



STANDARDS ALIGNMENT GUIDE

Minnesota 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. 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

NUMBER & OPERATION

STANDARD	DESCRIPTION	ACTIVITY
Demonstrate mastery of multiplication and division basic facts; multiple multi-digit numbers; solve real-world and mathematical problems using arithmetic.		
4.1.1.1	Demonstrate fluency with multiplication and division facts.	N/A
4.1.1.2	Use an understanding of place value to multiply a number by 10, 100 and 1000.	Survival City Making Roads 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. 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.
4.1.1.3	Multiply multi-digit numbers, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms.	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.
4.1.1.4	Estimate products and quotients of multi-digit whole numbers by using rounding, benchmarks and place value to assess the reasonableness of results.	N/A
4.1.1.5	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 technology, and the context of the problem to assess the reasonableness of results.	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.
4.1.1.6	Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide multidigit whole numbers by one- or two-digit numbers. Strategies may include mental strategies, partial quotients, the commutative, associative, and distributive properties and repeated subtraction.	Long Division in Minecraft Students will build long division math models in Minecraft and solve division problems on paper using the algorithm. Decimal Dungeon – Part 5 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.

Represent and compare fractions and decimals in real-world and mathematical situations; use place value to understand how decimals represent quantities.		
4.1.2.1	Represent equivalent fractions using fraction models such as parts of a set, fraction circles, fraction strips, number lines and other manipulatives. Use the models to determine equivalent fractions.	<p>Decimal/Fraction Garden Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard.</p>
4.1.2.2	Locate fractions on a number line. Use models to order and compare whole numbers and fractions, including mixed numbers and improper fractions.	<p>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.</p> <p>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.</p> <p>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.</p> <p>Javelin Line Plots Students will throw 10 tridents and track their distance on a line plot graph.</p> <p>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.</p> <p>Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard.</p> <p>Fraction Stories</p>

		Have students discover fractions in real life settings and have them communicate their findings through fraction stories.
4.1.2.3	Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations. Develop a rule for 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.
4.1.2.4	Read and write decimals with words and symbols; use place value to describe decimals in terms of thousands, hundreds, tens, ones, tenths, hundredths and thousandths.	Decimal Dungeon – Part 1 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. Decimal/Fraction Garden Students will demonstrate understanding a fractional and decimal relationships using a 10 x 10 garden.
4.1.2.5	Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks.	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. Fractions in Minecraft Students will build math models that correspond to fraction operations and solve four to six problems per standard. 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.
4.1.2.6	Read and write tenths and hundredths in decimal and fraction notations using words and symbols; know the fraction and decimal equivalents for halves and fourths.	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. 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.
4.1.2.7	Round decimals to the nearest tenth.	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.

Algebra

STANDARD	DESCRIPTION	ACTIVITY
Use input-output rules, tables and charts to represent patterns and relationships and to solve real-world and mathematical problems.		
4.2.1.1	Create and use input-output rules involving addition, subtraction, multiplication and division to solve problems in various contexts. Record the inputs and outputs in a chart or table.	N/A
User number sentences involving multiplication, division and unknowns to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences.		
4.2.2.1	Understand how to interpret number sentences involving multiplication, division and unknowns. Use real-world situations involving multiplication or division to represent number sentences.	<p>Breaking Numbers Break down arrays and rebuild them in groups of equal numbers to understand how number families are the key to the multiplication and division.</p> <p>Build a Two-Step Word Problem Design and solve a two-step word problem by building it as scene in Minecraft.</p> <p>Finding the Unknown Students construct math models in Minecraft to determine missing variables.</p> <p>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.</p> <p>Commutative Property Bed Wars Build Minecraft math models that represent the commutative property of multiplication and use them in a mini-game.</p> <p>Repeated Addition with Parkour Students analyze math models and build their own parkour course in Minecraft to demonstrate understanding.</p>
4.2.2.2	Use multiplication, division and unknowns to represent a given problem situation using a number sentence. Use number sense, properties of multiplication, and the relationship between multiplication and division to find values for the unknowns that make the number sentences true.	<p>Finding the Unknown Students construct math models in Minecraft to determine missing variables.</p>

GEOMETRY & MEASUREMENT

STANDARD	DESCRIPTION	ACTIVITY
Name, describe, classify and sketch polygons.		
4.3.1.1	Describe, classify and sketch triangles, including equilateral, right, obtuse and acute triangles. Recognize triangles in various contexts.	N/A
4.3.1.2	Describe, classify and draw quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms and kites. Recognize quadrilaterals in various contexts.	<p>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.</p> <p>Classifying Quadrilaterals Define, build, and classify quadrilaterals then will peer review classmates' structures by labeling shapes with signs and documentation.</p> <p>Lines, Angles, and Architecture Students study lines and angles and use them to design a facade of a building.</p>
Understand angle and area as measurable attributes of real-world and mathematical objects. Use various tools to measure angles and areas.		
4.3.2.1	Measure angles in geometric figures and real-world objects with a protractor or angle ruler.	<p>Lines, Angles, and Architecture Students study lines and angles and use them to design a facade of a building.</p> <p>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.</p>
4.3.2.2	Compare angles according to size. Classify angles as acute, right and obtuse.	N/A
4.3.2.3	Understand that the area of a two-dimensional figure can be found by counting the total number of same size square units that cover a shape without gaps or overlaps. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into one unit by one unit squares and viewing these as grouped into rows and columns.	<p>Area Functions In this lesson, you will be challenged to write code to make quadrilaterals that you have made by hand in Minecraft.</p> <p>Area and Perimeter Tasks Students will demonstrate their knowledge of area and perimeter in these performance tasks.</p> <p>Area and Volume This project aims to enhance understanding in the concepts of area and volume in Grade 5 students.</p> <p>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.</p> <p>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.</p>

		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. 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 Making Roads 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. 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.
4.3.2.4	Find the areas of geometric figures and real-world objects that can be divided into rectangular shapes. Use square units to label area measurements.	N/A
Use translations, reflections and rotations to establish congruency and understand symmetries.		
4.3.3.1	Apply translations (slides) to figures.	N/A
4.3.3.2	Apply reflections (flips) to figures by reflecting over vertical or horizontal lines and relate reflections to lines of symmetry.	N/A
4.3.3.3	Apply rotations (turns) of 90° clockwise or counterclockwise.	N/A
4.3.3.4	Recognize that translations, reflections and rotations preserve congruency and use them to show that two figures are congruent.	N/A

DATA ANALYSIS

STANDARD	DESCRIPTION	ACTIVITY
Collect, organize, display and interpret data, including data collected over a period of time and data represented by fractions and decimals.		
4.4.1.1	Use tables, bar graphs, timelines and Venn diagrams to display data sets. The data may include fractions or decimals. Understand that spreadsheet tables and graphs can be used to display data.	Survival Olympics Students will fish, mine ores, and fight monsters. Then they will make and compare their activities to create bar graphs.