STANDARDS ALIGNMENT GUIDE

Nebraska 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

NUMBER

STANDARD	DESCRIPTION	ACTIVITY
MA.4.1.1 Numeric Relationships: Students will demonstrate, represent, and show relationships among fractions and decimals within the base-ten number system.		
MA.4.1.1.a	Read, write, and demonstrate multiple equivalent representations for whole numbers up to one million and decimals to the hundredths, using objects, visual representations, standard form, word form, and expanded notation.	Minecraft Math Gladiators (MMG): Base Ten Puzzles Students take part in a game show mini game. Inside they will learn how to solve problems using base-ten numerals.
MA.4.1.1.b	Recognize a digit in one place represents ten times what it represents in the place to its right and 1/10 what it represents in the place to its left.	Minecraft Math Gladiators (MMG): Elytra Flight Rounding Solve Base 10 rounding math problems by playing the Minecraft Math Gladiators: Elytra Flight and Rounding mini-game. 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. Decimal Dungeon – Part 1 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.
MA.4.1.1.c	Classify a number up to 100 as 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.
MA.4.1.1.d	Determine whether a given whole number up to 100 is a multiple of a given one-digit number.	N/A
MA.4.1.1.e	Determine factors of any whole number up to 100.	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.
MA.4.1.1.f	Compare whole numbers up to one million and decimals through the hundredths place using >, <, and = symbols, and visual representations.	Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard. Minecraft Math Gladiators (MMG): Base Ten Puzzles Students take part in a game show mini game. Inside they will learn how to solve problems using base-ten numerals. Decimal Dungeon – Part 2 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.
MA.4.1.1.g	Round a multi-digit whole number to any given place.	Minecraft Math Gladiators (MMG): Elytra Flight Rounding Solve Base 10 rounding math problems by playing the Minecraft Math Gladiators: Elytra Flight and Rounding mini-game.

		Round Number Video Students demonstrate rounding by breaking and placing blocks in Minecraft. They then set up their own problem, creating a video to explain their rounding.
MA.4.1.1.h	Use decimal notation for fractions with denominators of 10 or 100.	Decimal/Fraction Garden Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden. Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard.
MA.4.1.1.i	Generate and explain equivalent fractions by multiplying by an equivalent fraction of 1.	Decimal/Fraction Garden Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden. Capture the Flag! 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. Fractions Steeplechase 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. Measuring Landforms Students will choose and name their own length of measurement. Then they will get into a world and measure different kinds land features. Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard.
MA.4.1.1.j	Explain how to change a mixed number to a fraction and how to change a fraction to a mixed number.	N/A
MA.4.1.1.k	Compare and order fractions having unlike numerators and unlike denominators using visual representations (number line), comparison symbols and verbal reasoning (e.g., using benchmarks or common numerators or common denominators).	Fraction Stories Have students discover fractions in real life settings and have them communicate their findings through fraction stories. Capture the Flag! 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. Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard. Fraction Pixel Art

		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. Fractions Steeplechase 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. Javelin Line Plots Students will throw 10 tridents and track their distance on a line plot graph.
MA.4.1.1.l	Decompose a fraction into a sum of fractions with the same denominator in more than one way and record each decomposition with an equation and a visual representation.	N/A
MA 4.1.2 Operations: Students will demonstrate the meaning of addition and subtraction of whole numbers and fractions and compute accurately.		
MA 4.1.2.a	Add and subtract multi-digit numbers using the standard algorithm.	Angler Arithmetic – Cool math! 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. Minecraft Math Gladiators (MMG): Regrouping Obstacle Course Inside Minecraft Math Gladiators students will watch videos that will help them find strategies for regrouping. 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. Regrouping Video Students will be able to produce a video of them solving a three-digit addition and subtraction problem. Subtraction + Regrouping CTF Students will view and build math models of base 10 subtraction problems.
MA 4.1.2.b	Multiply a four-digit whole number by a one-digit whole number.	Math Bed Wars 2! 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.
MA 4.1.2.c	Multiply a two-digit whole number by a two-digit whole number using the standard algorithm.	Multi Digit Multiplication Students will solve and build area models of multi digit multiplication problems. Decimal Dungeon – Part 3 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.

MA 4.1.2.d	Divide up to a four-digit whole number by a one-digit divisor with and without a remainder.	Long Division in Minecraft Students will build long division math models in Minecraft and solve division problems on paper using the algorithm.
MA 4.1.2.e	Use drawings, words, and symbols to explain the meaning of addition and subtraction of fractions with like denominators.	Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard.
MA 4.1.2.f	Add and subtract fractions and mixed numbers with like denominators.	Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard.
MA 4.1.2.g	Multiply a fraction by a whole number.	Fraction Capture the Flag Solve fraction problems, peer review math models based on solutions and use the models to play a mini-game. Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard.
MA 4.1.2.h	Determine the reasonableness of whole number products and quotients in real-world problems using estimation, compatible numbers, mental computations, or other strategies.	Build a Two-Step Word Problem Design and solve a two-step word problem by building it as scene in Minecraft. Two Step Word Problems Design and solve a two-step word problem by building it as scene in Minecraft. Build a Word Problem Students will use blocks in the game to solve multiplication or division world problems and then create a video to show understanding. Building Word Problems Build a scene in Minecraft that tells a story involving multiplication or division.

ALGEBRA

STANDARD	DESCRIPTION	ACTIVITY
MA 4.2.1 Algebraic Relationships: Students will demonstrate, represent, and show relationships with expressions and equations.		
MA 4.2.1.a	Create a simple algebraic expression or equation using a variable for an unknown number to represent a math process (e.g., $3 + n = 15$, $81 \div n = 9$).	N/A
MA 4.2.1.b	Generate and analyze a number or shape pattern to follow a given rule, such as $y = 3x + 5$ is a rule to describe a relationship between two variables and can be used to find a second number when a first number is given.	American Flag Three-Act Math Welcome to the world of Three-Act Mathematics in Minecraft! Ask Questions, Work Collaboratively, and Build Understanding. Patterns and Motifs

		Students will understand patterns in history to identify information about how people lived, their beliefs, their surroundings and culture.
		Number Pattern Architecture
		Students explore math models to learn about arithmetic patterns and create towers in architectural designs.
MA 4.2.2 Algebraic Processes: Students will apply the operational properties when evaluating expressions and solving equations.		
MA 4.2.2.a	Solve one- and two-step problems which use any or all of the four basic operations and include the use of a letter to represent the unknown quantity.	Finding the Unknown Students construct math models in Minecraft to determine missing variables.
MA 4.2.3 Applications: Students will solve real-world problems involving equations with fractions.		
MA 4.2.3.a	Solve real-world problems involving multi-step equations comprised of whole numbers using the four operations, including interpreting remainders.	N/A
MA 4.2.3.b	Solve real-world problems involving addition and subtraction of fractions and mixed numbers with like denominators.	Exploring Systems of Measurement 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. Fraction Stories Have students discover fractions in real life settings and have them communicate their findings through fraction stories. Fraction World Based on a lesson plan submitted by another user, wold download available. Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard. Fraction Farm Explore math models of addition and subtraction problems with fractions then create a plan for a farm in Minecraft using what you've learned.

GEOMETRY

STANDARD	DESCRIPTION	ACTIVITY
MA 4.3.1 Characteristics: Students will identify and describe geometric characteristics and create two- and three-dimensional shapes.		
MA.4.3.1.a	Recognize angles as geometric shapes that are formed where two rays share a common endpoint.	Lines, Angles, and Architecture Students study lines and angles and use them to design a facade of a building. Measuring Angles and Building Bridges

		Students will explore parallel lines, perpendicular lines, acute angles, and obtuse angles and use this knowledge to design facades for buildings.
MA.4.3.1.b	Classify an angle as acute, obtuse, or right.	N/A
MA.4.3.1.c	Identify and draw points, lines, line segments, rays, angles, parallel lines, perpendicular lines, and intersecting lines, and recognize them in two-dimensional figures.	Lines, Angles, and Architecture Students study lines and angles and use them to design a facade of a building. Measuring Angles and Building Bridges Students will explore parallel lines, perpendicular lines, acute angles, and obtuse angles and use this knowledge to design facades for buildings. Points, Lines, Rays, Segments, and Droppers Students will learn about 2D geometric figures by creating dropper games in Minecraft.
MA.4.3.1.d	Classify two-dimensional shapes based on the presence or absence of parallel and perpendicular lines, or the presence or absence of specific angles.	Area Functions In this lesson, you will be challenged to write code to make quadrilaterals that you have made by hand in Minecraft. Patterns and Motifs Students will understand patterns in history to identify information about how people lived, their beliefs, their surroundings and culture. Capture the Flag (Quadrilateral Capture the Flag) Compare, contrast and define different quadrilaterals. Build them on the map to play the capture the flag mini-game. Classifying Quadrilaterals Define, build, and classify quadrilaterals then will peer review classmates' structures by labeling shapes with signs and documentation.
MA.4.3.1.e	Identify right triangles.	N/A
MA.4.3.1.f	Measure angles in whole number degrees using a protractor.	Lines, Angles, and Architecture Students study lines and angles and use them to design a facade of a building. Measuring Angles and Building Bridges Students will explore parallel lines, perpendicular lines, acute angles, and obtuse angles and use this knowledge to design facades for buildings.
MA.4.3.1.g	Sketch angles of a specified measure.	Lines, Angles, and Architecture Students study lines and angles and use them to design a facade of a building.
MA.4.3.1.h	Recognize and draw lines of symmetry in two-dimensional shapes.	Patterns and Motifs Students will understand patterns in history to identify information about how people lived, their beliefs, their surroundings and culture. Symmetry in Pixel Art Study and use lines of symmetry in pixel art. Design your own pixel art with a partner.
MA 4.3.2 Coordinate Geometry: Students will determine location, orientation, and relationships on the coordinate plane.		
No additional indicator(s) at this level. Mastery is expected at previous grade levels.		

MA 4.3.3 Measurement: Students will perform and compare measurements and apply formulas.		
MA.4.3.3.a	Apply perimeter and area formulas for rectangles.	Area and Perimeter Tasks Students will demonstrate their knowledge of area and perimeter in these performance tasks. Area and Volume This project aims to enhance understanding in the concepts of area and volume in Grade 5 students. Area Functions In this lesson, you will be challenged to write code to make quadrilaterals that you have made by hand in Minecraft. Class Village 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. Survival City Making homes Part 1 Survival City Making homes Part 2 Survival City Making homes Part 3 Design a prototype of a home and find the area and perimeter. Survival City Part 2 Survival City Part 3 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.
MA.4.3.3.b	Identify and use the appropriate tools, operations, and units of measurement, both customary and metric, to solve real-world problems involving time, length, weight, mass, capacity, and volume.	Exploring Systems of Measurement 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. Measurement Mini Game Students will play, examine, and create plans for a mini game that is 120 meters long and document their work.
MA.4.3.3.c	Generate simple conversions from a larger unit to a smaller unit within the customary and metric systems of measurement.	City Planning - Survival Roads Students will build roads that are 0.2 kilometers long and write equations to figure out how many blocks they will need. Liquid Measurements Students will use the fill command to fill up a liter measuring cup. Then they will design an aquarium that is 1000 blocks or 1,000,000 liters. They will build the aquarium with the fill command and make a coral reef. Measurement Mini Game Students will play, examine, and create plans for a mini game that is 120 meters long and document their work.

DATA

STANDARD	DESCRIPTION	ACTIVITY
MA 4.4.1 Representations: Students will create displays that represent data.		
MA.4.4.1.a	Represent data using line plots where the horizontal scale is marked off in appropriate units (e.g., whole numbers, halves, quarters, or eighths).	Javelin Line Plots Students will throw 10 tridents and track their distance on a line plot graph. Javelin Line Plots-3 Students engage in a javelin throwing competition in Minecraft, plotting the distances and scores on line plot graphs in the game.
MA 4.4.2 Analysis & Applications: Students will analyze data to address the situation.		
MA.4.4.2.a	Solve problems involving addition or subtraction of fractions using information presented in line plots.	Javelin Line Plots Students will throw 10 tridents and track their distance on a line plot graph. Javelin Line Plots-3 Students engage in a javelin throwing competition in Minecraft, plotting the distances and scores on line plot graphs in the game.
MA 4.4.3 Probability: Students will interpret and apply concepts of probability.		
No additional indicator(s) at this level.		