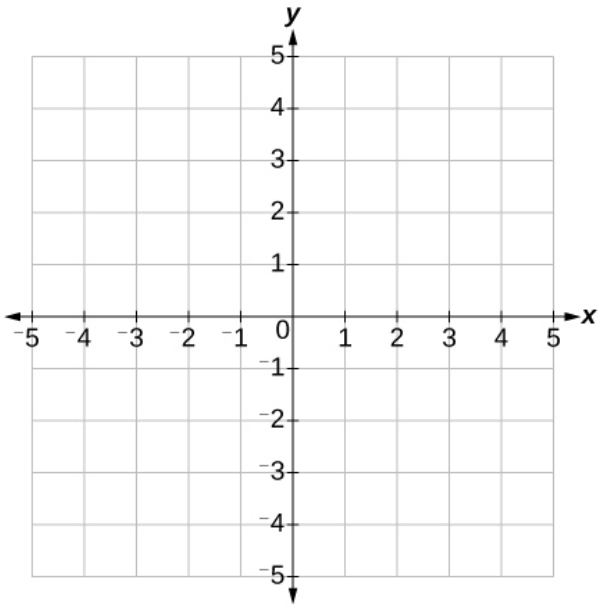
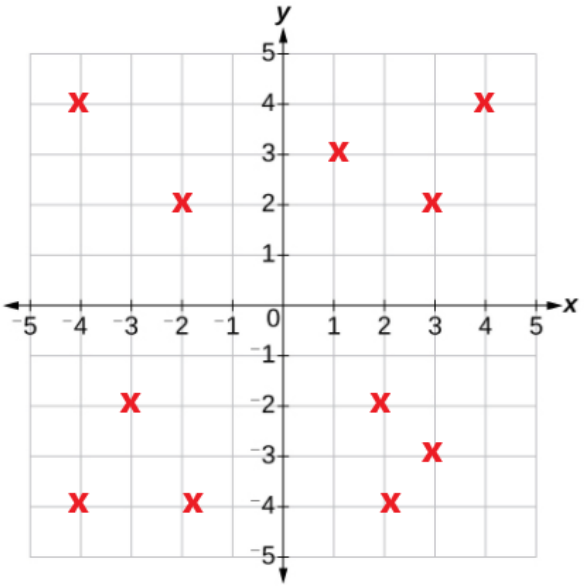
Grid Lock

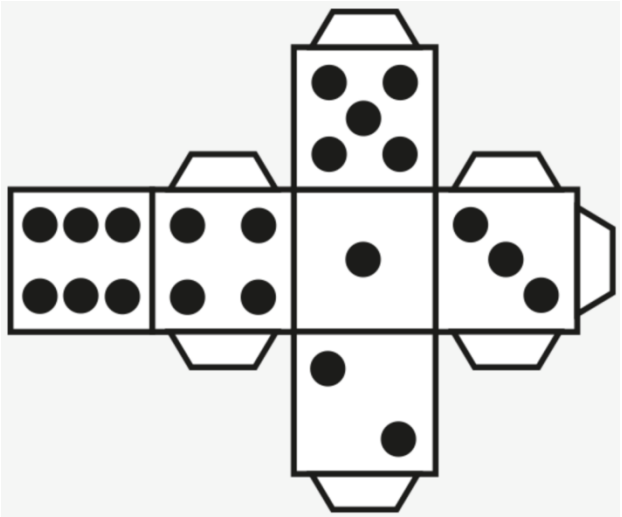
Level	3 (Age group 11-14)
Resources Required	40 counters per player (if counters are not available, players can also use a pen/pencil to mark coordinates) Paper with coordinate grid and pencil (per player) Four dice
Alternate Options for the Resources	Players can make the coordinate grid by following these steps: 1. Draw a horizontal number line along the bottom of the piece of paper that goes from -6 to 6 2. At the 0 point on the horizontal number line, draw a vertical number line that goes from -6 to 6 3. See image below for reference, making sure to create number lines form -6 to 6 instead of -5 to 5 as shown below  Player can make the dice by: 1. Drawing 4 equal sized squares horizontally 2. Drawing 2 squares above and below the 2nd square on the horizontal line draw in step 1 3. Cutting along the outer edge of the shape and folding along the edges to form a cube (refer to the images in the images section below) 4. Use an adhesive to stick the edges together 5. On each face draw dots to represent numbers from 1-6 6. Use two different colored pens for each dice 7. See image at the bottom for illustration of the dice template 8. Create 2 dice with positive numbers (1 to 6) and 2 dice with negative numbers (-1 to -6). You can use the same color for the dice representing the same axis coordinate. For example, you can use a blue pen to write the positive and negative numbers on the two dice representing x

	coordinate values and a red pen for the two dice representing positive and negative y coordinate values
Strand Covered	geometry and measurement
Targeted Skills	Plotting ordered pairs in all four quadrants of a cartesian plane
Inspired by	Mathwire
Time Required	20 minutes for the game 20 minutes to draw out the grid and make the two dice
Previous Learning Required	Knowledge on coordinates (including positive and negative integers)
Support Required	Low support

Rules of the Game:

Goal	Have the greatest number of coordinate hits at the end of the game to win. A coordinate hit is the placement of one counter on the grid.
Rules	Decide which dice will show the x coordinate value and which dice will show the y coordinate value, before the game starts (based on color, size of dice, a marking on the dice etc.) Remember to have two dice for x-axis coordinate values with positive and negative values. The same color can be used to represent these. Do the same for the positive and negative dice representing y-axis coordinate value Players will play 3 sets of 5 plays. They will roll 2 dice at a time in the following order: 1. first turn: positive x axis and positive y axis dice 2. second turn: positive x axis and negative y axis dice 3. third turn: negative x axis and negative y axis dice 4. fourth turn: any pair 5. fifth turn: any pair Players cannot roll the dice more than once in the same turn. Once a player rolls the dice, he/she will have to wait their turn for the rest of the plays Each player will play 3 sets i.e. they will roll the dice 15 times Before the game starts, **10 crosses** must be placed on each of the players' grid quadrants, at coordinates of their choice. Players are not allowed to change the location of the pre-placed crosses at any point in the game. See image below for example of cross placement:

	 Coordinates with 0 in them are not included in this game. For example, (0,5) and (-4,0) are both invalid neither counters nor crosses should not be placed on these spots.
Steps	Step 1: Each player (of the 2-4 players) places their own grids and counters in front of them. Step 2: Each player uses a pencil and places crosses on 10 random coordinates of their choice as shown in the image above. Make sure you have 10 crosses in all four quadrants (total 40 crosses) Step 3: Player 1 rolls the dice and calls out the coordinate. For example, (-4,2). If, on player 1's grid, this coordinate is cross-free, then all players places a counter on (-4,2) and score 1 point or one coordinate hit. Players whose grid has a cross on that coordinate that was called out do not get any points on that play. If coordinates are unavailable, players can mark the coordinate that was called out using a pen or pencil by drawing a circle on the coordinate point. Step 4: This continues until each player has rolled the dice 15 times The player with the most counters or circles on their grid wins
Images or Illustrations	Net of a dice:

	
Variations of the Game	1. This game can be played by rolling 2 dice twice per turn. The sum of the two dice on the first roll is the value of the x coordinate, and the sum of the two dice on the second roll is the value for the y coordinate. This allows a grid expansion to 12 on each axis.
Simplification	1. The number of counters can be decreased to 10