



Inside you'll find:

- Complete student pages from Amplify Desmos Math
- Student pages from requested domains, partially designed

For Review Only.
Not Final Format.

Amplify Desmos Math
NEW YORK

Grade 6

Student Edition Sampler

About Amplify

Amplify is dedicated to collaborating with educators to create learning experiences that are rigorous and riveting for all students. Amplify creates K–12 core and supplemental curriculum, assessment, and intervention programs for today’s students.

A pioneer in K–12 education since 2000, Amplify is leading the way in next-generation curriculum and assessment. All of our programs provide teachers with powerful tools that help them understand and respond to the needs of every student.

Amplify Desmos Math is based on the Illustrative Mathematics (IM) curriculum. IM 6–8 Math was originally developed by Open Up Resources and authored by Illustrative Mathematics, and is © 2017–2019 Open Up Resources. Additional adaptations and updates to IM 6–8 Math are © 2019 Illustrative Mathematics. IM 9–12 Math is © 2019 Illustrative Mathematics. IM 6–8 Math and IM 9–12 are licensed under the Creative Commons Attribution 4.0 International license (CC BY 4.0). Additional modifications contained in Amplify Desmos Math are © 2020 Amplify Education, Inc. and its licensors. Amplify is not affiliated with the Illustrative Mathematics organization.

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55 Washington Street, Suite 800,
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www.amplify.com

Welcome reviewer

Welcome to your Amplify Desmos Math New York Student Edition sampler!

Amplify Desmos Math New York is the result of two groundbreaking research and development efforts in K–12 mathematics instruction led by the Amplify and Desmos Classroom teams. Merging the two teams in 2022 enabled us to build a new curriculum around the idea that all students deserve to engage in high-quality grade-level mathematics every day. Based on Illustrative Mathematics[®] IM K–12 Math[™], Amplify Desmos Math New York combines strong pedagogy, arresting design, and forward-looking collaborative technology to deliver a classroom experience that keeps students engaged and asking productive questions.

Every lesson in the Amplify Desmos Math digital platform has a corresponding lesson in the print teacher and student editions. While we are in the process of finalizing the print materials, we have provided exemplars highlighting the unique design and ease of use of the Amplify Desmos Math print resources. To provide content covering your specific domain requests, in this physical sampler we have included both robust Amplify Desmos Math student pages and partially designed student pages. However, all of the lessons can be reviewed in their complete forms online.

All Amplify Desmos Math lessons include:

- Easy-to-follow lesson plans, tested in classrooms across the country.
- Clear teaching suggestions and strategies, including math language routines.
- Recommended differentiation moves and practice sets.

Diagnostic, formative, and summative assessments are provided with each unit along with lesson-level checks for understanding.

Amplify and New York City have a long history of partnering to provide equitable, high-quality instruction to our next generation of leaders. We look forward to continuing this partnership with New York City Public Schools in middle school mathematics.



—Jason Zimba and the
Amplify Desmos Math team



Amplify Desmos Math New York

Helping New York City teachers develop and celebrate student thinking

Deep and lasting learning occurs when students are able to make connections to prior thinking and experiences. This requires teachers to deliver math instruction that balances exploration and explanation, and that puts student thinking at the center of classroom instruction.

Amplify Desmos Math students are invited to explore the math that fills their everyday lives, while strengthening their knowledge of math facts, procedural skills, and conceptual knowledge. Using the Amplify Desmos Math print and digital lesson plans, teachers can confidently guide and instruct as they build on students' understandings to help them develop a better grasp of mathematics.

Amplify Desmos Math is a **truly student-centered program** built around three core tenets:

1 A strong foundation in **problem-based learning** is critical to developing deep conceptual understanding, procedural fluency, and application.

Students are introduced to interesting problems and leverage both their current understandings and problem-solving strategies to develop reasonable answers. The learning experience is an active one that leads students to explore, notice, question, solve, justify, explain, represent, and analyze. Teachers guide the process, supporting synthesis and sensemaking at the end of each lesson.



2 Technology can provide **ongoing, enriched feedback** that encourages students to persevere in problem solving.

Especially when new ideas are being introduced, Desmos Classroom technology shows students the meaning of their thinking in context, interpreting it mathematically rather than reducing it to a question of right or wrong. This creates a culture of going deep with mathematics and students as doers of mathematics, so that as learning progresses and correctness is the goal, incorrect answers become objects of curiosity rather than embarrassment. This information in response to student ideas is what we call “enriched feedback.” Amplify Desmos Math New York offers more enriched feedback than any other math program.

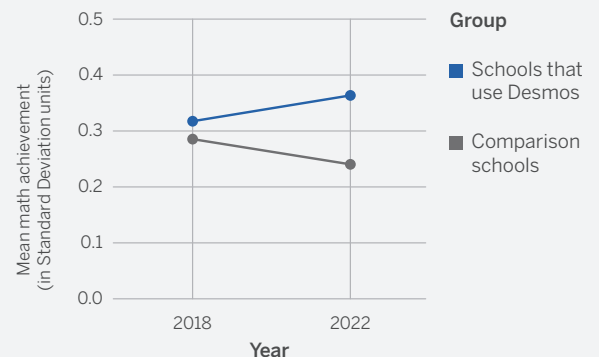
3 A commitment to **access and equity** should underpin every development decision.

All students can dive into problems on their own, and activities are designed to honor different approaches. Activities rely on collaboration and lots of hands-on, experiential learning.

And the program works.

Amplify Desmos Math New York expands on the Desmos Math 6–8 curriculum, which was recently proven to increase average math achievement in a study of more than 900 schools in nine states led by WestEd.

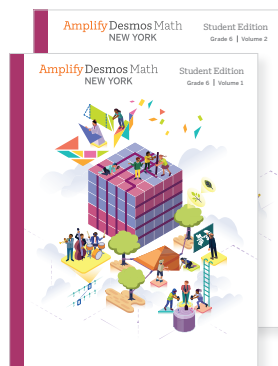
Mean Math Achievement for Desmos Schools and Matched Comparison Schools in 2018 and 2022



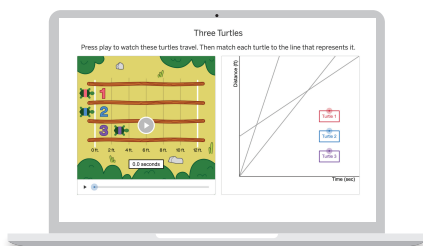
The Effect of Desmos Math Curriculum on Middle School Mathematics Achievement in Nine States. WestEd., (McKinney, D., Strother, S., Walters, K. & Schneider, S., 2023).

Amplify Desmos Math New York program resources

Student bundle includes:



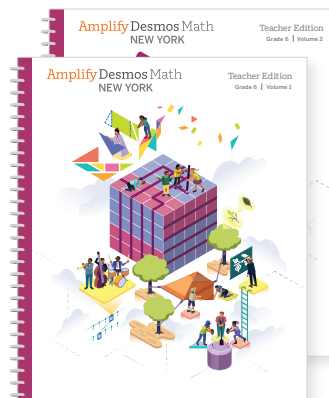
NY Student Edition, multivolume, consumable



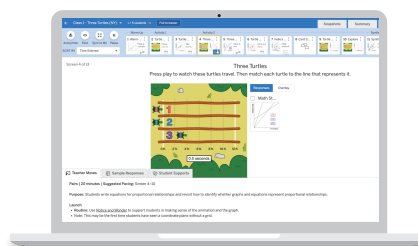
NY Digital Experience (English and Spanish), featuring:

- Interactive Student Activity Screens
- Enriched feedback
- Collaboration tools

Teacher bundle includes:



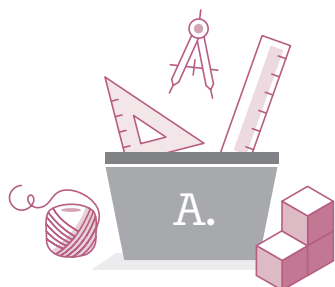
NY Teacher Edition, multivolume, spiral-bound



NY Digital Experience (English and Spanish), featuring:

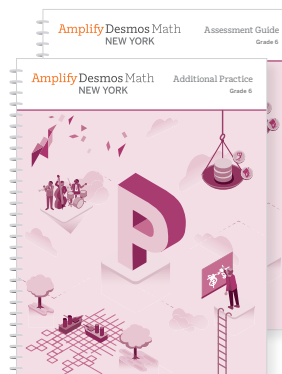
- Facilitation and progress monitoring tools
- Presentation Screens
- Instructional supports
- Assessment

Optional:



Middle School Manipulative Kit (Grades 6–8)

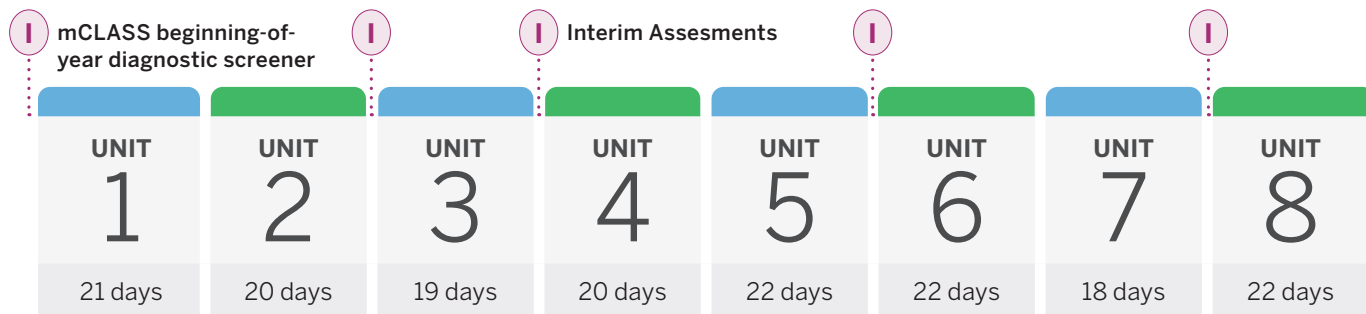
Extra Practice and Assessment Blackline Masters



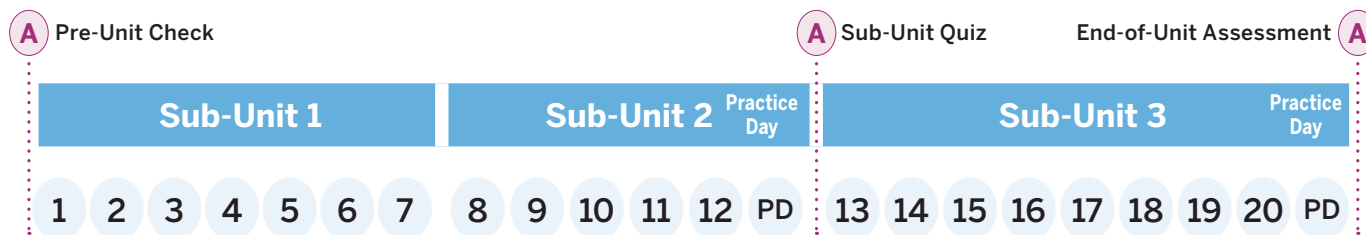
Additional components and features may roll out over time.

Program architecture

Course

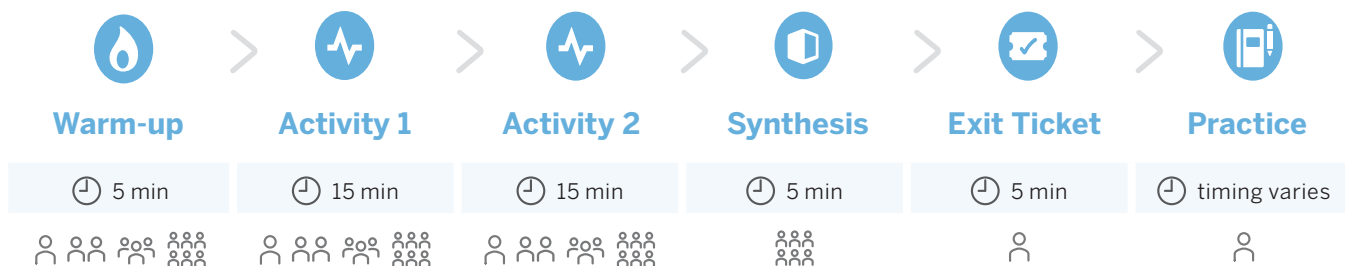


Unit



Note: The number of sub-units and lessons vary from unit to unit; this depiction shows the general structure of a unit.

Lesson



Note: The number of activities and timing vary from lesson to lesson; this depiction shows the general structure of a lesson.

Key:

- Independent
- Small Groups
- Pairs
- Whole Class

Unit 1 Area and Surface Area

The area of a shape is the amount of space the shape covers. You know the names of many two-dimensional and three-dimensional shapes, and have calculated the areas of rectangles. How can you use what you have learned to cover other two-dimensional shapes? And what does it mean to cover a three-dimensional shape?

Pre-Unit

Getting to Know Each Other



Pre-Unit Check

Sub-Unit 1 Area

- 1.01 Shapes on a Plane | Exploring Area
- 1.02 Letters | Area Strategies
- 1.03 Exploring Parallelograms | Parallelograms on a Grid
- 1.04 Off the Grid | Calculating Areas of Parallelograms
- 1.05 Exploring Triangles | Triangles on a Grid
- 1.06 Triangles and Parallelograms | Generalizing the Area of a Triangle
- 1.07 Off the Grid, Part 2 | Applying the Formula for the Area of a Triangle
- 1.08 Pile of Polygons | Investigating Polygons and Their Areas



Practice Day 1



Quiz

Sub-Unit 2 Surface Area

- 1.09 Renata's Stickers | Intro to Surface Area
- 1.10 Plenty of Polyhedra | Polyhedra and Their Faces
- 1.11 Nothing But Nets | Nets and Surface Area on a Grid
- 1.12 Face Value | Surface Area Off of a Grid
- 1.13 Take It To Go | Surface Area in Context



Practice Day 2

End-Unit



End-of-Unit Assessment

Unit 2 Introducing Ratios

Shapes come in all different sizes. But what makes a shape big or small? One way to compare sizes is by measuring the space inside of a shape. In this unit, you'll do this for many two-dimensional shapes you already know, and even for some three-dimensional solids.

Pre-Unit



Pre-Unit Check

Sub-Unit 1 Introducing Ratios

- 2.01 Pizza Maker | Exploring Ratios
- 2.02 Ratio Rounds | Describing Ratios
- 2.03 Rice Ratios | Introduction to Equivalent Ratios
- 2.04 Fruit Lab | Creating Equivalent Ratios
- 2.05 Balancing Act | Introduction to Double Number Lines
- 2.06 Product Prices | Unit Prices



Practice Day 1



Quiz

Sub-Unit 2 Solving Problems with Ratios

- 2.07 Mixing Paint Part 1 | Comparing Ratios
- 2.08 World Records | Comparing Speeds
- 2.09 Disaster Preparation | Using Ratio Tables With Large Quantities
- 2.10 Balloons | Solving Multistep Ratio Problems
- 2.11 Community Life | Solving Equivalent Ratio Problems
- 2.12 Mixing Paint Part 2 | Part-Part-Whole Ratios
- 2.13 City Planning | Applying Part-Part-Whole Ratio Problems
- 2.14 Lunch Waste | Applying Ratio Strategies



Practice Day 2

End-Unit



End-of-Unit Assessment

Unit 3 Unit Rates and Percentages

In Unit 2, you discovered how to use ratios to compare quantities and determine unknown amounts. In this unit, you'll explore unit rates — how much per one —and percentages — how much per one hundred. They can help you answer questions like: How much soft serve can I buy? How fast can a toy train travel? How does someone make money selling t-shirts? Which country has the greatest percentage of young people?

Pre-Unit



Pre-Unit Check

Sub-Unit 1 Sub-unit 1: Units and Measurement

- 3.01 Many Measurements | Everyday Measurements
- 3.02 Counting Classrooms | Measuring With Different Units
- 3.03 Pen Pals | Converting Units

Sub-Unit 2 Unit Rates

- 3.04 Model Trains | Comparing Rates
- 3.05 Soft Serve | Two Unit Rates
- 3.06 Welcome to the Robot Factory | Using Unit Rates
- 3.07 More Soft Serve | Solving Rate Problems



Practice Day 1



Quiz

Sub-Unit 3 Percentages

- 3.08 Lucky Duckies | Benchmark Percentages
- 3.09 Bicycle Goals | Friendly Percentages
- 3.10 What's Missing? | Solving Percentage Problems
- 3.11 Cost Breakdown | Any Percentage of a Number
- 3.12 More Bicycle Goals | Unknown Percentages
- 3.13 A Country as a Village | Applying Ratios, Rates, and Percentages



Practice Day 2

End-Unit



End-of-Unit Assessment

Unit 4 Dividing Fractions

Division is a useful operation for solving problems involving groups of equal size, such as “How many groups?” or “How many in 1 group?” You have gained experience dividing with whole numbers. But what does it mean when the number of groups is a fraction? Or when there is less than 1 group?

Pre-Unit



Pre-Unit Check

Sub-Unit 1 Introduction to Dividing Fractions

- 4.01 Cookie Cutter | Estimating Quotients
- 4.02 Making Connections | Representing Division Situations
- 4.03 Flour Planner | How Many Groups? Part 1
- 4.04 Flower Planters | How Many in Each Group?

Sub-Unit 2 Dividing Fractions

- 4.05 Garden Bricks | How Many Groups? Part 2
- 4.06 Fill the Gap | More or Less Than One Group?
- 4.07 Break It Down | Using Common Denominators to Divide Fractions
- 4.08 Potting Soil | Dividing by Unit Fractions
- 4.09 Division Challenges | Two Strategies for Dividing Fractions
- 4.10 Swap Meet | Division of Fractions in Context



Practice Day 1



Quiz

Sub-Unit 3 Area and Volume With Fractions

- 4.11 Classroom Comparisons | Comparing Fractional Lengths
- 4.12 Puzzling Areas | Areas With Fractional Dimensions
- 4.13 Volume Challenges | Volumes With Fractional Dimensions
- 4.14 Planter Planner | Applying Fraction Division



Practice Day 2

End-Unit



End-of-Unit Assessment

Unit 5 Decimal Arithmetic

Decimals embody the numerical language of precision. Being able to add, subtract, multiply, and divide any numbers with any number of decimal places can help you determine and make sense of many real-world situations.

Pre-Unit



Pre-Unit Check

Sub-Unit 1 Adding and Subtracting Decimals

- 5.01 Dishing Out Decimals | Reasoning With Decimals
- 5.02 Decimal Diagrams | Representing Decimals
- 5.03 Fruit by the Pound | Adding and Subtracting Decimals Part 1
- 5.04 Missing Digits | Adding and Subtracting Decimals Part 2



Quiz

Sub-Unit 2 Multiplying and Dividing Decimals

- 5.05 Decimal Multiplication | Introduction to Multiplying Decimals
- 5.06 Multiplying With Areas | Using Area Models to Multiply Decimals
- 5.07 Multiplication Methods | Multiplying Decimals Using Vertical Calculations
- 5.08 Division Diagrams | Making Sense of Decimal Division
- 5.09 Long Division Launch | Long Division and Decimals
- 5.10 Return of the Long Division | Long Division With Remainders
- 5.11 Movie Time | Dividing Decimals in Context



Practice Day 1



Quiz

Sub-Unit 3 Solving Problems With Decimals

- 5.12 Budget Vehicles | Operations With Decimals in Context
- 5.13 Grocery Prices | Percentages as Decimals

Sub-Unit 4 Least Common Multiple and Greatest Common Factor

- 5.14 Common Multiples | Investigating Least Common Multiples
- 5.15 Common Factors | Investigating Greatest Common Factor



Practice Day 2

End-Unit



End-of-Unit Assessment

Unit 6 Expressions and Equations

Up until now, an equal sign meant you were being asked to calculate an answer. In this unit, you'll learn about its other meaning — balance. And when things are in balance, it becomes possible to know the unknown.

Pre-Unit



Pre-Unit Check

Sub-Unit 1 Solving Equations

- 6.01 Weight for It | Reasoning About Unknown Values
- 6.02 Five Equations | Tape Diagrams, Equations, Contexts
- 6.03 Hanging Around | Introduction to Balanced Hangers
- 6.04 Hanging It Up | Solving Equations
- 6.05 Swap and Solve | Solving Equations in Context

Sub-Unit 2 Equivalent Expressions

- 6.06 Vari-apples | Introduction to Variable Expressions
- 6.07 Border Tiles | Equivalent Expressions
- 6.08 Products and Sums | Distributive Property Part 1
- 6.09 Products, Sums, and Differences | Distributive Property Part 2



Practice Day 1



Quiz

Sub-Unit 3 Exponents

- 6.10 Powers | What Are Exponents?
- 6.11 Exponent Expressions | Exponents and Order of Operations
- 6.12 Squares and Cubes | Exponent Expressions With Variables

Sub-Unit 4 Introduction to Representing Relationships

- 6.13 Turtles All the Way | Stories and Tables and Variables, Oh My!
- 6.14 Representing Relationships | Interpreting Graphs of Relationships
- 6.15 Connecting Representations | Tables, Equations, and Graphs of Relationships
- 6.16 Subway Fares | Applying Relationships



Practice Day 2

End-Unit



End-of-Unit Assessment

Unit 7 Positive and Negative Numbers

Think back to when you first learned about whole numbers and used them to count. Later, you saw there were numbers between them: fractions and decimals. Up until now, every number you've encountered has always been greater than 0. But no more. There is an entire set of numbers (just as many, in fact), lurking on the other side of every number line.

Pre-Unit



Pre-Unit Check

Sub-Unit 1 Negative Numbers and Absolute Values

- 7.01 Can You Dig It? | Positive and Negative Numbers
- 7.02 Digging Deeper | Positions on the Number Line
- 7.03 Order in the Class | Comparing Numbers
- 7.04 Sub-Zero | Positive and Negative Numbers in Context
- 7.05 Distance on the Number Line | Introduction to Absolute Value



Practice Day 1



Quiz

Sub-Unit 2 Inequalities

- 7.06 Tunnel Travels | Graphing Inequalities
- 7.07 Comparing Weights | Writing Inequalities
- 7.08 Shira's Solutions | Solutions to Inequalities

Sub-Unit 3 The Coordinate Plane

- 7.09 Sand Dollar Search | Points in the Coordinate Plane
- 7.10 The A-maze-ing Coordinate Plane | Practice Plotting
- 7.11 Polygon Maker | Polygons in the Plane
- 7.12 Graph Telephone | The Coordinate Plane in Context



Practice Day 2

End-Unit



End-of-Unit Assessment

Unit 8 Describing Data

Statistics is the science of collecting and analyzing data. It is one of the most relevant aspects of mathematics in everyday life. And it is also used by researchers in many fields, such as zoologists identifying new species and studying populations of endangered species. In all cases, knowing what is typical is critical to understanding what is not.

Pre-Unit



Pre-Unit Check

Sub-Unit 1 Visualizing Data

- 8.01 Screen Time | Asking Questions, Collecting Data, and Making Claims
- 8.02 Dot Plots | Visualizing Data With Dot Plots
- 8.03 Minimum Wage | Creating Dot Plots
- 8.04 Lots More Dots | Comparing Dot Plots
- 8.05 The Plot Thickens | Introduction to Histograms
- 8.06 DIY Histograms | Creating Histograms

Sub-Unit 2 Measuring Data: Mean and MAD

- 8.07 Snack Time | Introduction to the Mean
- 8.08 Pop It! | Sum of the Deviations
- 8.09 Hoops | Mean Absolute Deviation
- 8.10 Hollywood Part 1 | Using Mean and MAD to Analyze Actor Salaries



Practice Day 1



Quiz

Sub-Unit 3 Measuring Data: Median and IQR

- 8.11 Toy Cars | Introducing the Median
- 8.12 In the News | Comparing Measures of Center
- 8.13 Pumpkin Patch | Introduction to Quartiles
- 8.14 Car, Plane, Bus, or Train? | Box Plots, IQR, and Range
- 8.15 Hollywood Part 2 | Comparing Box Plots
- 8.16 Hollywood Part 3 | Using Statistics to Analyze Movies



Practice Day 2

End-Unit



End-of-Unit Assessment

GRADE 6

Amplify Desmos Math
NEW YORK

Student Edition Sample Lessons

In this section, two lesson samples showcase the full print support for all lessons in the program, including Student Edition pages for recommended digital lessons. All Student Edition lessons will be created following this structure and design for delivery prior to the 2024-2025 school year.

Contents of this lesson:

- **Student Edition Overview**
- **Lesson 3.04: Model Trains**
Comparing Rates
Digital recommended lesson
- **Lesson 6.16: Subway Fares**
Applying Relationships
Print lesson

Equitable access with student materials

Every lesson in Amplify Desmos Math New York has a corresponding Student Edition page, ensuring equitable access for for all students.

- A print-based option is always available for students who need it, even for digital-recommended lessons.
- Student pages are closely aligned to digital Student Activity Screens, with screen-by-screen alignment in problem numbering.
- There's ample physical space provided for problem-solving and note-taking, even when students are on devices.



What if your students asked to do more math?

Amplify Desmos Math New York lessons are powerful in their ability to elicit student thinking and spark interesting and productive discussions.

The lessons pose problems that invite a variety of approaches with their dynamic and interactive learning experiences on computers, as well as experiences on paper that are flexible, creative, and engaging.

Unit 4
Lesson
8

Name: _____ Date: _____ Period: _____

Potting Soil

Let's find out how much soil we need to fill a planter.

1 Warm-Up

Habib says $2 \div \frac{1}{3}$ represents the brick situation. Inola says $2 \div \frac{1}{3}$ represents the flower situation.

Discuss why are they both correct?

Pause to test your results.

Lesson 8 Potting Soil 387

Digital recommended lesson

Unit 6
Lesson
16

Name: _____ Date: _____ Period: _____

Subway Fares

Let's use tables, graphs, and equations to help customers compare subway fares.

Warm Up

In Metropolis, there are three ticket options to ride the bus or subway.

| Option 1 Regular Fare | Option 2 Unlimited 7-Day Pass | Option 3 Reduced Fare |
|--------------------------|----------------------------------|--------------------------|
| | | |

For each option, how much will it cost to ride the subway 3 times?

Lesson 16 Subway Fares 387

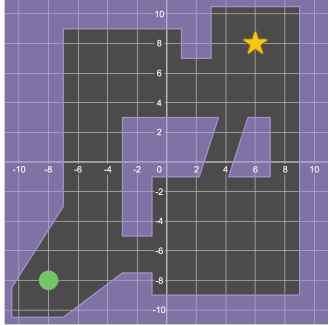
Print lesson

As students work online, they interact with visuals and simulations that show how their thinking and decisions play out. When appropriate, students will automatically see other students' responses and engage in collaborative math discussions.

Challenge #2

Enter coordinates to get the ball to collect the star.

Use the sketch tool if it helps you with your thinking.



Your Path

| |
|----------|
| (-8, -8) |
| |
| |
| |
| |
| |

Try It

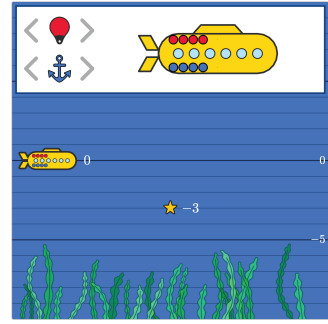
Grade 6

In this activity students plot points to navigate the marble through the maze to collect the star.

Collect the Star

This submarine starts with 4 floats and 4 anchors.

Adjust floats and anchors to collect the star at -3 units.



| Start | Action | Final |
|-------|--------|-------|
| 0 | | |

Check My Work

Grade 7

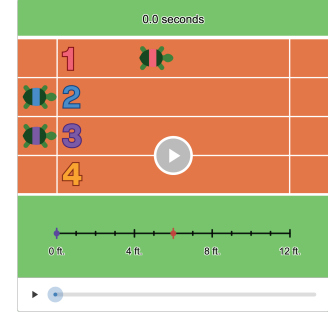
In this activity students explore positive and negative integer operations using the up and down movement of a submarine.

Write an Equation

A new turtle enters the race in Lane 4.

Write an equation for the new turtle. Then press play.

(Make the turtle finish in whatever place you want!)



| Turtle | Equation |
|--------|--------------|
| Lane 1 | $d = 6 + 1t$ |
| Lane 2 | $d = 3t$ |
| Lane 3 | $d = 1.5t$ |
| Lane 4 | |

Grade 8

In this activity students create rate, distance, and time equations based on turtle races.

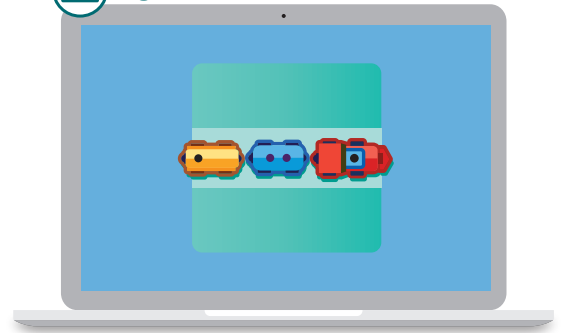
 TRY IT OUT

Start your review at

amplify.com/math-review-nyc



Digital Lesson



Model Trains

Let's calculate unit rates and use them to compare speeds.


Warm-Up

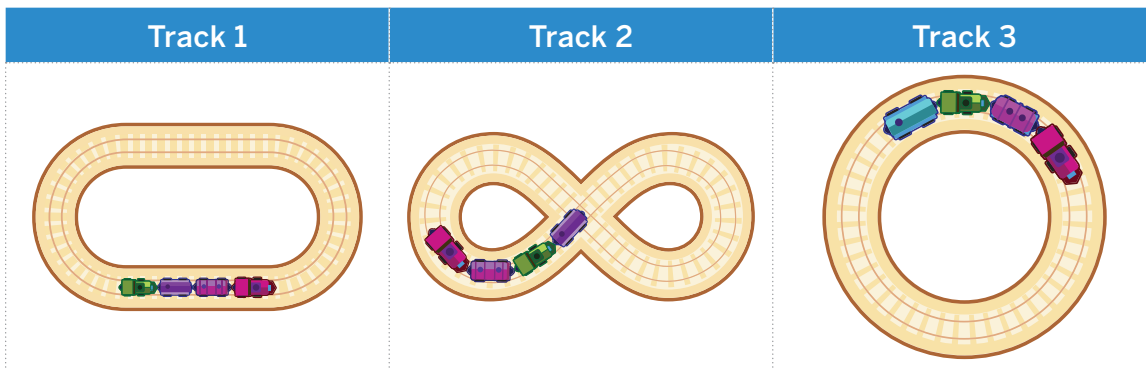
1 Which rate does not belong? Explain your thinking.

- A. 5 miles in 15 minutes
- B. 20 miles per 1 hour
- C. 3 minutes per mile
- D. 32 kilometers per 1 hour

How Fast?

2 Here are three designs for a model train set for a children's museum. Choose one.

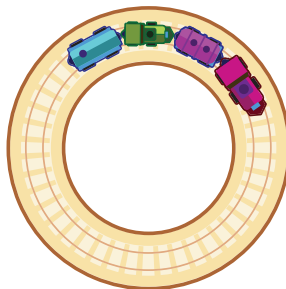
 **Discuss:** What do you notice? What do you wonder?



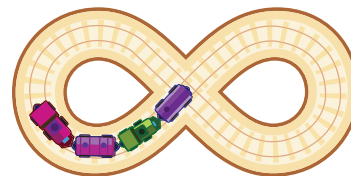
3 Here are Tracks 2 and 3. Which train is faster? Explain your thinking.

- A. Train A
- B. Train B
- C. Not enough information

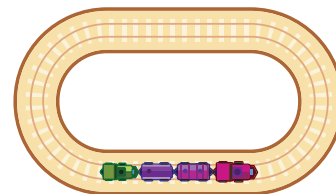
Train A:
15 seconds per lap



Train B:
20 seconds per lap



4 Here is Track 1. One lap is 325 centimeters. This train takes 10 seconds per lap. What is its speed in centimeters per second?

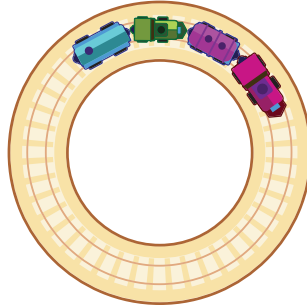


Name: _____ Date: _____ Period: _____

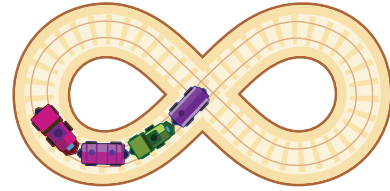
How Fast? (continued)**5** Which train is faster?

- A. Train A
 B. Train B
 C. They travel at the same speed.

Train A:
 270 centimeters in 15 seconds



Train B:
 380 centimeters in 20 seconds



6 Amoli and Tiam used different strategies to determine which train was faster given the length of each track.

| Amoli's strategy | Tiam's strategy | | | |
|---|--------------------|----------------|--------------------|----------------|
| <u>Train A</u> | <u>Train A</u> | | <u>Train B</u> | |
| $270 \div 15 = 18$, so the speed is 18 centimeters per second. | <u>Centimeters</u> | <u>Seconds</u> | <u>Centimeters</u> | <u>Seconds</u> |
| <u>Train B:</u> | 270 | 15 | 380 | 20 |
| $380 \div 20 = 19$, so the speed is 19 centimeters per second. | 1080 | 60 | 1140 | 60 |

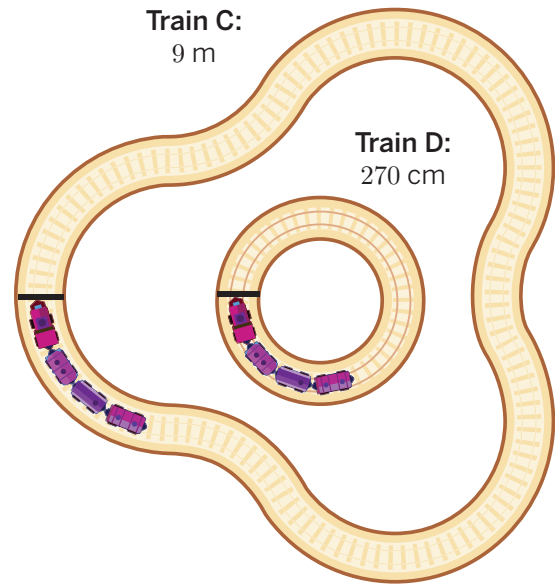
 **Discuss:** How are the strategies alike? How are they different?

Activity
2

Which is Faster?

7 Here are two trains. They each complete 1 lap in 20 seconds. What is each train's speed in centimeters per second?

| | Speed |
|---------|------------------------------|
| Train C | centimeters per second |
| Train D | centimeters per second |



8 Here are the distances and times for four model trains.

Train E: 325 centimeters in 30 seconds **Train F:** 270 centimeters in 20 seconds
Train G: 3.25 meters in 20 seconds **Train H:** 3.25 centimeters in 1 minute

Order the trains by speed from slowest to fastest.

| | | | |
|---------|--|--|---------|
| | | | |
| Slowest | | | Fastest |

You're invited to explore more.

9 A train's speed is 60 centimeters per second.

Choose a track length and determine the number of laps the train can complete in 10 seconds.

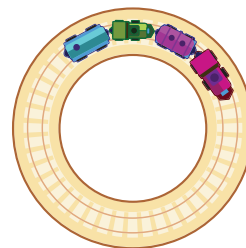


Synthesis

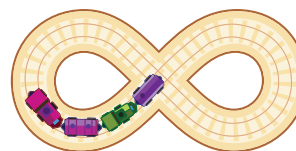
- 10** Describe two strategies for deciding which of two trains is faster.

Use the examples to help you with your explanation.

Train A:
270 centimeters in 15 seconds



Train B:
380 centimeters in 20 seconds



Summary

Rates expressed in the same units of measurement can be compared by using equivalent ratios or unit rates.

Consider two runners. Runner A runs the 400-meter dash in 50 seconds. Runner B runs the 5K (a 5-kilometer run) in 20 minutes. To compare their rates, they must first be expressed in the same units of measurement. Both runners' rates are converted to meters per second in this table.

| Runner A | | Runner B | |
|---------------------|---------------|---|----------------|
| Seconds | Meters | 5 kilometers = 5 000 meters 20 minutes = 1 200 seconds | |
| 50 | 400 | Seconds | Meters |
| 1 | 8 | 1 200 | 5 000 |
| 8 meters per second | | 1 | $4\frac{1}{6}$ |
| | | $4\frac{1}{6}$ meters per second | |

Runner A runs at a faster rate than Runner B because 8 meters is greater than $4\frac{1}{6}$ meters in the same amount of time (1 second).

Practice

Name: _____ Date: _____ Period: _____

For Problems 1–3, use the following information. Mia and Liam were trying out new remote control cars. Mia’s car traveled 135 feet in 3 seconds. Liam’s car traveled 228 feet in 6 seconds. Both cars traveled at a constant speed.

1. Determine the speed of each remote control car in feet per second.

Mia’s car speed:

_____ feet per second

Liam’s car speed:

_____ feet per second

2. Whose remote control car traveled faster?
3. Deven says he has a remote control car that can travel 12 yards per second. Is his car faster or slower than the other two? Show your thinking.
4. Emmanuel types 208 words in 4 minutes. Vihaan types 342 words in 6 minutes. Both type at a constant rate. Who types faster? Explain your thinking.

5. During practice, four baseball players recorded the time it takes them to run different distances.

Player A: 3 seconds to run 45 feet **Player B:** 48 feet in 2 seconds

Player C: 75 feet in 5 seconds **Player D:** 3 seconds to travel 46.5 feet

Which player ran at the fastest speed?

- | | |
|-------------|-------------|
| A. Player A | C. Player C |
| B. Player B | D. Player D |



6. Here are the approximate distances and times for four olympic swimmers in different events. Order the swimmers by speed from slowest to fastest.

Swimmer A: 800 meters in 8 minutes

Swimmer B: 100 meters in 50 seconds

Swimmer C: 1.5 kilometers in
15.5 minutes

Swimmer D: 50 meters in 20 seconds

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

Slowest

Fastest

For Problems 7 and 8, use this information. Penguin A walks 10 feet in 5 seconds. Penguin B walks 12 feet in 8 seconds. Each penguin continues walking at a constant speed.

7. How far does each penguin walk in 45 seconds?
8. If the two penguins start at the same place and walk in the same direction, how far apart will the two penguins be after 2 minutes? Show your thinking.

Spiral Review

For Problems 9–12, determine the missing value.

9. 12 ft = _____ yd

10. 300 m = _____ km

11. 500 m = _____ cm

12. 12 cups = _____ gal

Reflection

- Circle the question that you enjoyed doing the most.
- Use the space below to ask one question you have or to share something you are proud of.




Subway Fares

Let's use tables, graphs, and equations to help customers compare subway fares.



Warm-Up

In Metropolis, there are three ticket options to ride the bus or subway.

| Option 1 Regular Fare | Option 2 Unlimited 7-Day Pass | Option 3 Reduced Fare |
|--|--|--|
|  <p>TICKET</p> <p>\$2.50 PER RIDE</p> |  <p>\$30</p> <p>★★★★★ UNLIMITED 7-DAY PASS</p> |  <p>TICKET</p> <p>50% OFF REGULAR FARE</p> <p>For people who have low income, are 65 or older, or who have a qualifying disability.</p> |

1. For each option, how much will it cost to ride the subway 3 times in a single weekend?

Consider the Costs

The Metropolis Transit Association (MTA) is in charge of the public buses and subways in Metropolis.

Your task is to help an MTA employee show customers how much each option from the Warm-Up costs, based on the number of rides they use.

2. As a group, work together to create a table, graph, and equation for each option.

| | Table | | Graph | Equation |
|----------|----------------------|----------------------|-------|----------|
| Option 1 | Number of rides, r | Total cost (\$), c | | |
| Option 2 | Number of rides, r | Total cost (\$), c | | |
| Option 3 | Number of rides, r | Total cost (\$), c | | |

- a Which variable is the independent variable? Which is the dependent variable?
- b Write 2–3 sentences comparing and contrasting the graphs for the three options.

Name: _____ Date: _____ Period: _____

Consider the Costs (continued)

Read about four customers who ride the subway and circle one that you choose to help. Make sure each person in your group chooses a different customer.

| Eliza | Nikhil | Sydney | Bao |
|---|---|---|---|
| Eliza is 70 years old. She works at a daycare about 1.5 miles away from her house. Sometimes she walks to work and sometimes she rides the subway. She rides the subway between 2–8 times per week. | Nikhil is 23 years old. He uses a wheelchair and it takes him 20 minutes to get to the closest wheelchair -accessible subway station from his house. Nikhil works as a chef and rides the subway to and from work five days per week. | Sydney is 20 years old. They are a college student and work part time. They ride the subway to school and work. They usually ride between 15–20 times per week. | Bao is 16 years old. He walks to school during the week and only rides the subway on the weekends to visit friends. |

3. Which fare option should your customer choose?

A. Regular Fare

B. Unlimited

C. Reduced Fare

4. Use the tables, graphs, and equations you made earlier to support your recommendation.

Increased Fares

To help maintain the subway service, the MTA leadership is thinking about raising the *Regular Fare* by \$0.50.

5. Describe one advantage and one disadvantage of raising the *Regular Fare*. Explain your thinking for each.

One advantage to raising the *Regular Fare* is . . .

One disadvantage to raising the *Regular Fare* is . . .

6. Look back at your work for the *Regular Fare*. How would raising the fare by \$0.50 change each of the following?

| Table | Graph | Equation |
|-------|-------|----------|
| | | |

7. For which of the four customers will the fare increase have the greatest impact? Explain your thinking.

8. How would you adjust the fares to get the money you need to maintain service while also charging customers fairly?



Synthesis

How can making a graph and a table help us understand relationships in the world, such as subway fares?

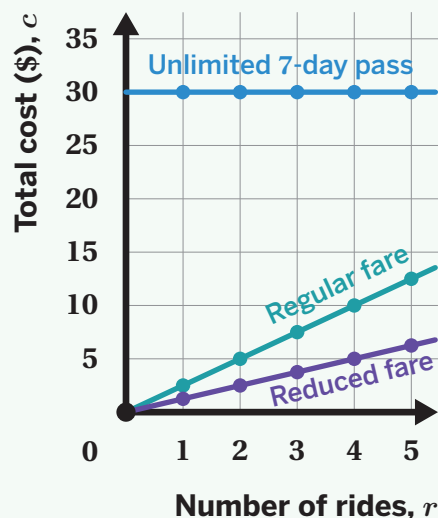
Summary

Tables, graphs, and equations help compare different relationships between quantities. When it comes to analyzing subway fares, these representations can help you make informed decisions about what option might be better to choose than another.

A graph can visually show how different rates compare.

- The **Regular fare** line is steeper than the **Reduced fare** line. This means its rate (cost per ride) is greater, $\$2.50 > \1.25 .
- The **Reduced fare** line is flatter than the **Regular fare** line. This means its rate is less, $\$1.25 < \2.50 .

By using these representations, you can make sure you get the best subway ticket for your needs!



Practice

Name: _____ Date: _____ Period: _____

1. Match each equation to the table it represents.

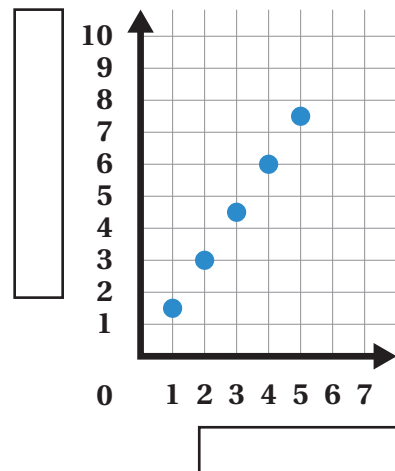
| $p = 2n$ | | $p = \frac{1}{2}n$ | | $p = n + 2$ | |
|----------|-----|--------------------|-----|-------------|-----|
| n | p | n | p | n | p |
| 10 | 5 | 10 | 20 | 10 | 12 |
| 20 | 10 | 20 | 40 | 20 | 22 |
| 100 | 50 | 100 | 200 | 100 | 102 |

For Problems 2–5, use this information. Riya’s biking app says that she rides at a speed of 5 miles per hour.

2. At this speed, how far does Riya ride in 1 hour?
3. At this speed, how far does Riya ride in 3 hours?
4. Write an equation for the relationship between Riya’s distance biked d and time t .
5. Riya’s speed last week could be represented by the equation $d = 3t$. What can you say about last week’s speed compared to this week’s speed? Explain your thinking.

For Problems 6–8, use the graph provided.

6. Write a situation that could be represented by the graph.
7. Label the axes on the graph to match your situation.



8. Fill in the table using the points on the graph. Label each column with variables to match the graph.

| | |
|---|-----|
| 1 | 1.5 |
| 2 | |
| | 4.5 |
| 4 | |
| | |

9. A school supply store sells boxes of markers. Each box contains 16 markers.

Write an equation to represent the total number of markers, y , in each boxes, x .

Equation: _____

If $x = 5$ for one day of sales, use your equation to determine the total number of markers the supply store sells. Show your thinking.

Spiral Review

10. Select *all* of the equations that have a solution of $n = 3$.

A. $10n = 103$

C. $\frac{1}{4} + n = \frac{13}{4}$

E. $\frac{1}{3}n = 3$

B. $5n = 15$

D. $n \div 2 = 6$

11. At a market, 3.1 pounds of peaches cost \$7.75. How much did the peaches cost per pound? Explain your thinking.

12. Use the numbers 1–9 only once to fill in each blank to make each inequality true.

$$\square^2 < 2\square$$

$$\square^2 > 2\square$$

$$\square^3 < 3\square$$

$$\square^3 > 3\square$$

Reflection

- Circle the question you think will help you most on the end of unit assessment.
- Use the space below to ask one question you have or to share something you are proud of.

GRADE 6

Unit 2

Student Lessons

Student lessons from Unit 2 are included here to provide NYC reviewers with access to the specific lessons in Amplify Desmos Math New York that demonstrate coverage of the **Ratios and Proportional Relationships** domain.

These lessons are partially designed and will be updated to match the exemplar Student Edition lessons included earlier in this sampler.

The background features a light purple color palette with various geometric elements: solid lines, dashed lines, squares, circles, and diamonds. There are also soft, light blue cloud-like shapes scattered throughout. Two horizontal maroon lines are positioned above and below the main text.

Grade 6 Unit 2

Student Edition Sampler



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 1: Notes

Name _____

My Notes

1. Explain why the cost of the pizzas might double but not the cost of delivery if someone orders twice as many pizzas.
2. Here are the toppings needed for 2 of Sneha’s favorite pizza.

How much of each topping is needed to make 8 of her favorite pizzas for her birthday party?

| Ingredient | 2 pizzas | 8 pizzas |
|------------|-----------|----------|
| Cheese | 10 ounces | |
| Pepperoni | 18 slices | |
| Onion | 20 slices | |
| Pineapple | 12 slices | |

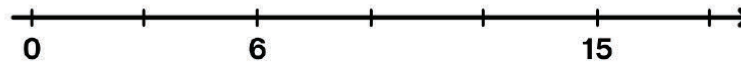


Summary

I can determine which quantities make sense to double in context and which do not.

Warm-Up

Label the blank tick marks on the number line.



Practice

Pablo's Pizza Place wants to double the number of customers they have next year.

1.1 Select **all** the quantities that are likely to double if they reach their goal.

- The number of pizzas they make
- The hours the store is open
- The amount of cheese they buy
- The number of items on the menu
- The amount of money they earn

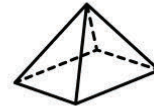
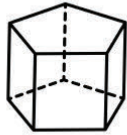
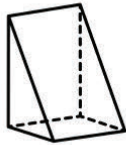
Pablo uses 2 bags of cheese to make 6 pizzas.

- 1.2 How many bags of cheese will he need to make 12 pizzas?
- 1.3 How many bags will he need to make 18 pizzas?
- 1.4 How many pizzas can he make using 10 bags of cheese?
- 1.5 Describe your strategy for the last problem.
- 1.6 Pablo uses 3 bags of pepperoni to make 9 pepperoni pizzas. He says he needs 6 bags to make 12 pepperoni pizzas. Is he correct? Explain your reasoning.



Unit 6.2, Lesson 1: Practice Problems

2. Select **all** of the triangular prisms.



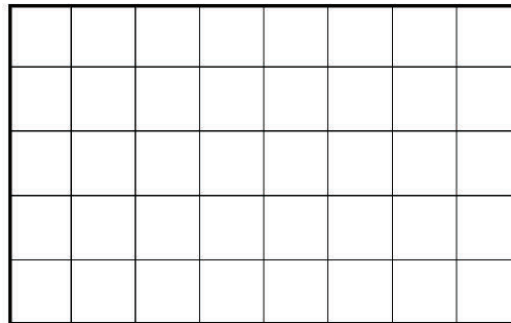
Determine if each quantity would be measured in centimeters, square centimeters, or cubic centimeters.

- 3.1 Area of a rectangle _____
- 3.2 Volume of a prism _____
- 3.3 Height of a triangle _____
- 3.4 Surface area of a cube _____

Explore

Here is a 5-by-8 grid.

Create a design so that there are 3 times as many unshaded squares as there are shaded squares.



Reflect

- 1. Circle the question you feel most confident about.
- 2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 2: Ratio Rounds

Name _____

Activity 1: Ratio Rounds

Round 1

| | |
|---|---|
| My Ratio | _____’s Ratio |
| For every ____ mushrooms, there are _____. | For every ____ mushrooms, there are _____. |

Round 2

| | |
|---|--------------------|
| Our Ratio | |
| My Ratio: The ratio of _____ to mushrooms is ____ to ____. | |
| _____’s Ratio: The ratio of _____ to mushrooms is ____ to ____. | |
| What is the same about your ratios? | What is different? |

Round 3

| | | |
|-------------------|-------------------|-------------------|
| My Ratios | _____’s Ratios | _____’s Ratios |
| mushrooms : _____ | mushrooms : _____ | mushrooms : _____ |
| _____ : _____ | _____ : _____ | _____ : _____ |
| _____ : mushrooms | _____ : mushrooms | _____ : mushrooms |
| _____ : _____ | _____ : _____ | _____ : _____ |

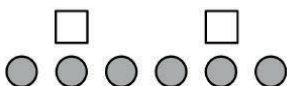
Intermission



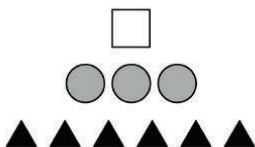
Unit 6.2, Lesson 2: Ratio Rounds

Name _____

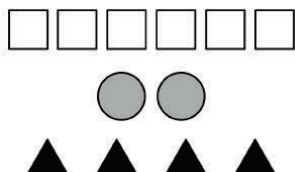
Activity 2: Two Truths and a Lie



1. Circle the false statement.
 - A. The ratio of circles to squares is 1:3.
 - B. There are 2 squares for every 6 circles.
 - C. For every square, there are 3 circles.



2. Circle the false statement.
 - A. For every circle, there are 2 triangles.
 - B. The ratio of circles to squares is 3 to 1.
 - C. The ratio of squares to triangles is 1:2.



- 3.1 Write three statements about this drawing: two that are true and one that is false.

- A. _____
- B. _____
- C. _____

- 3.2 Trade with a classmate. Name: _____
Which statement is false?

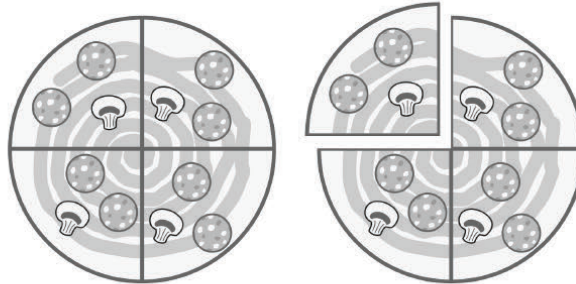
Make your own drawing.

- 4.1 Write three statements about your drawing: two that are true and one that is false.

- A. _____
- B. _____
- C. _____

- 4.2 Trade with a classmate. Name: _____
Which statement is false?

My Notes



1. Fill in the blanks based on the ratios you see above.
 - For every ___ mushrooms, there are _____.
 - The ratio of pepperoni to mushrooms is ___ to ___.
 - The ratio of mushrooms to pepperoni is ___ : ___.
 - pizzas : mushrooms
 _____ : _____

2. Circle the false statement.
 - A. The ratio of mushrooms to pepperoni is 1 : 2.
 - B. There are 8 pepperoni for every 1 pizza.
 - C. For every 4 mushrooms, there are 2 pizzas.

Edit the false statement to make it true.

Summary

I can explain what a ratio is.

I can describe ratios in many different ways.

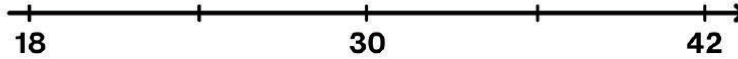


Unit 6.2, Lesson 2: Practice Problems

Name _____

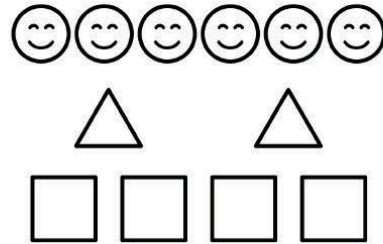
Warm-Up

Label the blank tick marks on the number line.



Practice

Answer the questions based on this picture.



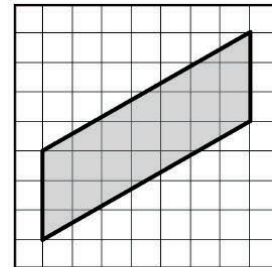
- 1.1 The ratio of smiley faces to triangles is ____ to ____.
- 1.2 The ratio of squares to triangles is ____ : ____.
- 1.3 For every 2 triangles, there are _____ squares.
- 1.4 Select the false statement.
 - A. The ratio of smiley faces to squares is 4 : 6.
 - B. The ratio of squares to triangles is 4 : 2.
 - C. There are 3 smiley faces for every 1 triangle.

Create a representation for each situation.

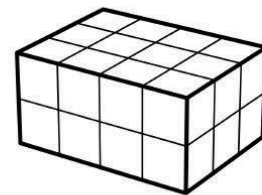
| Description | Picture |
|--|---------|
| 2.1 The ratio of stars to squares is 1 to 2. | |
| 2.2 The ratio of stars to hearts is 3 : 2. | |
| 2.3 There is 1 heart for every 3 squares. | |
| 2.4 | |
| 2.5 | |

Unit 6.2, Lesson 2: Practice Problems

3. Determine the area of the parallelogram. Show all of your thinking.



4. Determine the volume and surface area of the prism. Show all of your thinking.



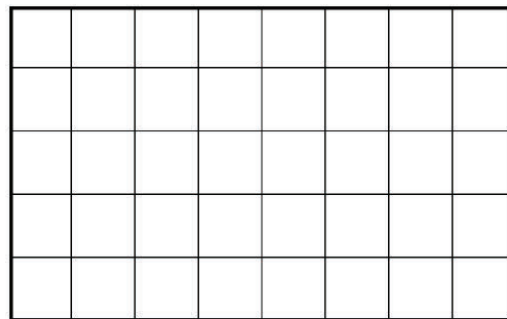
Volume: _____

Surface area: _____

Explore

Here is a 5-by-8 grid.

Create a design so that the ratio of unshaded squares to shaded squares is 3 : 2 .



Reflect

1. Star the question you spent the most time on.
2. Use the space below to ask one question you have or to share something you are proud of.



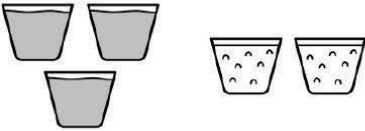

This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 3: Rice Ratios

Name(s) _____

Activity 1: Rice Advice

Here are the instructions for two different bags of basmati rice.

| | |
|---|--|
| Bag A | Bag B |
| Cook 3 cups of water for every 2 cups of rice. | Cook $1\frac{1}{2}$ cups of water for every cup of rice. |
|  |  |

1. How are these recipes different? How are they the same?
2. The ratios in these two recipes are called *equivalent ratios*. Why do you think they're called that?
3. Marco wants to make more rice than the recipe on Bag A calls for. What is another ratio of rice to water that he could use? Explain your thinking.
4. Bag A says its recipe makes rice for 6 people. What ratio of rice to water would you use to feed 18 people?

Activity 2: Rice Around the World

Use *equivalent ratios* to determine how much of each ingredient is needed in each situation.

Jollof Rice

Jollof rice is a tomato-based rice dish from West Africa.

Ingredients

Makes one large bowl

- 4 cups of rice
- 3 tablespoons of tomato paste
- 1 bell pepper
- 5 tomatoes
- 2 onions
- $\frac{1}{3}$ cup of oil

Jamar's family invited another family over for dinner.

How much of each ingredient is needed for **two** large bowls of jollof rice?

- ____ cups of rice
- ____ tablespoons of tomato paste
- ____ bell peppers
- ____ tomatoes
- ____ onions
- ____ cups of oil

Arroz Con Leche

Arroz con leche is a creamy dessert from Mexico and Spain.

Ingredients

Serves 4 people

- 2 cups of rice
- 4 cups of milk
- $\frac{1}{3}$ cup of sugar
- 1 handful of raisins
- 1 cinnamon stick

Nia wants to cook arroz con leche for 12 people.

1. How much of each ingredient does she need?

- ____ cups of rice
- ____ cups of milk
- ____ cups of sugar
- ____ handfuls of raisins
- ____ cinnamon sticks

Valeria wrote that Nia needs 9 cinnamon sticks.

2. How might Valeria have arrived at this answer?

3. What advice would you give her?



Unit 6.2, Lesson 3: Rice Ratios

Name(s) _____

Champorado

Champorado is a chocolate rice porridge eaten in the Philippines.

Ingredients

Serves 2 people

- $\frac{1}{2}$ cup of rice
- 2 cups of water
- 1 can of coconut milk
- $\frac{1}{4}$ cup of cocoa powder
- 1 cup of sugar

Julian has 2 cups of rice and wants to use all of it to make champorado.

1. How much of the other ingredients does he need?

2 ___ cups of rice

___ cups of water

___ cans of coconut milk

___ cups of cocoa powder

___ cups of sugar

2. How many people will Julian's champorado serve?

Risotto

Risotto is an Italian rice dish that uses broth to get a creamy texture.

Ingredients

Serves 8 people

- 3 cups of rice
- 10 cups of chicken broth
- 4 tablespoons of olive oil
- 2 tablespoons of butter
- 8 ounces of parmesan cheese

Ariana says this recipe makes too much risotto.

1. How much of each ingredient could she use to make a smaller amount of risotto?

___ cups of rice

___ cups of chicken broth

___ tablespoons of olive oil

___ tablespoons of butter

___ ounces of parmesan cheese

2. How many people will this serve?

My Notes

1. Explain what *equivalent ratios* are in your own words. Give at least one example.

Rice and Peas

Rice and peas is a popular side dish from the Caribbean.

2. What do you need to make this dish for 12 people?

Ingredients

Serves 4 people

- | | |
|---|------------------------------------|
| • 1 cup of long-grain rice | _____ cups of long-grain rice |
| • 14 ounces coconut milk | _____ ounces coconut milk |
| • 15 ounces of kidney beans | _____ ounces of kidney beans |
| • 3 pinches of thyme | _____ pinches of thyme |
| • $\frac{1}{2}$ teaspoon of ground allspice | _____ teaspoons of ground allspice |

3. Mio is making rice and peas for 8 people. She says she needs 18 ounces of coconut milk. Do you agree? Explain your reasoning.

Summary

| |
|--|
| <input type="checkbox"/> I can explain what equivalent ratios are. |
| <input type="checkbox"/> I can create equivalent ratios by doubling, tripling, and halving in context. |

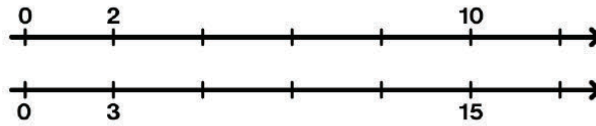


Unit 6.2, Lesson 3: Practice Problems

Name _____

Warm-Up

Label the blank tick marks on each number line.

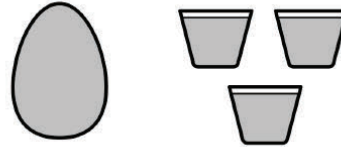


Practice

There are many recipes for pasta. Some of them call for the following ratio of eggs to flour.

- 1.1 Draw a picture that shows how many ounces of flour you would need for 2 eggs.

Mix 1 egg for every 3 ounces of flour.



Fill in the blanks to create equivalent ratios.

1.2

- 4 eggs
- _____ ounces of flour

1.3

- _____ eggs
- 15 ounces of flour

- 1.4 Thiago mixed 3 eggs with 6 ounces of flour.

Will his pasta taste the same as the original? Explain your thinking.

2. A bakery uses this ratio of water to flour to bake their bread recipe.

List 2 other ratios of water to flour that would make the same type of bread.

_____ pounds of water : _____ pounds of flour

_____ pounds of water : _____ pounds of flour

Mix 3 pounds water for every 5 pounds flour.



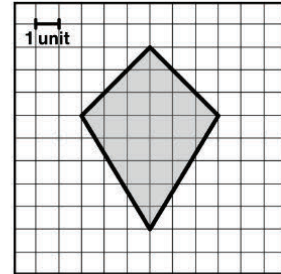
Unit 6.2, Lesson 3: Practice Problems

Koharu's pie dough recipe uses 6 ounces of flour, 4 ounces of butter, and 2 ounces of water. Complete the sentences to describe the ratios in her recipe.

- 3.1 For every 2 _____, there are 6 _____.
- 3.2 The ratio of _____ to _____ is 6 : 2.
- 3.3 The ratio of _____ to _____ is 2 : 3.
- 3.4 The ratio of _____ to _____ is 3 : 2.
- 3.5 Koharu made a new batch of pie dough with 3 ounces of flour, 2 ounces of butter, and 1 ounce of water.

Will her pie dough taste the same as the original recipe? Explain your reasoning.

4. Determine the area of this polygon.
Explain or show your strategy.



Explore

Make a true statement by filling in each blank using the digits 0 to 9 without repeating.

: is equivalent to :

Explain how you know your statement is true.

Reflect

1. Put a heart next to the problem you are most proud of.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 4: Supplement

Name(s) _____

Fruit Lab

Directions: Use this worksheet to organize your work on Screen 4.

1. Choose two fruits.
2. Write several equivalent ratios of those two fruits in one table below. Use the interactive scale to check your work.
3. Repeat with several other pairs of fruits.

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Are You Ready for More?

A ratio of 11 kiwis : 4 peaches balances and a ratio of 15 pears : 6 peaches.

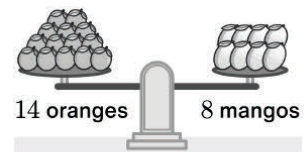
Write a ratio of kiwis to pears that would balance. Explain or show how you know.

My Notes

1. The scale balances with a ratio of 14 oranges to 8 mangos.

Select **all** of the equivalent ratios.

- 12 oranges to 6 mangos
- 42 oranges to 24 mangos
- 7 oranges to 4 mangos
- 18 oranges to 12 mangos
- 21 oranges to 12 mangos



- 2.1 Give an example of two ratios that are equivalent.
- 2.2 Give an example of two ratios that are **not** equivalent but someone might think are.
- 2.3 How can you tell whether or not two ratios are equivalent?

Summary

- I can explain which operations create equivalent ratios.
- I can decide whether two ratios are equivalent.
- I can create equivalent ratios and explain how I know they are equivalent.

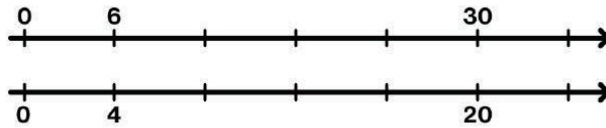


Unit 6.2, Lesson 4: Practice Problems

Name _____

Warm-Up

Label the blank tick marks on each number line.



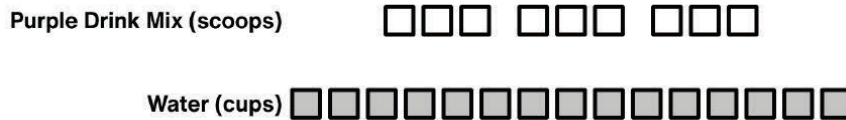
Practice

A package of purple drink mix says: Combine 3 scoops of purple drink mix and 5 cups of water.

- 1.1 Complete the table with other amounts that will create the same taste as the original.
- 1.2 Explain how you know one ratio you wrote will taste the same as the original. Draw a diagram if it helps you with your thinking.

| Purple Drink Mix (scoops) | Water (cups) |
|---------------------------|--------------|
| 3 | 5 |
| | |
| | |
| | |
| | |

- 1.3 Jaylin drew this diagram for one of their mixes. Will their mix taste the same as the original? Explain or show your reasoning.



- 2.1 Select **all** of the ratios that are equivalent to 4 : 5 .
 - 3 : 4
 - 8 : 10
 - 1 : 2.5
 - 9 : 10
 - 20 : 25
- 2.2 Write a different ratio that is equivalent to 4 : 5 .

Unit 6.2, Lesson 4: Practice Problems

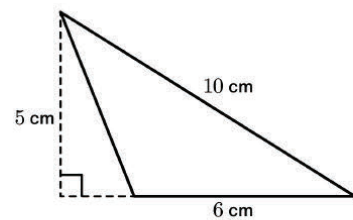
A shade of green paint is made by putting 10 ounces of green tint into 2 gallons of white paint.

3.1 Draw a picture to represent this ratio.

3.2 Select **all** the true statements.

- For every 5 ounces of green tint, you need 1 gallon of white paint.
- The ratio of green tint to white paint is 1 : 5.
- For every gallon of white paint, you need 5 ounces of green tint.
- For every ounce of green tint, you need 5 gallons of white paint.
- The ratio of white paint to green tint is 10 : 2.

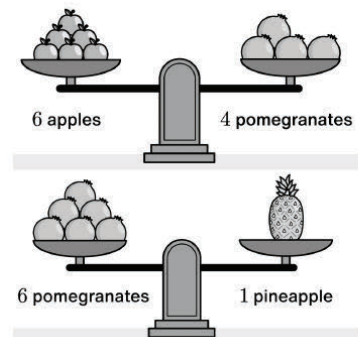
4. Determine the area of this triangle.
Explain or show your strategy.



Explore

Use any strategy to determine a combination of apples and pineapples that will balance the scale.

Explain how you know it will balance.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



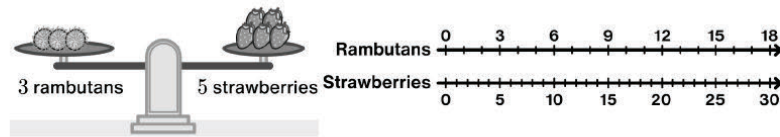
This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 5: Notes

Name _____

My Notes

The scale balances with a ratio of 3 rambutans to 5 strawberries.



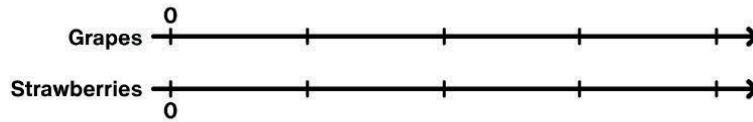
1.1 List several other equivalent ratios.

1.2 How many rambutans balance with 15 strawberries?

Circle where this is on the double number line.

A ratio of 12 grapes : 8 strawberries balances the scale.

2.1 Complete the double number line to represent this situation.



2.2 Use the double number line to complete the table.

| Grapes | Strawberries |
|--------|--------------|
| 12 | 8 |
| | 24 |
| 18 | |

Summary

- I can explain how to use a double number line diagram to find equivalent ratios.
- I can use double number line diagrams to solve problems.

Unit 6.2, Lesson 5: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

$7 \cdot 4 = \underline{\quad}$

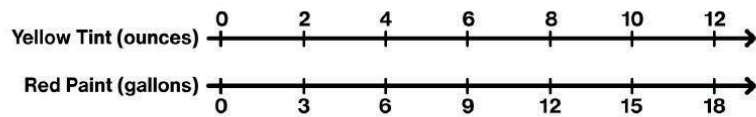
$7 \cdot 30 = \underline{\quad}$

$7 \cdot 34 = \underline{\quad}$

$7 \cdot 68 = \underline{\quad}$

Practice

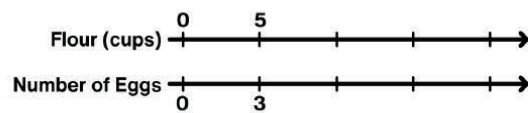
A shade of orange paint is made by mixing 2 ounces of yellow tint with 3 gallons of red paint.



- 1.1 List two other combinations of red paint and yellow tint that can create this shade of orange.
- 1.2 How much red paint do you need for 6 ounces of yellow tint?
- 1.3 How much yellow tint do you need for 12 gallons of red paint?

This double number line diagram shows the amount of flour and eggs for one batch of cookies.

- 2.1 Complete the double number line.
- 2.2 What is the ratio of cups of flour to eggs?
- 2.3 How much flour do you need for 12 eggs?



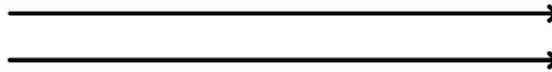
- 2.4 How many eggs do you need for 15 cups of flour? Explain or show your thinking.



Unit 6.2, Lesson 5: Practice Problems

Metropolis Elementary recommends 2 adults for every 15 students on a field trip.

3.1 Draw a double number line to represent this situation.



3.2 How many adults would you need to take 75 students on a trip?

3.3 How many adults would you recommend for 50 students? Explain your thinking.

Each pair of ratios are equivalent. Explain or show how you know they are equivalent.

4.1 5 : 2 and 15 : 6

4.2 18 : 3 and 6 : 1

4.3 2 : 7 and 100 : 350

Explore

Using the digits 0–9 without repetition, fill in each blank to create a double number line.



Reflect

- Put a smiley face next to a question that you understood well.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 6: Product Prices

Name(s) _____

Activity 1: How Much for One?

Imagine that you're at a store buying products for your family.

- Find cards A, B, and C. Sort the products from **least expensive** to **most expensive**.

Least expensive _____ _____ _____ Most expensive

- Discuss your strategy for sorting with a classmate.
- Select one card from A–C. What is the price per item? Show your reasoning.

Card _____

Activity 2: How Much for Many?

- Use the space below to write answers for cards D–F and show your reasoning.

Card D



Card E



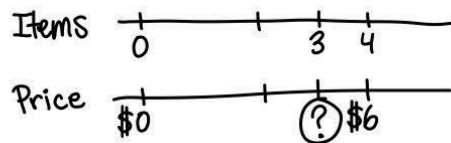
Card F

- Compare your answers and strategies with a classmate. Discuss any similarities and differences you see.

- Mariana drew this double number line.

Which card do you think she was working on?

Explain your thinking.





Unit 6.2, Lesson 6: Product Prices

Name(s) _____

4. Look through cards G–L. Which do you think is easiest to solve? Why?

5. Select three cards from G–L and answer them. Show or explain your reasoning.

Card ____



Card ____



Card ____

Two students made a mistake when solving card K.

6.1 Decide which student made your favorite mistake. Circle their name.

6.2 What did this student do well?

6.3 What advice would you give to this student?

Mariana's Work



Naoki's Work

$$\$10 \div 5 = \$2$$

$$\$2 \cdot 4 = \$8$$

Are You Ready for More?

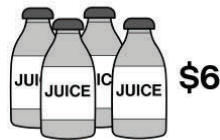
You have \$20 to spend on a mix of products from cards A–L. You can purchase up to the number of items shown on each card. Create a list of items that will cost as close to \$20 as you can (without going over).

My Notes

1. Explain what *unit price* means in your own words. Give at least one example.

Calculate the unit price of each item.

2.1

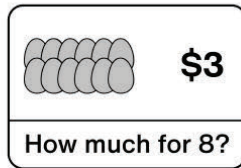


2.2

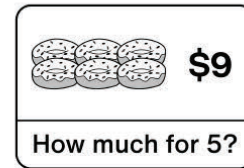


Answer each question. Show or explain your thinking.

3.1



3.2



Summary

- I can use a double number line diagram or table to calculate a unit price.
- I can use unit prices to solve problems.



Unit 6.2, Lesson 6: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

$8 \cdot 10 = \underline{\hspace{2cm}}$

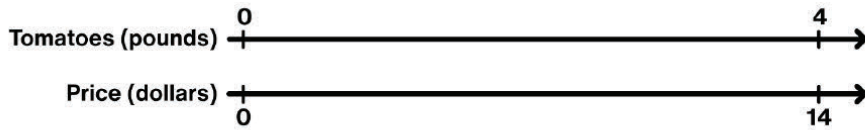
$8 \cdot 40 = \underline{\hspace{2cm}}$

$8 \cdot 41 = \underline{\hspace{2cm}}$

$8 \cdot 38 = \underline{\hspace{2cm}}$

Practice

The double number line below shows that 4 pounds of tomatoes cost \$14.



- 1.1 Draw and label tick marks that show the prices of 1, 2, and 3 pounds of tomatoes.
- 1.2 Ariel needs 6 pounds of tomatoes to make sauce. How much would that cost?

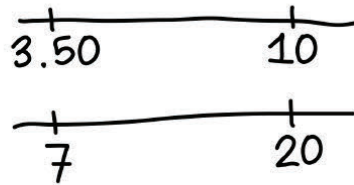
Callen bought several items at the grocery store. Calculate the price per item.

- | | | |
|---------------------|-------------------------------|--------------------------|
| 2.1 12 eggs for \$3 | 2.2 3 bags of rice for \$7.50 | 2.3 10 apples for \$3.50 |
|---------------------|-------------------------------|--------------------------|

At these rates, how much would it cost for:

- | | | |
|-------------|---------------------|---------------|
| 2.4 6 eggs? | 2.5 4 bags of rice? | 2.6 7 apples? |
|-------------|---------------------|---------------|

Callen drew a double number line for Problem 2.6.



- 3.1 What did Callen do well?
- 3.2 What advice would you give them?

Unit 6.2, Lesson 6: Practice Problems

4 movie tickets cost \$48. At this rate, what is the cost of:

4.1 5 movie tickets?

4.2 11 movie tickets?

4.3 Describe a strategy that can help you figure out the cost of any number of movie tickets.

5. Explain or show why $4 : 6$ and $8 : 10$ are **not** equivalent ratios.

Explore

Here are four groups of items.

1. If you bought one of each item, would your total be more or less than \$10? Explain or show your reasoning.



\$12



\$12

2. Create a list of these items with a total price of exactly \$10.



\$12



\$12

Reflect

1. Put a question mark next to a question you are feeling unsure of.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Practice Day 1: Task Cards

Rainy Roof

Water started to leak from Oscar's roof at a steady rate. Oscar used a bucket to collect the water. After 5 minutes, the bucket had 2 ounces of water.

1. At this rate, how much water will the bucket have after 15 minutes?

2. How much water will the bucket have after 1 hour (60 minutes)?

3. The bucket can hold 128 ounces.

If Oscar leaves the bucket for 8 hours, will it overflow? Explain your thinking.

4. Oscar finds a larger bucket that can hold 660 ounces.

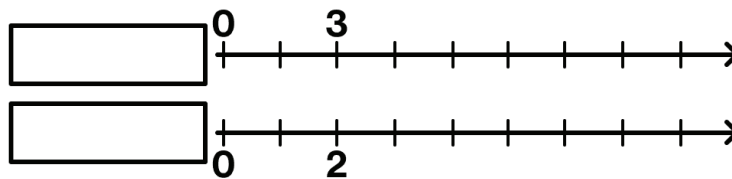
How long will it take for the water to fill that bucket?

Unit 6.2, Practice Day 1: Task Cards

Potato Price

Jaylin went to the grocery store, where it costs \$3 for every 2 pounds of potatoes.

1. How much do potatoes cost per pound at this store?
2. Label both number lines and fill in the missing values according to the situation.

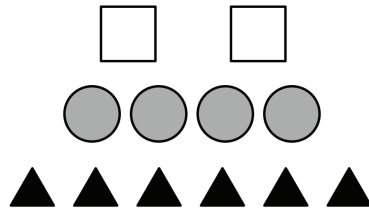


3. Troy is working at a soup kitchen and needs 7 pounds of potatoes. He goes to the same store with \$15. Is \$15 enough to buy 7 pounds of potatoes?
4. At a different store, Troy can buy 3 pounds of potatoes for \$5. Is the price at this store a better deal than the original store? Explain your thinking.



Unit 6.2, Practice Day 1: Task Cards

Not-So-Simple Symbols



1. Complete the sentences:

The ratio of squares to circles is ____ : 2.

For every 1 square, there are ____ triangles.

2. The ratio of circles to squares is 4 : 2.

Which of the following are equivalent ratios?

6 : 4

2 : 1

20 : 10

70 : 35

3 : 1

3. Draw your own set of symbols, like those at the top of the page.

4. Describe as many ratios as you can in your drawing.

Unit 6.2, Practice Day 1: Task Cards

Baking Biscuits

Keya's biscuit recipe calls for 8 cups of flour, 2 cups of butter, and 3 cups of milk.

1. If Keya uses 4 cups of flour, how many cups of butter and milk should she use?

2. If Keya uses 12 cups of flour, how many cups of butter and milk should she use?

Axel has a different biscuit recipe. His recipe says, "For every 7 cups of flour, use 1 cup of butter and 2 cups of milk."

- 3.1 Do you think Axel's biscuits and Keya's biscuits will taste the same?
Explain your thinking.

- 3.2 If Axel uses 10 cups of milk, how many cups of flour and butter should he use?

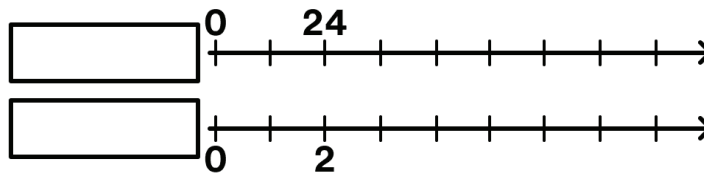


Unit 6.2, Practice Day 1: Task Cards

Museum Monitors

The museum requires a ratio of 2 adult chaperones to 24 children for school visits.

1. Label both number lines and fill in the missing values.



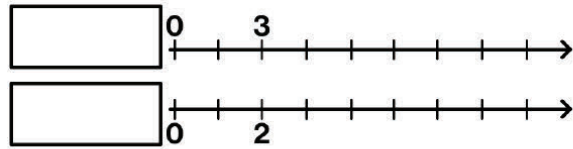
2. 60 sixth graders are going to the museum. How many adult chaperones are required?
3. Write a different question you could answer with your double number line.
4. Answer the question you wrote above.

Rainy Roof

- 1.
- 2.
- 3.
- 4.

Potato Price

- 1.
- 2.
- 3.
- 4.



Not-So-Simple Symbols

- 1. The ratio of squares to circles is ____ : 2.
- 2. For every 1 square, there are ____ triangles.
- 3.
- 4.



Unit 6.2, Practice Day 1: Worksheet

Name _____

Baking Biscuits

1.

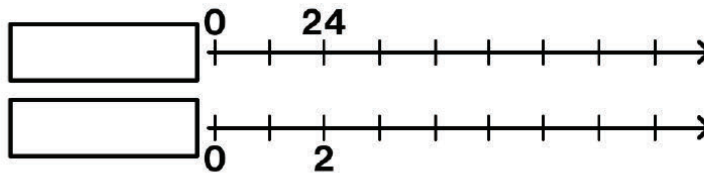
2.

3.1

3.2

Museum Monitors

1.



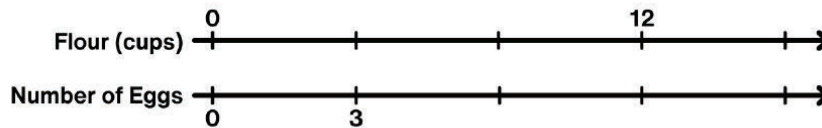
2.

3.

4.

Warm-Up

Fill in the missing values on the double number line.

**Practice: The Middle of the Story**

In this practice set, you will see problems (beginnings) **and** correct solutions (ends).

Your task is to explain all of the parts in the middle.

Problem 1

Faith is purchasing coffee beans for her coffee shop. One type of coffee bean costs \$10 for every 4 pounds.

- 1.1 The shop uses 12 pounds every day. How much would it cost to buy enough coffee for one day?
- 1.2 Faith has a budget of \$130. How many pounds can she purchase?

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Solution

- 1.1 \$30
- 1.2 52 pounds of coffee



Unit 6.2, Practice Day 1: Practice Problems

Problem 2

5: 3 and 10 : 6 are equivalent ratios.

- 2.1 Is 15: 13 equivalent to 5: 3?
- 2.2 Is 30: 18 equivalent to 5: 3?
- 2.3 Write two more ratios that are equivalent to 5: 3.

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Solution

- 2.1 No, it is not an equivalent ratio.
- 2.2 Yes, it is an equivalent ratio.
- 2.3 *Responses vary.*

Reflect

1. What is one math concept from this unit that you have improved on since the unit started? Explain what you did to help yourself improve.

2. What questions do you have about this unit so far?

Unit 6.2, Lesson 7: Notes

Name _____

My Notes

Mayra and Nicolas each made a shade of teal paint.



Mayra's Ratio
4 ounces teal
2 gallons white



Nicholas's Ratio
6 ounces teal
4 gallons white

1. Which ratio will make a darker teal? Explain your reasoning.
2. List several strategies for comparing ratios like the ones in Problem 1.
3. Mayra said, "They would be the same shade of teal because $4 + 2 = 6$ and $2 + 2 = 4$." What would you say to Mayra to help her see her mistake?

Summary

I can use strategies to compare ratios in context.



Unit 6.2, Lesson 7: Practice Problems

Name _____

Warm-Up

Complete each equation with a number that makes it true.

$8 \cdot 40 = \underline{\quad}$

$8 \cdot \underline{\quad} = 40$

$40 \cdot \underline{\quad} = 8$

$40 \cdot \underline{\quad} = 5$

Practice

To make 1 can of sky-blue paint, Ama mixes 2 ounces of blue tint with 3 gallons of white paint.

- 1.1 How much of each color does Ama need to make 4 cans?

- 1.2 Write a ratio of blue tint to white paint that would be a darker shade of blue.

- 1.3 Write a ratio of blue tint to white paint that would be a lighter shade of blue.

2. Here are two mixtures of light-purple paint.
 - Peony Purple: 5 ounces of purple tint for every 2 cups of white paint
 - Purple Pizazz: 15 ounces of purple tint for every 8 cups of white paint

Which mixture is a lighter shade of purple? Explain your reasoning.

3. Here are three mixtures of green paint.
 - 2 gallons white : 4 ounces green
 - 3 gallons white : 5 ounces green
 - 5 gallons white : 8 ounces green

Order the mixtures from lightest green to darkest green.

Lightest green _____ Darkest green

Unit 6.2, Lesson 7: Practice Problems

4. At DesGrocery, 5 tulips cost \$11. At GroceryMos, 6 tulips cost \$13. Is the price per tulip at each store equivalent? Explain how you know.

DesGrocery is selling frozen vegetables at 4 bags for \$9. At this rate, what is the cost of:

5.1 6 bags?

5.2 1 bag?

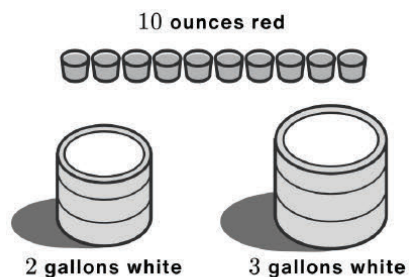
5.3 9 bags?

Explore

You have 10 ounces of red tint and two containers of white paint: one with 2 gallons and one with 3 gallons.

Divide the red tint between the two containers so that each container will be the same shade of pink.

Explain how you know they will be the same shade.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



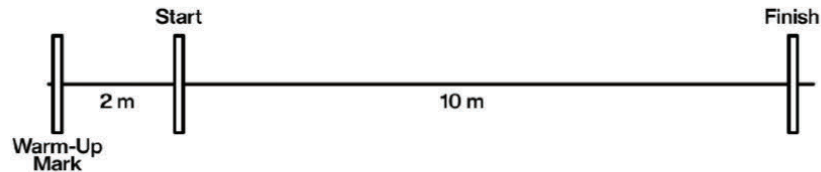
This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 8: World Records

Name(s) _____

Activity 1: Moving 10 Meters

What is your walking speed? Use the instructions displayed by your teacher to help you gather the data you need to find.

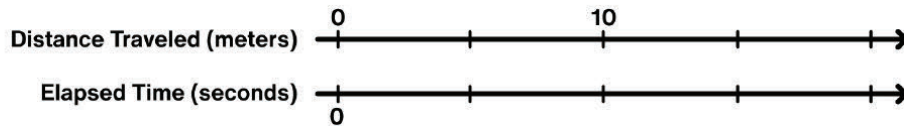


1. Gather data on your walking speed.

Distance: _____ meters

Time: _____ seconds

2. Use your data to complete the double number line diagram.



3. Estimate your walking speed using the unit rate “meters per second.”

4. At this rate, how long would it take you to walk 5 meters? 20 meters?

Activity 2: World Records

1. Danyl Boldyrev, Keni Harrison, and César Cielo each set records in their sports: climbing, hurdles, and swimming. Predict the order of these athletes from slowest to fastest.

Boldyrev
(15 m climb)
Harrison
(100 m hurdles)
Cielo
(50 m swim)
You
(10 m walk)

Slowest _____ **Fastest**

2. What information would help you determine the actual order?
3. Watch the partial videos. Discuss with a partner if your order changed.
4. Use the approximate times to determine the slowest-to-fastest order. Show your thinking.

| Athlete | Event | Distance (meters) | Approximate Time (seconds) |
|----------------|--------------|-------------------|----------------------------|
| Danyl Boldyrev | Climbing | 15 | |
| Keni Harrison | Hurdles | 100 | |
| César Cielo | Swimming | 50 | |
| You | Walking fast | 10 | |

Boldyrev
(15 m climb)
Harrison
(100 m hurdles)
Cielo
(50 m swim)
You
(10 m walk)

Slowest _____ **Fastest**

5. Watch the full videos. Use the exact times to determine the most accurate slowest-to-fastest order. Explain your thinking.

Unit 6.2, Lesson 8: Notes

Name _____

My Notes

1. Explain what *unit rate* means in your own words. Give at least one example.

Zhang Shuang walked 50 meters on his hands with a soccer ball between his legs in about 25 seconds. Christopher Irlmscher ran 100-meter hurdles in about 15 seconds while wearing flippers.

- 2.1 Who was moving faster: Zhang or Christopher?
Explain your reasoning.

- 2.2 Terrance can run 3 meters per second. Does he move faster than Zhang? Faster than Christopher?

Show or explain your thinking.

Summary

- I can calculate the speed of an object.
- I can determine which object is moving faster and explain how I know.



Unit 6.2, Lesson 8: Practice Problems

Name _____

Warm-Up

Complete each equation with a number that makes it true.

$35 \cdot 5 = \underline{\hspace{2cm}}$

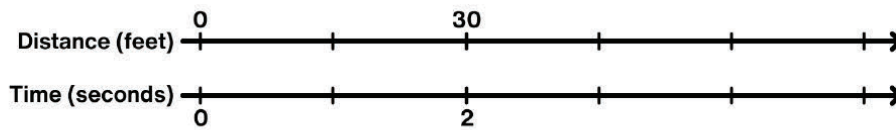
$35 \div 5 = \underline{\hspace{2cm}}$

$5 \div \underline{\hspace{2cm}} = 1$

$5 \cdot \underline{\hspace{2cm}} = 1$

Practice

A person on a scooter travels 30 feet in 2 seconds at a constant rate.



- 1.1 Fill in the missing values on the double number line.
- 1.2 What is the speed of the scooter in feet per second? _____
- 1.3 At this rate, determine how long it would take the scooter to travel 105 feet.

- 1.4 A person on a skateboard travels 55 feet in 4 seconds. Is the skateboard traveling faster than, slower than, or at the same speed as the scooter? Explain or show your reasoning.

- 1.5 A person on roller blades travels 90 feet in 5 seconds. Are the roller blades traveling faster than, slower than, or at the same speed as the scooter? Explain or show your reasoning.

2. Did you know the top speeds of these animals?
 - Galapagos tortoise: 16 meters in 3 minutes
 - Garden snail: 8 meters in 5 minutes
 - Three-toed sloth: 9 meters in 2 minutes

Order the animals from slowest to fastest.

Slowest _____ Fastest

Unit 6.2, Lesson 8: Practice Problems

3. Ariana gets paid \$90 for every 5 hours of work in her neighbor's garden. Last summer, Lucy got paid \$36 for every 2 hours of work in the same garden. Are they paid at the same rate? Explain your thinking.



Metropolis Elementary recommends a ratio of 2 adults for every 24 children on every field trip.



- 4.1 Label the axis of each number line and fill in the missing values to represent the situation.
- 4.2 If there are 72 children on the field trip, how many adults are needed?
- 4.3 The school has 20 adults and 350 students. If everyone goes on a field trip, would that meet the recommendation? Explain your thinking.

Explore

Using the digits 0–9 without repeating, fill the blanks so that Marc and Prisha have the same speed.

| Marc | Prisha |
|--|--|
|  [] seconds |  [] seconds |
| [] meters | [] meters |

Reflect

- Put a star next to the question you spent most of your time on.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 9: Supplement

Name(s) _____

Activity 2: FEMA Poster

Here are some additional pieces of guidance from FEMA:

- For every 100 people, have 20 rolls of **paper towels**.
- Plan for one-half gallon of **drinking water** per person per day.
- Have 1 **magnifying glass** for every 50 people.
- For every 100 people, have 3 bags of 50 **cotton balls**.
- Prepare 1 **bed** per person, plus 10 extra beds for volunteers.
- Have 6 pairs of **crutches**.

1. Use FEMA’s guidance to make recommendations for preparing 3 cities for a disaster.

| City | Population | Rolls of Paper Towels | Magnifying Glasses | Pairs of Crutches | Cotton Balls |
|---------------------|------------|-----------------------|--------------------|-------------------|--------------|
| Charlestown, Utah | 300 | | | | |
| Whitney, Texas | 2000 | | | | |
| Burlington, Vermont | 50 000 | | | | |

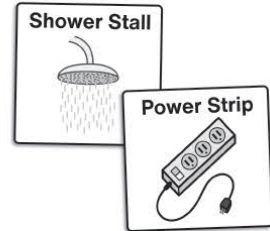
2. Is there anything you disagree with? If yes, explain which numbers you think should change and why. If no, explain why not.

- Complete the steps below and make a poster of your work.**
- Choose a city or town that is meaningful to you and look up its population.
 - Make recommendations to the city or town. Choose **at least four** different supplies from the list. Determine how many of each item the city should have on hand in case of a disaster.
 - Explain or show how you determined the amount of each item your city will need.
 - Explain **at least two** changes or additions you think FEMA should make to its guidance.

My Notes

FEMA (Federal Emergency Management Agency) has a list of items that cities should prepare in case of a disaster.

For a town of 600 people, FEMA recommends 24 shower stalls and 30 power strips.



1. At this rate, what would FEMA recommend for each city?

| City | Population | Shower Stalls | Power Strips |
|---------------------|------------|---------------|--------------|
| Blue Ridge, Georgia | 600 | 24 | 30 |
| Charlestown, Utah | 300 | | |
| Whitney, Texas | 2 000 | | |
| Burlington, Vermont | 50 000 | | |

2. Show or describe a strategy for determining the number of power strips recommended for Burlington, Vermont.

3. Show or describe a different strategy for the same problem.

Summary

I can use tables to determine missing values in a situation that involves large numbers.



Unit 6.2, Lesson 9: Practice Problems

Name _____

Warm-Up

Complete each equation with a number that makes it true.

$8 \cdot \underline{\quad} = 40$

$8 \cdot \underline{\quad} = 20$

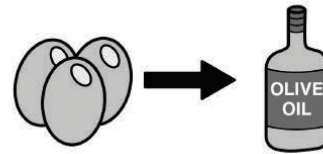
$8 \cdot \underline{\quad} = 200$

$8 \cdot \underline{\quad} = 2$

Practice

Did you know it takes about 40 pounds of olives to make 3 liters of olive oil?

- 1.1 Orchard A grew about 2 000 pounds of olives. How many liters of olive oil would this make? Use the table if it helps you with your thinking.

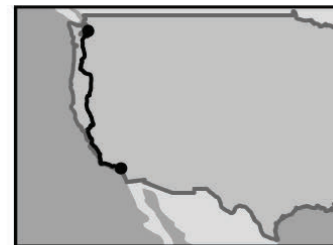


- 1.2 Orchard B grew about 3 000 pounds of olives. How many liters of olive oil would this make?

| Olives (lb.) | Olive Oil (L) |
|--------------|---------------|
| 40 | 3 |
| | |
| | |
| | |
| | |

There is a train that travels from Seattle, Washington, to Los Angeles, California. In its first 2 hours, the train went about 80 miles, including stops.

- 2.1 At this rate, how far does the train travel per hour?
- 2.2 At this rate, how long will it take to travel the 1 400 miles from Seattle to Los Angeles?



Unit 6.2, Lesson 9: Practice Problems

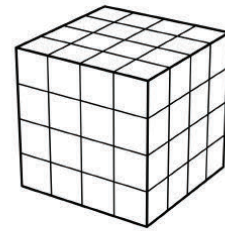
3. A park fountain sprayed 20 gallons of water in $\frac{1}{2}$ an hour, then was turned off for awhile. When it was turned back on, it sprayed 30 gallons in $\frac{3}{4}$ of an hour.

Explain how you know that the fountain sprayed water at the same rate both times it was on.

4. Explain or show how you know that 600:450, 60:45, and 4:3 are all equivalent.

- 5.1 What is the volume of this cube?

- 5.2 What is its surface area?



Explore

South Africa broke the world record for largest pizza in 1990. It weighed 26 833 pounds!

- 3 medium pizzas weigh about 2 pounds with toppings. About how many medium pizzas are equivalent to the world's largest pizza?
- How many people do you think the world's largest pizza could feed?

Reflect

- Circle the question you feel most confident about.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 10: Notes

Name _____

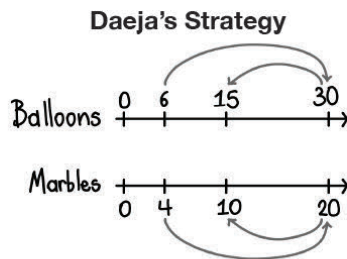
My Notes

Red balloons float orange marbles at a ratio of 6 : 4.



1. How many marbles can 24 balloons float?
2. How many balloons are needed to float 10 marbles?

3. Here are two students' work for Problem 2. Describe each strategy.



Charlie's Strategy

| Balloons | Marbles |
|----------|---------|
| 6 | 4 |
| 1.5 | 1 |
| 15 | 10 |

Summary

- I can solve problems using tables and double number line diagrams.
- I can compare different strategies for determining missing values.

Unit 6.2, Lesson 10: Practice Problems

Name _____

Warm-Up

Complete each equation with a number that makes it true.

$8 \cdot \underline{\hspace{1cm}} = 1$

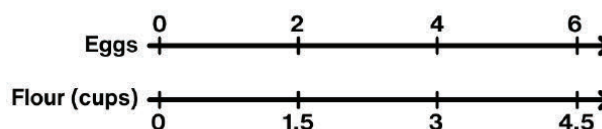
$\frac{1}{8} \cdot 8 = \underline{\hspace{1cm}}$

$\frac{5}{8} \cdot 8 = \underline{\hspace{1cm}}$

$8 \cdot \underline{\hspace{1cm}} = 3$

Practice

Here is part of a recipe for different-size cakes, showing the ratio of eggs to flour.

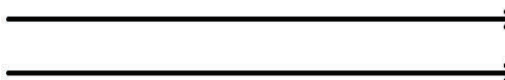


- 1.1 Make a table that represents the same situation.
- 1.2 How much flour do you need for each egg in this recipe?
- 1.3 How many eggs would you need for a bag that contains 18 cups of flour?

| Eggs | Flour (cups) |
|------|--------------|
| | |
| | |
| | |
| | |

The same cake recipe uses 2 cups of sugar for every 3 cups of flour.

- 2.1 Draw a double number line to represent this situation.



- 2.2 How much sugar would you need for a bag that contains 18 cups of flour?
- 2.3 Which representation do you prefer to answer the previous question: a table or a double number line? Explain your thinking.



Unit 6.2, Lesson 10: Practice Problems

Inola is making personal pizzas for her birthday party. For 4 pizzas, she uses 10 ounces of cheese. At this rate, how much cheese does she need if she makes:

3.1 12 pizzas?

3.2 22 pizzas?

3.3 11 pizzas?

Inola went to the farmers market to get ingredients. Determine the price per item of each vegetable.

4.1 6 onions for \$1.80

4.2 12 mushrooms for \$3

4.3 5 peppers for \$5.50

Explore

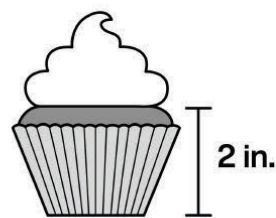
People have very different opinions about the perfect amount of cupcake frosting.

What do you think is the appropriate thickness of frosting for a 2-inch cake?

_____ inches of frosting : 2 inches of cake

At this rate, how thick would the frosting be if the cake were:

- 3 inches tall?
- 31 inches tall (close to the world record)?
- 1 centimeter tall?



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 11: Community Life

Name _____

Activity 1: Sort 'em

For this activity, you will need cards A–F. Place the cards with the numberless side facing up.

Without solving, determine which cards you plan to use equivalent ratios to solve.

Plan to Use Equivalent Ratios

Plan Not to Use Equivalent Ratios

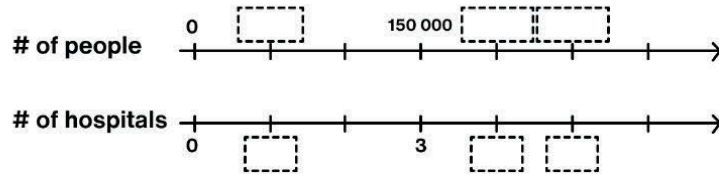
Activity 2: Closer Look

1. Antwon and Riku started working on Card D. With a partner, finish their work.

Antwon's Work

| # of people | # of hospitals |
|-------------|----------------|
| 0 | 0 |
| 150 000 | 3 |
| | |
| | |
| | |

Riku's Work



2. Discuss with a partner: *How are the two representations similar? How are they different?*
3. Which representation do you prefer for this situation? Explain your reasoning.
4. Answer the question on Card D: If the city population grows to 250 000 people, would you recommend the city to plan to have 6 hospitals? Explain your thinking.



Unit 6.2, Lesson 11: Community Life

Name _____

Activity 3: Solve 'em

Select two cards (other than Card D) and solve them. Show or explain your reasoning.

| | |
|-----------|-----------|
| Card ____ | Card ____ |
|-----------|-----------|

Are You Ready for More?

Write your own situation and problem that involves equivalent ratios. Trade problems with a partner.

My Notes

The Metropolis Delivery Service makes 15 deliveries every 2 hours. They need to make 100 deliveries tomorrow. At this rate, how long will it take to make all 100 deliveries?

1.1 Antwon started to answer this question. Finish their work.

Antwon's Work

| # of deliveries | # of hours |
|-----------------|------------|
| 0 | 0 |
| 15 | 2 |
| | |
| | |
| | |

1.2 How long will it take to make all 100 deliveries?

The Metropolis Pizza Place charges \$15 for every 2 medium pizzas plus \$5 for delivery. How many pizzas can you order for \$100?

2. Would the strategy you used on Problem 1 be useful here? Why or why not?

Summary

- I can use different strategies to solve problems involving ratios.
- I can decide whether or not to use equivalent ratios to solve a problem.



Unit 6.2, Lesson 11: Practice Problems

Name _____

Warm-Up

Complete each equation with a number that makes it true.

$4 \cdot \underline{\hspace{2cm}} = 24$

$24 \cdot \underline{\hspace{2cm}} = 4$

$\frac{1}{6} \cdot 6 = \underline{\hspace{2cm}}$

$6 \cdot \underline{\hspace{2cm}} = 1$

Practice

Julian is paid \$90 for 8 hours of work at a restaurant. How much should he be paid for:

1.1 24 hours of work?

1.2 10 hours of work?

1.3 3 hours of work?

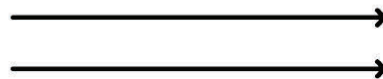
1.4 Wey Wey is paid \$40 for 3 hours of work. Is she being paid at the same rate as Julian? Explain your reasoning.

A restaurant makes pickles. The chef needs 15 gallons of vinegar to make the pickles. A store sells 2 gallons of vinegar for \$3.00 and allows customers to buy any amount of vinegar they want.

2.1 Make a table to represent this situation.

| | |
|--|--|
| | |
| | |
| | |
| | |

2.2 Draw a double number line to represent this situation.



2.3 Use any representation to determine how much the vinegar will cost.

2.4 Which representation did you prefer in this situation? Explain your reasoning.

Unit 6.2, Lesson 11: Practice Problems

3. The garlic bread at the restaurant uses 4 heads of garlic for every 3 loaves.
How many loaves can you make with 10 heads of garlic? Explain your thinking.

4. The sourdough bread machine at the restaurant can bake 20 loaves of bread in $\frac{1}{2}$ of an hour. The whole wheat bread machine can bake 30 loaves of bread in $\frac{1}{3}$ of an hour.
Which machine makes bread faster? Explain or show how you know.

Explore

There are many different ratios that exist inside of a restaurant.

Some examples from this practice set are hours of work to pay, gallons of vinegar to cost, heads of garlic to loaves of garlic bread, and baking time to number of loaves of bread.

List 3–5 other ratios that might come up in a restaurant.

Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

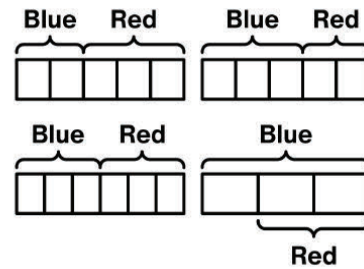
Unit 6.2, Lesson 12: Notes

Name _____

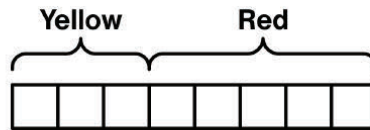
My Notes

Students are painting the lockers at their school. They are using a purple paint that has 3 parts blue paint for every 2 parts red paint.

- Which tape diagram represents this paint mixture ratio? Explain how you know.



Faith is curious how much yellow and red paint she needs to make 40 cups of orange paint for her room. Here's how she started:



- Fill in the numbers in each part of the tape diagram.
- How much yellow and red paint does Faith need?

Summary

I can use and interpret tape diagrams to solve problems involving part-part-whole ratios.

Warm-UpWhat is $\frac{1}{2}$ of 12?What is $\frac{1}{4}$ of 12?What is $\frac{3}{4}$ of 12?**Practice**

The ratio of coaches to players at practice is 2 : 5 . There are 21 people at practice.

- 1.1 Label the tape diagram to represent the situation. Include the value of each small rectangle.

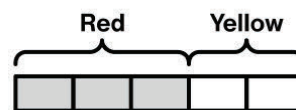


- 1.2 How many coaches are in the room?

- 1.3 How many players are in the room?

Here is a tape diagram representing the ratio of red paint to yellow paint in a mixture of orange paint.

- 2.1 What is the ratio of red paint to yellow paint?



- 2.2 If I had 6 gallons of red paint, how much yellow paint would I need? _____

How much red and yellow paint would I need if I wanted:

- 2.3 25 gallons of orange?

- 2.4 30 gallons of orange?

Red paint: _____ Yellow paint: _____

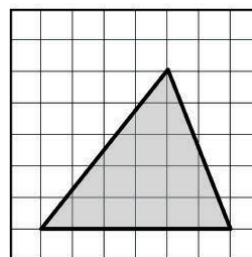
Red paint: _____ Yellow paint: _____



Unit 6.2, Lesson 12: Practice Problems

3. Taylor entered a 100-mile bike race. They know they can ride 32 miles in 160 minutes. At this rate, how long will it take them to finish the race? Use any strategy you find helpful.

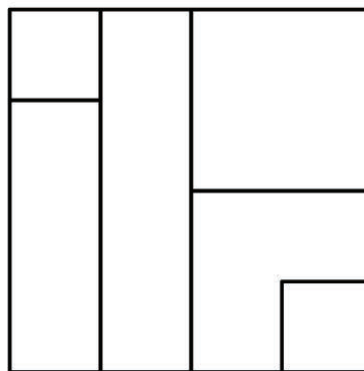
4. Determine the area of the triangle and show your reasoning.



Explore

Use what you know about area to shade in the figure so that the ratio of shaded area to unshaded area is $1 : 3$.

Explain how you know the ratio is $1 : 3$.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



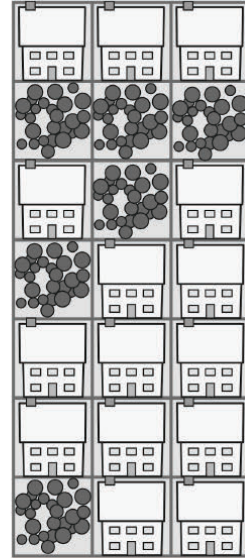
This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 13: Notes

Name _____

My Notes

Here is one neighborhood in Metropolis. Metropolis’s requirement for green space is 2 units of green space for every 5 units of building space.



1. Draw a tape diagram to represent this situation.

2. A new development has 35 units of land. How many units of building space can they build?

3. Brianna thinks a ratio of 3 : 4 instead of 2 : 5 would be better. If we use Brianna’s ratio, how many units of the new development would be:
 - Building space?

 - Green space?

Summary

I can create and use tape diagrams to solve problems involving part-part-whole ratios.



Unit 6.2, Lesson 13: Practice Problems

Name _____

Warm-UpWhat is $\frac{1}{2}$ of 20?What is $\frac{1}{5}$ of 20?What is $\frac{3}{5}$ of 20?**Practice**

Pasta is made from 3 parts water and 5 parts flour. Sora is making 32 ounces of pasta for a party.

- 1.1 Label the tape diagram to represent the situation.



- 1.2 How much water does Sora need to make 32 ounces of pasta?

- 1.3 How much flour does Sora need to make 32 ounces of pasta?

Sora is also making a salad. Her salad dressing recipe uses 6 teaspoons of vinegar for every 15 teaspoons of olive oil.

- 2.1 How much vinegar does Sora need for 5 teaspoons of olive oil?
- 2.2 How much olive oil does Sora need for 8 teaspoons of vinegar?
- 2.3 If Sora makes 42 teaspoons of salad dressing, how much of each ingredient is in it?
- 2.4 If Sora makes 14 teaspoons of salad dressing, how much of each ingredient is in it?

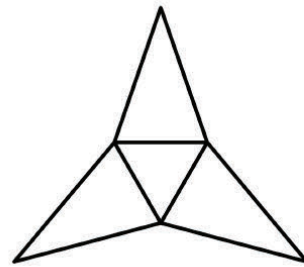
Unit 6.2, Lesson 13: Practice Problems

3. At the town book fair, all books cost the same amount. Katie paid \$13 for 4 books. Sydney bought 10 books. How much did she pay?

- 4.1 If this net were folded, what type of polyhedron would it make?

- A. A triangular pyramid
- B. A trapezoidal prism
- C. A triangular prism
- D. A rectangular pyramid

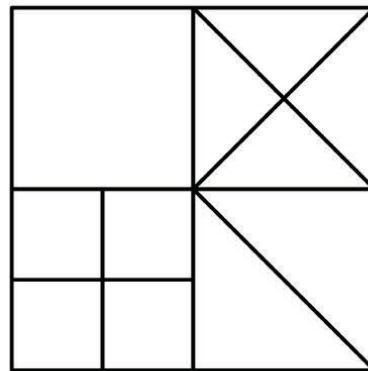
- 4.2 Describe a strategy for calculating the surface area of this polyhedron.



Explore

Use what you know about area to shade in the figure so that the ratio of shaded area to unshaded area is 3:5.

Explain how you know the ratio is 3:5.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.2, Lesson 14: Lunch Waste

Name(s) _____

Activity 1: How Much Waste?

Maria and Hoang noticed that their school generates a lot of trash during lunch time. After lunch one day, Maria and Hoang weighed the trash from all the students in their class.

They determined that 25 students threw away 10 pounds of trash. Of that trash:

- 1 pound was styrofoam trays.
- 6 pounds were food.
- 3 pounds were other types of trash (wrappers, milk cartons, etc.).

At this rate, calculate the following:

1. How much lunch trash would the 400 students in their school create in a day?
Show or explain your thinking.

2. Most schools have 180 school days each year. How much trash would the school generate in a school year? Show or explain your thinking.

3. How much of the yearly trash is styrofoam trays, food, and other trash? Explain your reasoning.
Styrofoam trays: _____
Food: _____
Other trash: _____

Activity 2: Cutting Waste

Maria and Hoang want to explore different ways to reduce the amount of trash the school generates.

1. One way to reduce trash is to switch from styrofoam to reusable trays.
How much yearly trash could be reduced by switching from styrofoam to reusable trays?

2. Composting is one way to reduce food trash. Maria and Hoang want to cut the amount of food that gets thrown away each year by 5 000 pounds.

How many students need to compost their food trash at lunch to meet this goal?

- 3.1 Maria and Hoang want to set a goal for reducing total yearly trash at the school. What do you think is a reasonable goal? Explain your thinking.

- 3.2 Write a plan for how you think Maria and Hoang can achieve this reduction at their school. Who at their school should they share the recommendation with? Include specific details about how the school can achieve this goal.

Are You Ready for More?

A stack of 125 styrofoam trays is approximately 24 inches tall. 400 students use styrofoam trays at lunch every day. After how many days could they make a stack of trays as tall as a 21-foot tall building?



Unit 6.2, Lesson 14: Notes

Name _____

My Notes

Maria decided to do a food waste experiment at home. She determined that her family threw away 9 pounds of trash in 5 days.

1. At this rate, how much trash would her family throw out in a year (365 days)?

2. Of the 9 pounds of trash, 3 pounds were plastic, 4 pounds were food, and 2 pounds were other waste. At this rate, how much of the yearly trash is plastic, food, and other trash? Explain or show your reasoning.

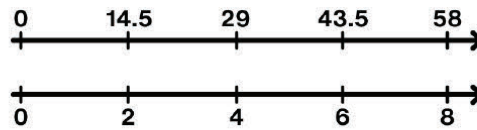
3. What recommendations would you give to Maria's family to reduce their waste?

Summary

I can apply ratio reasoning in order to answer questions about a real-world situation.

Warm-UpWhat is $\frac{1}{10}$ of 40?What is $\frac{3}{10}$ of 40?What is $\frac{3}{10}$ of 80?**Practice**

Oscar earned \$58 for working 8 hours.



- 1.1 Label each number line with a title and units to represent the situation.
- 1.2 How much does Oscar earn per hour? Explain your reasoning.
- 1.3 How much would Oscar earn if he worked 3 hours at the same rate tomorrow?

Oscar wants to both spend and save the money he earns. For every \$7 he puts in his wallet, he puts \$3 in savings.

- 2.1 Draw a tape diagram to match this situation.
- 2.2 If Oscar puts \$70 in his wallet, how much will he put in savings?
- 2.3 If Oscar earns \$70 in total, how much will he put in savings?
- 2.4 Explain how the two problems above are similar and how they are different.



Unit 6.2, Lesson 14: Practice Problems

3.1 Describe a situation that this tape diagram could represent.



3.2 Label the tape diagram so that it represents the situation.

3.3 Write a question you could use the tape diagram to answer.

Each pair of ratios are equivalent. Explain or show how you know they are equivalent.

4.1 $15 : 6$ and $10 : 4$

4.2 $40 : 15$ and $8 : 3$

4.3 $40 : 15$ and $200 : 75$

Explore

In 2018, about 3500 pounds of trash were created for every 4 Americans.¹

At this rate, estimate how much trash is created per year in the following places:

In Your Home

At Your School

In Your Neighbourhood

Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

¹ EPA, "National overview: Facts and figures on materials, wastes and recycling," <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#Generation>

Unit 6.2, Practice Day 2: Question Cards

1. The city of Metropolis requires that for every 15 standard parking spaces, there are 3 van accessible spaces.

The new library will have 54 parking spaces.
How many will need to be van accessible?

2. The city of Metropolis requires that for every 15 standard parking spaces, there are 3 van accessible spaces.

The new park will have 72 parking spaces.
How many will need to be van accessible?

3. In one year, a colony of bees produces 0.4 kg of honey for every 2 500 bees.

A small bee colony has approximately 20 000 bees.
How much honey can the bee colony produce in one year?

4. In one year, a colony of bees produces 0.4 kg of honey for every 2 500 bees.

How many bees would a farmer need in order to produce 2 kg of honey in one year?



Unit 6.2, Practice Day 2: Question Cards

A teacher is planning a class trip to the aquarium. The aquarium requires 2 adult chaperones for every 15 students.

- 5.1 If 75 sixth graders go on the trip, how many chaperones are needed?
- 5.2 How many tickets should the teacher purchase altogether?

A teacher is planning a class trip to the zoo. The zoo requires 3 adult chaperones for every 21 students.

- 6.1 If 84 seventh graders go on the trip, how many chaperones are needed?
- 6.2 How many tickets should the teacher purchase altogether?

- 7. Camila is training for a triathlon race.

Camila's watch recorded that she ran 2 kilometers in 15 minutes on Monday, and 3 kilometers in 20 minutes on Tuesday. She ran at a constant rate both days.

On which day did Camila run faster?

- 8. Camila is training for a triathlon race.

Camila's watch recorded that her heart beat 90 times in 30 seconds while biking, and 70 times in 20 seconds while swimming.

Which activity made Camila's heart beat faster?

Unit 6.2, Practice Day 2: Question Cards

9. Marcella bought 2 tacos and paid \$3. Farah's family bought 50 tacos for a party and paid \$72. Were Marcella's tacos the same price as Farah's?

10. Marcella bought 2 tacos and paid \$3. How many tacos can Marcella buy for \$36?

11. Adah is making chocolate chip cookies. Her recipe calls for a 2 : 5 ratio of cups of chocolate chips to cups of flour. Adah wants to use 3 cups of chocolate chips. How many cups of flour would she need?

12. Adah is making chocolate chip cookies. Her recipe calls for a 2 : 5 ratio of cups of chocolate chips to cups of flour. Adah wants to use 4 cups of flour. How many cups of chocolate chips would she need?



Unit 6.2, Practice Day 2: Worksheet

Name _____

Use this worksheet to record your thinking for each problem.

| | |
|----------------|----------------|
| 1. | 2. |
| 3. | 4. |
| 5.1 5.2 | 6.1 6.2 |

| | |
|-----|-----|
| 7. | 8. |
| 9. | 10. |
| 11. | 12. |

Are You Ready for More?

Josiah's recipe for sparkling orange juice mixes 3 parts orange juice with 4 parts soda water. Josiah made a mistake and added 5 cups of orange juice to 2 cups of soda water.

How much of each ingredient might Josiah add to fix his drink mix?



Unit 6.2, Practice Day 2: Practice Problems

Name _____

Warm-Up

Maria's smoothie recipe calls for 2 parts banana, 4 parts strawberries, and 1 part ice. Draw and label a tape diagram that could represent this situation.

Practice: The Middle of the Story

In this practice set, you will see problems (beginnings) **and** correct solutions (ends). Your task is to explain all of the parts in the middle.

Problem 1

Ahmed is making mango lassi. Here are the ingredients he needs.

Ingredients for Mango Lassi

- 3 cups of mango
- 2 cups of yogurt
- 1 cup of milk

- 1.1 Ahmed bought 12 cups of mango. How much of the other ingredients will he need if he wants to use all of the mango?
- 1.2 Ahmed makes this drink for a party. He needs 30 cups total to have enough. How much of each ingredient will he need?

Solution

- 1.1 8 cups of yogurt and 4 cups of milk
- 1.2 15 cups of mango, 10 cups of yogurt, and 5 cups of milk

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Unit 6.2, Practice Day 2: Practice Problems

Problem 2

Irene's old shower flows at a rate of 14 gallons of water every 4 minutes. Her new shower flows at a rate of 10.5 gallons of water every 5 minutes.

- 2.1 With the new shower, how much water will she use if she takes an 8-minute shower?
- 2.2 In one 8-minute shower, how much water will she save?

Solution

- 2.1 16.8 gallons of water
- 2.2 She will save 11.2 gallons of water.

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Reflect

1. Write 1–2 big ideas from this unit that you think are important to understand.

2. Name one strategy in this unit that you found particularly useful, and explain why it was useful to you. Also, if you learned it from another student, give that student credit.

GRADE 6

Unit 3

Student Lessons

Student lessons from Unit 3 are included here to provide NYC reviewers with access to the specific lessons in Amplify Desmos Math New York that demonstrate coverage of the **Ratios and Proportional Relationships** domain.

These lessons are partially designed and will be updated to match the exemplar Student Edition lessons included earlier in this sampler.



Grade 6 Unit 3

Student Edition Sampler



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 1: Many Measurements

Name _____

Activity 1: Describe It

- With a partner, use words, drawings, hand gestures, familiar objects, or other strategies to answer the question: *How much is _____?*

Check off each measurement as you describe it.

- 1 foot 1 meter 1 gallon 1 millimeter
 1 cup 1 square foot 1 yard 1 square inch

- Which measurements were easy to describe? Hard to describe?

| Easy to Describe | Hard to Describe |
|------------------|------------------|
| | |

Activity 2: Sort It

- Sort the units of measurement cards into groups based on whether they measure length, volume, or mass/weight. There will be four cards in each group.
- Sort the cards in each group from smallest unit to largest unit. Record your results below.

| Attribute | Smallest Unit | Largest Unit |
|-------------|---------------|--------------|
| Length | _____ | _____ |
| Volume | _____ | _____ |
| Mass/Weight | _____ | _____ |

- Match each picture card with the unit of measurement that best represents it.
- Pick one card. Discuss with a partner: *What else could we measure about this object?*

Are You Ready for More?

The table below shows four unit conversions. Add any other unit conversions you can think of.

| Length | Mass/Weight |
|---------------------|--------------------------|
| 1 foot = 12 inches | 1 kilogram = 1 000 grams |
| Volume | Time |
| 1 gallon = 4 quarts | 1 hour = 60 minutes |



Unit 6.3, Lesson 1: Notes

Name _____

My Notes

1. Describe what each unit measures.

Use "L" for length, "V" for volume, and "M" for mass or weight.

___ meters ___ liters ___ feet ___ pounds

___ gallons ___ inches ___ grams ___ cups

___ miles ___ tons ___ kilograms ___ quarts

2. Four of the units above measure length. Order them from smallest to largest.

Smallest _____, _____, _____, _____ **Largest**

3. Circle the units of measure you would use to measure the following fish tank.

| | | |
|---------------------|-------------|-------------|
| Volume: | milliliters | gallons |
| Mass/Weight: | pounds | grams |
| Height: | inches | millimeters |



Summary

- I can determine whether units measure length, area, mass/weight, or volume.
- I can compare different units of measure of length, volume, and mass/weight.
- I can connect units of measurement and measurements of everyday objects

Unit 6.3, Lesson 1: Practice Problems

Name _____

Warm-Up

Select all the expressions that are equivalent to $2 \cdot \frac{2}{5}$.

0.8

$\frac{4}{10}$

$\frac{1}{5}$

2.4

$\frac{4}{5}$

Practice

Choose the unit you would most likely use to measure each object.

1.1 The height of a building ____

1.2 The length of a fingernail ____

1.3 The mass of a paper clip ____

1.4 The distance between two cities ____

1.5 The weight of a package ____

1.6 The volume of a water cooler ____

A. Gallons

B. Centimeters

C. Grams

D. Pounds

E. Feet

F. Kilometers

Circle the larger unit of measure. Then determine if the unit measures length, volume, or mass.

2.1 meter or kilometer

2.2 yard or foot

2.3 pound or ounce

Name an object that:

3.1 Is about 1 meter in length.

3.2 Weighs about 5 pounds.

3.3 Has an area around 1 square foot.

3.4 Is about 1 centimeter in length.



Unit 6.3, Lesson 1: Practice Problems

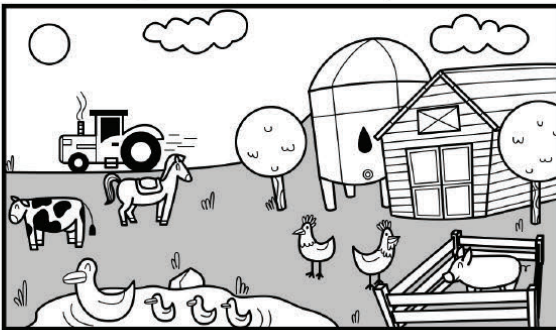
Jalen earns \$33 for babysitting 4 hours.

- 4.1 At this rate, how much will he earn if he babysits for 7 hours? Explain your thinking.

- 4.2 After how many hours of babysitting will Jalen have made over \$500 ? Explain your thinking.

Explore

Use the image below to find examples of each unit.



| Appropriate Unit of Measure | Example |
|-----------------------------|-----------------------|
| Feet | Length of the tractor |
| Gallons | |
| Square inches | |
| Miles per hour | |
| Centimeters | |

Reflect

1. Star the problem you spent the most time on.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

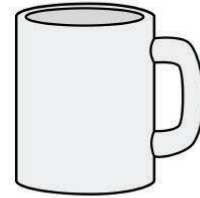
Unit 6.3, Lesson 2: Notes

Name _____

My Notes

1. Draw a line to match each measurement of the coffee cup to the unit used to measure it.

| Measurement | Unit of Measure |
|-------------|-----------------|
| Volume: 10 | Ounces |
| Volume: 0.3 | Liters |
| Width: 10 | Millimeters |
| Width: 4 | Centimeters |
| Width: 100 | Inches |



2. Sahana and Amara measured the same book using different units of measurement.



Fill in Amara's measurements.

| | Sahana | Amara |
|--------------------|----------------|-------------------|
| Bottom Edge | 22 centimeters | _____ millimeters |
| Weight | 32 ounces | _____ pounds |

Note: 1 centimeter = 10 millimeters, and 1 pound = 16 ounces.

Summary

- I can explain why it takes more of a smaller unit to measure the same quantity.
- I can convert measurements from one unit to another in the same system of measurement.



Unit 6.3, Lesson 2: Practice Problems

Name _____

Warm-UpSelect all the expressions that are equivalent to $3 \cdot \frac{3}{4}$.

3.75

$\frac{9}{4}$

$2 \frac{1}{4}$

$\frac{9}{8}$

$\frac{1}{4}$

Practice

12 in. = 1 ft.

3 ft. = 1 yd.

100 cm = 1 m

36 in. = 1 yd.

1.1 A room is 30 feet wide.
How many yards is that?

1.2 A car is 4.5 meters long.
How many centimeters is
that?

1.3 A table is 72 inches wide.
How many feet is that?

Kwame is 165 centimeters tall. Roberto is 1.7 meters tall.

2.1 Who is taller: Kwame or Roberto? Explain your reasoning.

2.2 Which would you rather use to describe your height: centimeters or meters? Why?

3. Neena knows that there are 4 quarts in a gallon. She wants to know how many gallons 12 quarts is. Her work is below.

$$12 \text{ quarts} \cdot 4 \text{ quarts per gallon} = 48 \text{ gallons}$$

What would you say to help her understand her mistake?

Unit 6.3, Lesson 2: Practice Problems

4. A watermelon is placed on a digital scale. The scale reads 10.5 . What could units be?
- A. Kilograms B. Grams C. Cubic inches D. Milligrams

Choose the unit you would use to measure each object.

- 5.1 The length of a standard piece of paper is about 1 _____.
- 5.2 The distance of a doorknob from the floor is about 1 _____.
- 5.3 The thickness of a fingernail is about 1 _____.

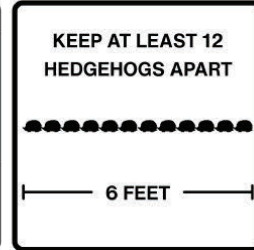
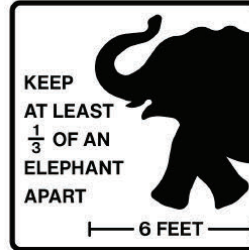
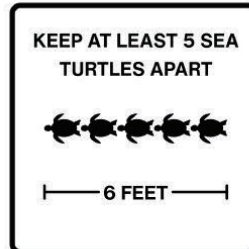
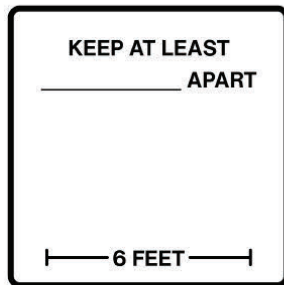
- A. Millimeter
B. Meter
C. Foot

6. Arnav bought 3 hats for \$22.50 . At this rate, how many hats could he buy with \$60 ?

Explore

Here are some different signs that tell people to keep a distance of 6 feet apart.

- Determine how long each animal is (and include the units).
- Create your own animal sign to show a distance of 6 feet.



Reflect

- Put a heart next to the problem you feel most confident about.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 3: Notes

Name _____

My Notes

1 kg = 1 000 g 200 g \approx 7 oz. 10 kg \approx 22 lb.

Fill in each blank.

- 1.1 35 ounces is approximately _____ grams.
- 1.2 2500 grams is approximately _____ kilograms.
- 1.3 60 kilograms is approximately _____ pounds.

- 2. Binta’s bird eats 3 pounds of bird food per month. Will this bag of bird food be enough for one month?

Explain your thinking.



- 3. A macaw at a zoo eats 6 kilograms of food per month. About how many pounds is that?

Summary

I can convert measurements from one unit to another in different measurement systems.

Warm-UpSelect **all** the expressions that are equivalent to $4 \cdot \frac{3}{8}$.

$\frac{12}{8}$

$\frac{3}{2}$

$\frac{12}{32}$

4.325

1.5

Practice

1 kg = 1 000 g

3 oz. \approx 85 g

4 kg \approx 141 oz.

11 lb. \approx 5 kg

1.1 15 oz. is approximately
_____ g.1.2 2 kg is approximately
_____ oz.1.3 20 lb. is approximately
_____ kg.

2. Malik's height is 57 inches. What could be his height in centimeters? (100 inches = 254 cm)

A. 22.4

B. 57

C. 144.8

D. 3 551

Explain your reasoning.

Jordan's family exchanged 250 dollars for 5 000 pesos.

3.1 Jordan bought a sweater for 550 pesos. How many dollars did the sweater cost?

3.2 If Jordan's family exchanges 200 dollars at the same rate, how many pesos will they have?



Unit 6.3, Lesson 3: Practice Problems

4. 5 gallons is about equal to 19 liters. Which has a larger volume: 1 gallon or 1 liter?

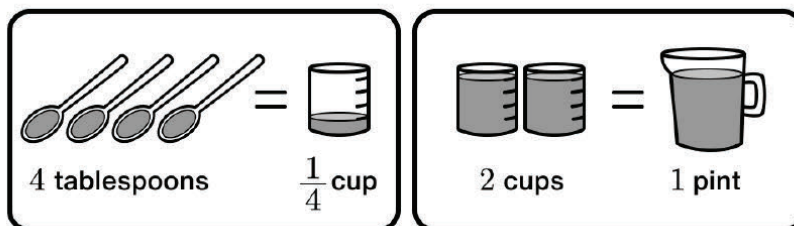
Explain your reasoning.

Kwasi bought 15 postage stamps for \$8.25. All stamps cost the same amount.

5.1 How much will 12 stamps cost?

5.2 How many stamps can Kwasi purchase with \$22?

Explore



4 tablespoons are in $\frac{1}{4}$ of a cup. 2 cups are in 1 pint. How many tablespoons are there in 1 pint?

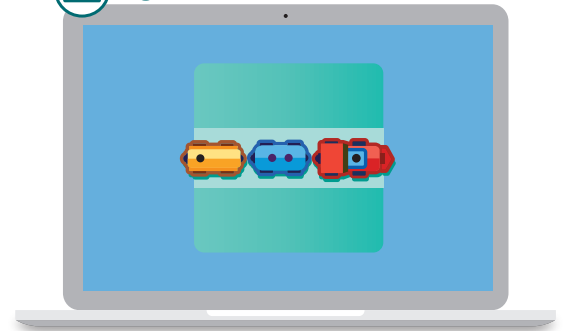
If you get stuck, consider making a double number line or making a table.

Reflect

1. Put a question mark next to a problem you would like to compare with a classmate.
2. Use the space below to ask one question you have or to share something you are proud of.



Digital Lesson



Model Trains

Let's calculate unit rates and use them to compare speeds.


Warm-Up

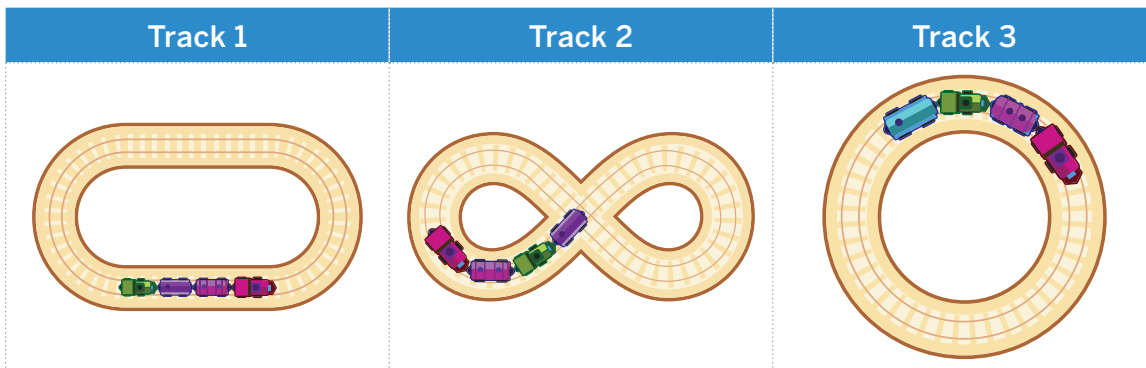
1 Which rate does not belong? Explain your thinking.

- A. 5 miles in 15 minutes
- B. 20 miles per 1 hour
- C. 3 minutes per mile
- D. 32 kilometers per 1 hour

How Fast?

2 Here are three designs for a model train set for a children's museum. Choose one.

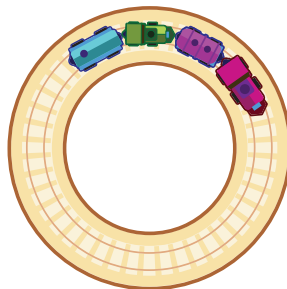
 **Discuss:** What do you notice? What do you wonder?



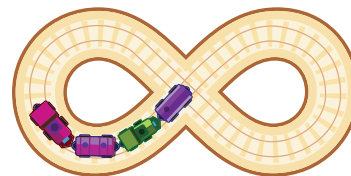
3 Here are Tracks 2 and 3. Which train is faster? Explain your thinking.

- A. Train A
- B. Train B
- C. Not enough information

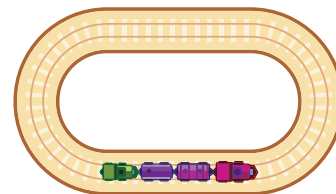
Train A:
15 seconds per lap



Train B:
20 seconds per lap



4 Here is Track 1. One lap is 325 centimeters. This train takes 10 seconds per lap. What is its speed in centimeters per second?

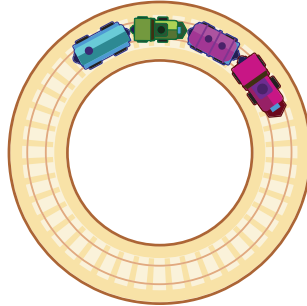


Name: _____ Date: _____ Period: _____

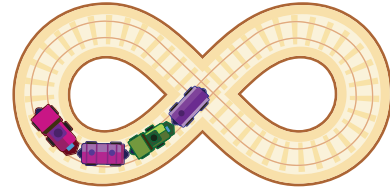
How Fast? (continued)**5** Which train is faster?

- A. Train A
 B. Train B
 C. They travel at the same speed.

Train A:
 270 centimeters in 15 seconds



Train B:
 380 centimeters in 20 seconds



6 Amoli and Tiam used different strategies to determine which train was faster given the length of each track.

| Amoli's strategy | Tiam's strategy | | | |
|---|--------------------|----------------|--------------------|----------------|
| <u>Train A</u> | <u>Train A</u> | | <u>Train B</u> | |
| $270 \div 15 = 18$, so the speed is 18 centimeters per second. | <u>Centimeters</u> | <u>Seconds</u> | <u>Centimeters</u> | <u>Seconds</u> |
| <u>Train B:</u> | 270 | 15 | 380 | 20 |
| $380 \div 20 = 19$, so the speed is 19 centimeters per second. | 1080 | 60 | 1140 | 60 |

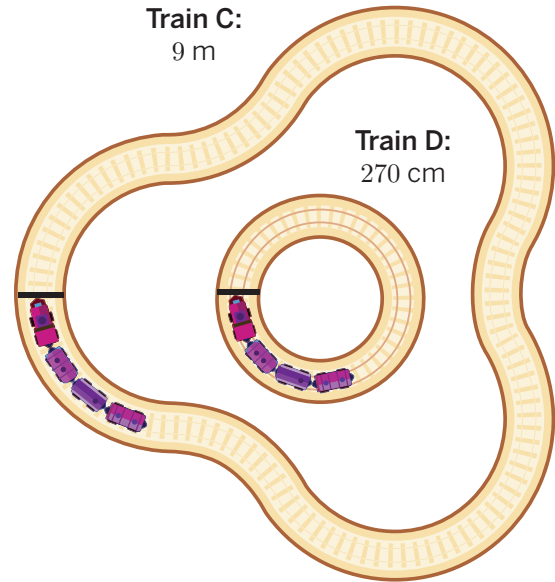
 **Discuss:** How are the strategies alike? How are they different?

Activity
2

Which is Faster?

7 Here are two trains. They each complete 1 lap in 20 seconds. What is each train's speed in centimeters per second?

| | Speed |
|---------|------------------------------|
| Train C | centimeters per second |
| Train D | centimeters per second |



8 Here are the distances and times for four model trains.

Train E: 325 centimeters in 30 seconds **Train F:** 270 centimeters in 20 seconds
Train G: 3.25 meters in 20 seconds **Train H:** 3.25 centimeters in 1 minute

Order the trains by speed from slowest to fastest.

| | | | |
|---------|--|--|---------|
| | | | |
| Slowest | | | Fastest |

You're invited to explore more.

9 A train's speed is 60 centimeters per second.

Choose a track length and determine the number of laps the train can complete in 10 seconds.

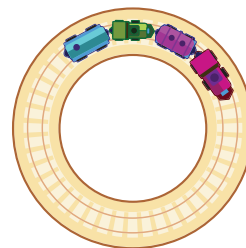


Synthesis

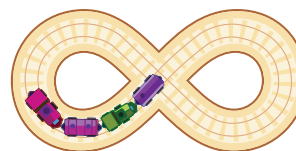
- 10** Describe two strategies for deciding which of two trains is faster.

Use the examples to help you with your explanation.

Train A:
270 centimeters in 15 seconds



Train B:
380 centimeters in 20 seconds



Summary

Rates expressed in the same units of measurement can be compared by using equivalent ratios or unit rates.

Consider two runners. Runner A runs the 400-meter dash in 50 seconds. Runner B runs the 5K (a 5-kilometer run) in 20 minutes. To compare their rates, they must first be expressed in the same units of measurement. Both runners' rates are converted to meters per second in this table.

| Runner A | | Runner B | |
|---------------------|---------------|---|----------------|
| Seconds | Meters | 5 kilometers = 5 000 meters 20 minutes = 1 200 seconds | |
| 50 | 400 | Seconds | Meters |
| 1 | 8 | 1 200 | 5 000 |
| 8 meters per second | | 1 | $4\frac{1}{6}$ |
| | | $4\frac{1}{6}$ meters per second | |

Runner A runs at a faster rate than Runner B because 8 meters is greater than $4\frac{1}{6}$ meters in the same amount of time (1 second).

Practice

Name: Date: Period:

For Problems 1–3, use the following information. Mia and Liam were trying out new remote control cars. Mia’s car traveled 135 feet in 3 seconds. Liam’s car traveled 228 feet in 6 seconds. Both cars traveled at a constant speed.

1. Determine the speed of each remote control car in feet per second.

Mia’s car speed:

..... feet per second

Liam’s car speed:

..... feet per second

2. Whose remote control car traveled faster?
3. Deven says he has a remote control car that can travel 12 yards per second. Is his car faster or slower than the other two? Show your thinking.

4. Emmanuel types 208 words in 4 minutes. Vihaan types 342 words in 6 minutes. Both type at a constant rate. Who types faster? Explain your thinking.

5. During practice, four baseball players recorded the time it takes them to run different distances.

Player A: 3 seconds to run 45 feet **Player B:** 48 feet in 2 seconds

Player C: 75 feet in 5 seconds **Player D:** 3 seconds to travel 46.5 feet

Which player ran at the fastest speed?

- | | |
|-------------|-------------|
| A. Player A | C. Player C |
| B. Player B | D. Player D |



6. Here are the approximate distances and times for four olympic swimmers in different events. Order the swimmers by speed from slowest to fastest.

Swimmer A: 800 meters in 8 minutes

Swimmer B: 100 meters in 50 seconds

Swimmer C: 1.5 kilometers in
15.5 minutes

Swimmer D: 50 meters in 20 seconds

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

Slowest

Fastest

For Problems 7 and 8, use this information. Penguin A walks 10 feet in 5 seconds. Penguin B walks 12 feet in 8 seconds. Each penguin continues walking at a constant speed.

7. How far does each penguin walk in 45 seconds?
8. If the two penguins start at the same place and walk in the same direction, how far apart will the two penguins be after 2 minutes? Show your thinking.

Spiral Review

For Problems 9–12, determine the missing value.

9. 12 ft = _____ yd

10. 300 m = _____ km

11. 500 m = _____ cm

12. 12 cups = _____ gal

Reflection

- Circle the question that you enjoyed doing the most.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 5: Notes

Name _____

My Notes

A new flavor of soft serve costs 4 dollars for 10 ounces.

1. Complete the table.
2. Explain the meaning of each of the numbers you found.

| Cost (dollars) | Weight (ounces) |
|----------------|-----------------|
| 4 | 10 |
| 1 | |
| | 1 |

3. How much does 6 ounces of soft serve cost?
4. How many ounces of soft serve can you buy with \$5.00 ?

Summary

| |
|--|
| <input type="checkbox"/> I can calculate and interpret the two unit rates for the same relationship. |
| <input type="checkbox"/> I can choose which unit rate to use to solve a problem and explain my choice. |

Unit 6.3, Lesson 5: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

$$\frac{1}{4} \text{ of } 60 =$$

$$\frac{3}{4} \cdot 60 =$$

$$\frac{1}{4} \cdot 30 =$$

$$\frac{3}{4} \cdot 30 =$$

Practice

A copy machine can make 500 copies every 4 minutes.

1.1 How many copies per minute can it make?

1.2 How many minutes per copy?

1.3 How many copies can it make in 10 minutes?

1.4 A teacher made 700 copies.
How long did it take to make?

Jamar's class painted 50 square feet of a mural using 4 cans of paint.

2.1 How many square feet could they paint **per can of paint**?

2.2 How many cans did they use **per square foot**?

2.3 They want to paint a total of 310 square feet. How many cans of paint will they need?

Show or explain your thinking.

2.4 Jamar predicted that they would need 3 875 cans of paint. His work is below.

$$310 \cdot 12.5 \text{ cans per square foot} = 3875 \text{ cans}$$

Do you agree? Explain your reasoning.



Unit 6.3, Lesson 5: Practice Problems

At the grocery store, Abdullah purchased 3 pounds of mac and cheese for \$7.50 .

3.1 What does mac and cheese cost per pound?

3.2 How much mac and cheese does he get per dollar?

3.3 How much mac and cheese could Abdullah buy with \$20 ?

4. Here are the prices for cans of juice at different stores. The cans are the same brand and size.

| Store A | Store B | Store C |
|-------------------|-------------------|------------------|
| 4 cans for \$2.48 | 5 cans for \$3.00 | 59 cents per can |

Which store offers the best deal? Explain your reasoning.

Explore

Here is information about gasoline usage for two cars. Which car is more fuel efficient (uses gas at a lower rate)?

6 liters per 100 kilometers

1 gallon per 100 miles



Note:

5 miles \approx 8 kilometers

5 gallons \approx 19 liters

Reflect

- Put a heart next to a question that you understand well.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 6: Notes

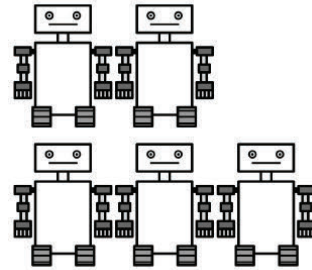
Name _____

My Notes

It takes 40 ounces of paint to paint 5 tiny robots.

1. Complete the table.

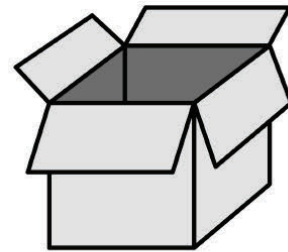
| Robots | Paint (oz.) |
|--------|-------------|
| 5 | 40 |
| 3 | |
| | 72 |



2. If you know the number of ounces of paint you have, how would you determine the number of robots you can paint?

3. A factory can make 12 boxes in 3 minutes. Complete the table for different numbers of boxes.

| Boxes | Time (min.) |
|-------|-------------|
| 12 | 3 |
| | 5 |
| 40 | |
| | 1 |



Summary

- I know that you can multiply by a unit rate to go from one column to another in a table of equivalent ratios.
- I can use unit rates to complete a table of equivalent ratios.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 6: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

$\frac{1}{3}$ of 66 =

$\frac{1}{3} \cdot 33 =$

$\frac{2}{3} \cdot 33 =$

$\frac{5}{3} \cdot 33 =$

Practice

The table shows the amounts of onions and tomatoes in different-size batches of a salsa recipe.

1.1 How many onions do you need to go with 40 tomatoes?

1.2 How many tomatoes do you need to go with 3.5 onions?

1.3 One unit rate in this situation is 8. What does it mean?

1.4 Another unit rate is $\frac{1}{8}$. What does it mean?

| Onions | Tomatoes |
|--------|----------|
| 2 | 16 |
| 4 | 32 |
| 10 | 80 |

It takes 10 pounds of potatoes to make 15 servings of mashed potatoes. At this rate:

2.1 How many servings of mashed potatoes can be made with 15 pounds of potatoes?
Use the table if it helps with your thinking.

2.2 How many pounds of potatoes are needed to make 50 servings of mashed potatoes?

| Potatoes (lb.) | Mashed Potatoes (servings) |
|----------------|----------------------------|
| 10 | 15 |
| | |
| | |
| | |
| | |

Unit 6.3, Lesson 6: Practice Problems

3. A train is traveling at a constant rate. Complete the table.

| Time (hours) | Distance Traveled (miles) |
|----------------|---------------------------|
| 2 | 110 |
| 1 | |
| | 27.5 |
| $1\frac{1}{2}$ | |
| | 165 |

4. A pet hamster is placed on a digital scale. The scale reads 4.3. What could be the units?
- A. Milligrams B. Ounces C. Pounds D. Inches
5. Lola's family is looking to purchase a car that is 176.5 inches long. They have a parking space that is 16.25 feet long. Can this car fit in the parking space? Explain your answer.

Explore

Aditi wants to use one measurement tool to make their fruit salad. She chooses a $\frac{1}{4}$ cup scoop. Complete the table with the number of $\frac{1}{4}$ cup scoops Aditi needs for each ingredient in the recipe.

| Fruit Salad Recipe |
|---|
| $\frac{3}{4}$ cup of chopped strawberries |
| 2 cups of sliced bananas |
| $1\frac{1}{4}$ cups of diced apples |
| $\frac{1}{4}$ cup of blueberries |

| Ingredient | Number of $\frac{1}{4}$ cups |
|--------------|------------------------------|
| Strawberries | |
| Bananas | |
| Apples | |
| Blueberries | |

Reflect

- Put a star next to one question you are still wondering about.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 7: Notes

Name _____

My Notes

A shop charges \$6.40 for 8 ounces of soft serve.

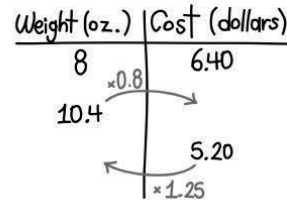


- 1. Here are some new orders. Complete the table.

| Weight (oz.) | Cost (dollars) |
|--------------|----------------|
| 8 | 6.40 |
| 10.4 | |
| | 5.20 |

Here is Riya’s strategy for filling out the table.

- 2. What do the numbers 0.8 and 1.25 tell us about the soft serve?



- 3. What are some things that are important to remember when calculating unknown quantities in a table of equivalent ratios?

Summary

I can make comparisons and calculate unknown quantities using unit rates.

Unit 6.3, Lesson 7: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

$\frac{2}{3}$ of 30 =

$\frac{1}{4}$ of 30 =

$\frac{3}{4} \cdot 30 =$

$\frac{3}{5} \cdot 30 =$

Practice

A kangaroo hops 2 kilometers in 3 minutes. At this rate:

- 1.1 How long does it take the kangaroo to travel 5 kilometers?

- 1.2 How far does the kangaroo travel in 2 minutes?

Neel buys 8 dog treats for \$4.40.

- 2.1 What is the cost per dog treat?

- 2.2 Complete the table to show other amounts of dog treats he could buy at this rate.

| Dog Treats | Cost (dollars) |
|------------|----------------|
| 8 | 4.40 |
| 18 | |
| 25 | |
| | 6.05 |

3. Haru and Victor are on scooters. Haru goes 15 meters in 6 seconds. Victor goes 22 meters in 10 seconds. Who is moving faster? Explain your reasoning.

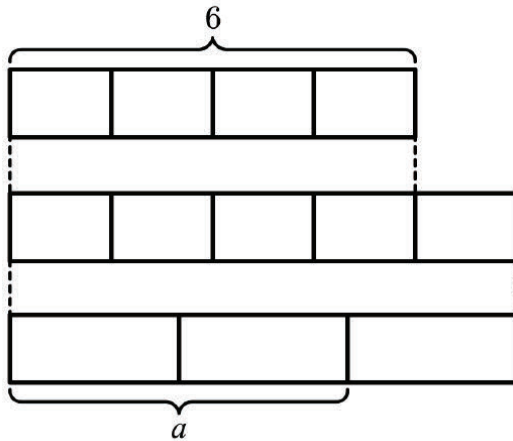


Unit 6.3, Lesson 7: Practice Problems

- A soccer field is 105 meters long. A football field is 120 yards long. Which is longer? Explain your thinking. (11 meters is about 12 yards.)
- At 8 a.m., Sothy goes for a walk and plans to walk 10 000 steps. At 8:23 a.m., his phone tells him that he has taken 2 000 steps. If he continues at this rate, at what time will he reach 10 000 steps?

Explore

Here are three tape diagrams. Determine the value of a .



Reflect

- Put a question mark next to a question you were feeling stuck on.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Practice Day 1: Task Cards

Milk Containers

A school cafeteria has a refrigerator full of milk in the kitchen.

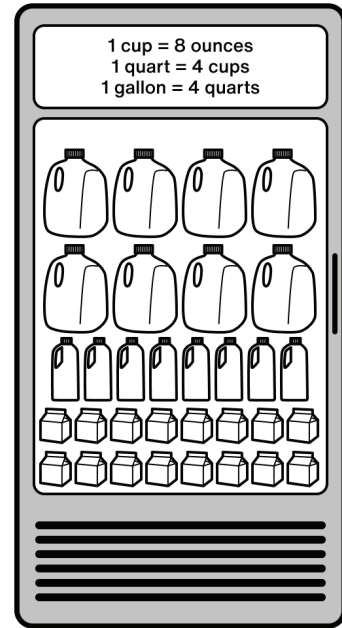
- List several things we could measure about these milk containers.
- Label each container with its size.



- 1 quart
- 1 cup
- 1 gallon

One week, the cafeteria only had quart-size containers.

- They need 12 gallons of milk for their recipes. How many quart-size containers is this?
- One of the recipes uses 10 cups of milk. How many quart-size containers is this?



The cafeteria got a shipment of milk containers that are 236 milliliters each.

- About how many ounces are in each container? Note: 2 ounces is about 59 mL.

Are You Ready for More?

The cafeteria runs out of gallon-size containers one day. They need 2 gallons to make their recipes. What are some ways they could make 2 gallons using the other sizes of containers available?



Unit 6.3, Practice Day 1: Task Cards

The Better Deal

There are new deals on some of the items the cafeteria usually orders.

1. Circle the better deal on your worksheet. Explain or show your thinking.

Original Deal

Juice

\$3.50

New Deal

Juice

\$2.40

2. Circle the better deal on your worksheet. Explain or show your thinking.

Original Deal

Yogurt

\$4.40

New Deal

Yogurt

\$3.24

3. How much would the cafeteria pay for 4 granola bars if the new deal is the same cost per granola bar as the original? Explain or show your thinking.

Original Deal

Granola

\$4.40

New Deal

Granola

?

Are You Ready for More?

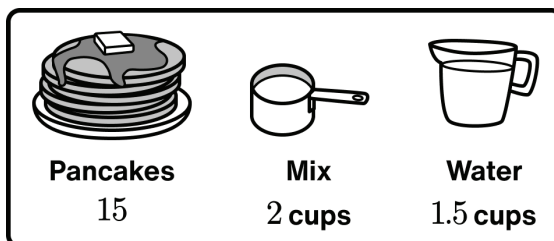
The cafeteria has \$100 to spend one week on a mix of snacks from the cards above. Create a list of snacks that will cost as close to \$100 as you can (without going over).

Unit 6.3, Practice Day 1: Task Cards

Pancake Breakfast

The cafeteria makes pancakes using 2 cups of mix for every 15 pancakes.

1. How many pancakes can you make **per cup of pancake mix**?
2. How many cups of pancake mix do you need **per pancake**?



Solve each problem and show your thinking.

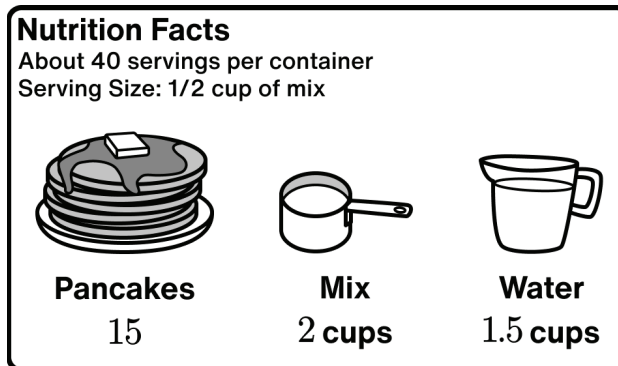
3. There are only 5 cups of pancake mix left. How many pancakes can you make?
4. How many cups of pancake mix are needed to make 50 pancakes?

Are You Ready for More?

The package says, “Makes 150 pancakes!”

Based on the information on the package, is this true?

Explain your thinking.





Unit 6.3, Practice Day 1: Task Cards

Apples and Cinnamon

The cafeteria uses 4 pounds of apples to make 5 cups of applesauce. Help them figure out how many apples they need.

Use the table if it helps you with your thinking.

How much applesauce can the cafeteria make with:

- 1.1 7 pounds of apples?
- 1.2 10 pounds of apples?

| Pounds of Apples | Cups of Applesauce |
|------------------|--------------------|
| 4 | 5 |
| | |
| | |
| | |
| | |
| | |
| | |

How many pounds of apples would they need to make:

- 2.1 9 cups of applesauce?
- 2.2 12 cups of applesauce?

3. The cafeteria likes to add cinnamon to their applesauce. Order these recipes from least strong cinnamon flavor to strongest cinnamon flavor.

- A. 40 ounces of applesauce, 4 teaspoons of cinnamon
- B. 32 ounces of applesauce, 2 teaspoons of cinnamon
- C. 2 pounds of applesauce, 1 tablespoon of cinnamon

1 pound = 16 ounces

1 tablespoon = 3 teaspoons

Least Strong Cinnamon Flavor _____, _____, _____ Strongest Cinnamon Flavor

Are You Ready for More?

Mai can cut 4 pounds of apples in 10 minutes. Peter can cut 9 pounds of apples in 15 minutes. At these rates, how long will it take them to cut 100 pounds of apples if they work together? How much applesauce would this make?

Milk Containers

- 1.
2. Label each container with its size.



- 1 quart
- 1 cup
- 1 gallon

- 3.
- 4.
- 5.

Are You Ready for More?

The Better Deal

1. Circle the better deal.
Original Deal **New Deal**
Explain or show your thinking.
2. Circle the better deal.
Original Deal **New Deal**
Explain or show your thinking.

- 3.

Are You Ready for More?



Unit 6.3, Practice Day 1: Worksheet

Name _____

Pancake Breakfast

1.

2.

3.

4.

Are You Ready for More?

Apples and Cinnamon

1.1

2.1

1.2

2.2

3.

Least Strong Cinnamon Flavor _____, _____, _____ Strongest Cinnamon Flavor

Are You Ready for More?

Unit 6.3, Practice Day 1: Practice Problems

Name _____

Warm-Up

Order these weights from lightest to heaviest.

5 pounds 2 kilograms 15 ounces 500 grams

Lightest _____ **Heaviest**

| | | |
|----------------|-----------------------|------------------------|
| 1 kg = 1 000 g | 200 g \approx 7 oz. | 10 kg \approx 22 lb. |
|----------------|-----------------------|------------------------|

Practice: The Middle of the Story

In this practice set, you will see problems (beginnings) **and** correct solutions (ends).
Your task is to explain all of the parts in the middle.

Problem 1

Maria and Hoang’s class started recycling. In 10 days, they had 11.6 pounds of recycling!

- 1.1 How many pounds per day is that?
- 1.2 How many days per pound is that?
- 1.3 The school is offering a prize when a class reaches 50 pounds of recycling. At this rate, how many days will it take Maria and Hoang’s class to reach this goal?

Solution

- 1.1 1.16 pounds per day
- 1.2 \approx 0.862 days per pound
- 1.3 44 days

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

**Unit 6.3, Practice Day 1: Practice Problems****Problem 2**

This is Binta's spaghetti recipe.

SPAGHETTI
Ingredients

- 1 box of spaghetti
- 450 grams of bell pepper
- 200 grams of tomato
- 150 grams of onion
- 3 bouillon cubes
- 400 grams of ground beef
- 800 grams of Italian sausage
- Habanero peppers, curry powder, ginger, salt, oil

Help Eva convert the measurements from grams to ounces so she can make Binta's recipe.

Note: 200 grams \approx 7 ounces

Solution

- 15.75 ounces of bell pepper
- 7 ounces of tomato
- 5.25 ounces of onion
- 14 ounces of ground beef
- 28 ounces of Italian sausage

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Reflect

1. Name at least two ideas from earlier units about area and ratios that have appeared in this unit so far. Explain how they are connected to what we are learning now.

2. What questions do you have about this unit so far?



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 8: Notes

Name _____

My Notes

1. In your own words, explain what 25% of a number means.

Esteban bought a bag of candies that come in different colors. They like the orange candies the least.

2. How many orange candies are in each bag?

| | |
|---|--|
| Bag A 40 pieces 25% are orange | |
| Bag B 60 pieces 10% are orange | |

3. There are 60 candies in Bag B. 75% of them are red. How many red candies are in Bag B? Explain your thinking.

Summary

| |
|---|
| <input type="checkbox"/> I can use the word <i>percent</i> and the symbol % to mean for every 100 . |
| <input type="checkbox"/> I can calculate 10% , 25% , 50% , or 75% of a number. |



Unit 6.3, Lesson 8: Practice Problems

Name _____

Warm-Up

Shade in $\frac{3}{4}$ of the rectangle below.



Shade in $\frac{3}{5}$ of the rectangle below.



Practice

1. Here are 24 stars. Circle 25% of these stars.



2. Evan made 40 muffins. 25% of the muffins are chocolate. How many muffins are chocolate?

3. Which is greater: 75% of 12 or 25% of 32?
Show how you know.

Unit 6.3, Lesson 8: Practice Problems

Complete each statement. Make a tape diagram if it helps you with your thinking.

4.1 25% of 20 is _____. | 4.2 25% of 60 is _____. | 4.3 25% of 200 is _____.

5. The length of an olympic pool is 50 meters. What is its length in yards?
(11 meters is about 12 yards.)

A. 51 B. 45.8 C. 54.5 D. 58.2

6. At Florida A&M University, the ratio of students from Florida to students **not** from Florida is about 3 : 1 . How many of its 12 000 students are from Florida?

Explore

Which is greater: 50% of 25 or 25% of 50 ?

Explain your reasoning.

Reflect

1. Put a smiley face next to a question you were stuck on and then figured out.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 9: Notes

Name _____

My Notes

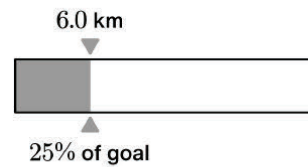
Faaria’s goal was to ride her bike 30 kilometers.

- 1.1 Complete the table.
- 1.2 She rode 40% of her goal.
How far did she ride?

| Km Biked | % of Goal |
|----------|-----------|
| 30 | 100 |
| | 10 |
| | 40 |

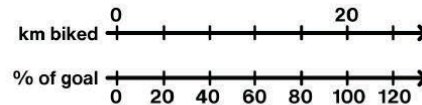
Juliana rode 6 kilometers, which is 25% of her goal.

- 2. What was her goal distance?



Emmanuel’s goal was to ride 20 km. He rode 120% of his goal.

- 3. How far did he ride?



Summary

- I can make connections between percentages and ratios.
- I can use a double number line, tape diagram, or table to determine unknown parts or wholes.

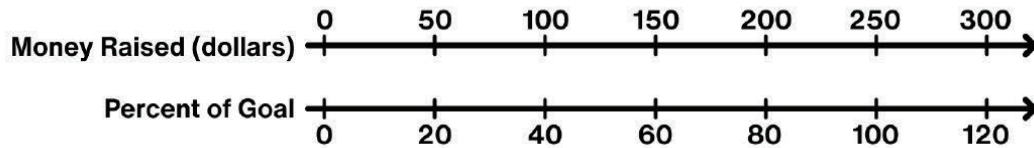
Warm-Up

What percent of each figure is shaded?

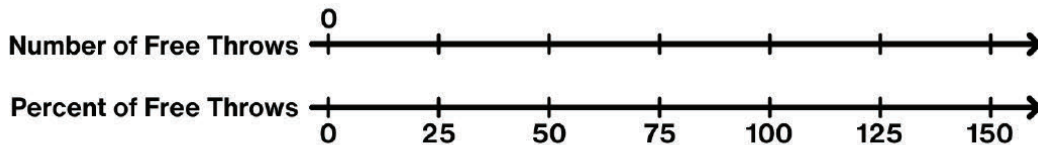


Practice

Here is a double number line that Deja made to measure her fundraising goal progress.



- 1.1 How much was Deja's fundraising goal? 1.2 A local store donated \$100 .
What percent of the goal amount is that?
- 1.3 One person donated 10% of the goal.
How much money did that person donate?
- 1.4 Deja ended up raising 140% of her goal.
How much money did she raise?
2. During basketball practice, Martina attempted 40 free throws. 25% of those attempts went into the basket. How many of her free throws went into the basket?
Use the double number line diagram if it helps with your thinking.





Unit 6.3, Lesson 9: Practice Problems

Leonardo works as a server in a restaurant. He gets a 20% tip on the food cost for every order.

3.1 What tip will he get when the food costs \$60 ?

3.2 What tip will he get when food costs \$82 ?

3.3 Leonardo got an \$18 tip. What was the cost of the food for this order?

Light travels about 180 000 000 kilometers in 10 minutes. This could also be written as:

4.1 _____ kilometers **per minute**

4.2 _____ kilometers **per second**

4.3 How far can light travel in 7 minutes?

Explore

Which is greater?

50% of 20% of 200 or 20% of 50% of 200

Explain your reasoning.

Reflect

1. Circle a question you are still curious about.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 10: What's Missing?

Name _____

Activity 1: What's Missing?

| | Question | Representation | Solution |
|---|--|----------------|----------|
| 1 | <p>I have a 40% off coupon.</p> <p>If I buy a shirt with a regular price of \$20, how much money would I save?</p> | | |
| 2 | <p>I have a 20% off coupon.</p> <p>If I use the coupon, I will save \$40. What is the regular price of this shirt?</p> | | |
| 3 | <p>I paid \$40 for a jacket whose regular price is \$50.</p> <p>What percent of the regular price did I pay?</p> | | |
| 4 | | | |



Unit 6.3, Lesson 10: What's Missing?

Activity 2: Sale Price and Regular Price

| | Question | Representation | Solution |
|---|--|----------------|----------|
| 5 | <p>Eliza bought a hat for \$21 . The regular price is \$30 .</p> <p>What percent of the regular price did she pay?</p> | | |
| 6 | <p>A discount store sells items at 80% of the regular prices.</p> <p>If the regular price of pants is \$55 , what is the sale price?</p> | | |
| 7 | <p>A discount store sells items at 80% of the regular price.</p> <p>If the sale price of sneakers is \$96 , what is the regular price?</p> | | |

Are You Ready for More?

Precious's Bicycle Distance Goals

| Day | Su | M | Tu | W | Th | F | Sa |
|-----------|----|---|----|----|----|---|----|
| Goal (km) | 0 | 8 | 4 | 10 | 0 | 8 | 20 |

Precious biked 125% of her daily goal on Monday.

What percent of her total weekly goal did she bike on Monday?

My Notes

For each question, use a tape diagram, double number line, or table to figure out the solution.

1. Axel has read 60 pages of a book. He is 40% finished. How many pages are in the book?

Representation

Solution

2. There are 300 pages in a book. Tay is 80% finished. How many pages have they read?

Representation

Solution

3. Pilar has read 160 out of 200 pages in a book. What percent of the book has she read?

Representation

Solution

Summary

I can create tape diagrams, double number line diagrams, or tables to determine unknown parts, percentages, or wholes.

**Unit 6.3, Lesson 10: Practice Problems**

Name _____

Warm-Up

Calculate the following values:

100% of 40

50% of 40

150% of 40

10% of 40

Practice

A hardware store offers customers a coupon for \$25 off.

- 1.1 The regular price of a power drill is \$125 . If a customer uses the coupon, what percent will the customer save?

- 1.2 The regular price of a ladder is \$250 . If a customer uses the coupon, what percent will the customer save?

Kiri is curious how many people think aliens exist. She asked the 30 students in her class.

- 2.1 12 students said they think aliens exist. What percent of the class is that?

- 2.2 Kiri's older brother asked the 25 students in his class. 11 students said they think aliens exist. Which class has a greater percentage of students who think aliens exist: Kiri's or her brother's? Explain your thinking.

Daniela is planning a party and trying to decide how many people to invite. She expects 90% of the people she invites will attend.

- 3.1 If she invites 20 people, how many does she expect will attend?
- 3.2 If she invites 40 people, how many does she expect will attend?

Unit 6.3, Lesson 10: Practice Problems

A 16-ounce bottle of orange juice contains 200 milligrams of vitamin C, which is 250% of the daily recommended amount (for adults).

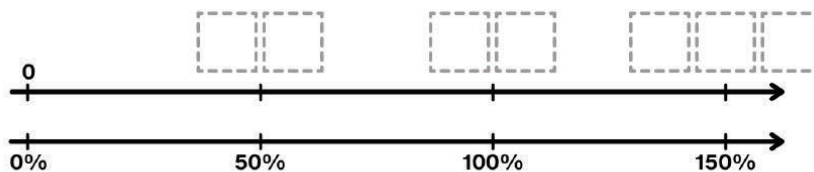
- 4.1 What is 100% of the daily recommended amount of vitamin C?
- 4.2 Yosef drank 4 ounces of orange juice. What percent of the daily recommended amount of vitamin C is this? Explain your thinking.

Alexis is 56 inches tall.

- 5.1 What is her height in centimeters? (100 inches = 254 centimeters)
- 5.2 What is her height in meters?

Explore

Using the digits 0–9, without repeating, fill the blanks to create a true double number line.



Reflect

1. Circle a question you want to talk to a classmate about.
2. Use the space below to ask one question you have or to share something you are proud of.



Unit 6.3, Lesson 11: Notes

Name _____

My Notes

Here is the work Anand did to calculate 21% of \$52.

1. Explain Anand's strategy.

| Percentage (%) | Cost (dollars) |
|----------------|---------------------------|
| 100 | 52 |
| 1 | $\frac{52}{100}$ |
| 21 | $\frac{52}{100} \cdot 21$ |

2. Select
- all**
- of the expressions that could be used to calculate 54% of \$22.

$\frac{22}{100} \cdot 54$

$\frac{22}{100}$

$\frac{100}{22} \cdot 54$

$\frac{54}{100} \cdot 22$

$\frac{22}{54} \cdot 100$

A pair of shoes cost \$60. The store's profit is 22% of the cost.

3. How much is the store's profit on a pair of shoes?



Summary

 I can calculate any percentage of a number. I can explain two different expressions you can use to calculate a percentage of a number.

Warm-Up

Calculate the following values.

50% of 70

10% of 70

1% of 70

2% of 70

Practice

1. A store is having a 30% off sale. The regular price for headphones is \$150. How much would a customer save with the sale?

2. Order the following expressions from least to greatest.

55% of 180

300% of 26

12% of 700

Least

Greatest

3. To find 40% of 75, Jamal calculates $\frac{2}{5} \cdot 75$. Does his calculation give the correct value for 40% of 75? Explain or show how you know.
4. Emika has a monthly budget for her cell phone bill. Last month she spent 120% of her budget, and the bill was \$60. What is Emika's monthly budget?



Unit 6.3, Lesson 11: Practice Problems

5. Two stores sell identical sandwich rolls in different-size packages. Store A sells a six-pack for \$5.28. Store B sells a four-pack for \$3.40. Which store offers the better per-roll price? Explain your reasoning.

On a field trip, there are 3 chaperones for every 20 students. There are 92 total people on the trip.

6.1 How many chaperones are there?

6.2 How many children are there?

Explore

Using the digits 0–5 without repeating, fill in each blank such that the left expression is greater than the right expression.

| Left | Right |
|---|--|
| <input type="text"/> <input type="text"/> % of 50 | 50% of <input type="text"/> <input type="text"/> |

Are you ready for more?

Is it possible to make the left and right expressions have the same value? Explain your thinking.

Reflect

1. Put a heart next to the question you are most proud of.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 12: Notes

Name _____

My Notes

On Thursday, Alejandro rode 21 km. His goal was 25 km. Here is how he calculated the percentage of his goal that he rode.

| Distance (km) | Percent of Goal |
|---------------|---------------------------|
| 25 | 100 |
| 1 | $\frac{100}{25}$ |
| 21 | $\frac{100}{25} \cdot 21$ |



- 1 kilometer is what percent of Alejandro's goal?
- What percent of his goal did he ride?
- Use Alejandro's strategy to calculate 17 out of 25 as a percentage.
- Write an expression that can be used to calculate 46 out of 40 as a percentage.

Summary

I can calculate an unknown percentage.

I can explain different expressions for calculating an unknown percentage.



Unit 6.3, Lesson 12: Practice Problems

Name _____

Warm-Up

Calculate the following values:

10% of 27

1% of 27

6% of 27

16% of 27

Practice

1. Select **all** of the expressions that will correctly calculate what percent 19 is of 20.

$\frac{19}{20} \cdot 100$

$\frac{19}{20} \div 100$

$\frac{20}{19} \cdot 100$

$\frac{19 \cdot 100}{20}$

2. A bathtub can hold 80 gallons of water. The faucet flows at a rate of 4 gallons per minute. What percent of the tub will be filled after 6 minutes? Explain your thinking.

A 6th grade class did a weekend fitness challenge. Each student set a goal of 75 minutes of fitness.

- 3.1 Luca exercised for 54 minutes. What percent of the goal did he achieve?
- 3.2 Brandon did 64% of the recommendation. How many minutes did he exercise for?
- 3.3 Amanda exercised for 78 minutes. What percent of the goal did she achieve?

Unit 6.3, Lesson 12: Practice Problems

Complete each statement.

4.1 20% of 60 is _____. 4.2 ____% of 50 is 41. 4.3 75 is ____% of 250.

5. Demetrius needs 48 hot dogs. He can buy them in six-packs for \$2.10 per pack, or eight-packs for \$3.12 per pack. What's the cheapest way for him to buy 48 hot dogs? Explain your reasoning.

Explore

The numbers 5 and 20 have a special relationship:

$\frac{1}{5}$ is equivalent to 20%. $\frac{1}{20}$ is equivalent to 5%.

Are there any other numbers that have a relationship like this? Why does this relationship happen?

Reflect

1. Put a star next to the question you understood best.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Lesson 13: Notes

Name _____

My Notes

Here are some facts about the Philippines.

- 1. How many people in the Philippines have access to the internet?

Population: 110 million people

60% have access to the internet.

81 out of 100 people are Catholic.

- 2. How many people practice Catholicism?

Imagine the Philippines were a village with just 100 people. How many people would have each of these characteristics?

- 3.1 Have access to the internet?

- 3.2 Practice Catholicism?

- 4. What are some things that are important to remember when working with percentages?

Summary

I can use rates and percentages to analyze characteristics of a country's population.

Warm-Up

Fill in each blank.

14 is 100% of _____. 14 is 50% of _____. 14 is 10% of _____. 14 is 40% of _____.

Practice

The sale price of every item in a store is 85% of its regular price.

- 1.1 The regular price of a backpack is \$30 . What is its sale price?

- 1.2 The sale price of a soccer ball is \$15.30 . What is its regular price?

- 1.3 The sale price of a jacket is \$21.08 . What is its regular price?

Last Sunday, an amusement park had 1 575 visitors.

- | | | |
|--|--|--|
| 2.1 56% of the visitors were adults. How many adults visited the park? | 2.2 16% of the visitors were teenagers. How many teenagers visited the park? | 2.3 28% of the visitors were children ages 12 and under. How many children visited the park? |
|--|--|--|



Unit 6.3, Lesson 13: Practice Problems

3. A school has 1 140 students. On the last day of school, 1 092 students attended. What percent of students were at school that day?

Complete each statement.

- | | | |
|------------------------|------------------------|--------------------------|
| 4.1 5% of 70 is _____. | 4.2 25% of _____ is 6. | 4.3 12% of 700 is _____. |
|------------------------|------------------------|--------------------------|

Calculate the price for 11 cans of dog food at each store. Show or explain your reasoning.

- | | |
|--|--|
| 5.1 The cost of 5 cans of dog food at Store A is \$4.35. | 5.2 The cost of 20 cans of dog food at Store B is \$18.40. |
|--|--|

Explore

Fill in the boxes to make a true sentence. First, use the digits 0–9 as many times as you want. Then try again without repeating any digits.

 is 50% of
 and 25% of

What do you notice about all the solutions?

Reflect

1. Put a star next to a question you are still curious about.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.3, Practice Day 2: Cards

Running Teams

1 kilometer = 1000 meters 3 meters \approx 10 feet 1 mile = 5280 feet 8 kilometers \approx 5 miles

Four schools have running teams. Each team practices for competitions by running around their own track.

When a person completes 1 trip around their track, they count 1 **lap**.



The length of 1 lap for each school is below.

1200 feet

400 meters

$\frac{1}{2}$ kilometer

0.3 kilometers

Put the laps in order from shortest to longest. Show or describe your thinking.

Lap Predictions

Mio is on the running team. She runs 4 laps in 6 minutes.

Use the table on your worksheet if it helps you with your thinking.

1. How many laps per minute is this?
2. How many minutes per lap is this?
3. At this rate, how many laps can Mio run in 15 minutes?
4. At this rate, how long will it take for her to run 15 laps?



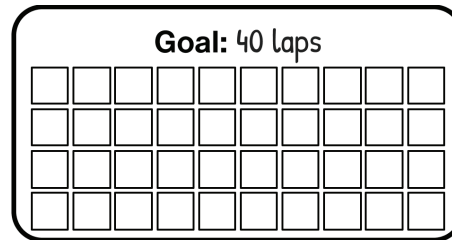
Unit 6.3, Practice Day 2: Cards

Lap Goals

Four students are getting ready for a running competition. They each set a goal to run a certain number of laps in the week before the competition.

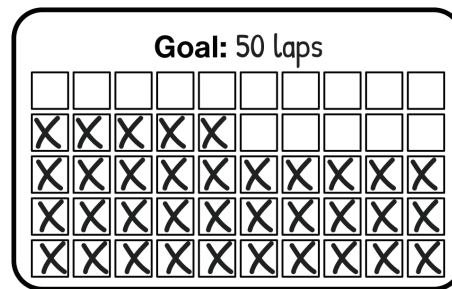
- 1. Marquis's goal is to run 40 laps.
He ran 75% of his goal.

How many laps is that?

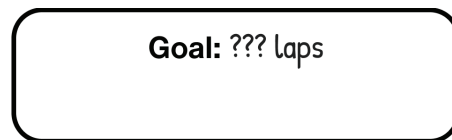


- 2. Ivory's goal is to run 50 laps.
They ran 35 laps.

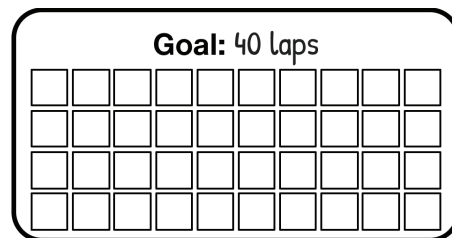
What percent of their goal is this?



- 3. Nia ran 10 laps. This is 20% of her goal.
How many laps is her goal?



- 4. Ricardo's goal was to run 40 laps. At the end of the week, he ran 125% of his goal.
How many laps is that?



Unit 6.3, Practice Day 2: Cards

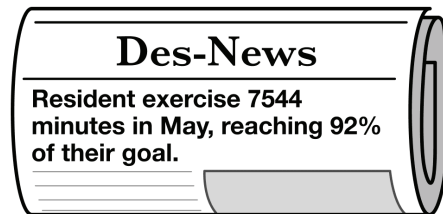
What's Missing?

Use a table, double number line, or any strategy to answer each question.

1. What is 40% of 25 ?
2. 40 is 25% of what number?
3. 40 is what percent of 25 ?
4. What is 32% of 40 ?
5. 32 is what percent of 40 ?
6. 60 is 40% of what number?

Are You Ready for More?

May is National Physical Fitness and Sports Month. During the month of May, some residents of a city recorded the number of minutes they spent on different fitness activities. The city published an article in the local newspaper about their progress.



How many minutes was the residents exercise goal for May?



Unit 6.3, Practice Day 2: Worksheet

Name _____

Running Teams

Shortest _____, _____, _____, _____ Longest

Lap Predictions

- 1. _____
- 2. _____
- 3. _____
- 4. _____

| Number of Laps | Number of Minutes |
|----------------|-------------------|
| 4 | 6 |
| | |
| | |
| | |
| | |

Lap Goals

- 1. _____
- 2. _____
- 3. _____
- 4. _____

What's Missing?

1.

2.

3.

4.

5.

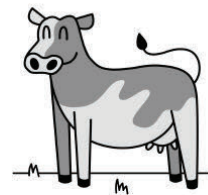
6.

Are You Ready for More?

Did You Know?

In Ireland, a *cow's grass* was a measurement used by farmers before the 1800s. A cow's grass was equal to the amount of land that could produce grass to feed 1 cow. The actual size varied between 6 and 20 acres.

Source: Thomas Campbell Foster, *Letters on the Condition of the People of Ireland*. (Chapman and Hall, 1846).





Unit 6.3, Practice Day 2: Practice Problems

Name _____

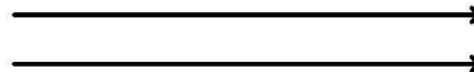
Warm-Up

Draw a tape diagram and double number line that each represent 80% of $\$40 = \32 .

Tape Diagram



Double Number Line



Practice: The Middle of the Story

In this practice set, you will see problems (beginnings) **and** correct solutions (ends). Your task is to explain all of the parts in the middle.

Problem 1

30% of the money raised at every school bake sale goes to the 6th grade.

- 1.1 If January's bake sale raised \$250, how much money would go to the 6th grade?
- 1.2 \$120 of the \$250 raised went to the 7th graders. What percent is this?
- 1.3 The 6th grade wants to raise \$120 for a pizza party. How much will they need to raise to meet their goal?

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Solution

- 1.1 \$75
- 1.2 48%
- 1.3 \$400

Unit 6.3, Practice Day 2: Practice Problems

Problem 2

Neo is making invitations for their birthday party. In 30 minutes, they made 6 out of 40 total invitations.

- 2.1 What percent of the invitations has Neo made?
- 2.2 At this rate, how long will it take Neo to finish the invitations?

Solution

- 2.1 15%
- 2.2 200 minutes (or 3 hours and 20 minutes)

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Reflect

1. What is one math concept from this unit that you have improved on since the unit started? Explain what you did to help yourself improve.

2. Write 1–2 big ideas from this unit that you think are important to understand about this unit.

GRADE 6

Unit 6

Student Lessons

Student lessons from Unit 6 are included here to provide NYC reviewers with access to the specific lessons in Amplify Desmos Math New York that demonstrate coverage of the **Expressions, Equations, and Inequalities** domain.

These lessons are partially designed and will be updated to match the exemplar Student Edition lessons included earlier in this sampler.



Grade 6 Unit 6

Student Edition Sampler



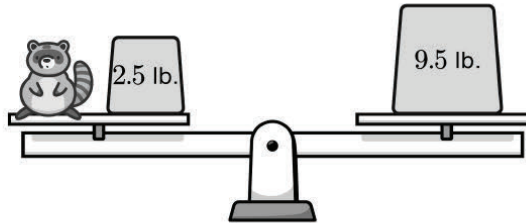
This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 1: Notes

Name _____

My Notes

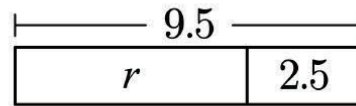
This raccoon and 2.5 pounds balance with a 9.5 lb. weight.



1.1 Nekeisha wrote $r + 2.5 = 9.5$ to represent the situation. How is the equation like balancing the raccoon and weights?

1.2 Nekeisha also drew a tape diagram to help determine the weight of the raccoon.

Explain how this tape diagram is like the equation.



1.3 How much does the raccoon weigh? Use the equation or tape diagram if it helps your thinking.

Summary

- I can make connections between tape diagrams and equations.
- I can use reasoning and tape diagrams to figure out unknown values.

Unit 6.6, Lesson 1: Practice Problems

Name _____

Warm-Up

Fill in each blank to create a true equation.

$7 + \underline{\quad} = 10$

$\underline{\quad} \cdot 5 = 45$

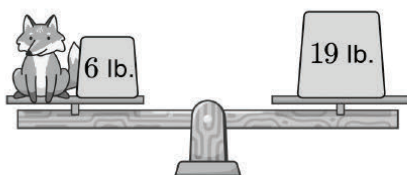
$23 - \underline{\quad} = 11$

$\underline{\quad} \div 4 = 8$

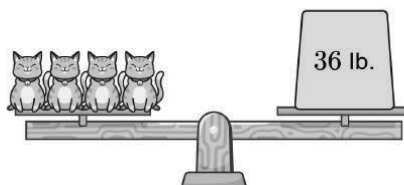
Practice

These scales are balanced.

- 1.1 Determine the weight of 1 fox.

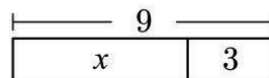
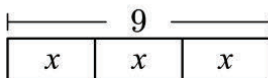


- 1.2 Determine the weight of 1 cat.



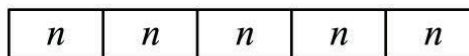
2. Match each equation to the tape diagram that best represents it.

| | | | | |
|---------------------------|-----------------------|-----------------------|--------------------------|---------------------------|
| A. $3 \cdot x = 9$ | B. $3 + x = 9$ | C. $x = 9 - 3$ | D. $x = 9 \div 3$ | E. $x + x + x = 9$ |
|---------------------------|-----------------------|-----------------------|--------------------------|---------------------------|



Kwabena is trying to figure out the value of n in the equation $5n = 35$. He begins drawing a tape diagram but isn't sure how to complete it.

- 3.1 Complete Kwabena's tape diagram so it represents the equation $5 \cdot n = 35$.



- 3.2 Determine the value of n .



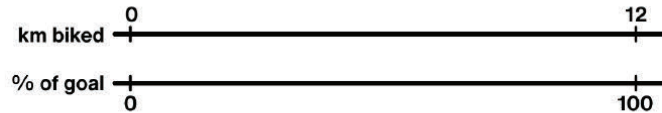
Unit 6.6, Lesson 1: Practice Problems

Calculate the price per pound for each item.

4.1 \$2.52 for 4.5 pounds of potatoes.

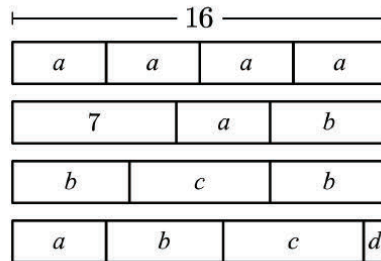
4.2 \$7.75 for 2.5 pounds of broccoli.

5. Adhira set a goal to bike 12 km in a week. After her ride on Tuesday, Adhira's app said she had completed 25% of her goal. How many kilometers has Adhira biked so far?
Use the double number line if it helps you with your thinking.



Explore

Determine the values of a , b , c , and d .



Reflect

- Star the problem you spent the most time on.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 2: Five Equations

Name(s) _____

Activity 1: Equations and Tape Diagrams

Here are five equations.

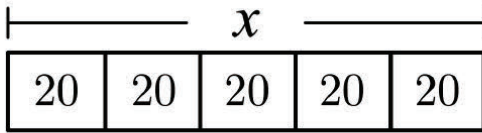
| | | | | |
|--------------------|--------------------|------------------------|-----------------|-----------------|
| A. $x + 5 = 20$ | B. $x = 20 + 5$ | C. $5 \cdot 20 = x$ | D. $5x = 20$ | E. $20x = 5$ |
|--------------------|--------------------|------------------------|-----------------|-----------------|

1. Select two equations that have something in common.

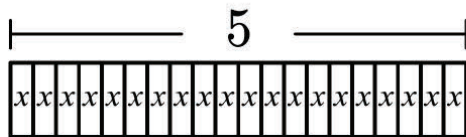
| | | |
|-----------------|----------------------------------|-------------------------|
| Equation: _____ | How are these equations similar? | How are they different? |
| Equation: _____ | | |

Match each tape diagram with one of the equations above.

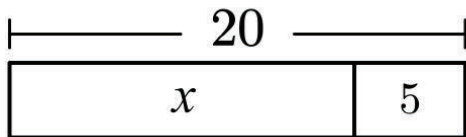
2. Equation: _____



3. Equation: _____



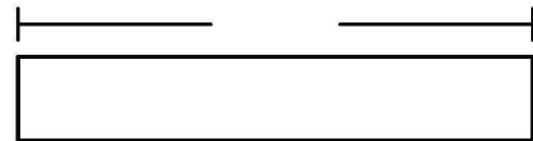
4. Equation: _____



5. Select an equation that **did not** match a tape diagram.

Equation: _____

Draw a tape diagram for this equation.





Unit 6.6, Lesson 2: Five Equations

Name(s) _____

Activity 2: Which Equation?

For each situation, choose the equation that best represents it. Then, determine the solution and explain what the solution means in the situation.

| | | | | |
|---------------------------|---------------------------|-------------------------------|------------------------|------------------------|
| A. $x + 5 = 20$ | B. $x = 20 + 5$ | C. $5 \cdot 20 = x$ | D. $5x = 20$ | E. $20x = 5$ |
|---------------------------|---------------------------|-------------------------------|------------------------|------------------------|

1. Mohamed walked 20 blocks to school each day for 5 days.
He walked x blocks total.

| Equation | Solution | Meaning of Solution |
|----------|----------|---------------------|
| | | |

2. Rebecca has \$20 to spend on day passes to ride the subway. Each day pass costs \$5.
She can buy x day passes total.

| Equation | Solution | Meaning of Solution |
|----------|----------|---------------------|
| | | |

3. Kwasi rides the bus for a total of 20 stops to get to work. After x stops, he has 5 stops left.

| Equation | Solution | Meaning of Solution |
|----------|----------|---------------------|
| | | |

4. **Select an equation** that did not match a situation. Write your own situation that could be represented by the equation you selected.

| Equation | Solution | Meaning of Solution |
|----------|----------|---------------------|
| | | |

My Notes

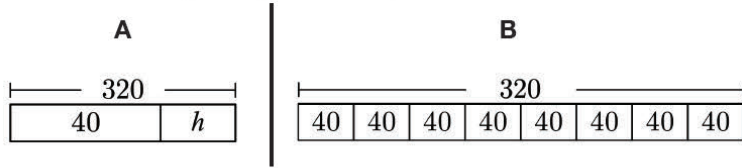
Here is a situation along with an equation that represents it.

Kiandra sold 40 hats and made \$320. The hats cost h dollars each.

| Equation | Solution | Meaning of the Solution |
|-------------|----------|-------------------------|
| $40h = 320$ | | |

1.1 What is the *variable* in the equation? _____
 What does the variable represent in this situation?

1.2 Circle the tape diagram that represents this situation.



1.3 Determine the *solution* to the equation.

1.4 Explain what the solution means in this situation.

Summary

| |
|--|
| <input type="checkbox"/> I can make connections between tape diagrams, equations, and situations. <input type="checkbox"/> I know what the terms <i>variable</i> and <i>solution</i> mean when solving equations. |
|--|



Unit 6.6, Lesson 2: Practice Problems

Name _____

Warm-Up

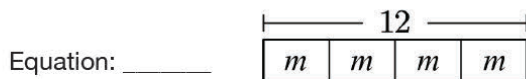
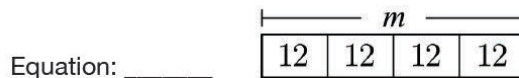
Select **all** the true equations.

- $5 + 0 = 0$
 $15 \cdot 0 = 0$
 $1.4 + 2.7 = 4.1$
 $\frac{2}{3} \cdot \frac{5}{9} = \frac{7}{12}$
 $4\frac{2}{3} = 5 - \frac{1}{3}$

Practice

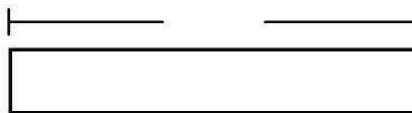
1. Match each equation to a tape diagram.

| | | | |
|------------------------|---------------------|------------------------|---------------------------|
| A. $12 - m = 4$ | B. $12 = 4m$ | C. $12 + 4 = m$ | D. $m \div 4 = 12$ |
|------------------------|---------------------|------------------------|---------------------------|



Aaliyah filled a water bottle with 24 ounces of water before school. They drank 15 ounces at lunch. There are x ounces of water left.

2.1 Draw a tape diagram to represent the situation.



2.2 Select **all** of the equations that could represent this situation.

- $24 - 15 = x$
 $24 + 15 = x$
 $x + 15 = 24$
 $15x = 24$
 $24 \div 15 = x$

2.3 For one of the equations you selected above, determine the solution and explain its meaning.

| Equation | Solution | Meaning of Solution |
|----------|----------|---------------------|
| | | |

Unit 6.6, Lesson 2: Practice Problems

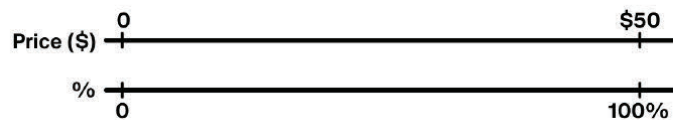
Fill in the blanks to make each equation true.

3.1 $2.83 - 1.6 = \underline{\hspace{2cm}}$

3.2 $\underline{\hspace{2cm}} + 2.1 = 7$

3.3 $\frac{3}{4} \cdot \underline{\hspace{2cm}} = 8$

4. Hailey paid \$40 for a jacket whose regular price was \$50. What percent of the regular price did Hailey pay? Use the double number line if it helps with your thinking.



Explore

Using the digits 0–9, without repeating, fill in each blank such that x is the same value in each equation.

$$x = \square \cdot \square$$

$$x = \square + \square$$

$$x + \square = \square$$

Reflect

1. Put a heart next to the problem you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



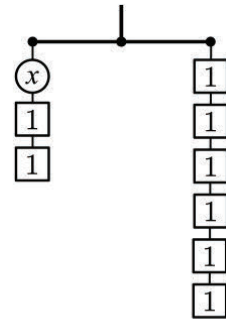
This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 3: Notes

Name _____

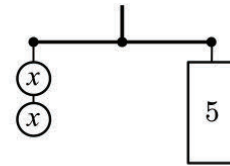
My Notes

1. What value of x balances this hanger?



2.1 Which equation represents this hanger?

- A. $x + 2 = 5$
- B. $5 \cdot 2 = x$
- C. $2x = 5$
- D. $x + 5 = 2$



2.2 Determine the value of x that balances this hanger

Summary

- I can make connections between balanced hangers and true equations.
- I can use balanced hangers to solve equations.

Warm-Up

Calculate the value of each expression.

$12 + 2.4$

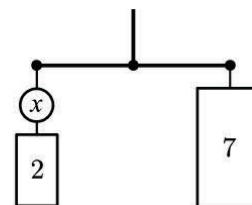
$12 \cdot 2.4$

$12 - 2.4$

$12 \div 2.4$

Practice

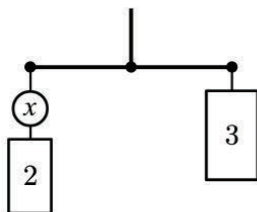
1. Anushka says that to balance this hanger, the value of x must be 7. Do you agree with her? Show or explain your reasoning.



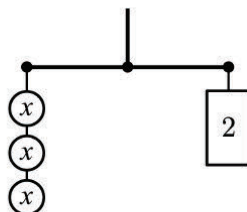
Match each hanger with the equation that it represents. You will have one equation left over.

| | | | |
|-----------------------|-----------------------|--------------------|--------------------|
| A. $3 + x = 2$ | B. $2 + x = 3$ | C. $2x = 3$ | D. $3x = 2$ |
|-----------------------|-----------------------|--------------------|--------------------|

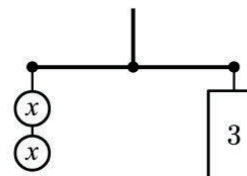
2.1



2.2



2.3

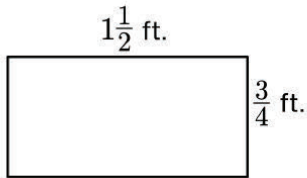


3. Pick two hangers from above and figure out the value of x that balances each hanger.

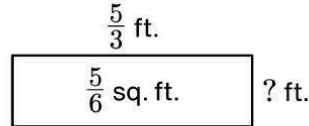


Unit 6.6, Lesson 3: Practice Problems

4.1 Calculate the area of this rectangle.



4.2 Calculate the height of this rectangle.



Precious set a goal to save \$20 to buy a new game. How much money will Precious have when she has saved:

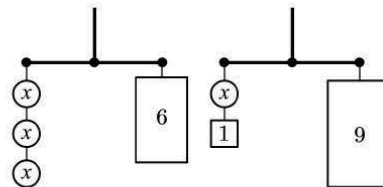
5.1 25% of her goal?

5.2 75% of her goal?

5.3 125% of her goal?

Explore

Add or remove shapes on **one** hanger so that the same value of x balances both hangers.



Reflect

1. Put a question mark next to a problem you would like to compare with a classmate.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 4: Notes

Name _____

My Notes

1. Daeja and Juana solved this equation: $6 = \frac{1}{2}s$.

Daeja: The solution is $s = 12$.

Juana: The solution is $s = 3$.

Who is correct?

Explain how you know.

Determine the solution to each equation.

Draw a hanger or a tape diagram if it helps you with your thinking.

2.1 $y + 1.8 = 14.7$

2.2 $1.8 = 3t$

Summary

I can solve equations that include whole numbers, decimals, and fractions.



Unit 6.6, Lesson 4: Practice Problems

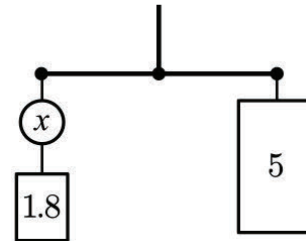
Name _____

Warm-UpSelect **all** the equations that have a solution of $n = 11$.

- $2n = 22$
 $23 - n = 12$
 $4n = 411$
 $n \div 1 = 11$
 $n - 7 = 3$

Practice

- 1.1 Determine the value of x in the equation $x + 1.8 = 5$.
Use the hanger if it helps you with your thinking.



- 1.2 Vihaan says the solution to $x + 1.8 = 5$ is $x = 6.8$.
Explain how you know that this is incorrect.

Solve each equation. Draw a hanger or a tape diagram if it helps you with your thinking.

| | |
|------------------|----------------------------------|
| 2.1 $4m = 8$ | 2.2 $\frac{1}{2}a = \frac{5}{8}$ |
| 2.3 $10d = 32$ | 2.4 $w + 5.2 = 17$ |
| 2.5 $1.5x = 0.9$ | 2.6 $24.6 = 6.1 + c$ |

Unit 6.6, Lesson 4: Practice Problems

Calculate each product.

3.1 $212 \cdot 2$

3.2 $21.2 \cdot 0.2$

3.3 $21.2 \cdot 0.02$

4. Kweku and Javier each used a different strategy to determine 25% of 60.
Which strategy is correct?
Explain your reasoning.

Kweku's Strategy

$$60 \times 25$$

Javier's Strategy

$$60 \div 4$$

Explore

Using the digits 0–9, without repeating, fill in each blank so that the value of x is the same for each equation on the left and the same for each equation on the right.

$$\begin{aligned} x &= \square \\ x + \square &= \square \end{aligned}$$

$$\begin{aligned} x &= \square \\ x + \square &= \square \end{aligned}$$

Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 5: Swap and Solve

Name(s) _____

Activity 1: Stronger and Clearer Each Time

1. Select an equation from the list your teacher shared and determine the solution.

| Equation | Solution |
|----------|----------|
| | |

2. Write a situation to match this equation.
3. Explain what the variable represents in your situation.

| | |
|--|------------------------------|
| First Draft | |
| Conversation Notes #1 | Conversation Notes #2 |
| Second Draft | |
| Describe what the solution to the equation means in your situation. | |

Activity 2: Trade and Solve

| | | |
|-------------------------------------|-----------------|----------------------------|
| 1. Partner's name: | | |
| Equation for Their Situation | Solution | Meaning of Solution |
| | | |

| | | |
|-------------------------------------|-----------------|----------------------------|
| 2. Partner's name: | | |
| Equation for Their Situation | Solution | Meaning of Solution |
| | | |

| | | |
|-------------------------------------|-----------------|----------------------------|
| 3. Partner's name: | | |
| Equation for Their Situation | Solution | Meaning of Solution |
| | | |

| | | |
|-------------------------------------|-----------------|----------------------------|
| 4. Partner's name: | | |
| Equation for Their Situation | Solution | Meaning of Solution |
| | | |

| | | |
|-------------------------------------|-----------------|----------------------------|
| 5. Partner's name: | | |
| Equation for Their Situation | Solution | Meaning of Solution |
| | | |



Unit 6.6, Lesson 5: Notes

Name _____

My Notes

1. You must be 3 feet tall to ride a roller coaster.

Mauricio is $2\frac{1}{4}$ feet tall.

Which equation represents the number of feet Mauricio must grow, f , in order to ride the roller coaster?

- A. $3 + 2\frac{1}{4} = f$ B. $2\frac{1}{4} + f = 3$
- C. $3 + f = 2\frac{1}{4}$ D. $2\frac{1}{4}f = 3$

Here is an equation: $0.5 \cdot 32 = x$.

- 2.1 Write a situation to match this equation.

- 2.2 Solve this equation.

- 2.3 Explain what the solution represents in your situation.

Summary

- | |
|--|
| <p><input type="checkbox"/> I can write a situation to represent an equation.</p> <p><input type="checkbox"/> I can explain what the solution to an equation means in a situation.</p> |
|--|

Warm-UpSelect **all** the equations that have a solution of $c = 1.5$.

$4c = 41.5$
 $150 \div c = 100$
 $13.5 - c = 10$
 $6c = 9$
 $0.2c = 0.3$

Practice

1.1 Anika buys 5 notebooks that contain 60 pages each.

Select **all** the equations that represent the **total number of pages, p** .

$p = 60 \div 5$
 $5 + 60 = p$
 $p = 5 \cdot 60$
 $p \div 5 = 60$
 $5p = 60$

1.2 Tiara buys a pack of paper with 200 pages. She splits the paper equally into 5 binders.

Select **all** the equations that represent the number of **pages in each binder, b** .

$b = 200 \div 5$
 $200 \div b = 5$
 $b = 5 \cdot 200$
 $b \div 5 = 200$
 $5b = 200$

Complete the table by creating matching equations and situations.

| | Equation | Situation | Meaning of x |
|-----|-----------------------|---|----------------|
| 2.1 | $\frac{1}{2} + x = 4$ | | |
| 2.2 | | A plant in Zahra's garden grows 0.8 inches taller each week. After x weeks, the plant has grown 6 inches. | |

**Unit 6.6, Lesson 5: Practice Problems**

Solve each equation.

3.1 $6m = 33$

3.2 $p + 7.04 = 11.8$

3.3 $n + \frac{3}{5} = \frac{8}{10}$

4. Compare the information given about Triangle C and Triangle D.

Which triangle has the greater area?

Show or explain your thinking.

| Triangle C | Triangle D |
|------------------|--------------------|
| Base= 12 inches | Base= 15 inches |
| Height= 8 inches | Height= 6.5 inches |

ExploreUsing the digits 0–9, without repeating, fill in each blank such that the value of x is the same in each equation.

$\square x = \square$

$x + \square = \square$

$x - \square = \square$

Reflect

- Put a heart next to a question that you understand well.
- Use the space below to ask one question you have or to share something you are proud of.



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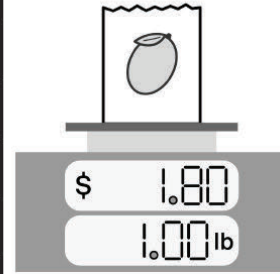
Unit 6.6, Lesson 6: Notes

Name _____

My Notes

- Mangos cost \$1.80 per pound. Complete the table.

| Mangos (lb.) | Total Cost (\$) |
|--------------|-----------------|
| 1 | 1.80 |
| 2 | |
| 5 | |
| 10 | |
| p | |



- Adnan paid x dollars for a pizza and an extra \$10.00 to have it delivered. Write an expression for the total cost.
 - Explain how each part of your expression relates to the situation.

Summary

I can write an expression with a variable to represent a situation.



Unit 6.6, Lesson 6: Practice Problems

Name _____

Warm-UpEvaluate the expression $3m + 5$ for all the values of m .

$m = 7$

$m = 0.8$

$m = \frac{5}{6}$

$m = 2.4$

Practice

Oranges cost \$1.25 per pound. How much would it cost to buy:

1.1 2 pounds of oranges?

1.2 5 pounds of oranges?

1.3 x pounds of oranges?

You need red and blue ribbon for a craft project. The instructions say that the red ribbon should be 7 inches longer than the blue ribbon. How long should the red ribbon be if the blue ribbon is:

2.1 10 inches?

2.2 27 inches?

2.3 x inches?

3. 35 riders are on a bus, and n riders get off at the same stop. In this scenario, what does the expression $35 - n$ represent?

Unit 6.6, Lesson 6: Practice Problems

The variable s represents the number of students in one class in your school.

4.1 What does $\frac{1}{2}s$ represent?

4.2 What does $s + 1$ represent?

5. LaShawn’s class raised \$500 for a fundraiser. They used 10% of the money to cover the cost of materials, saved 20% for the next fundraising project, and donated the rest.

How much money did LaShawn’s class **donate**?

A garbage bin can hold 50 gallons of waste. What percent of the bin would be filled if it had:

6.1 5 gallons of waste?

6.2 30 gallons of waste?

6.3 45 gallons of waste?

Explore

Select any number to represent a and use it to complete the puzzle on the right.

| | | | | | | | | |
|------|---|------|---|------|---|------|---|------|
| $3a$ | + | 4 | = | | | | | |
| - | | | | + | | | | - |
| a | | $4a$ | + | $4a$ | - | | = | $5a$ |
| - | | + | | = | | | | = |
| a | | | | | - | $2a$ | = | |
| - | | = | | | | + | | |
| a | + | $6a$ | - | | = | $4a$ | | |
| = | | + | | | | = | | |
| | | a | | a | + | | = | |

Reflect

- Put a star next to one question you are still wondering about.
- Use the space below to ask one question you have or to share something you are proud of.



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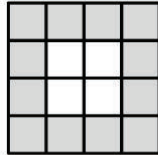
Unit 6.6, Lesson 7: Notes

Name _____

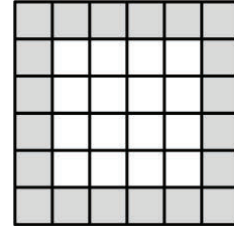
My Notes

How many gray tiles are used to make the border for each square?

1.1 2-by-2



1.2 4-by-4



1.3 10-by-10

1.4 n -by- n

2. Show or explain how you know that $2n + 2$ and $2(n + 1)$ are equivalent.

Summary

- I can explain what it means for two expressions to be equivalent.
- I can justify whether two expressions are equivalent.

Warm-UpEvaluate each expression for $b = 5$.

$3.5b$

$6b + 1$

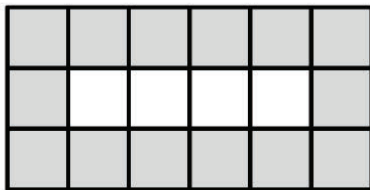
$\frac{1}{4} + b$

$\frac{1}{2}b$

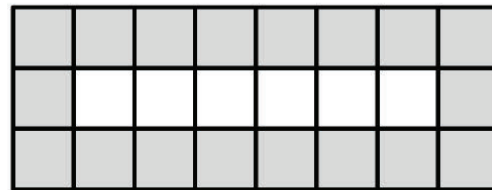
Practice

For each rectangle, determine how many gray tiles are used to make the border.

1.1

4-by-1 Rectangle

1.2

6-by-1 Rectangle

1.3 Diego says $2n + 6$ represents the number of gray tiles needed for the border of an n -by-1 rectangle, like the rectangles above. Explain why his strategy is correct.

2.1 Select **all** the expressions that are equivalent to $2n + 6$.

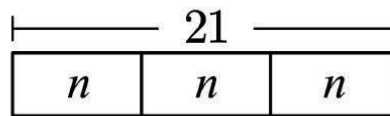
- $2 + 6n$ $2(n + 3)$ $n + 3$ $(n + 3) + (n + 3)$ $n + n + 6$

2.2 Choose an expressions that is **not** equivalent. Explain how you know it is not equivalent.



Unit 6.6, Lesson 7: Practice Problems

3.1 Write an equation to represent the tape diagram.



3.2 Determine the value of n .

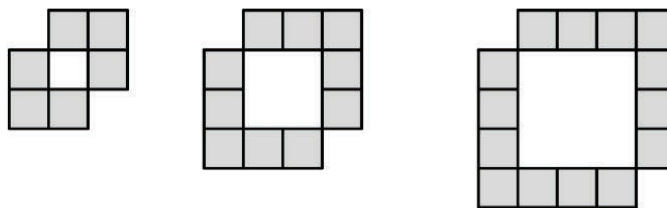
Write an equation to represent each scenario.

4.1 Aba's dog was $5\frac{1}{2}$ inches tall when it was a puppy but is now 14 inches tall. Aba's dog grew n -inches.

4.2 Apples cost \$1.10 per pound. Darius bought x pounds of apples for a total cost of \$2.75.

Explore

Write an expression that describes the number of **gray** tiles for any stage in the visual pattern below. Show your thinking.



Can you see the pattern in a different way that would produce a different expression? Show your thinking.

Reflect

1. Put a question mark next to a question you were feeling stuck on.
2. Use the space below to ask one question you have or to share something you are proud of.



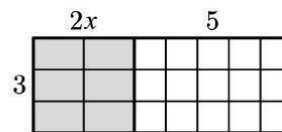
This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 8: Notes

Name _____

My Notes

- 1. Write two equivalent expressions that could be used to represent the area of this rectangle.



Expression 1

Expression 2

- 2.1 Write an expression that is equivalent to $8x + 4$. Draw a rectangle if it helps you with your thinking.
- 2.2 Show or explain how you know that $8x + 4$ and $8(x + 4)$ are **not** equivalent.

Summary

I can use an area model to write equivalent expressions.

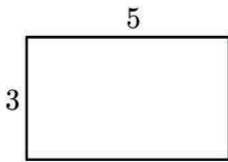


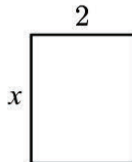
Unit 6.6, Lesson 8: Practice Problems

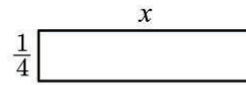
Name _____

Warm-Up

Write an expression to represent the area of each rectangle.







Practice

1. Select all of the expressions that are equivalent to $4b$.

$b + b + b + b$

$b + 4$

$b \cdot b \cdot b \cdot b$

$2b + 2b$

2. Select all of the expressions that represent the area of the rectangle:

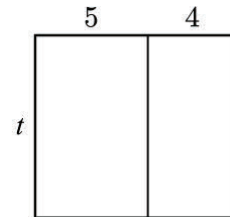
$t + 5 + 4$

$5t + 4t$

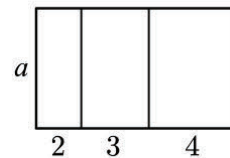
$9t$

$4 \cdot 5 \cdot t$

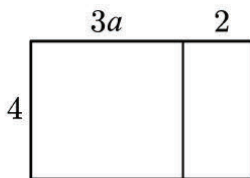
$(5 + 4)t$



3. Zola wrote the area of the rectangle as $2a + 3a + 4a$. Amir wrote the area as $(2 + 3 + 4)a$. Explain why they are both correct.



4. Write two equivalent expressions that could be used to represent the area of the rectangle.



Expression 1

Expression 2

Unit 6.6, Lesson 8: Practice Problems

Titus's aunt is 17 years older than him. How old will his aunt be when Titus is:

5.1 15 years old?

5.2 30 years old?

5.3 x years old?

Solve each equation. Show your thinking. Use a diagram if it helps.

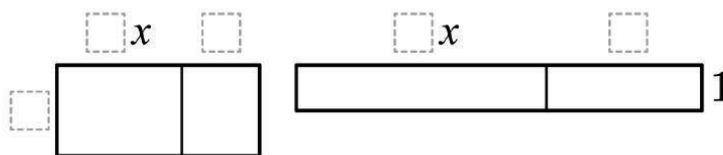
6.1 $10m = 25$

6.2 $13.65 = h + 4.88$

6.3 $k + \frac{1}{4} = 5\frac{1}{8}$

Explore

Using the digits 0–9, without repeating, fill in the blanks such that each rectangle has the same area.



Reflect

1. Put a smiley face next to a question you were stuck on and then figured out.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 9: Products, Sums, and Differences

Name _____

Activity 1: Card Sort

- Sort the expression cards into two or more groups according to similarities you see.
- Match each area model with two expressions for its area. You will have two leftover cards.

| | Area Model | Product | Sum |
|---|------------|---------|-----|
| A | | | |
| B | | | |
| C | | | |
| D | | | |
| E | | | |
| F | | | |

- Circle one of the expressions above. Explain how you decided which area model it represents.

Intermission

$3(k - 2)$

$20 - 5w$

Activity 2: Writing Equivalent Expressions

- Complete each row in the table by filling in the missing version of the expression.

Draw an area model if it helps you with your thinking.

| | Product | Sum or Difference |
|----------|------------------------|-------------------|
| A | $7(c - 4)$ | |
| B | | $24a + 16b$ |
| C | | $18 - 12d$ |
| D | $\frac{1}{2}(8x + 4)$ | |
| E | | $4y + 5y$ |
| F | $\frac{1}{3}(9a - 6b)$ | |

Are You Ready for More?

- Draw an area model on an index card (or a slip of paper).
- In the space below, write two area expressions for your area model.
- Trade area models with a partner. Determine their area expressions.



Unit 6.6, Lesson 9: Notes

Name _____

My Notes

1. Complete the table.

| Area Model | Product | Sum |
|------------|------------|-----------|
| | $4(x + 7)$ | |
| | | $2x + 2y$ |

2.1 The expressions $2(m + 8)$ and $2m + 16$ are equivalent.
Write an expression that is equivalent to $2(m - 8)$.

2.2 The expressions $3p - 18$ and $3(p - 6)$ are equivalent.
Write an expression that is equivalent to $18 - 3p$.

Summary

 I can write equivalent expressions, including expressions that have subtraction.

Warm-Up

Determine the greatest common factor (GCF) for each pair of numbers.

6 and 8

10 and 50

14 and 21

Practice

1. Select
- all**
- of the expressions that are equivalent to
- $4x + 8$
- .

$4(x + 2)$

$(4 + 8)x$

$2(2x + 4)$

$2(2x + 6)$

Complete the table by writing expressions that represent the area of each rectangle.

| | Area Model | Product of Two Factors | Sum of Two Terms |
|-----|------------|------------------------|------------------|
| 2.1 | | | $8 + 2x$ |
| 2.2 | | $5(m + 3)$ | |
| 2.3 | | | |

3. Latifa and Joel are trying to rewrite
- $8y + 24$
- as a product of two factors. Are Latifa's and Joel's expressions both equivalent to
- $8y + 24$
- ?

Explain your thinking.

| |
|---------------------|
| Latifa's Expression |
| $8(y+3)$ |

| |
|-------------------|
| Joel's Expression |
| $2(4y + 12)$ |

**Unit 6.6, Lesson 9: Practice Problems**

Complete the table by filling in the missing version of each expression. Draw a model if it helps with your thinking.

| | Product of Two Factors | Sum or Difference of Two Terms |
|-----|------------------------|--------------------------------|
| 4.1 | | $4x - 8$ |
| 4.2 | $(6 + 8)d$ | |
| 4.3 | | $10m + 7m$ |
| 4.4 | $3(2b + 5)$ | |
| 4.5 | $6(u - 2t)$ | |

Solve each equation.

5.1 $x + 5 = 11$

5.2 $0.6y = 1.8$

5.3 $5w = 17.5$

Explore

The area of a rectangle is $30 + 12x$. List at least three possibilities for the length and width of the rectangle.

Reflect

1. Circle a question you are still curious about.
2. Use the space below to ask one question you have or to share something you are proud of.

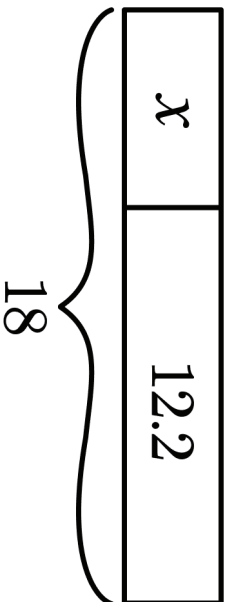


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Unit 6.6, Practice Day 1: Scavenger Hunt Sheets

$$15p + 21$$

Which equation represents this tape diagram?



- A.** $12.2x = 18$ **B.** $x + 12.2 = 18$
- C.** $18 + 12.2 = x$ **D.** $18x = 12.2$



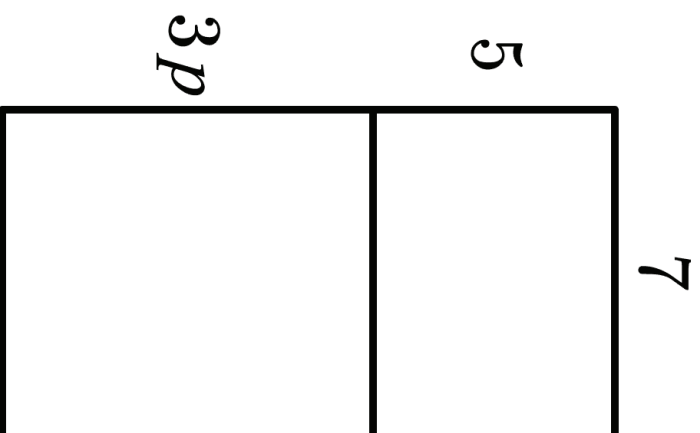
B

Determine the solution to this equation.

$$6x = 18$$

$$x = 3$$

Write an expression
as a sum for the area
of this rectangle.





$$35 + 21p$$

Which equation has the solution $x = 1.5$?

- A.** $6x = 1.5$ **B.** $1.5 + x = 6$
- C.** $6x = 7.5$ **D.** $6 + x = 7.5$

D

Here is an expression: $\frac{1}{2} (8b + 5)$.

What is the value of this expression
when $b = 4$?



Unit 6.6, Practice Day 1: Scavenger Hunt Sheets

18.5

Determine the solution to this equation.

$$\frac{1}{4}x = 12$$

$$x = 48$$

Which expression is equivalent to $2(a + 7)$?

- A.** $2a + 14$ **B.** $2a + 7$
- C.** $7(a + 2)$ **D.** $2a + 9$



A

Dakota ate 5 bananas this week. He ate 3 bananas at school and x bananas after school.

Which equation represents this situation?

A. $3x = 5$

B. $5 + 3 = x$

C. $3 + x = 5$

D. $5x = 3$

C

Determine the solution to this equation.

$$x + 2.05 = 3.9$$



Unit 6.6, Practice Day 1: Scavenger Hunt Sheets

$$x = 1.85$$

Here is an expression as a product: $3(5p + 7)$.

Write an equivalent expression as a sum.

Draw a rectangle if it helps you with your thinking.

Are You Ready for More?

Here is a rectangle.

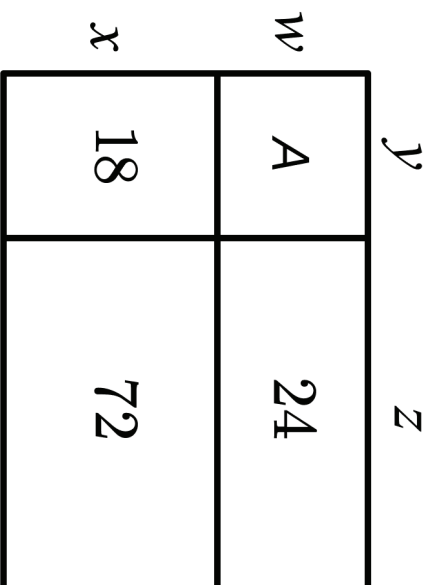


Diagram not to scale

Determine whole number values for w , x , y , z , and A .

Are there other values that will work?

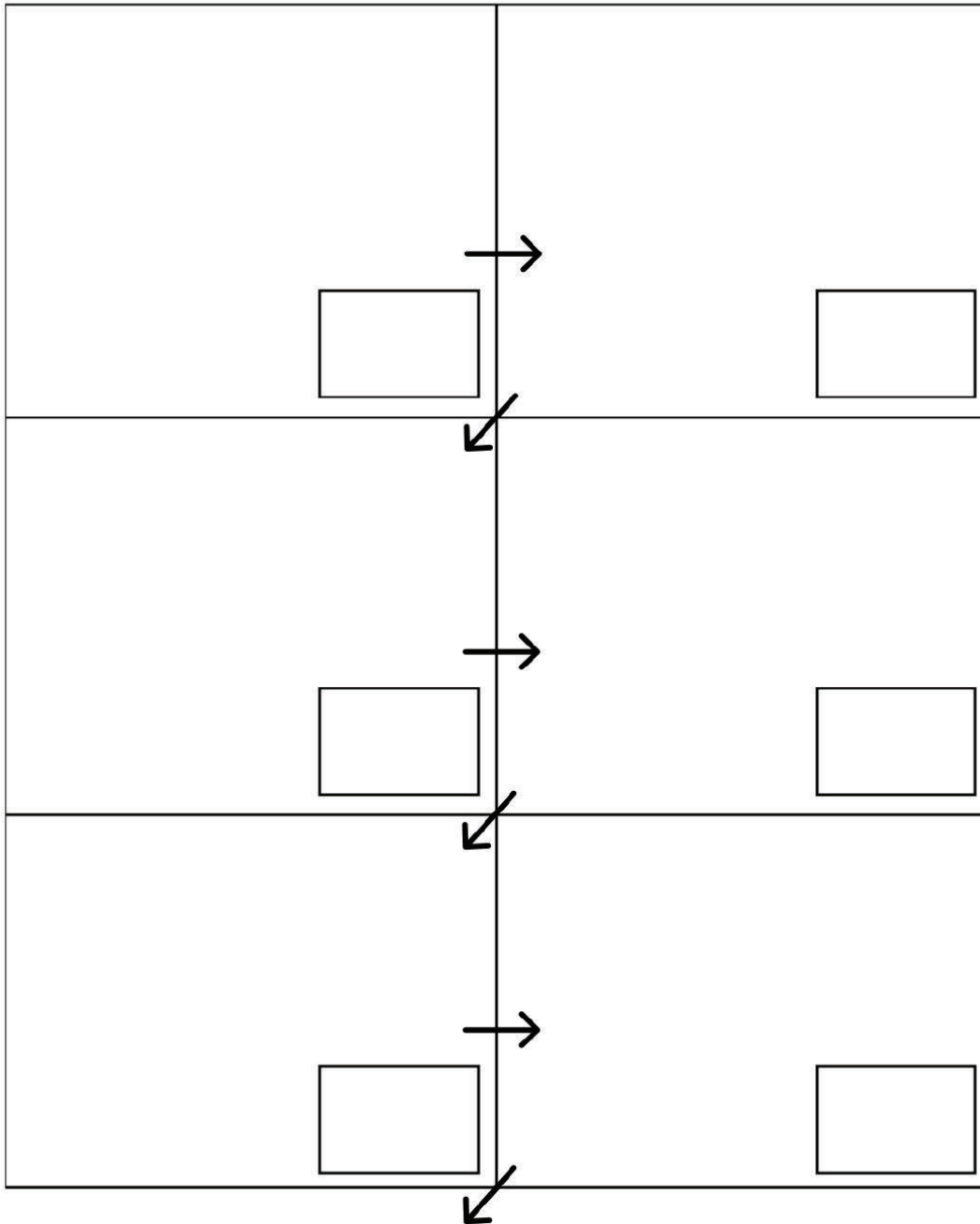
How many possibilities are there?



Unit 6.6, Practice Day 1: Worksheet

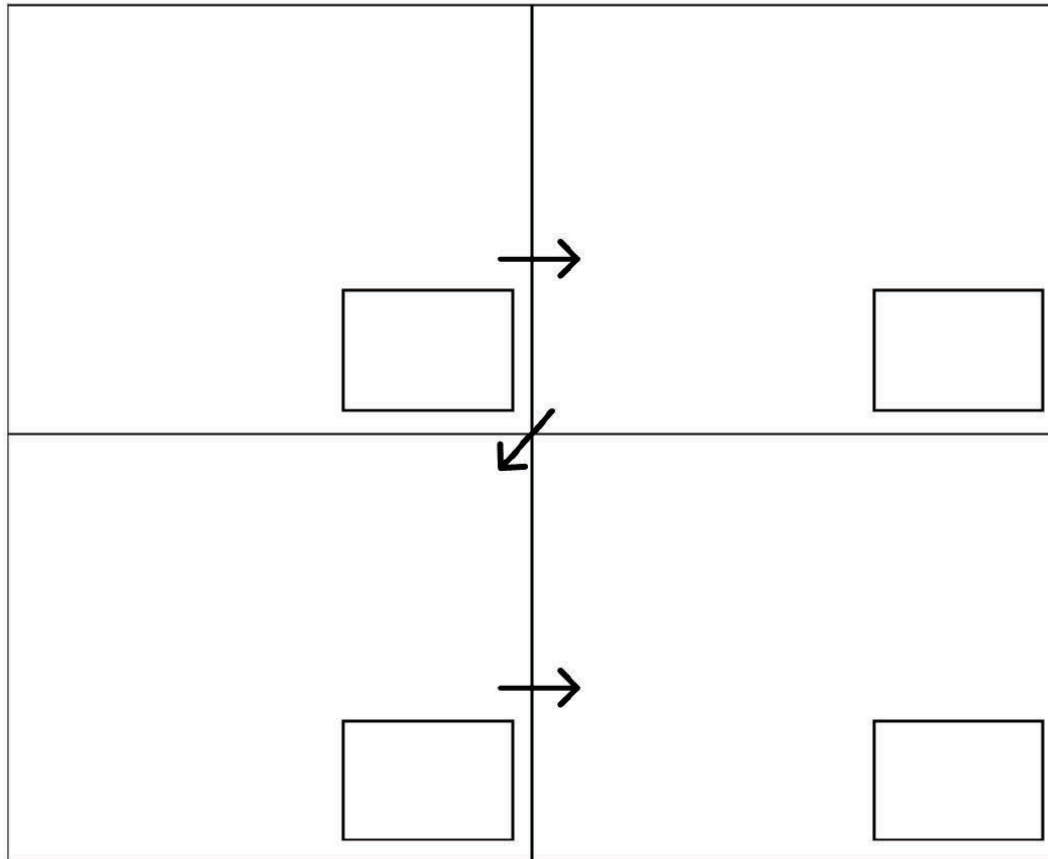
Name(s) _____

Start at any of the scavenger hunt sheets. Use this worksheet to solve the problem. Then, look for your answer at the top of another scavenger hunt sheet and solve the problem on that sheet.



Unit 6.6, Practice Day 1: Worksheet

Name(s) _____



Are You Ready for More?



Unit 6.6, Practice Day 1: Practice Problems

Name _____

Warm-UpDraw a tape diagram or balanced hanger to represent the equation $6 = x + 4$.**Practice: The Middle of the Story**

In this practice set, you will see problems (beginnings) **and** correct solutions (ends).
Your task is to explain all of the parts in the middle.

Problem 1

Determine the solution to each equation.

1.1 $4x = 12$

1.2 $7.35 = x + 4.2$

Solutions

1.1 $x = 3$

1.2 $x = 3.15$

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Problem 2Is $b = 5$ a solution to the equation $15 = \frac{1}{3}b$?**Solution**

No

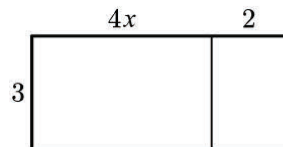
The Middle of the Story

Unit 6.6, Practice Day 1: Practice Problems

Problem 3

Select **all** the expressions that represent the area of this rectangle.

- $7x + 5$
- $3(4x + 2)$
- $12x + 6$
- $6(2x + 1)$
- $3(4x + 6)$



The Middle of the Story

Solutions

- ✓ $3(4x + 2)$
- ✓ $12x + 6$
- ✓ $6(2x + 1)$

Problem 4

Are $4(x - 5)$ and $4x - 5$ equivalent?

The Middle of the Story

Solution

No

Reflect

1. What advice would you give to yourself or others when solving equations?

2. Name one strategy you've found useful so far, and explain why it was useful to you. Also, if you learned it from another student, give that student credit.



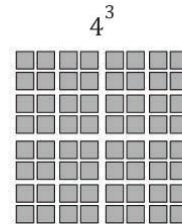
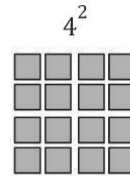
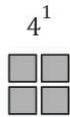
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Unit 6.6, Lesson 10: Notes

Name _____

My Notes

The number of squares in each image represents a power of 4.



1. Explain how you could figure out the value of 4^4 .

2. Complete the table.

| With Exponent | Without Exponent |
|---------------|---|
| 3^5 | $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$ |
| | $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$ |
| $(0.6)^3$ | |

3. Select **all** the expressions that are equal to 81.

- 1^{81}
 81^1
 3^4
 2^9
 $3^3 \cdot 3$

Summary

- I can explain what an expression with an exponent means (e.g., 3^5).
 I can decide whether two expressions that include exponents are equivalent.

Warm-Up

Determine the value of each expression.

$3 + 3 + 3 + 3$

$3 \cdot 3 \cdot 3 \cdot 3$

$4(3)$

3^4

Practice

1. Complete the table.

| Expression With Exponent | Expression Without Exponent |
|--------------------------|---|
| 3^5 | $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$ |
| | $2 \cdot 2 \cdot 2 \cdot 2$ |
| 4^3 | |
| 5^1 | |
| | $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$ |
| $(\frac{1}{3})^4$ | |

2. Select
- all**
- the expressions that are equal to 16.

8^2

2^4

2^8

4^2

16^1

3. Here are four expressions. Circle two expressions that have the same value.

$6 + 6 + 6$

6^3

3^6

$3 \cdot 6$

Explain how you know they are equivalent.

**Unit 6.6, Lesson 10: Practice Problems**

Solve each equation.

4.1 $a - 2.01 = 5.5$

4.2 $b + 2.01 = 5.5$

4.3 $10c = 13.71$

5. Write two expressions to represent the area of each rectangle.

| Rectangle | Product | Sum |
|-----------|---------|-----|
| | | |
| | | |

ExploreWhat value of a makes both of these equations true? Explain how you know.

$$a^2 = 2^a \quad a^4 = 4^a$$

Reflect

- Circle a question you want to talk to a classmate about.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 11: Exponent Expressions

Name _____

Activity 1: What's Missing?

| | Diagram | Expression | Value |
|---|---------|---------------|-------|
| 1 | | $5 \cdot 3^2$ | |
| 2 | | | |
| 3 | | | |
| 4 | | | |



Unit 6.6, Lesson 11: Exponent Expressions

Activity 2: Partner Problems

| Partner A | Partner B |
|---|---|
| 1. $5^2 + 4$ | 1. $2^2 + 25$ |
| 2. $9 \cdot 2^1$ | 2. $3 \cdot 6^1$ |
| 3. $3 \cdot 4^2$ | 3. $12 \cdot 2^2$ |
| 4. $(7 + 2)^2$ | 4. $17 + 4^3$ |
| 5. $5^2 + 2$ | 5. $(1 + 2)^3$ |
| 6. $\frac{1}{9} \cdot \left(\frac{1}{2}\right)^3$ | 6. $\frac{1}{8} \cdot \left(\frac{1}{3}\right)^2$ |
| Are you ready for more? Write an expression with an exponent that has the same value as your partner's but uses different numbers. | Are you ready for more? Write an expression with an exponent that has the same value as your partner's but uses different numbers. |

My Notes

Here are two figures.

Figure A

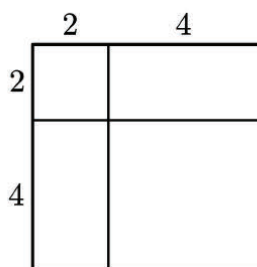
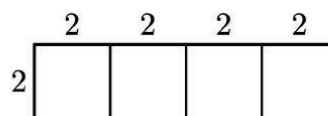


Figure B



1. Match each figure with an expression that describes its area. You will have one expression left over.

$(4 \cdot 2)^2$

$4 \cdot 2^2$

$(2 + 4)^2$

Figure _____

Figure _____

Figure _____

Calculate the value of each expression.

2.1 $(4 \cdot 2)^2$

2.2 $4 \cdot 2^2$

2.3 $(2 + 4)^2$

Summary

I can determine the value of an expression that has an exponent and addition, subtraction, multiplication, or division.



Unit 6.6, Lesson 11: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

$3(5)$

$3(5) + 2$

$3(5 + 2)$

$3(2 + 5)$

Practice

Here are three different figures.

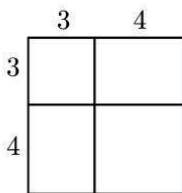


Figure A

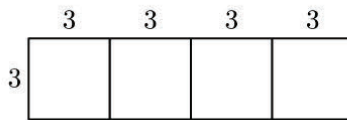


Figure B

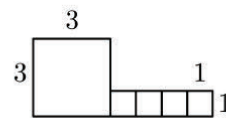


Figure C

1.1 Match each figure with an expression that describes its area.

$4 \cdot 3^2$

$3^2 + 4$

$(3 + 4)^2$

Figure _____

Figure _____

Figure _____

1.2 Calculate the value of each of the expressions from above.

$4 \cdot 3^2$

$3^2 + 4$

$(3 + 4)^2$

2. Here are three more expressions. Calculate their values. Draw a picture if it helps you with your thinking.

$5 + 4^2$

$(3 + 2)^3$

$2^2 \cdot 5$

Unit 6.6, Lesson 11: Practice Problems

Determine the value of each expression.

3.1 $7 + 2^3$

3.2 $9 \cdot 3^1$

3.3 $20 - 2^4$

3.4 $8 \cdot \left(\frac{1}{2}\right)^2$

4. Select **all** the expressions that are equal to 3^4 .

$3 \cdot 3 \cdot 3 \cdot 3$

12

$3 + 3 + 3 + 3$

$9 \cdot 9$

81

A ticket at a movie theater costs \$9.50. One night, the theater sold \$13,433 in tickets.

5.1 **Estimate** the number of tickets sold.
Show or explain your reasoning.

5.2 **Calculate** the exact number of tickets sold.
Show or explain your reasoning.

Explore

Using the digits 1–9, without repeating, fill in the blanks so that the values are in order from smallest to largest.

Smallest 4^{\square} , \square^4 , \square^2 , 3^{\square} , \square^3 , 2^{\square} Largest

Reflect

1. Put a heart next to the question you are most proud of.
2. Use the space below to ask one question you have or to share something you are proud of.



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Unit 6.6, Lesson 12: Practice Problems

For each pair of expressions, circle the expression with the greater value.

| | | | |
|-----|------------------------------|------------------------------|---------------------------|
| 4.1 | 2^3 | 3^2 | They have the same value. |
| 4.2 | 1^{10} | 10^1 | They have the same value. |
| 4.3 | 3^4 | 9^2 | They have the same value. |
| 4.4 | $\left(\frac{1}{2}\right)^3$ | $\left(\frac{1}{3}\right)^2$ | They have the same value. |

Some say that a restaurant should charge its customers about 3.5 times the cost of the ingredients. How much should a restaurant charge if the ingredients cost:

5.1 \$10?

5.2 \$5?

5.3 d dollars?

5.4 If a restaurant charges \$15.75 for something, how much did the ingredients cost?

Explore

Using the digits 0–9, without repeating, fill in the blanks to create equivalent expressions. Show or explain how you know they are equivalent.

$$\begin{array}{c} \square \cdot \square^2 \\ (\square + \square)^2 \end{array}$$

Reflect

- Put a star next to a question that looked more difficult to solve than it really was.
- Use the space below to ask one question you have or to share something you are proud of.



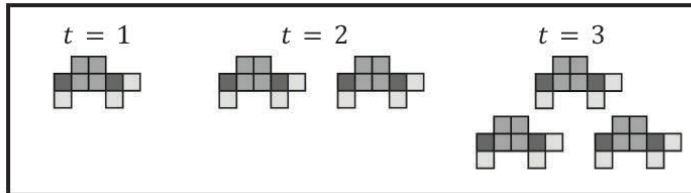
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Unit 6.6, Lesson 13: Notes

Name _____

My Notes

Here is a pattern of turtles.



The *independent variable* is t , the number of turtles.

- 1.1 Explain what an *independent variable* is.
- 1.2 Explain what a *dependent variable* is. Give one example.

Adah made a table to represent the relationship between the number of turtles, t , and the total area, a .

2.1 What is the dependent variable?

2.2 Which equation represents this relationship?

$t = 9a$ $a = 9t$ $a = t + 9$

Explain your thinking.

| t | a |
|-----|-----|
| 1 | 9 |
| 2 | 18 |
| 3 | 27 |

Summary

- I understand what the independent and dependent variables are in a relationship.
- I can use a table or an equation to represent a relationship.



Unit 6.6, Lesson 13: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

3^2

2^3

2^5

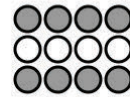
2^1

Practice

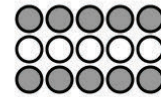
1. Here is a pattern of circles. The *independent variable* is c , the number of circles along the bottom.



$c = 2$



$c = 4$



$c = 5$

List 2–3 *dependent variables* you could count or measure, and assign each variable a letter.

Karima wants to help a community kitchen figure out how much broth they need for their famous chicken soup. Each serving of soup uses 2 cups of broth.

 s = number of servings of soup b = number of cups of broth

- 2.1 Complete the table.
- 2.2 Which variable is the *independent variable*?
Explain your thinking.

| s | b |
|-----|-----|
| 1 | |
| 2 | |
| 5 | |
| | 16 |

- 2.3 Karima and her sister each wrote an equation to help them understand the relationship.

Karima: $s = 2b$

Karima's sister: $b = 2s$

Who do you agree with? Explain your reasoning.

Unit 6.6, Lesson 13: Practice Problems

Determine the value of each expression when $x = 4$.

3.1 $(6 - x)^3$

3.2 $2(6 - x)^3$

3.3 $2^x - 6$

3.4 $(\frac{1}{x})^3$

I have a coupon for \$4 off any item at a store. How much would I pay if I buy an item that costs:

4.1 \$10?

4.2 \$22?

4.3 d dollars?

Explore

Draw a pattern that represents the relationship shown in this table.

See Problem 1 for an example of a pattern.

| n | a |
|-----|-----|
| 1 | 5 |
| 2 | 10 |
| 3 | 15 |

What does n represent?

What does a represent?

Reflect

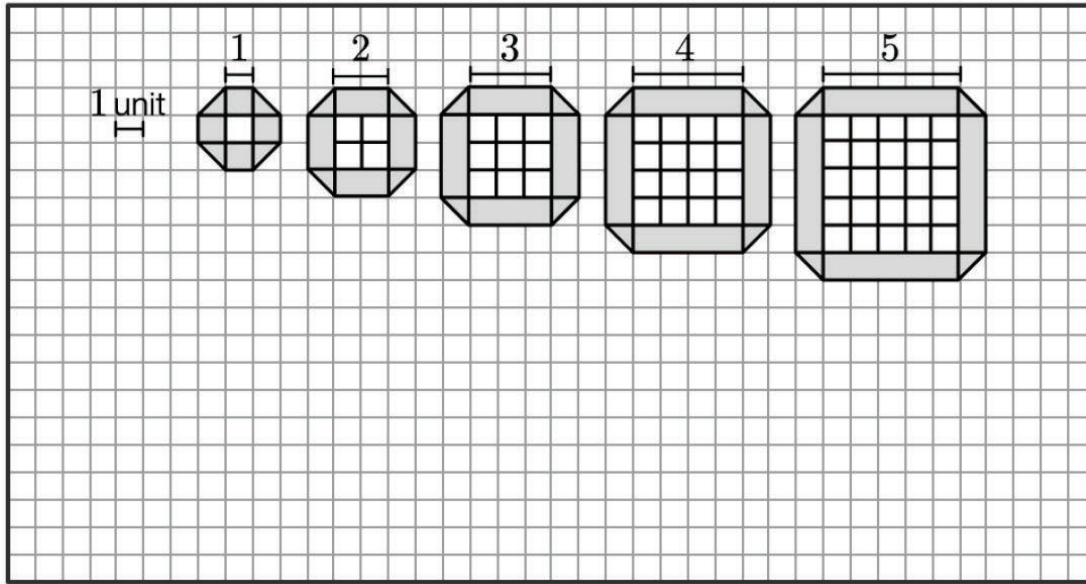
1. Put a star next to the question you understood best.
2. Use the space below to ask one question you have or to share something you are proud of.



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Unit 6.6, Lesson 14: Supplement

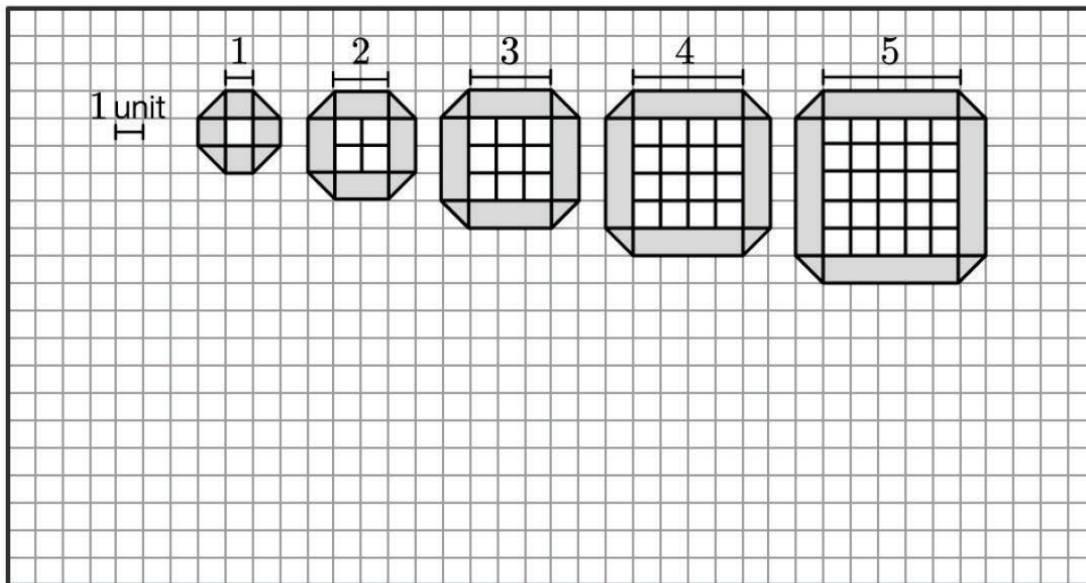
Name _____



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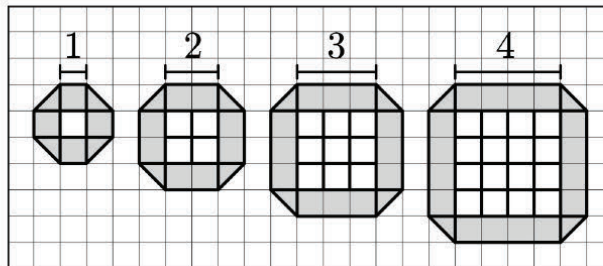
Unit 6.6, Lesson 14: Supplement

Name _____



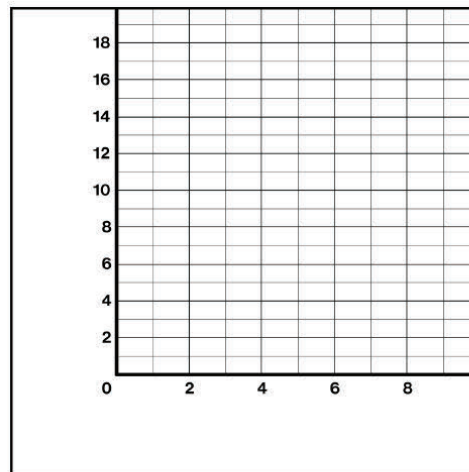
My Notes

Kanna is exploring the relationship between the side length, n , and the total area of the border, b .



1. Use Kanna's table to create a graph of the relationship. Be sure to label each axis with what it represents.

| n | b |
|-----|-----|
| 1 | 6 |
| 2 | 10 |
| 4 | 18 |



2. If the graph were larger, it would include the point $(6, 26)$. Describe what this point means in the situation.

Summary

I can represent relationships using tables and graphs.



Unit 6.6, Lesson 14: Practice Problems

Name _____

Warm-Up

Determine the value of each expression.

3^3

$2(3)^3$

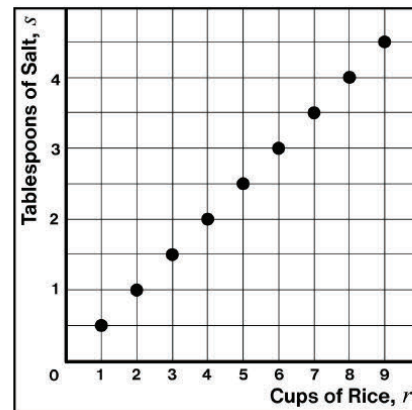
$3^3 + 4$

$2 \cdot 3^3 + 4$

PracticeThis graph shows the number of tablespoons of salt, s , needed to make r cups of rice.

- 1.1 Complete the table to reflect some of the values on the graph.

| Cups of Rice, r | Tablespoons of Salt, s |
|-------------------|--------------------------|
| 1 | $\frac{1}{2}$ |
| 4 | |
| | 3 |
| | |



- 1.2 What does the point (8, 4) mean in this situation?

- 1.3 Which equation represents the relationship between the number of tablespoons of salt, s , and the number of cups of rice, r ?

A. $r = \frac{1}{2}s$

B. $s = 2r$

C. $s = \frac{1}{2}r$

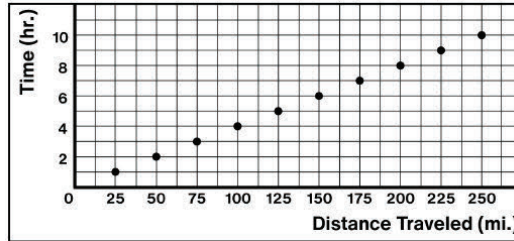
D. $s = \frac{1}{2} + r$

Explain how you know your equation is correct.

Unit 6.6, Lesson 14: Practice Problems

The graph represents the amount of time in hours that it takes a ship to travel various distances in miles.

2.1 Circle one point on the graph and explain what it means in this situation.



2.2 What is the **independent** variable?

2.3 What is the **dependent** variable?

2.4 Complete the table using any three points on the graph.

Use the top row to label each column with a variable.

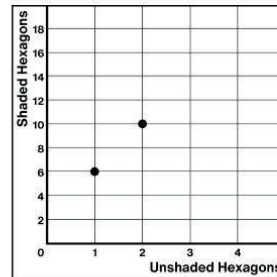
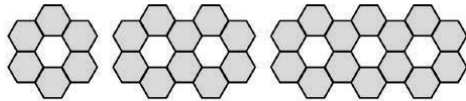
| | |
|--|--|
| | |
| | |
| | |
| | |

3. Select **all** of the expressions that are equivalent to $10x - 30$.

- $10(x - 3)$
 $10(x - 30)$
 $5(2x - 6)$
 $30 - 10x$
 $x(10 - 30)$

Explore

Here is a pattern. Draw the next stage in the pattern and plot the missing points that represent the pattern.



Reflect

- Circle one question you want to discuss with a classmate tomorrow.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Lesson 15: Connecting Representations Name _____

Activity 1: What's Missing?

| Situation | Table | Graph | Equation |
|--|-------|-------|----------|
| <p>1 Amanda sells paletas for \$2 each.</p> <p>What is the total amount of money she can earn?</p> | | | |
| <p>2 Tameeka sells paletas for \$2.50 each.</p> <p>What is the total amount of money she can earn?</p> | | | |
| <p>3 Esteban sells piraguas for \$3.50 each.</p> <p>What is the total amount of money he can earn?</p> | | | |

1. Choose one row above. Circle or highlight the price per item in each representation.
2. Angel sells piraguas for \$4.50 each. How will Angel's graph be different from Esteban's?

Activity 2: Rough Draft Graph

Sora sells popsicles for \$3 each. She made a table and a graph to help her understand how much money she can make.

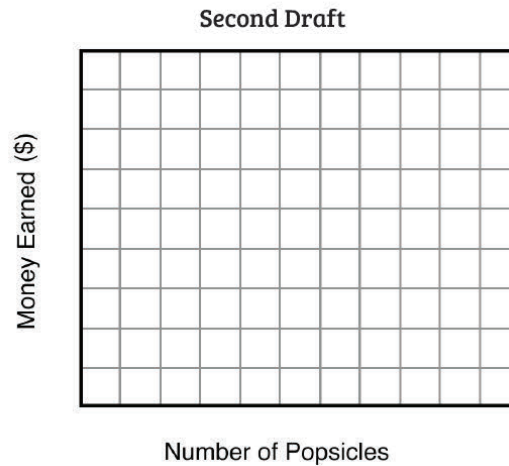
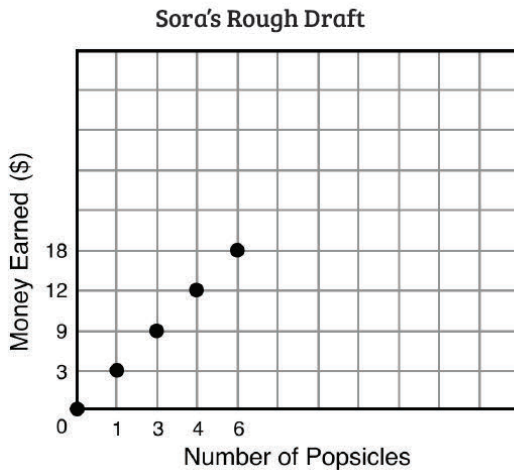
Her table is correct, but her graph is not quite right.

| Number of Popsicles | Money Earned (\$) |
|---------------------|-------------------|
| 0 | 0 |
| 1 | 3 |
| 3 | 9 |
| 4 | 12 |
| 6 | 18 |

- 1.1 What is one thing she did well in her graph?

- 1.2 What is one thing you would change about her graph?

2. Use Sora's table to create a second draft of her graph.



3. Circle one point on your graph. Explain what that point means in Sora's situation.

4. What are some other mistakes a person might make when they are creating a graph?

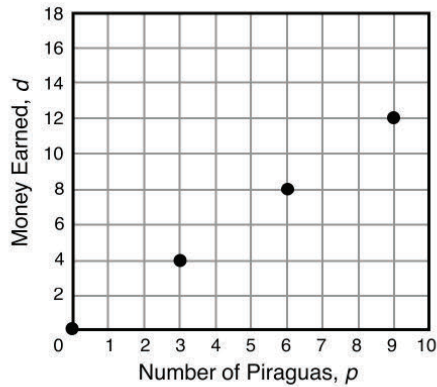


Unit 6.6, Lesson 15: Notes

Name _____

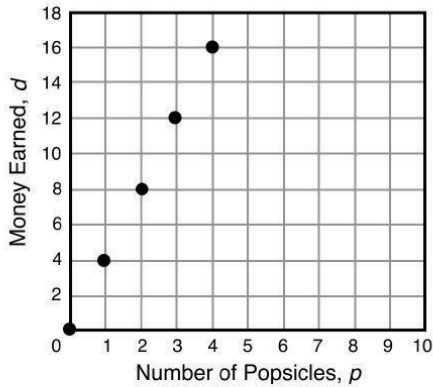
My Notes

1. Create a table that represents this graph.



| p | d |
|-----|-----|
| | |
| | |
| | |
| | |

2. Which equation represents this graph?



$p = 4d$

$d = 4 + p$

$d = 4p$

Explain how you know.

Summary

I can connect tables, graphs, and equations that represent the same relationship.

Warm-Up

Determine the value of each.

25% of 40

30% of 60

45% of 90

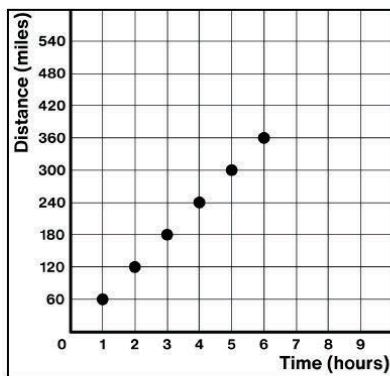
Practice

Melissa is selling cookies for \$1.50 each.

- 1.1 Write an equation that represents how much money Melissa earns, m , for selling a number of cookies, c .
- 1.2 Complete the table that represents this situation.

| c | m |
|-----|---------|
| 2 | |
| 4 | |
| | \$16.50 |
| | \$22.50 |

This graph represents the distance a car drove, d , over time, t .



- 2.1 Create a table to represent the points on the graph.

- 2.2 Nathan determined that the equation $d = 60t$ represents this situation. Explain how the parts of his equation relate to the situation.

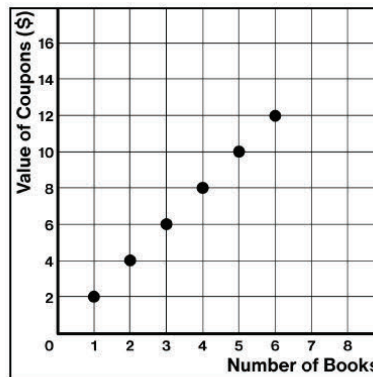


Unit 6.6, Lesson 15: Practice Problems

3. A bookstore gives out coupons for \$2 off each book. This graph represents the situation.

Circle one point on the graph.

Explain what that point means in this situation.



Bao sells lemonade for \$0.35 per cup.

- 4.1 If Bao earned \$9.80, how many cups of lemonade did he sell?
- 4.2 Bao bought 50 paper cups for \$0.05 each, how much did he spend to buy the paper cups?

Explore

In your everyday life, what relationship representation do you see most often: equations, tables, or graphs? Explain your thinking and provide examples.

Reflect

1. Circle a question you want to talk to a classmate about.
2. Use the space below to ask one question you have or to share something you are proud of.




Subway Fares

Let's use tables, graphs, and equations to help customers compare subway fares.



Warm-Up

In Metropolis, there are three ticket options to ride the bus or subway.

| Option 1 Regular Fare | Option 2 Unlimited 7-Day Pass | Option 3 Reduced Fare |
|--|--|--|
|  <div data-bbox="350 999 553 1171"> <p>TICKET</p> <p>\$2.50 PER RIDE</p> </div> |  <div data-bbox="750 999 953 1171"> <p>\$30</p> <p>★★★★★ UNLIMITED 7-DAY PASS</p> </div> |  <div data-bbox="1149 999 1352 1171"> <p>TICKET</p> <p>50% OFF REGULAR FARE</p> </div> <p data-bbox="1036 1213 1352 1360">For people who have low income, are 65 or older, or who have a qualifying disability.</p> |

1. For each option, how much will it cost to ride the subway 3 times in a single weekend?

Consider the Costs

The Metropolis Transit Association (MTA) is in charge of the public buses and subways in Metropolis.

Your task is to help an MTA employee show customers how much each option from the Warm-Up costs, based on the number of rides they use.

2. As a group, work together to create a table, graph, and equation for each option.

| | Table | | Graph | Equation |
|----------|----------------------|----------------------|-------|----------|
| Option 1 | Number of rides, r | Total cost (\$), c | | |
| Option 2 | Number of rides, r | Total cost (\$), c | | |
| Option 3 | Number of rides, r | Total cost (\$), c | | |

- a Which variable is the independent variable? Which is the dependent variable?
- b Write 2–3 sentences comparing and contrasting the graphs for the three options.

Name: _____ Date: _____ Period: _____

Consider the Costs (continued)

Read about four customers who ride the subway and circle one that you choose to help. Make sure each person in your group chooses a different customer.

| Eliza | Nikhil | Sydney | Bao |
|---|---|---|---|
| Eliza is 70 years old. She works at a daycare about 1.5 miles away from her house. Sometimes she walks to work and sometimes she rides the subway. She rides the subway between 2–8 times per week. | Nikhil is 23 years old. He uses a wheelchair and it takes him 20 minutes to get to the closest wheelchair -accessible subway station from his house. Nikhil works as a chef and rides the subway to and from work five days per week. | Sydney is 20 years old. They are a college student and work part time. They ride the subway to school and work. They usually ride between 15–20 times per week. | Bao is 16 years old. He walks to school during the week and only rides the subway on the weekends to visit friends. |

3. Which fare option should your customer choose?

A. Regular Fare

B. Unlimited

C. Reduced Fare

4. Use the tables, graphs, and equations you made earlier to support your recommendation.

Increased Fares

To help maintain the subway service, the MTA leadership is thinking about raising the *Regular Fare* by \$0.50.

5. Describe one advantage and one disadvantage of raising the *Regular Fare*. Explain your thinking for each.

One advantage to raising the *Regular Fare* is . . .

One disadvantage to raising the *Regular Fare* is . . .

6. Look back at your work for the *Regular Fare*. How would raising the fare by \$0.50 change each of the following?

| Table | Graph | Equation |
|-------|-------|----------|
| | | |

7. For which of the four customers will the fare increase have the greatest impact? Explain your thinking.
8. How would you adjust the fares to get the money you need to maintain service while also charging customers fairly?

Synthesis

How can making a graph and a table help us understand relationships in the world, such as subway fares?

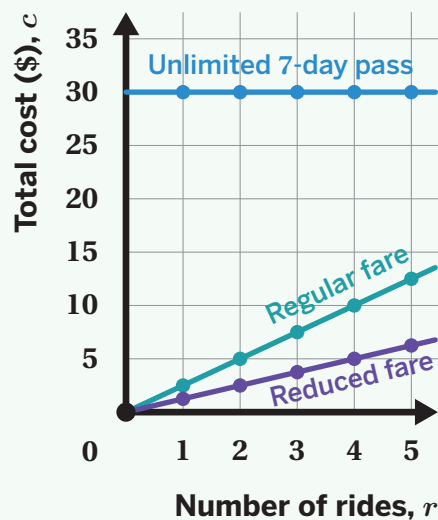
Summary

Tables, graphs, and equations help compare different relationships between quantities. When it comes to analyzing subway fares, these representations can help you make informed decisions about what option might be better to choose than another.

A graph can visually show how different rates compare.

- The **Regular fare** line is steeper than the **Reduced fare** line. This means its rate (cost per ride) is greater, $\$2.50 > \1.25 .
- The **Reduced fare** line is flatter than the **Regular fare** line. This means its rate is less, $\$1.25 < \2.50 .

By using these representations, you can make sure you get the best subway ticket for your needs!



Practice

Name: _____ Date: _____ Period: _____

1. Match each equation to the table it represents.

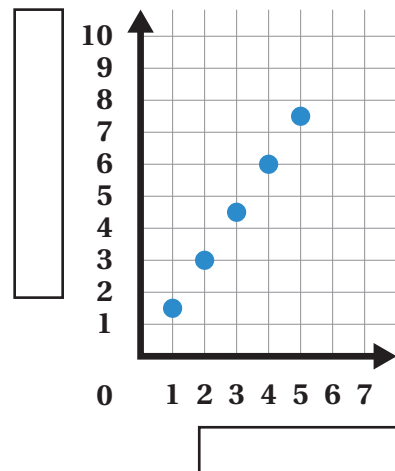
| $p = 2n$ | | $p = \frac{1}{2}n$ | | $p = n + 2$ | |
|----------|-----|--------------------|-----|-------------|-----|
| n | p | n | p | n | p |
| 10 | 5 | 10 | 20 | 10 | 12 |
| 20 | 10 | 20 | 40 | 20 | 22 |
| 100 | 50 | 100 | 200 | 100 | 102 |

For Problems 2–5, use this information. Riya’s biking app says that she rides at a speed of 5 miles per hour.

2. At this speed, how far does Riya ride in 1 hour?
3. At this speed, how far does Riya ride in 3 hours?
4. Write an equation for the relationship between Riya’s distance biked d and time t .
5. Riya’s speed last week could be represented by the equation $d = 3t$. What can you say about last week’s speed compared to this week’s speed? Explain your thinking.

For Problems 6–8, use the graph provided.

6. Write a situation that could be represented by the graph.
7. Label the axes on the graph to match your situation.



8. Fill in the table using the points on the graph. Label each column with variables to match the graph.

| | |
|---|-----|
| 1 | 1.5 |
| 2 | |
| | 4.5 |
| 4 | |
| | |

9. A school supply store sells boxes of markers. Each box contains 16 markers.

Write an equation to represent the total number of markers, y , in each boxes, x .

Equation: _____

If $x = 5$ for one day of sales, use your equation to determine the total number of markers the supply store sells. Show your thinking.

Spiral Review

10. Select *all* of the equations that have a solution of $n = 3$.

A. $10n = 103$

C. $\frac{1}{4} + n = \frac{13}{4}$

E. $\frac{1}{3}n = 3$

B. $5n = 15$

D. $n \div 2 = 6$

11. At a market, 3.1 pounds of peaches cost \$7.75. How much did the peaches cost per pound? Explain your thinking.

12. Use the numbers 1–9 only once to fill in each blank to make each inequality true.

$$\square^2 < 2\square$$

$$\square^2 > 2\square$$

$$\square^3 < 3\square$$

$$\square^3 > 3\square$$

Reflection

- Circle the question you think will help you most on the end of unit assessment.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.6, Practice Day 2: Task Cards

Dance-a-Thon

The Black Student Union is hosting a dance-a-thon fundraiser for their school. Tyler's cousin Faaria promises to donate based on the number of minutes Tyler dances.

1. Complete the table to show Faaria's donation, d , for different numbers of minutes that Tyler dances, t .

| Time (min), t | Donation (\$), d |
|-----------------|--------------------|
| 1 | |
| 2 | |
| 4 | 6 |
| 10 | |

2. How much money will Faaria donate for each minute of dancing?
3. Write an equation that represents the money donated, d , for dancing t minutes.
4. Predict how much Faaria will donate if Tyler dances for 60 minutes.
5. Create a graph that represents the relationship between t and d .
6. If the graph were larger, it would include the point (18, 27). Describe what this point means in the situation.

Unit 6.6, Practice Day 2: Task Cards

Equivalent Expressions

Each round has two expressions that are equivalent and one that is not.

For each round:

- 1.1 Figure out which expression is not equivalent to the others.
- 1.2 Change the expression you wrote so that it has the same value as the others.

Round 1

A. 6^2

B. $4(3^2)$

C. $2^3 \cdot 4$

Round 2

D. $5^2 + 3^2$

E. $16(2^2)$

F. $(5 + 3)^2$

Round 3

G. $3 \cdot 3 \cdot 3 + 3$

H. $(3 + 3)^2 + 2$

I. $4^2 + 4^2 - 2$

2. Create your own challenge!
Write two expressions that are equivalent and one that is not.



Unit 6.6, Practice Day 2: Task Cards

Solve 'em

Round 1

Choose **three** equations and solve them.

| | | |
|---------------------------|----------------------------------|---------------------------------|
| A. $24 - x = 13$ | B. $\frac{2}{3} \cdot 24 = x$ | C. $2.50 \cdot p = 10$ |
| D. $2.50 + p = 10$ | E. $x \div 2 = 18$ | F. $x + \frac{2}{3} = 24$ |
| G. $10 \cdot 2.50 = p$ | H. $x - 13 = 24$ | I. $6 = \frac{2}{3} \cdot x$ |

Round 2

1. Select **two** situations.
2. For each situation:
 - Match the situation with one of the equations from Round 1.
 - Determine the solution and explain the meaning of the solution in the situation.

| Situation 1 | Situation 2 | Situation 3 |
|--|--|--|
| Santino has \$10 to spend on laundry. It costs \$2.50 to wash and dry each load. How many loads of laundry, p , can Santino do? | Zahara's water bottle holds 24 ounces. Zahara filled the water bottle and drank x ounces. 13 ounces are left. How many ounces did Zahara drink? | Luis has a flower bed that is 24 square feet. He wants to plant $\frac{2}{3}$ of the bed with moon flowers. How many square feet of moon flowers should Luis plant? |

Unit 6.6, Practice Day 2: Task Cards

Reflection

Discuss with a classmate: *What advice would you give to yourself or others when solving equations like these?*

Rectangles and Expressions

1.1 Which expression represents the area of this rectangle?

- A. $2x + 1 + 7$
- B. $7(2x + 1)$
- C. $7 \cdot 2x + 1$
- D. $2(7x + 1)$

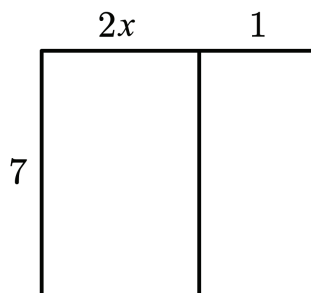


Diagram not to scale

1.2 What is the area of this rectangle if $x = 6$?

1.3 What is the area of this rectangle if $x = \frac{1}{4}$?

2. Select **three** expressions.

For each expression:

- Draw an area model to represent the expression.
- Write an equivalent expression.

| | | | |
|------------------------|------------|------------|------------|
| $\frac{1}{3}(6x + 12)$ | $14a + 2b$ | $(4 + 5)x$ | $5a + 10b$ |
|------------------------|------------|------------|------------|



Unit 6.6, Practice Day 2: Task Cards

Are You Ready for More?

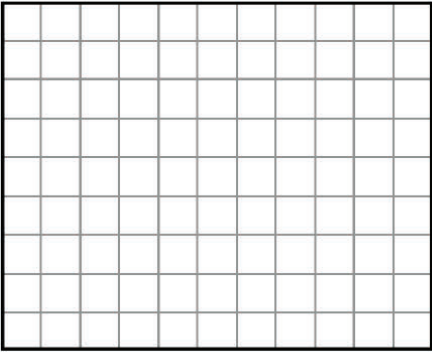
Here is an equation:

$$\square^2 + \square^2 = \square^2$$

On a separate sheet of paper:

1. Fill in the blanks to create an equation that is true.
2. Fill in the blanks to create an equation that is **not** true.
3. Explain: *Is it possible to create more than one true equation? Why or why not?*

Dance-a-Thon

| <p>1.</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Time (min), t</th> <th style="padding: 5px;">Donation (\$), d</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">1</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;">2</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;">4</td> <td style="padding: 5px;">6</td> </tr> <tr> <td style="padding: 5px;">10</td> <td style="padding: 5px;"></td> </tr> </tbody> </table> <p>2.</p> <p>3.</p> <p>4.</p> | Time (min), t | Donation (\$), d | 1 | | 2 | | 4 | 6 | 10 | | <p>5.</p> <div style="border: 1px solid black; width: 100%; height: 100%; text-align: center; padding: 10px;">  </div> <p>6.</p> |
|---|--------------------|--------------------|---|--|---|--|---|---|----|--|--|
| Time (min), t | Donation (\$), d | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 4 | 6 | | | | | | | | | | |
| 10 | | | | | | | | | | | |

Equivalent Expressions

| | | | | |
|---|---|----|----|----|
| <p style="text-align: center;">Round 1</p> <p>1.1</p> <p>1.2</p> | <p style="text-align: center;">Round 2</p> <p>1.1</p> <p>1.2</p> | | | |
| <p style="text-align: center;">Round 3</p> <p>1.1</p> <p>1.2</p> | <p style="text-align: center;">My Challenge</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; border-right: 1px solid black; padding: 5px; vertical-align: top;">A.</td> <td style="width: 33%; border-right: 1px solid black; padding: 5px; vertical-align: top;">B.</td> <td style="width: 33%; padding: 5px; vertical-align: top;">C.</td> </tr> </table> | A. | B. | C. |
| A. | B. | C. | | |



Unit 6.6, Practice Day 2: Worksheet

Name _____

Solve 'em

Round 1

| | | |
|-----------------|-----------------|-----------------|
| Equation: _____ | Equation: _____ | Equation: _____ |
| Solution: _____ | Solution: _____ | Solution: _____ |

Round 2

| | | | |
|--------------------|----------|----------|---------------------|
| Situation _____ | Equation | Solution | Meaning of Solution |
| Situation _____ | Equation | Solution | Meaning of Solution |

Rectangles and Expressions

| | | |
|-----|-----|-----|
| 1.1 | 1.2 | 1.3 |
|-----|-----|-----|

| | | |
|--------------------------------|--------------------------------|--------------------------------|
| Expression: _____ | Expression: _____ | Expression: _____ |
| Equivalent Expression _____ | Equivalent Expression _____ | Equivalent Expression _____ |

Unit 6.6, Practice Day 2: Practice Problems

Name _____

Warm-Up

1. Draw a rectangle with area $4(2x + 6)$.
2. Write an equivalent expression for the area.

Practice: The Middle of the Story

In this practice set, you will see problems (beginnings) **and** correct solutions (ends).
Your task is to explain all of the parts in the middle.

Problem 1

Determine the value of each expression.

1.1 5^3

1.2 $4(3)^2$

Solutions

1.1 125

1.2 36

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Problem 2

What is the value of $6x^3$ when:

2.1 $x = 2$?

2.2 $x = \frac{1}{2}$?

Solutions

2.1 48

2.2 $\frac{6}{8}$ (or equivalent)

The Middle of the Story



Unit 6.6, Practice Day 2: Practice Problems

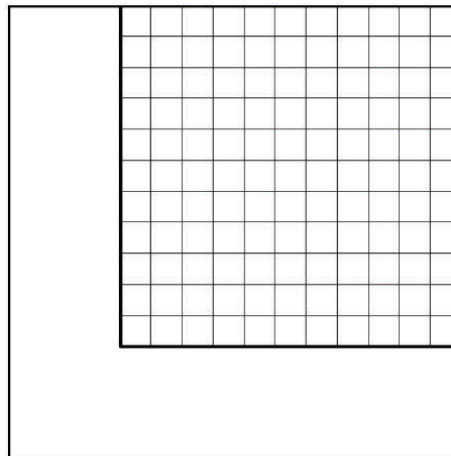
Problem 3

This table shows a relationship between the number of bus rides Anya takes, r , and the total cost in dollars, c .

| # of Rides, r | Total Cost (\$), c |
|--------------------|-------------------------|
| 1 | 1.50 |
| 2 | 3 |
| 5 | 7.50 |
| 6 | |

- 3.1 Write an equation to represent this relationship.
- 3.2 How many rides can Anya take with \$36?
- 3.3 Create a graph that represents this relationship.

The Middle of the Story



Solutions

- 3.1 $c = 1.50r$
- 3.2 24 rides
- 3.3 *Graphs vary.*

Reflect

1. Write 1–2 big ideas from this unit that you think are important to understand.

2. What is one math concept from this unit that you have improved on since the unit started? Explain what you did to help yourself improve.

GRADE 6

Unit 7

Student Lessons

Student lessons from Unit 7 are included here to provide NYC reviewers with access to the specific lessons in Amplify Desmos Math New York that demonstrate coverage of the **Expressions, Equations, and Inequalities** domain.

These lessons are partially designed and will be updated to match the exemplar Student Edition lessons included earlier in this sampler.

NOTE: *We have included only those lessons from Unit 7 that cover the standards in the Expressions, Equations, and Inequalities domain.*



Grade 6 Unit 7

Student Edition Sampler



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.7, Lesson 6: Notes

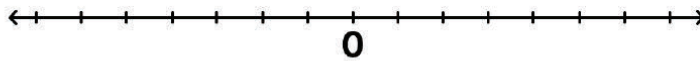
Name _____

My Notes

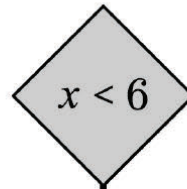
1.1 Circle all the values of x that make the inequality $x < 6$ true.

5.9 -6 6.1 0 100

1.2 Create a graph to represent the inequality $x < 6$.



1.3 Write a sign that could be represented by this inequality.



2. Match each sentence with an inequality.

| | |
|---|------------|
| _____ I spent less than 3 hours on my homework. | A. $x > 3$ |
| _____ This game is for kids over 3 years old. | B. $x = 3$ |
| _____ This recipe uses 3 cups of flour. | C. $3 > x$ |

Summary

I can show the same information about an inequality using words, symbols, and a number line.

Warm-Up

Complete each number sentence with the symbol $<$, $>$, or $=$.

$-12 \underline{\hspace{1cm}} |-15|$

$-12 \underline{\hspace{1cm}} -15$

$12 \underline{\hspace{1cm}} -12$

$|-12| \underline{\hspace{1cm}} 12$

Practice

At a book sale, all books cost less than \$5.



- 1.1 List three possible prices for a book at this book sale.

- 1.2 Write an inequality to show the cost of a book, b , at the book sale.

- 1.3 Make a graph of all the possible prices of books at the sale.



Eva estimated that there are more than 100 candies in the jar.



- 2.1 List three possible numbers of candies based on Eva's estimate.

- 2.2 Write an inequality to show Eva's estimate for c , the number of candies in the jar.

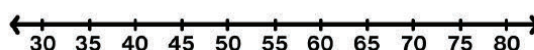
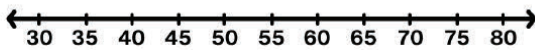
- 2.3 Make a graph showing Eva's estimate for the number of candies in the jar.



3. One day in Boston, the temperature was above 52° and below 60° . Make two inequalities and two graphs to show the temperatures, T , it could have been on that day.

Inequality: _____

Inequality: _____





Unit 6.7, Lesson 6: Practice Problems

4.1 Match each statement with a number sentence. There will be one number sentence left over.

_____ -5 is a distance of 5 units away from 0 on the number line.

_____ 4 is greater than -5.

_____ -5 is farther away from 0 than 4 on the number line.

A. $4 > -5$

B. $|-5| = 5$

C. $|-5| = |5|$

D. $|-5| > |4|$

4.2 Write a statement to match the leftover number sentence.

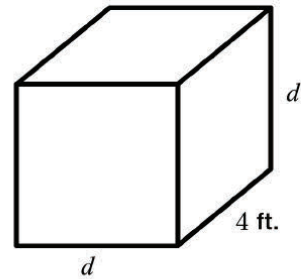
Here is a rectangular prism.

5.1 Write an expression for the volume of the prism.

5.2 Calculate the volume of the prism for each value of d .

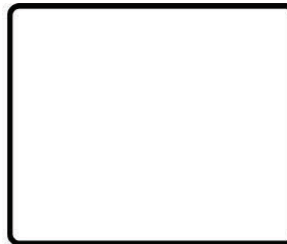
$d = 2$ ft

$d = \frac{1}{2}$ ft

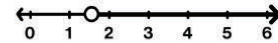


Explore

Create your own sign and graph to represent a situation.



Example



Reflect

1. Star the question you spent most time on.
2. Use the space below to ask one question you have or to share something you are proud of



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.7, Lesson 7: Notes

Name _____

My Notes

Complete the table so that each row shows the same relationship.

| Hanger | Inequality | Graph |
|--------|------------|-------|
| | | |
| | | |
| | $h < 6.5$ | |
| | $6.5 < h$ | |

Summary

I can write and interpret inequalities to describe unbalanced hangers.



Unit 6.7, Lesson 7: Practice Problems

Name _____

Warm-Up

Complete each number sentence with a number that makes it true.

$-0.3 > \underline{\hspace{1cm}}$

$|-0.3| > \underline{\hspace{1cm}}$

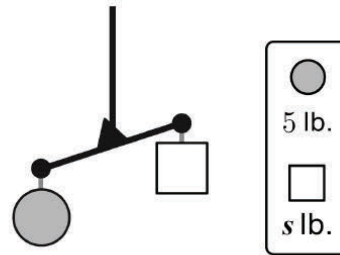
$|-0.3| < \underline{\hspace{1cm}}$

$\underline{\hspace{1cm}} < 0.3$

Practice

Here is an unbalanced hanger.

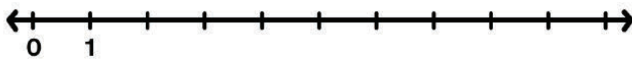
1.1 Which shape is heavier? Explain how you know.



1.2 The circle weighs 5 pounds.
List three possible weights for the square.

1.3 Write an inequality to represent the hanger.

1.4 Graph all the possible weights of the square.



There is leftover food that has been in Jin's refrigerator for d days.

2.1 What does the inequality $d < 7$ tell you about Jin's food?

2.2 What does the inequality $d > 0$ tell you about Jin's food?

2.3 List three possible values of d that make both $d < 7$ and $d > 0$ true.

Unit 6.7, Lesson 7: Practice Problems

3. Gabriel has an older brother named Alejandro. Gabriel is 12 years old. Select **all** the inequalities that show the relationship between Gabriel's age, g , and Alejandro's age, a .

$a < g$ $g < a$ $a > g$ $g > a$ $a > 12$

Angel's family is driving to their grandmother's house, which is 325 miles away.

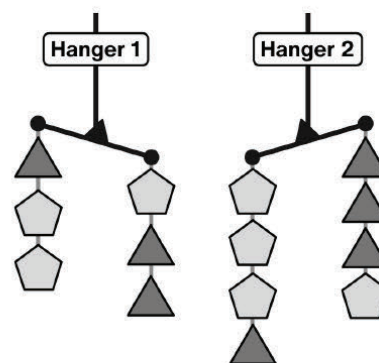
- 4.1 After they drive 26 miles, what percent of the distance have they travelled?

- 4.2 How far have they driven if they are 72% of the way to grandma's house?

Explore

Hanger 1 is correct. Is Hanger 2 correct or incorrect?

Explain how you know.



Reflect

1. Mark the question you spent the most time on.
2. Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.7, Lesson 8: Notes

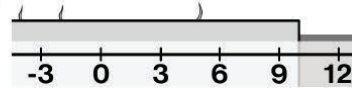
Name _____

My Notes

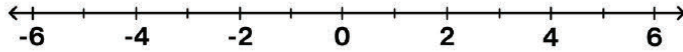
1.1 Write an inequality so that all the blades of grass are solutions and the water has no solutions.



1.2 Write three other solutions to the inequality you wrote.



2.1 Plot all of the solutions to $-2 < x$ on the number line.



2.2 Is -2 a solution to $-2 < x$? _____ Explain how you know.

2.3 How many solutions does the inequality $-2 < x$ have? _____ Explain how you know.

Summary

- I can draw and label a number line diagram that represents the solutions to an inequality.
- I can explain how many solutions an inequality can have.
- I can justify whether or not a value is a solution to a given inequality.

Warm-Up

Complete each number sentence with the symbol $<$, $>$, or $=$.

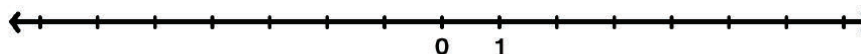
$$\left| -\frac{9}{20} \right| \underline{\hspace{1cm}} -0.5 \quad |-0.5| \underline{\hspace{1cm}} \frac{9}{20} \quad \left| -\frac{9}{20} \right| \underline{\hspace{1cm}} 0.5 \quad \left| -\frac{9}{20} \right| \underline{\hspace{1cm}} |-0.5|$$

Practice

1.1 Select all of the values of k that are solutions to the inequality $k > 5$.

- 4.9
 5
 6
 5.2
 -5.01

1.2 Make a graph of all of the solutions to this inequality.



Complete the first three rows with an inequality that fits the given information.

Complete the last row with information that fits the given inequality.

| Solutions | Inequality in Symbols |
|--|-----------------------|
| 2.1 All of the solid points and none of the open points are solutions. | |
| 2.2 All of the solid points and none of the open points are solutions. | |
| 2.3 Solutions: $-\frac{2}{3}$, -1.5, -5 Not solutions: 2, 0, 100 | |
| 2.4 Solutions: _____, _____, _____ Not solutions: _____, _____, _____ | $x < -2.25$ |

**Unit 6.7, Lesson 8: Practice Problems**

The price of a cell phone is usually \$250.

- 3.1 Manuel's stepmom buys one of these cell phones for \$150. What percent of the usual price did she pay?
- 3.2 Manuel's stepbrother buys the same cell phone for 75% of the usual price. How much did he pay?
- 3.3 Who got a better deal? Explain your reasoning.

4. Select **all** of the expressions that are equivalent to $(\frac{1}{2})^3$.

$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$
 $\frac{1}{2^3}$
 $(\frac{1}{3})^2$
 $\frac{1}{6}$
 $\frac{1}{8}$

Explore

Fill in the blanks using each number **once**.

-3, -2, -1, 0, 1, 2, 3

$$x < \underline{\hspace{1cm}} \text{ and } x > \underline{\hspace{1cm}}$$

Solutions to **both** inequalities: , ,

Not solutions to **both** inequalities: ,

Use the extra space below to record your thinking.

Reflect

- Put a smiley face on the question that you understood the best.
- Use the space below to ask one question you have or to share something you are proud of.



This lesson is still being upgraded to the Amplify Desmos Math design style for the 2024–25 school year.

Unit 6.7, Practice Day 2: Task Cards

Plot It

Fabiana wrote these coordinates to make a letter.

| Point | Coordinates |
|----------|-------------|
| <i>A</i> | (4, 2) |
| <i>B</i> | (4, 6) |
| <i>C</i> | (-7, 6) |
| <i>D</i> | (-7, 2) |
| <i>E</i> | (-3, 2) |
| <i>F</i> | (-3, -8) |
| <i>G</i> | (0, -8) |
| <i>H</i> | (0, 2) |

1. Plot and label each point. Connect the points in order to create a polygon.
2. What letter did Fabiana make?
3. What is the length of the segment between *B* and *C*?
4. What is the perimeter of Fabiana's letter?



Unit 6.7, Practice Day 2: Task Cards

Finish It

- 1.1 Write an inequality where -3 , -2 , 0 , and 100 **are** solutions, but -100 , -30 , -10 , and -4 **are not** solutions.

- 1.2 Make a graph of this inequality on the number line.

2. Three coordinates of rectangle $ABCD$ are $A(3, 0)$, $B(3, -5)$, and $C(-4, -5)$.
What are the coordinates of point D ?
Show how you know.

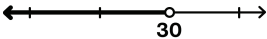
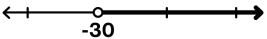

3. Two coordinates of rectangle $EFGH$ are $E(-3, 4)$ and $F(5, 4)$.
What could the coordinates of points G and H be?
Show how you know.

4. One coordinate of square $IJKL$ is $I(-5, 0)$.
What could be the coordinates of points J , K , and L ?
Show how you know.

Unit 6.7, Practice Day 2: Task Cards

Sort It

- On your worksheet, group together cards that represent the same inequality. There will be one missing representation in each group.
- Create all the missing representations.

| | | |
|--|--|--|
| <p>A.</p> <p>You must be taller than 30 inches to ride the ferris wheel.</p> | <p>B.</p> <p>The circle weighs less than 30 grams.</p> | <p>C.</p> <p>It was colder than -30°F.</p> |
| <p>D.</p> <p>$x > -30$</p> | <p>E.</p> <p>$-30 > x$</p> | <p>F.</p> <p>$x > 30$</p> |
| <p>G.</p>  | <p>H.</p>  | <p>I.</p>  |
| <p>J.</p> <p>Solutions: -20, 0, 30</p> <p>Not solutions: -40, -75</p> | <p>K.</p> <p>Solutions: 40, 75, 100</p> <p>Not solutions: 25, 0</p> | <p>L.</p> <p>Solutions: 0, 25, 10</p> <p>Not solutions: 30, 75</p> |

**Unit 6.7, Practice Day 2: Task Cards****Interpret It**

Jacy took a long walk and recorded her elevation, in feet, at different times. On her graph, time 0 represents noon.

Use the graph on your worksheet to help you answer each question.

1. What was Jacy's elevation at noon?
Explain how you know.
2. At 3:00 p.m., Jacy's elevation was -7 feet. Add this point to the graph.
3. At 8:00 a.m., Jacy's elevation was 1 foot. Add this point to the graph.
4. From 4:00 p.m. to 5:00 p.m., Jacy walked down into a cave.
Add a point to the graph that shows a possible elevation at 5:00 p.m.
5. Create your own point anywhere on the graph.
Explain what that point means in terms of Jacy's walk.

Unit 6.7, Practice Day 2: Task Cards

Are You Ready for More?

Select **one** question and record your response.

- Describe something you learned in this unit that you found surprising. Then make up a problem whose answer is surprising and solve it.

- Describe something you learned in this unit that you found challenging. Then make up a problem that you think would be challenging and solve it.

- Give one example of something you learned from this unit that you think is creative, and explain what you find creative about it.
Then make up a problem that you think is creative and solve it.

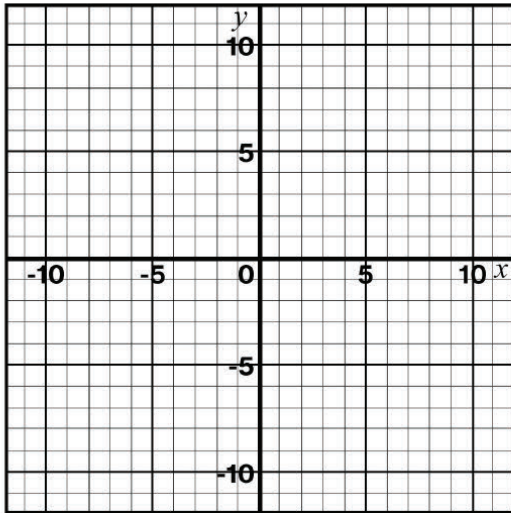


Unit 6.7, Practice Day 2: Worksheet

Name _____

Plot It

1.



2.

3.

4.

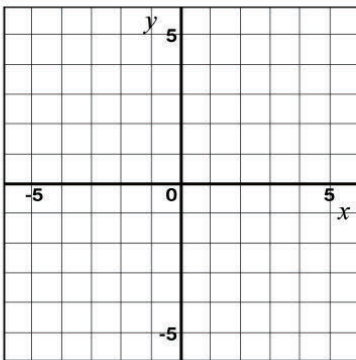
Finish It

1.1 Inequality:

1.2

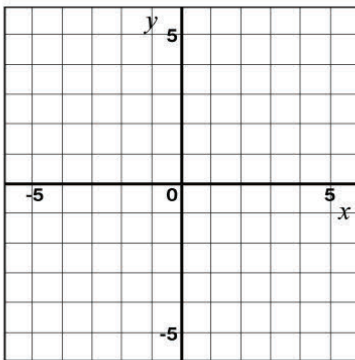


2.



Point *D*:

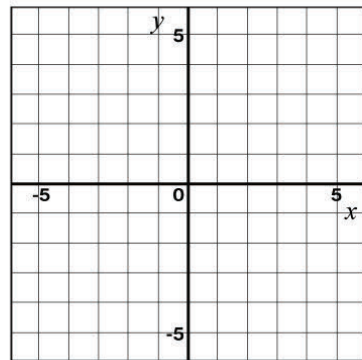
3.



Point *G*:

Point *H*:

4.



Point *J*:

Point *K*:

Point *L*:

Sort It

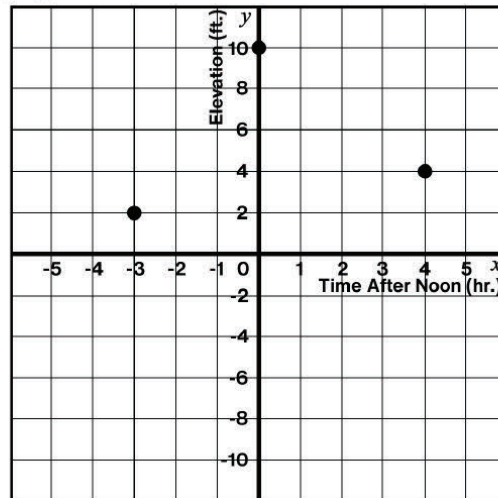
| Sentence | Inequality | Graph | Solutions |
|----------|------------|-------|-----------|
| A. | | | |
| B. | | | |
| C. | | | |
| | | | |

Interpret It

1.

2-4.

5.



Are You Ready for More?



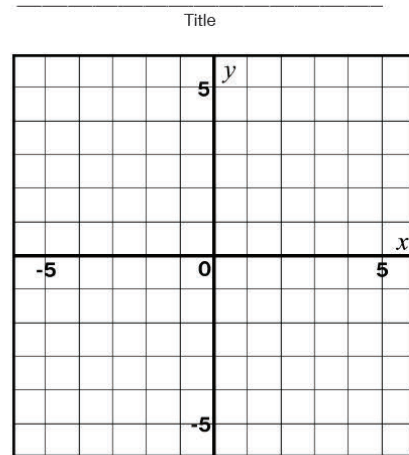
Unit 6.7, Practice Day 2: Practice Problems

Name _____

Warm-Up

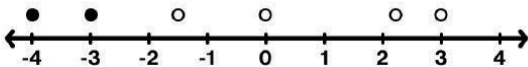
Create your own coordinate plane drawing!

1. Plot several points on the coordinate plane and label them with their coordinates. Include points with positive and negative coordinates.
2. Connect your points to create a drawing.
3. Give your polygon a title.



Practice: The Middle of the Story

Problem 1



- 1.1 Write an inequality where all the solid points and none of the open points are solutions.
- 1.2 Write three other solutions to the inequality you wrote. Justify how you know each is a solution.
- 1.3 Describe a situation that could be represented by your inequality.

Solutions

- 1.1 Responses vary. $x < -2.5$
- 1.2 Responses vary. $-5, -3.3, -100$
- 1.3 They cancel school if the temperature drops below -2.5°F .

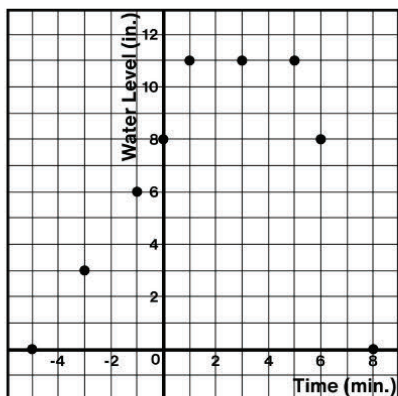
The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

Unit 6.7, Practice Day 2: Practice Problems

Problem 2

This graph shows the water level in my bathtub.
Time 0 is when I got into the bathtub.



- 2.1 What was the water level when I got into the bathtub?
- 2.2 Add the point $(-4, 2)$ to my graph. What does this point tell us?
- 2.3 Write a new point that would not make sense on this graph.

Solution

- 2.1 8 inches
- 2.2 4 minutes before I got into the bathtub, it had 2 inches of water in it.
- 2.3 *Responses vary.* $(10, -1)$

Reflect

1. What advice would you give to someone plotting points in the coordinate plane?
2. Give one example of a creative idea you've seen in this unit or a way that you were creative. Explain what was creative about it.

The Middle of the Story

Explain how to go from the problem to the solution. Be as detailed as possible.

