TEKSING TOWARD STAAR

MATHEMATICS ®

GRADE 5

TEKS/STAAR-BASED LESSONS

TEACHER GUIDE
Six Weeks 1

TEKSING TOWARD STAAR SCOPE AND SEQUENCE
Grade 5 Mathematics

SIX WEEKS 1

Lesson	TEKS-BASED LESSON CONTENT	STAAR Category Standard	Spiraled Practice	Student (SA) and Hands-On (HO) Activity	Problem Solving	Skills and Concepts Homework
Lesson 1 ____ days	**5.2A/**represent the value of the digit in decimals through the thousandths using expanded notation and numerals	Category 1 Supporting	SP 1 SP 2	HO 1 SA 1 SA 2	PS 1 PS 2	Homework 1 Homework 2
Lesson 2 ____ days	**5.2B**/compare and order two decimals to thousandths and represent comparisons using the symbols >, <, or =	Category 1 Readiness	SP 3 SP 4	SA 1 HO 1 SA 2	PS 1 PS 2	Homework 1 Homework 2
Lesson 3 ____ days	**5.4A/** identify prime and composite numbers	Category 1 Supporting	SP 5 SP 6	HO 1 SA 1 HO 2	PS 1	Homework 1
Lesson 4 ____ days	**5.3B/**multiply with fluency a three-digit number by a two-digit number using the standard algorithm **5.3A/**estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division	Category 2 Supporting Category 2 Supporting	SP 7 SP 8 SP 9	SA 1 SA 2 HO 1	PS 1 PS 2	Homework 1 Homework 2
Lesson 5 ____ days	**5.3D/**represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models **5.3E/**solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers	Category 2 Supporting Category 2 Readiness	SP 10 SP 11 SP 12	SA 1 HO 1 SA 2	PS 1 PS 2	Homework 1 Homework 2 Homework 3
Lesson 6 ____ days	**5.4H/**represent and solve problems related to perimeter and/or area…	Category 3 Readiness	SP 13 SP 14	HO 1 SA 1 SA 2 HO 2 SA 3 SA 4 HO 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 7 ____ days	**5.9A/**represent categorical data with bar graphs… **5.9C/**Solve one- and two-step problems using data from…a bar graph…	Category 4 Supporting Category 4 Readiness	SP 15 SP 16	SA 1 SA 2 HO 1	PS 1 PS 2	Homework 1 Homework 2
Lesson 8 ____ days	**5.10A/**define income tax, payroll tax, sales tax, and property tax	Category 4 Supporting	SP 17 SP 18	SA 1 SA 2 HO 1	PS 1 PS 2	Homework 1 Homework 2

SIX WEEKS 1

Lesson	TEKS-BASED LESSON CONTENT	STAAR Category Standard	Spiraled Practice	Student (SA) and Hands-On (HO) Activity	Problem Solving	Skills and Concepts Homework
Lesson 9 ____ days	**5.3K**/add and subtract positive rational numbers fluently **5.2C**/round decimals to tenths or hundredths **5.3A**/estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division	Category 2 Readiness Category 1 Supporting Category 2 Supporting	SP 19 SP 20	SA 1 HO 1 SA 2 SA 3 HO 1	PS 1 PS 2 PS 3	Homework 1 Homework 2 Homework 3
Review	**Six Weeks 1 Open-Ended Review**					
Assessment	**Six Weeks 1 Assessment**					

NOTES:

GRADE 5 MATERIALS LIST - SIX WEEKS 1

LESSON	MATERIALS NEEDED
1	**1. Teacher Notes: Problem-Solving 1** Per pair of students: 1 set of 9 number cards **2. Hands-On Activity 1** Per pair of students: 3 different color pencils, meter stick, scissors, 50 cm x 50 cm white paper square (cut from butcher paper or large sheets of white art paper)
2	**1. Hands-On Activity 1** Per class: Decimal Cards (copy on cardstock so that you will have one class set. Place the decimal cards in one zipper baggie and the blank cards in another zipper baggie.), 15-20 foot length of wide painter's tape for this activity for each class, black permanent marker Per pair of students: 1 dry erase marker
3	**1. Teacher Notes: Problem-Solving 1** Per 4 students: (Copy this page on light color paper. Then cut apart on the dashed lines. This page makes enough 100 charts for 2 partner pairs.) **2. Hands-On Activity 1** Per group of 4: 50 color tiles, 4 sheets 1-inch grid paper (copy extra grid paper), crayons, scissors, glue sticks, colored construction paper **3. Hands-On Activity 2** Per pair of students: 1 Goldbach's Number Conjecture Record
4	**1. Hands-On Activity 1** Per student: 1 Multiplication Makes Sense Problems page (copy of colored paper), 1 Creator's Products and Check page (copy on a second color paper), 1 Partner's Products and Check page (copy on a third color paper)
5	**1. Student Activity 1** Per pair of students: 1 set of base-ten blocks in a zipper baggie (2 flats, 20 rods, and 20 small cubes), 1 set of color tiles in a zipper baggie (25 red, 25 blue, 25 green, and 25 yellow), 5 different color pencils **2. Hands-On Activity 1** Per pair of students: Two 8.5 by 5.5 inch cards (cut sheets of colored cardstock in half), sets of base-ten blocks in zipper baggies, sets of color tiles in zipper baggies, sets of color pencils in zipper baggies
6	**1. Hands-On Activity 1** Per group of 4: 1 set of pattern blocks (6 of each shape in a zipper baggie), 8 sheets of Pattern Block Triangle Paper Per teacher: 1 set of transparent overhead pattern blocks for projection **2. Hands-On Activity 2** Per pair of students: Color tiles (60 each of 2 different colors in a zipper baggie), Color Tile Grid Paper, colored markers (per teacher) set of transparent overhead color tiles for projection

GRADE 5 MATERIALS LIST - SIX WEEKS 1

LESSON	MATERIALS NEEDED
6 (cont'd)	**3. Student Activity 4** Per group of 4: 1 meterstick, 1 yardstick, 1 metric/standard measuring tape, 1 standard ruler, 1 metric ruler **4. Hands-On Activity 3** Per group of 4: 1 rectangular box, 1 metric/standard ruler
7	**1. Hands-On Activity 1** Per class: 1 set of Student Number Cards (copy on cardstock and cut apart), 1 set of Cafeteria Survey Question Assignment Cards, (copy on cardstock and cut apart) Per group of 4: 1 sheet of butcher paper, colored markers, metric and standard rulers
8	**1. Hands-On Activity 1** Per pair of students: 1 "Taxes in Exchange for Goods and Services" data record **2. Teacher Resource:** http://economicstexas.org/ - download *free Personal Financial Literacy for Grade 4-6 Classrooms* from the Texas Council on Economic Education **Lesson 1: The Case of the Disappearing Paycheck**
9	

GRADE 5 TEKS-BASED ASSESSMENTS – SIX WEEKS 1
TEKS Correlation and Answer Key for Mini-Assessments

Mini-Assessment And TEKS Assessed	TEKS and Answer Key									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Lesson 1 MA 5.2A	D	H	A	G	C	F	A	J	B	J
Lesson 2 MA 5.2B	A	J	B	G	B	J	C	H	D	J
Lesson 3 MA 5.4A	D	G	D	F	D	J	A	H	C	H
Lesson 4 MA 5.3B/5.3A	B 5.3B	H 5.3B	D 5.3B	J 5.3B	C 5.3B	F 5.3A	C 5.3A	720 5.3A	A 5.3A	G 5.3A
Lesson 5 MA 5.3D/5.3E	D 5.3D	H 5.3D	B 5.3D	H 5.3D	B 5.3D	F 5.3E	B 5.3E	J 5.3E	C 5.3E	G 5.3E
Lesson 6 MA 5.4H	C	J	C	108	C	J	B	H	D	H
Lesson 7 MA 5.9A/5.9C	A	H	B	J	A	J	A	J	A	73
Lesson 8 MA 5.10	C	G	C	J	D	H	D	H	A	97.20
Lesson 9 MA 5.3K/5.2C/5.3A	85.1 5.3K	H 5.3K	C 5.3K	F 5.3K	A 5.2C	G 5.2C	B 5.2C	H 5.3A	D 5.3A	F 5.3A

Lesson 2

5.2B LESSON & ASSESSMENT

Lesson Focus

For TEKS 5.2B students are expected to compare and order two decimals to thousandths and represent comparisons using the symbols >, <, or =.

For this TEKS students should be able to apply mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value.

For STAAR Category 1 students should be able to demonstrate an understanding of how to represent and manipulate numbers and expressions.

Process Standards Incorporated Into Lesson

5.1.A Apply mathematics to problems arising in everyday life, society, and the workplace.

5.1.E Create and use representations to organize, record, and communicate mathematical ideas.

Materials Needed for Lesson

1. Hands-On Activity 1

Per class: Decimal Cards (copy on cardstock so that you will have one class set. Place the decimal cards in one zipper baggie and the blank cards in another zipper baggie.), 15-20 foot length of wide painter's tape for this activity for each class, black permanent marker

Per pair of students: 1 dry erase marker

Vocabulary for Lesson

PART I
decimal
compare
order
= is equal to
> is greater than
< is less than

Math Background Part I - Compare Decimals

Place-value charts and number lines can be used to compare decimals. The place value of the digits can also be used to compare decimals. The symbols used to compare numbers are: **<** (is less than), **>** (is greater than), and **=** (is equal to).

NOTE: Remember, placing a zero at the end of a decimal does not change its value.

5.4 = 5.40

15.34 = 15.340

715.04 = 715.04**0**

Place-Value Chart to Compare Decimals

Looking at the numbers in a place-value chart can help compare decimals.

EXAMPLE 1: Use a place-value chart to compare 2.7 and 2.725.

Zeros can be written at the end of 2.7 until it has the same number of digits to the right of the decimal point as 2.725. So, 2.7 = 2.7**00**.

Ones	.	Tenths	Hundredths	Thousandths
2	.	7	**0**	**0**
2	.	7	2	5

- Start at the left. Look at the digits in the ones place.

  2.700 2.725

  Both numbers have a 2 in the ones place.
- Look at the digits in the tenths place.

  2.700 2.725

  Both numbers have a 7 in the tenths place.
- Look at the digits in the hundredths place.

  2.700 2.725

Since 2 > 0, then 2.725 > 2.700 and 2.700 < 2.725.

EXAMPLE 2: Use a place-value chart to compare 0.227 and 0.28.

Zeros can be written at the end of 0.28 until it has the same number of digits to the right of the decimal point as 0.227. So, 0.28 = 0.28**0**.

Ones	.	Tenths	Hundredths	Thousandths
0	.	2	2	7
0	.	2	8	**0**

- Start at the left. Look at the digits in the ones place.

  0.227 0.280

  Both numbers have a 0 in the ones place.
- Look at the digits in the tenths place.

  0.227 0.280

  Both numbers have a 2 in the tenths place.
- Look at the digits in the hundredths place.

  0.227 0.280

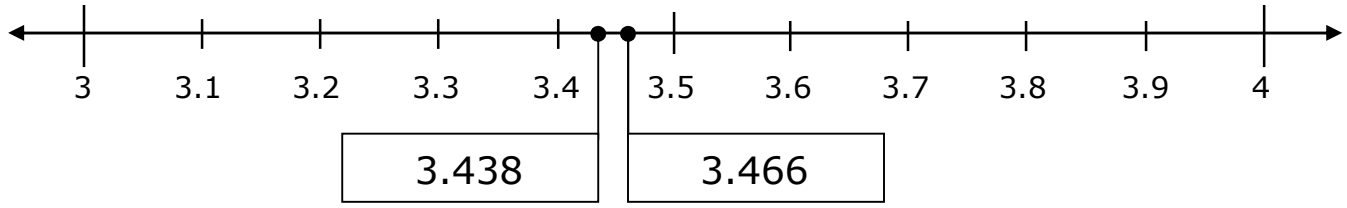
Since 8 > 2, then 0.28 > 0.227 and 0.227 < 0.28.

Number Line to Compare Decimals

Looking at decimals on a number line can also help compare the numbers.

EXAMPLE: Compare 3.466 and 3.438.

• Place 3.466 and 3.438 on a number line.



• Both numbers are greater than 3 and less than 4.

• The numbers are the same in the ones and tenths places.

• Look at the hundredths places. 3 < 6, therefore 3.438 comes first on the number line between 3.4 and 3.5.

• 3.466 is a little to the right of the middle between 3.4 and 3.5.

• 3.438 is closer to 3.4 than 3.5.

• 3.466 is closer to 3.5 than 3.4.

So, 3.438 < 3.466 and 3.466 > 3.438.

Place-Value to Compare Decimals

A simple way to compare decimals is to use what you know about place-value.

EXAMPLE: Compare 2.49 and 2.485.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Compare the hundredths.
2.49 ↓ 2.485	2.49 ↓ 2.485 2 = 2	2.49 ↓ 2.485 4 = 4	2.49 ↓ 2.485 9 > 8

Since 9 > 8, then 2.49 > 2.485 and 2.485 < 2.49

Compare Decimals

Place-value charts and number lines can be used to compare decimals.

The place value of the digits can also be used to compare decimals.

The symbols used to compare numbers are:
< (is less than), **>** (is greater than), and
= (is equal to).

NOTE

Remember, placing a zero at the end of a decimal does not change its value.

$$5.4 = 5.4\mathbf{0}$$

$$15.34 = 15.34\mathbf{0}$$

$$715.04 = 715.04\mathbf{0}$$

Place-Value Chart to Compare Decimals

Looking at the numbers in a place-value chart can help compare decimals.

EXAMPLE 1

Use a place-value chart to compare 2.7 and 2.725.

Zeros can be written at the end of 2.7 until it has the same number of digits to the right of the decimal point as 2.725. So, 2.7 = 2.7**00**.

Ones	.	Tenths	Hundredths	Thousandths
2	.	7	**0**	**0**
2	.	7	2	5

- Start at the left.
  Look at the digits in the ones place.

  2.700 2.725

  Both numbers have a 2 in the ones place.
- Look at the digits in the tenths place.

  2.700 2.725

  Both numbers have a 7 in the tenths place.
- Look at the digits in the hundredths place.

  2.700 2.725

Since 2 > 0, then 2.725 > 2.700 and 2.700 < 2.725.

EXAMPLE 2

Use a place-value chart to compare 0.227 and 0.28.

Zeros can be written at the end of 0.28 until it has the same number of digits to the right of the decimal point as 0.227. So, 0.28 = 0.28**0**.

Ones	.	Tenths	Hundredths	Thousandths
0	.	2	2	7
0	.	2	8	**0**

- Start at the left.
  Look at the digits in the ones place.

  0.227 0.280

  Both numbers have a 0 in the ones place.
- Look at the digits in the tenths place.

  0.227 0.280

  Both numbers have a 2 in the tenths place.
- Look at the digits in the hundredths place.

  0.227 0.280

Since 8 > 2, then 0.28 > 0.227 and

0.227 < 0.28.

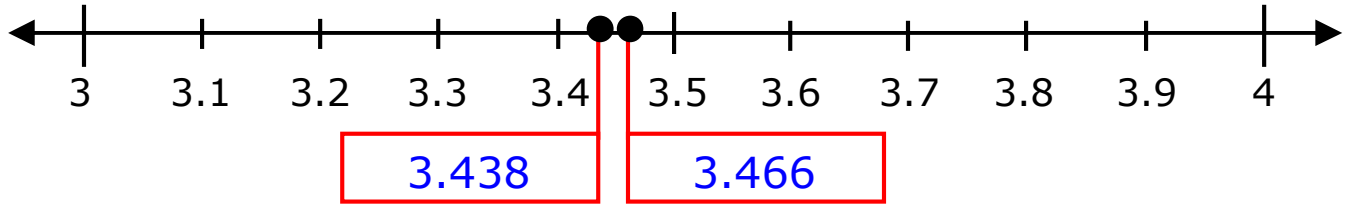
Number Line to Compare Decimals

Looking at decimals on a number line can also help compare the numbers.

EXAMPLE

Compare 3.466 and 3.438.

- Place 3.466 and 3.438 on a number line.



- Both numbers are greater than 3 and less than 4.
- The numbers are the same in the ones and tenths places.
- Look at the hundredths places.
  3 < 6, therefore 3.438 comes first on the number line between 3.4 and 3.5.
- 3.466 is a little to the right of the middle between 3.4 and 3.5.
- 3.438 is closer to 3.4 than 3.5.
- 3.466 is closer to 3.5 than 3.4.

So, 3.438 < 3.466 and 3.466 > 3.438.

Place-Value to Compare Decimals

A simple way to compare decimals is to use what you know about place-value.

EXAMPLE

Compare 2.49 and 2.485.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Compare the hundredths.
2.49 ↓ 2.485	2.49 ↓ 2.485 2 = 2	2.49 ↓ 2.485 4 = 4	2.49 ↓ 2.485 9 > 8

Since 9 > 8, then 2.49 > 2.485 and 2.485 < 2.49.

Problem-Solving 1

The coaches of six teams kept a record of the total number of miles the members of their team ran to prepare for a cross-country meet.

Miles to Prepare for Meet	
Team	Number of Miles
Red	133.34
White	127.401
Blue	133.309
Yellow	139.1
Green	134.003
Brown	127.43

1. Write a true comparison for the number of miles for Team Brown and Team White. Use > or < in the comparison.

2. Explain why your comparison is correct.

3. Write a different true comparison for the number of miles for Team Brown and Team White. Use > or < in the comparison.

4. Explain why your comparison is correct.

Miles to Prepare for Meet	
Team	Number of Miles
Red	133.34
White	127.401
Blue	133.309
Yellow	139.1
Green	134.003
Brown	127.43

5. Write a true comparison for the number of miles for Team Red and Team Blue. Use > or < in the comparison.

6. Explain why your comparison is correct.

7. Write a different true comparison for the number of miles for Team Red and Team Blue. Use > or < in the comparison.

8. Explain why your comparison is correct.

Student Activity 1

Work with a partner to complete Student Activity 1.

PROBLEM 1: Use a place-value chart to compare 0.238 and 0.24.

Ones	.	Tenths	Hundredths	Thousandths

Remember: Zeros can be placed at the end of a decimal without changing its value.

- Start at the _____. Look at the digits in the _____ place.

  Both numbers have a _____ in the ones place.

- Look at the digits in the _____ place.

  Both numbers have a _____ in the tenths place.

- Look at the digits in the _____ place.

Since ___ > ___, then _____ > _____ and _____ < _____.

PROBLEM 2: Use a place-value chart to compare 2.345 and 2.327.

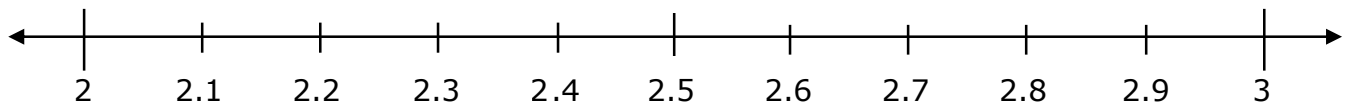
Ones	.	Tenths	Hundredths	Thousandths

- Compare the decimals starting at the first digit on the _____.
- First, look in the _____ place. Both decimals have a ____ in the ones place.
- Next, look in the _____ place. Both decimals have a ____ in the tenths place.
- Now, move to the _____ place. One number has a ____ in the hundredths place and the other number has a ____ in the hundredths place.

Since ___ > ___, then _____ > _____ and _____ < _____.

PROBLEM 3: Use a number line to compare 2.345 and 2.367.

- Place a point at the location of 2.345 and 2.367. Label each point with the number it represents.



- Both numbers are greater than _____ and less than _____.
- The number _____ comes first on the number line between 2.3 and _____ because _____ __ _____
- The number _____ is a little closer to 2.3 than _____.
- The number _____ is a little closer to _____ than 2.3.

So, _____ > _____ and _____ < _____.

PROBLEM 4: Use a place-value chart to compare 0.672 and 0.68.
Remember: Zeros can be placed at the end of a decimal without changing its value.

Ones	.	Tenths	Hundredths	Thousandths

- Start at the _____. Look at the digits in the _____ place.

  Both numbers have a _____ in the ones place.
- Look at the digits in the _____ place.

  Both numbers have a _____ in the tenths place.
- Look at the digits in the _____ place.

Since ___ > ___, then _____ > _____ and _____ < _____.

PROBLEM 5: Use what you know about place-value to compare 8.637 and 8.673.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Compare the hundredths.
__._____ ↓ __._____	__._____ ↓ __._____ ___ = ___	__._____ ↓ __._____ ___ = ___	__._____ ↓ __._____ ___ __ ___

Since ___ __ ___, then _____ > _____ and _____ < _____.

Explain how you know your answers are correct.

PROBLEM 6: Use a place-value chart to compare 3.468 and 3.486.

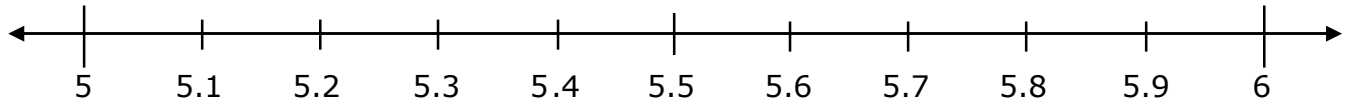
Ones	.	Tenths	Hundredths	Thousandths

- Compare the decimals starting at the first digit on the _____.
- First, look in the _____ place. Both decimals have a ____ in the ones place.
- Next, look in the _____ place. Both decimals have a ____ in the tenths place.
- Now, move to the _____ place. One number has a ____ in the hundredths place and the other number has a ____ in the hundredths place

Since ___ > ___, then _____ > _____ and _____ < _____.

PROBLEM 7: Use a number line to compare 5.432 and 5.474.

- Place a point at the location of 5.432 and 5.474. Label each point with the number it represents.



- Both numbers are greater than _____ and less than _____.
- The number _____ comes first on the number line between 5.4 and _____ because _____ __ _____
- The number _____ is closer to 5.4 than _____.
- The number _____ is closer to _____ than 5.4

So, _____ > _____ and _____ < _____.

PROBLEM 8: Use what you know about place-value to compare 4.44 and 4.044.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Compare the hundredths.
__._____ ↓ __._____	__._____ ↓ __._____ ___ = ___	__._____ ↓ __._____ ___ = ___	__._____ ↓ __._____ ___ __ ___

Since ___ __ ___, then _____ > _____ and _____ < _____.

NAME_____ DATE_____ SCORE ___/5

5.2B Skills and Concepts Homework 1

The chart shows the number of meters five miniature cars traveled in a distance contest. Use the chart to complete Problem 1 and Problem 2.

Miniature Car Distance Contest

Car	Meters Traveled
Chevy	4.407
Ford	4.397
Toyota	4.419
Mazda	4.346
Dodge	4.908

1. Use a place-value chart to compare the distances the Ford and the Mazda traveled.

Ones	.	Tenths	Hundredths	Thousandths

_____ > _____ and _____ < _____.

Explain how your know your answers are correct.

2. Use a place-value chart to compare the distances the Chevy and the Toyota traveled.

Ones	.	Tenths	Hundredths	Thousandths

_____ > _____ and _____ < _____.

Explain how your know your answers are correct.

3. Teri has these numbers cards.

She is making a number with the greatest possible value using all the number cards, placing the 6 card in the hundredths place, and placing the 3 card in the thousandths place.

What number will Teri make? _____

Explain how you know your answer is correct.

Next, Teri is using the same five number cards to make a number with the least possible value using all the number cards, placing the 6 card in the thousandths place, and placing the 4 card in the tens place.

What number will Teri make? _____
Explain how you know your answer is correct.

Cheri cut crepe paper streamers for her sister's surprise birthday party. The yellow streamer is 5.861 meters long, the red streamer is 5.453 meters long, the blue streamer is 5.809 meters long, and the green streamer is 5.464 meters long. Use this information to complete Problem 4 and Problem 5.

4. Use a number line to compare the lengths of the yellow and blue streamers.
   - Place a point at the location of the length of each streamer. Label each point with the number it represents.

_____ > _____ and _____ < _____.

5. Use what you know about place-value to compare the lengths of the red streamer and green streamer.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Compare the hundredths.
__.____ ↓ __.____	__.____ ↓ __.____ ___ = ___	__.____ ↓ __.____ ___ = ___	__.____ ↓ __.____ ___ __ ___

Since ___ __ ___, then _____ > _____ and _____ < _____.

Explain how you know your answers are correct.

Math Background Part II - Ordering Decimals

Place-value charts and number lines can be used to order decimals. The place value of the digits can also be used to order decimals.

NOTE: Remember, placing a zero at the end of a decimal does not change its value.

5.4 = 5.40

15.34 = 15.340

715.04 = 715.040

Place-Value Chart to Order Decimals

Looking at the numbers in a place-value chart can help order decimals.

EXAMPLE 1: Use a place-value chart to order 5.602, 5.51, 0.871 and 4.52 from least to greatest.

Remember: Zeros can be written at the end of a decimal without changing its value.

Ones	.	Tenths	Hundredths	Thousandths
5	.	6	0	2
5	.	5	1	**0**
0	.	8	7	1
4	.	5	2	**0**

- Start at the left. Three of the numbers have a 4 or a 5 in the ones place.

  5.602 5.510 0.871 4.520

  These numbers will be greater than the number that has a zero in the ones place. The least number is 0.871.

- Two of the numbers have a 5 in the ones place and one of the numbers has a 4 in the ones place.

  5.602 5.51 4.520

  The number with a 4 in the ones place is less than the numbers with a 5 in the ones place.

- Decide which of the two numbers with a 5 in the ones place is less. Look at the next place value, the tenths place.

  5.602 5.510

  One of the numbers with a 5 in the ones place has a 6 in the tenths place.

  The other number with a 5 in the ones place has a 5 in the tenths place.

  Since 5 is less than 6, the number 5.51 is less than the number 5.602.

The numbers in order from least to greatest are as follows:

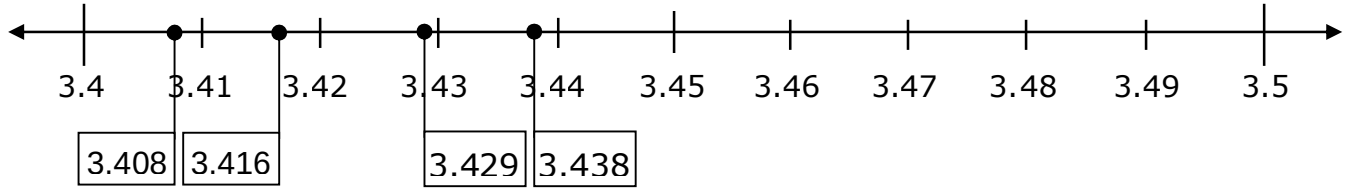
$$0.871 < 4.52 < 5.51 < 5.602$$

Number Line to Order Decimals

Looking at decimals on a number line can also help order the numbers.

EXAMPLE: Order 3.416, 3.438, 3.408 and 3.429.

- Place 3.416, 3.438, 3.408 and 3.439 on a number line.



- All four numbers are greater than 3.4 and less than 3.5.
- The numbers are the same in the ones and tenths places.
- Look at the hundredths places. 3.40 < 3.41 < 3.42 < 3.43, therefore 3.408 comes first on the number line between 3.4 and 3.41.

  3.408 is closer to 3.41 than 3.4.
- 3.416 comes next on the number line between 3.41 and 3.42.

  3.416 is closer to 3.42 than 3.41.
- 3.429 comes next on the number line between 3.42 and 3.43.

  3.429 is closer to 3.43 than 3.42.
- 3.438 comes last on the number line between 3.43 and 3.44.

  3.438 is closer to 3.44 than 3.43.

So, 3.438 > 3.429 > 3.416 > 3.408 and 3.408 < 3.416 < 3.429 < 3.438.

Place-Value to Order Decimals

A simple way to order decimals is to use what you know about place-value.

EXAMPLE: Order 2.497, 2.45, 2.479 and 2.48.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Continue to compare the tenths.
2.497 ↓ 2.45 ↓ 2.479 ↓ 2.48	2.497 ↓ 2.45 ↓ 2.479 ↓ 2.48 2 = 2 = 2 =2	2.497 ↓ 2.45 ↓ 2.479 ↓ 2.48 9 > 5 9 > 7 9 > 8 So, 2.497 is the greatest number.	2.45 ↓ 2.479 ↓ 2.48 8 > 5 and 7, so 2.48 is the next greatest number. 7 > 5, so 2.479 is the next greatest number, and 2.45 is the least number.

So, 2.497 > 2.48 > 2.479 > 2.44 and 2.44 < 2.479 < 2.48 < 2.497.

Ordering Decimals

Place-value charts and number lines can be used to order decimals. The place value of the digits can also be used to order decimals.

NOTE

Remember, placing a zero at the end of a decimal does not change its value.

$$5.4 = 5.40$$

$$15.34 = 15.340$$

$$715.04 = 715.040$$

Place-Value Chart to Order Decimals

Looking at the numbers in a place-value chart can help order decimals.

EXAMPLE 1

Use a place-value chart to order 5.602, 5.51, 0.871 and 4.52 from least to greatest.

Remember

Zeros can be written at the end of a decimal without changing its value.

Ones	.	Tenths	Hundredths	Thousandths
5	.	6	0	2
5	.	5	1	**0**
0	.	8	7	1
4	.	5	2	**0**

- Start at the left.
  Three of the numbers have a 4 or a 5 in the ones place.

  5.602 5.510 0.871 4.520

  These numbers will be greater than the number that has a zero in the ones place.

  The least number is 0.871.

Ones	.	Tenths	Hundredths	Thousandths
5	.	6	0	2
5	.	5	1	**0**
0	.	8	7	1
4	.	5	2	**0**

- Two of the numbers have a 5 in the ones place and one of the numbers has a 4 in the ones place.

  5.602 5.51 4.520

  The number with a 4 in the ones place is less than the numbers with a 5 in the ones place.

- Decide which of the two numbers with a 5 in the ones place is less. Look at the next place value, the tenths place.

  5.602 5.510

  One of the numbers with a 5 in the ones place has a 6 in the tenths place.

  The other number with a 5 in the ones place has a 5 in the tenths place.

  Since 5 is less than 6, the number 5.51 is less than the number 5.602.

The numbers in order from least to greatest are: 0.871 < 4.52 < 5.51 < 5.602

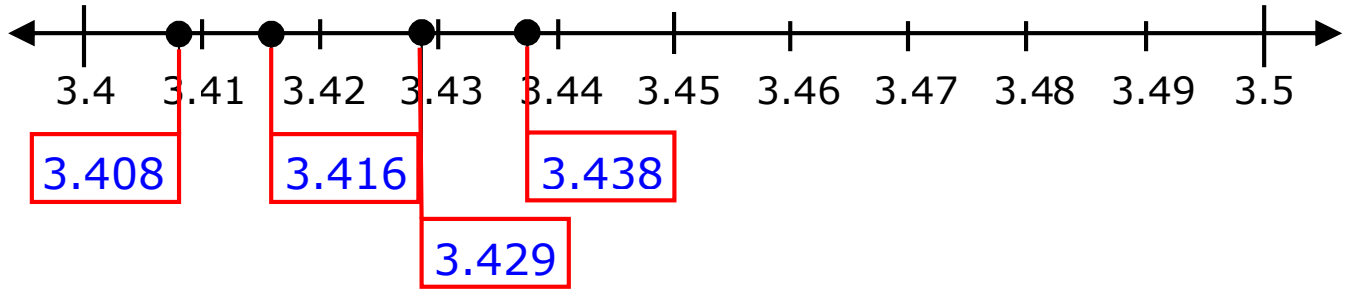
Number Line to Order Decimals

Looking at decimals on a number line can also help order the numbers.

EXAMPLE

Order 3.416, 3.438, 3.408 and 3.429.

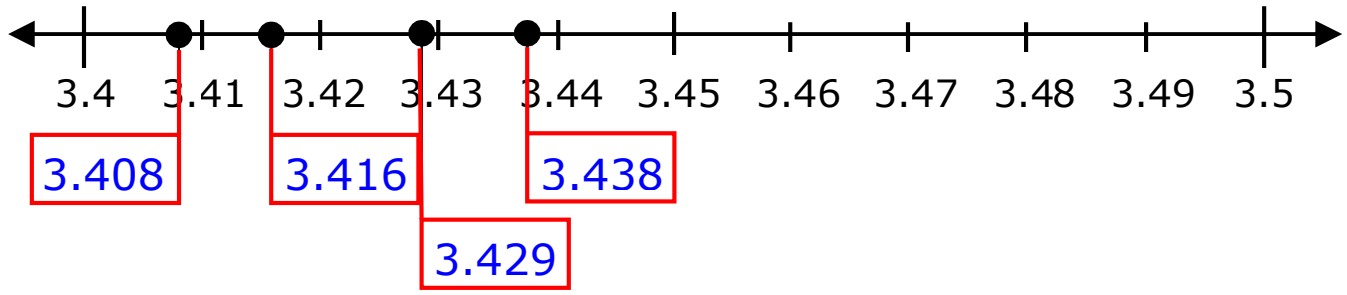
- Place 3.416, 3.438, 3.408 and 3.439 on a number line.



- All four numbers are greater than 3.4 and less than 3.5.
- The numbers are the same in the ones and tenths places.
- Look at the hundredths places.

  3.40 < 3.41 < 3.42 < 3.43, therefore 3.408 comes first on the number line between 3.4 and 3.41.

  3.408 is closer to 3.41 than 3.4.



- 3.416 comes next on the number line between 3.41 and 3.42.

  3.416 is closer to 3.42 than 3.41.

- 3.429 comes next on the number line between 3.42 and 3.43.

  3.429 is closer to 3.43 than 3.42.

- 3.438 comes last on the number line between 3.43 and 3.44.

  3.438 is closer to 3.44 than 3.43.

So, 3.438 > 3.429 > 3.416 > 3.408 and

3.408 < 3.416 < 3.429 < 3.438.

Place-Value to Order Decimals

A simple way to order decimals is to use what you know about place-value.

EXAMPLE

Order 2.497, 2.45, 2.479 and 2.48.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Continue to compare the tenths.
2.497 ↓ 2.45 ↓ 2.479 ↓ 2.48	2.497 ↓ 2.45 ↓ 2.479 ↓ 2.48 2 = 2 = 2 = 2	2.497 ↓ 2.45 ↓ 2.479 ↓ 2.48 9 > 5 9 > 7 9 > 8 So, 2.497 is the greatest number.	2.45 ↓ 2.479 ↓ 2.48 8 > 5 and 7, so 2.48 is the next greatest number. 7 > 5, so 2.479 is the next greatest number, and 2.45 is the least number.

So, 2.497 > 2.48 > 2.479 > 2.44 and

2.44 < 2.479 < 2.48 < 2.497.

Problem-Solving 2

The table shows the batting averages for five players who were on the Texas Rangers.

Texas Rangers Batting Averages	
Player	Batting Average
L. Nix	0.304
A. Soriano	0.296
K. Mench	0.271
H. Blalock	0.299
M. Young	0.322

NOTE

The lowest batting average number is the best batting average.

1. List the batting averages in order from best to worst.

2. List the names of the players in order from the player with the worst batting average to the player with the best batting average.

3. E. Kunz had a batting average that is better than L. Nix's but worse that M. Young's. List 3 possible batting averages for E. Kunz.

4. Explain why the possible batting averages for E. Kunz are correct.

Teacher Notes: Hands-On Activity 1

Materials: Decimal Cards (copy on cardstock so that you will have one class set. Place the decimal cards in one zipper baggie and the blank cards in another zipper baggie.), 15-20 foot length of wide painter's tape for this activity for each class, black permanent marker, 1 dry erase marker for each pair of students

Procedure: Display the Decimal Number Line projection page.

- Use the painter's tape as a big blank number line. Secure the big blank number line on the wall or on the floor.
- In front of the students, use a black permanent marker to make a benchmark line in the middle of the tape and at the left and right ends of the tape.
- Choose 1 pair of students to place the 0, and 5 cards on the number line. Discuss the placement of those cards as a class.
- Give each pair of students 2 decimal cards. Number the Partner Pairs so they will be in an order to rotate around the room so each Partner Pair can place 1 decimal card on the number line.
- Begin the rotation again with Partner Pair 1 and their second card. Continue until all pairs have placed all cards on the number line.
- The whole class now stands back and discusses placement of all the cards on the number line. List observations of the placement of the cards.
- Display the Extension projection page and continue the activity.

Ask these questions before partner pairs place their first card on the number line:

- How can you determine where to place your numbers on the number line?
- How are you going to describe where your numbers go on the number line?

Ask these questions at various times as partner pairs place cards:

- What strategies can you use to place your number on the number line?
- What is the greatest number on the number line? How do you know?
- What is the least number on the number line? How do you know?
- What benchmark is the most helpful in placing your number on the number line? Explain.
- Do you need to rearrange previously placed number to appropriately place your number on the number line? Why or why not?
- What do you notice about the placement of your number in relation to other numbers?
- Could you decide where your numbers belong if there were no other numbers on the number line?
- How do you know your number is on this side of _____?
- How do you know how far away from _____ to put your number?

Listen for the following as students describe how they place their numbers:

- Do the students verbalize patterns such as the number always being before, between or after a particular number?
- Do the students accurately read the decimal value to the hundredths place using the appropriate number naming patterns?
- Do the students clearly describe strategies for placing the decimals on the number line?
- Do the students' strategies and explanations involve place value and benchmarks?

Look for the following as students place their numbers:

- Do the students attempt to place the number at a specific place on the number line (e.g., 2 inches from the left, exactly in the middle, etc.)?
- Do the students position the number on the number line without assistance?
- Do the students check for reasonableness of number placement on the number line?
- Do the students use benchmarks to position numbers on the number line?

Answers to these questions can be used to support decisions related to further whole class instruction or group and individual student instruction during tutorial settings.

Decimal Number Line

1. Your teacher will make a benchmark line in the middle, at the left end, and at the right end of the big blank number line.
2. Work on this activity in Partner Pairs and your teacher will give you a Partner Pair order number.
3. Your teacher will choose 1 Partner Pair to place the 0 and the 5 cards on the number line. The class will discuss the placement of these two cards on the number line.
4. Your teacher will number the Partner Pairs, then give 2 decimal cards to each Partner Pair. Each Partner Pair will place 1 of their decimal cards on the number line in the Partner Pair number order.
5. Each Partner Pair will describe the strategy used to place their card on the number line.
6. Begin the rotation again with Partner Pair 1 placing their remaining card on the number line and describing their placement strategy.
7. Continue until all cards are placed on the number line, then the class stands back and looks at the number line and discusses the placement of all cards on the number line.

EXTENSION

1. Your teacher will give each Partner Pair two blank cards. Use a dry erase marker to write a decimal that is not on the number line on each of the cards.
2. Trade cards with another Partner Pair.
3. Begin the rotation again with Partner Pair 1 placing both of their cards on the number line and describing their placement strategy to the whole class.
4. Continue until all cards are placed on the number line.
5. The whole class stands back and looks at the number line.
6. The class discusses placement of all the cards on the number line.

DECIMAL CARDS 1

(Copy on cardstock, laminate, cut out - place 0 and 5 number cards in an envelope - place all other number cards in a zipper baggie - place the blank number cards in a different zipper baggie)

0	5	0.1	0.2
0.3	0.4	0.5	0.6
0.7	0.8	0.9	1.0
1.2	1.4	1.7	1.9
2.0	2.4	3.3	3.6

DECIMAL CARDS 2

4.9	0.25	0.75	0.14
2.14	2.35	4.91	3.75
1.02	2.12	3.80	4.07
3.049	3.873	4.994	4.603
3.695	4.771	4.808	2.255

DECIMAL CARDS 3

2.039	3.695	4.771	4.808
0.125	0.375	0.625	0.875
1.371	1.022	2.125	3.805
4.071	4.088	1.025	1.899
3.303	4.484	2.022	1.101

BLANK CARDS 1

BLANK CARDS 2

BLANK CARDS 3

Student Activity 2

Work with a partner to complete Student Activity 2.

PROBLEM 1: Use a place-value chart to order 2.29, 4.528, 4.7 and 2.2.

Remember: Zeros can be written at the end of a decimal without changing its value.

Ones	.	Tenths	Hundredths	Thousandths

• First look at the digits in the ones place.

The numbers _____ and _____ both have a _____ in the ones place. They are the two greatest numbers.

For these two numbers, compare the digits in the tenths place.

Since _____ __ _____ , the number _____ __ _____ .

The greatest number is _____; it should be written first.

The next-greatest number is _____; it should be written next.

• Look at the remaining two numbers. Compare the digits.

Both numbers have a _____ in the ones place and the tenths place. Look at the hundredths place.

Since _____ __ _____ , the number _____ __ _____ .

The least number is _____; it should be written last.

The numbers in order are:

_____ > _____ > _____ > _____

and also

_____ < _____ < _____ < _____.

PROBLEM 2: Use a place-value chart to order 5.703, 5.62, 0.981 and 4.63.

Remember: Zeros can be written at the end of a decimal without changing its value.

Ones	.	Tenths	Hundredths	Thousandths

- Start at the _____. Two of the numbers have a 5 in the _____ place and one of the numbers has a 4 in the _____ place.

  These three numbers will be _____ than the number that has a _____ in the ones place.

  The least number is _____.

- Two of the numbers left have a _____ in the ones place and one of the numbers has a _____ in the ones place.

  The number with a _____ in the ones place is less than the numbers with a _____ in the ones place.

- Decide which of the two numbers with a 5 in the ones place is less. Look at the next place value, the _____ place.

  One of the numbers with a 5 in the ones place has a _____ in the tenths place.

  The other number with a 5 in the ones place has a _____ in the tenths place.

  Since _____ is less than _____, the number _____ is less than the number _____.

The numbers in order are:

_____ < _____ < _____ < _____

and also

_____ > _____ > _____ > _____.

PROBLEM 3: Use a number line to order 5.493, 5.417, 5.476 and 5.424.

- Place a point at the location of 5.493, 5.417, 5.476 and 5.424. Label each point with the number it represents.

- All four numbers are greater than _____ and less than _____.
- The numbers are the same in the _____ and _____ places.
- Look at the hundredths places. 5.4__ < 5.4__ < 5.4__ < 5.4__, therefore 5.4___ comes first on the number line between 5.__ and 5.___.
  5.417 is closer to 5.4 than 5.4____.
- 5.4____ comes next on the number line between 5.4 and 5.___.
  5.424 is a little closer to 5.4__ than 5.4__.

• 5.4____ comes next on the number line between 5.4__ and 5.4__.

5.476 is closer to 5.4__ than 5.4__.

• 5.4____ comes next on the number line between 5.4__ and 5.__.

5.493 is closer to 5.4__ than 5.__.

So, 5.____ > 5.____ > 5.____ > 5.____ and 5.____ < 5.____ < 5.____ < 5.____.

PROBLEM 4: Use a place-value chart to order 4.03, 5.639, 5.7 and 4.09.

Remember: Zeros can be written at the end of a decimal without changing its value.

Ones	.	Tenths	Hundredths	Thousandths

• First look at the digits in the ones place.

The numbers _____ and _____ both have a _____ in the ones place. They are the two greatest numbers.

For these two numbers, compare the digits in the tenths place.

Since _____ __ _____ , the number _____ __ _____ .

The greatest number is _____; it should be written first.

The next-greatest number is _____; it should be written next.

• Look at the remaining two numbers. Compare the digits.

Both numbers have a _____ in the ones place and a _____ the tenths place.

Look at the _____ place.

Since _____ __ _____ , the number _____ __ _____ .

The least number is _____; it should be written last.

The numbers in order are:

_____ > _____ > _____ > _____

and also

_____ < _____ < _____ < _____.

PROBLEM 5: Use what you know about place-value to order 6.14, 6.685, 6.529 and 6.32.

Step 1 Line up the decimal points.	**Step 2** Compare the ones.	**Step 3** Compare the tenths.	**Step 4** Continue to compare the tenths.
__.____ ↓ __.____ ↓ __.____ ↓ __.____	__.____ ↓ __.____ ↓ __.____ ↓ __.____ __ = __ = __ =__	__.____ ↓ __.____ ↓ __.____ ↓ __.____ 6 > __ 6 > __ 6 > __ So, __.____ is the greatest number.	__.____ ↓ __.____ ↓ __.____ 5 > __ and __, so __.____ is the next greatest number. __ > __, so __.____ is the next greatest number, and __.___ is the least number.

So, 6._____ > 6._____> 6._____ > 6._____ and 6._____ < 6._____ < 6._____ < 6._____.

PROBLEM 6: Use a place-value chart to order 4.602, 3.62, 0.706 and 4.59.

Remember: Zeros can be written at the end of a decimal without changing its value.

Ones	.	Tenths	Hundredths	Thousandths

- Start at the _____. Three of the numbers have a digit greater than 0 in the _____ place.

  These numbers will be _____ than the number that has a 0 in the ones place.

  The least number is _____.
- Two of the numbers left have a _____ in the ones place and one of the numbers has a _____ in the ones place.

  The number with a _____ in the ones place is less than the numbers with a _____ in the ones place.

- Decide which of the two numbers with a 4 in the ones place is less. Look at the next place value, the _____ place.

  One of the numbers with a 4 in the ones place has a _____ in the tenths place. The other number with a 4 in the ones place has a _____ in the tenths place. Since _____ is less than _____, the number _____ is less than the number _____.

The numbers in order are:

_____ < _____ < _____ < _____

and also

_____ > _____ > _____ > _____.

NAME_____ DATE_____ SCORE ___/5

5.2B Skills and Concepts Homework 2

1. Cherise, Tom, Kerri and Trace are playing a math game. A player scores a point when holding the card with the greatest value. They each draw a card for the first round. Cherise's card is 0.543, Tom's card is 0.352, Kerri's card is 0.713, and Trace's card is 0.709.

   List the order of the numbers on the cards from least to greatest number.

   _____ < _____ < _____ < _____

   Which player will score the point for the first round? _____
   Explain why your answer is correct.

2. The chart shows the number of meters four miniature cars traveled in a distance contest.

Miniature Car Distance Contest

Car	Meters Traveled
Chevy	4.407
Ford	4.397
Toyota	4.419
Mazda	4.346
Dodge	4.908

   List the order of the distances traveled from greatest to least number.

   _____ > _____ > _____ > _____ > _____

   Which car traveled farther than the Mazda, but not as far as the Chevy or the Toyota? _____ Explain why your answer is correct.

3. At a track meet, Amie jumped 4.07 meters, Sue jumped 4.7 meters, Yvette jumped 4.77 meters and Terri jumped 4.17 meters in the long jump contest. The results were posted in order from longest to shortest jump.

   List the order of the jumps from longest to shortest.

   _____ > _____ > _____ > _____ > _____

   Which person had a shorter jump than Yvette, but a longer jump than Terri?

   _____ Explain why your answer is correct.

4. Some of the winning times for the women's Olympic swimming 200 meter freestyle are listed in the table below.

Women's 200 Meter Freestyle	
Year	Time (minutes and seconds)
1996	1 min 59.01 sec
2000	1 min 59.67 sec
2004	1 min 58.03 sec
2008	1 min 54.82 sec
2012	1 min 53.61 sec

According to this table, in which year was the least amount of time recorded?

_____ Explain why your answer is correct.

According to this table, in which year was the greatest amount of time recorded?

_____ Explain why your answer is correct.

4. The table lists some of the mountains in the United States that are greater than 2 miles high.

United States Mountains	
Mountain	Height (in miles)
Wheeler Mountain	2.493
Boundary Mountain	2.488
Grand Teton Mountain	2.607
Cloud Mountain	2.495

Compare the heights of Boundary Mountain and Cloud Mountain.

_____ mi > _____ mi and _____ mi < _____ mi

So, the height of _____ Mountain is greater than the height of

_____ Mountain.

Compare the heights of Cloud Mountain and Wheeler Mountain.

_____ mi > _____ mi and _____ mi < _____ mi

So, the height of _____ Mountain is less than the height of

_____ Mountain.

NAME_____ DATE_____ SCORE ___/10

5.2B Mini-Assessment

1. Which comparison is true?

   A 4.670 > 4.667

   B 4.067 > 4.667

   C 4.607 > 4.667

   D 4.660 > 4.667

---

2. Which correctly compares the numbers 3.209 and 3.29?

   F 3.29 = 3.209

   G 3.209 > 3.29

   H 3.29 < 3.209

   J 3.209 < 3.29

---

3. Kendra is comparing the numbers 9.503 and 9.562. What is the least place value she needs to compare to decide which number is greater?

   A Ones

   B Hundredths

   C Tenths

   D Thousandths

---

4. Which correctly compares the numbers 8.300 and 8.3?

   F 8.3 < 8.300

   G 8.300 = 8.3

   H 8.3 > 8.300

   J 8.300 < 8.3

5. Trina recorded the amount of time it took her to run 2 miles each day during one week.

2-Mile Run Record

Day	Time (minutes)
Monday	15.32
Tuesday	15.56
Wednesday	15.04
Thursday	15.74
Friday	15.28
Saturday	15.7
Sunday	15.63

On which day did it take Trina the least amount of time to run 2 miles?

A Monday

B Wednesday

C Friday

D Sunday

---

6. Alberto ran a race in 17.6 seconds. Jake ran the race in 18.307 seconds. Morris ran the race in a time greater than 17.6 seconds but less than 18.307 seconds. Which could represent a comparison of the times the three boys ran the race?

F 17.6 s < 17.054 s < 18.307 s

G 17.6 s < 18.4 s < 18.307 s

H 17.6 s < 17.39 s < 18.307 s

J 17.6 s < 18.21 s < 18.307 s

---

7. Louis recorded the mass of four different quartz crystals in grams. Which shows the mass of the quartz crystals in order from least to greatest?

A 59.07 g < 59.67 g < 59.6 g < 59.61 g

B 59.56 g < 59.6 g < 59.55 g < 59.41 g

C 59.21 g < 59.3 g < 59.43 g < 59.66 g

D 59.9 g < 59.72 g < 59.63 g < 59.61 g

8. The table below shows the weight of the largest striper bass caught by three different fishermen during a fishing tournament.

Striper Bass Weights

Fisherman	Weight (pounds)
A	6.577
B	6.84
C	6.563

Which correctly represents the weights of the fish in order from greatest to least?

F 6.563 > 6.577 > 6.84

G 6.84 > 6.563 > 6.577

H 6.84 > 6.577 > 6.563

J 6.577 > 6.563 > 6.84

---

9. Amie jumped 4.07 meters in the long jump contest at a track meet. Sue jumped 4.7 meters, Yvette jumped 4.77 meters and Terri jumped 4.17 meters. Which correctly represents the lengths of the jumps if they are posted in order from longest to shortest jump?

A 4.07 m > 4.77 m > 4.17 m > 4.7 m

B 4.77 m > 4.07 m > 4.7 m > 4.17 m

C 4.17 m > 4.07 m > 4.7 m > 4.77 m

D 4.77 m > 4.7 m > 4.17 m > 4.07 m

---

10. The table shows the total number of liters of water needed in 4 different beakers for a science experiment.

Science Experiment	
Beakers	Liters of Water
1	3.09
2	2.95
3	3.49
4	3.14

Which represents the number of liters of water needed in the beakers from least to greatest?

F 2.95 < 3.14 < 3.49 < 3.09

G 3.09 < 3.14 < 3.49 < 2.95

H 3.49 < 3.14 < 3.09 < 2.95

J 2.95 < 3.09 < 3.14 < 3.49

Lesson 4

5.3B/5.3A LESSON & ASSESSMENT

Lesson Focus

For TEKS 5.3B students are expected to multiply with fluency a three-digit number by a two-digit number using the standard algorithm.

For TEKS 5.3A students are expected to estimate to determine solutions to mathematical and real-word problems involving addition, subtraction, multiplication, and division. Focus for this lesson is multiplication.

For these TEKS students should be able to apply mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy.

For STAAR Category 2 students should be able to demonstrate an understanding of how to perform operations and represent algebraic relationships.

Process Standards Incorporated Into Lesson

5.1.B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of a solution.

5.1.D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.

Materials Needed for Lesson

1. Hands-On Activity 1

Per student: 1 Multiplication Makes Sense Problems page (copy of colored paper), 1 Creator's Products and Check page (copy on a second color paper), 1 Partner's Products and Check page (copy on a third color paper)

Vocabulary for Lesson

PART I	PART II
multiplication	estimate
factor	reasonable
product	overestimate
partial product	underestimate
	compatible numbers

Math Background Part I - Multiplication of Whole Numbers

Multiplication is a shortcut for combining groups of equal size.

EXAMPLE: Your family is taking 268 pounds of aluminum cans to a recycling center. The recycling center pays 12¢ per pound for aluminum cans that are brought for recycling. Adding 12¢ for 268 times would take a very long time, so using multiplication is a much faster process.

Two terms in multiplication are **factor** and **product**. The **factors** are the numbers being multiplied. Factors represent the number in each group and the number of groups. The **product** is the result of the multiplication and represent the total.

The operation of multiplication can be indicated by the multiplication symbol ($\times$) or by a dot ($\bullet$). 2×3 can also be written as $2 \bullet 3$.

EXAMPLE: The More Music store ordered a new CD by Silly Sounds. During the first week, the store sold 2 boxes of the CDs. There are 81 CDs in each box. What is the number of CDs the store sold during the first week?

The number in each group is 81. The number of groups is 2.

81 ← Factor
× 2 ← Factor
162 ← Product

The store sold 162 CDs during the first week.

If you know how to multiply 1-digit numbers such as 8×6, you can also multiply larger numbers such as 8×666. Multiplying multi-digit numbers is done one at a time. Each product is called a **partial product**. Multiply the value of each digit from one factor by the value of each digit from the other factor. Then find the sum of the partial products.

Multiply a 3-Digit Number by a 1-Digit Number

These procedures can be used to multiply when both factors are greater than 10.

- Multiply the value of each digit in the 3-digit number by the value of the 1-digit number, one at a time. List the partial products and then add.
- Multiply without listing the partial products. Use what you know about regrouping.

EXAMPLE: The fire department in a large Texas city responded to 555 calls per day during one week. Find the number of calls they responded to during that week.

To solve the problem, multiply 555 by 7.

- **One Way** - Multiply the value of each digit in the 3-digit number by the value of the 1-digit number, one at a time. List the partial products and then add.

HTO
555
× 7
35 Multiply the **ones**. **7** x **5** ones = **35** ones
350 Multiply the **tens**. **7** x **5** tens = **350**
3500 Multiply the **hundreds**. **7** x **5** hundreds = **3500**
3885 Add the partial products. 35 + 350 + 3500 = 3885

The fire department responded to 3,885 calls during that week.

- **Another Way** - Multiply without listing the partial products.

```
  HTO
  3 3
  555
×   7
-----
 3885
```

Multiply the **ones**.
Since **35** ones is **3** tens and **5** ones,
Write **5** in the ones place.
Write **3** above the tens place so you won't forget it.

Multiply the **tens**.
Since **35** tens is **3** hundreds and **5** tens,
add the **5** tens to the 3 tens you already have.
Write **8** in the tens place.
Write **3** above the hundreds place so you won't forget it.

Multiply the **hundreds**.
Since **35** hundreds is **3** thousands and **5** hundreds,
add the **5** hundreds to the 3 hundreds you already have.
Write **8** in the hundreds place.
Write **3** in the thousands place.

- The fire department responded to 3,885 calls during that week.

Either way, the fire department responded to 3,885 calls during that week.

Multiply a 2-Digit Number by a 2-Digit Number

These procedures can be used to multiply when both factors are greater than 10.

- Multiply the value of each digit in one factor by the value of each digit in the other factor. List the partial products and then add.
- Multiply without listing every partial product. Use what you know about regrouping.
- Multiply using the Distributive Property of Multiplication. Break apart one of the factors before multiplying.

EXAMPLE: The school auditorium has 14 rows. Each row has 28 seats. Find the number of seats in the auditorium.

To solve the problem, multiply 14 by 28.

- **One Way** - Multiply the value of each digit in one factor by the value of each digit in the other factor. List the partial products and then add.

Tens → **TO** ← Ones

```
  14
× 28
-----
  32   Multiply by the ones.
       8 x 4 ones = 32
  80   8 x 10 ones = 80
  80   Multiply the tens.
       20 x 4 tens = 80
 200   20 x 10 tens = 200
-----
 392   Add the partial products  32 + 80 + 80 + 200 = 392
```

There are 392 seats in the auditorium.

- **Another Way** - Multiply without listing every partial product. Use what you know about regrouping

```
  TO
   3
  14
× 28
 112
```

Multiply by the ones 8 x 14 ones = **?**
8 x 4 ones = 32 → **2** ones with **3** tens to regroup
8 x 10 ones = 80 → 8 tens + 3 tens = **11** tens
So, 8 x 14 = **112**

```
   3
  14
× 28
 112
 280
 392
```

Multiply by the tens 20 x 14 tens = **?**
20 x 4 ones = 80 → **8** tens + **0** ones
20 x 10 ones = 200 → **2** hundreds
So, 20 x 14 = **280**.
Add the partial products. 112 + 280 = 392

There are 392 seats in the auditorium.

- **Another Way** - Use what you know about the Distributive Property of Multiplication. Break apart one of the factors before multiplying.

Break apart one factor into numbers that are easy to multiply.	14 x 28 = (**10** + **4)** x 28
Multiply.	**10** x 28 = **280** **4** x 28 = **112**
Add the two products.	112 + 280 392

There are 392 seats in the auditorium.

Using any of these procedures for multiplying two-digit numbers, there are 392 seats in the auditorium.

NOTE: Zeros may seem like "nothing" in a factor or product, but they are very important.

EXAMPLE: The website www.staarmaterials.com receives an average of 305 visits per week. At this rate, about how many visits would the website receive in 4 weeks?

To find the answer, multiply 305 by 4.

```
 HTO
  2
 305
×  4
1220
```

4 x 5 = 20 → **2** tens + **0** ones
There are no tens in 305, but that does not mean we can forget about the tens.
4 x 0 = **0** tens
0 tens + 2 tens = **2** tens
4 x 300 = 1,200 tens → 1 thousand + 2 hundreds

At this rate, the website would receive about 1,220 visits in 4 weeks.

Multiply a 3-Digit Number by a 2-Digit Number

When you multiply a 3-digit number by a 2-digit number, you are finding 6 products and several sums. So, it is very important to record **every** step.

These procedures can be used to multiply a 3-digit number by a 2-digit number.

- Multiply the value of each digit in one factor by the value of each digit in the other factor, record each product, and then find the sum of the partial products.
- Multiply without using the partial products. Use what you know about regrouping.
- Multiply using the Distributive Property of Multiplication. Break apart one of the factors before multiplying.

EXAMPLE: The fifth grade art class is making mementos for a school Cinco de Mayo celebration. Each student in the school will be given 1 memento made with 24 cm of ribbon. The school has 674 students. Find the amount of ribbon needed to make all of the mementos.

To solve the problem, multiply 24 × 674.

- **One Way** - Multiply the value of each digit in one factor by the value of each digit in the other factor, record each product, and then find the sum of the partial products.

HTO 674	
× 24	
16	Multiply by the **ones**. **4** x 4 = 16
280	**4** x 70 = 280
2400	**4** x 600 = 2400
	Multiply by the **tens**.
80	**20** x 4 = 80
1400	**20** x 70 = 1400
12000	**20** x 600 = 12000
16176	Add the partial products.

At least 16,176 cm of ribbon is needed to make the mementos.

- **Another Way** - Multiply without listing the partial products.

HTO **2 1** 674	Multiply by the **ones**. 4 x 674 = ? **4** x 4 = 16 → **6** ones with **1** ten to regroup
× 24	**4** x 70 = 280 → **8** tens + **1** ten with 2 hundreds to regroup
2696	**4** x 600 = 2400 → **24** hundreds + **2** hundreds
HTO **1** 2 1 674	Multiply by the **tens**. 20 x 674 = ? **20** x 4 = 80 → **8** tens and 0 ones
× 24	**20** x 70 = 1400 → **4** hundreds with 1 thousand to regroup
2696	**20** x 600 = 12000 → **12** thousands + **1** thousand
13480	
16176	Add the partial products.

At least 16,176 cm of ribbon is needed to make the mementos.

- **Another Way** - Use what you know about the Distributive Property of Multiplication. Break apart one of the factors before multiplying.

Break apart one factor into numbers that are easy to multiply.	24 x 674 = (**10** + **10** + **2** + **2**) x 674
Multiply.	**10** x 674 = **6740** **10** x 674 = **6740** **2** x 674 = **1348** **2** x 674 = **1348**
Add the four products.	6740 6740 1354 +1354 16176

At least 16,176 cm of ribbon is needed to make the mementos.

Using any of these procedures for multiplying multi-digit numbers, at least 16,176 cm of ribbon is needed to make the mementos.

Checking Multiplication

Always check multi-digit multiplication because so many steps are involved that it is easy to make a mistake.

These are 2 different methods that can be used to check multiplication.

- Reverse the factors.
- Use the lattice method.

Jerissa found the product of 24 x 38 = 912. Now she needs to check to make sure her multiplication is correct.

EXAMPLE 1: Jerissa can reverse the factors.

1 3 24 × 38 1 192 720 912	1 3 38 × 24 1 152 760 912

If reversing the factors gives the same product, then the multiplication is correct.

If reversing the factors does not give the same product, then one of the products is not correct.

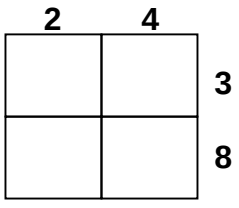
Reversing the factors shows her work is correct.

EXAMPLE 2: Jerissa could also use the lattice method.

- **Step 1: Draw a grid.**

  Write one factor on top.

  Write the other factor on the right.

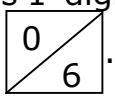


- **Step 2: In each square, write a product.**

  Multiply the digit at the top of the column by the digit to the right of the row.

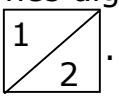
  Note: Use a diagonal line to separate the digits in each product.

  If the product is 1-digit, write the product as 0__.

  Write 2 x 3 as 

.

  If the product is 2-digits, write the tens digit in the top left and write the ones digit in the bottom right.

  Write 4 x 3 as 

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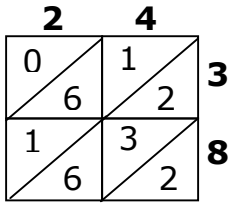
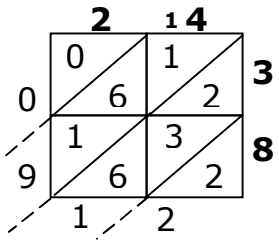


- **Step 3: Add along the diagonals.**

  Begin at the lower right.

  For 2-digit sums, add the tens digit to the digits in the next diagonal.



- **Step 4: Read the product.**

  Begin reading the product at the top left and end at the bottom right

  24 x 38 = 912

The lattice method shows her work is correct.

Using either method to check her multiplication, Jerissa's product is correct.

Multiplication of Whole Numbers

Multiplication is a shortcut for combining groups of equal size.

EXAMPLE

Your family is taking 268 pounds of aluminum cans to a recycling center. The recycling center pays 12¢ per pound for aluminum cans that are brought for recycling.

Adding 12¢ for 268 times would take a very long time, so using multiplication is a much faster process.

Two terms in multiplication are **factor** and **product**.

The **factors** are the numbers being multiplied. Factors represent the number in each group and the number of groups.

The **product** is the result of the multiplication and represents the total.

The operation of multiplication can be indicated by the multiplication symbol (×) or by a dot (•).

2×3 can also be written as $2 \cdot 3$.

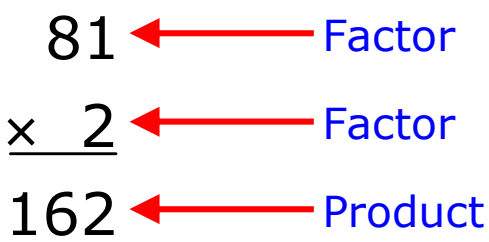
EXAMPLE

The More Music store ordered a new CD by Silly Sounds. During the first week, the store sold 2 boxes of the CDs. There are 81 CDs in each box.

What is the number of CDs the store sold during the first week?

The number in each group is 81.

The number of groups is 2.



So, the store sold 162 CDs during the first week.

If you know how to multiply 1-digit numbers such as 8×6, you can also multiply larger numbers such as 8×666.

Multiplying multi-digit numbers is done one at a time.

Each product is called a **partial product**.

Multiply the value of each digit from one factor by the value of each digit from the other factor. Then find the sum of the partial products.

Multiply a 3-Digit Number by a 1-Digit Number

These procedures can be used to multiply when both factors are greater than 10:

- Multiply the value of each digit in the 3-digit number by the value of the 1-digit number, one at a time.

  List the partial products and then add.

- Multiply without listing the partial products.

  Use what you know about regrouping.

EXAMPLE

The fire department in a large Texas city responded to 555 calls per day during one week. Find the number of calls they responded to during that week.

To solve the problem, multiply 555 by 7.

One Way

Multiply the value of each digit in the 3-digit number by the value of the 1-digit number, one at a time.

List the partial products and then add.

HTO

555

× 7

35 Multiply the **ones**. **7** x **5** ones = **35**

350 Multiply the **tens**. **7** x **5** tens = **350**

3500 Multiply the **hundreds**. **7** x **5** hundreds = **3500**

3885 Add the partial products. **35** + **350** + **3500** = **3885**

So, the fire department responded to 3,885 calls during that week.

Another Way

Multiply without listing the partial products.

Use what you know about regrouping.

HTO
3 3
555
× 7
3885

Multiply the **ones**.
Since **35** ones is **3** tens and **5** ones,
Write **5** in the ones place.
Write **3** above the tens place so you won't forget it.

Multiply the **tens**.
Since **35** tens is **3** hundreds and **5** tens,
add the **5** tens to the 3 tens you already have.
Write **8** in the tens place.
Write **3** above the hundreds place so you won't forget it.

Multiply the **hundreds**.
Since **35** hundreds is **3** thousands and **5** hundreds,
add the **5** hundreds to the 3 hundreds you already have.
Write **8** in the hundreds place.
Write **3** in the thousands place.

So, the fire department responded to 3,885 calls during that week.

Either way, the fire department responded to 3,885 calls during that week.

Multiply a 2-Digit Number by a 2-Digit Number

These procedures can be used to multiply when both factors are greater than 10:

- Multiply the value of each digit in one factor by the value of each digit in the other factor.

  List the partial products and then add.

- Multiply without listing every partial product.

  Use what you know about regrouping.

- Multiply using the Distributive Property of Multiplication.

  Break apart one of the factors before multiplying.

EXAMPLE

The school auditorium has 14 rows.
Each row has 28 seats.
Find the number of seats in the auditorium.

To solve the problem, multiply 14 by 28.

One Way

Multiply the value of each digit in one factor by the value of each digit in the other factor.

List the partial products and then add.

Tens → **TO** ← Ones

14
× 28

32 ← Multiply by the **ones**.
8 x 4 ones = **32**

80 ← **8** x 10 ones = **80**

80 ← Multiply the **tens**.
20 x 4 tens = **80**

200 ← **20** x 10 tens = **200**

392 Add the **partial products**.
32 + **80** + **80** + **200** = **392**

So, there are 392 seats in the auditorium.

Another Way

Multiply without listing every partial product.
Use what you know about regrouping.

3
14
× 28
112

Multiply by the **ones**. **8** x 14 ones = **?**
8 x 4 ones = **32** → **2** ones with **3** tens to regroup
8 x 10 ones = **80** → **8** tens + **3** tens = **11** tens
So, **8** x 14 = **112**

3
14
× 28
112
280
392

Multiply by the **tens**. **20** x 14 tens = **?**
20 x 4 ones = **80** → **8** tens + **0** ones
20 x 10 ones = **200** → **2** hundreds

So, **20** x 14 = **280**.

Add the partial products. **112** + **280** = **392**

So, there are 392 seats in the auditorium.

Another Way

Use what you know about the Distributive Property of Multiplication.

Break apart one of the factors before multiplying.

Break apart one factor into numbers that are easy to multiply.	14 x 28 = (**10** + **4**) x 28
Multiply.	**10** x 28 = **280** **4** x 28 = **112**
Add the two products.	**112** +**280** **392**

So, there are 392 seats in the auditorium

Using any of these procedures for multiplying two-digit numbers, there are 392 seats in the auditorium.

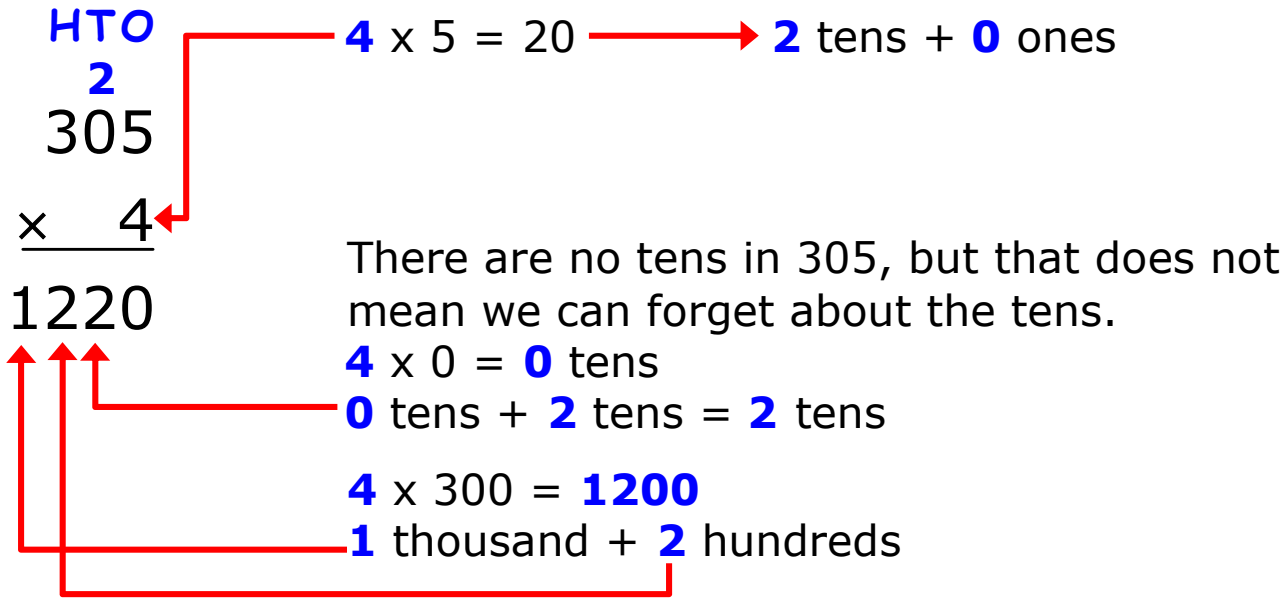
NOTE

Zeros may seem like "nothing" in a factor or product, but they are very important.

EXAMPLE

The website www.staarmaterials.com receives an average of 305 visits per week. At this rate, about how many visits would the website receive in 4 weeks?

To find the answer, multiply 305 by 4.



So, at this rate, the website would receive about 1,220 visits in 4 weeks.

Multiply a 3-Digit Number by a 2-Digit Number

When you multiply a 3-digit number by a 2-digit number, you are finding 6 products and several sums. So, it is very important to record **every** step.

These procedures can be used to multiply a 3-digit number by a 2-digit number:

- Multiply the value of each digit in one factor by the value of each digit in the other factor, record each product, and then find the sum of the partial products.
- Multiply without using the partial products.

  Use what you know about regrouping.
- Multiply using the Distributive Property of Multiplication.

  Break apart one of the factors before multiplying.

EXAMPLE

The fifth grade class is making mementos for a Cinco de Mayo celebration. Each of the 674 students in the school will be given 1 memento made using 24 cm of ribbon. Find the amount of ribbon needed to make all of the mementos.

To solve the problem, multiply 24 × 674.

One Way

Multiply the value of each digit in one factor by the value of each digit in the other factor, record each product, then find the sum of the partial products.

HTO

674

× 24

Multiply by the **ones**.

16 ← **4** x 4 = **16**

280 ← **4** x 70 = **280**

2400 ← **4** x 600 = **2400**

Multiply by the **tens**.

80 ← **20** x 4 = **80**

1400 ← **20** x 70 = **1400**

12000 ← **20** x 600 = **12000**

Add the **partial products**.

16176

16 + **280** + **2400** + **80** + **1400** + **12000** = **16176**

So, at least 16,176 cm of ribbon is needed to make the mementos.

Another Way

Multiply without listing the partial products.
Use what you know about regrouping.

```
   HTO
   21
   674
 x  24
 ----
  2696
```

Multiply by the **ones**. **4** x 674 = **?**
4 x 4 = **16** → **6** ones with **1** ten to regroup
4 x 70 = **280** → **8** tens + **1** ten with **2** hundreds to regroup
4 x 600 = **2400** → **24** hundreds + **2** hundreds
So, **4** x 674 = **2696**

```
   HTO
    1
   21
   674
 x  24
 ----
  2696

 13480
 16176
```

Multiply by the **tens**. **20** x 674 = **?**
20 x 4 = **80** → **8** tens and **0** ones
20 x 70 = **1400** → **4** hundreds with **1** thousand to regroup
20 x 600 = **12000** → **12** thousands + **1** thousand
So, **20** x 674 = **13480**
Add the **partial products**.
2696 + **13480** = **16176**

So, at least 16,176 centimeters of ribbon is needed to make the mementos.

Another Way

Use what you know about the Distributive Property of Multiplication.

Break apart one of the factors before multiplying.

Break apart one factor into numbers that are easy to multiply.	24 x 674 = (**10** + **10** + **2** + **2**) x 674
Multiply.	**10** x 674 = **6740** **10** x 674 = **6740** **2** x 674 = **1348** **2** x 674 = **1348**
Add the four products.	6740 6740 1354 +1354 16176

So, at least **16,176** centimeters of ribbon is needed to make the mementos.

Using any of these procedures for multiplying multi-digit numbers, at least 16,176 cm of ribbon is needed to make the mementos.

Checking Multiplication

Always check multi-digit multiplication because so many steps are involved that it is easy to make a mistake.

These are 2 different methods that can be used to check multiplication:

- Reverse the factors.
- Use the lattice method.

EXAMPLE

Jerissa found the product of **38** x **24** = **912**.

Now she needs to check to make sure her multiplication is correct.

- Jerissa can **reverse the factors**.

1 3 24 × 38 1 192 720 912	1 3 38 × 24 1 152 760 912

If reversing the factors gives the same product, then the multiplication is correct.

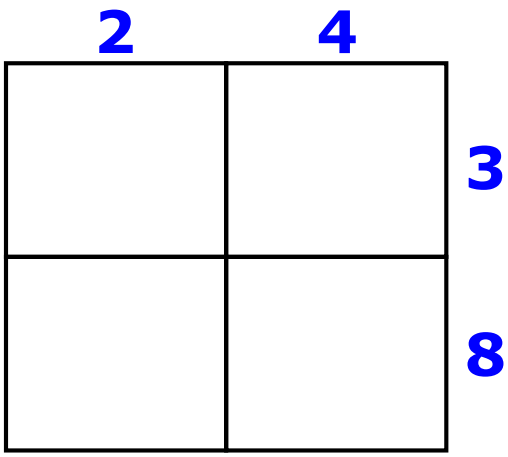
If reversing the factors does not give the same product, then one of the products is not correct.

So, reversing the factors shows Jerissa's work is correct.

- Jerissa could also **use the lattice method**.

Step 1: Draw a grid.

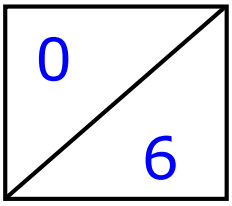
Write one factor on top.
Write the other factor on the right.



Step 2: In each square, write a product.

Multiply the digit at the top of the column by the digit to the right of the row.

Note: Use a diagonal line to separate the digits in each product.

If the product is 1-digit, write the product as 0__. Write 2 x 3 as 

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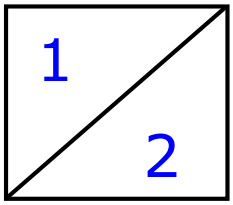
If the product is 2-digits, write the tens digit in the top left and write the ones digit in the bottom right.

Write 4 x 3 as 

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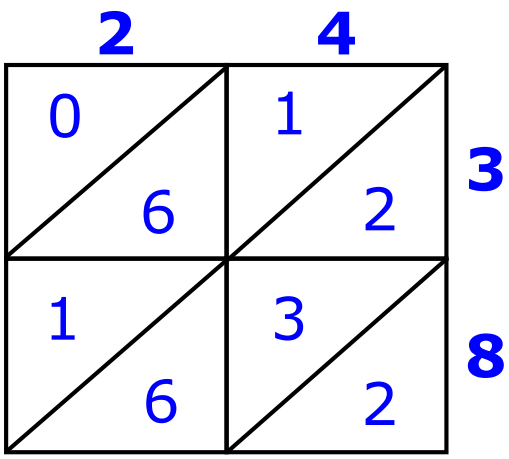
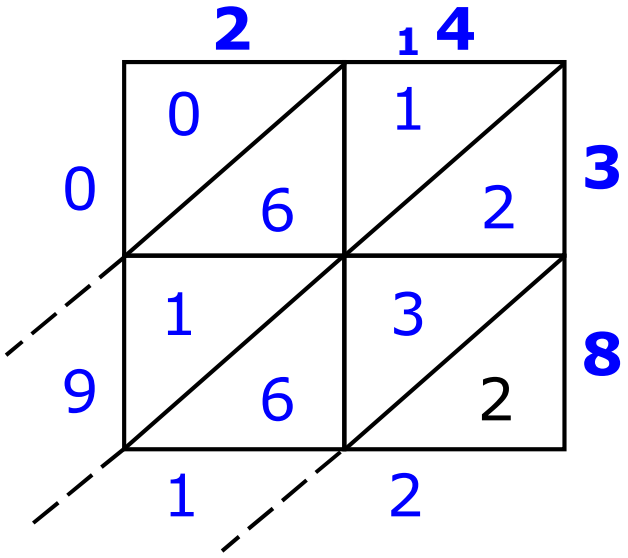


Step 3: Add along the diagonals.

Begin at the lower right. For 2-digit sums, add the tens digit to the digits in the next diagonal.



Step 4: Read the product.

Begin reading the product at the top left and end at the bottom right

$$24 \times 38 = 912$$

The lattice method shows her work is correct.

So, using either method to check multiplication, Jerissa's product is correct.

Problem-Solving 1

Problem 1

A golf shop ordered 124 boxes of golf balls. Each box contains 18 golf balls.

1. How many golf balls did the golf shop order? Show your work.
2. Show your work to check your answer. Use the lattice method or reverse the factors.

Problem 2

An artist sketched 11 charcoal portraits each day for 111 days.

1. What is the total number of portraits he sketched? Show your work.
2. Show your work to check your answer. Use the lattice method or reverse the factors.

Problem 3

Mr. Diaz bought 264 bottles of flavored syrup for his snow cone stand. Each bottle contains 78 ounces of syrup.

1. How many ounces of syrup did Mr. Diaz buy? Show your work.
2. Show your work to check your answer. Use the lattice method or reverse the factors.

Student Activity 1

Work with a partner to complete Student Activity 1.

PROBLEM 1: Krista ordered 15 cases of cookies to sell for her scout troop. Each case had 244 cookies in it. How many cookies did she order in all?

- Since all the cases have the same _____ of cookies, the operation of _____ can be used to find how many cookies she ordered in all.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

Krista ordered _____ cookies to sell for her scout troop.
Now, reverse the products to check your multiplication in the space above.
Decide if reversing the factors to check your multiplication gave you the same product as your original answer for Problem 1.

My original product for Problem 1 was _____ x _____ = _____.

This is _____ the product when I reversed the factors to
("the same as" or "different from")
check my multiplication. So, my original product _____ correct.
("is" or "is not")

NOTE: If reversing the factors did not give you the same product as your original product for Problem 1, go back and rework the problem on the back of this page, then check your answer again using reverse factors.

PROBLEM 2: A children's hospital collected money to buy toys and books for the children's play room. A total of 81 people donated $14 each. What is the total amount of these donations?

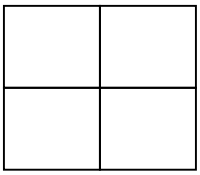
- Since all the donations are for the same _____, the operation of _____ can be used to find the total amount of the donations.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

The total amount of donations is _____.
Use the lattice method to check your answer to **Problem 2**.

- **Step 1: Draw a grid.**

  Write one factor on top.

  Write the other factor on the right.

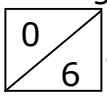


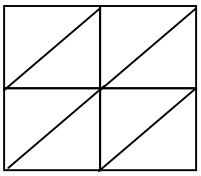
- **Step 2: In each square, write a product.**

  Multiply the digit at the top of the column by the digit to the right of the row.

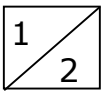
  Note: Use a diagonal line to separate the digits in each product.

  If the product is 1-digit, write the product as 0__.

  Write 2 x 3 as  .



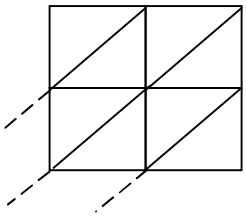
  If the product is 2-digits, write the tens digit in the top left and write the ones digit in the bottom right.

  Write 4 x 3 as  .

- **Step 3: Add along the diagonals.**

  Begin at the lower right.

  For 2-digit sums, add the tens digit to the digits in the next diagonal.



- **Step 4: Read the product.**

  Begin reading the product at the top left and end at the bottom right.

_____ x _____ = _____

Decide if the lattice method for checking multiplication gave you the same product as your original product for Problem 2.

My original product for Problem 2 was _____ x _____ = _____.

This is _____ the product when using the lattice method to
("the same as" or "different from")
check my multiplication. So, my original product _____ correct.
("is" or "is not")

NOTE: If the lattice method did not give you the same product as your original product for Problem 2, go back and rework the problem on the back of this page, then check your answer on the back of this page using reverse factors.

PROBLEM 3: An irrigation system in an orange orchard can spray 845 gallons of water every hour. If the system operated for a total of 25 hours last week, how many gallons did it spray?

- Since the irrigation system sprays the same _____ of water each _____,

  the operation of _____can be used to find how many gallons

  the system sprayed in 25 _____ last week.

- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

The irrigation system sprayed _____ gallons in _____ hours last week.
Reverse the products to check your multiplication in the space above.

PROBLEM 4: Michael has 37 baseball cards in his collection. Tino has 14 times as many baseball cards in his collection. How many cards are in Tino's collection?

- The operation of _____ can be used to find how many cards are in Tino's collection.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

Tino has _____ baseball cards in his collection.
Reverse the products to check your multiplication in the space above.

PROBLEM 5: A special on a flight to Harlingen costs $106. There were 98 tickets sold for the 12:30 p.m. flight on Friday. What is the total amount collected for these tickets?

- Since all the tickets are the same _____, the operation of _____ can be used to find the total _____ collected for these tickets.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below.

The total amount collected for _____ tickets to Harlingen on Friday is $_____.
Reverse the products to check your multiplication in the space above.

PROBLEM 6: An artist in New Orleans created 13 tile mosaics each day for 134 days. What is the total number of tile mosaics he created during the 134 days?

- Since the artist created the same _____ of tile mosaics each _____, the operation of _____ can be used to find the total number of tile mosaics he created during the 134 days.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

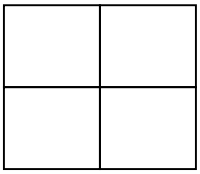
The artist created _____ tile mosaics in _____ days.
Reverse the products to check your multiplication in the space above.

PROBLEM 7: Ms. Romano. Diaz bought 64 bottles of pancake syrup for her café. Each bottle contains 78 ounces of syrup. How many ounces of syrup did Ms. Romano buy?

- Since all the bottles have the same _____ of syrup, the operation of _____ can be used to find how many ounces of syrup Ms. Romano bought.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

Ms. Romano bought _____ ounces of pancake syrup for her café.
Use the lattice method to check your answer to **Problem 2**.

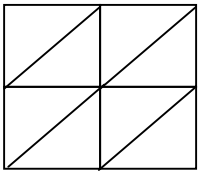
- **Step 1: Draw a grid.**
  Write one factor on top.
  Write the other factor on the right.



- **Step 2: In each square, write a product.**
  Multiply the digit at the top of the column by the digit to the right of the row.

Note: Use a diagonal line to separate the digits in each product.
If the product is 1-digit, write the product as 0__.

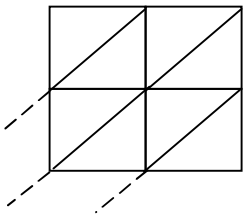
Write 2 x 3 as $\begin{array}{|c|}\hline 0 \diagup 6 \\ \hline \end{array}$.



If the product is 2-digits, write the tens digit in the top left and write the ones digit in the bottom right.

Write 4 x 3 as $\begin{array}{|c|}\hline 1 \diagup 2 \\ \hline \end{array}$.

- **Step 3: Add along the diagonals.**
  Begin at the lower right.
  For 2-digit sums, add the tens digit to the digits in the next diagonal.



- **Step 4: Read the product.**
  Begin reading the product at the top left and end at the bottom right.

_____ x _____ = _____

Decide if the lattice method for checking multiplication gave you the same product as your original product for Problem 7.

My original product for Problem 7 was _____ x _____ = _____.

This is _____ the product when using the lattice method to
("the same as" or "different from")
check my multiplication. So, my original product _____ correct.
("is" or "is not")

NOTE: If the lattice method did not give you the same product as your original product for Problem 7, go back and rework the problem on the back of this page, then check your answer on the back of this page using reverse factors.

PROBLEM 8: The Sullivan's family SUV travels an average of 405 miles on each tank of gasoline. At this rate, how many miles did the family travel if they used 9 tanks of gasoline during their winter vacation?

- Since the Sullivan can travel an average of _____ miles on each tank of gas, the operation of _____ can be used to find how many miles they traveled.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

The Sullivan family traveled _____ miles on the winter vacation.
Reverse the factors to check your multiplication in the space above.

PROBLEM 9: A group of volunteers painted the lockers in the hallway at Garner Elementary. The group divided the lockers into 15 different sections and worked on 1 section at a time. Each section took 35 hours to paint. How many hours did it take to paint all the lockers in the school?

- Since it took the same _____ of _____ to paint each section, the operation of _____ can be used to find how many _____ it took to paint all the lockers in the school.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

The volunteers took _____ hours to paint _____ sections of lockers.
Reverse the factors to check your multiplication in the space above.

PROBLEM 10: The Student Council bought 137 boxes of microwave popcorn for the concession stand at the football field. Each box contains 12 packages of popcorn. How many packages of popcorn did they buy?

- Since the Student Council bought boxes of popcorn with the same _____ of packages of popcorn in each box, the operation of _____ can be used to find how many packages they bought.
- The expression _____ x _____ can be used to solve this problem. Show your work in the space below. Label the factors and the product.

The Student Council bought _____ packages of popcorn.
Reverse the factors to check your multiplication in the space above.

NAME_____ DATE_____ SCORE ___/5

5.3B/5.3A Skills and Concepts Homework 1

1. An irrigation system in a cotton field can spray 785 gallons of water every hour. If the system operated for a total of 24 hours last week, how many gallons did it spray? Show your work and use reverse factors to check your multiplication.

2. Joel earns $15 for mowing 1 lawn. He mowed 17 lawns each month during the last 4 months. What is the total amount of money he made during the 4 months? Show your work and use reverse factors to check your multiplication.

3. Ms. Janis teaches math to 254 students each day. She grades one paper for each student each day. If Ms. Janis teaches for 25 days this month, how many papers does she grade? Show your work and use reverse factors to check your multiplication.

4. A pizza parlor charges $17 for a large pizza. If they sell 39 pizzas on Saturday, how much money will they collect, not including tax? Show your work and use reverse factors to check your multiplication.

5. A Chinese restaurant ordered 15 cases of fortune cookies. Each case contains 288 fortune cookies. How many cookies did the restaurant order? Show your work and use reverse factors to check your multiplication.

Math Background Part II - Estimating Products

A **product** is the result of multiplication. Sometimes when you multiply, an exact product is not needed, so you can **estimate** the product.

The answer to any problem can be estimated before you find the exact answer. The estimate tells you about how large or small the exact answer should be. If you estimate first, you will know whether your exact answer is **reasonable**. For example, some problems ask you whether a certain number is a reasonable answer to a problem.

Front-End Estimation of Products

To estimate products, the front digits of the factors can be multiplied.

EXAMPLE: The air mileage between Chicago and New York is 714 miles. Mr. Conrad made the trip 52 times in one year because he flew 26 roundtrips during the year. He earned 1 bonus point for each mile he flew. Did he earn enough bonus points for a flight that requires 30,000 points?

Use front-end estimation to answer the problem because you need to know whether he flew more than or less than 30,000 miles.

• Estimate the product of 52×714 to solve the problem.

$$\begin{array}{rcl} 714 & \longrightarrow & 700 \\ \times\ 52 & \longrightarrow & \times\ 50 \\ & & 35000 \end{array}$$

Mr. Conrad earned about 35,000 bonus points.

NOTE: The exact product is greater than 35,000 because both numbers were rounded down.

Rounding One Factor to Estimate Products

If one factor is a 1-digit number, you can estimate by rounding only 1 factor.

EXAMPLE: The fifth grade play was performed on 4 different days. Each day, all 389 tickets were sold. About how many tickets were sold for the 4 days?

• Estimate the product of 4×389 to solve the problem.

$$\begin{array}{c} 4 \times 389 \\ \downarrow \quad \downarrow \\ 4 \times 400 = 1{,}600 \end{array}$$

Only 1 factor was rounded.

About 1,600 tickets were sold for the 4 days.

NOTE: Since 400 is greater than 389, then 4×400 is greater than 4×389. The estimate of 1,600 is greater than the actual product. This is an **overestimate**. Less than 1,600 tickets were sold for the 4 days.

Rounding Both Factors to Estimate

If each factor is a 2-digit or a 3-digit number, you can estimate by rounding each factor to the greatest place value.

EXAMPLE 1: The school auditorium has 38 rows of 53 seats. About how many seats are in the auditorium?

• Estimate the product of 38×53 to solve the problem.

38×53 → $40 \times 50 = 2{,}000$ (Both 38 and 53 were rounded.)

About 2,000 seats are in the auditorium.

NOTE: This **estimate** is close to the actual product because one factor was rounded up 2 and one factor was rounded down 3.

EXAMPLE 2: A factory made 621 computer stations for a Texas school district. Each station required 43 screws. About how many screws did the factory use for the computer stations?

• Estimate the product of 43×621 to solve the problem.

43×621 → $40 \times 600 = 24{,}000$ (Both 43 and 621 were rounded.)

About 24,000 screws were used for the computer stations.

NOTE: This **estimate** is less than the actual product because both factors were rounded down.

Compatible Numbers to Estimate Products

When you estimate, look for **compatible numbers**. Compatible numbers are numbers that work well together. In multiplication, they are number pairs that are easy to multiply.

To estimate products, replace one or both factors with compatible numbers.

EXAMPLE: There are 18 weeks in the school semester. Your principal gives each student a school motto pencil each week. There are 618 students in your school. About how many school motto pencils did your principal order for the semester?

• Find compatible numbers for 18 and 618 and use them to estimate the product of 18×618. Try 20×600.

$$\begin{array}{rcl} 618 & \longrightarrow & 600 \\ \times\ 18 & \longrightarrow & \times\ 20 \\ & & 12000 \end{array}$$

The principal ordered about 12,000 school motto pencils for the semester.

618 is close to 600. 18 is close to 20. So, the principal ordered about 12,000 motto pencils for the semester.

The estimate of 12,000 is greater than the actual product because both numbers were rounded up. This is an **underestimate**. The principal actually ordered less than 12,000 pencils.

Any factor is compatible with a multiple of 10, because there are shortcuts for multiplying by multiples of 10.

EXAMPLE: Each of the 63 sections of a rodeo arena has 98 seats. About how many seats are in the rodeo arena?

• Estimate the product of 63×98 to solve the problem.

$$\begin{array}{c} 63 \times 98 \\ \downarrow \quad \downarrow \\ 60 \times 100 = 6{,}000 \end{array}$$

Both 62 and 100 were rounded to a multiple of 10.

The rodeo arena has about 6,000 seats.

NOTE: This **estimate** is close to the actual product because one factor is rounded down 3 and the other factor is rounded up 2.

Estimating Products

A **product** is the result of multiplication.

Sometimes when you multiply, an exact product is not needed, so you can **estimate** the product.

The answer to any problem can be estimated before you find the exact answer.

The estimate tells you about how large or small the exact answer should be.

If you estimate first, you will know whether your exact answer is **reasonable**. Some problems ask you whether a certain number is a reasonable answer to a problem.

Front-End Estimation of Products

To estimate products, the front digits of the factors can be multiplied.

EXAMPLE

The air mileage between Chicago and New York is 714 miles. Mr. Conrad made the trip 52 times in one year because he flew 26 roundtrips during the year. He earned 1 bonus point for each mile he flew. Did he earn enough bonus points for a flight that requires 30,000 points?

Use front-end estimation to answer the problem because you need to know whether he flew more than or less than 30,000 miles.

- Estimate the product of 52 × 714 to solve the problem.

$$\begin{array}{rcr} 714 & \longrightarrow & 700 \\ \times\ 52 & \longrightarrow & \times\ 50 \\ & & 35000 \end{array}$$

Mr. Conrad earned about 35,000 bonus points.

NOTE

The exact product is greater than 35,000 because both numbers were rounded down.

Rounding One Factor to Estimate Products

If one factor is a 1-digit number, you can estimate by rounding only 1 factor.

EXAMPLE

The fifth grade play was performed on 4 different days. Each day, all 389 tickets were sold. About how many tickets were sold for the 4 days?

- Estimate the product of 4 × 389 to solve the problem.

$$4 \times 389$$

Only 1 factor was rounded.

$$4 \times 400 = 1600$$

So, about 1,600 tickets were sold for the 4 days.

NOTE

Since 400 is greater than 389, then 4 × 400 is greater than 4 × 389.

The estimate of 1,600 is greater than the actual product.

This is an **overestimate**.

So, less than 1,600 tickets were sold for the 4 days.

Rounding Both Factors to Estimate

If each factor is a 2-digit or a 3-digit number, you can estimate by rounding each factor to the greatest place value.

EXAMPLE 1

The school auditorium has 38 rows of 53 seats. About how many seats are in the auditorium?

- Estimate the product of 38 × 53 to solve the problem.

$$38 \times 53$$

$$\downarrow \quad \downarrow$$

$$40 \times 50 = 2000$$

Both 38 and 53 were rounded.

So, about 2,000 seats are in the auditorium.

NOTE

This **estimate** is close to the actual product because one factor was rounded up 2 and one factor was rounded down 3.

EXAMPLE 2

A factory made 621 computer stations for a Texas school district. Each station required 43 screws. About how many screws did the factory use for the computer stations?

- Estimate the product of 43 × 621 to solve the problem.

$$43 \times 621$$

Both 43 and 621 were rounded.

$$40 \times 600 = 24000$$

So, about 24,000 screws were used for the computer stations.

NOTE

This **estimate** is less than the actual product because both factors were rounded down.

Compatible Numbers to Estimate Products

When you estimate, look for **compatible numbers**. Compatible numbers are numbers that work well together. In multiplication, they are number pairs that are easy to multiply.

To estimate products, replace one or both factors with compatible numbers.

EXAMPLE

There are 18 weeks in the school semester. Your principal gives each student a school motto pencil each week. There are 618 students in your school. About how many school motto pencils did your principal order for the semester?

- Find compatible numbers for 18 and 618 and use them to estimate the product of 18 × 618.

  Try 20 × 600.

$$\begin{array}{rcl} 618 & \longrightarrow & 600 \\ \times\ 18 & \longrightarrow & \times\ 20 \\ & & 12000 \end{array}$$

So, the principal ordered about 12,000 school motto pencils for the semester.

618 is close to 600. 18 is close to 20.
So, the principal ordered about 12,000 motto pencils for the semester.

The estimate of 12,000 is more than the actual product because both numbers were rounded up. This is an **underestimate**.

So, the principal actually ordered less than 12,000 motto pencils.

Any factor is compatible with a multiple of 10, because there are shortcuts for multiplying by multiples of 10.

EXAMPLE

Each of the 63 sections of a rodeo arena has 98 seats. About how many seats are in the rodeo arena?

- Estimate the product of 63 × 98 to solve the problem.

$$63 \times 98$$

Both 62 and 100 were rounded to a multiple of 10.

$$60 \times 100 = 6{,}000$$

The rodeo arena has about 6,000 seats.

NOTE

This **estimate** is close to the actual product because one factor is rounded down 3 and the other factor is rounded up 2.

Problem-Solving 2

A dining and sight-seeing train at Royal Gorge in Colorado can take 158 passengers at a time. The train runs 26-33 times each month. Find a reasonable number of passengers the train takes in one month.

1. What is the least number of passengers the train takes in one month? Show your work.

2. Use reverse factors of the lattice method to check your multiplication. Show your work.

3. What is the greatest number of passengers the train takes in one month?

4. Use reverse factors of the lattice method to check your multiplication. Show your work.

5. Copy and complete this sentence on your notebook paper.

The dining and sight-seeing train at Royal Gorge in Colorado takes less than _____, more than_____, and between _____ and _____ passengers each month.

Student Activity 2

Work with a partner to complete Student Activity 2.

PROBLEM 3: Yolanda plays CDs while she does her homework. The CD lasts 26 minutes. Estimate the total number of minutes Yolanda worked on homework last month if she played her CD all the way through 33 times.

- The CD lasts _____ minutes.

  Round _____ to _____.
- Yolanda played the CD _____ times last month while she worked on her homework.

  Round _____ to _____.
- Since the CD lasts the same _____ of _____ each time it is played, the operation of _____ can be used to solve the problem.
- An estimated number of minutes Yolanda worked on homework last month is:

  _____ x _____ = _____ .

Yolanda worked about _____ minutes on homework last month.

- Reverse the factors to check your multiplication. Show your work on notebook paper.

PROBLEM 2: A Texas high school in the Valley is sending 27 of is Glee Club members and two directors to a weekend competition in Austin. The cost per person for the trip is $588. Estimate the total amount of money the school will pay for the trip to the nearest $100.

- The cost for the trip is $_____ per person.

  Round _____ to _____.
- _____ Glee Club members and _____ directors are going on the trip.

  Round _____ to _____.
- Since the cost of the trip is the same _____ for _____, the operation of _____ can be used to estimate the total amount.
- An estimated total amount of money the school will pay for the trip, to the nearest $100 is:

  _____ x _____ = _____ .

The school will pay about $_____ for ____ Glee Club members and __ directors for the trip to Austin for the competition.

- Reverse the factors to check your multiplication. Show your work.

PROBLEM 3: An airplane traveled a distance of about 328 miles each hour for 16 hours. To the nearest 10, estimate the total distance the airplane traveled during the 16 hours. Show your work.

Explain why this is a good estimate.

Is this estimate an underestimate or an overestimate? _____
Explain why you know your answer is correct.

PROBLEM 4: Estimate the product of 724×39 to the nearest 10. Show your work.

Explain why this is a good estimate.

Is this estimate an underestimate or an overestimate? _____
Explain why you know your answer is correct.

PROBLEM 5: Latrell runs on the treadmill for 32 to 39 minutes every day. To the nearest 10, Estimate the least number of minutes Latrell runs on the treadmill in 30 days. Show your work.

Explain why this is a good estimate.

Is this estimate an underestimate or an overestimate? _____
Explain why you know your answer is correct.

To the nearest 10, Estimate the greatest number of minutes Latrell runs on the treadmill in 30 days. Show your work.

Explain why this is a good estimate.

Is this estimate an underestimate or an overestimate? _____
Explain why you know your answer is correct.

NAME_____ DATE_____ SCORE ___/5

5.3B/5.3A Skills and Concepts Homework 2

1. Hector used blocks to build a scale model of a building. The model is 949 millimeters tall. Each block is 32 millimeters tall. To the nearest ten, estimate the number of blocks Hector used to make the model.
   - Show your work on notebook paper.
   - Explain why this is a good estimate.
   - Is this estimate an underestimate or an overestimate? Explain why you know your answer is correct.

2. There are 687 golfers competing in a tournament. The golf course gives each golfer 12 golf balls with the course logo on them. To the nearest ten, estimate the number of golf balls the course needs to order to make sure they have enough for all the golfers competing in the tournament.
   - Show your work on notebook paper.
   - Explain why this is a good estimate.
   - Is this estimate an underestimate or an overestimate? Explain why you know your answer is correct.

3. There are 982 reference books in one school library in a district. To the nearest 10, about how many reference books are in the district if all 17 schools have about the same number of reference books?
   - Show your work on notebook paper.
   - Explain why this is a good estimate.
   - Is this estimate an underestimate or an overestimate? Explain why you know your answer is correct.

4. Mrs. James is sewing an edging around baby blankets. The distance around each blanket measures approximately 646 centimeters. She is making 19 blankets. About how much edging will she need to finish all of the blankets?
   - Show your work on notebook paper.
   - Explain why this is a good estimate.
   - Is this estimate an underestimate or an overestimate? Explain why you know your answer is correct.

5. Twelve post-office workers each sorted an average of 478 pieces of mail each day during 23 days one month. To the nearest 10, estimate the total number of pieces of mail the 12 workers sorted during the 23 days?
   - Show your work on notebook paper.
   - Explain why this is a good estimate.
   - Is this estimate an underestimate or an overestimate? Explain why you know your answer is correct.

Teacher Notes: Hands-On Activity 1

Materials: (for each student) 1 Multiplication Makes Sense Problems page (copy of colored paper), 1 Creator's Products and Check page (copy on a second color paper), 1 Partner's Products and Check page (copy on a third color paper)

Procedure:

- For each student - Distribute 1 Multiplication Makes Sense Problems page, 1 Creator's Products and Check page, and 1 Partner's Products and Check page
- Students work in partner pairs to brainstorm real-world reasons to use multiplication, then record the situations and reasons for multiplication on a chart. Each situation must include a 3-digit and a 2-digit factor.
- Partner pairs write multiplication problems using situations from their chart, find products their own problems, then exchange problems with their partner.
- Remind students the situations they record MUST require use of a 3-digit and a 2 digit factor to solve a problem.

Ask this question before the students begin working on the activity:

- How can you use multiplication to solve problems that require use of a 3-digit and a 2-digit factor in the real world?

Roam the room as students write their problems and listen for the following:

- Do the students' explanations match their written words?
- Are the students using appropriate vocabulary?

Look for the following as you roam the room while students write problems:

- Can the students identify real-world problems that can be solved using multiplication?
- Can the students pose a problem that can be solved by multiplication?
- Do the students pose a problem that is clear and easily interpreted by another partner pair?
- Can the students check their multiplication using the reverse factors method?

Ask the following after partners pairs trade problems:

- What is the question being asked in the problem your partner gave you?

Roam the room after partners trade problems and listen for the following:

- Do the students' explanations match their written work?
- Are the students using appropriate vocabulary?
- Are the students able to discuss the reasonableness of their solutions?

Look for the following as students solve their partner's problems:

- Can the students identify the factors in the problem?
- Can the students correctly multiply a 3-digit by a 2-digit whole number factor?
- Do the students solve the problems in more than one way?
- Do the students' expressions match their explanations?
- Can the students check their multiplication using the reverse factors method?
- Do the students self-correct any errors?

Multiplication Makes Sense Problems

Multiplication Problem 1:

Multiplication Problem 2:

Creator's Products

Multiplication Problem 1:

Multiplication Problem 2:

Partner's Products and Answer Check

Multiplication Problem 1:

Multiplication Problem 2:

Hands-On Activity 1

MULTIPLICATION MAKES SENSE

Materials: (for each partner) 1 Multiplication Makes Sense Problems page, 1 Creator's Products and Check page, 1 Partner's Products and Check page

Procedure: Work in partner pairs for this activity.

- Work with your partner to brainstorm a list of 5 real-world situations where the operation of multiplication using a **3-digit** and a **2-digit** whole number factor is needed.
- Record the situations and reasons multiplication is needed in this chart.

Multiplication Makes Sense Data Chart

(The situations you record must require use of a 3-digit and a 2-digit whole number factor to solve a problem.)

Real Word Situation	Reason Multiplication is Needed

Part 1

Each partner chooses one of the real-world situations from the Multiplication Makes Sense Data Chart and creates a multiplication problem using factors related to the situation. Write the problem in words on your Multiplication Makes Sense page in the space for Multiplication Problem 1.

- Write an expression that can be used to solve your Multiplication Problem 1.
- Use the expression to find the product for your Multiplication Problem 1. Record the product of the factors in your problem on the top of the Creator's Products page for Multiplication Problem 1. Be sure to show your work. Check your product using the reverse factors method.
- Trade Multiplication Makes Sense pages with your partner.
- Write an expression that can be used to solve your partner's Multiplication Problem 1.
- Use the expression to find the product for your Multiplication Problem 1. Record the product of the factors in the problem on the top of the Partner's Products page for Multiplication Problem 1. Be sure to show your work. Check your product using the reverse factors method.
- Return the Multiplication Makes Sense page to your partner. Discuss factors and products for both of your Multiplication Problem 1 problems.

Part 2

Each partner chooses a different real-world situation from the Multiplication Makes Sense Data Chart and creates a multiplication problem using factors related to the situation. Write the problem in words on your Multiplication Makes Sense page in the space for Multiplication Problem 2.

- Write an expression that can be used to solve your Multiplication Problem 2.
- Use the expression to find the product for your Multiplication Problem 2. Record the product of the factors in your problem on the top of the Creator's Products page for Multiplication Problem 2. Be sure to show your work. Check your product using the reverse factors method.
- Trade Multiplication Makes Sense pages with your partner.
- Write an expression that can be used to solve your partner's Multiplication Problem 2.
- Use the expression to find the product for your Multiplication Problem 2. Record the product of the factors in the problem on the top of the Partner's Products page for Multiplication Problem 2. Be sure to show your work. Check your product using the reverse factors method.
- Return the Multiplication Makes Sense page to your partner. Discuss factors and products for both of your Multiplication Problem 2 problems.

Part 3

Work by yourself to answer these questions.

- What did you think about when you were creating your problems?

- Do your problems use a 3-digit and a 2-digit whole number?

- Can your problems be solved using multiplication?

- How did you solve your partner's problems?

- Do the expressions you wrote match the problems you created?

- Do the expressions you wrote for your partner's problems match the problems your partner created?

- Are the products you found for the problems you created reasonable? _____ How do you know?

- Are the products you found for the problems your partner created reasonable? _____ How do you know?

- Estimate the product to the nearest ten for the Multiplication Problem 1 you created. Show your work below.

  Explain why your estimate is an overestimate or an underestimate.

- Estimate the product to the nearest ten for the Multiplication Problem 2 you created. Show your work below.

  Explain why your estimate is an overestimate or an underestimate.

NAME_____ DATE_____ SCORE ___/10

5.3B/5.3A Mini-Assessment

1. A bank building in the downtown area stands 42 feet tall. If a high rise office building is 102 times as tall as the bank building, how tall is the office building?

   A 504 feet

   B 4,284 feet

   C 484 feet

   D Not here

---

2. A Chinese restaurant ordered 15 cases of fortune cookies. Each case contains 288 fortune cookies. How many cookies did the restaurant order?

   F 3,280

   G 4,280

   H 4,320

   J Not Here

---

3. Alicia deposits $355 in her savings account each month. How much money will she deposit in her savings account in one year?

   A $3,343

   B $2,885

   C $3,150

   D $4,260

---

4. Henry ran around the track at school 12 times. The distance around the track is 440 yards. What was the total distance Henry ran?

   F 1,120 yd

   G 1,320 yd

   H 5,080 yd

   J 5,280 yd

5. During the first semester of school, Lupe filled 138 pages of her math spiral notebook. On the last page of her spiral she found a note that tells her to multiply the number of pages she has filled by 17. The note also tells her to take her answer to the school office to pick up a prize if the answer is correct. What is the correct answer?

   A 2,432

   B 1,240

   C 2,346

   D 2,436

---

6. Miranda built a wall with linking cubes. The wall is 130 cubes high and 23 cubes across. Which is the best estimate for the number of linking cubes she used to build the wall?

   F 2,600

   G 3,750

   H 1,000

   J 4,500

---

7. Which equation represents the best estimate for the product of 183 and 31?

   A $180 \times 40 = 7{,}200$

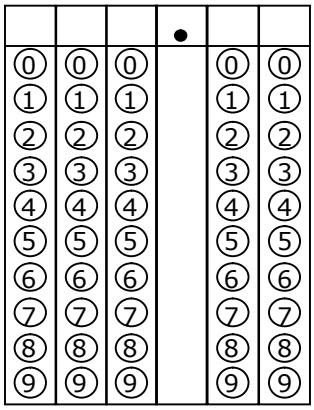
   B $130 \times 30 = 3{,}900$

   C $180 \times 30 = 5{,}400$

   D $190 \times 40 = 7{,}600$

8. A group of 29 scouts went on a weekend camping trip. Each of them paid $24 for expenses for the camping trip. If you only round one factor, what is the best estimate for the total amount of money the group of scouts paid for all of their expenses?

   Your answer is in dollars. Record your answer and fill in the bubbles on the grid. Be sure to use the correct place value.



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9. An airplane traveled a distance of about 328 miles each hour for 6 hours. Which is the best estimate for the total distance the airplane traveled?

   A 1,980 mi

   B 1,440 mi

   C 1,380 mi

   D 1,320 mi

---

10. Laverne runs on the treadmill for 34 to 39 minutes every day. Which could be the total number of minutes that Laverne runs on the treadmill in 50 days?

    F Less than 1,700 min

    G Between 1,700 min and 2,000 min

    H Between 2,000 and 2,300 min

    J More than 2,300 min

Six Weeks 1 Review

Teacher Notes: Six Weeks Review

The Six Weeks Review includes two components:

- A classroom review with 3 questions for each TEKS addressed in lessons and on the Six Weeks Assessment.
- A homework review with 1 question for each TEKS addressed in lessons and on the Six Weeks Assessment.

Classroom Review

- Students should work in partner pairs to complete the review.
- Students may use their math notes and other work from the six weeks to help them complete the review.
- Assign pairs of students to lead a class discussion for each question and answer.

Homework Review

- Remind parents/guardians that they have a Parent Guide that may be useful as a tool to help students who have difficulty with any of the review questions.
- Students may use their math notes and other work from the six weeks to help them complete the homework review.
- Before the Six Weeks Assessment is given - assign pairs of students to lead a class discussion for each question and answer.

Name _____ Date _____

5.2A

1. There are 4.508 milliliters of water in an eyedropper. Write 4.508 in expanded notation.

2. Write a 5-digit number that has the digit 4 in the tenths place and the digit 7 in the thousandths place.

3. Write the value of the 9 in the number 50.59. (9 × _____)

5.2B

Sonja is comparing the cost per ounce of her favorite cereal with several different sized boxes of cereal at several different stores.

Cereal Cost Comparison

Box of Cereal	Cost per ounce ($)
1	0.2
2	0.149
3	0.14
4	0.091
5	0.101

4. Which box of cereal is the least cost per ounce? Box ___ Explain how you know your answer is correct.

5. Which box of cereal is the greatest cost per ounce? Box ___ Explain how you know your answer is correct.

6. Use the greater than and less than symbols to put these numbers in order from greatest to least, the put these numbers in order from least to greatest.

0.774 0.77 0.447 0.777

5.2C

7. A centipede measures 1.347 inches long. Write the length of the centipede rounded to the nearest hundredth.

8. Round 6.389 to the nearest hundredth.

9. Round 0.483 to the nearest hundredth.

5.3A

10. Perry's Popcorn Company sold bags of popcorn at the circus. The chart shows how many pounds of popcorn were popped for the three performances.

Pounds of Popcorn Popped

Day of Performance	Number of Pounds of Popcorn
Thursday	6.2
Friday	10.8
Saturday	7.9

Estimate the total number of pounds of popcorn popped during the three performances. Show your work. Explain why your estimate is correct.

11. Alfred can bicycle around the lake bicycle trail in 37.3 to 41.8 minutes. What is a reasonable number of minutes it will take him to bicycle around the trail 8 times? Show your work. Explain why your estimate is reasonable.

12. Lupe bought a spiral notebook for $1.83 and a pencil for $0.37. About how much money did Lupe spend for the spiral notebook and the pencil? Show your work. Explain why your estimate is reasonable.

5.3B

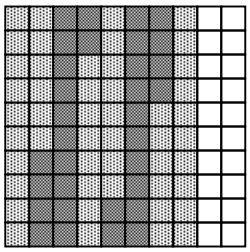
13. A car wash charges $26 for a deluxe car wash. If they finish 347 deluxe car washes today, how much money will they collect, not including tips? Show your work. Check your answer.

14. Ms. Janis teaches math to 254 students each day. She grades one paper for each student each day. If Ms. Janis teaches for 25 days this month, how many papers does she grade? Show your work. Check your answer.

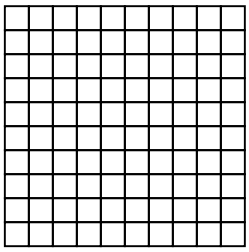
15. A small bag of mixed nuts contains 427 calories. How many calories are in 24 small bags of mixed nuts? Show your work. Check your answer.

5.3D

16. The model is shaded to represent an expression. What expression is represented by the model? Explain why your answer is correct.



17. A Saguaro cactus grows an average of 0.02 inch each month during the first few years of growth. Shade the model to represent the average number of inches a Saguaro cactus grows during 6 months. Explain why your model is correct.



18. The rental fee for a surf board is $5.65 per hour. Jason rented a surf board for 1 hour. Mia rented a surf board for 3 more hours than Jason. Create a model that can be used to find the total cost for their combined surf board rentals. Explain why your model is correct.

5.3E

19. When a certain number is multiplied by 1,000, the product is 9,430. When the same number is multiplied by 10, the product is 94.3. What is the product if the number is multiplied by 1? _____ What is the product if the number is multiplied by 100? ____ Explain how you know your answers are correct.

20. Brenda used 100 ceramic tiles to create her art project. Each tile has an area of 0.25 square inch. Write an equation Brenda use to find the area of her art project. Explain how you know the equation can be used to find the area of Brenda's art project.

21. What is the product of 0.9 and 3.5? Show your work. Explain how you know your answer is correct.

5.3K

22. Serena has a beginning monthly balance of $926.94 in her savings account. Find the amount she will have left after she withdraws $149.57 to pay her electric bill. Show your work. Explain how you know your answer is correct.

23. Mr. Thomas has two lengths of chain link fencing. The first length is 28.7 meters, and the second length is 35.9 meters. Find the difference between the 2 lengths of chain link fencing. Show your work. Explain how you know your answer is correct.

24. Celia has 2 miniature tea sets in her collection. Including tax, she paid $33.84 for 1 of the tea sets and $27.59 for the other. Find the total amount she paid for the two tea sets. Show your work. Explain how you know your answer is correct.

5.4A

25. List all whole number factors of 21. Explain how you know your list is correct.

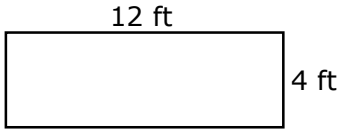
26. Create a factor tree for the number 48. Create the tree on notebook paper. Explain how you know your factor tree shows all whole number factors of 48.

27. List all factor pairs for the number 72. Explain how you know you have listed all possible factor pairs.

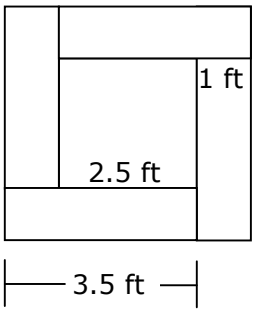
5.4H

28. Mrs. Gomez made a lace border for a rectangular pillow. She used 60 centimeters of lace for each width and 48 centimeters of lace for each length. How much lace did she use to border the pillow? Show your work. Explain how you know your answer is correct.

29. The plan for a butterfly garden project for the science club at school is shown. What will be the area of the butterfly garden? Show your work. Explain how you know your answer is correct.



30. Marilou cut 5 pieces of wood to make a top for a table. The top of the table has a square in the middle surrounded by 4 equal rectangles as shown in the figure. What is the perimeter of each of the four congruent rectangles that surround the square. Show your work. Explain how you know your answer is correct.



5.9A

The table below shows the number of different flavors of ice cream cakes sold at the local ice cream store last week. Jeri has decided to make a bar graph to represent the data. Use the data to answer questions 31-33.

Ice Cream Cakes

Flavor	Number Sold
Vanilla	20
Double Chocolate	40
Strawberry	30
Chocolate Mint	15

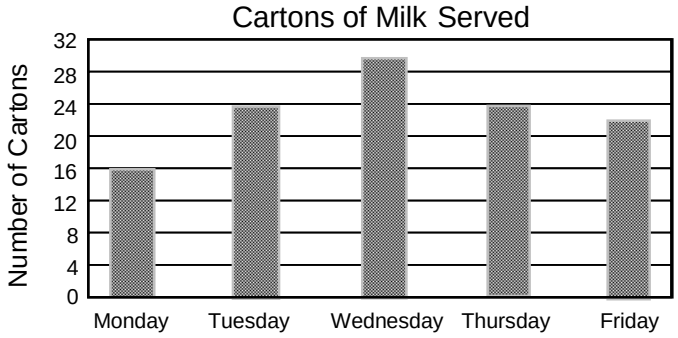
31. Describe a scale that Jeri can use for her bar graph.

32. Which bar will be longest on Jeri's graph? _____
Explain how you know your answer is correct.

33. Which bar will be longer than the bar for chocolate mint, but shorter than the bar for strawberry? _____ How do you know?

5.9C

The bar graph represents the number of cartons of milk the cafeteria at Miller Elementary served during breakfast last week. Use the graph to answer questions 31-33.



34. Write a comparison of the number of cartons served on Tuesday and Friday combined and the number of cartons served on Wednesday.

35. Write a comparison of the number of cartons served on Monday and Thursday and the number of cartons served on Tuesday and Thursday.

36. Is the number of cartons served on Wednesday and Friday greater or less than 50? Explain how you know your answer is correct.

5.10A

37. Katrina is buying a new sleeping bag for a camping trip. The sleeping bag costs $65 plus tax. Katrina gives the cashier $100 and receives $29.80 in change. What is the amount of sales tax Katrina paid for the sleeping bag? Show your work.

38. Alyssa wants to buy $90 worth of items at a discount store. The sales tax is $0.08 for every dollar she spends. What will be the total cost of her purchase? Show your work.

39. Tony's new storage shed has a value of $5,000. The property tax in his city for one year is $12.50 for every $1,000 of property value. What is the amount Tony pays in property taxes on his new shed for one year? Show your work.

Name _____ Date _____

Homework Review

5.2A

1. Write the number 1.728 in expanded notation.

5.2B

2. Write the symbols >, < or = to make each comparison true.

2.554 __ 2.545 2.045 __ 2.545 2.450 __ 2.545

5.2C

3. Beau is 1.176 meter tall. Round 1.176 to the nearest hundredth.

5.3A

4. Stella swam for 16.317 seconds without stopping during her first lesson. She swam for 58.908 seconds without stopping during her third lesson. About how much more time did she swim without stopping during her third lesson than during her first lesson? Show your work.

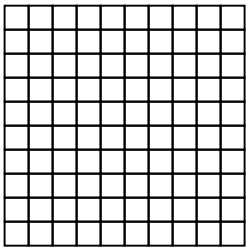
Explain how you know your estimate is correct.

5.3B

5. A large wooden spool contains 237 yards of electrical wire. If each spool contains the same amount of wire, what is the length of electrical wire on 18 spools? Show your work. Check your answer.

5.3D

6. Tristan's water bottle holds 0.24 liter of water. He drinks 3 bottles of water during tennis practice. Shade the model to represent the amount of water Tristan drinks during tennis practice. Explain why your model is correct.



5.3E

7. Use the Distributive Property to find the product of 8 × 0.36. Show your work.

5.3K

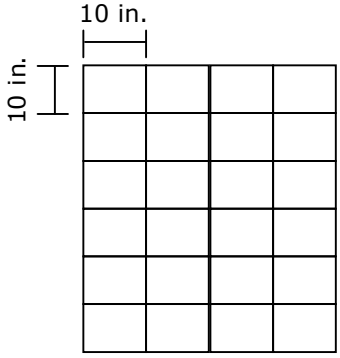
8. On Friday Margo found a CD player that was priced at $82.78. When she went back to buy the CD player on Saturday, it was on sale for $75.99. Find how much lower the price of the CD player was on Saturday than on Friday. Show your work.

5.4A

9. List all whole number factors of 24. Explain why your list is correct.

5.4H

10. The diagram shows the number of congruent sections on a baby's quilt. The length and width of one section is labeled in inches. What is the area of the quilt? Show your work. Explain how you know your answer is correct.



5.9A

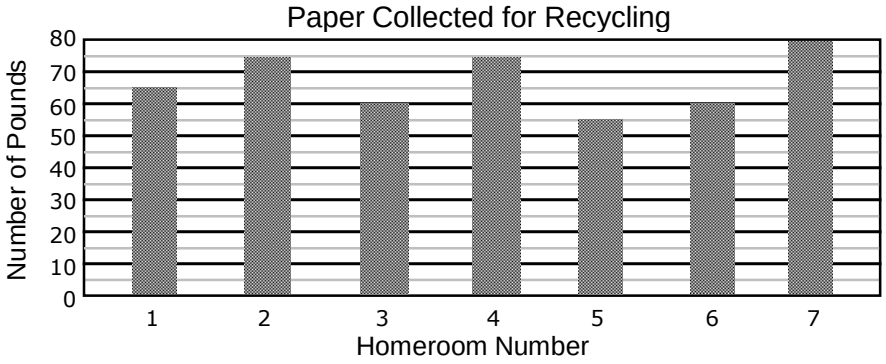
11. The table below shows the number of different types of used vehicles sold at the City Auto Sales for last month. Describe a good scale that could be used to make a bar graph to represent this data. Explain why this is a good scale to use.

Used Vehicle Sales

Type	Number Sold
Pick-Up	7
4-door Sedan	9
2-door Sedan	4
Van	6

5.9C

12. The fifth grade homerooms at an elementary school collected paper to recycle as a class project. The bar graph shows the number of pounds of paper each class collected. What is the difference between the number of pounds of paper collected by homeroom 5 and homeroom 7? _____ pounds. Explain how you know your answer is correct.



5.10A

13. Selena earned $790 dollars this week. Her federal income taxes are $92.25. Her pay after taxes is $655.60. What is the amount she paid in other taxes? Show your work. Explain why your answer is correct.

TEKSING TOWARD STAAR

MATHEMATICS

®

GRADE 5

TEKS/STAAR

Six Weeks 1 Assessment

Answer Key and TEKS/STAAR Category and Standard Correlation

- Copy 1 assessment for each student.
- Students answer the questions individually, however, the same assistance may be given as will be allowed on the actual STAAR.
- Record class performance on the Class Profile and have students record individual performance on their Student Profile.

Question	Answer	TEKS Assessed	STAAR Category	STAAR Standard
1	B	5.2A	1	Supporting
2	J	5.2B	1	Readiness
3	B	5.4A	1	Supporting
4	J	5.3B	2	Supporting
5	A	5.3D	2	Supporting
6	J	5.3E	2	Readiness
7	B	5.4H	3	Readiness
8	H	5.9C	4	Readiness
9	A	5.9A	4	Supporting
10	J	5.10A	4	Supporting
11	C	5.2C	1	Supporting
12	H	5.3A	2	Supporting
13	A	5.2B	1	Readiness
14	F	5.3E	2	Readiness
15	A	5.4H	3	Readiness
16	J	5.3K	2	Readiness
17	B	5.9C	4	Readiness
18	H	5.4H	2	Readiness
19	C	5.3E	3	Readiness
20	6.19	5.3K	2	Readiness

1. Which statement correctly compares 0.07 to 0.007?

   A 0.07 is $\frac{1}{10}$ of 0.007

   B 0.07 is 10 times as much as 0.007

   C 0.07 is $\frac{1}{100}$ of 0.007

   D 0.07 is 100 times as much as 0.007

---

2. Some of the winning times for the women's Olympic swimming 200 meter freestyle are listed in the table.

Women's 200-Meter Freestyle

Year	Time (minutes and seconds)
1988	1 min 59.01 sec
1992	1 min 59.67 sec
1996	1 min 59.56 sec
2000	1 min 58.81 sec

In which year was the shortest time recorded?

F 1988

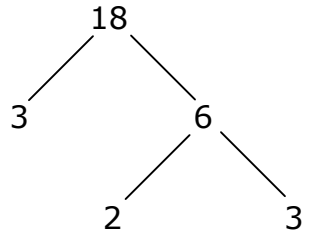
G 1992

H 1996

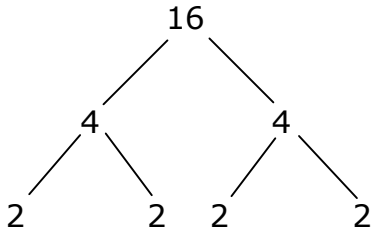
J 2000

3. Which diagram represents a prime number?

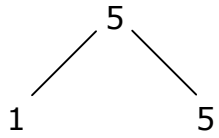
A



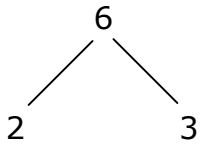
C



B



D



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4. A pizza parlor charges $17 for a large pizza. If they sell 339 pizzas on Saturday, how much money will they collect, not including tax?

F $5,665

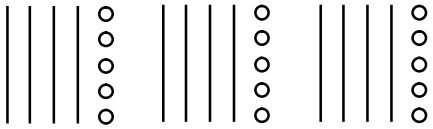
G $5,503

H $6,763

J $5,763

---

5. A multiplication problem can be solved using this model.



Which problem can be solved using the model?

A 3×0.45

B 0.3×0.45

C 4×0.35

D 0.3×45

6. A team of fifth grade students cut ribbons for an art project. They cut 1,000 pieces of ribbon. Each ribbon they cut is 1.45 meters long. Which equation represents the number of meters of ribbon the team cut for the art project?

F $1{,}000 \times 1.45 = 14{,}500$

G $1{,}000 \times 1.45 = 145$

H $1{,}000 \times 1.45 = 14.5$

J $1{,}000 \times 1.45 = 1{,}450$

---

7. Mr. Meyer has a rectangular tulip garden that is 3 feet wide and 7 feet long. If he makes the garden 5 feet wide and keeps the same length, what will be the new perimeter of his tulip garden?

A 25 ft

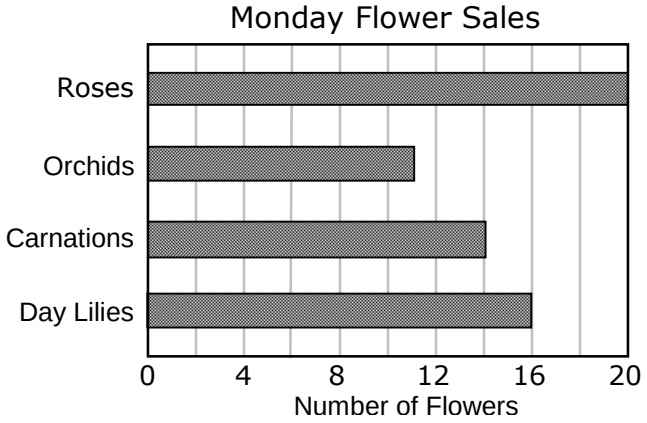
B 24 ft

C 16 ft

D 12 ft

---

8. Linda's Flower Shop sold the following types of flowers on Monday.



How many more roses and day lilies did Linda's Flower Shop sell on Monday than carnations and orchids?

F 13

G 9

H 11

J 5

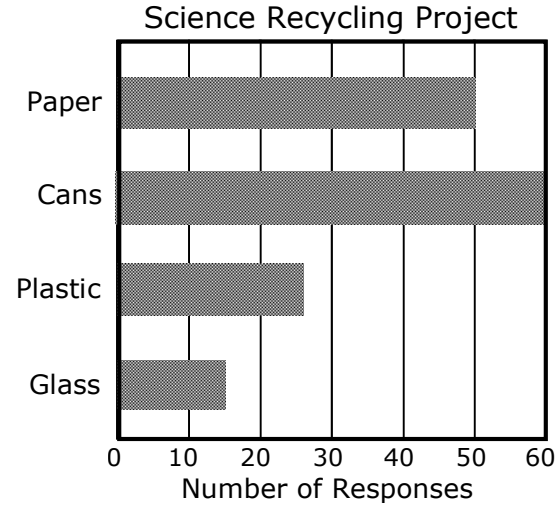
9. For his science project, Dilbert collected data on the recycling program in the city he lives in. He sent out letters and e-mails asking for residents to respond to the type of recycling they did on a regular basis. The data he received for the residents that responded to his survey is displayed in the table.

Science Recycling Project

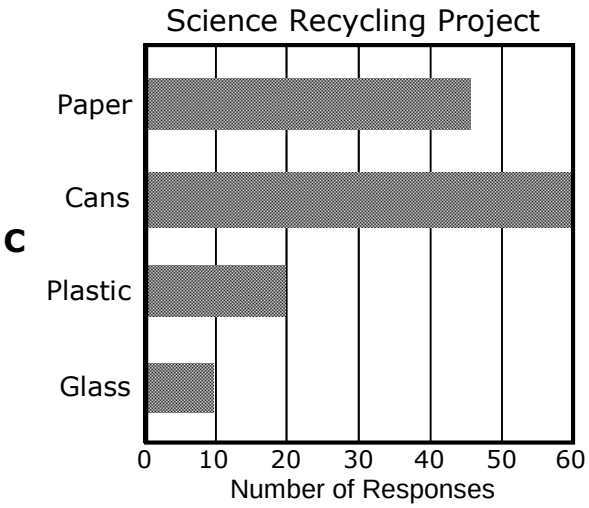
Type of Item Recycled	Number of Responses
Paper	50
Cans	60
Plastic	25
Glass	15

Which bar graph best represents the data shown in the table?

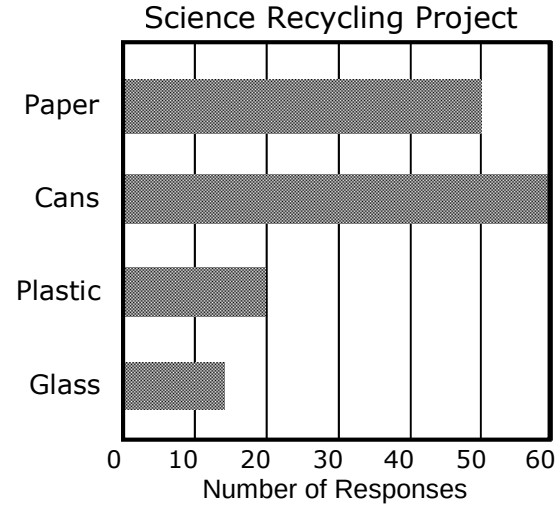
A



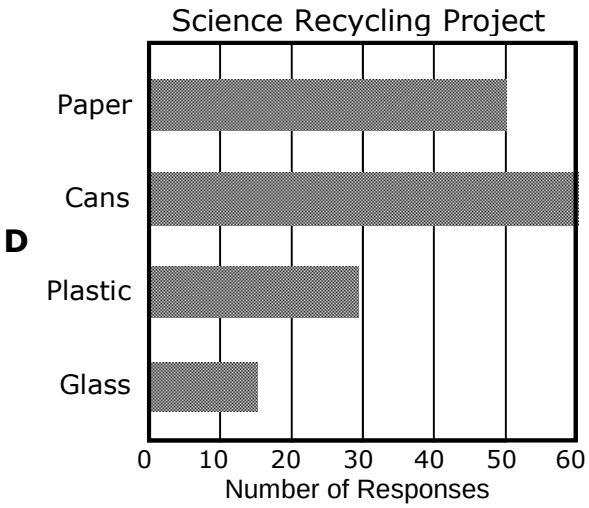
C



B



D



10. The property tax on a home with a value of $100,000 is $1,550 in a town in Texas. Based on this information, which statement is true?

F The property tax rate in the town is $10.50 for every thousand dollars in value.

G The property tax rate in the town s $155 for every thousand dollars in value.

H The property tax rate in the town is $25 for every thousand dollars in value.

J The property tax rate in the town is $15.50 for every thousand dollars in value.

---

11. Chef Monique uses 2.438 kilograms of blueberries for muffins. There are four containers of fresh blueberries at the farmer's market. Which container has an amount of blueberries that is closest to 2.438 kilograms?

A 2.4 kg

B 2.53 kg

C 2.44 kg

D 2.5 kg

---

12. Keri bought 6 rugs for her dorm room. She paid $33.95 for each rug. About how much did she pay for the rugs?

F $160

G $250

H $200

J $300

---

13. Which comparison is true?

A $6.31 < 6.313$

B $6.32 < 6.313$

C $6.314 < 6.313$

D $6.323 < 6.313$