



# STANDARDS ALIGNMENT GUIDE

## Oklahoma State Standards Mathematics Grade 4

### INTRODUCTION

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Minecraft: Education Edition is an open-world game that promotes creativity, collaboration, and problem-solving in an immersive environment where the only limit is your imagination. As a game-based learning platform, Minecraft offers educators a transformative way to engage students and ignite their passion for learning. Teachers from around the world are using Minecraft in their classroom to successfully:

- Increase Student Engagement,
- Facilitate Classroom Collaboration
- Provide opportunities for Creative Exploration
- Connect Learning to Tangible Outcomes

This alignment guide will provide you with links to activities you can use in your classroom. These activities take full advantage of Minecraft's capabilities to complement and enhance classroom teaching. In this guide, you will find a list of applicable standards along with links and descriptions of Minecraft activities that focus on each objective.



For more information on using Minecraft in your classroom or to find additional education resources and training materials, visit us online.

[education.minecraft.net](http://education.minecraft.net)

## Number & Operations

STANDARD	DESCRIPTION	ACTIVITY
<b>4.N.1 Solve real-world and mathematical problems using multiplication and division.</b>		
4.N.1.1	Demonstrate fluency with multiplication and division facts with factors up to 12.	N/A
4.N.1.2	Use an understanding of place value to multiply or divide a number by 10, 100 and 1,000.	<a href="#">Decimal Dungeon – Part 1</a> Explore the Decimal Dungeon in a five-part unit on Numbers & Operations in Base Ten where students observe and build math models to solve problems. <a href="#">Survival City Making Roads</a> Students will design a prototype of a home. Then they use their knowledge of area and perimeter to find out how much and what kind of materials they will need to build it in survival.
4.N.1.3	Multiply 3-digit by 1-digit or a 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms.	<a href="#">Decimal Dungeon – Part 3</a> Explore the Decimal Dungeon in a five-part unit on Numbers & Operations in Base Ten where students observe and build math models to solve problems. <a href="#">Math Bed Wars 2!</a> Students build and explain Minecraft math models that show the inverse relationship between multiplication and division and add design purpose to their models by using them strategically in a mini-game. <a href="#">Multi Digit Multiplication</a> Students will solve and build area models of multi digit multiplication problems.
4.N.1.4	Estimate products of 3-digit by 1-digit or 2-digit by 2-digit whole numbers using rounding, benchmarks and place value to assess the reasonableness of results. Explore larger numbers using technology to investigate patterns.	N/A
4.N.1.5	Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction, and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of appropriate technology, and the context of the problem to assess the reasonableness of results.	<a href="#">Angler Arithmetic – Cool math!</a> Gamify Math Class or use Game-Based Learning and Project-Based Learning with a healthy dose of competition to engage students of all ages with FISHING <a href="#">Build a Two-Step Word Problem</a> Design and solve a two-step word problem by building it as scene in Minecraft. <a href="#">Two Step Word Problems</a> Design and solve a two-step word problem by building it as scene in Minecraft. <a href="#">Build a Word Problem</a> Students will use blocks in the game to solve multiplication or division world problems and then create a video to show understanding. <a href="#">Building Word Problems</a>

		<p>Build a scene in Minecraft that tells a story involving multiplication or division.</p> <p><a href="#">Minecraft Math Gladiators (MMG): Wither Battle Regrouping</a></p> <p>Students take part in a gameshow mini game. Inside they will regroup numbers in Minecraft and work together to fight the Wither Boss.</p> <p><a href="#">Multi Digit Multiplication</a></p> <p>Students will solve and build area models of multi digit multiplication problems.</p> <p><a href="#">Regrouping Video</a></p> <p>Students will be able to produce a video of them solving a three-digit addition and subtraction problem.</p> <p><a href="#">Decimal Dungeon – Part 3</a></p> <p>Explore the Decimal Dungeon in a five-part unit on Numbers &amp; Operations in Base Ten where students observe and build math models to solve problems.</p> <p><a href="#">Subtraction + Regrouping CTF</a></p> <p>Students will view and build math models of base 10 subtraction problems.</p>
4.N.1.6	Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide 3-digit dividend by 1-digit whole number divisors. (e.g., mental strategies, standard algorithms, partial quotients, repeated subtraction, the commutative, associative, and distributive properties).	<p><a href="#">Long Division in Minecraft</a></p> <p>Students will build long division math models in Minecraft and solve division problems on paper using the algorithm.</p>
4.N.1.7	Determine the unknown addend(s) or factor(s) in equivalent and non-equivalent expressions. (e.g., $5 + 6 = 4 + \square$ , $3 \times 8 < 3 \times \square$ ).	N/A
<b>4.N.2 Represent and compare fractions and decimals in real-world and mathematical situations; use place value to understand how decimals represent quantities.</b>		
4.N.2.1	Represent and rename equivalent fractions using fraction models (e.g. parts of a set, area models, fraction strips, number lines).	<p><a href="#">American Flag Three-Act Math</a></p> <p>Welcome to the world of Three-Act Mathematics in Minecraft! Ask Questions, Work Collaboratively, and Build Understanding.</p> <p><a href="#">Decimal/Fraction Garden</a></p> <p>Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden.</p> <p><a href="#">Fraction Stories</a></p> <p>Have students discover fractions in real life settings and have them communicate their findings through fraction stories.</p> <p><a href="#">Fraction World</a></p> <p>Based on a lesson plan submitted by another user, wold download available.</p> <p><a href="#">Capture the Flag!</a></p> <p>Students will be able to build and explain Minecraft math models that show the relationship between equivalent</p>

		<p>fractions. Then add design purpose to their models by using them strategically in a mini-game.</p> <p><a href="#">Fractions in Minecraft</a> Students will build math models that correspond to fraction operations and solve four to six problems per standard.</p> <p><a href="#">Fractions Steeplechase</a> Students will build and explain Minecraft math models that show fractions, improper fractions, and mixed numbers on number lines, then use number lines to create jumps for a horse race.</p> <p><a href="#">Measuring Landforms</a> Students will choose and name their own length of measurement. Then they will get into a world and measure different kinds land features.</p> <p><a href="#">Shapes From Shapes</a> Enter the Math Model Exhibition World, examine math models, and find the fraction for each piece. Next they will be asked to make a shape made out of smaller equal size pieces. Last they will recreate their partners work using different size pieces.</p>
4.N.2.2	Use benchmark fractions (0, 1, 1/4, 1/3, 1/2, 2/3, 3/4, 1) to locate additional fractions on a number line. Use models to order and compare whole numbers and fractions less than and greater than one using comparative language and symbols.	<p><a href="#">American Flag Three-Act Math</a> Welcome to the world of Three-Act Mathematics in Minecraft! Ask Questions, Work Collaboratively, and Build Understanding.</p> <p><a href="#">Decimal/Fraction Garden</a> Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden.</p> <p><a href="#">Fraction Stories</a> Have students discover fractions in real life settings and have them communicate their findings through fraction stories.</p> <p><a href="#">Fraction World</a> Based on a lesson plan submitted by another user, wold download available.</p> <p><a href="#">Capture the Flag!</a> Students will be able to build and explain Minecraft math models that show the relationship between equivalent fractions. Then add design purpose to their models by using them strategically in a mini-game.</p> <p><a href="#">Fractions in Minecraft</a> Students will build math models that correspond to fraction operations and solve four to six problems per standard.</p> <p><a href="#">Fraction Pixel Art</a> Using a pixel art editor (or graph paper) students design an artwork, then break down the colors into fractions, discuss number patterns and unit fractions, then build their designs in Minecraft.</p>

		<p><a href="#">Fractions Steeplechase</a> Students will build and explain Minecraft math models that show fractions, improper fractions, and mixed numbers on number lines, then use number lines to create jumps for a horse race.</p> <p><a href="#">Javelin Line Plots</a> Students will throw 10 tridents and track their distance on a line plot graph.</p> <p><a href="#">Shapes From Shapes</a> Enter the Math Model Exhibition World, examine math models, and find the fraction for each piece. Next they will be asked to make a shape made out of smaller equal size pieces. Last they will recreate their partners work using different size pieces.</p>
4.N.2.3	Decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations (e.g., $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ ).	N/A
4.N.2.4	Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations.	<p><a href="#">Fractions in Minecraft</a> Students will build math models that correspond to fraction operations and solve four to six problems per standard.</p>
4.N.2.5	Represent tenths and hundredths with concrete models, making connections between fractions and decimals.	<p><a href="#">American Flag Three-Act Math</a> Welcome to the world of Three-Act Mathematics in Minecraft! Ask Questions, Work Collaboratively, and Build Understanding.</p> <p><a href="#">Decimal/Fraction Garden</a> Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden.</p> <p><a href="#">Fraction Stories</a> Have students discover fractions in real life settings and have them communicate their findings through fraction stories.</p> <p><a href="#">Fraction World</a> Based on a lesson plan submitted by another user, wold download available.</p> <p><a href="#">Fractions in Minecraft</a> Students will build math models that correspond to fraction operations and solve four to six problems per standard.</p> <p><a href="#">Shapes From Shapes</a> Enter the Math Model Exhibition World, examine math models, and find the fraction for each piece. Next they will be asked to make a shape made out of smaller equal size pieces. Last they will recreate their partners work using different size pieces.</p>
4.N.2.6	Represent, read and write decimals up to at least the hundredths place in a variety of contexts including money.	<p><a href="#">Decimal/Fraction Garden</a> Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden.</p>

		<a href="#">Decimal Dungeon – Part 2</a> Explore the Decimal Dungeon in a five-part unit on Numbers & Operations in Base Ten where students observe and build math models to solve problems.
4.N.2.7	Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks.	<a href="#">Decimal/Fraction Garden</a> Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden. <a href="#">Exploring Systems of Measurement</a> Students will use Minecraft to reimagine system of measurement in ancient China. Can you use the materials available in Minecraft to create a system of measurement similar to those used by people living in ancient China. <a href="#">Fractions in Minecraft</a> Students will build math models that correspond to fraction operations and solve four to six problems per standard. <a href="#">Decimal Dungeon – Part 1</a> <a href="#">Decimal Dungeon – Part 2</a> Explore the Decimal Dungeon in a five-part unit on Numbers & Operations in Base Ten where students observe and build math models to solve problems.
4.N.2.8	Compare benchmark fractions ( $\frac{1}{4}$ , $\frac{1}{3}$ , $\frac{1}{2}$ , $\frac{2}{3}$ , $\frac{3}{4}$ ) and decimals (0.25, 0.50, 0.75) in real-world and mathematical situations.	<a href="#">Fraction Stories</a> Have students discover fractions in real life settings and have them communicate their findings through fraction stories.
<b>4.N.3 Determine the value of coins in order to solve monetary transactions.</b>		
4.N.3.1	Given a total cost (whole dollars up to \$20 or coins) and amount paid (whole dollars up to \$20 or coins), find the change required in a variety of ways. Limited to whole dollars up to \$20 or sets of coins.	<a href="#">Steve's New Home</a> Steve has just arrived in a new land and has no-where to live. All he has with him is £300 to buy resources and build a new home.

## Algebraic Reasoning & Algebra

STANDARD	DESCRIPTION	ACTIVITY
<b>4.A.1 Use multiple representations of patterns to solve real-world and mathematical problems</b>		
4.A.1.1	Create an input/output chart or table to represent or extend a numerical pattern.	<a href="#">American Flag Three-Act Math</a> Welcome to the world of Three-Act Mathematics in Minecraft! Ask Questions, Work Collaboratively, and Build Understanding. <a href="#">Patterns and Motifs</a> Students will understand patterns in history to identify information about how people lived, their beliefs, their surroundings and culture. <a href="#">Number Pattern Architecture</a> Students explore math models to learn about arithmetic patterns and create towers in architectural designs.

4.A.1.2	Describe the single operation rule for a pattern from an input/output table or function machine involving any operation of a whole number.	<a href="#">Number Patterns Algebra Architecture</a> Students complete and document problems in Minecraft to find growth patterns and missing numbers then use a number pattern to build an architectural structure.
4.A.1.3	Create growth patterns involving geometric shapes and define the single operation rule of the pattern.	<a href="#">American Flag Three-Act Math</a> Welcome to the world of Three-Act Mathematics in Minecraft! Ask Questions, Work Collaboratively, and Build Understanding. <a href="#">Patterns and Motifs</a> Students will understand patterns in history to identify information about how people lived, their beliefs, their surroundings and culture. <a href="#">Number Pattern Architecture</a> Students explore math models to learn about arithmetic patterns and create towers in architectural designs.
<b>4.A.2 Use multiplication and division with unknowns to create number sentences representing a given problem situation.</b>		
4.A.2.1	Use number sense, properties of multiplication and the relationship between multiplication and division to solve problems and find values for the unknowns represented by letters and symbols that make number sentences true.	<a href="#">Build a Word Problem</a> Students will use blocks in the game to solve multiplication or division world problems and then create a video to show understanding. <a href="#">Finding the Unknown</a> Students construct math models in Minecraft to determine missing variables.
4.A.2.2	Solve for unknowns in problems by solving open sentences (equations) and other problems involving addition, subtraction, multiplication, or division with whole numbers. Use real-world situations to represent number sentences and vice versa.	<a href="#">Breaking Numbers</a> Break down arrays and rebuild them in groups of equal numbers to understand how number families are the key to the multiplication and division. <a href="#">Build a Two-Step Word Problem</a> Design and solve a two-step word problem by building it as scene in Minecraft. <a href="#">Two Step Word Problems</a> Design and solve a two-step word problem by building it as scene in Minecraft. <a href="#">Build a Word Problem</a> Students will use blocks in the game to solve multiplication or division world problems and then create a video to show understanding. <a href="#">Building Word Problems</a> Build a scene in Minecraft that tells a story involving multiplication or division. <a href="#">Commutative Property Bed Wars</a> Build Minecraft math models that represent the commutative property of multiplication and use them in a mini-game. <a href="#">Finding the Unknown</a> Students construct math models in Minecraft to determine missing variables. <a href="#">Math Bed Wars 2!</a> Students build and explain Minecraft math models that show the inverse relationship between multiplication and

		<p>division and add design purpose to their models by using them strategically in a mini-game.</p> <p><a href="#">Repeated Addition with Parkour</a></p> <p>Students analyze math models and build their own parkour course in Minecraft to demonstrate understanding.</p>
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## Geometry & Measurement

STANDARD	DESCRIPTION	ACTIVITY
<b>4.GM.1 Name, describe, classify and construct polygons, and three-dimensional figures.</b>		
4.GM.1.1	Identify points, lines, line segments, rays, angles, endpoints, and parallel and perpendicular lines in various contexts.	<p><a href="#">Lines, Angles, and Architecture</a></p> <p>Students study lines and angles and use them to design a facade of a building.</p> <p><a href="#">Measuring Angles and Building Bridges</a></p> <p>Students will explore parallel lines, perpendicular lines, acute angles, and obtuse angles and use this knowledge to design facades for buildings.</p> <p><a href="#">Points, Lines, Rays, Segments, and Droppers</a></p> <p>Students will learn about 2D geometric figures by creating dropper games in Minecraft.</p>
4.GM.1.2	Describe, classify, and sketch quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms, and kites. Recognize quadrilaterals in various contexts.	<p><a href="#">Area Functions</a></p> <p>In this lesson, you will be challenged to write code to make quadrilaterals that you have made by hand in Minecraft.</p> <p><a href="#">Capture the Flag (Quadrilateral Capture the Flag)</a></p> <p>Compare, contrast and define different quadrilaterals. Build them on the map to play the capture the flag mini-game.</p> <p><a href="#">Classifying Quadrilaterals</a></p> <p>Define, build, and classify quadrilaterals then will peer review classmates' structures by labeling shapes with signs and documentation.</p> <p><a href="#">Lines, Angles, and Architecture</a></p> <p>Students study lines and angles and use them to design a facade of a building.</p>
4.GM.1.3	Given two three-dimensional shapes, identify similarities, and differences.	<p><a href="#">Cubic Units</a></p> <p>In this lesson, students will create shapes using code and then determine the number of cubic units that combined shapes would make.</p> <p><a href="#">Patterns and Motifs</a></p> <p>Students will understand patterns in history to identify information about how people lived, their beliefs, their surroundings and culture.</p>
<b>4.GM.2 Understand angle, length, and area as measurable attributes of real-world and mathematical objects. Use various tools to measure angles, length, area, and volume.</b>		
4.GM.2.1	Measure angles in geometric figures and real-world objects with a protractor or angle ruler.	<p><a href="#">Lines, Angles, and Architecture</a></p> <p>Students study lines and angles and use them to design a facade of a building.</p>



		<p><a href="#">Measuring Angles and Building Bridges</a></p> <p>Students will explore parallel lines, perpendicular lines, acute angles, and obtuse angles and use this knowledge to design facades for buildings.</p>
4.GM.2.2	Find the area of polygons that can be decomposed into rectangles.	<p><a href="#">Area and Perimeter Tasks</a></p> <p>Students will demonstrate their knowledge of area and perimeter in these performance tasks.</p> <p><a href="#">Area and Volume</a></p> <p>This project aims to enhance understanding in the concepts of area and volume in Grade 5 students.</p> <p><a href="#">Area Functions</a></p> <p>In this lesson, you will be challenged to write code to make quadrilaterals that you have made by hand in Minecraft.</p> <p><a href="#">Class Village</a></p> <p>Students will need to explore and find their way through the maze. Collecting resources that they can use when it's time to build their village.</p> <p><a href="#">Survival City Making homes Part 1</a></p> <p><a href="#">Survival City Making homes Part 2</a></p> <p><a href="#">Survival City Making homes Part 3</a></p> <p>Design a prototype of a home and find the area and perimeter.</p> <p><a href="#">Survival City Part 2</a></p> <p><a href="#">Survival City Part 3</a></p> <p>Students will design a prototype of a home. Then they use their knowledge of area and perimeter to find out how much and what kind of materials they will need to build it in survival.</p>
4.GM.2.3	Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms with whole-number edge lengths can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements such as $\text{cm}^3$ .	<p><a href="#">Area and Volume</a></p> <p>This project aims to enhance understanding in the concepts of area and volume in Grade 5 students.</p> <p><a href="#">Class Village</a></p> <p>Students will need to explore and find their way through the maze. Collecting resources that they can use when it's time to build their village.</p> <p><a href="#">Cubic Units</a></p> <p>In this lesson, students will create shapes using code and then determine the number of cubic units that combined shapes would make.</p> <p><a href="#">Exploring Systems of Measurement</a></p> <p>Students will use Minecraft to reimagine system of measurement in ancient China. Can you use the materials available in Minecraft to create a system of measurement similar to those used by people living in ancient China.</p> <p><a href="#">Volume World</a></p> <p>Students will learn about volume by filling sandboxes, creating equations, and finding the total amount of block in rectangular prisms.</p>

4.GM.2.4	Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or quarter-inch.	<a href="#">How Fast Can you Go?</a> Students will understand how challenging it was to walk for thousands of miles. <a href="#">Measuring Landforms</a> Students will choose and name their own length of measurement. Then they will get into a world and measure different kinds land features.
4.GM.2.5	Solve problems that deal with measurements of length, when to use liquid volumes, when to use mass, temperatures above zero and money using addition, subtraction, multiplication, or division as appropriate (customary and metric).	<a href="#">Exploring Systems of Measurement</a> Students will use Minecraft to reimagine system of measurement in ancient China. Can you use the materials available in Minecraft to create a system of measurement similar to those used by people living in ancient China. <a href="#">Steve's New Home</a> Steve has just arrived in a new land and has no-where to live. All he has with him is £300 to buy resources and build a new home. <a href="#">Measurement Mini Game</a> Students will play, examine, and create plans for a mini game that is 120 meters long and document their work.
<b>4.GM.3 Determine elapsed time and convert between units of time</b>		
4.GM.3.1	Determine elapsed time.	<a href="#">How Fast Can you Go?</a> Students will understand how challenging it was to walk for thousands of miles. <a href="#">Build a Clock!</a> Student will learn about how to read time by building a clock in Minecraft. They will do this by using command blocks with the testforblock and setblock commands. Then they will build a minecart ticker to start the clock and keep time.
4.GM.3.2	Solve problems involving the conversion of one measure of time to another.	N/A

## Data & Probability

STANDARD	DESCRIPTION	ACTIVITY
<b>4.D.1 Collect, organize, and analyze data.</b>		
4.D.1.1	Represent data on a frequency table or line plot marked with whole numbers and fractions using appropriate titles, labels, and units.	<a href="#">Javelin Line Plots</a> Students will throw 10 tridents and track their distance on a line plot graph. <a href="#">Javelin Line Plots-3</a> Students engage in a javelin throwing competition in Minecraft, plotting the distances and scores on line plot graphs in the game.
4.D.1.2	Use tables, bar graphs, timelines, and Venn diagrams to display data sets. The data may include benchmark fractions or decimals (1/4, 1/3, 1/2, 2/3, 3/4, 0.25, 0.50, 0.75).	<a href="#">Survival Olympics</a> Students will fish, mine ores, and fight monsters. Then they will make and compare their activities to create bar graphs.

4.D.1.3	Solve one- and two-step problems using data in whole number, decimal, or fraction form in a frequency table and line plot.	<a href="#">Javelin Line Plots</a> Students will throw 10 tridents and track their distance on a line plot graph. <a href="#">Javelin Line Plots-3</a> Students engage in a javelin throwing competition in Minecraft, plotting the distances and scores on line plot graphs in the game.
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