i-Ready®

Grade 3 Mathematics

Student At-Home Activity Packet

This At-Home Activity Packet includes 26 sets of practice problems that align to important math concepts your student has worked with so far this year.

We recommend that your student completes one page of practice problems each day.

Encourage your student to do the best they can with this content—the most important thing is that they continue developing their mathematical fluency and skills.

See the Grade 3 Math concepts covered in this packet!

i-Ready®

Grado 3 Matemáticas

Paquete de actividades para el hogar del estudiante

Este Paquete de actividades para el hogar incluye un conjunto de 26 problemas prácticos que están alineados con importantes conceptos de matemáticas en los que sus estudiantes ya han trabajado durante este año.

Se recomienda que el estudiante complete una página de problemas de práctica cada día.

Anime al estudiante a hacer su mejor esfuerzo al trabajar en este contenido. Lo más importante es que continúe desarrollando sus habilidades y fluidez en matemáticas.

¡Mire los conceptos de Matemáticas del Grado 3 que cubre este paquete!

Grado 3 Conceptos de matemáticas cubiertos en este paquete

Concept *Concepto*	**Practice** *Práctica*	**Fluency and Skills Practice** *Fluidez y práctica de destrezas*	**Page** *Página*
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Grade 3 Math concepts covered in this packet

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Understanding of Multiplication Models

Name: _____

1 Show 3×5 by drawing equal groups of 5.

Show 3×5 by drawing an array.

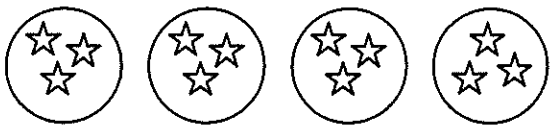
Complete the equation. $3 \times 5 =$ _____

2 Write an equation that matches the array.

△△△△△△
△△△△△△

_____

3 Write an equation that matches the picture.



_____

4 Use words to describe the drawing for problem 3.

Multiplying with 2, 5, and 10

Name: _____

Multiply.

1. $5 \times 2 =$ _____
2. $2 \times 5 =$ _____
3. $2 \times 10 =$ _____
4. $10 \times 2 =$ _____
5. $10 \times 5 =$ _____
6. $5 \times 10 =$ _____
7. $6 \times 2 =$ _____
8. $2 \times 6 =$ _____
9. $3 \times 10 =$ _____
10. $10 \times 3 =$ _____
11. $7 \times 2 =$ _____
12. $2 \times 7 =$ _____
13. $4 \times 10 =$ _____
14. $10 \times 4 =$ _____
15. $5 \times 4 =$ _____
16. $4 \times 5 =$ _____
17. $2 \times 2 =$ _____
18. $5 \times 5 =$ _____
19. $10 \times 10 =$ _____

20. What patterns do you notice in the problems? Explain.

21. Draw a model to show how you solved one of the problems.

Multiplying with 0 and 1

Name: _____

Write the missing digits in the boxes to make each multiplication problem true.

$3 \times 1 = \square$ $0 \times 7 = \square$ $5 \times 1 = \square$ $1 \times 0 = \square$

$1 \times 7 = \square$ $4 \times \square = 0$ $4 \times \square = 4$ $9 \times \square = 0$

$\square \times 1 = 3$ $\square \times 9 = 9$ $\square \times 8 = 0$ $\square \times 6 = 0$

Write two factors to make each multiplication problem true.

$\square \times \square = 5$ $\square \times \square = 7$ $\square \times \square = 2$ $\square \times \square = 1$

Write a digit in the box to make the multiplication problem true. Then use words to write about the groups.

$\square \times 0 = 0$

Multiplying with 3

Name: _____

Multiply.

1. $2 \times 3 =$ _____
2. $3 \times 2 =$ _____
3. $10 \times 3 =$ _____
4. $3 \times 10 =$ _____
5. $5 \times 3 =$ _____
6. $3 \times 5 =$ _____
7. $4 \times 3 =$ _____
8. $3 \times 4 =$ _____
9. $9 \times 3 =$ _____
10. $3 \times 9 =$ _____
11. $1 \times 3 =$ _____
12. $3 \times 1 =$ _____
13. $8 \times 3 =$ _____
14. $3 \times 8 =$ _____
15. $6 \times 3 =$ _____
16. $3 \times 6 =$ _____
17. $7 \times 3 =$ _____
18. $3 \times 7 =$ _____
19. $0 \times 3 =$ _____
20. $3 \times 3 =$ _____

21. Tell how you could check that your answer to problem 9 is correct.

22. Draw a model to show how you solved one of the problems.

Multiplying with 4

Name: _____

Multiply.

1. $2 \times 4 =$ _____
2. $3 \times 4 =$ _____
3. $10 \times 4 =$ _____
4. $5 \times 4 =$ _____
5. $7 \times 4 =$ _____
6. $6 \times 4 =$ _____
7. $8 \times 4 =$ _____
8. $9 \times 4 =$ _____
9. $1 \times 4 =$ _____
10. $4 \times 5 =$ _____
11. $0 \times 4 =$ _____
12. $4 \times 10 =$ _____
13. $4 \times 3 =$ _____
14. $4 \times 2 =$ _____
15. $4 \times 1 =$ _____
16. $4 \times 4 =$ _____

17. Tell what strategy you used to solve 6×4.

18. Draw a model to show how you solved one of the problems.

Multiplying with 6

Name: _____

Multiply.

1. $5 \times 6 =$ _____
2. $3 \times 6 =$ _____
3. $10 \times 6 =$ _____
4. $2 \times 6 =$ _____
5. $7 \times 6 =$ _____
6. $4 \times 6 =$ _____
7. $8 \times 6 =$ _____
8. $1 \times 6 =$ _____
9. $9 \times 6 =$ _____
10. $6 \times 5 =$ _____
11. $0 \times 6 =$ _____
12. $6 \times 10 =$ _____
13. $6 \times 3 =$ _____
14. $6 \times 2 =$ _____
15. $6 \times 5 =$ _____
16. $6 \times 6 =$ _____

17. Tell a strategy you can use to show 5×6.

18. Explain how problem 2 and problem 13 are related.

Multiplying with 7

Name: _____

The answers are mixed up at the bottom of the page. Cross out the answers as you complete the problems.

1. $3 \times 7 =$ _____
2. $6 \times 7 =$ _____
3. $8 \times 7 =$ _____
4. $2 \times 7 =$ _____
5. $9 \times 7 =$ _____
6. $1 \times 7 =$ _____
7. $7 \times 0 =$ _____
8. $10 \times 7 =$ _____
9. $4 \times 7 =$ _____
10. $5 \times 7 =$ _____
11. $7 \times 3 =$ _____
12. $0 \times 7 =$ _____
13. $7 \times 2 =$ _____
14. $7 \times 10 =$ _____
15. $7 \times 4 =$ _____
16. $7 \times 1 =$ _____
17. $7 \times 5 =$ _____
18. $7 \times 7 =$ _____

Answers

14	63	35	70	0	42
7	28	14	21	56	21
28	0	70	49	35	7

Multiplying with 8

Name: _____

The answers are mixed up at the bottom of the page. Cross out the answers as you complete the problems.

1. $2 \times 8 =$ _____
2. $6 \times 8 =$ _____
3. $7 \times 8 =$ _____
4. $3 \times 8 =$ _____
5. $9 \times 8 =$ _____
6. $1 \times 8 =$ _____
7. $0 \times 8 =$ _____
8. $10 \times 8 =$ _____
9. $4 \times 8 =$ _____
10. $5 \times 8 =$ _____
11. $8 \times 3 =$ _____
12. $8 \times 0 =$ _____
13. $8 \times 2 =$ _____
14. $8 \times 10 =$ _____
15. $8 \times 4 =$ _____
16. $8 \times 7 =$ _____
17. $8 \times 5 =$ _____
18. $8 \times 8 =$ _____

Answers

64	40	48	8	0	56
72	80	24	32	16	32
24	0	80	40	56	16

Multiplying with 9

Name: _____

The answers are mixed up at the bottom of the page. Cross out the answers as you complete the problems.

1. $1 \times 9 =$ _____
2. $6 \times 9 =$ _____
3. $7 \times 9 =$ _____
4. $2 \times 9 =$ _____
5. $8 \times 9 =$ _____
6. $3 \times 9 =$ _____
7. $0 \times 9 =$ _____
8. $10 \times 9 =$ _____
9. $4 \times 9 =$ _____
10. $5 \times 9 =$ _____
11. $9 \times 3 =$ _____
12. $9 \times 8 =$ _____
13. $9 \times 2 =$ _____
14. $9 \times 10 =$ _____
15. $9 \times 4 =$ _____
16. $9 \times 7 =$ _____
17. $9 \times 5 =$ _____
18. $9 \times 9 =$ _____

Answers

63	45	18	81	90	36
72	54	27	36	72	63
90	0	18	9	27	45

Using Order to Multiply

Name: _____

Write the missing numbers in the boxes to make each multiplication problem true.

$5 \times 6 = \square$
$6 \times 5 = \square$

$2 \times 6 = \square$
$6 \times 2 = \square$

$4 \times 5 = \square$
$5 \times 4 = \square$

$3 \times 8 = \square$
$8 \times 3 = \square$

$4 \times 7 = \square$
$7 \times 4 = \square$

$5 \times 9 = \square$
$9 \times 5 = \square$

$9 \times 2 = \square$
$2 \times \square = 18$

$\square \times 5 = 15$
$5 \times 3 = \square$

$7 \times 8 = \square$
$\square \times 7 = 56$

$\square \times 10 = 70$
$10 \times \square = 70$

$\square \times 5 = 10$
$5 \times \square = 10$

$3 \times \square = 12$
$\square \times 3 = 12$

1 Look at 6×5 and 5×6. How does the order of the factors change the product?

2 Draw two arrays to show 4×7 and 7×4.

Using Grouping to Multiply

Name: _____

Draw parentheses around the numbers you want to multiply first. Then find the product.

1 $6 \times 3 \times 2$

$6 \times (3 \times 2)$

$6 \times 6 = 36$

Sample Student Work:

$3 \times 2 = 6; 6 \times 6 = 36$

2 $4 \times 3 \times 3$

3 $5 \times 2 \times 8$

4 $8 \times 2 \times 4$

5 $2 \times 2 \times 7$

6 $6 \times 5 \times 2$

7 $3 \times 3 \times 7$

8 $2 \times 4 \times 5$

9 $7 \times 4 \times 2$

10 $6 \times 3 \times 3$

11 $3 \times 3 \times 10$

12 $2 \times 3 \times 4$

13 How did you decide which factors to group?

14 Choose one problem. Tell two ways you can group the factors. Then explain which way is easier for you to solve.

Using Order and Grouping to Multiply

Name: _____

Order and group the factors to show how you want to multiply. Then find the product.

1 $5 \times 7 \times 2$

$5 \times 2 \times 7$

$(5 \times 2) \times 7$

$10 \times 7 = 70$

2 $3 \times 5 \times 3$

3 $4 \times 8 \times 2$

4 $2 \times 9 \times 5$

5 $2 \times 10 \times 5$

6 $2 \times 8 \times 2$

7 $3 \times 9 \times 3$

8 $5 \times 2 \times 6$

9 $4 \times 5 \times 2$

10 $2 \times 9 \times 2$

11 $3 \times 8 \times 2$

12 $4 \times 2 \times 7$

13 What strategies did you use to decide how to order and group the factors?

14 Why do you need to reorder factors in some problems?

Understanding of Division Models

Name: _____

1 Draw a model to show 12 ÷ 6. Show 6 equal groups. How many are in each group?

There are 12 in all. There are 6 equal groups. There are _____ in each group.
12 ÷ 6 = _____

2 Draw a model to show 12 ÷ 6. Show 6 in each group. How many groups are there?

There are 12 in all. There are 6 in each group. There are _____ groups.
12 ÷ 6 = _____

3 Draw an array to find 21 ÷ 3.

21 ÷ 3 = _____

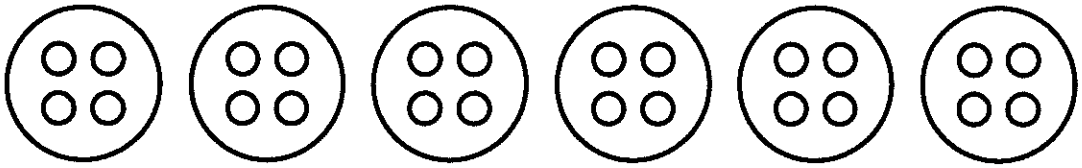
4 Draw an array to find 20 ÷ 4.

20 ÷ 4 = _____

5 What situation could be modeled with the equation 40 ÷ 8 = 5?

Understanding of How Multiplication and Division Are Connected

Name: _____



1 There are 24 marbles. Each bag has 4 marbles.

Write an equation that shows the number of bags.

_____

2 There are 24 marbles. An equal number of marbles are in 6 bags.

Write an equation that shows the number of marbles in each bag.

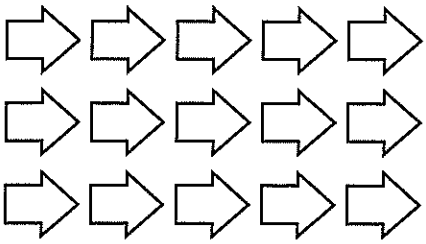
_____

3 There are 6 bags of marbles. 4 marbles are in each bag.

Write two different equations that show the total number of marbles.

_____ _____

4 Write 2 multiplication equations and 2 division equations for this array.



_____ _____

_____ _____

Find the value of ? to complete each fact.

5 $6 \times ? = 48$

$48 \div 6 = ?$

? = _____

6 $? \times 5 = 45$

$45 \div ? = 5$

? = _____

7 $63 \div 9 = ?$

$? \times 9 = 63$

? = _____

8 $32 \div ? = 8$

$8 \times ? = 32$

? = _____

Working with Division Facts

Name: _____

The answers are mixed up at the bottom of the page. Cross out the answers as you complete the problems.

1. $40 \div 4 =$ _____
2. $18 \div 3 =$ _____
3. $24 \div 4 =$ _____
4. $24 \div 8 =$ _____
5. $14 \div 2 =$ _____
6. $40 \div 8 =$ _____
7. $42 \div 7 =$ _____
8. $64 \div 8 =$ _____
9. $32 \div 8 =$ _____
10. $56 \div 8 =$ _____
11. $27 \div 9 =$ _____
12. $28 \div 7 =$ _____
13. $72 \div 8 =$ _____
14. $90 \div 9 =$ _____
15. $54 \div 9 =$ _____
16. $48 \div 8 =$ _____
17. $49 \div 7 =$ _____
18. $27 \div 3 =$ _____

Answers:

4	4	9	6	7	10
5	10	3	3	6	7
8	6	6	7	6	9

Using a Multiplication Table

Name: _____

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Write the missing numbers in the boxes to make each multiplication or division problem true.

$5 \times 7 = \square$ $\quad$ $32 \div 8 = \square$ $\quad$ $4 \times 7 = \square$ $\quad$ $27 \div \square = 9$

$\square \div 5 = 7$ $\quad$ $8 \times \square = 32$ $\quad$ $\square \div 4 = 7$ $\quad$ $9 \times \square = 27$

$4 \times 4 = \square$ $\quad$ $9 \times 6 = \square$ $\quad$ $6 \times 6 = \square$ $\quad$ $81 \div \square = 9$

$\square \div 4 = 4$ $\quad$ $54 \div \square = 6$ $\quad$ $63 \div \square = 9$ $\quad$ $40 \div 8 = \square$

$\square \div 8 = 6$ $\quad$ $56 \div \square = 8$ $\quad$ $45 \div 5 = \square$ $\quad$ $\square \div 7 = 7$

1 Write 3 possible answers for the equation $36 \div \square = \square$.

Understanding of Patterns

Name: _____

Solve. Look for patterns.

1 Subtract.

$10 - 1 =$ _____ $20 - 1 =$ _____ $30 - 1 =$ _____

$100 - 1 =$ _____ $200 - 1 =$ _____ $300 - 1 =$ _____

$200 - 100 =$ _____ $300 - 100 =$ _____ $400 - 100 =$ _____

$200 - 101 =$ _____ $300 - 101 =$ _____ $400 - 101 =$ _____

2 Multiply.

$2 \times 10 =$ _____ $2 \times 9 =$ _____

$3 \times 10 =$ _____ $3 \times 9 =$ _____

$4 \times 10 =$ _____ $4 \times 9 =$ _____

$5 \times 10 =$ _____ $5 \times 9 =$ _____

$6 \times 10 =$ _____ $6 \times 9 =$ _____

$7 \times 10 =$ _____ $7 \times 9 =$ _____

$8 \times 10 =$ _____ $8 \times 9 =$ _____

$9 \times 10 =$ _____ $9 \times 9 =$ _____

3 Describe the patterns that you notice in the problems you just solved.

Solving Problems About Equal Groups

Name: _____

Read and solve each problem. Show your work.

1 Heather has 18 photographs of rockets. She wants to hang them on 3 different walls in her room. Each wall will have the same number of photographs. How many photographs will hang on each wall?

There will be _____ photographs on each wall.

2 There are 24 people who want to play volleyball. The coach divides the players into teams of 6. How many teams can she make?

The coach can make _____ teams.

3 At an art show, there are 7 groups of paintings with 6 paintings in each group. How many paintings are there in all?

There are _____ paintings.

4 Jasmine reads for 10 minutes each night. If she reads for 5 nights, how many minutes will she read in all?

Jasmine will read for _____ minutes.

5 Rhonda plants 28 tomato plants in her garden. She plants 7 tomato plants in each row. How many rows does she plant?

Rhonda plants _____ rows.

6 Mr. Jones buys 6 packages of pencils. There are 8 pencils in each package. How many pencils does Mr. Jones buy?

Mr. Jones buys _____ pencils.

7 Choose one problem. Describe the strategy you used to solve it.

Solving Problems About Arrays

Name: _____

Read and solve each problem. Show your work.

1 A parking lot has 6 rows of parking spaces. There are 5 spaces in each row. How many parking spaces are in the lot?

There are _____ parking spaces.

2 Jack has 36 toy robots. He wants to display 9 on each shelf in his room. How many shelves will Jack need to display all of the robots?

Jack will need _____ shelves.

3 There are 24 dancers. The teacher has them stand in 3 equal rows. How many dancers are in each row?

There are _____ dancers in each row.

4 Emily is putting away plates. She puts 6 plates each in 3 stacks. How many plates does she put away?

Emily puts away _____ plates.

5 A farmer picks 54 pumpkins. She places an equal number of pumpkins in 9 wagons. How many pumpkins are in each wagon?

There are _____ pumpkins in each wagon.

6 The school band marches in rows at the parade. There are 24 band members and they form rows with 4 members in each row. How many rows are there?

There are _____ rows.

7 Choose one problem. Describe and use a strategy to check your answer.

Solving Problems About Area

Name: _____

Read and solve each problem. Show your work.

1 Nya covers a rectangular tray with 1-square-inch tiles. She uses 42 tiles, arranged in 7 rows. How many tiles are in each row?

There are _____ tiles in each row.

2 Jacob uses tiles to cover a rectangular hallway. Each tile has an area of 1 square foot. He uses 3 rows of tiles, with 8 tiles in each row. What is the area of the hallway?

The area of the hallway is _____ square feet.

3 Sara covers the top of a box with squares of paper that are 1 square centimeter. She uses 48 squares, with 6 squares in each row. How many rows did she make?

Sara made _____ rows.

4 There are 64 squares on Rasha's chessboard. Each square is 1 square inch. There are 8 rows of squares on her chessboard. How many squares are in each row?

There are _____ squares in each row.

5 A rectangular patio at an outdoor restaurant is made of 35 tiles. Each tile is 1 square yard. If there are 5 tiles in each row, how many rows are there?

There are _____ rows of tiles.

6 Mr. Reilly uses square pieces of fabric that are each 1 square inch for a rectangular wall hanging. He uses 81 squares. If he makes 9 rows of squares, how many squares will be in each row?

There will be _____ squares in each row.

7 Choose one problem. Describe the strategy you used to solve it.

8 Explain why you chose that strategy to solve the problem.

Solving Two-Step Word Problems Using Two Equations

Name: _____

Read and solve each problem by writing an equation for each step. Use letters for the unknown numbers. Show your work.

1 Hirami has 12 cups of flour in a bag and 6 cups of flour in a jar. He is making batches of bread that each call for 3 cups of flour. How many batches of bread can Hirami make?

Hirami can make _____ batches of bread.

2 Cassi bought 50 pounds of dirt. She used 10 pounds to fill a hole in her yard. Then she filled pots with 5 pounds of soil in each pot. How many pots could she fill?

Cassi can fill _____ pots.

3 Becky has 6 packages of clay that each weigh 5 pounds. To make a bowl, she needs 3 pounds of clay. How many bowls can Becky make?

Becky can make _____ bowls.

4 Marc has 36 pounds of apples to use to make pies. He uses 4 pounds of apples for each pie. Marc uses all of the apples to make pies, and then sells each pie for $8. How much money does Marc collect for all the pies?

Marc collects $ _____ for all the pies.

5 Choose one problem. Tell how you could solve the problem in a different way.

Solving Two-Step Word Problems Using One Equation

Name: _____

Read and solve each problem by writing one equation. Show your work.

1 Mrs. Nelson has one $10-bill and one $20-bill. She wants to buy as many movie tickets as she can with this money. If movie tickets cost $6 each, how many tickets, *t*, can she buy?

Mrs. Nelson can buy _____ tickets.

2 Daisy has a goal of reading 75 minutes in one week. She reads 9 minutes a day for 5 days. How many more minutes, *m*, will she have to read to reach her goal?

Daisy will have to read _____ more minutes.

3 Mr. Garcia buys 3 bags of cat food that each weigh 9 pounds and another bag of cat food that weighs 7 pounds. How many pounds, *p*, of cat food did Mr. Garcia buy?

Mr. Garcia bought _____ pounds of cat food.

4 Jackson has 48 trading cards. His sister gives him 12 more cards. Then he puts all his trading cards in 6 equal stacks. How many cards, *c*, are in each stack?

There are _____ cards in each stack.

5 Choose one problem. Explain how you decided which operations to use to solve it.

Estimating Solutions to Word Problems

Name: _____

Read each problem. Estimate the answer by rounding to the nearest ten. Then find the actual answer. Show your work.

1 Marie has 231 toothpicks in one box and 175 toothpicks in another box. She uses 319 toothpicks to make a bridge. How many toothpicks does she have left?

Estimate: There are about _____ toothpicks left.

Marie has _____ toothpicks left.

2 Kennedy School has 124 third-grade students. Carter School has 16 fewer third-grade students than Kennedy School. How many third-grade students in all are at Kennedy School and Carter School?

Estimate: There are about _____ students.

There are _____ students.

3 There are 197 oak trees in the park. There are 27 more pine trees than oak trees in the park. How many trees are there in all?

Estimate: There are about _____ trees.

There are _____ trees in all.

4 On the first day of a bus trip, Brian and his dad traveled 341 miles. On the second day, they traveled 39 fewer miles. How many miles did they travel in all after two days?

Estimate: They traveled about _____ miles.

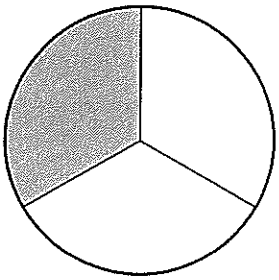
They traveled _____ miles.

5 How does an estimate help you decide if your answer is reasonable?

Describing Parts of a Whole with Fractions

Name: _____

Write the fraction of the figure that is shaded.

1 

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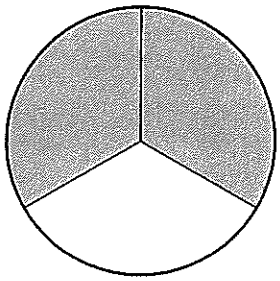
2 

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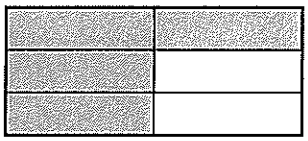
3 

_____

4 

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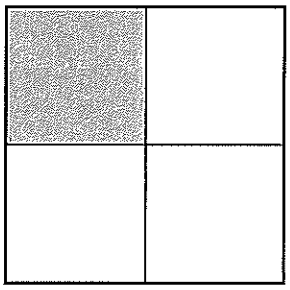
5 

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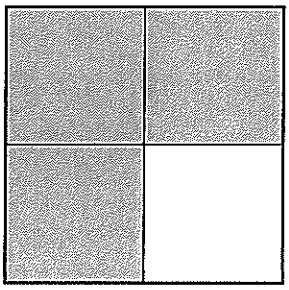
6 

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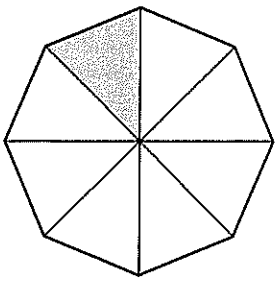
7 

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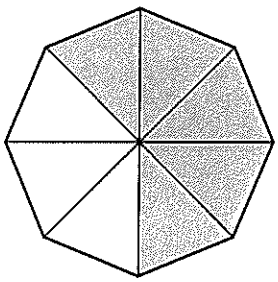
8 

_____

Describing Parts of a Whole with Fractions *continued*

Name: _____

9 Draw a circle that shows 4 equal parts. Then shade to show $\frac{2}{4}$.

10 Draw a rectangle that shows 3 equal parts. Then shade to show $\frac{2}{3}$.

11 Draw a square that shows 8 equal parts. Then shade to show $\frac{3}{8}$.

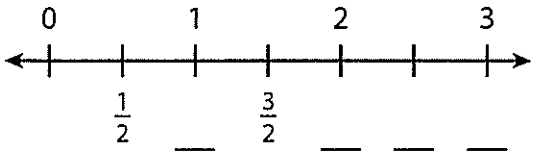
12 Draw a circle that shows 6 equal parts. Then shade to show $\frac{5}{6}$.

Understanding of Fractions on a Number Line

Name: _____

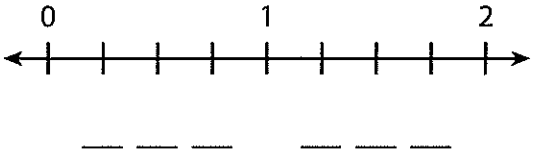
Set A

Write the missing labels on the number line.



Set B

Use this number line to solve problems 1–4.



1. How many equal parts are between 0 and 1? _____
2. How many equal parts are between 1 and 2? _____
3. What fraction does each part show? _____
4. Write fractions to label the marks.

Understanding of Fractions on a Number Line *continued*

Name: _____

Set C

Use this number line to solve problems 5–7.

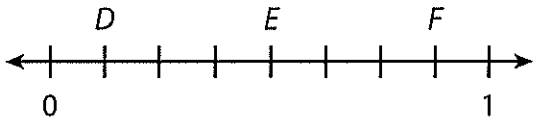
5 ***A*** is _____.

6 ***B*** is _____.

7 ***C*** is _____.

Set D

Use this number line to solve problems 8–10.



8 ***D*** is _____.

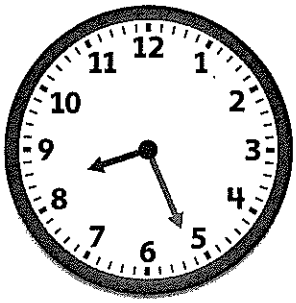
9 ***E*** is _____.

10 ***F*** is _____.

Telling Time to the Minute

Name: _____

Write the time the clock shows.

1 

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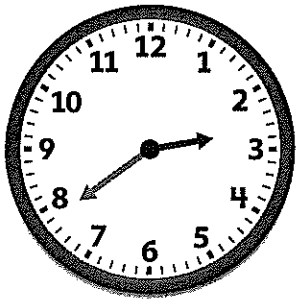
2 

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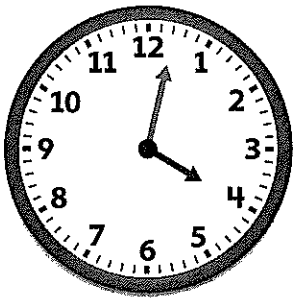
3 

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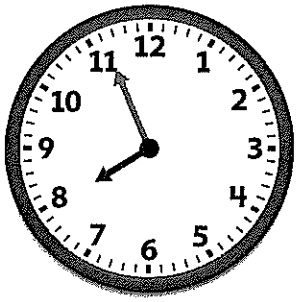
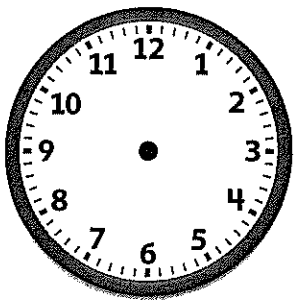
4 

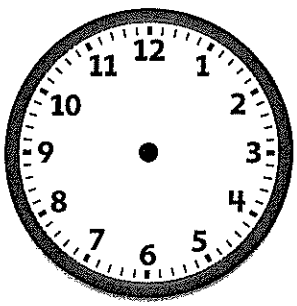
_____

Draw hands on the clock to show the given time.

5 16 minutes after 1

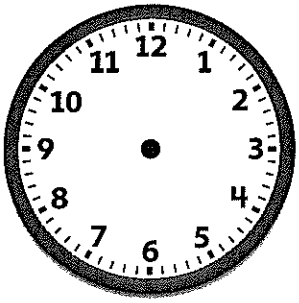


6 7 minutes before 9

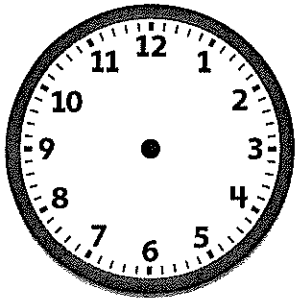


Name: _____

7 35 minutes after 3



8 26 minutes before 8



9 Write a word problem that could use one of the times shown on one of the clocks.

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PARTICIPANT NOTES

CURRICULUM STUDY

G3M5 Fractions as Numbers

14 Pages

Overview

1 **Read the Mission 5 Overview.**

What representations of fractions will students use throughout this mission?

Mission 5

Fractions as Numbers

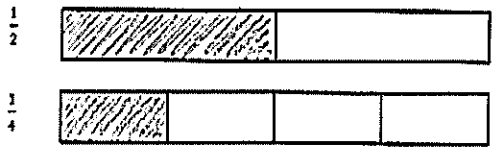
OVERVIEW

In this mission, students extend and deepen Grade 2 practice with equal shares to understanding fractions as equal partitions of a whole. Their knowledge becomes more formal as they work with area models and the number line. Throughout the mission, students have multiple experiences working with the Grade 3 specified fractional units of halves, thirds, fourths, sixths, and eighths. To build flexible thinking about fractions, students are exposed to additional fractional units such as fifths, ninths, and tenths.

Topic A opens Mission 5 with students actively partitioning different models of wholes into equal parts (e.g., concrete models and drawn pictorial area models on paper). They identify and count unit fractions as *1 half*, *1 fourth*, *1 third*, *1 sixth*, and *1 eighth* in unit form.

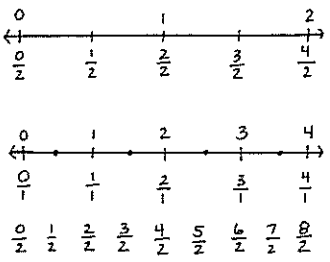
In **Topic B**, students are introduced to the fraction form $\frac{1}{b}$ and understand that fractions are numbers. Just like any number, they can be written in different forms.

Students compare and make copies of unit fractions to build non-unit fractions. They understand unit fractions as the basic building blocks that compose other fractions, which parallels the understanding that the number 1 is the basic building block of whole numbers (e.g., 1 and 1 and 1 make 3 just as 1 third and 1 third and 1 third make 1).



Compare unit fractions using fraction strips.

In **Topic C**, students practice comparing unit fractions using fraction strips. They specify the whole and label fractions in relation to the number of equal parts in that whole.



Students transfer their work to the number line in **Topic D**. They begin by using the interval from 0 to 1 as the whole. Continuing beyond the first interval, they partition, place, count, and compare fractions on the number line. In Topic E, they notice that some fractions with different units are placed at the exact same point on the number line, and therefore, are equal. For example, $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, and $\frac{4}{8}$ are equivalent fractions; they are different ways of naming the same number. Students recognize that whole numbers can be written as fractions, as exemplified on the number lines to the left.

Topic F concludes the mission with comparing fractions that have the same numerator. As students compare fractions by reasoning about their size, they understand that fractions with the same numerator and a larger denominator are actually smaller pieces of the whole. Topic F leaves students with a new method for precisely partitioning a number line into unit fractions of any size without using a ruler.

Read and solve this problem from the Mid-Mission Assessment.

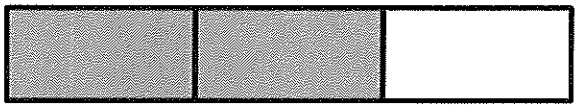
Consider strategies students may use to solve.

The bakery had a chocolate cake and a vanilla cake that were exactly the same size. Mr. Chu bought 1 fourth of the chocolate cake. Mrs. Ramirez bought 1 sixth of the vanilla cake. Who bought a larger piece? Explain your answer using words, pictures, and numbers.

3

Read and solve this problem from the End-of-Mission Assessment.
Consider strategies students may use to solve.

Gabriel used the picture below to show his son how to find a fraction equal to $\frac{2}{3}$.
Explain what Gabriel might have said and done using words, pictures, and numbers.



Fluency

1 **Read Unit and Non-Unit Fractions of 1 Whole from Lesson 8.**

How does this activity reinforce the idea of fractions as equal parts of a whole?

Unit and Non-Unit Fractions of 1 Whole
(2 min)

Materials: (S) Personal white board

Note: This activity reviews naming the shaded and unshaded equal parts of a whole.

T: (Draw a shape partitioned in halves with 1 half shaded.) Write the fraction that is shaded.
S: (Write $\frac{1}{2}$.)
T: Write the fraction that is not shaded.
S: (Write $\frac{1}{2}$.)

Continue with the following possible sequence of shaded and non-shaded parts: $\frac{2}{3}$ and $\frac{1}{3}$, $\frac{4}{5}$ and $\frac{1}{5}$, $\frac{9}{10}$ and $\frac{1}{10}$, and $\frac{7}{8}$ and $\frac{1}{8}$.

2 **Read Counting by Fractional Units from Lesson 14, Lesson 15, and Lesson 16.**

How does this activity help students think of fractions as numbers?

How does this activity evolve over these lessons?

LESSON 14

Counting by Fractional Units
(3 min)

Note: This activity reviews counting by fractional units and supports students as they work with fractions on the number line in Topic D.

T: Count by eighths from 1 eighth to 8 eighths and back to 0.
S: $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}, \frac{7}{8}, \frac{6}{8}, \frac{5}{8}, \frac{4}{8}, \frac{3}{8}, \frac{2}{8}, \frac{1}{8}, 0.$

Continue with the following possible sequence: fifths, thirds, and fourths.

Multiple Means of Engagement:

- Change directions so that the sequence stays unpredictable.
- React to misunderstandings by repeating transitions until mastery.
- Support by recording on a number line as students count.
- Extend by having students say "1" or "1 whole" instead of a fraction (e.g., "..., 6 eighths, 7 eighths, 1, 7 eighths, 6 eighths, ...").

LESSON 15

Counting by Fractional Units
(3 min)

Note: This activity reviews counting by fractional units and supports students as they work with fractions on the number line in Topic D.

T: Count by fourths from 1 fourth to 8 fourths and back to 0.
S: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}, \frac{7}{4}, \frac{6}{4}, \frac{5}{4}, \frac{4}{4}, \frac{3}{4}, \frac{2}{4}, \frac{1}{4}, 0.$

Continue with the following possible sequence: thirds, halves, and fifths.

LESSON 16

Counting by Fractional Units
(2 min)

Note: This activity reviews counting by fractional units and supports students as they work with fractions on the number line in Topic D.

T: Count by halves from 1 half to 6 halves and back to 0.
S: $\frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \frac{4}{2}, \frac{5}{2}, \frac{6}{2}, \frac{5}{2}, \frac{4}{2}, \frac{3}{2}, \frac{2}{2}, \frac{1}{2}$, 0.

Continue with the following possible sequence: thirds, fifths, and fourths.

3

Skim through the Whole Group Fluency materials*.

Identify 1-2 fluency activities you'll want to emphasize in this mission to ensure your students understand fraction as numbers.

*Access Whole Group Fluency materials in the Teacher-Led Instruction section of the G3M5 mission page.

Word Problems

1 **Read and solve Lesson 10's Whole Group Word Problem.**
Consider strategies students may use to solve.

Sarah makes soup. She divides each batch equally into thirds to give away. Each family that she makes soup for gets 1 third of a batch. Sarah needs to make enough soup for 5 families. How much soup does Sarah give away? Write your answer in terms of batches.

2 **Read and solve Lesson 18's Whole Group Word Problem.**
Consider strategies students may use to solve.

Third-grade students are growing peppers. The student with the longest pepper wins the Green Thumb award. Jackson's pepper measured 3 inches long. Drew's measured $\frac{10}{4}$ inches long. Who won the award? Draw a number line to help prove your answer.

3 **Read and solve Lesson 29's Whole Group Word Problem.**
Consider strategies students may use to solve.

Catherine and Diana buy matching scrapbooks. Catherine decorates $\frac{5}{9}$ of the pages in her book. Diana decorates $\frac{5}{6}$ of the pages in her book. Who has decorated more pages of her scrapbook? Draw a picture to support your answer.

4 **Skim through the Whole Group Word Problems materials*.**
Take note of the different strategies and models that students will use throughout this mission.

*Access Whole Group Word Problems materials in the Teacher-Led Instruction section of the G3M5 mission page.

Small Group Lessons

1 **Read Lesson 9.**

How do concrete models help students see unit fractions and 1 whole?

Lesson 9

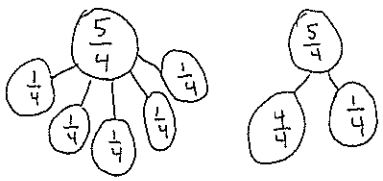
YOUR NOTES

Build and write fractions greater than one whole using unit fractions.

Materials: (S) Personal white board, fraction strips

Note: Oranges are the concrete example used in the Independent Digital Lesson. Instead use a concrete example that you have in your classroom.

T: I brought 2 oranges for lunch today. I cut each one into fourths so that I could eat them easily. Draw a picture on your personal white board to show how I cut my 2 oranges.
S: (Draw.)
T: If 1 orange represents 1 whole, how many copies of 1 fourth are in 1 whole?
S: 4 copies.
T: Then, what is our unit?
S: Fourths.
T: How many copies of 1 fourth are in two whole oranges?
S: 8 copies.
T: Let's count them.
S: 1 fourth, 2 fourths, 3 fourths, ..., 8 fourths.
T: Are you sure our unit is still fourths? Talk with your partner.
S: No, it's eighths because there are 8 pieces. → I disagree because the unit is fourths in each orange. → Remember, each orange is a whole, so the unit is fourths. 2 oranges aren't the whole!
T: I was so hungry I ate 1 whole orange and 1 piece of the second orange. Shade in the pieces I ate.
S: (Shade.)
T: How many pieces did I eat?
S: 5 pieces.
T: And what's our unit?
S: Fourths.
T: So we can say that I ate 5 fourths of an orange for lunch. Let's count them.



S: 1 fourth, 2 fourths, 3 fourths, 4 fourths, 5 fourths.
T: On your board, work together to show 5 fourths as a number bond of unit fractions.
S: (Work with a partner to draw a number bond.)

T: Compare the number of pieces I ate to 1 whole orange. What do you notice?
S: The number of pieces is larger! → You ate more pieces than the whole.
T: Yes. If the number of parts is greater than the number of equal parts in the whole, then you know that the fraction describes more than 1 whole.
T: Work with a partner to make a number bond with 2 parts. One part should show the pieces that make up the whole. The other part should show the pieces that are more than the whole.
S: (Work with a partner to draw a number bond.)

Demonstrate again using another concrete example. Follow by working with fraction strips. Fold fraction strips so that students have at least 2 strips representing halves, thirds, fourths, sixths, and eighths. Students can then build and identify fractions greater than 1 with the sets of fraction strips. Note that these fraction strips are used again in Lesson 10. It might be a good idea to collect them or have students store them in a safe place.

YOUR NOTES

NOTES

Debrief Questions

- Have students discuss with a partner how to identify a fraction greater than one whole. If appropriate, advance to how they can identify a fraction greater than 2 wholes, etc.

Multiple Means of Action and Expression

Turn and Talk is an excellent way for English language learners to use English to discuss their math thinking. Let English language learners choose the language they wish to use to discuss their math reasoning, particularly if their English language fluency is limited.

Multiple Means of Engagement

For students working below grade level, respectfully facilitate self-assessment of personal goals. Guide students to reflect upon questions such as, "Which fraction skills am I good at? What would I like to be better at? What is my plan to improve?" Celebrate improvement.

Learning Extension

With Zearn Math, students learn content in two ways. During today's Grade 3 Mission 5 Study, we explored one way - **Teacher-Led Instruction**.

As learning extension work, we recommend that you complete all the **Independent Digital Lessons** to explore the other way that students will learn content in Grade 3 Mission 5. We have highlighted some of these lessons below, and have suggested ways to incorporate content from these lessons into your live instruction.

Focus on the following lessons in Grade 3 Mission 5:

- **Lesson 6**
  In this lesson, students copy unit fractions to build non-unit fractions, which is an important foundational concept. Use Whole Group Fluency to practice naming the shaded and unshaded parts of a whole. This can help students better understand part-whole relationships with fractions.

- **Lesson 9**
  This lesson guides students to create fractions greater than 1. Students might find it challenging to identify the unit fraction used to represent a fraction greater than 1. During Whole Group Word Problems, support students with visualizing fractions greater than 1 by using concrete objects and familiar contexts to help students identify unit fractions.

- **Lesson 10**
  This is the first lesson of Topic C, which focuses on comparing fractions by reasoning about their size. During Small Group Lessons, concrete and pictorial representations

help students compare fractions by visually comparing their size. This will set the conceptual foundation for students to compare fractions numerically later on.

- **Lesson 14**
  In this lesson, students learn how to represent fractions on a number line. Plotting fractions on a number line can be difficult for some students. During Whole Group Word Problems or on flex days, challenge students to represent fractions on a number line using area models as support. This practice is important because number lines will become increasingly useful for representing fractions in future grades.

- **Lesson 21**
  This is an important lesson in which students prove that equivalent fractions represent the same point on a number line. The transition from proving fraction equivalence with area models to proving it with number lines can help students grasp the big idea of the mission - understanding fractions as numbers. During Small Group Lessons, prompt students to explain fraction equivalence using area models and number lines to continue building toward this big idea.

- **Lesson 28**
  In this lesson, students apply a variety of strategies to compare fractions using what they learned in this mission. During Small Group Lessons and Whole Group Fluency, encourage students to explain their thinking when comparing fractions and challenge them to prove their answer with different representations.

If your students need additional support with this content, consider using Small Group Lessons from these foundational mission during flex time:

- **G2M8**

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PARTICIPANT NOTES

CURRICULUM STUDY

G3M6 Display Data

22 Pages

Overview

1 **Read the Mission 6 Overview.**

Underline ways that students will apply multiplication and fraction knowledge from earlier missions to represent and analyze data.

Mission 6

Display Data

OVERVIEW

This mission builds on Grade 2 concepts about data, graphing, and line plots.

Topic A's Small Group Lessons begin with a lesson in which students generate categorical data, organize it, and then represent it in a variety of forms. Drawing on Grade 2 knowledge, students might initially use tally marks, tables, or graphs with one-to-one correspondence. By the end of the lesson, they show data in tape diagrams where units are equal groups with a value greater than 1. In the next two lessons, students rotate the tape diagrams vertically so that the tapes become the units or bars of scaled graphs. Students understand picture and bar graphs as vertical representations of tape diagrams and apply well-practiced skip-counting and multiplication strategies to analyze them. In Lesson 4, students synthesize and apply learning from Topic A to solve one- and two-step problems. Through problem solving, opportunities naturally surface for students to make observations, analyze, and answer questions such as, "How many more?" or "How many less?" Topic A's Independent Digital Lessons complement this progression with a focus on organizing and analyzing data in pictures and bar graphs.

In **Topic B**, students learn that intervals do not have to be whole numbers but can have fractional values that facilitate recording measurement data with greater precision. In Lesson 5, they generate a six-inch ruler marked in whole-inch, half-inch, and quarter-inch increments, using the Mission 5 concept of partitioning a whole into parts. This creates a conceptual link between measurement and recent learning about fractions. Students then use the rulers to measure the lengths of precut straws and record their findings to generate measurement data.

Lesson 6 reintroduces line plots as a tool for displaying measurement data. Although familiar from Grade 2, line plots in Grade 3 have the added complexity of including fractions on the number line. In this lesson, students interpret scales involving whole, half, and quarter units in order to analyze data. This experience lays the foundation for them to create their own line plots in Lessons 7 and 8. To draw line plots, students learn to choose appropriate intervals within which to display a particular set of data. For example, to show measurements of classmates' heights, students might notice that their data fall within the range of 45 to 55 inches and then construct a line plot with the corresponding interval.

Students end the mission by applying learning from Lessons 1–8 to problem solving. They work with a mixture of scaled picture graphs, bar graphs, and line plots to problem solve using both categorical and measurement data.

2 **Read and solve part a of this problem from the End-of-Mission Assessment.** Consider strategies your students may use to solve this problem.

Carol measures 16 bamboo shoots. Her measurements are recorded in the table below.

Heights of Bamboo Shoots (in inches)			
$93\frac{3}{4}$	$94\frac{1}{4}$	$94\frac{1}{2}$	$94\frac{3}{4}$
$94\frac{3}{4}$	95	$94\frac{3}{4}$	$95\frac{1}{4}$
$94\frac{1}{2}$	$94\frac{3}{4}$	$94\frac{3}{4}$	$94\frac{1}{2}$
95	$94\frac{3}{4}$	$94\frac{3}{4}$	95

a. Make a line plot of the bamboo shoot data. Explain your choice of scale.

3 **Now solve part b of this problem from the End-of-Mission Assessment.** Consider strategies your students may use to solve this problem.

b. How many more bamboo shoots measured $94\frac{3}{4}$ inches than both 95 and $94\frac{1}{2}$ inches combined?

Fluency

Many fluency activities in Mission 6 focus on knowing all products of 2 one-digit numbers, a Grade 3 core fluency. Let's look at an activity that works towards this fluency.

1

Read the Group Counting activity from Lesson 5.

How can you emphasize the relationship between multiplication and division in this activity?

Group Counting
(6 min)

Materials: (S) Personal white boards

Note: This group counting activity reviews units of 6 and the relationship between multiplication and division.

T: Count by sixes to 60. (Write on the board as students count.)
S: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60.

6	12	18	24	30	36	42	48	54	60
1 six	2 sixes	3 sixes	4 sixes	5 sixes	6 sixes	7 sixes	8 sixes	9 sixes	10 sixes
6 ÷ 6	12 ÷ 6	18 ÷ 6	24 ÷ 6	30 ÷ 6	36 ÷ 6	42 ÷ 6	48 ÷ 6	54 ÷ 6	60 ÷ 6

T: (Beneath 6, write 1 six. Point to the 12.) 12 is the same as how many sixes?
S: 2 sixes.
T: (Write 2 sixes beneath 12. Point to the 18.) 18 is the same as how many sixes?
S: 3 sixes.
T: (Write 3 sixes beneath 18. Point to 1 six.) Let's count units of 6. (Write as students count.)
S: 1 six, 2 sixes, 3 sixes, 4 sixes, 5 sixes, 6 sixes, 7 sixes, 8 sixes, 9 sixes, 10 sixes.
T: (Point to 60.) How many sixes are in 60?
S: 10 sixes.
T: (Beneath 10 sixes, write 60 ÷ 6 = ___.) What is 60 ÷ 6?
S: 10.

T: (Write 60 ÷ 6 = 10. Beneath 1 six, write 6 ÷ 6 = ___.) On your personal white board, write the number sentence.
S: (6 ÷ 6 = 1.)

Repeat the process for the rest of the chart.

We just looked at a fluency activity that focuses on fluency with products of 2 one-digit numbers.

2

Share your reflections on Group Counting with a partner.

How can you support students if they are not seeing the relationship between multiplication and division at this point in the year?

We just looked at one activity that focuses on the Grade 3 core fluency of finding the products of 2 one-digit numbers. Let's look at some others.

Skim through your Whole Group Fluency materials*.

If students need additional support in knowing all products of 2 one-digit numbers, which activities could you focus on to develop this fluency?

*Access Whole Group Fluency materials in the Teacher-Led materials instruction section of G3M6 mission page.

Many other fluency activities in Mission 6 give students additional practice working with data. Let's look at one of these activities.

Read the Read Bar Graphs activity from Lesson 6.

How do the group counting fluency activities help prepare students for this activity?

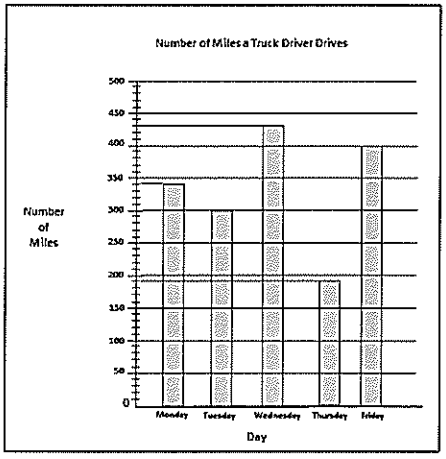
What strategies might your students use to solve how many miles the truck driver drove?

Read Bar Graphs
(4 min)

Materials: Number of Miles bar graph (Fluency Template) pictured (S) Personal white boards

Note: This fluency activity reviews Small Group Lesson 4. Students may initially need support beyond what is written below to find the exact number of miles driven, slightly extending the time this activity takes.

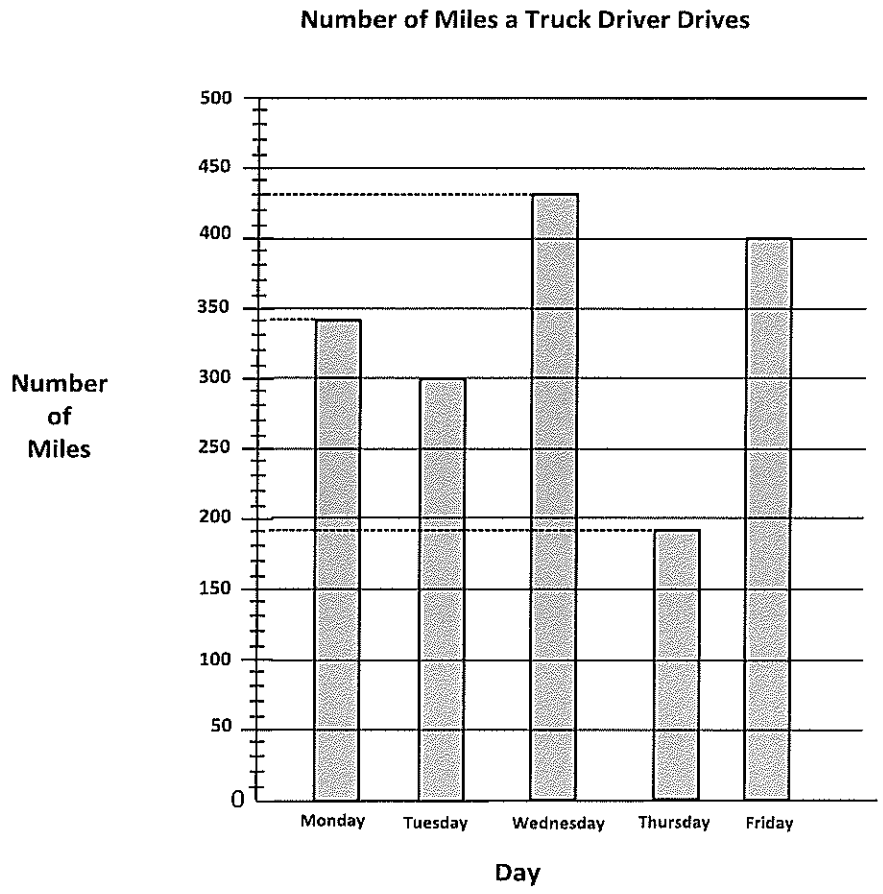
T: (Project the bar graph.) What does this bar graph show?
S: The number of miles a truck driver drove Monday through Friday.
T: On which day did the truck driver drive the most miles?
S: Wednesday.
T: On which day did the truck driver drive the least number of miles?
S: Thursday.
T: What is the scale for number of miles?
S: 50.
T: How many intervals are there between each 50?
S: 5.
T: On your boards, write a number sentence to show the value of the smaller intervals.
S: (Write 50 ÷ 5 = 10.)
T: How many miles did the truck driver drive on Monday?
S: 340 miles.
T: (Write 340 miles.)



Continue the process for the following: Tuesday, Wednesday, Thursday, and Friday.

T: Write a number sentence to find how many miles the truck driver drove from Monday through Wednesday.
S: (Write 340 + 300 + 430 = 1,070.)
T: Write a number sentence to find how many more miles the truck driver drove on Friday than on Thursday.
S: (Write 400 – 190 = 210.)

Number of Miles Bar Graph (Fluency Template)



We just looked at one example of a fluency activity in the mission that focuses on data. Let's find another one.

Skim through your Whole Group Fluency materials* again.

Which fluency activities could you focus on to give students more practice analyzing data?

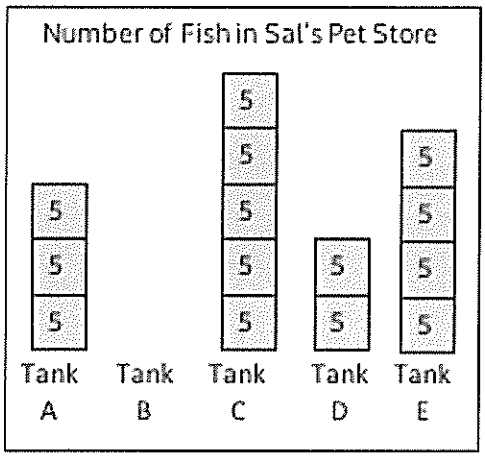
*Access **Whole Group Fluency** materials in the Teacher-Led instruction section of the **G3M6 mission page**.

Word Problems

In Mission 6 word problems, students apply their understanding of multiplication and fractions to solve problems about data. Let's look at a problem where students use multiplication.

1 **Read and solve Lesson 3's Whole Group Word Problem.**

Consider strategies your students may use to solve.



The vertical tape diagrams show the number of fish in Sal's Pet Store.

a. Find the total number of fish in Tank C.

b. Tank B has a total of 30 fish. Draw the tape diagram for Tank B.

c. How many more fish are in Tank B than in Tanks A and D combined?

Share what you notice about the student's solution with a partner.

What strategies would you choose to highlight with your whole class?

How can you support students in moving towards these strategies?

Now let's look at a problem where students use their understanding of fractions to solve.

3

Read and solve Lesson 7's Whole Group Word Problem.

What is tricky about this problem?

The chart shows the lengths of straws measured in Mr. Han's class.

Straw Lengths (in Inches)				
3	4	$4\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{3}{4}$
$3\frac{3}{4}$	$4\frac{1}{2}$	$3\frac{1}{4}$	4	$4\frac{3}{4}$
$4\frac{1}{4}$	5	3	$3\frac{1}{2}$	$4\frac{1}{2}$
$4\frac{1}{2}$	4	$3\frac{1}{4}$	5	$4\frac{1}{4}$

a. How many straws were measured?

b. What is the smallest measurement on the chart? The greatest?

c. Were the straws measured to the nearest inch? How do you know?

Share what you notice about the student's solution with a partner.

How will students' upcoming work with line plots help them analyze this data more efficiently?

We just looked at two word problems from Mission 6.

Skim through your Whole Group Word Problems materials.*

What problems do you anticipate will be most challenging for students? Why?

What questions could you ask students to support them in solving these problems?

* Access Whole Group Word Problems materials in the Teacher-Led Instruction section of the G3M6 mission page.

Small Group Lessons

Small Group Lessons focus on the big idea of the mission, using multiplication and fraction knowledge to represent and analyze data. Let's look at a lesson that uses multiplication.

Read Lesson 1.

How does this lesson build on students' understanding of multiplication and units?

Lesson 1

Generate and organize data.

YOUR NOTES

Note: Today's lesson uses the Problem Set. Solutions for each problem are included below.

Materials: (S) Problem Set (see Appendix), class list (preferably in alphabetical order, as shown to the right)

Part 1: Collect Data

List the following five colors on the board: green, yellow, red, blue, and orange.

T: Today you will collect information, or data. We will use a survey to find out each person's favorite color from one of the five colors listed on the board. How can we keep track of our data in an organized way? Turn and talk to your partner.

S: We can write everyone's name with the person's favorite color next to it. → We can write each name and color code it with the person's favorite color. → We can put it in a chart.

T: All of those ways work. One efficient way to collect and organize our data is by recording it on a tally chart. (Draw a single vertical tally mark on the board.) Each tally like the one I drew has a value of 1 student. Count with me. (Draw tally marks as students count.)

S: 1 student, 2 students, 3 students, 4 students, 5 students.

T: (Draw 𝍸.) This is how 5 is represented with tally marks. How might writing each fifth tally mark with a slash help you count your data easily and quickly? Talk to your partner.

S: It is bundling tally marks by fives. → We can bundle 2 fives as ten.

T: (Pass out the Problem Set and class list.) Find the chart on Problem 1 of your Problem Set (pictured to the right). Take a minute now to choose your favorite color out of those listed on the chart. Record

Room 7 - Third Grade
Mrs. Lee / Mrs. Prescott
Anna
Caleb
Charlotte
Christopher
Emily
Hyun Soo
James
Jia
Jinhee
John
Joseph
Josh
Jung
Kathy
Kylie
Matthew
Mike
Noah
Steven
Susan
William

your favorite color with a tally mark on the chart, and cross your name off your class list.

1. "What is your favorite color?" Survey the class to complete the tally chart below.

Favorite Colors	
Color	Number of Students
Green	
Yellow	
Red	
Blue	
Orange	

T: (Students record.) Take six minutes to ask each of your classmates, "What is your favorite color?" Record each classmate's answer with a tally mark next to his favorite color. Once you are done with each person, cross the person's name off your class list to help you keep track of who you still need to ask. Remember, you may not change your color throughout the survey.

S: (Conduct the survey for about six minutes.)

T: How many total students said green was their favorite color?

S: (Say the number of students.)

T: I am going to record it numerically on the board below the label *Green*.

Continue with the rest of the colors.

T: This chart is another way to show the same information.

T: Use mental math to find the total number of students surveyed. Say the total at my signal. (Signal.)

S: 22 students.

T: Discuss your mental math with your partner for 30 seconds.

S: I added 4 and then 2 to get 6. Six and 6 is 12, and then I noticed I had 10 left. Twelve and 10 is 22. → I made 2 tens—6 plus 4 and 7 plus 3—and then, I added 2 more.

Example Board:

Green	Yellow	Red	Blue	Orange
4	2	6	7	3

Total: 4 + 2 + 6 + 7 + 3 = 22

YOUR NOTES

Part 2: Construct a picture graph from the data.

YOUR NOTES

3. Use the tally chart in Problem 1 to complete the picture graphs below.

a.

Favorite Colors				
Green	Yellow	Red	Blue	Orange

Each ♡ represents 1 student.

b.

Favorite Colors				
Green	Yellow	Red	Blue	Orange

Each ♡ represents 2 students.

T: Using pictures or a picture graph, let's graph the data we collected. Read the directions for Problem 3 on your Problem Set (pictured to the right). (Pause for students to read.) Find the **key**, which tells you the value of a unit, on each picture graph. (Pause for students to locate the keys.) What is different about the keys on these two picture graphs?

S: In Problem 3(a), one heart represents 1 student, but in Problem 3(b), one heart represents 2 students.

T: Good observations! Talk to a partner: How would you represent 4 students in Problems 3(a) and 3(b)?

S: In Problem 3(a), I would draw 4 hearts. → In Problem 3(b), I would only draw 2 hearts because the value of each heart is 2 students.

T: (Draw ♡ ♡ ♡) Each heart represents 2 students, like in Problem 3(b). What is the value of this picture?

S: 6 students.

T: Write a multiplication sentence to represent the value of my picture, where the number of hearts is the number of groups, and the number of students is the size of each group.

S: (Write 3 × 2 = 6.)

T: Turn and talk: How can we use the hearts to represent an odd number like 5?

S: We can draw 3 hearts and then cross off a part of 1 heart to represent 5. → We can show half of a heart to represent 1 student.

T: What is the value of half of 1 heart?

S: 1 student.

T: I can estimate to erase half of 1 heart. (Erase half of 1 heart to show ♡ ♡ (.) Now, my picture represents a value of 5.

T: Begin filling out the picture graphs in Problem 3. Represent your tally chart data as hearts and half-hearts to make your picture graphs.

1. "What is your favorite color?" Survey the class to complete the tally chart below.

Favorite Colors	
Color	Number of Students
Green	𝍸 |
Yellow	||
Red	𝍸 |
Blue	𝍸 𝍸 ||
Orange	||

YOUR NOTES

2. Use the tally chart to answer the following questions.

a. How many students chose orange as their favorite color?

3 students chose orange.

b. How many students chose yellow as their favorite color?

2 students chose yellow

c. Which color did students choose the most? How many students chose it?

Students chose blue the most. 7 students chose blue.

d. Which color did students choose the least? How many students chose it?

Students chose yellow the least. 2 students chose yello

e. What is the difference between the number of students in (c) and (d)? Write a number sentence to show your thinking.

7-2=5 5 more students chose blue than yellow

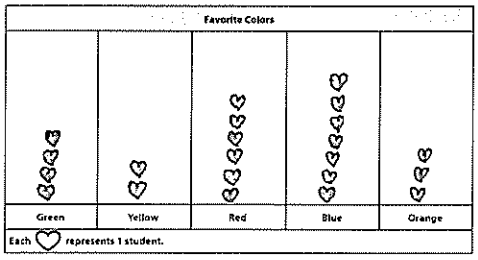
f. Write an equation to show the total number of students surveyed on this chart.

4+2+6+7+3=22 (4+2+6 = 12; 7+3 = 10)

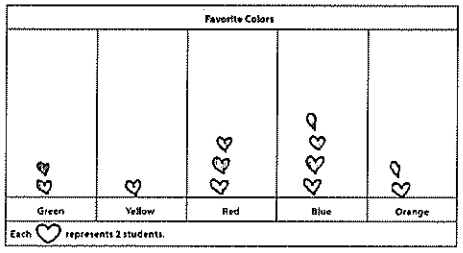
22 students were surveyed.

3. Use the tally chart in Problem 1 to complete the picture graphs below.

a.



b.



4. Use the picture graph in problem 3(b) to answer the following questions.

YOUR NOTES

a. What does each ♡ represent?

Each ♡ represents 2 students

b. Draw a picture and write a number sentence to show how to represent 3 students in your picture graph.

♡ ♡ 2 + 1 = 3
2 1

c. How many students does ♡♡♡♡♡♡♡ represent? Write a number sentence to show how you know.

7 x 2 = 14

It represents 14 students.

d. How many more ♡ did you draw for the color that students chose the most than for the color that students chose the least? Write a number sentence to show the difference between the number of votes for the color that students chose the most and the color that students chose the least.

I drew 2 $\frac{1}{2}$ more hearts for blue than for yellow.

7 - 2 = 5

5 more students chose blue than yellow.

NOTES

Debrief Questions

- Compare the data in the picture graphs in Problems 3(a) and 3(b).
- Share answers to Problems 4(c) and 4(d). What would Problem 4(d) look like as a multiplication sentence?
- Compare picture graphs with tally charts. What makes each one useful? What are the limitations of each?
- Why is it important to use the **key** to understand the value of a unit in a picture graph?
- What math vocabulary did we use today to talk about recording and gathering information? (*data, survey*)

Vocabulary

Students are familiar with tally marks and tally charts from their work in Grades 1 and 2. In Grades 1 and 2 they also used the word *table* to refer to these charts.

Multiple Means of Action and Expression

Precise sketching of hearts drawn in the picture graph of Problem 3 may prove challenging for students working below grade level and others. The task of completing the picture graph may be eased by providing pre-cut hearts and half-hearts that can be glued. Alternatively, offer the option to draw a more accessible picture, such as a square. If students choose a different picture, they need to be sure to change the key in order to reflect their choice.

Multiple Means of Representation

Familiarize English language learners and others with common language used to discuss data, such as *most common, favorite, how many more*, and *how many less*. Offer explanations in students' first language, if appropriate.

We just read Lesson 1, a lesson that uses multiplication knowledge to represent and analyze data.

Look at Part 2 from Lesson 1 again.

What guiding questions could you ask to help students draw the picture graphs?

How can you draw upon students' previous work with multiplication and division to help them with picture graphs?

We looked at a Small Group Lesson that focuses on using multiplication to represent and analyze data. Now take a look at a lesson that uses fractions.

Skim Topic B in your Small Group Lessons materials* to find another lesson from Mission 6.

How does this lesson build on students' understanding of fractions?

What misconceptions do you anticipate your students may have, and how will you address them?

*Access **Small Group Lessons** materials in the Teacher-Led instruction section of the **G3M6 mission page**.

Learning Extension

With Zearn Math, students learn content in two ways. During today's Grade 3 Mission 6 Study, we explored one way - **Teacher-Led Instruction.**

As learning extension work, we recommend that you complete all the **Independent Digital Lessons** to explore the other way that students will learn content in Grade 3 Mission 6. We have highlighted some of these lessons below, and have suggested ways to incorporate content from these lessons into your live instruction.

Focus on the following lessons in Grade 3 Mission 6:

- **Lesson 3**
  This is an important lesson as students learn to create scaled bar graphs, a key difference from their previous work with data. While creating graphs during your Small Group Lessons, have students discuss their title, scale, and key, as well as their calculations to ensure a deep understanding of this representation.

- **Lesson 7**
  This lesson may be tricky for students as they need to make observations and answer questions about the distribution of the data. Review language such as "most frequent", "at least", and "most common" during your Small Group Lessons and Whole Group Fluency to ensure students are comfortable with the language used in different data analysis questions.

- **Lesson 9**
  This lesson brings together many concepts from the mission, having students solve word problems with picture graphs and line plots. During your Small Group Lesson, have students discuss which graph they would use to display different sets of data and their choices in creating their graph, like their scale and interval. This Independent Digital Lesson also gives students the opportunity to digitally build a line plot.

If your students need additional support with this content, consider using Small Group Lessons from these foundational missions during flex time:

- **G2M7**