

## CLOSE TO EQUAL

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<b>Level</b>	3 (Age group 11-14)
<b>Resources Required</b>	Pen or Pencil Paper (1 per pair) Die (1 per pair)
<b>Alternate Options for the Resources</b>	A die can be made using these instructions and the example in the Images/Illustrations section: <ol style="list-style-type: none"> <li>1. Drawing 4 equal sized squares horizontally.</li> <li>2. Drawing 2 squares above and below the 2<sup>nd</sup> square on the horizontal line draw in step 1.</li> <li>3. Cutting along the outer edge of the shape and folding along the edges to form a cube.</li> <li>4. Use an adhesive on the flaps to stick the edges together.</li> <li>5. On each face draw dots to represent numbers from 1-6. Use the example in the Images/Illustrations section to determine where each number should go.</li> </ol>
<b>Strand Covered</b>	Numbers and Operations
<b>Targeted Skills</b>	Multiplying decimals
<b>Inspired by</b>	<a href="#">Julia Robinson Mathematics Festival</a> - Gordon Hamilton
<b>Time Required</b>	30 mins (for game) 15 mins (setup)
<b>Previous Learning Required</b>	Multiplication of 2 digit numbers Knowledge of decimals
<b>Support Required</b>	Low supervision

### Rules of the Game:

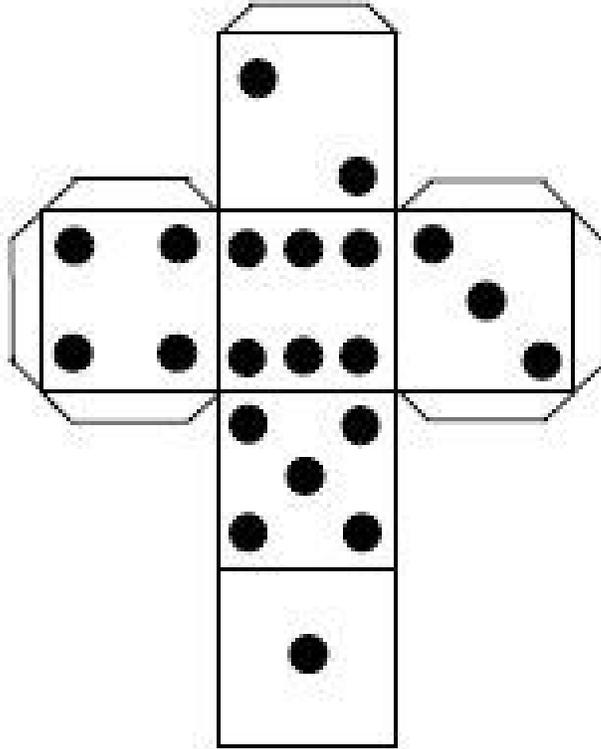
<b>Goal</b>	Player 1 wins if the score at the end of the game is greater than 15. Player 2 wins if the score at the end of the game is less than or equal to 15.
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<b>Steps</b>	<p>Step 1: The teacher groups players into pairs.</p> <p>Step 2: The teacher gives each pair a piece of paper and a dice.</p> <p>Step 3: players draw the game board as in the Images/Illustrations section.</p> <p>Step 4: players decide who will be Player 1 and who will be Player 2. There will be two products at the end of the game. Player 1 is trying to make it so that the difference between these two products is greater than 15. Player 2 is trying to make it so that the difference between these two products is less than or equal to 15.</p> <p>Step 5: players write down who is Player 1 and Player 2 on their piece of paper so that they do not forget.</p> <p>Step 6: Starting with Player 1, players take turns rolling the die and placing the number they roll into one of the empty boxes.</p> <p>Step 7: When all 8 boxes are filled, players calculate their two products. The teacher should make sure that players know that the numbers they are multiplying are decimals.</p> <p>Step 8: players calculate the difference in the two products they get by subtracting the smaller number from the larger number. This difference is the score for the game.</p> <p>Step 9: If the score is greater than 15, Player 1 wins. If the score is less than or equal to 15, Player 2 wins.</p>
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Images or  
Illustrations



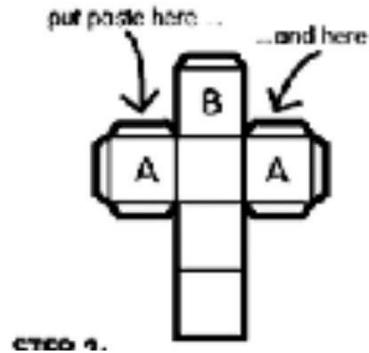


Step 1: Make creases along the lines. Flip the shape over so the decorated side is away from you.

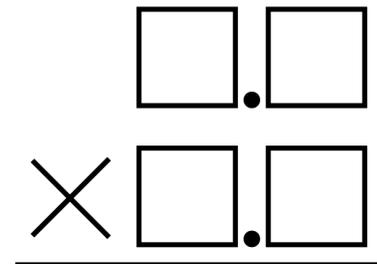
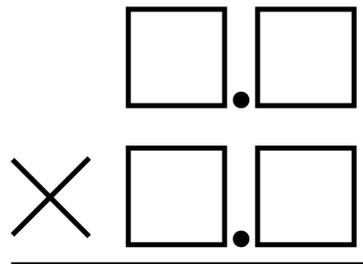
Step 2: Now bend the sides labeled "A" and apply glue on the two tabs where shown. Fold up the tab labeled "B" against the glue covered tabs.

Step 3: Put some glue on all the remaining tabs, Fold tab "C" over the top of the dice and press against the glue-covered dice.

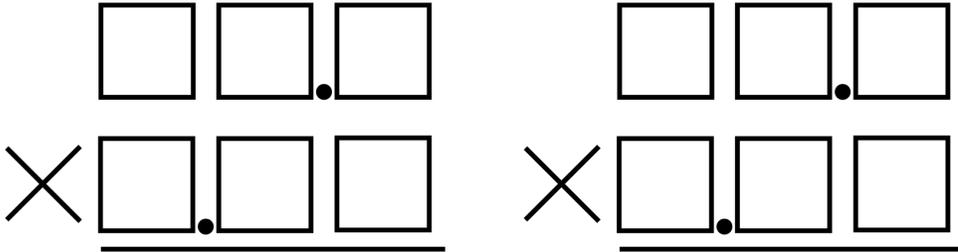
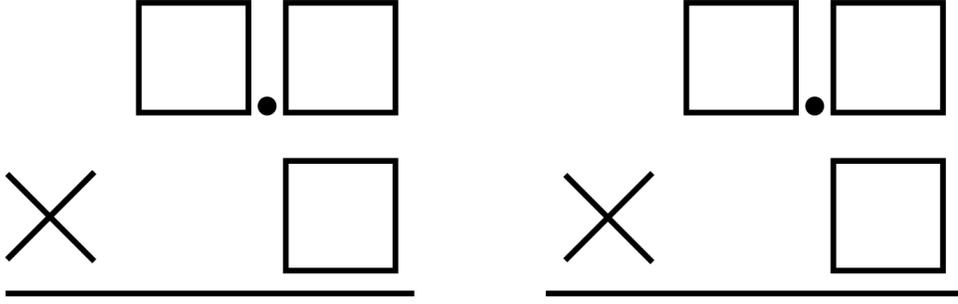
Step 4: Now lay something not too heavy on the dice to hold them in place while they dry.



Example Game Board:





	<p>Example Game Board (Enrichment):</p>  <p>Example Game Board (Simplification):</p> 
<b>Enrichment</b>	<ul style="list-style-type: none"><li>• Have players multiply 3 digit decimals (See Images/Illustrations).</li><li>• Create dice with larger numbers e.g. from 3, 4, 5, 6, 7, 8, and 9.</li></ul>
<b>Simplification</b>	<ul style="list-style-type: none"><li>• Have players multiply a 2 digit decimal by a whole number (See Images/Illustrations).</li><li>• Create dice with smaller numbers e.g. 1, 1, 2, 2, 3, and 3.</li></ul>