

Unit 3: Geometry, Measurement, and Data

Content Area: **Mathematics**
Course(s):
Time Period: **Generic Time Period**
Length: **8 weeks**
Status: **Published**

Standards

MA.4.4.G.A	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
MA.4.4.MD.C.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
MA.4.4.G.A.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
MA.4.4.MD.C.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle 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.
TECH.8.1.5	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.C	Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E	Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F	Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.5.E	Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.
MA.4.4.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.
LA.4.W.4.10	Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

MA.4.4.MD	Measurement and Data
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
MA.4.4.G	Geometry
LA.4.RI.4.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
MA.4.4.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.
MA.4.4.MD.A.1	Know relative sizes of measurement units within one system of units including km, m, cm, mm; 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.
LA.4.SL.4.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
LA.4.SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
CRP.K-12.CRP11	Use technology to enhance productivity. 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 for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36),...
LA.4.SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
LA.4.SL.4.1.C	Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
LA.4.L.4.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
LA.4.SL.4.1.D	Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.
MA.4.4.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.

MA.4.4.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.

CRP.K-12.CRP4.1

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others’ time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CAEP.9.2.4.A.4

Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

LA.4.SL.4.3

Identify the reasons and evidence a speaker provides to support particular points.

MA.4.4.MD.A.3

Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

LA.4.L.4.4

Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

CRP.K-12.CRP8

Utilize critical thinking to make sense of problems and persevere in solving them.

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.

LA.4.SL.4.6

Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation.

LA.4.L.4.1

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

MA.4.4.MD.C

Geometric measurement: understand concepts of angle and measure angles.

MA.4.4.MD.C.5

Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

MA.4.4.MD.C.5a

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 $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.

MA.4.4.MD.C.5b

An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

CRP.K-12.CRP1

Act as a responsible and contributing citizen and employee.

CRP.K-12.CRP6

Demonstrate creativity and innovation.

CRP.K-12.CRP6.1

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and

suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

Learning Objectives

Unit Focus:

- Classify and analyze geometric figures based on their properties.
- Understand concepts of angles and angle measures.
- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

Critical Area:

Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Chapter Ten: Lesson Learning Objectives

- 10.1 Identify and draw points, lines, line segments, rays, and angles.
- 10.2 Classify triangles by the size of their angles.
- 10.3 Identify and draw parallel lines and perpendicular lines.
- 10.4 Sort and classify quadrilaterals.
- 10.5 Determine whether a figure has a line of symmetry.
- 10.6 Identify and draw lines of symmetry in two-dimensional figures.
- 10.7 Use the strategy *act it out* to solve pattern problems.

Chapter Eleven: Lesson Learning Objectives

- 11.1 Relate angles and fractional parts of a circle.
- 11.2 Relate degrees to fractional parts of a circle by understanding that an angle that measures n° turns through

$n/360$ of a circle.

11.3 Use a protractor to measure an angle and draw an angle with a given measure.

11.4 Determine the measure of an angle separated into parts.

11.5 Use the strategy *draw a diagram* to solve angle measurement problems.

Chapter Twelve: Lesson Learning Objectives

12.1 Use benchmarks to understand the relative sizes of measurement units.

12.2 Use models to compare customary units of length.

12.3 Use models to compare customary units of weight.

12.4 Use models to compare customary units of liquid volume.

12.5 Make and interpret line plots with fractional data.

12.6 Use models to compare metric units of length.

12.7 Compare metric units of mass and liquid volume.

12.8 Use models to compare units of time.

12.9 Use the strategy *draw a diagram* to solve elapsed time problems.

12.10 Solve problems involving mixed measures.

12.11 Use patterns to write number pairs for measurement units.

Chapter Thirteen: Lesson Learning Objectives

13.1 Use a formula to find the perimeter of a rectangle.

13.2 Use a formula to find the area of a rectangle.

13.3 Find the area of combined rectangles.

13.4 Given perimeter or area, find the unknown measure of a side of a rectangle.

13.5 Use the strategy *solve a simpler problem* to solve area problems.

Essential Questions

Chapter Ten Essential Question:

How can you draw and identify lines and angles, and how can you classify shapes?

Lesson Essential Questions:

10.1 How can you identify and draw points, lines, line segments, rays, and angles?

10.2 How can you classify triangles by the size of their angles?

10.3 How can you identify and draw parallel lines and perpendicular lines?

10.4 How can you sort and classify quadrilaterals?

10.5 How can you check if a shape has line symmetry?

10.6 How do you find lines of symmetry?

10.7 How can you use the strategy *act it out* to solve pattern problems?

Chapter Eleven Essential Question:

How can you measure angles and solve problems involving angle measures?

Lesson Essential Questions:

11.1 How can you relate angles and fractional parts of a circle?

11.2 How are degrees related to fractional parts of a circle?

11.3 How can you use a protractor to measure and draw angles?

11.4 How can you determine the measure of an angle separated into parts?

11.5 How can you use the strategy *draw a diagram* to solve angle measurement problems?

Chapter Twelve Essential Question:

How can you use relative sizes of measurements to solve problems and to generate measurement tables that show a relationship?

Lesson Essential Questions:

12.1 How can you use benchmarks to understand the relative sizes of measurement units?

12.2 How can you use models to compare customary units of length?

12.3 How can you use models to compare customary units of weight?

12.4 How can you use models to compare customary units of liquid volume.

12.5 How can you make and interpret line plots iwth fractional data?

12.6 How can you use models to compare metric units of length?

12.7 How can you compare metric units of mass and liquid volume?

12.8 How can you use models to compare units of time?

12.9 How can you use the strategy *draw a diagram* to solve elapsed time problems?

12.10 How can you solve problems involving mixed measures?

12.11 How can you use patterns to write number pairs for measurement units?

Chapter Thirteen Essential Question:

How can you use formulas for perimeter and area to solve problems?

Lesson Essential Questions:

- 13.1 How can you use a formula to find the perimeter of a rectangle?
- 13.2 How can you use a formula to find the area of a rectangle?
- 13.3 How can you find the area of combined rectangles?
- 13.4 How can you find an unknown measure of a rectangle given its area or perimeter?
- 13.5 How can you use the strategy *solve a simpler problem* to solve area problems?

Materials

Go Math Digital Resources:

iStudent Edition

eTeacher Edition

Personal Math Trainer

Math on the Spot Video

Real World Video

Animated Math Models

iTools

HMH Mega Math

iPad

Computer

Go Math Print Resources:

Student Edition

Practice and Homework (in the Student Edition)

Reteach (in the Chapter Resources)

Enrich (in the Chapter Resources)

Grab-and-Go Centers Kit

Achieve the Core:

<http://achievethecore.org/page/2853/go-math-k-5-guidance-documents>

Activities

Geometry, Measurement, and Data

Unit Project: Landscape Architects

Chapter Ten: Two-Dimensional Figures

Vocabulary Game: Going to a Botanical Garden

Lesson 1: Lines, Rays, and Angles

Lesson 2: Classify Triangles by Angles

Lesson 3: Parallel Lines and Perpendicular Lines

Lesson 4: Classify Quadrilaterals

Mid-Chapter Checkpoint

Lesson 5: Line Symmetry

Lesson 6: Find and Draw Lines of Symmetry

Lesson 7: Problem Solving - Shape Patterns

Chapter Eleven: Angles

Vocabulary Game: Picture It

Lesson 1: Investigate - Angles and Fractional Parts of a Circle

Lesson 2: Degrees

Lesson 3: Measure and Draw Angles

Mid-Chapter Checkpoint

Lesson 4: Investigate - Join and Separate Angles

Lesson 5: Problem Solving - Unknown Angle Measures

Chapter Twelve: Relative Sizes of Measurement Units

Vocabulary Game: Bingo

Lesson 1: Measurement Benchmarks

Lesson 2: Customary Units of Length

Lesson 3: Customary Units of Weight

Lesson 4: Customary Units of Liquid Volume

Lesson 5: Line Plots

Mid-Chapter Checkpoint

Lesson 6: Investigate - Metric Units of Length

Lesson 7: Metric Units of Mass and Liquid Volume

Lesson 8: Units of Time

Lesson 9: Problem Solving - Elapsed Time

Lesson 10: Mixed Measures

Lesson 11: Algebra - Patterns in Measurement Units

Chapter Thirteen: Algebra - Perimeter and Area

Vocabulary Game: Guess the Word

Lesson 1: Perimeter

Lesson 2: Area

Lesson 3: Area of Combined Rectangles

Mid-Chapter Checkpoint

Lesson 4: Find Unknown Measures

Lesson 5: Problem Solving - Find the Area

Other Activities:

[4.G.A.1 The Geometry of Letters](#)

[4.G.A.1 What's the Point?](#)

[4.G.A.2 Are these right?](#)

[4.G.A.2 Defining Attributes of Rectangles and Parallelograms](#)

[4.G.A.3 Finding Lines of Symmetry](#)

[4.G.A.3 Lines of symmetry for triangles](#)

[4.MD.C.6, 4.MD.C.7, 4.G.A.1 Measuring Angles](#)

[4.MD.C.7, 4.G.A.2 Finding an unknown angle](#)

[4.OA.A.3 Carnival Tickets](#)

Assessment

MAP Assessment

Diagnostic:

Show What You Know

Digital Personal Math Trainer

Formative:

Lesson Quick Check

Mid-Chapter Checkpoint

Digital Personal Math Trainer

- Assessment Animation
- Assessment Video

Summative:

Chapter Review/Test

Chapter Test

Performance Assessment Task

Digital Personal Math Trainer

Fact Fluency

Go Math Resources for Fact Family

- Fluency Standard Lessons (Student Edition)
- Fluency Builder (Teacher Edition)

- Strategies and Practice for Skills and Facts Fluency - Intermediate G3-6
- HMH Mega Math
- Personal Math Trainer: Standards Quizzes
- Animated Math Models

Other Resources for Fact Fluency

- Mad Minute
- Rocket Math
- FASTT Math
- Flash Cards

MA.4.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Accommodations and Modifications

Interactive Student Edition

Personal Math Trainer (Adaptive assessment and intervention system)

Leveled Quizzes, Tests, and Performance Tasks

Grab & Go Differentiated Centers

Intensive Intervention Resource

Strategic Intervention Resource

Reteach Activities

RTI Tiered Resources and Activities

Math on the Spot Videos

Others/ Notes

Standards for Mathematical Practice

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.3 Construct viable arguments and critique the reasoning of others.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

MP.6 Attend to precision.

MP.7 Look for and make use of structure.

MP.8 Look for and express regularity in repeated reasoning.