Gr5 Unit 6 Investigations in Measurement; Decimal Multiplication and Division

Content Area: **Math**
Course(s):
Time Period: **Trimester 2**
Length: **4**
Status: **Published**

Course Pacing Guide

In this unit, students apply their understanding of place value to multiply and divide decimals by powers of 10. They investigate how patterns in used to convert powers of 10 can be used to convert measurements in metric units, learn how line plots can be used to organize and analyze measurement data, and explore of method of finding volumes of figures that are not rectangular prisms. Students also extend whole-number methods to multiply and divide decimal.

Unit	MP/Trimester	Weeks
Unit 1 Area and Volume	1	3
Unit 2 Whole Number Place Value and Operations	1	4
Unit 3 Fraction Concepts Addition and Subtraction	1	4
Unit 4 Decimal Concepts and Coordinate Grids	2	4
Unit 5 Operations with Fractions	2	4
Unit 6 Investigations in Measurement;Decimal multiplication and Division	**2**	**4**
Unit 7 Multiplication of Mixed Numbers;Geometry;Graphs	3	4
Unit 8 Applications of Measurement, Computation, and Graphing	3	4

6.1

Use a calculator to multiply and divide decimals by powers of 10.
6.2
Exponent Ball – to practice dividing and multiplying decimals by powers of 10.

6.3
Apply understanding of multiplication and division by powers of 10.
6.4
Create line plots to display measurement data in fractions of a unit.
6.5
Use information presented in line plots to solve problems.

6.6
Apply knowledge of volume concepts to calculate volume of a building.
6.7
Use displacement to measure volumes of objects.
6.8
Use estimation and number sense to predict the relative size of decimal products and quotients.
6.9
Learn two strategies for solving decimal multiplication problems.

6.10

Solve a multistep number stories using decimals and explain why answers make sense.
6.11
Discuss how estimation can used to place the decimal point when dividing decimals by whole numbers.
6.12
Create equivalent problems to solve division problems involving decimal dividends and divisors.
6.13
Collect reaction time data and create a line plot.

Unit Overview

Theme:

Investigations in Measurement Decimal Multiplication and Division

Conceptual Lens:

Refer to page 542 in teacher manual for mathematical content and topics.

Students will know:

Multiply and divide decimals by powers of 10.

Convert between measurement units in the metric system.

Represent fractional data on line plots.

Answer questions about data on line plots.

Estimate answers to decimal multiplication and division problems.

Multiply decimals Divide decimals.

Enduring Understandings

I can remove zeros from the factors to compute multiples.
The key words to look for when I am choosing multiplication are: times, of, twice, and product.

When I divide whole numbers, multiplication and division are inverse operations.

When I divide, I can user the result to write an equation that represents the dividend.

I can use models to understand decimals.

I can use a pattern to multiply a decimal number by 10, 100 or 1,000.

I can multiply decimals by doing the same process as whole numbers and then finding the total number of decimal places in the factors.

Finally, I can count that many places from the right n the product to place the decimal point.

I can use the relationship between multiplication and division to understand decimal division.

A line plot shows how closely grouped together or how spread out over a range the data are.

I can use line plots to solve problems in possibly more than one operation.

Essential Questions

Essential Questions:

How can I use multiples?

What are the key words to look for when I choose multiplication to solve a problem?

How can I divide whole numbers?

How can I add or subtract decimals?

How do I multiply decimals?

How do I divide decimals?

How can I apply what I have learned about measurement? What are different ways to display data?

How can data be used to answer questions? Why is it important to organize data?

How are coordinates used to find a point a point on a plane?

Guiding Questions:

Why it is important to know the value of each digit?

Why do we compare numbers?

What do commas and decimal points mean in numbers?

When might you add, subtract or multiply decimal numbers in real life?

What do numbers on the left hand side of the decimal point represent?

New Jersey Student Learning Standards (No CCS)

MA.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.
MA.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.
MA.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.
MA.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.
MA.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.
MA.5.MD.C.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
MA.5.MD.C.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
MA.5.MD.C.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

Amistad Integration

Amistad Integration Document

The Girl With a Mind for Math: The Story of Raye Montague by Julia Finley Mosca

SOC.5-8.1.3.1	Compare and contrast differing interpretations of current and historical events.
SOC.5-8.1.3.2	Assess the credibility of sources by identifying bias and prejudice in documents, media, and computer-generated information.

Holocaust/Genocide Education

- Teach district mandated diversity lessons
- Incorporate Responsive Classroom Program into classroom community

SOC.5-8.1.1.1	Construct timelines of the events occurring during major eras including comparative events in world history for the different civilizations.
SOC.5-8.1.1.2	Explain how major events are related to one another in time.

Interdisciplinary Connections

Lesson 6.1 – Science

Multiplying and dividing by powers of 10. TM 555, Activity Card 71. Students explore the number of times a human heart beats and illustrates finding in exponential notation.

Lesson 6.2 – Science

Comparing Animal Weights TM 563, MM 214 Using a variety of animal weights, students practice multiplication and division by evaluating scientific data.

Lesson 6.3 – Science

Converting Distance to the Moon. TM 569, MM 216. Students practice converting metric units by utilizing scientific data about the location and distance of planets.

Lesson 6.5 – Physical Education

Comparing Diving Scores, TM 581, MM 222-223 Students utilize data of competitive divers to extend work on creating and analyzing line plots.

Lesson 6.10 – ELA Fundraising Activity – TM 610-617

Students write an open response on the Fundraising Activity. Peers edit and review responses. Revisions are

made to the open response as necessary.

Technology Standards

Digital Resources:

https://www.mathplayground.com/grade_5_games.html

https://www.khanacademy.org/math/cc-fifth-grade-math/5th-volume

http://newtech.coe.uh.edu/

TECH.8.1.5.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.5.A.4	Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
TECH.8.1.5.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.5.C.CS4	Contribute to project teams to produce original works or solve problems
TECH.8.1.5.F.CS1	Identify and define authentic problems and significant questions for investigation.

21st Century Themes/Careers

Through the integration and interdisciplinary connections in each unit, students will develop the understanding that math relates to the individual and global society.

Activity cards and enrichment activities provide a variety of options for developing computational strategies.

The following site provides access to real life collaborative math projects.

http://mathwire.com/problemsolving/probs58.html

CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters ® and determine attributes of career success.
CAEP.9.2.8.B.4	Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

Financial Literacy Integration

Making a Difference

Essential Question: How can sharing with others improve our community and the lives of people throughout the world?

Objective: Create colorful, persuasive posters that entice others to support a charity of each student's choice.

http://www.scholastic.com/browse/article.jsp?id=3758472

9.1.8.A.1 Explain the meaning and purposes of taxes and tax deductions and why fees for various benefits (e.g., medical benefits) are taken out of pay.

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income. 9.1.8.A.3 Differentiate among ways that workers can improve earning power through the acquisition of new knowledge and skills.

9.1.8.A.4 Relate earning power to quality of life across cultures.

9.1.8.A.5 Relate how the demand for certain skills determines an individual's earning power.

9.1.8.A.6 Explain how income affects spending decisions.

9.1.8.B.1 Distinguish among cash, check, credit card, and debit card.

9.1.8.B.2 Construct a simple personal savings and spending plan based on various sources of income.

9.1.8.B.3 Justify the concept of "paying yourself first" as a financial savings strategy.

9.1.8.B.4 Relate the concept of deferred gratification to [investment,] meeting financial goals, and building wealth.

9.1.8.B.5 Explain the effect of the economy on personal income, individual and family security, and consumer decisions.

9.1.8.B.6 Evaluate the relationship of cultural traditions and historical influences on financial practice.

9.1.8.B.9 Determine the most appropriate use of various financial products and services (e.g., ATM, debit cards, credit cards, check books).

9.1.8.B.10 Justify safeguarding personal information when using credit cards, banking electronically, or filing forms.

9.1.8.D.5 Explain the economic principle of supply and demand.

9.1.8.E.1 Explain what it means to be a responsible consumer and the factors to consider when making consumer decisions. 9.1.8.E.2 Identify personal information that should not be disclosed to others and the possible consequences of doing or not doing so.

9.1.8.E.3 Compare and contrast product facts versus advertising claims.

9.1.8.E.4 Prioritize personal wants and needs when making purchases.

9.1.8.E.6 Compare the value of goods or services from different sellers when purchasing large quantities and

small quantities.

9.1.8.E.8 Recognize the techniques and effects of deceptive advertising.

CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
CAEP.9.2.8.B.7	Evaluate the impact of online activities and social media on employer decisions.

Instructional Strategies & Learning Activities

Refer to the last page of every lesson additional instructional learning actitivies.

Additional Materials Needed for Advanced Preparation

Base Ten Blocks

Base Ten flats

Tape measure
6 sided die
Coins

Connecting cubes

Centimeter Ruler

Rubber Bands

Index cards

Chart Paper

Scissors

Differentiated Instruction

See pages inTeacher's Manual p. 555, 563, 569, 575, 581, 587. 593, 599, 605, 611, 621, 627, 633 for Readiness Activities, Enrichment and Extra Practice

- Use data from Tech-Exit Tickets, Exit Slips, and Progress Monitoring to group students for each skill
- Student "may-do" activities
- sentence and discussion stems
- visual anchor charts for previous, current, and next lessons

Formative Assessments

Exit tickets

journal pages, home links

Open Response

Math Messages

Slate Activities

EDM4 Games

Exponent Ball

Decimal Top-It

Prism-Pile Up

Doggone Decimal

Spend and Save

Division Top-It

Fraction Top-It

Summative Assessment

Unit 6 Assessment and cumulative assessment

Quizzes

Assessment Check in

Benchmark Assessments

Mid- year benchmark assessment.

Alternate Assessments

Progress monitoring by standard on Link it.

Resources & Technology

https://www.ixl.com/math/grade-5

BOE Approved Texts

McGraw Hill Education - Everyday Math Manual - Volumes 1 and 2

Closure

- Gallery Walk - On chart paper, small groups of students write and draw what they learned. After the completed works are attached to the classroom walls, others students affix post-its to the posters to extend on the ideas, add questions.
- Low-Stakes Quizzes - Give a short quiz using technologies like Kahoot or a Google form.
- Have students write down three quiz questions (to ask at the beginning of the next class).
- Question Stems - Have students write questions about the lesson on cards, using question stems framed around Bloom's Taxonomy. Have students exchange cards and answer the question they have acquired.
- Kids answer the following prompts: "What takeaways from the lesson will be important to know three years from now? Why?
- Have students dramatize a real-life application of a skill.
- Ask a question. Give students ten seconds to confer with peers before you call on a random student to answer. Repeat.
- Have kids orally describe a concept, procedure, or skill in terms so simple that a child in first grade would get it.
- Direct kids to raise their hands if they can answer your questions. Classmates agree (thumbs up) or disagree (thumbs down) with the response.
- Have kids create a cheat sheet of information that would be useful for a quiz on the day's topic.

At Risk/504, Gifted and Talented, ELL, Special Education

Struggling Learners/504

- behavior management support
- Have student restate information
- preferential seating
- extended time on tests and assignments
- reduced homework or classwork
- Have student restate information
- Lab and math sheets with highlighted instructions
- Graph paper to assist in organizing or lining up math problems
- Use of manipulatives
- No penalty for spelling errors or sloppy handwriting
- Follow a routine/schedule
- each time management skills
- Verbal and visual cues regarding directions and staying on task
- Adjusted assignment timelines
- Visual daily schedule
- Immediate feedback
- Work-in-progress check
- Pace long-term projects

Gifted and Talented Students (Challenge Activities)

- Offer the Most Difficult First
- Pretest for Volunteers
- Offer choice
- Speak to Student Interests
- Allow G/T students to work together
- Tiered learning
- Focus on effort and practice
- Encourage risk taking

English Language Learners

- Advance Notes
- Extended Time
- Teacher Modeling
- Simplified Written and Verbal Instructions
- E-Dictionaires
- Google Translate

Special Education Students

- Give directions in small steps and in as few words as possible.
- Number and sequence the steps in a task.
- Have student repeat the directions for a task.
- Provide visual aids.
- Go over directions orally.
- Shorten assignments to focus on mastery of key concepts.
- Provide a vocabulary list with definitions.
- Permit as much time as needed to finish tests.
- Allow tests to be taken in a room with few distractions (e.g., the library).
- Have test materials read to the student, and allow oral responses.
- Divide tests into small sections of similar questions or problems.

6.1 – Exchanging base 10 6.1 – Exploring 6.1- Vocabulary activity 6.1 – Multiplying and

blocks to represent place value shifts. MM TA33	multiplication with powers of 10. MM 212	p. 555	Dividing by Powers of 10. Activity card 71.
6.2 – Placing values with a range of numbers. MM G28,	6.2 – Forming expressions with Powers of 10. Activity card 72.	6.2 – Activate background knowledge p. 563	6.2 – Comparing animal weights MM 214
6.3 – Using unit conversations to rename measurements. SRB 328	6.3 – Converting the distance to the moon. MM 216.	6.3 – Connecting currency knowledge p. 569	6.3 – Converting measurements in the metric system. Activity card 73.
6.4 – Labelling number lines with fractional increments. MM 218	6.4 – Conducting a measurement investigation. Activity card 74.	6.4 – Role play to introduce vocabulary p. 575	6.4 – Using a line plot to solve problems. MM 219
6.5 – Interpreting line plot data activity p. 581	6.5 – Comparing diving scores. MM 222- 223.	6.5 – Vocabulary activity p. 581	6.5 – Using line plots to solve problems. Activity card 75. MJ 208
6.6 – Reviewing volume strategies. Activity card 13.	6.6 – Solving a packaging problem. Activity card 76 and MM 227	6.6 – Vocabulary activity p. 587	6.6 – Playing Prism Pile Up. SRB 319
6.7 – Reviewing liters and milliliters activity p. 593	6.7 – Solving overflow problems. Activity card 77 and MJ 215	6.7 – Vocabulary activity p. 593	6.7 – Exploring the volume of the human heart and brain. MM 229
6.8 – Estimating whole number products and quotients activity p. 599	6.8 – Estimating decimal products and quotients in number stories. MM 231.	6.8 - Using think alouds to discuss vocabulary p. 599	6.8 – Practicing decimal estimation. Activity card 78
6.9 –Practicing whole number multiplication activity p. 605	6.9 – Solving real-world decimal multiplication problems. MM 234	6.9 – Noun and verb form practice p. 605	6.9 – Comparing decimal products. Activity card 79 and MJ 219-220
6.11 – Playing Division Top It- SRB 325	6.11 – Exploring column division. SRB and MM 239	6.11- Role play activity p. 621	6.11- Dividing decimals by whole numbers. Activity card 80.
6.12 – Reviewing prerequisite skills for decimal division. MM 241	6.12 – Finding a more precise answer. MM 242	6.12 – Currency activity p. 627	6.12 – Dividing decimals by decimals, Activity card 81.
6.13 – Thinking about decimals as data points. MM 245	6.13 – Collecting and interpreting data. Activity card 82.	6.13 – Vocabulary activity p. 633	6.1443 – Comparing left hand and right hand reaction times. MJ 230-231, MM 244