STANDARDS ALIGNMENT GUIDE

Common Core State Standards
Mathematics Grade 5

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
5.OA.A.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	City Planning - Survival Roads 1 Students will work in groups to build a road that is 0.2 kilometers long. In order to do this they will need to write equations to figure how many blocks they will need to craft or gather and document their work.
5.OA.A.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	City Planning - Survival Roads 2 Students will work in groups to build a road that is 0.2 kilometers long. In order to do this they will need to write equations to figure how many blocks they will need to craft or gather and document their work.
5.OA.B.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.	City Planning - Survival Roads 3 Students will work in groups to build a road that is 0.2 kilometers long. In order to do this they will need to write equations to figure how many blocks they will need to craft or gather and document their work.

NUMBERS & OPERATIONS IN BASE TEN

STANDARD	DESCRIPTION	ACTIVITY
5.NBT.A.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	The Decimal Dungeon - Part 1 Explore the Decimal Dungeon in a five-part unit focused on Numbers & Operations in Base Ten where students observe and build math models to solve problems. Part 1 is focused around place value in multi-digit numbers.
5.NBT.A.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	The Decimal Dungeon - Part 1 Explore the Decimal Dungeon in a five-part unit focused on Numbers & Operations in Base Ten where students observe and build math models to solve problems. Part 1 is focused around place value in multi-digit numbers.
5.NBT.A.3	Read, write, and compare decimals to thousandths.	The Decimal Dungeon - Part 2 Explore the Decimal Dungeon in a five-part unit focused on Numbers & Operations in Base Ten where students observe and build math models to solve problems. Part 2 is focused around comparing and rounding decimal place values in multi-digit numbers.
5.NBT.A.4	Use place value understanding to round decimals to any place.	The Decimal Dungeon - Part 2 Explore the Decimal Dungeon in a five-part unit focused on Numbers & Operations in Base Ten where students observe and build math models to solve problems. Part 2 is focused around comparing

		and rounding decimal place values in multi-digit numbers.
5.NBT.B.5	Fluently multiply multi-digit whole numbers using the standard algorithm.	The Decimal Dungeon - Part 3 Explore the Decimal Dungeon in a five-part unit focused on Numbers & Operations in Base Ten where students observe and build math models to solve problems. Part 3 is focused around multiplication of multi-digit numbers.
5.NBT.B.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.	The Decimal Dungeon - Part 4 & 5 Explore the Decimal Dungeon in a five-part unit focused on Numbers & Operations in Base Ten where students observe and build math models to solve problems. Parts 4 &5 are focused around addition, subtraction, and division of decimals.
5.NBT.B.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	The Decimal Dungeon - Part 4 & 5 Explore the Decimal Dungeon in a five-part unit focused on Numbers & Operations in Base Ten where students observe and build math models to solve problems. Parts 4 &5 are focused around addition, subtraction, and division of decimals.

NUMBERS & OPERATIONS - FRACTIONS

STANDARD	DESCRIPTION	ACTIVITY
5.NF.A.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.	Fraction Farms Students explore math models of addition and subtraction problems with fractions then create a plan for a farm in Minecraft using what they've learned.
5.NF.A.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.	Fraction Farms Students explore math models of addition and subtraction problems with fractions then create a plan for a farm in Minecraft using what they've learned.
5.NF.B.3	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	Crafting Fractions Students will observe crafting recipes, write them as fractions, and use this knowledge to complete a task.
5.NF.B.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	Fractions and Multiplication Video Observe and build math models that show patterns when multiplying numbers greater than, less than, or

		equal to one. Create a video to demonstrate knowledge.
5.NF.B.5	Interpret multiplication as scaling (resizing)	[Fractions and Multiplication Video](#) Observe and build math models that show patterns when multiplying numbers greater than, less than, or equal to one. Create a video to demonstrate knowledge.
5.NF.B.5.A	Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	[Fractions and Multiplication Video](#) Observe and build math models that show patterns when multiplying numbers greater than, less than, or equal to one. Create a video to demonstrate knowledge.
5.NF.B.5.B	Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	[Fractions and Multiplication Video](#) Observe and build math models that show patterns when multiplying numbers greater than, less than, or equal to one. Create a video to demonstrate knowledge.
5.NF.B.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	[Fractions and Multiplication Video](#) Observe and build math models that show patterns when multiplying numbers greater than, less than, or equal to one. Create a video to demonstrate knowledge.
5.NF.B.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	[Crafting Fractions](#) Students will observe crafting recipes, write them as fractions, and use this knowledge to complete a task.

MEASUREMENT & DATA

STANDARD	DESCRIPTION	ACTIVITY
5.MD.A.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	[City Planning - Survival Roads 1](#) Students will work in groups to build a road that is 0.2 kilometers long. In order to do this they will need to write equations to figure how many blocks they will need to craft or gather and document their work.
5.MD.B.2	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots	[Javelin Line Plots](#) Students engage in a javelin throwing competition in Minecraft, plotting the distances and scores on line plot graphs in the game.

5.MD.C.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	Volume World: Part 1 To better understand volume, students will take part in three challenges within Minecraft: filling sandboxes with piles of sand, a maze where students create equations and find the volume of rectangular prisms, and last they will find the volume of irregular shapes.
5.MD.C.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	Volume World: Part 2 To better understand volume, students will take part in three challenges within Minecraft: filling sandboxes with piles of sand, a maze where students create equations and find the volume of rectangular prisms, and last they will find the volume of irregular shapes.
5.MD.C.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	Volume World: Part 3 To better understand volume, students will take part in three challenges within Minecraft: filling sandboxes with piles of sand, a maze where students create equations and find the volume of rectangular prisms, and last they will find the volume of irregular shapes.

GEOMETRY

STANDARD	DESCRIPTION	ACTIVITY
5.G.A.1	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	Coordinate Planes in Minecraft Students explore coordinate planes in a provided Minecraft world by plotting points and drawing lines with basic functions. An instructional worksheet and help videos are supplied to aide instruction.
5.G.A.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	Coordinate Planes in Minecraft Students explore coordinate planes in a provided Minecraft world by plotting points and drawing lines with basic functions. An instructional worksheet and help videos are supplied to aide instruction.
5.G.B.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	Classifying Quadrilaterals Define, build, and classify quadrilaterals then will peer review classmates' structures by labeling shapes with signs and documentation.

5.G.B.4	Classify two-dimensional figures in a hierarchy based on properties.	Classifying Quadrilaterals Define, build, and classify quadrilaterals then will peer review classmates' structures by labeling shapes with signs and documentation.