



Middle School Math Long-Term Sub Plans, 4 Weeks

Four complete week binders of middle school math, grades 6 to 8. Every day has individual work and a team task, and every task has a "say this" script.

PREVIEW

What is included

- Four week binders (64, 66, 65, 64 pages): 259 pages
- 52 front pages: binder cover, important information, note to the sub, the week plan filled in, schedule, set index, class list, how it went, Monday opener
- 40 solo blocks (20 math sets, 20 calm blocks) and 20 team tasks for groups of four
- A "say this to the class" script for all 84 tasks: 2 or 3 sentences the sub reads out
- A core task and a ★ challenge in every math set and team task
- 20 optional games, each on that day's math lesson, a fun way to end the class
- Answer keys for everything; color and ink-saver B&W, US Letter and A4

How it works

1. Leave the four binders out. Each has its own filled-in plan with page numbers.
2. The sub reads the "say this" box out, then runs the day's math set in every period; students work on their own. Everyone does the core task, early finishers go on to the ★ challenge.
3. The calm block fits any gap, the team task fills a block period or extra time, the game the last 15 minutes.
4. No prep and no tech: print and go.

The 20 days, 20 topics: a math set, a team task and a game each day

- **Week 1, days 1 to 5. Math:** Ratios, Rates and Percent, Integers and Order of Operations, Fractions and Decimals, Area and Perimeter, Data and Graphs. **Team tasks:** The Number Line-Up, The Garden Plot Plan, Design the Dog Park, Time Capsule Code, The Calculator Debate.
- **Week 2, days 6 to 10. Math:** Unit Rates and Proportions, Expressions and the Distributive Property, One-Step Equations, Area of Triangles and Polygons, Mean, Median, Mode and Range. **Team tasks:** Snack Order Showdown, Expression Match-Up, Locker Combination Relay, Plaza Tile Planner, Class Survey Lab.
- **Week 3, days 11 to 15. Math:** Discount, Tax, Tip and Percent Change, Multiplying and Dividing Negative Numbers, Two-Step Equations, Circumference and Area of Circles, Probability. **Team tasks:** Sale Day Store, Temperature Trek, Number Machine Makers, Round Garden Design, Fair Game Carnival.
- **Week 4, days 16 to 20. Math:** Proportional Relationships in Tables and Graphs, Inequalities, Angle Relationships, Volume and Surface Area of Prisms, Box Plots and Spread. **Team tasks:** Map Scale Expedition, Field Day Limits, Laser Maze, Package Designer, Paper Airplane Test Flight.

Optional game every day, on that day's math lesson: Mon **Whiteboard Quiz Game** Tue **Paper Password** Wed **Class Feud** Thu **Classroom Millionaire** Fri **Mystery Box**

What this preview shows: the note to the substitute, the Week 1 plan, more front pages, one page of every daily part, a full math set with its answer key, a calm block, a team task, the game types and one ink-saver page. Every product page is watermarked. The full product has 259 pages.



Note to the Substitute

Grades 6 to 8 · five days · every set runs from the printout alone

Thank you for covering my classes this week

Everything you need is in this binder. The front pages (important information, weekly schedule, class list) are filled in for this week. After them come the work sets, one per day: **Math 1** is Monday's set, **Math 2** is Tuesday's, and so on to **Math 5** on Friday. Run the day's set in every period you teach that day. Each set is one period (45 to 55 minutes), stands alone, and has its own answer key at the back of the binder, so you never have to make anything up or know the subject. Every task starts with a short **Say this to the class** box under its title: read it out, and the class knows what to do and how to start.

Every student page has a core task first, then a ★ challenge. Every student does the core task. Students who finish early go on to the ★ challenge; it fills a few extra minutes, and nobody has to finish it.

After the subject sets come the shared blocks, one of each per day. The **calm block** is always allowed: for a period that runs short, a loud class, or anyone who finishes early. The **team task** fills a period on its own. The **game** is optional: a fun way to end the class, or something for extra time. Fifteen minutes, from the script.

Each day has

- One Math set (one period, core task + ★ challenge on every page)
- A calm and quiet block: a math puzzle and a self-checking practice page
- A team task for groups of four
- A paper game from the script

If the class is loud

- Set a voice level with a number, 0 to 3, and use it all week (the Day 1 opener explains it).
- Switch to the calm block. Nobody needs to move.
- Every student page has a ★ challenge, so fast finishers always have something.
- If a set is not working, stop it and use the calm block or the team task. Every set starts cold.

At the end of each day

Please fill in that day's line on the "How it went" page. It takes two minutes and I read every word.

Did this kit work well for your class? A quick review helps other teachers find it and earns you TpT credits. Thank you!



This Week's Plan

Filled in for you: run the day's set in every period you teach. Keep it as it is, or use the blank schedule on the next page for your own order.

WHEN	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Start of class	Meet Your Sub p. 11 · 15 min, every period	Attendance, voice level	Attendance, voice level	Attendance, voice level	Attendance, voice level
Main work, every period	Math 1 Ratios, Rates and Percent p. 14	Math 2 Integers and Order of Operations p. 22	Math 3 Fractions and Decimals p. 31	Math 4 Area and Perimeter p. 40	Math 5 Data and Graphs p. 49
Early finishers or a loud moment	Word Search and Quiet Practice p. 17	Term Match and Quiet Practice p. 25	Code Breaker and Quiet Practice p. 34	Word Scramble and Quiet Practice p. 43	Cross-Number and Quiet Practice p. 52
Block period or extra time	The Number Line-Up p. 19	The Garden Plot Plan p. 27	Design the Dog Park p. 36	Time Capsule Code p. 45	The Calculator Debate p. 54
Last 15 minutes (optional): a fun way to end the class, or for extra time	Whiteboard Quiz Game p. 20	Paper Password p. 29	Class Feud p. 38	Classroom Millionaire p. 47	Mystery Box p. 56

How to use this plan

- Page numbers point to the first page of each set. Copy one per student.
- The calm block is always allowed: a period that runs short, a loud class, or anyone who finishes early.
- The game is optional: a fun way to end the class, or something for extra time.

MATH SUB PLANS WEEK 1

Middle School Math, 5 Days of Print and Go Work

Teacher _____
Room _____
Grade and classes _____
Week of _____

Everything a sub needs for five days is in this binder: a filled-in weekly plan, a blank schedule, the class list, and for every day one Math set, a calm block, a team task and a paper game. Each set is one period, stands alone, and has its own answer key. Nothing needs subject knowledge, a login or a projector.



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Math Sub Plans Week 1: Middle School Math, 5 Days of Print and Go Work

Important Information

The page the sub reads first. Fill it in once you help it current.

People to call

Office _____
Teacher next door _____
Nurse _____
Principal / admin _____
Tech help _____

Emergency procedures

Fire: exit and meeting point _____
Lockdown _____
Severe weather _____
Medical _____
Where the first aid kit is _____

Helpful students

Students who need extra support

Where things are

Attendance / how to take it _____
Paper, pencils, supplies _____
Hall passes _____
Copier, if the sub may use it _____

Class routines

Start of class _____
Bathroom _____
Phones _____
End of class _____

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Important information

Weekly Schedule (Blank)

Your sub enters, writes the set for each period (Monday: Math 1, Tuesday: Math 2, and so on) and the class next to each period. Cross out or remove periods to match the school day.

PERIOD / CLASS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Period 1					
Class					
Period 2					
Class					
Period 3					
Class					
Period 4					
Class					
Period 5					
Class					
Period 6					
Class					
Period 7					
Class					

How to fill it in

- One set per period. Each set runs 45 to 55 minutes. If a period runs longer, the 30 challenges fit a few minutes, or add that day's team task.
- Same subject all day? Write the day's set in every period you teach. Planning, lunch and duty periods: cross them out.
- On Monday the opener (15 minutes) comes first in every period, then the set.
- The game is optional: put it in the last period as a fun way to end the class, or use it for extra time. The calm block goes in any gap.

Set naming

Sets are named by subject and day. Math 1 is Monday's set, Math 2 is Tuesday's, and so on to Math 5 on Friday. The set index lists every set with its minutes and page.

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Weekly schedule, blank

Class List and Dismissal

Name, what a sub must know, and how every student goes home. Copy one per class.

☐ bus (write the number) ☐ walks ☐ picked up (write who) ☐ after-school program ☐ other

★ in the notes: a student who finds the core task essay may start with the challenge.

STUDENT NAME	NOTES (ALLERGIES, NEEDS, HELPFUL, LEAVES EARLY)	HOME	BUS # / PICKED UP BY / PROGRAM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

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Class list and dismissal

How It Went

For the sub/schedule. One line per day, two minutes at the end of each day. Check the boxes and go.

Monday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Tuesday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Wednesday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Thursday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Friday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

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How it went

Meet Your Sub

Key tip: 10 minutes of the start of every period on Monday, before the set. Nothing to prepare.

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Sub script (same routine for every class)

- Before first period, fill in the introduction sheet (next page) once. Keep it honest and short. Students read a sub in ten seconds, give them something real to read.
- Introduce yourself from the sheet, two minutes. Then hold up the "Ask the Sub" list and take three questions from hands. Three, not ten.
- Read the class agreement out loud. Ask the class to add one line of their own and write it on the board for that period. That line is theirs, they will keep it better than yours.
- Set the voice level with a number, 0 to 3 (bottom of the sheet). Say which level the set needs. Use the numbers all week.
- Start the set. "This is today's math. Do the core task first. When you finish, try the star challenge, and the calm block is always allowed."

If the class is loud

- Skip the questions, keep the agreement and the voice level.
- Start the set sooner. Leave the voice level number on the board for the whole period.

If a period has ten minutes left

- Play Math Two Truths and a Lie (rules on the class page) in groups of six. Each group picks one to share.
- Or hand out the quiet practice page from the calm block.

Monday morning checklist (before first period)

- ☐ Read the Important Information page: office number, emergency exits, the nurse.
- ☐ Check the class list for allergies, medical needs and students who leave early.
- ☐ Find today's set on the weekly schedule and count copies for every period.
- ☐ Fill in the About Your Sub sheet and pin it where the class can see it.
- ☐ Write the voice levels 0 to 3 on the board.
- ☐ Put the answer keys somewhere students cannot reach them.

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Day 1: opener, sub script

ONE PAGE OF EVERY DAILY PART

Math Set 4: Area and Perimeter

Today we review area and perimeter of rectangles, triangles and composite shapes, finding a missing side, square units.

Task 1: Rectangle

Area = length $\times$ width
Perimeter = add all four sides
 $A = 7 \times 3 = 21 \text{ sq. m}$
 $P = 7 + 3 + 7 + 3 = 20 \text{ m}$

Task 2: Triangle

Area = $\frac{1}{2} \times \text{base} \times \text{height}$
The height is the dashed line that meets the base at a right angle.
 $A = \frac{1}{2} \times 6 \times 4 = 12 \text{ sq. cm}$
 $P = 6 + 5 + 5 + 10 \text{ cm}$

Task 3: Composite shape

Split it into two rectangles.
Find each area, then add.
Perimeter: go all the way around.
 $A = 8 \times 3 + 4 \times 2 = 18 + 8 = 26 \text{ sq. ft}$
 $P = 23 \text{ ft}$

Task 4: Missing side

A rectangle has an area of 48 sq. m and a length of 8 m.
Width = area $\div$ length
 $48 \text{ sq. m} \div 8 \text{ m} = 6 \text{ m}$ width
 $P = 8 + 6 + 8 + 6 = 28 \text{ m}$

Remember

- Perimeter is the distance around a shape. Add every side. The unit is plain, cm, ft, m.
- Area is the space inside. The unit is square sq. cm, sq. ft, square centimeters, square feet.
- Rectangle: $A = \text{length} \times \text{width}$, $P = 2 \times (\text{length} + \text{width})$. Triangle: $A = \frac{1}{2} \times \text{base} \times \text{height}$.
- Composite shapes: split into rectangles and triangles, then add the areas. Find any missing side lengths first.

Warm-up: count the squares

Each small square is 1 square unit, with sides of 1 unit. Find the area and perimeter of each shaded shape.

Area = ____ sq. units
Perimeter = ____ units

Area = ____ sq. units
Perimeter = ____ units

Challenge

A square and a rectangle 4 cm wide both have a perimeter of 32 cm. Which shape has the larger area, and by how much?

Math set, Week 1 (solo)

Math Set 5: Which Measure Fits Best?

Write a measure for each data set. Then write the measure of center that describes the set best: mean, median or mode.

DATA SET

1. Scores on 50 dashes
31, 27, 38, 22, 33

2. Prices of 6 used games at a yard sale (\$)
4, 5, 3, 5, 6, 43

3. People in each car at a school game
2, 4, 1, 2, 3, 2, 5, 2, 2

4. Scores on one level of a puzzle game
88, 92, 90, 13, 94, 91

Look across the table

1. Which two data sets have an outlier? Name each outlier.

2. In which data set are the mean and the median equal?

3. Which two data sets have no mode?

Why did you pick the best measure for the set? Write one sentence.

Challenge

Days 1-6 gets 6 math sheets with 85 books. Find the new mean and the new median. Which one changed more?

Math practice, Week 2 (solo)

Math Set 3: Apply It in Word Problems

Six word problems, write on separate paper for the student, solve it, and write the answer with a partner.

1. A phone plan costs a \$25 one-time fee plus \$15 a month. Customer has paid \$130 in all. How many months has he had the plan?

2. A spring plays \$10 to park and buys 4 museum tickets at the same price. They spent \$64 in all. What does one ticket cost?

3. Maria has \$45 saved and adds \$8 every week. After how many weeks will she have \$100?

4. A taxi charges \$3.50 plus \$2.25 for every mile. A ride costs \$28. How many miles long is the ride?

5. A gym class loses 3 students to a field trip. The next split into 5 equal teams of 6. How many students are in the classes?

6. At 6 a.m. it was -4 degrees. The temperature rose by the same amount each hour, and at noon it was -14 degrees. How much did it rise each hour?

Challenge

1. Write a word problem that the equation $6x + 20 = 110$ could solve. Then solve it.

2. Solve: $40x - 25 = 28$. Check your answer.

Word problems + challenge, Week 3 (solo)

Calm Block, Day 4: Inequality Words Match

Write the words of the matching inequality and number line. Write the number line on the back of the word card.

Terms

1. inequality
2. at least
3. at most
4. solution set
5. open circle
6. closed circle
7. boundary
8. greater than
9. less than
10. flip

Meanings

1. every value of the variable that makes a statement true
2. trigger then, but never equal to
3. a filled-in dot showing the end number DOES work
4. smaller than, but never equal to
5. the number where the shading on a number line starts
6. turn the sign around after multiplying or dividing by a negative
7. a number line mark showing the end number does NOT work
8. a number sentence saying one side is bigger or smaller than the other
9. this amount or more: the smallest allowed value counts too
10. this amount or fewer: the biggest allowed value counts too

How to start

- Do the pages you are sure of first and cross off those letters.
- Read each letter meaning slowly and by every team let it sit.
- Every letter is used exactly once, so the last pair checks the rest.

Done early?

You can challenge your team to write examples of each term, with numbers.

Calm block: math puzzle (solo)

Calm Block, Day 4: Quiet Practice

Write the words of the matching inequality and number line. Write the number line on the back of the word card.

Circle Check

Diameter = 2 $\times$ radius. Circumference = 3.14 $\times$ diameter. Area = 3.14 $\times$ radius $\times$ radius. Use the radius for area, never the diameter.

1. A circle has a radius of 11 cm. What is its diameter?
Answer: ____

2. A circle has a diameter of 30 m. What is its radius?
Answer: ____

3. Circumference of a circle with diameter 8 m is ____ (C = 3.14)
Answer: ____

4. Area of a circle with radius 24 cm is ____ (A = 3.14)
Answer: ____

5. Area of a half circle with radius 10 m is ____ (A = 3.14)
Answer: ____

6. A circle has a circumference of 94.2 m. What is its diameter?
Answer: ____

7. A circle has an area of 28.26 sq. m. What is its radius?
Answer: ____

Answer bank

Two answers in each box belong to the problem. Write the answer in the box next to the problem. Circle the answer that is not in the box.

1. 220 2. 15 3. 157 4. 27 5. 30 6. 31.4 7. 43.98 8. 107 9. 1,396

In my own words

Write one problem. Write the first step you took, so a friend could follow it.

Calm block: quiet practice (solo)

Team Task, Day 5: Fair Game Carnival

Groups of four. Year level 2. You need a pencil and a paper clip. Please only write on your own paper.

The carnival

The school carnival needs both games, and every game must be fair. Two players, and each one has the same chance to score a point on a spin. Your group is the fairness team. Check three booths. Test a spinner, then design a booth of your own.

Spinner A

Booth 1: Red or Not (spinner A)
Booth 2: Green Machine (spinner B)
Booth 3: Even Steven (spinner C)

Part 1: Is each booth fair?

Booth 1: Red or Not (spinner A)
Booth 2: Green Machine (spinner B)
Booth 3: Even Steven (spinner C)

The 40 minutes

Make the paper clip spinner. 40 min. Part 1: Is each booth fair? 10 min. Part 2: Design your booth. 10 min. Part 3: Design and test your own booth. 10 min. Share your booth with another group. 10 min.

Challenge

Booth 3 is not fair. Change only Player 2's numbers so the booth is fair and no number repeats for both players.

Team task, Week 3 (groups of four)

Week 4, Halfway Up the Hill

Write the words of the matching inequality and number line. Write the number line on the back of the word card.

Sub script (every period, the same steps)

1. Print on the board as the class comes in. View 4, the date, today's topic and voice level 1 are up before the bell. If this happens the rest of you give your name and one sentence about yourself.

2. Take three questions from the data set and the class page, each with a different table.

3. Read the Week 4 agreement. Add the class for one extra line and write it on the board for this period only.

4. Walk through the routine sheet (next page), the five topics of the week and the order of every period. Circle today's topic.

5. Read out today's list and remind everyone: core task, then the calm block if there is time left.

If the room is unsettled

- Drop the questions and the extra agreement line. Still print the voice level and show the routine sheet.
- Start the voice level and stay close to the board group for the first few minutes.

If ten minutes are left

- Play Which One Doesn't Belong (class pages), show one set of four and find reasons for each choice. One reason per item in the answer key.
- Or hand out page 2 of today's calm block for quiet practice.

Week 4 checklist (before first period)

- Count copies of today's set, the class page and the team task for every period.
- Look over the data set once more for eight minutes and early periods.
- Write week 4, the date and today's topic on the board before the bell.
- Play the weekly answer key in a folder that stays with you.
- Read the Which One Doesn't Belong card once, so it's ready as a spare.
- Set down one line for the teacher after each period, what worked and who was absent.

Board before the bell

Week 4 Handy

Today's Proper Relationships in Tables and Graphs

Voice level: 1

Core task, then the story challenge.

Update the voice level as the period goes on: 1 for the set, 2 for the team task, 3 for a whole-class game.

Monday opener, Week 4 (whole class)

Game, Day 3: Class Feud

Write the words of the matching inequality and number line. Write the number line on the back of the word card.

Set up and play

1. Split the room into two teams. Choose five numbered lines (up the board, all team up to the board level).

2. Read out the question from each team's line. Read the question. The first team to answer, if the answer is on the line, gets it on its line. The other player may try to answer a higher answer. The team with the higher answer gets the point.

3. The playing team answers one student at a time. On the line, write it with its points. Not on the line, a 10 min. 4. Three strikes, the other team has the question and gets ONE point. Right they are all the points wrong. Wrong the playing team keeps them.

5. When all five are found, the playing team takes the points. Read out any answers nobody found.

Round 1, Q1: Name an angle size people know by heart

1. 90 degrees 20
2. 180 degrees 24
3. 45 degrees 18
4. 30 degrees 12
5. 90 degrees 10

Round 2, Q2: Name two angles that add up to 90 degrees

1. 45 and 45 14
2. 30 and 60 16
3. 45 and 45 18
4. 30 and 60 12
5. 30 and 70 9

Round 3, Q3: Name a kind of angle pair from today

1. Vertical 32
2. Supplementary 28
3. Complementary 20
4. Corresponding 16
5. Alternate angles 9

Round 4, Q4: Name a place where you see parallel lines

1. Railroad tracks 24
2. Highway lanes 28
3. Stairs 16
4. Ladder 12
5. Crayons 10

Round 5, Q5: Name two angles that make a straight line (double)

1. 90 and 90 20
2. 120 and 60 24
3. 150 and 30 28
4. 100 and 80 18
5. 100 and 80 10

Round 6, Q6: Name something shaped like an X (vertical angles) (double)

1. Scissors 32
2. Crosses 28
3. Crayons 24
4. Pencils 16
5. Sharpshooter 9

Round 7, Q7: Name a tool for drawing or measuring angles (double)

1. Protractor 40
2. Ruler 28
3. Compass 16
4. Pencil 12
5. Sharpshooter 9

Round 8, Q8: Name a game where a bounce angle matters (double)

1. Pool 24
2. Mini golf 28
3. Basketball 16
4. Air hockey 12
5. Football 10

Game: Class Feud (whole class)

Game, Day 5: The Boxes

Write the words of the matching inequality and number line. Write the number line on the back of the word card.

Box 1

Box 2

Box 3

Box 4

Box 5

Box 6

Box 7

Box 8

Box 9

Box 10

Box 11

Box 12

Scores

Team 1

Team 2

Team 3

Team 4

Team 5

Team 6

Game: Mystery Box (whole class)



Math Set 1: Proportional Relationships in Tables and Graphs

Math • Day 1

Study the four worked examples first. Then try the warm-up tables below, one column at a time.

This set reviews: proportional tables, the constant of proportionality k , graphs through $(0, 0)$ and equations $y = kx$



"Today you work on your own on proportional relationships, where y is always the same number times x . That number is called k , and you find it by dividing y by x . Read the four worked examples on page 1 first, and try the star challenge when a page is done."

1 Proportional or not?

Find $y \div x$ in every column. If every ratio is the same, the table is proportional.

$24 \div 2 = 12$, $36 \div 3 = 12$, $60 \div 5 = 12$. All equal, so it is proportional.

cups of flour	2	3	5
muffins	24	36	60

2 The constant k from a table

The constant of proportionality k is the ratio $y \div x$ that every column shares.

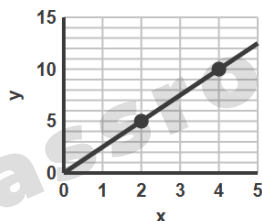
$k = 30 \div 2 = 15$ dollars per hour. Check: $15 \times 7 = 105$.

hours	2	4	7
dollars	30	60	105

3 The constant k from a graph

A proportional graph is a straight line through $(0, 0)$. Pick a point on the line and divide y by x .

The point $(4, 10)$ is on the line: $k = 10 \div 4 = 2.5$. The line also goes through $(1, 2.5)$.



4 Write $y = kx$

A printer prints 18 pages in 3 minutes at a steady speed. Find k , then put it in front of x .

$k = 18 \div 3 = 6$ pages per minute, so $y = 6x$ (y pages in x minutes).

Remember

- Proportional** means $y \div x$ is the same number in every pair. That number is k , the constant of proportionality.
- The equation is $y = kx$. The graph is a straight line through $(0, 0)$, and it passes through the point $(1, k)$.

Warm-up: proportional or not?

Find $y \div x$ for each column. Circle yes or no. If yes, write k .

A

x	2	5	8
y	6	15	24

yes / no $k =$ _____

B

x	1	3	6
y	4	10	19

yes / no $k =$ _____

C

x	4	10	14
y	2	5	7

yes / no $k =$ _____

D

x	3	6	9
y	7	14	22

yes / no $k =$ _____

★ Challenge

Jamal says this table is proportional because y goes up by 5 every time x goes up by 1. Is he right? Use $y \div x$ to explain.

x	1	2	3	4
y	7	12	17	22



Math Set 1: Find k Four Ways

Find the constant of proportionality k in every problem. Then write the equation $y = kx$ where it asks.

Math • Day 1

A. From a table: find k , then write $y = kx$

1.

x	2	5	9
y	16	40	72

 $k =$ _____
 $y =$ _____

2.

x	3	7	10
y	4.5	10.5	15

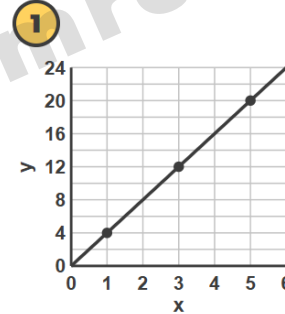
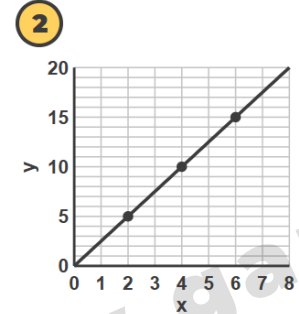
 $k =$ _____
 $y =$ _____

3.

x	4	8	20
y	3	6	15

 $k =$ _____
 $y =$ _____

B. From a graph: find k , then write $y = kx$



C. From words: find k , then write $y = kx$

1. Kofi walks 9 miles in 3 hours at a steady pace. How many miles per hour?

$k =$ _____ $y =$ _____

2. 6 bags of mulch cost \$27. Dollars per bag?

$k =$ _____ $y =$ _____

3. A rice recipe uses 5 cups of water for every 2 cups of rice. Cups of water per cup of rice?

$k =$ _____ $y =$ _____

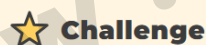
D. Use the equation

1. $y = 6x$. Find y when $x = 7$.

2. $y = 0.4x$. Find y when $x = 15$.

3. $y = 12x$. Find x when $y = 84$.

4. $y = 2.5x$. Find x when $y = 20$.



Challenge

Lana's printer follows $y = 14x$ (pages in x minutes). Mei's printer prints 48 pages in 3 minutes. Whose printer is faster, and by how many pages per minute?

Faster: _____

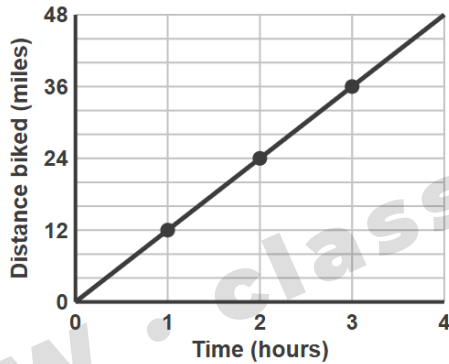
By how much: _____



Math Set 1: Read the Graph and Word Problems

Math • Day 1

First read Malik's bike graph, then solve the six word problems. Show your work in each box.



Malik's bike ride at a steady speed

a. What is k ? What does the point (1, 12) tell you?

b. Write the equation of the line.

c. How far does Malik bike in 3.5 hours?

- 1 Jada earns \$54 for 6 hours of babysitting. If she keeps the same hourly rate, what does she earn for 10 hours?

- 2 A car goes 87 miles on 3 gallons of gas. Write an equation for miles y and gallons x . How far does it go on 8 gallons?

- 3 A gym charges \$20 to join plus \$15 each month. Is the total cost proportional to the number of months? Explain.

- 4 Mei uses 4 cups of flour for every 3 batches of muffins. How many cups of flour does she need for 9 batches?

- 5 Store A sells 4 bottles of juice for \$6. Store B's price follows $y = 1.4x$. Which store is the better buy, and by how much per bottle?

- 6 A printer prints 135 pages in 9 minutes. At the same speed, how many minutes does it take to print 240 pages?

★ Challenge

- 1 What does the point (0, 0) mean on Malik's graph? Why does every proportional graph go through (0, 0)?

- 2 A straight line goes through (0, 0) and (5, 8). Find k and the point on the line where $x = 1$.



Answer Keys (1 of 6)

Teacher copy. Keep these pages out of the student sets.

Opener: Which One Doesn't Belong (one reason for each item)

A. Numbers: 4: the only one-digit even number; 9: the only odd perfect square; 15: the only one that is not a perfect square; 16: the only two-digit even number.

B. Ways to write a number: 0.5: the only decimal; $\frac{1}{4}$: the only one that is not equal to one half; 50%: the only percent; $\frac{2}{4}$: the only fraction that is not in simplest form.

C. Shapes: the square: the only one with all sides equal and right angles; the rectangle: the only four-sided shape whose sides are not all equal; the hexagon: the only one with more than four sides (and no right angle); the triangle: the only one with an odd number of sides.

D. Number sentences: $x + 5 > 8$: the only inequality; it has many solutions; $2x = 6$: the only one where every number is even; $x - 1 = 2$: the only one with subtraction; $3x = 12$: the only equation whose solution is not 3.

Accept any other reason that is true for the chosen item and not for the other three.

Math Set 1: Proportional Relationships in Tables and Graphs

Warm-up: A. yes, $k = 3$; B. no (4, 3.33, 3.17); C. yes, $k = 0.5$; D. no (2.33, 2.33, 2.44). **Challenge, page 1:** no: $y \div x$ gives 7, 6, 5.67, 5.5, which are not equal. Adding the same amount each time is not the same as multiplying by k (at $x = 0$, y would be 2, not 0).

A: 1. $k = 8$, $y = 8x$; 2. $k = 1.5$, $y = 1.5x$; 3. $k = 0.75$, $y = 0.75x$. **B:** 1. $k = 4$ ($y = 4x$); 2. $k = 2.5$ ($y = 2.5x$). **C:** 1. $k = 3$, $y = 3x$; 2. $k = 4.5$, $y = 4.5x$; 3. $k = 2.5$, $y = 2.5x$. **D:** 1. $y = 42$; 2. $y = 6$; 3. $x = 7$; 4. $x = 8$. **Challenge, page 2:** Mei's printer, by 2 pages per minute ($k = 48 \div 3 = 16$ against $k = 14$).

Graph: a. $k = 12$; Malik bikes 12 miles in 1 hour; b. $y = 12x$; c. 42 miles. **Word problems:** 1. \$90 ($k = 9$ dollars per hour); 2. $y = 29x$; 232 miles; 3. no: 1 month costs \$35 and 2 months cost \$50; $35 \div 1$ and $50 \div 2 = 25$ are not equal (and 0 months still costs \$20); 4. 12 cups ($k = \frac{4}{3}$ cup per batch); 5. Store B, by \$0.10 per bottle ($k = 1.5$ at Store A); 6. 16 minutes ($k = 15$ pages per minute).

Challenge, page 3: 1. 0 hours of biking means 0 miles; in $y = kx$, when $x = 0$, $y = k \times 0 = 0$. Accept any answer that ties (0, 0) to zero time and zero miles; 2. $k = 1.6$; the point (1, 1.6).



Calm Block, Day 1: Word Search

Find all 12 shopping math words. Every direction, including backward. Pencils only, voices at 0.

Calm • Day 1



SAY THIS TO
THE CLASS

"This calm block is a quiet one for working alone, voices at zero. Page 1 hides twelve shopping math words, and page 2 has eight money problems you can check in the answer bank. Pick either page to start, and go at your own pace."

E	G	N	A	H	C	D	Z	J	U	R	K	S	T
T	P	I	E	C	E	R	M	R	N	H	Y	R	E
A	R	S	A	U	C	Y	T	I	U	T	A	R	G
V	I	D	I	S	C	O	U	N	T	A	L	E	U
P	W	V	R	V	G	X	U	C	H	X	K	S	I
Q	L	A	T	O	T	N	M	P	U	K	R	A	M
B	I	D	G	K	Z	B	I	G	O	S	T	E	A
L	A	N	I	G	I	R	O	V	Y	N	P	R	P
T	W	T	C	Q	C	C	V	W	A	C	S	C	H
I	A	U	S	R	T	N	T	L	W	S	A	E	C
R	O	U	M	B	E	O	D	L	C	F	L	D	I
Y	V	M	L	J	O	A	Z	B	Z	K	E	V	W
B	X	B	S	L	H	H	S	L	A	P	W	B	Z
S	D	N	V	S	F	S	Q	E	P	Q	Z	B	S

DISCOUNT

MARKUP

SALE

ORIGINAL

INCREASE

DECREASE

CHANGE

COUPON

RECEIPT

GRATUITY

SAVINGS

TOTAL

Done early?

Pick three of the words. Write a tiny example of each one, like \$50 at 20% off is \$40 for a discount.

.....

.....



Team Task, Day 2: Cards and Strategy

Cut on the dashed lines: 16 cards. After the game, answer the strategy questions together.

Team • Day 2

$\times (-1)$	$\times (-1)$	$\times (-1)$	$\times (-2)$
$\times (-2)$	$\times (-2)$	$\times 2$	$\times 2$
$\times 3$	$\times 3$	$\times (-3)$	$\times (-3)$
$\div 2$	$\div 2$	$\div (-2)$	$\div (-2)$

Strategy questions

- The marker is at -6. Team Heat holds $\times (-2)$ and $\times 3$. Which card should they play, and where does the marker land?
.....
- The marker is at 8. Team Frost holds $\div (-2)$ and $\times 2$. Which card should they play, and where does the marker land?
.....
- The marker is at -5. Team Heat holds $\div 2$ and $\times (-1)$. Which card should they play, and where does the marker land?
.....
- Start at 3 and play $\times (-2)$, then $\times 3$, then $\div (-2)$, then $\times (-1)$. Where does the marker end? Would a different order change the end?
.....
- What fraction of the 16 cards would turn a temperature above 0 into one below 0? Which team should hope for those cards late in the game?
.....



Challenge The marker is at -10. Team Frost holds $\times (-3)$ and $\div (-2)$. Both cards make it positive! Which one is better for Frost, and why?
.....



Game, Day 1: The Board

Tape this to the whiteboard or copy it. Cross squares off as they are played.

Game • Day 1

TABLE K	GRAPH K	$Y = KX$	MISSING	WORD PROBS
100	100	100	100	100
200	200	200	200	200
300	300	300	300	300
400	400	400	400	400
500	500	500	500	500

Scores

Team 1

.....

.....

.....

Team 2

.....

.....

.....

Team 3

.....

.....

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Team 4

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.....

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Team 5

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.....

.....

Team 6

.....

.....

.....



Game, Day 2: Paper Password

Sub script and math word list. 15 minutes at the end of the period, or for extra time. Optional.

Game • Day 2



SAY THIS TO THE CLASS

"For extra time, we can play Paper Password, an optional word game in pairs, just for fun. Every word is from today's lesson on multiplying and dividing negatives, and fewer clues mean more points."

Set up (2 minutes)

1. Pairs sit face to face. Give each pair one card page, cut into the four round cards (or folded so one card shows).
2. Partner A is the clue giver in rounds 1 and 3, Partner B in rounds 2 and 4. The guesser never sees the card.
3. Each round lasts 2 minutes. The clue giver says ONE word. The guesser gets ONE guess. Wrong: give another one-word clue.
4. After five clues without a right guess, the word scores 0 and the pair moves on. Say "Go" and "Stop" for each round.

Read this out

"Your clue is one word only. You may not say the secret word or any part of it. If the word is snowman, you cannot say snow or man. No gestures, no spelling, no rhymes. Break a rule and that word scores zero."

Scoring: guessed on clue 1 = 5 points, clue 2 = 4, clue 3 = 3, clue 4 = 2, clue 5 = 1. The clue giver circles the number on the card. After round 4, pairs add their four round totals. Highest total wins; ask pairs to call out totals over 60.

Referee calls

Two words glued together ("hotdog") count as one clue only if they make a real single word. Plurals and "-ing" forms of the secret word are not allowed. If two pairs argue about a clue, the word scores zero and they move on. The example clues below are allowed and show students what a good first clue sounds like.

Timing (15 minutes)

0:00

Set up, rules

2:00

Round 1, Partner A

4:30

Round 2, Partner B

7:00

Round 3, Partner A

9:30

Round 4, Partner B

12:00

Add totals, winners

Round 1: Partner A gives clues

MINUS	example clue: negative
POSITIVE	example clue: plus
HEAT	example clue: warm
QUOTIENT	example clue: division
SIGN	example clue: symbol

Round 3: Partner A gives clues

RATIONAL	example clue: decimal
WEATHER	example clue: forecast
EVEN	example clue: pairs
COUNT	example clue: tally
SPLIT	example clue: halves

Round 2: Partner B gives clues

DIVIDEND	example clue: share
DIVISOR	example clue: denominator
ODD	example clue: strange
MAGNITUDE	example clue: size
UNDEFINED	example clue: impossible

Round 4: Partner B gives clues

DEGREES	example clue: thermometer
FROST	example clue: icy
RULE	example clue: law
OWE	example clue: borrow
DEPTH	example clue: deep



Game, Day 4: Classroom Millionaire

Sub script and the 12 questions. 15 minutes at the end of the period, or for extra time. Optional.

Game • Day 4



"For extra time we can play Classroom Millionaire, an optional game where the whole class climbs a ladder of twelve questions together. Every question is about today's volume and surface area of prisms, and a new student takes the hot seat each time."

How it works

1. Tape up the ladder sheet. The whole class is one player. Pick a student for the hot seat (a new student for every question).
2. Read the question and the four options, then read the options again. The hot seat may listen to quiet advice, then says "final answer" and a letter.
3. Right: the class climbs one rung. Before hearing the next question, the class may vote to walk away and keep what it has.
4. Wrong: the climb ends. Rungs 4 and 8 are safe: the class keeps the last safe amount it passed.
5. Time left over? Play the questions again as a team quiz.

Three lifelines (one use each)

Ask the class: everyone shows 1, 2, 3 or 4 fingers at once for A, B, C or D. The hot seat looks, then decides.

50/50: read out the two wrong options listed under the question. Cross them off.

Phone a friend: the hot seat picks one classmate, who has 30 seconds to say what they think out loud.

"Only the hot seat's final answer counts. Shout an answer and the class loses a lifeline."

Rungs 1 to 4, rung 4 is safe

1. **\$100** Volume is measured in which kind of units?
A. square B. cubic C. inches D. degrees
Answer: B. cubic (50/50 removes C and D)
2. **\$250** How many faces does a box have?
A. 4 B. 8 C. 12 D. 6
Answer: D. 6 (50/50 removes A and C)
3. **\$500** Box 5 by 2 by 6 cm. Volume in cubic cm?
A. 60 B. 13 C. 104 D. 30
Answer: A. 60 (50/50 removes B and D)
4. **\$1,000** A cube has 6 in edges. Volume in cubic in?
A. 36 B. 18 C. 216 D. 24
Answer: C. 216 (50/50 removes B and D)

Rungs 5 to 8, rung 8 is safe

5. **\$2,500** Paper to wrap a box: which do you find?
A. surface area B. volume C. height D. perimeter
Answer: A. surface area (50/50 removes C and D)
6. **\$5,000** Surface area of a cube with edges of 4 m?
A. 64 sq m B. 16 sq m C. 24 sq m D. 96 sq m
Answer: D. 96 sq m (50/50 removes B and C)
7. **\$10,000** Surface area of a box 8 by 3 by 2?
A. 48 B. 92 C. 46 D. 184
Answer: B. 92 (50/50 removes C and D)
8. **\$25,000** Prism: triangle base 6, height 5, length 9. Volume?
A. 270 B. 150 C. 135 D. 45
Answer: C. 135 (50/50 removes B and D)

Rungs 9 to 12

9. **\$50,000** Volume 168 cubic in, base 7 in by 4 in. Height?
A. 24 in B. 11 in C. 12 in D. 6 in
Answer: D. 6 in (50/50 removes B and C)
10. **\$100,000** 75 sq in of cardboard at 2 cents per sq in. Cost?
A. \$0.75 B. \$1.50 C. \$1.77 D. \$37.50
Answer: B. \$1.50 (50/50 removes C and D)
11. **\$500,000** Ends: 6, 8, 10 right triangles. Length 5. Surface area?
A. 168 B. 144 C. 120 D. 240
Answer: A. 168 (50/50 removes C and D)
12. **\$1 MILLION** Tank 50 by 20 by 30 cm. 1,000 cubic cm = 1 L. Liters?
A. 300 B. 3,000 C. 30 D. 3
Answer: C. 30 (50/50 removes B and D)

If the class misses

- | | |
|------------------------|-----------------------------|
| Wrong on rung 1 to 4 | class keeps \$0 |
| Wrong on rung 5 to 8 | class keeps \$1,000 |
| Wrong on rung 9 to 12 | class keeps \$25,000 |
| Walk away after rung n | class keeps rung n |



Math Set 2: Inequalities

Math • Day 2

Read the four worked examples, then decide true or false in the warm-up. Put the value in for x to test it.

This set reviews: inequality symbols, number line graphs, one-step and two-step inequalities, flipping the sign, at least and at most



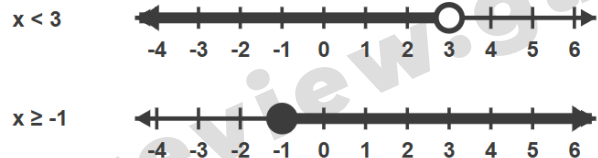
"Today's math is inequalities, and you work on your own: start with the four worked examples on page 1. An inequality has many answers, so we graph them on a number line with an open or closed circle. Watch for the one big rule on page 1: flip the sign when you multiply or divide by a negative."

1 The four symbols

$<$ less than. $>$ greater than. $\leq$ less than or equal to, also said at most. $\geq$ greater than or equal to, also said at least.
 $x \geq 4$ means x can be 4 or any number bigger than 4.

2 Graph on a number line

Open circle: the number is NOT a solution ($<$ or $>$). Closed circle: it IS a solution ($\leq$ or $\geq$). Shade toward the numbers that work.



3 Solve in one step

$x + 7 > 12$. Undo the $+ 7$: subtract 7 from both sides, just like an equation.
 $x > 5$. Check with 6: $6 + 7 = 13$, and $13 > 12$ is true.

4 Two steps and the flip

$-3x + 4 \leq 19$. Subtract 4: $-3x \leq 15$. Divide both sides by -3 , and FLIP the sign because you divided by a negative.
 $x \geq -5$. Check with 0: $-3 \times 0 + 4 = 4$, and $4 \leq 19$ is true.

Remember

- Solve an inequality like an equation: do the same thing to both sides.
- Flip the sign** ($<$ becomes $>$, $\leq$ becomes $\geq$) whenever you multiply or divide both sides by a **negative** number.
- Check by testing a number from your answer in the original inequality.

Warm-up: true or false?

Put the value in for x . Circle T if the inequality is true, F if it is false.

- | | | | |
|--------------------------------|-----|----------------------------------|-----|
| 1 $x > 6$, when $x = 6$ | T F | 2 $x \geq 6$, when $x = 6$ | T F |
| 3 $x < -2$, when $x = -5$ | T F | 4 $2x + 1 \leq 9$, when $x = 4$ | T F |
| 5 $3x - 5 > 10$, when $x = 5$ | T F | 6 $-x < 3$, when $x = -4$ | T F |
| 7 $x/2 \geq 3$, when $x = 7$ | T F | 8 $10 - x > 4$, when $x = 6$ | T F |

★ **Challenge** Find every whole number that makes BOTH $x > 3$ and $2x + 1 < 15$ true.

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