STANDARDS ALIGNMENT GUIDE

Common Core State Standards
Mathematics Grade 4

INTRODUCTION

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. Teacher 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

OPERATIONS AND ALGEBRAIC THINKING

STANDARD	DESCRIPTION	ACTIVITY
4.OA.A.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	Math Bed Wars! Students build arrays to show commutative properties of multiplication while constructing defenses as part of a Minecraft mini-game.
4.OA.A.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	Build a Word Problem Students write word problems then build a representation of their problem in Minecraft, including characters to help tell the story and models to prove their math.
4.OA.A.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Build a Two-Step Word Problem in Minecraft Students write word problems then build a representation of their problem in Minecraft, including characters to help tell the story and models to prove their math.
4.OA.B.4	Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	Finding Factors Students will use a 100 chart on paper as a map to build rectangles that show the factors for each number between 1 and 100.
4.OA.C.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way*.	Number Pattern Architecture Students explore math models to learn about arithmetic patterns then use these patterns to create towers in architectural designs.

NUMBERS & OPERATIONS IN BASE TEN

STANDARD	DESCRIPTION	ACTIVITY
4.NBT.A.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division*.	Minecraft Math Gladiators (MMG) Wither Battle Regrouping Students take part in a gameshow mini game. Inside they will regroup numbers in Minecraft and work together to fight the Wither Boss.

4.NBT.A.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Minecraft Math Gladiators (MMG): Base Ten Puzzles Students take part in a game show mini game. Inside they will learn to solve problems using base-ten numerals.
4.NBT.A.3	Use place value understanding to round multi-digit whole numbers to any place.	Minecraft Math Gladiators: Elytra Flight and Rounding Solve Base 10 rounding math problems and play Minecraft Minigames.
4.NBT.B.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Minecraft Math Gladiators: Addition with Regrouping Death Run Solve Base 10 rounding math problems and play Minecraft Minigames.
4.NBT.B.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Subtraction with Regrouping Capture the Flag Students will build math models of base 10 subtraction and use them as obstacles in a Capture the Flag game map.
4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Multi Digit Multiplication in Minecraft Bed Wars Students will solve and build area models of multi digit multiplication problems and use this knowledge to play a mini game.
4.NBT.B.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Long Division in Minecraft Students will build long division math models in Minecraft and solve division problems on paper using the algorithm.

NUMBERS & OPERATIONS - FRACTIONS

STANDARD	DESCRIPTION	ACTIVITY
4.NF.A.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Minecraft Math Superstars Creating Equivalent Fractions with the "Great 1" In this Minecraft world, students will build math models and answer questions pertaining to the 4th grade numbers and fractions standards.
4.NF.A.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that	Minecraft Math Superstars: Comparing Fractions

	comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	In this Minecraft world, students will build math models and answer questions pertaining to the 4th grade numbers and fractions standards.
4.NF.B.3	Understand a fraction *a/b* with *a* > 1 as a sum of fractions 1/*b*.	Minecraft Math Superstars: Adding and Subtracting Fractions with Like Denominators

In this Minecraft world, students will build math models and answer questions pertaining to the 4th grade numbers and fractions standards. |
| 4.NF.B.4 | Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. | Minecraft Math Superstars: Multiplying Whole Number to Fractions

In this Minecraft world, students will build math models and answer questions pertaining to the 4th grade numbers and fractions standards. |
| 4.NF.C.5 | Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.[2]*For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.* | Minecraft Math Superstars: Adding fractions with denominators of 10 and 100

In this Minecraft world, students will build math models and answer questions pertaining to the 4th grade numbers and fractions standards. |
| 4.NF.C.6 | Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram*. | Minecraft Math Superstars: Converting Decimals to Fractions

In this Minecraft world, students will build math models and answer questions pertaining to the 4th grade numbers and fractions standards. |
| 4.NF.C.7 | Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. | Minecraft Math Superstars: Comparing Decimals

In this Minecraft world, students will build math models and answer questions pertaining to the 4th grade numbers and fractions standards. |

MEASUREMENT & DATA

STANDARD	DESCRIPTION	ACTIVITY
4.MD.A.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table*	Measurement Mini Game

Students will play, examine, and create plans for a mini game that is 120 meters long. Also they will make tables that will show how many meters, centimeters, and kilometers each level of the game is, then they will test each others games. |

	for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), …	
4.MD.A.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	Measurement Mini Game Students will play, examine, and create plans for a mini game that is 120 meters long. Also they will make tables that will show how many meters, centimeters, and kilometers each level of the game is, then they will test each others games.
4.MD.A.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor*.	Survival City Making Homes Unit, Part 1 Survival City Making Homes Unit, Part 2 Survival City Making Homes Unit, Part 3 Design a prototype of a home and use area and perimeter to find out how many materials they will need to build it in survival.
4.MD.B.4	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection*.	Javelin Line Plots In this world students will learn about line plots by throwing tridents and tracking their distance on a line plot graph.
4.MD.C.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: A) An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. B) An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	Lines, Angles, and Architecture Students will explore parallel lines, perpendicular lines, acute angles, and obtuse angles and use this knowledge to design facades for buildings.
4.MD.C.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	Measuring Angles and Building Bridges Students will enter the world in pairs and work together to measure and build angles, add and subtract angles, and finally design a bridge built at an angle that a boat can sail under.
4.MD.C.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle	Measuring Angles and Building Bridges

| | measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure. | Students will enter the world in pairs and work together to measure and build angles, add and subtract angles, and finally design a bridge built at an angle that a boat can sail under. |

GEOMETRY

STANDARD	DESCRIPTION	ACTIVITY
4.G.A.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Points, Lines, Rays, Segments, and Droppers Students will learn about 2 dimensional geometric figures by creating dropper games in Minecraft.
4.G.A.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	Lines, Angles, and Architecture Students will explore parallel lines, perpendicular lines, acute angles, and obtuse angles and use this knowledge to design facades for buildings.
4.G.A.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	Symmetry in Pixel Art In Minecraft, students find lines of symmetry within pixel art, solve partially complete models, and finally design their own symmetrical pixel art with a partner.