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# Elementary Math Games

## Introduction

Games provide a fun environment for supporting children in building number fluency. As children learn to play the games, speed should not be the focus. Encourage strategy and ask students to explain their thinking.

If students are experiencing difficulty with their computations they should be encouraged to work out the answer mentally or on paper. They should use whatever methods make sense to them. At any time you should be able to ask how they know a numerical answer. The importance should be placed on how they communicate their thinking and the strategy that was used for the calculation.

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# How Many Rows?
# How Many in Each Row?

**You Need**

- two players
- one die
- recording sheet for game (one 10x10 grid for each player)

**How to Play**

Player A rolls a die two times. The first roll determines the number of rows and the second roll determines the number of squares in each row. Player A draws a rectangle that corresponds to the rolls in any location on the grid on the recording sheet, then writes the number sentence (for example, 3x4 = 12) in the rectangle.

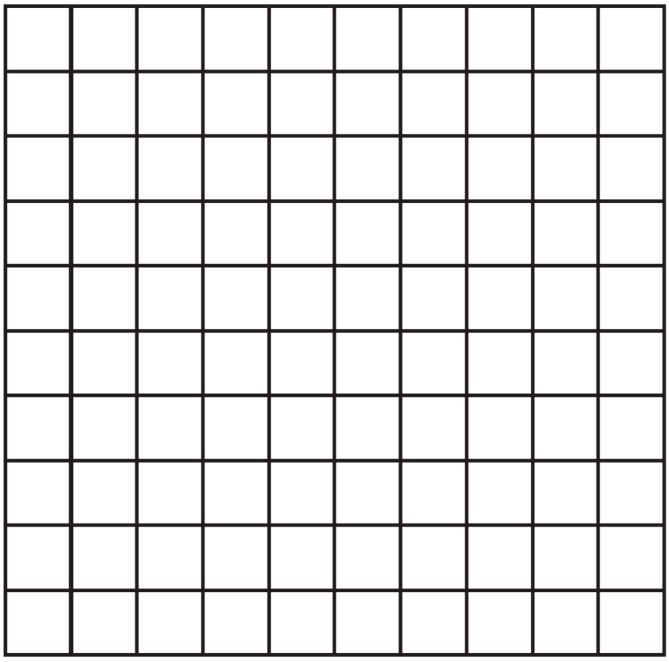
Player B rolls the die twice. Again, the first roll determines the number of rows and the second roll determines the number of squares in each row. Player B draws the rectangle that corresponds to the rolls in any location on the other grid, then writes the number sentence in the rectangle.

Players take turns. Each rectangle drawn cannot overlap a previous rectangle.
Each player continues until he or she is unable to place a rectangle on the grid.
At that stage, the player records both the total number of squares covered by rectangles on the grid, as well as the number of uncovered squares.

**Variation**

After rolling the die twice to determine a product, the player can make any rectangle that covers that number of squares.

# How Many Rows?
# How Many In Each Row?



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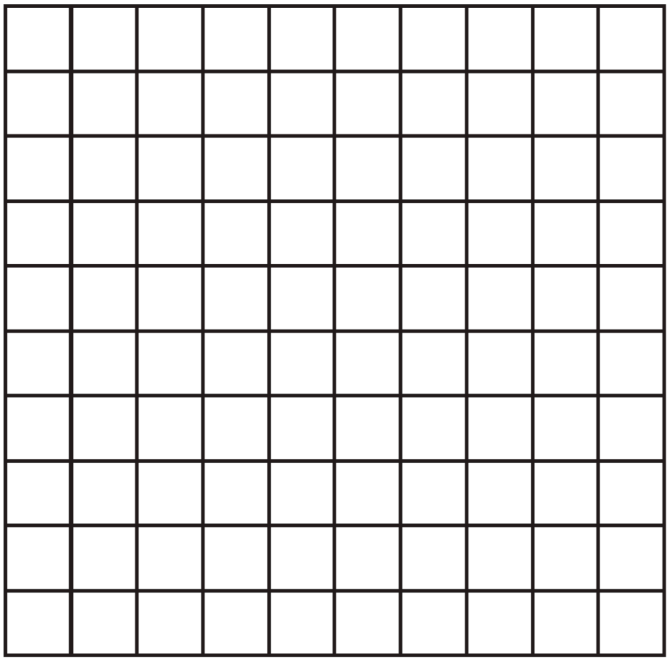

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# Circles and Stars

**You Need**

- two players
- one die
- paper and pencil for each player

**How to Play**

Player A rolls the die, then draws that number of fairly large circles.
Player B rolls the die and does the same.
Player A rolls the die and draws that number of stars in each of his circles.
Player B rolls the die and does the same.
Each player writes the number sentence that tells how many stars he or she has (for example, four circles with three stars in each circle would be 4x3 = 12 stars).
Play six rounds, then determine the total number of stars that each player has.

**Variation**

For each round, after Player A draws stars in his circle, determine the probability that Player B will end up with more stars than Player A.

# The Big Bad Wolf

**You Need**

- two players
- paper and pencil

**How to Play**

Write the numbers 1 to 6 in a horizontal row. You (Player A) will play the Big Bad Wolf (Player B). Every time it is your turn, you can take any number in the list, as long as at least one factor of that number is also in the list. You get your number and the Big Bad Wolf gets all of the factors of that number that are on the list. For example, if you take a 4, the Big Bad Wolf would get 1 and 2 since those are the factors of 4 left in the list.

The Taxman must get something every time, which means you cannot choose a number if no factors of the number remain in the list. When no number in the list has any factors left in the list, the game is over and the Taxman gets all the numbers that are left in the list.

**Variation**

Try Big Bad Wolf with the numbers 1–10 or the numbers 1–12. Can you find a winning strategy for any string of number?

From Helping with Math at Home: More Ideas for Parents. 2006. Portsmouth, NH: Heinemann.

# Tic-Tac-Toe Products

**You Need**

- two players
- two markers for the bottom row of factors (for example, paper clips)
- two sets of different markers for each player to cover each product (for example, pennies and nickels)
- Tic-Tac-Toe Products Game Sheet

**How to Play**

Player X selects two factors at the bottom of the page by placing markers on two of the numbers (1–9) to multiply. The product of the two numbers is covered.
Player O may move only one marker to make a new product and place their marker on the grid. The markers can both be on the same number.

Players alternate moving one marker at a time and continue placing their markers on the grid until a player has marked four products in a row. Then, the players should discuss their strategies.

This game is a great way to practice and build fluency in single digit multiplication. If a player needs support, a times table can be provided. Eventually a player will not need the table.

From Helping with Math at Home: More Ideas for Parents. 2006. Portsmouth, NH: Heinemann.

# Tic-Tac-Toe Products

| | | | | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 12 | 14 |
| 15 | 16 | 18 | 20 | 21 | 24 |
| 25 | 27 | 28 | 30 | 32 | 35 |
| 36 | 40 | 42 | 45 | 48 | 49 |
| 54 | 56 | 63 | 64 | 72 | 81 |

1 2 3 4 5 6 7 8 9

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# Tic-Tac-Toe Products 2

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 81 | 16 | 63 | 12 | 45 | 8 | 27 | 4 |
| 32 | 63 | 24 | 49 | 16 | 35 | 8 | 21 |
| 72 | 24 | 18 | 40 | 12 | 24 | 6 | 56 |
| 40 | 54 | 30 | 42 | 20 | 30 | 10 | 18 |
| 45 | 48 | 35 | 36 | 25 | 24 | 15 | 12 |
| 64 | 27 | 48 | 21 | 32 | 15 | 16 | 9 |
| 36 | 56 | 28 | 42 | 20 | 28 | 12 | 14 |
| 72 | 18 | 54 | 14 | 36 | 10 | 18 | 6 |

1 2 3 4 5 6 7 8 9

# Tic-Tac-Toe Sums

**You Need**

- two players
- two markers for the bottom row of addends (for example, paper clips)
- two sets of different markers for each player to cover each sum (for example, pennies and nickels)
- Tic-Tac-Toe Sums Game Sheet

**How to Play**

Player X selects two addends from the bottom of the page by placing markers on two of the numbers (0–12) to add. Placing a marker on the grid covers the sum.
Player O may move only one addend marker to make a new sum and cover it on the grid. The markers can both be on the same number.

Players alternate moving one marker at a time and continue placing their markers until a player has marked four sums in a row. Then, the players should discuss their strategies.

This game is a great way to practice and build fluency in single and double-digit addition.

# Tic-Tac-Toe Sums

| | | | | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 13 | 14 | 15 | 16 | 17 | 18 |
| 4 | 19 | 5 | 20 | 6 | 21 |

1 2 3 4 5 6 7 8 9 10 11 12

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# Get to Zero

**You Need**

- two or three players
- three dice
- paper and pencil

**How to Play**

First, on a sheet of paper, each player needs to write the players' names and the number 999 under them.

A player rolls the three dice, then arranges the three numbers (for example, 2, 3, 5) in some order (for example, 235, 352, 532, and so on) and subtracts that 3-digit number from 999. The other players also should subtract as a check.

The players take turns, rolling the die to make their special number and continuing to subtract.

The winner is the first player to reach 0, but they must get to 0 exactly.

At any time, a player may choose to roll only one or two dice, instead of three dice. If the only numbers a player can make are larger that his remaining score, the player loses his turn.

# Pig

**You Need**

- two or more players
- two dice

**How to Play**

The goal is to be the first player to reach 100. On your turn, roll the dice and determine the sum. You can either stop and record that sum or continue rolling and add the new sums together. Roll the pair of dice as many times as you choose. Again, when you decide to stop, record the current total for your score (and add it to your previous score).

But beware! If you roll a 1 on exactly one die, your turn ends and 0 is your recorded score for that turn. And, if you roll double 1s, your turn ends and your entire score is set back to 0.

# Shut the Box

**You need**

- one or more players
- two dice
- paper and pencil

**How to Play**

Write the numbers 1 through 9 in a horizontal row on the paper. Player 1 rolls the dice and calculates the sum of the two numbers. Player 1 then chooses to cross out numbers that have the same sum as what was calculated from the dice roll. If the numbers 7, 8 and 9 are all covered, player 1 may choose to roll one or two dice. If any of these numbers are still uncovered, the player must use both dice. Player 1 continues rolling dice, calculating the sum and crossing out numbers until they can no longer continue. If all numbers are crossed out the player say's "shut the box". If not all numbers are crossed out player 1 determines the sum of the numbers that are not crossed out and that is their score. If "shut the box" is achieved, player 1 records a score of "0".

Player two writes the numbers 1 through 9 and follows the same rules as player 1. The player with the lowest score wins.

**Variation**

Player 1 and 2 can choose to play 5 rounds, totaling their score at the end of each round. The player with the lowest total score wins the game.

# Race to One Hundred

**You Need**

- two players
- two dice
- two hundred's chart
- two markers
- pencil

**How to Play**

Each player takes turns rolling the two dice. Player 1 may choose to calculate the sum, difference, product or quotient of the two numbers displayed on the dice. Player 1 then moves their marker to that number on the chart. Player 2 takes their turn. For player 1's second turn they determine the sum, difference, product or quotient. This number is then added to the number under their marker and the marker is moved to this sum. Play ends when one player reaches one hundred. If a player rolls and computes a number that cannot be added to the last number without going over 100 they lose their turn. If player 1 reaches 100 first, player 2 finishes the round to see if they can tie the game.

**Variation**

Players can choose to include negative number achieved through taking the difference of two numbers where the number subtracted is greater than the starting number.

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# Race to One Hundred

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

# Prime Time

**You Need**

- two players
- one die
- two hundred's chart
- two different colored high lighters

**How to Play**

Player 1 and player 2 each pick a different colored high lighter. Player 1 rolls the die and colors in every multiple of that number on the hundred chart. If a player rolls a 1 they color all of the prime numbers. Player 2 rolls the die and colors every multiple of that number on the hundred chart. If a multiple is already colored the player skips that number and continues coloring any available multiple of their number to 100. If a player rolls and there are no multiples available for their number they lose their turn.

When the hundred chart is completely colored, each player should count the number of squares they have high lighted. The player with the greatest number of colored squares wins the game.

**Variation**

On your turn, skip count the squares you color by the number you rolled. For example, you roll a three so you count 3, 6, 9, etc. Record your final count as your score at the end of your turn. At the end of the game find the sum of your scores for each turn and record your total. The player with the highest score wins.

# Prime Time

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

# Bowl-a-Fact

**You Need**

- a partner
- one die
- paper and pencil

**How to Play**

Draw 10 circles in the same placement as bowling pins and write the numbers 1–10 in the circles as shown.

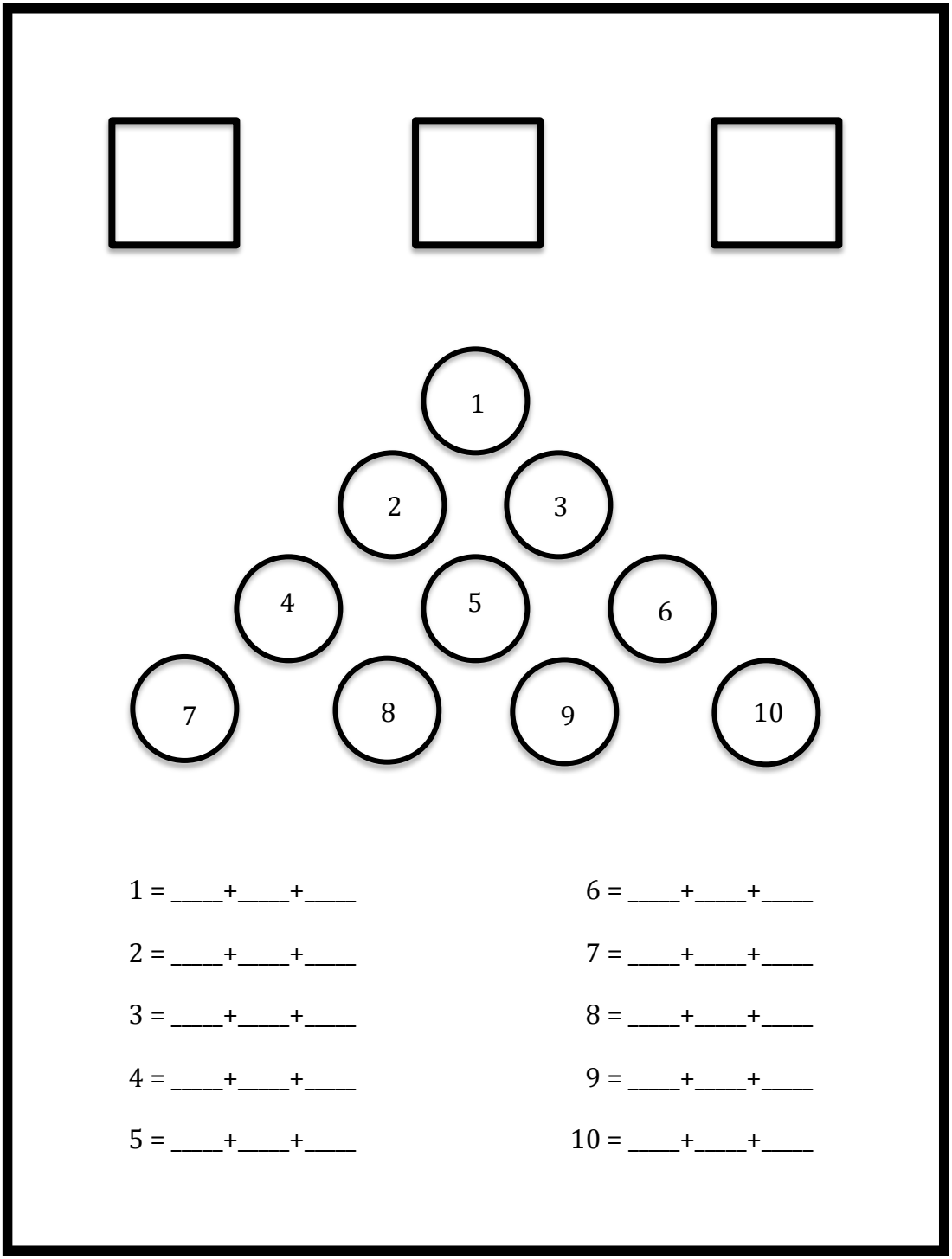
Roll a die three times and record the digits. Work with your partner to write number sentences (using only those three digits) that equal as many of the numbers 1 through 10 as possible. Record each number sentence and cross out the corresponding answer (that is, the bowling pin).

Can you eliminate each of the ten numbers for a strike? If not, roll the die three more times and use those new digits to produce number sentences. Can you get a spare?

**Variation**

Each player has their own set of 10 bowling pins. Each player rolls the die three times and records their numbers. Both players write number sentences to see who can knock down the most pins.

# Bowl-a-Fact




1 = ____+____+____

2 = ____+____+____

3 = ____+____+____

4 = ____+____+____

5 = ____+____+____

6 = ____+____+____

7 = ____+____+____

8 = ____+____+____

9 = ____+____+____

10 = ____+____+____

**Resources:**

| | |
|---|---|
| Conceptua Math | http://www.conceptuamath.com/ |
| Buzzmath | https://www.buzzmath.com/ |
| ST Math | http://web.stmath.com/ |

**Additional Games:**

| | |
|---|---|
| Set | http://www.setgame.com/set |
| Muggins! | http://www.mugginsmath.com/store.asp |
| Mancala | |

**Games & Apps:**

| | |
|---|---|
| Motion Math | http://motionmathgames.com/ |
| Dragon Box | http://www.dragonboxapp.com/ |
| Refraction | http://play.centerforgamescience.org/refraction/site/ |
| Wuzzit Trouble | http://innertubegames.net |
| Mancala | http://www.coolmath-games.com/0-mancala/ |