LETTER HOME

Factors and Multiples

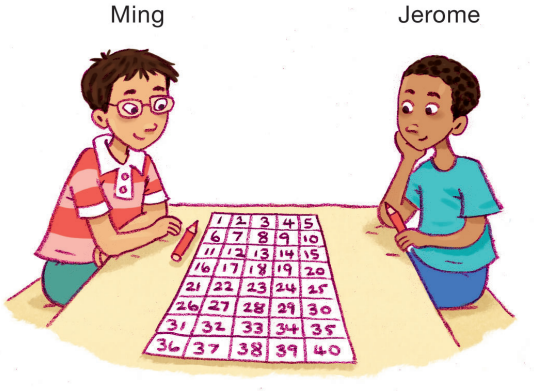
Dear Family Member:

During this unit, your child will investigate factors, multiples, primes, and square numbers. Your child will explore patterns in our number system, describe the patterns, and use them to solve problems. Your child will use concrete objects, paper-and-pencil activities, and games to understand how numbers are related. These activities will help with addition, subtraction, multiplication, and division of whole numbers and fractions.

You can help your child to learn more about our number system with the following activities:

Play Factor Games. Ask your child to play the Factor 20, Factor 40, or, for a challenge, Factor 100 game. For this game, players take turns identifying all the factors of a target number. The directions for these games are in Lesson One.

Play Operation Target. Ask your child to play Operation Target. This game is introduced in Lesson Six. Players use four digits and the operations +, −, ×, and ÷ to make different whole numbers.



Playing the game *Factor 40* helps students learn how numbers are related.

Play Multiples Cover-Up. Players use a spinner to identify the number or numbers for which they need to find multiples. They then choose a number to cover on their game board that matches the description on the spinner. The first player to cover all the numbers on his or her board wins the game. This game is introduced in Lesson Eight.

Play Number Bingo. In Lesson Nine, your child will play Number Bingo. Players spin a spinner and then cover a number on their board that matches the description on the spinner.

Thank you for taking time to talk with your child about what he or she is learning in math. Please feel free to contact me with any questions, concerns, or comments.

Sincerely,

Name _____ Date _____

Unit 9: Home Practice

Part 1 Multiplication and Division Practice

Solve the following problems. Estimate to be sure your answers are reasonable. Use the *Multidigit Multiplication Strategies Menu* and *Division Strategies Menu* in the *Student Guide* Reference section.

1. A. $2170 \div 52 =$

B. $28 \times 69 =$

C. $1307 \times 9 =$

D. $9603 \div 3 =$

E. $444 \times 99 =$

F. $300 \times 60 =$

2. Explain your estimation strategy for Question 1A.

3. Explain a mental math strategy for one of the problems in Question 1.

Name _____ Date _____

Part 2 Going to the Theater

Arti and Lin helped collect tickets at Arti's mother's theater. Tickets for the play are $14 for adults and $9 for students. Adult theater members get a discount and only have to pay half-price ($7).

Number of Tickets in Each Category

Performance	Adult Tickets (full price)	Student Tickets	Adult Member Tickets
Friday	97	15	13
Saturday	103	21	20
Sunday	82	43	5

1. How many people attended each performance of the play?

2. Find the amount of money collected for each performance.

3. How many more adults than students saw the play?

Name _____ Date _____

Part 3 The Band

Choose an appropriate method to solve each of the following problems. For some questions you may need to find an exact answer, while for others you may only need an estimate. For each question, you may choose to use paper and pencil, mental math, or a calculator. Use a separate sheet of paper to explain how you solved each problem.

1. The Krinkles, a pop rock band from Chicago, toured the United States in the year 2000. Their tour van can travel about 12 miles on 1 gallon of gas. They bought about 200 gallons of gas on their tour. About how many miles did they travel?

2. If gas costs $1.50 per gallon, how much did the Krinkles spend on gas during their tour?

3. The Krinkles tour lasted 20 days. Each day the Krinkles budgeted $20 per person for food and $45 per person for a motel room. There are 5 members in the band. What was the total amount of money the band budgeted to spend on food, motel rooms, and gas?

4. On average, 300 people came to each of their concerts. Tickets were $5.00 per person at every concert.

A. If they performed each of the 20 days of the tour, about how many people saw the Krinkles on tour?

B. About how much money did they collect?

C. After paying for gas, motels, and food, about how much money was left to pay the band?

D. About how much did each member make?

E. About how much did each band member make each day?

Name _____ Date _____

Part 4 Exponents and Order of Operations

Use the order of operations to find the value.

A. $9^3 \times 5 \div 3 =$

B. $(4^4 + 4) \div 10 =$

C. $(6 + 3) \times 5^2 \div 5 =$

D. $(3^2 \times 6) + 8 \div 4 =$

Part 5 Using Exponents

1. Each of the three numbers below is written as a product of primes. Rewrite the prime factorizations using exponents.

A. $180 = 2 \times 3 \times 5 \times 2 \times 3 =$ _____

B. $2125 = 5 \times 17 \times 5 \times 5 =$ _____

C. $17{,}820 = 11 \times 2 \times 3 \times 3 \times 5 \times 2 \times 3 \times 3 =$ _____

2. Write each of the following numbers as a product of its primes without exponents. Use factor trees. Then write the number as a product of its primes using exponents.

A. 20

B. 48

C. 56

Name _____ Date _____

Part 6 Practice Computation

Solve the following problems using paper and pencil or mental math. Estimate to be sure your answers are reasonable. Show or tell your estimation strategies. Use the *Addition, Subtraction, Multidigit Multiplication*, and *Division Strategies Menus* in the *Student Guide* Reference section.

A. $46 \times 23 =$

B. $372 \times 9 =$

C. $3850 \times 5 =$

D. $2076 \div 9 =$

E. $78 \times 19 =$

F. $5945 + 6148 =$

G. $9005 - 8747 =$

H. $260 \div 13 =$

Name _____ Date _____

100 Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Name _____ Date _____

Sifting for Primes Check-In: Q# 8–10 Feedback Box

Sifting for Primes Check-In: Q# 8–10 Feedback Box	Expec-tation	Check In	Comments
Identify and categorize prime, composite, and square numbers. [Q# 10]	E1		
Identify and find multiples of numbers. [Q# 8]	E2		
Find all the factors of a number for numbers between 1 and 100. [Q# 9]	E5		

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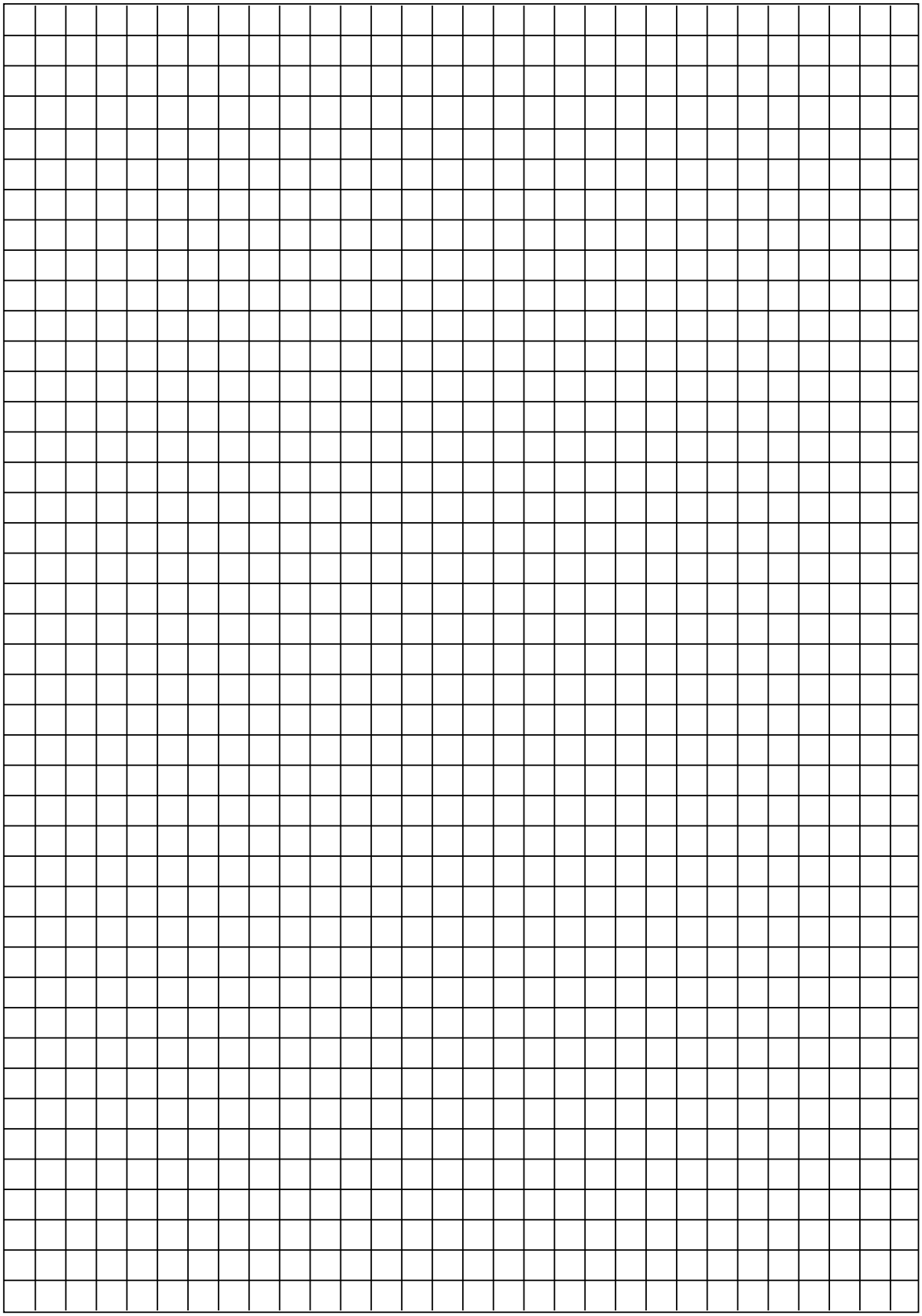


Growth Patterns on Planet Gzorp
Check-In: Q# 17–20 Feedback Box

	Expec-tation	Check In	Comments
Identify and describe number patterns.	E3		
Use variables in formulas to represent number patterns and make predictions.	E4		
Represent number patterns using words, tables, and graphs.	E8		
Make predictions and generalizations using data tables and graphs.	E9		

	Yes . . .	Yes, but . . .	No, but . . .	No. . .
MPE2. Find a strategy. I choose good tools and an efficient strategy for solving the problem.				
MPE3.Check for reasonableness. I look back at my solution to see if my answer makes sense. If it does not, I try again.				
MPE5. Show my work. I show or tell how I arrived at my answer so someone else can understand my thinking.				

Name _____ Date _____

Square Number Patterns
Check-In: Questions 12–13 Feedback Box

	Expec-tation	Check In	Comments
Identify and describe number patterns. [Q# 12C]	E3		
Use variables in formulas to represent number patterns and make predictions. [Q# 12D–E, 13A–B]	E4		
Represent number patterns using words, tables, and graphs. [Q# 12B–D, 13A]	E8		
Make predictions and generalizations using data tables and graphs. [Q# 12D–E, 13B]	E9		

Operation Target

The goal is to use four digits and the operations +, −, ×, and ÷ to make as many different whole numbers as you can. This is a cooperative contest for two or three people.

Materials

- one or two pieces of paper for each player
- pencil for each player
- calculator that uses order of operations

Directions

- You must use each of the four digits 9, 5, 2, and 1 exactly once.
- You can use the operations +, −, ×, and ÷ once, more than once, or not at all.
- Parentheses and exponents are allowed.
- Make as many whole numbers as you can. For example, $9 + 5 \times 2 - 1 = 18$.
- All division operations must give whole numbers. For example, $9 \div 2 = 4.5$ is not allowed.
- List the numbers you make and show how you made them.

Variations

- Play with different digits. For example, play with 3, 4, 5, and 9.
- Allow the digits to be arranged to make fractions and decimals.
- Allow the digits to be arranged into 2-digit numbers. For example, using the digits 9, 5, 2, and 1, the following is permitted: $12 \times 95 = 1140$.

Name _____ Date _____

Rachel's Problems

1. Rachel is exploring function machines. *N* represents the input and *S* the output. Help Rachel complete each of the tables.

A.

$S = 4 + N \times 3$	
N **Input Number**	***S*** **Output Number**
1	7
2	
3	
4	
10	
50	

B.

$S = 24 \div N \times 3$	
N **Input Number**	***S*** **Output Number**
1	72
2	
3	
4	
6	
8	

C.

$S = (2 + N)^2 \times 3$	
N **Input Number**	***S*** **Output Number**
1	27
2	
3	
4	
6	
12	

2. Write the following numbers as products of primes using exponents.

A. 126

B. 360

C. Write the calculator keystrokes you used to check your answer in Question 2B.

Rachel's Problems Feedback Box	Expectation	Check In	Comments
Use variables in formulas to represent number patterns and make predictions. [Q# 1]	E4		
Find the prime factorization of a number. [Q# 2]	E6		
Use order of operations to make calculations that involve exponents and the use of parentheses. [Q# 1]	E7		

Name _____ Date _____

Math Practices Notes

Solving a problem:

1. **Know the problem.** I read the problem carefully. I know the questions to answer and what information is important.	2. **Find a strategy.** I choose good tools and an efficient strategy for solving the problem.
3. **Check for reasonableness.** I look back at my solution to see if my answer makes sense. If it does not, I try again.	4. **Check my calculations.** If I make mistakes, I correct them.

Showing or telling how I solve a problem:

5. **Show my work.** I show or tell how I arrived at my answer so someone else can understand my thinking.	6. **Use labels.** I use labels to show what numbers mean.

Name _____ Date _____

Jona's Work

My 6-Column 100-Chart

Today, in the afternoon, our teacher gave us a chart of 6-columns 100 chart to find the multiples of 2, 3, 5, and 7. Here are a few patterns that we found. I found that the multiples of "2" are in columns 2, 4, 6th columns, all multiples of 2 are even. The number 2 is prime and even. It's the only even number that is prime.

All the multiples of 3 are in column 3 and 6th. The 3 has multiples of 2 for example 6, 12, 18..., also it shares multiples of 5 and 7 like in 5, 5; 15; 14. The 7, shares multiples with the #3: 7, 21, 63, 84.

The multiples of 5 end up in 5 or 0 and are in a diagonal. There are 4 diagonals of 5, they go in a diagonal from right to left, also every other multiple of 5 shares multiples of 2. First look for all the numbers with a "0" and that is also a multiple of 2: 10, 20, 30, 40, 50....

The seven goes in a diagonal from left to right, opposite of 5. Every other multiple of 7 end up in a even number like. 0, 2, 4, 6, 8 are multiples of 2. Finally, I had lots of fun finding patterns because it's like a challenge.

Name _____ Date _____

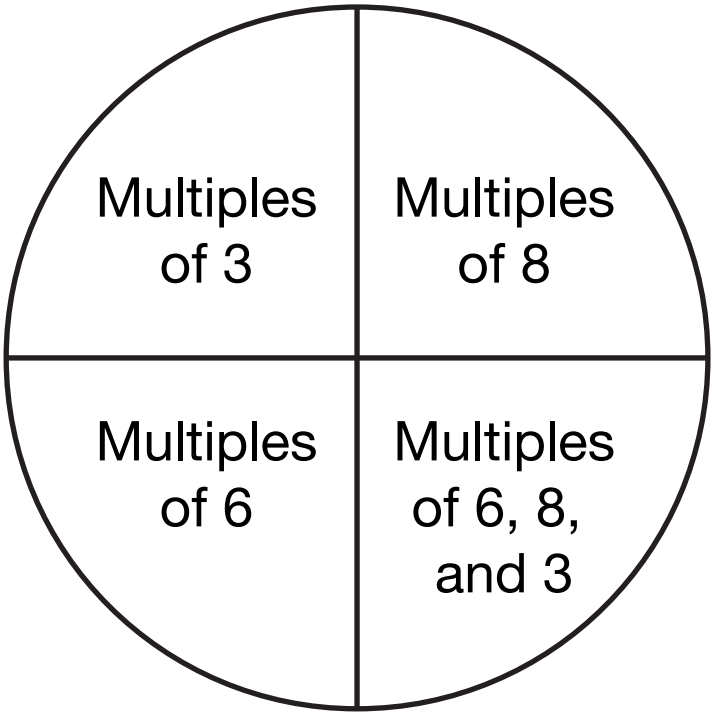
Margo's Work

6-column 100 chart

Today in the afternoon our teacher gave us a 6-column 100 chart, and another paper that had steps for doing the chart. The first step is to cross the first number of the chart. Then it told me to circle the number two because the number two is prime. It told me to color over all the multiples of two. The prime numbers that I circled were 2, 3, 5, 7. The patterns that I found for the number two is that the end of the multiples of two are numbers that are even, and that the multiples of two are multiples of other numbers. The patterns that I found in the prime number 3 is that multiples of three are the multiples of other numbers. The other patttern that I found for all the prime numbers, and the other num is that you are doubling the number. I know that the number 2 is the first prime number. The patterns that I found for the number five are that all multiples of five end with zero, and with 5. I know that other numbers have multiples of even if they are odd or they are even, it dosen't matter and I know that five has 4 diagonal and it's intersecting with the other prime numbers. the patterns that I see for the prime number seven are that it has multiples of the other numbers like 3 of like 5.

Finally, I think 6-column 100 chart was a little difficult to do for the people that don't know what the prime numbers are.

Multiples Cover-Up



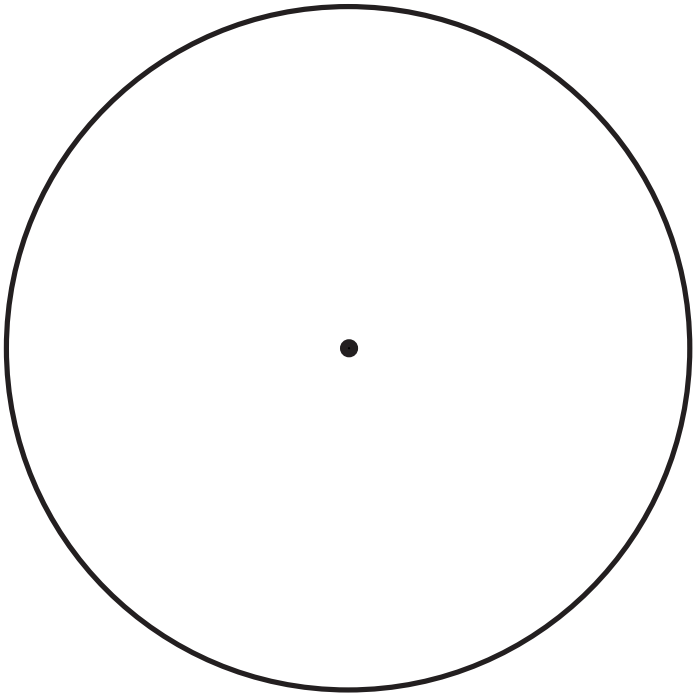
Ana's Game Board

32	24	120	180
48	18	12	?
72	96	240	64
60	36	108	9

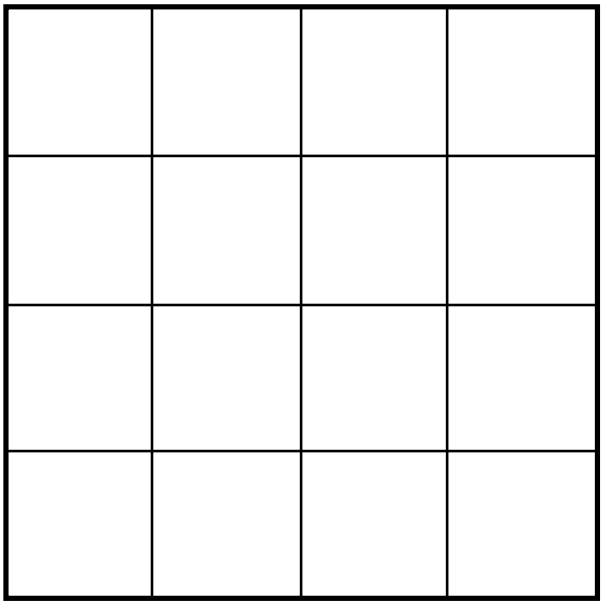
Multiples Cover-Up Spinner and Game Board

Use the blank spinner and game board to create a Multiples Cover-Up game to play at home. Divide the spinner into 3, 4 or 6 spaces. Choose two numbers if your spinner has three outcomes. If your spinner has four outcomes, choose three numbers for the game and if your spinner has six outcomes you can find the multiples of 3 or more numbers. Each player will need to make a 4 × 4 game board. Directions are in the *Student Guide*.

Multiples Cover-Up Spinner



Multiples Cover-Up Game Board



Name _____ Date _____

What Number Am I Cards

Cut along the dotted lines. Then fold along the solid line so that the words appear on the inside of each folded piece of paper.

Numbers	Clues
I am 11.	I am a square number between 20 and 30. What number am I?
I am 25.	I am a twin prime number. My twin is 11. What am I?
I am 13.	I am a composite number. My prime factorization is $2^2 \times 3$. What number am I?
I am 12.	I am the only even prime number. What number am I?
I am 2.	I am the largest square number between 1 and 50. What number am I?
I am 49.	I am the largest prime factor of 15. What number am I?
I am 5.	I am 2^4. What number am I?

Name _____ Date _____

Numbers	Clues
I am 16.	I am a twin prime number. My twin is 31. What number am I?
I am 29.	I am the next square number larger than 100. What number am I?
I am 121.	I am a factor of every number whose digits add up to 3. What number am I?
I am 3.	I am a prime number. My only factors are 1 and 41. What number am I?
I am 41.	I am a composite number. My prime factorization is $2 \times 3 \times 5$. What number am I?
I am 30.	I am the only number in the prime factor tree of 49. What number am I?
I am 7.	I am a square number between 30 and 40. What number am I?
I am 36.	I am a one-digit number. Prime numbers always end with a 1, 3, 7, or with me. What number am I?
I am 9.	I am neither prime nor composite. What number am I?

Name _____ Date _____

Numbers	Clues
I am 1.	My prime factorization is $5^2 \times 2^2$. What number am I?
I am 100.	I am a composite number. All of my factors are 1, 2, 3, 4, 6, 8, 12, and myself. What number am I?
I am 24.	I am 3^3. What number am I?
I am 27.	I am both 3^4 and 9^2. What number am I?
I am 81.	I am the 8th odd number. What number am I?
I am 15.	I am the 11th even number. What number am I?
I am 22.	I am both a square number and a cube number. I am less than 100 and I am not 1. What number am I?
I am 64.	I am the next prime number after 47. What number am I?
I am 53.	I am the largest prime factor of 88. What number am I?