

# Dice Activities for Multiplication

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## Directions for Four in a Row

### Objectives:

Introduce the Four in a Row activities by demonstrating on an overhead and playing against the class.

Two teams with two players on a team are suggested. Teams give students an opportunity to discuss moves and strategies and provide a check on correct computation.

### How to Play

- Each team tosses a die. The higher number goes first.
- Team tosses two dice, finds the sum, and then multiplies the sum by the specific multiplicand for the activity.
- Team attempts to line up four tokens either vertically, horizontally, or diagonally before the opposing team does.
- First team to align four tokens in a row wins.

### Suggestions

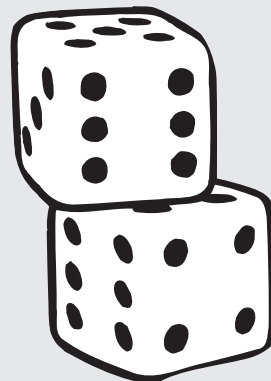
If students are struggling with recalling multiplication facts, suggest that they list the multiples of the multiplicand as a reference.

Before placing a token on the chart, the team members should say the multiplication fact aloud—for example, “Seven times three equals twenty-one.”

- Practice computing the sum of number combinations 1 through 12
- Practice multiplication facts 2 through 12
- Develop an awareness of an opponent’s possible moves
- Analyze an opponent’s possible moves in order to develop a strategy to block opponent
- Distinguish between the role of luck versus skill in an activity using dice
- Develop communication and cooperation skills by working in teams of two students

### Discussion

- This activity is similar to the games *Othello*® and *Pente*®, where defense is important. How does the toss of the dice influence strategy? Is this activity more a game of defense or offense?
- Does this activity involve more luck or skill?
- Keep a recording of each dice toss. Which combinations were tossed the most? The least?



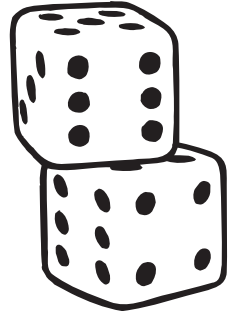
## Four in a Row

### Two Dice × 2 Chart

- Two teams with two players on a team.
- Teams toss a die. Higher number goes first.
- Each team chooses a color token.

#### **How to Play**

- *Toss 2 dice. Find the sum.*
- *Multiply the sum of the two dice by 2.*
- *Place a token on the product.*
- *First team to get 4 tokens in a row, vertically, horizontally, or diagonally, wins.*



<b>18</b>	<b>20</b>	<b>22</b>	<b>10</b>	<b>16</b>	<b>8</b>	<b>14</b>
<b>4</b>	<b>24</b>	<b>14</b>	<b>6</b>	<b>8</b>	<b>14</b>	<b>16</b>
<b>22</b>	<b>18</b>	<b>14</b>	<b>20</b>	<b>20</b>	<b>12</b>	<b>10</b>
<b>10</b>	<b>6</b>	<b>20</b>	<b>16</b>	<b>12</b>	<b>18</b>	<b>12</b>
<b>6</b>	<b>8</b>	<b>12</b>	<b>18</b>	<b>10</b>	<b>14</b>	<b>8</b>
<b>14</b>	<b>22</b>	<b>16</b>	<b>4</b>	<b>12</b>	<b>24</b>	<b>20</b>
<b>16</b>	<b>8</b>	<b>24</b>	<b>10</b>	<b>14</b>	<b>8</b>	<b>6</b>

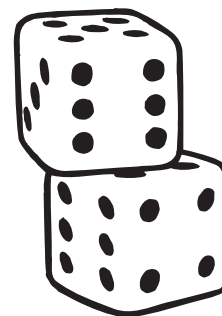
## Four in a Row

### Two Dice × 4 Chart

- Two teams with two players on a team.
- Teams toss a die. Higher number goes first.
- Each team chooses a color token.

#### **How to Play**

- Toss 2 dice. Find the sum.
- Multiply the sum of the two dice by 4.
- Place a token on the product.
- First team to get 4 tokens in a row, vertically, horizontally, or diagonally, wins.



28	40	48	20	24	12	16
8	36	32	48	16	28	24
28	44	28	20	8	40	16
20	48	40	24	28	32	36
32	12	44	36	40	8	20
36	32	24	28	16	44	40
20	12	36	16	24	28	32

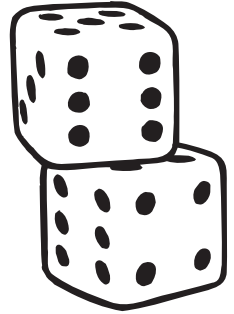
## Four in a Row

### Two Dice × 8 Chart

- Two teams with two players on a team.
- Teams toss a die. Higher number goes first.
- Each team chooses a color token.

#### **How to Play**

- Toss 2 dice. Find the sum.
- Multiply the sum of the two dice by 8.
- Place a token on the product.
- First team to get 4 tokens in a row, vertically, horizontally, or diagonally, wins.



32	80	56	24	88	16	80
16	40	80	72	64	56	32
56	88	48	40	72	80	24
24	72	32	64	40	48	56
40	48	64	96	56	72	96
80	32	48	56	64	88	64
96	16	56	40	32	72	48

# Directions for Square Off

## Objectives:

Introduce **Square Off** by demonstrating on an overhead and playing against the class.

Two teams with two players on a team are suggested. Teams give students an opportunity to discuss moves and strategies and provide a check on correct computation.

## How to Play

- Each team tosses a die. The higher number goes first.
- Teams toss two dice, find the sum, and multiply the sum by the specific multiplicand for the activity.
- Teams attempt to arrange four tokens to form any size square, 2-by-2, 3-by-3, 4-by-4, and so on. Orientation of the square can be on the diagonal.
- First team to form three squares wins.

## Suggestions

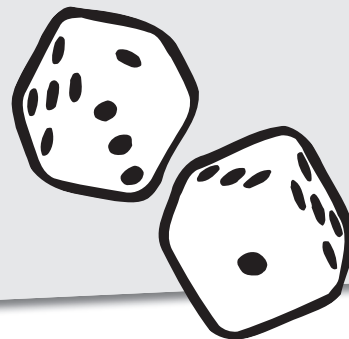
If students are struggling with recalling multiplication facts, suggest that they list the multiples of the multiplicand as a reference.

Before placing a token on the chart, the team members should say the multiplication fact aloud—for example, “Seven times three equals twenty-one.”

- Practice computing the sum of number combinations 1 through 12
- Practice multiplication facts 2 through 12
- Develop an awareness of an opponent’s possible moves
- Analyze an opponent’s possible moves in order to develop a strategy to block opponent
- Distinguish between the role of luck versus skill in an activity using dice
- Develop communication and cooperation skills by working in teams of two students

## Discussion

- Is this more a game of luck or skill?
- Is there more opportunity in **Square Off** than in **Four in a Row** or **Cross Over** to play defensively—that is, to prevent the opposing team from making a square?
- Which of the three activities, **Square Off**, **Four in a Row**, or **Cross Over**, offers more opportunities to block the other team? Why is that?



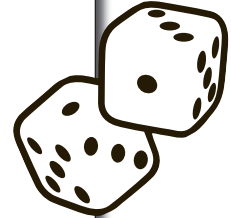
## Square Off

### Two Dice × 3 Chart

- Each team chooses a color token.
- Toss a die.
- Higher number goes first.

#### **How to Play**

- *Toss 2 dice. Find the sum.*
- *Multiply the sum of the two dice by 3.*
- *Place a token on the product.*
- *If the product has a token on it, lose a turn.*
- *First team to place tokens forming three squares wins.*



<b>27</b>	<b>30</b>	<b>33</b>	<b>15</b>	<b>24</b>	<b>12</b>	<b>18</b>
<b>6</b>	<b>36</b>	<b>21</b>	<b>9</b>	<b>12</b>	<b>21</b>	<b>24</b>
<b>9</b>	<b>27</b>	<b>21</b>	<b>6</b>	<b>30</b>	<b>33</b>	<b>15</b>
<b>15</b>	<b>30</b>	<b>12</b>	<b>21</b>	<b>18</b>	<b>27</b>	<b>18</b>
<b>24</b>	<b>12</b>	<b>18</b>	<b>27</b>	<b>15</b>	<b>21</b>	<b>36</b>
<b>21</b>	<b>33</b>	<b>9</b>	<b>6</b>	<b>18</b>	<b>24</b>	<b>30</b>
<b>24</b>	<b>12</b>	<b>36</b>	<b>15</b>	<b>21</b>	<b>27</b>	<b>9</b>

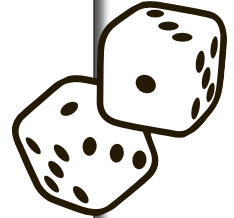
## Square Off

### Two Dice × 6 Chart

- Each team chooses a color token.
- Toss a die.
- Higher number goes first.

#### **How to Play**

- Toss 2 dice. Find the sum.
- Multiply the sum of the two dice by 6.
- Place a token on the product.
- If the product has a token on it, lose a turn.
- First team to place tokens forming three squares wins.



<b>36</b>	<b>60</b>	<b>54</b>	<b>24</b>	<b>66</b>	<b>18</b>	<b>42</b>
<b>12</b>	<b>48</b>	<b>30</b>	<b>72</b>	<b>42</b>	<b>54</b>	<b>36</b>
<b>42</b>	<b>66</b>	<b>48</b>	<b>30</b>	<b>12</b>	<b>60</b>	<b>24</b>
<b>24</b>	<b>72</b>	<b>60</b>	<b>36</b>	<b>42</b>	<b>48</b>	<b>54</b>
<b>30</b>	<b>18</b>	<b>42</b>	<b>54</b>	<b>60</b>	<b>42</b>	<b>30</b>
<b>48</b>	<b>12</b>	<b>36</b>	<b>42</b>	<b>24</b>	<b>66</b>	<b>60</b>
<b>24</b>	<b>18</b>	<b>54</b>	<b>30</b>	<b>36</b>	<b>72</b>	<b>48</b>



## Square Off

### Two Dice × 9 Chart

- Each team chooses a color token.
- Toss a die.
- Higher number goes first.

#### **How to Play**

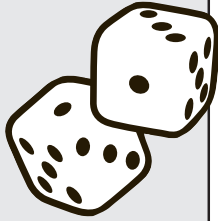
- Toss 2 dice. Find the sum.
- Multiply the sum of the two dice by 9.
- Place a token on the product.
- If the product has a token on it, lose a turn.
- First team to place tokens forming three squares wins.



<b>81</b>	<b>63</b>	<b>54</b>	<b>27</b>	<b>99</b>	<b>18</b>	<b>45</b>
<b>108</b>	<b>45</b>	<b>90</b>	<b>72</b>	<b>81</b>	<b>54</b>	<b>36</b>
<b>54</b>	<b>63</b>	<b>45</b>	<b>36</b>	<b>72</b>	<b>90</b>	<b>108</b>
<b>18</b>	<b>72</b>	<b>36</b>	<b>63</b>	<b>54</b>	<b>99</b>	<b>81</b>
<b>63</b>	<b>81</b>	<b>63</b>	<b>27</b>	<b>90</b>	<b>72</b>	<b>99</b>
<b>90</b>	<b>36</b>	<b>45</b>	<b>54</b>	<b>81</b>	<b>108</b>	<b>63</b>
<b>27</b>	<b>18</b>	<b>63</b>	<b>90</b>	<b>36</b>	<b>72</b>	<b>45</b>

# Directions for Cross Over

## Objectives:



- Practice computing the sum of number combinations 1 through 12
- Practice multiplication facts 2 through 12
- Develop an awareness of an opponent's possible moves
- Analyze an opponent's possible moves in order to develop a strategy to block opponent
- Distinguish between the role of luck versus skill in an activity using dice
- Develop communication and cooperation skills by working in teams of two students

Introduce **Cross Over** by demonstrating on an overhead and playing against the class. The goal is to be the first team to make a connected line of tokens across the board.

Two teams with two players on a team are suggested.

## How to Play

- Each team tosses a die. Team with the higher number goes first.
- Team A tosses two dice, finds the sum, and multiplies the sum by the specific multiplicand for the activity.
- Team A locates the product in either the outside right or outside left column of the chart and places a token on the product. If no box in either column contains the product, the team loses its turn.
- Team B tosses two dice, finds the sum, and multiplies the sum by the specific multiplicand for the activity. The team must place its first token in the outside column on the opposite side of the chart from Team A's first token.
- With each toss of the dice, the teams attempt to place their tokens in continuous alignment, connecting them vertically, horizontally, or diagonally to reach the opposite side of the chart. The path across the chart may meander on its way to the other side.
- First team to reach the opposite side wins.

## Suggestions

If students are struggling with recalling multiplication facts, suggest that they list the multiples of the multiplicand as a reference. Before placing a token on the chart, the team members should say the multiplication fact aloud—for example, “Seven times three equals twenty-one.”

## Discussion

- Is this more a game of luck or skill?
- Which of the three activities, **Square Off**, **Four in a Row**, or **Cross Over**, offers more opportunities to block the other team? Why?

## Cross Over

### Two Dice × 5 Chart

- Two teams with two players on a team.
- Teams toss a die. Higher number goes first.
- Each team chooses a color token.
- Teams start on opposite sides of the chart.

#### **How to Play**

- Toss 2 dice. Find the sum.
- Multiply the sum by 5. Place a token on the product.
- If the product has a token on it, lose a turn.
- First to cross over wins.

<b>35</b>	<b>50</b>	<b>55</b>	<b>25</b>	<b>30</b>	<b>15</b>	<b>20</b>
<b>10</b>	<b>45</b>	<b>40</b>	<b>60</b>	<b>20</b>	<b>45</b>	<b>30</b>
<b>35</b>	<b>50</b>	<b>40</b>	<b>25</b>	<b>10</b>	<b>50</b>	<b>20</b>
<b>20</b>	<b>60</b>	<b>25</b>	<b>30</b>	<b>35</b>	<b>40</b>	<b>45</b>
<b>35</b>	<b>15</b>	<b>55</b>	<b>45</b>	<b>50</b>	<b>35</b>	<b>30</b>
<b>40</b>	<b>10</b>	<b>30</b>	<b>35</b>	<b>20</b>	<b>55</b>	<b>50</b>
<b>25</b>	<b>15</b>	<b>45</b>	<b>25</b>	<b>35</b>	<b>60</b>	<b>40</b>

## Cross Over

### Two Dice × 10 Chart

- Two teams with two players on a team.
- Teams toss a die. Higher number goes first.
- Each team chooses a color token.
- Teams start on opposite sides of the chart.

#### **How to Play**

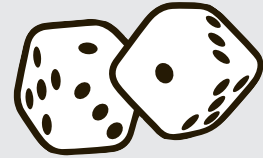
- Toss 2 dice. Find the sum.
- Multiply the sum by **10**. Place a token on the product.
- If the product has a token on it, lose a turn.
- First to cross over wins.

<b>100</b>	<b>70</b>	<b>120</b>	<b>50</b>	<b>80</b>	<b>60</b>	<b>30</b>
<b>80</b>	<b>20</b>	<b>90</b>	<b>110</b>	<b>40</b>	<b>100</b>	<b>70</b>
<b>50</b>	<b>90</b>	<b>70</b>	<b>30</b>	<b>90</b>	<b>60</b>	<b>120</b>
<b>40</b>	<b>60</b>	<b>80</b>	<b>100</b>	<b>70</b>	<b>50</b>	<b>80</b>
<b>110</b>	<b>90</b>	<b>50</b>	<b>60</b>	<b>20</b>	<b>70</b>	<b>40</b>
<b>70</b>	<b>40</b>	<b>80</b>	<b>120</b>	<b>60</b>	<b>30</b>	<b>100</b>
<b>20</b>	<b>100</b>	<b>90</b>	<b>70</b>	<b>40</b>	<b>110</b>	<b>50</b>

## Tic-Tac-Toe / Four-Grid Tic-Tac-Toe Activities

### Objectives:

- Practice computing the sum of number combinations 1 through 12
- Practice multiplication facts 2 through 12
- Develop an understanding of the difference between a “fair game” and a “game of chance”
- Develop communication and cooperation skills by working in teams of two students



The Tic-Tac-Toe activities introduce the standard game of Tic-Tac-Toe and introduce students to the concepts of fair chance and what makes a game fair.

Each Tic-Tac-Toe activity is paired with a Four-Grid Tic-Tac-Toe activity, providing a way to diversify reinforcing multiplication facts. This presents opportunities for students to practice playing Tic-Tac-Toe with each set of multiples 2 through 9, before moving on to the more complicated Four-Grid Tic-Tac-Toe.

### Warm-Up Activity: Tic-Tac Toe

Introduce the Tic-Tac-Toe activities by demonstrating a standard game of Tic-Tac-Toe, using Xs and Os and playing against the class.

- Decide who is to use X and who is to use O.
- Each side tosses a die. Higher number goes first.
- Players take turns placing their X or O on the 3-by-3 Tic-Tac-Toe grid.
- First side to place three Xs or Os in continuous alignment, vertically, horizontally, or diagonally, wins the game.
- First side to win 2 out of 3 games is the winner.

### Discussion

- Does the person who goes first have an advantage?
- Is this a game of luck or skill?
- Is it a fair game?

### How to Play:

#### Two-Dice $\times$ 2 Tic-Tac-Toe

- Introduce the **Two-Dice  $\times$  2 Tic-Tac-Toe** activity by demonstrating it on an overhead and playing against the class.
- Two players on a team are suggested. Teams give students an opportunity to discuss moves and strategies and provide a check on correct computation.
- Each team chooses a color token and tosses a die. Higher number goes first.
- Team tosses two dice, finds the sum, and then multiplies the sum by the multiplicand for the activity (in this activity, 2).
- Team places a token on the product on the Tic-Tac-Toe grid.
- With each dice toss, teams attempt to place their tokens in continuous alignment, vertically, horizontally, or diagonally, to win the game.

- If the product is not shown on the grid or already has a token on it, team loses a turn.
- First team to form a Tic-Tac-Toe vertically, horizontally, or diagonally wins.
- Teams play 3 games.
- Team winning 2 out of 3 games is the winner.

### Discussion

- How does the dice toss influence your strategy?
- How does the dice toss influence the outcome of the game?
- Is there a fair chance of each multiple being tossed?
- Is this a fair game?

### Suggestions

If students are struggling with recalling multiplication facts, suggest that they list the multiples of the multiplicand as a reference.

Before placing a token on the chart, the team members should say the multiplication fact aloud—for example, “Seven times three equals twenty-one.”



### How to Play:

#### Two Dice $\times$ 2 Four-Grid Tic-Tac-Toe

- Introduce **Two Dice  $\times$  2 Four-Grid Tic-Tac-Toe** by demonstrating on an overhead and playing against the class.
- Each team chooses a color token and tosses a die. Higher number goes first.
- The team tosses two dice, finds the sum, and then multiplies the sum by the specific multiplicand for the activity (in this case, 2).

- The team locates the product on any of the Tic-Tac-Toe grids and places a token on *only one* of the products.
- With each dice toss, teams attempt to place their tokens in continuous alignment, vertically, horizontally, or diagonally, forming as many Tic-Tac-Toe wins as possible.
- If a product is not shown on the grid or already has a token on it, the team loses a turn.
- When no more plays are possible, teams count their Tic-Tac-Toe wins. The team with more Tic-Tac-Toes wins.

### Variation:

- The team tosses two dice, finds the sum, and multiplies the sum by the multiplicand for the activity.
- The team places a token in every box where that product appears on all four Tic-Tac-Toe grids.

### Discussion

- Is this a game of luck or skill?
- Is there opportunity to play defensively?
- What are the most Tic-Tac-Toe wins possible on one of the grids?
- Which strategy works best: trying to get the most three tokens in a row or trying to block your opponent?

Agree with your opponents to both use the same strategy to see what happens. Agree to each use a different strategy.

## Two Dice × 11 Tic-Tac-Toe

- Each team chooses a color token.
- Toss die. Higher number goes first.



### How to Play

- Toss 2 dice. Find the sum.
- Multiply the sum by 11.
- Find the product on the grid and place a token on it.
- If number already has a token on it, lose a turn.
- First team to get three in a row wins.
- Play 3 games. Team winning 2 out of 3 games wins.

<b>33</b>	<b>99</b>	<b>88</b>
<b>66</b>	<b>77</b>	<b>121</b>
<b>44</b>	<b>55</b>	<b>110</b>

## Two Dice × 12 Tic-Tac-Toe

- Each team chooses a color token.
- Toss die. Higher number goes first.



### **How to Play**

- Toss dice. Find the sum.
- Multiply the sum by 12.
- Find the product on the grid and place a token on it.
- If number already has a token on it, lose a turn.
- First team to get three in a row wins.
- Play 3 games. Team winning 2 out of 3 games wins.

<b>132</b>	<b>108</b>	<b>96</b>
<b>84</b>	<b>72</b>	<b>36</b>
<b>48</b>	<b>60</b>	<b>120</b>