END-OF-YEAR WORD PROBLEMS

Directions – Read and solve the word problems.

Do one problem each day.

Moses is making a thank-you card for his teacher at the end of the year. He covers 3/12 of the card in glitter. Name two fractions that are equivalent to 3/12.

1

Ms. Morrison is taking down all of her classroom decorations at the end of the year. The biggest poster is a square with a side length of 36 inches. What is the area of this poster?

2

Mr. Lukas is pouring juice for his students' end-of-year party. Each cup holds 1/4 of a liter of juice. He fills 28 cups of juice. How many liters is this?

3

Principal Sarek is treating Bridgewater Elementary School to an end-of-year pizza party. Each pizza has 12 slices in it. Principal Sarek buys 49 pizzas. How many slices are there altogether?

4

Mr. McAvoy is the custodian at Green Meadows Elementary School. At the end of the year, he collects 83.24 pounds of trash from the classrooms. This is 14.09 more pounds than he collected last year. How many pounds of trash did he collect last year?

5

There are 348 school buses in Bristol County. Over the summer, they park in a garage that has 6 levels. If each level holds the same number of buses, how many buses are on each level?

6

Coach Singer measured how much faster students could run around the track at the end of the year than they could at the beginning of the year. At the beginning of the year, it took Jim 5.61 minutes. At the end of the year, it took Jim 4.08 minutes. How much less time did it take Jim to run around the track at the end of the year?

7

Karmen always eats chocolate chip pancakes for breakfast to celebrate the last day of school. Each pancake has 2/9 of an ounce of chocolate chips in it. Karmen ate 4 pancakes. How many ounces of chocolate chips did she eat?

8

Mr. Favereaux is giving his class one last math problem before the year is over. He asks the class to round 184,962 to the nearest thousand. Ivy says that it's 180,000. Will says it's 185,000. Which student is correct? Explain your reasoning.

9

Miriam is decorating a cake for her class's end-of-year party. The cake is a rectangle with a length of 20 inches and a width of 9 inches. If she pipes icing along the perimeter, how many inches of icing will she need?

10

The cafeteria workers at Polk Elementary are making special cookies for the students on the last day of school. The recipe calls for 5/9 of a pound of brown sugar and 6/8 of a pound of white sugar. Do the cookies have more brown sugar or white sugar? Explain your reasoning.

11

Jonas and Liam are cleaning out their desks at the end of the year. Jonas fills 3/9 of a recycling bin with old papers. When Liam adds his papers, the bin is completely full. What fraction of the recycling bin is full of Liam's papers?

12

For the end-of-year party, Principal Mendrose bought six giant bags of candy. Each bag had 538 pieces of candy in it. How many pieces of candy are there altogether?

13

Mr. Reyes is asking his class about their summer plans. Of the students, 3/9 are going to visit the beach, and 2/9 are going to visit the mountains. What fraction of the class is going to either the beach or the mountains?

14

Two friends are signing yearbooks at their class's end-of-year party. Ruben takes 0.35 of a minute to sign his name. Jace takes 0.4 of a minute. Determine who takes longer to sign his name. Explain your reasoning.

15

At the end of the school year, Jenny sees that she has lost 4/10 of her markers. What are two fractions that are equivalent to this fraction?

16

Families are being seated for the 5th grade graduation party. There are 27 rows of seating with 22 seats in each row. How many total seats are there for families to sit in?

17

Ms. Wilkins is the custodian at West Glen Elementary school. He is waxing the gym floor at the end of the year. The floor is a rectangle with a width of 50 feet and a length of 81 feet. What is the area of the gym floor?

18

©Jennifer Findley

Name: _____ Date: _____

1.	2.	3.
4.	5.	6.
7.	8.	9.

Name: _____   Date: _____

10.	11.	12.
13.	14.	15.
16.	17.	18.

ANSWER KEY

#	Skill	Answer
1	Equivalent Fractions	1/4, 6/24, 9/36
2	Area	1,296 square inches
3	Multiplying Fractions by Whole Numbers	7 liters
4	Multi-Digit Multiplication	588 slices
5	Decimal Operations/Measurement Word Problem	69.15 pounds
6	Dividing by 1-Digit Divisors	58 buses
7	Decimal Operations/Measurement Word Problem	1.53 minutes
8	Multiplying Fractions by Whole Numbers	8/9 of an ounce
9	Rounding Whole Number	Will is correct.
10	Perimeter	58 inches
11	Comparing Fractions	The cookies have more white sugar.
12	Subtracting Fractions	6/9 or 2/3 of the bin
13	Multi-Digit Multiplication	3,228 pieces of candy
14	Fraction Operations	5/9 of the class
15	Comparing Decimals	Jace takes longer to sign his name.
16	Equivalent Fractions	2/5, 8/20
17	Multi-Digit Multiplication	594 seats
18	Area	4,050 square feet

Name #: _____   Date: _____

Paragraph of the Week

Over the course of this week, you will be writing a paragraph. You will choose a topic (within the given parameters) and will brainstorm, draft, and write a complete paragraph. Be sure to use all that we have learned in class when writing this paragraph. So let's get started!

Monday

Brainstorm which place you would most like to visit. What about this place makes it appealing to you? Where specifically would you go? What would you do there? Write down everything you can think of about this topic.

Tuesday

Using the brainstorm you created yesterday, choose 3 of your reasons for choosing the place that you did. They will become the three details about the topic. Write a sentence for each. Then, write an explanation sentence for each. Then write the topic/closing sentences to create an entire paragraph about your topic.

Wednesday

Now that your paragraph is written, choose at least two sentences to enhance and revise. Using the revision checklist, make sure that the two sentences add more to your writing. You may also go back to Tuesday's page and revise on there as well.

Thursday

It is time to put all of your work together in the form of a final draft. This is where you take your revisions, polish them up, and create a final product for your readers. Be sure to write neatly and check the rubric.
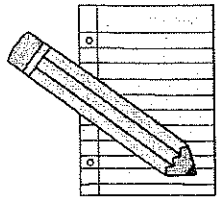
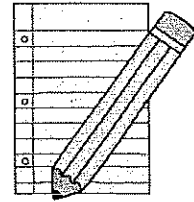| Revising Checklist		Paragraph Rubric	
	Topic is narrow and manageable.	4	Complete sentences, topic sentence, 3 supporting details with evidence sentence, closing sentence, vivid adjectives, engaging beginning, a great deal of varied sentence structure, correct punctuation, correct spelling, neat and legible, on topic.
	The sentences are varied (complex, compound, simple)	3	Complete sentences, topic sentence, 3 supporting details with evidence sentence, adjectives, engaging beginning, some varied sentence structure, closing sentence, correct punctuation, correct spelling, neat and legible, on topic.
	The sentences have different beginnings.		
	The details support the main idea/topic sentence.	2	Mostly complete sentences, topic sentence, 3 supporting details which may contain evidence sentence, closing sentence, may or may not include adjectives and engaging beginning, a few varied sentence structure, mostly correct punctuation and correct spelling, somewhat neat and legible, somewhat on topic.
	The spelling, punctuation, and capitals are correct.		
	Specific descriptive words are used to enhance the writing (ie: WOW words instead of BLAH words)	1	Some complete sentences, may or may not contain the following: topic sentence, 3 supporting details with evidence sentence, vivid adjectives, engaging beginning, varied sentence structure, closing sentence, incorrect punctuation, incorrect spelling, not really neat or legible, off topic.

Paragraph of the Week

Monday

Brainstorm which place you would most like to visit. What about this place makes it appealing to you? Where specifically would you go? What would you do there? Write down everything you can think of about this topic.

Which place in the world would you most like to visit?

Place to visit

Paragraph of the Week

Now that you have the topic of your paragraph, you will write the topic sentence, main body sentences (with explanations) and your closing sentence. Be sure that they are all on topic, as this is the rough draft of your paragraph.
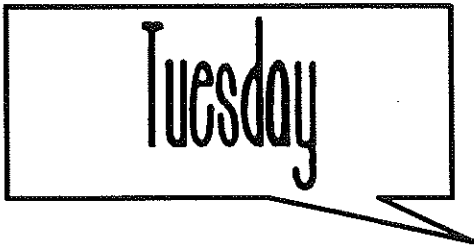
Tuesday

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Topic Sentence : _____
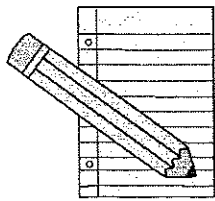
_____

Detail One : _____

_____

Explanation : _____

_____

Detail Two : _____

_____

Explanation : _____

_____

Detail Three : _____

_____

Explanation : _____

_____

Closing Sentence : _____

_____

Paragraph of the Week

When you revise and edit, you take what you have and "make it better".
Use vivid adjectives, vary your types of sentences, and make your
writing interesting to read.

Wednesday

Now that your paragraph is written, choose at least two sentences to enhance and revise. Using the revision checklist, make sure that the two sentences add more to your writing. You may also go back to Tuesday's page and revise on there as well.

Original Sentence : _____

_____

_____

Revision : _____

_____

_____

_____

	Topic is narrow and manageable.
	The sentences are varied (complex, compound, simple)
	The sentences have different beginnings.
	The details support the main idea/topic sentence.
	The spelling, punctuation, and capitals are correct.
	Specific descriptive words are used to enhance the writing (ie: WOW words instead of BLAH words)

Topic is narrow and manageable.	
The sentences are varied (complex, compound, simple)	
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The spelling, punctuation, and capitals are correct.	
Specific descriptive words are used to enhance the writing (ie: WOW words instead of BLAH words)	

Original Sentence : _____

_____

_____

Revision : _____

_____

_____

_____

_____

Place to visit

Paragraph of the Week

A final draft is as "perfect" as you can get it. Be sure you really show your writing off here!

Thursday

It is time to put all of your work together in the form of a final draft. This is where you take your revisions, polish them up, and create a final product for your readers. Be sure to write neatly and check the rubric.

4	Complete sentences, topic sentence, 3 supporting details with evidence sentence, closing sentence, vivid adjectives, engaging beginning, a great deal of varied sentence structure, correct punctuation, correct spelling, neat and legible, on topic.
3	Complete sentences, topic sentence, 3 supporting details with evidence sentence, adjectives, engaging beginning, some varied sentence structure, closing sentence, correct punctuation, correct spelling, neat and legible, on topic.
2	Mostly complete sentences, topic sentence, 3 supporting details which may contain evidence sentence, closing sentence, may or may not include adjectives and engaging beginning, a few varied sentence structure, mostly correct punctuation and correct spelling, somewhat neat and legible, somewhat on topic.
1	Some complete sentences, may or may not contain the following: topic sentence, 3 supporting details with evidence sentence, vivid adjectives, engaging beginning, varied sentence structure, closing sentence, incorrect punctuation, incorrect spelling, not really neat or legible, off topic.

_____

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Place to visit

Name _____

Read the passage. Use the ask and answer questions strategy to help you understand what you read.

Migration

	You may know people who have moved from one city to another. When
13	people move, they usually stay in their new place for quite a while. Did
27	you know that there are many animals that move two times a year? This
41	regular movement is called migration.
46	A migration is usually a round trip made between two areas. Most
58	animals that migrate move when the seasons change in spring and fall.
70	They go where there is better weather and more food. Some animals
82	migrate to areas where their young will have a better chance to live.
95	There are different types of migration. Many kinds of birds migrate
106	between north and south. They live in northern areas in the spring and
119	summer. In fall, when the weather turns cold, they fly south. In spring
132	when the weather warms up, they fly north again.
141	Other animals move between a higher place and a lower one when the
154	seasons change. In summer, they make their homes high up on a mountain.
167	When winter comes, they head to warmer areas down the slopes. Birds
179	called mountain quail migrate in this way. These quail are birds that do not
193	normally fly. In the fall, they walk down the mountain and in the spring
207	they walk back up again!
212	Some mammals and tropical birds live in climates that are very wet for
225	at least part of the year. When the dry season comes, these animals move
239	to a place that is wet during this season. When the rainy season returns,
253	they go back home.
257	How do these animals know when to migrate? Scientists who have
268	studied this behavior think that animals know when seasons are about
279	to change. They also seem to know where they are going and how to
293	get there.

Name _____

Many animals migrate to and from the same places year after year. How do they know where to go? Many birds travel the same paths every year. These routes are called flyways. How do they know which path to follow? Human explorers have studied astronomy, and have used the sun, moon, and stars to guide them. Birds and other animals also use the stars and the sun to help them find their way. Some even use geographic features, such as rivers and mountain ranges, as landmarks. Biologists say some animals also seem to have the help of a built-in sense of direction.

Many types of birds, such as Canada geese, migrate each year.

Arctic terns are sea birds that fly huge distances. They can fly 22,000 miles in a year. That's farther than any other bird. Many terns live part of the year on the East Coast of North America and on islands in the Arctic Ocean. That is where they have their young. In late August, the terns begin their journey to Antarctica. They return to North America around the middle of June.

The monarch butterfly migrates up to 2,000 miles. They leave each fall to go to a warmer climate. In the fall, monarchs from Canada and the northeastern United States fly to a warmer climate in the mountains of central Mexico. Some from western North America seek warmer weather on the California coast.

Some fish migrate to reproduce. Salmon are known for making a hard journey to lay their eggs. Most salmon live in the ocean, but they are born in freshwater lakes and streams. To have their young, salmon travel back to the lakes and streams where they were born.

People have studied how animals migrate for hundreds of years. One famous migration is that of the swallows of Mission San Juan Capistrano in California. A popular song celebrated their annual return. Many of the swallows have now abandoned the Mission for other places in the area. But they haven't stopped migrating.

Name _____

A. Reread the passage and answer the questions.

1. What are two key details in the third paragraph?

   _____

   _____

   _____

2. How are these details connected?

   _____

   _____

   _____

3. What is the main idea in the third paragraph?

   _____

   _____

   _____

B. Work with a partner. Read the passage aloud. Pay attention to rate and accuracy. Stop after one minute. Fill out the chart.

	Words Read	–	Number of Errors	=	Words Correct Score
First Read		–		=	
Second Read		–		=	

Name ....

Hands On
Numerical Expressions

A **numerical expression**, such as $8 + 7$, is a combination of numbers and at least one operation. You can find the value, or **evaluate**, the numerical expression by completing each operation.

Draw It

Gregory and his family went hiking over the weekend. On Saturday, they hiked 5 miles and on Sunday, they hiked 5 miles. Use the bar diagram to write and evaluate two numerical expressions to represent the total number of miles hiked.

Where's the escalator?

← total miles →	
5 mi	**5 mi**
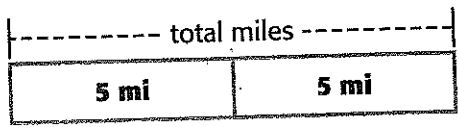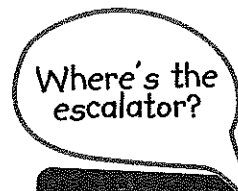
⬆ Use the bar diagram to write an addition expression.

$5 +$ ....

Evaluate the expression.

$5 +$ .... $=$ ....

② Use the bar diagram to write a multiplication expression.

.... $\times 5$

Evaluate the expression.

.... $\times 5 =$ ....

So, they hiked a total of .... miles.

Try It

Mrs. Yearling has two groups of 5 students and two groups of 4 students. Use the bar diagram to write and evaluate two numerical expressions to represent the total number of students.

| |---------------- total students ----------------| |
| 5 students | 5 students | 4 students | 4 students |
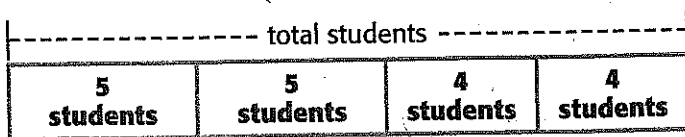
1 Use the bar diagram to write an expression using only addition.

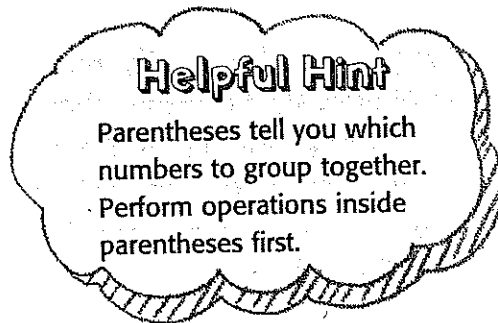$5 + \underline{\hspace{2cm}} + 4 + \underline{\hspace{2cm}}$

Evaluate the expression.

$5 + \underline{\hspace{2cm}} + 4 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

2 Use the bar diagram to write an expression using multiplication and addition.

$(\underline{\hspace{2cm}} \times 5) + (\underline{\hspace{2cm}} \times 4)$

Evaluate the expression.

$(\underline{\hspace{2cm}} \times 5) + (\underline{\hspace{2cm}} \times 4) = \underline{\hspace{2cm}}$

Helpful Hint
Parentheses tell you which numbers to group together. Perform operations inside parentheses first.

So, there are $\underline{\hspace{2cm}}$ students that are divided into groups.

Talk About It

1. Evaluate the addition expressions to find the sum. Does the order in which the expression is written change the sum? Explain.

| addition expression |
| $7 + 7 + 5 + 5$ |

| addition expression |
| $7 + 5 + 7 + 5$ |

_____

_____

2. **Mathematical PRACTICE 4 Model Math** Suppose Mrs. Yearling also had another group of 4 students. Write two new numerical expressions to represent the total number of students.

Expression 1

$5 + \underline{\hspace{2cm}} + 4 + 4 + \underline{\hspace{2cm}}$

Expression 2

$(2 \times \underline{\hspace{2cm}}) + (\underline{\hspace{2cm}} \times 4)$

Practice It

3. Caleb's music class is divided into 5 groups of 4 students for a project. Use the bar diagram to write and evaluate two numerical expressions to represent the total number of students in his music class.

total students				
4 students	**4** students	**4** students	**4** students	**4** students

Write and evaluate an expression using only addition.

_____

Write and evaluate an expression using multiplication.

_____

So, there are _____ students in his music class.

Mathematical
4. PRACTICE **7** **Identify Structure** Bailey's soccer team had snacks after the game that included 12 granola bars, 12 mini muffins, and 14 bananas. Use the bar diagram to write and evaluate two numerical expressions to represent the total number of snacks after the soccer game.

I JUST SCORED A SNACK!

total snacks		
12 granola bars	**12 mini** muffins	**14** bananas

Write and evaluate an expression using only addition.

_____

Write and evaluate an expression using multiplication and addition.

_____

So, there are _____ total snacks after the game.
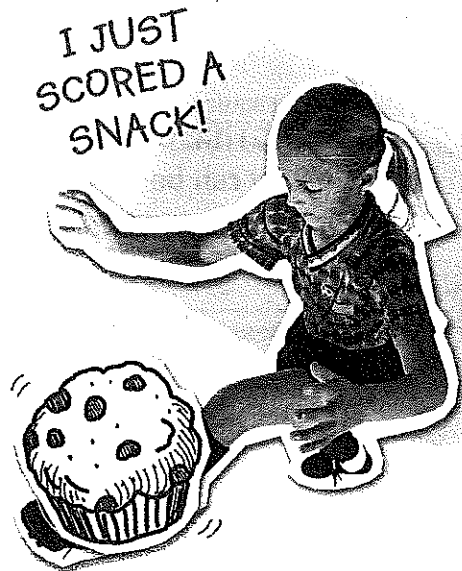
Apply It

5. Wasah went bird watching and spotted 6 robins, 5 sparrows, 6 cardinals, and 6 doves. Use the bar diagram to write and evaluate two numerical expressions to represent the total number of birds Wasah spotted.
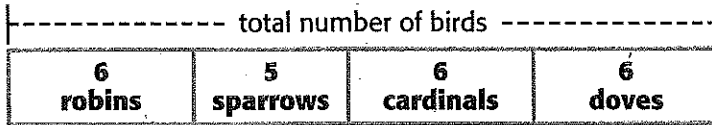
Can you see me now?

←―――――――― total number of birds ――――――――→			
6 robins	**5** sparrows	**6** cardinals	**6** doves

Write and evaluate an expression using only addition.

_____

Write and evaluate an expression using multiplication and addition.

_____

So, Wasah spotted a total of _____ birds.
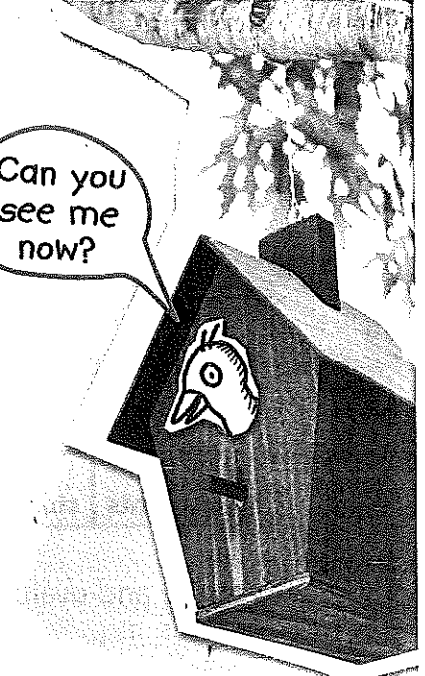
Mathematical
6. **PRACTICE** **Which One Doesn't Belong?** The bar diagram below can be represented by three of the four expressions underneath it. Find the value of each expression and circle the one that does not represent the bar diagram.

5	4	5	4	5	4

$5 + 4 + 5 + 4 + 5 + 4$ | $(3 \times 5) + (3 \times 4)$ | $3 + 5 + 3 + 4$ | $3 \times (5 + 4)$

Write About It

7. How can bar diagrams be used to model numerical expressions?

_____

_____

MY Homework

Homework Helper [eHelp]

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Paul has a fruit basket that includes 3 oranges, 4 apples, 3 bananas, and 2 grapefruits. Use the bar diagram to write and evaluate two numerical expressions to represent the total number of fruit in the basket.

←-------------- total number of fruit --------------→			
3 oranges	**4** apples	**3** bananas	**2** grapefruits

1 Use the bar diagram to write an expression using only addition.

$3 + 4 + 3 + 2$

Evaluate the expression.

$3 + 4 + 3 + 2 = 12$

2 Use the bar diagram to write an expression using multiplication and addition.

$(2 \times 3) + 4 + 2$

Evaluate the expression.

$(2 \times 3) + 4 + 2 = 12$

So, there are 12 total pieces of fruit in the basket.

Practice

1. Refer to the Homework Helper. Suppose Paul went to the store and bought 4 peaches to add to the basket. Write two new numerical expressions to represent the total number of fruit in the basket.

Expression 1

$3 + \underline{\hspace{1cm}} + 3 + 2 + \underline{\hspace{1cm}}$

Expression 2

$(2 \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times 4) + 2$

Order of Operations

Math in My World (Watch) (Tutor)

Example 1

The table shows the number of Calories burned in one minute for two different activities. Nathan swims for 4 minutes and then runs for 8 minutes. How many Calories has Nathan burned in all?

Activity	Calories Burned per Minute
Swimming	12
Running	10

Evaluate the expression $12 \times 4 + 10 \times 8$.

Write the expression. $12 \times 4 + 10 \times 8$

Multiply 12 by 4. $\underline{} + 10 \times 8$

Multiply 10 by 8. $\underline{} + \underline{}$

Add.

So, Nathan has burned .... Calories.

Burning Calories!

The **order of operations** is a set of rules to follow when more than one operation is used in an expression.

Key Concept Order of Operations

1. Perform operations in parentheses.

2. Find the value of exponents.

3. Multiply and divide in order from left to right.

4. Add and subtract in order from left to right.
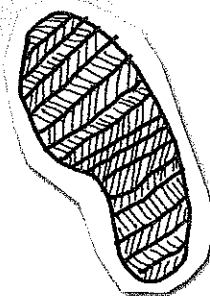
Parentheses include brackets [ ] as well as braces { }. Perform operations inside parentheses first, then perform operations inside brackets, and finally, perform operations inside braces.

Example 2 [Tutor]

Evaluate $20 - \{4 + [4 + (10 \div 2)]\}$.

Write the expression.　　　　　　$\_\_\_ - \{4 + [\_\_\_ + (10 \div \_\_\_)]\}$

Divide 10 by 2.　　　　　　　　$20 - \{4 + [4 + \_\_\_]\}$　　parentheses 1st

Add.　　　　　　　　　　　　$20 - \{4 + \_\_\_\}$　　　brackets 2nd

Add.　　　　　　　　　　　　$20 - \_\_\_$　　　　　braces 3rd

Subtract.　　　　　　　　　　$\_\_\_$

So, $20 - \{4 + [4 + (10 \div 2)]\} = \_\_\_$.

Guided Practice [Check ✓]

1. Evaluate $\{28 + [(2 \times 4^2) \div 8]\}$.

Write the expression.　　$\{\_\_\_ + [(2 \times \quad 4^2) \div \_\_\_]\}$

Find 4^2.　　　　　　　$\{28 + [(2 \times \_\_\_) \div 8]\}$

Multiply.　　　　　　　$\{28 + [\_\_\_ \div 8]\}$　　parentheses 1st

Divide.　　　　　　　　$\{28 + \_\_\_\}$　　　brackets 2nd

Add.　　　　　　　　　$\_\_\_$　　　　　braces 3rd

So, $\{28 + [(2 \times 4^2) \div 8]\} = \_\_\_$.

Talk MATH
Explain why it is important to follow the order of operations when evaluating $15 + 3 \times 4$.
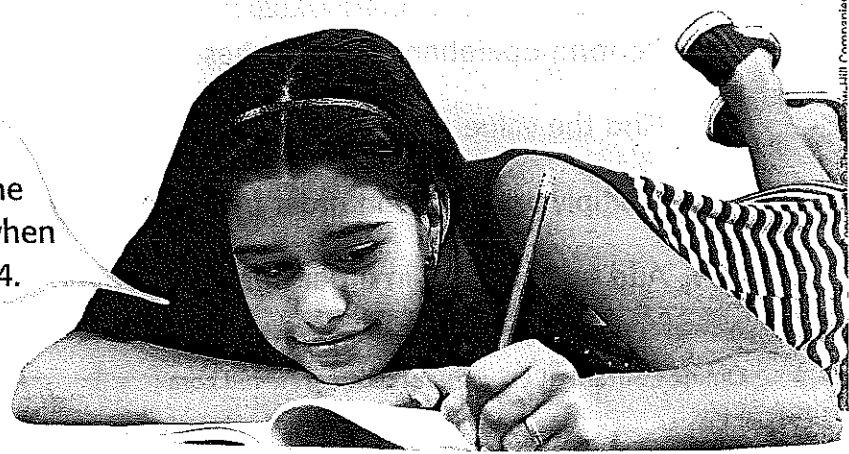
Independent Practice

Evaluate each expression.

2. $5 \times (92 - 18) =$ ....

3. $12 + (4^2) - 11 =$ ....

4. $(15 - 5) \times [(9 \times 3) + 3] =$ ....

5. $58 - 6 \times 7 =$ ....

6. $55 - [(5^2 \times 3) - 5^2] =$ ....

7. $7 \times 10 + 3 \times 30 =$ ....

8. $2^2 + \{[1 \times (5 - 2)] \times 3\} =$ ....

9. $\{2 \times [4 - (6 \div 2)]\} \times 3 =$ ....

Algebra Find each unknown.

10. $3^3 + 3 \times 5 = k$

$k =$ ....

11. $12 - [(3^2 \times 4) - 30] = b$

$b =$ ....

12. Three students are on the same team for a relay race. They finish the race in 54.3 seconds. The runners' times are shown in the table. Evaluate $54.3 - (18.8 + 17.7)$ to find the time of the third runner. Record your answer in the table.

Relay Times	
Runner	Time (seconds)
1	18.8
2	17.7
3	

My Work!

13. You can find the temperature in degrees Celsius by using the expression $5 \times (°F - 32) \div 9$. If the temperature of a cup of hot chocolate is 104°F, what is the temperature of the cup of hot chocolate in degrees Celsius?

14. Ryan and Maggie split the cost of a $12 pizza. They also have a coupon for $2 off. Evaluate $(12 - 2) \div 2$ to find the cost each person will pay.
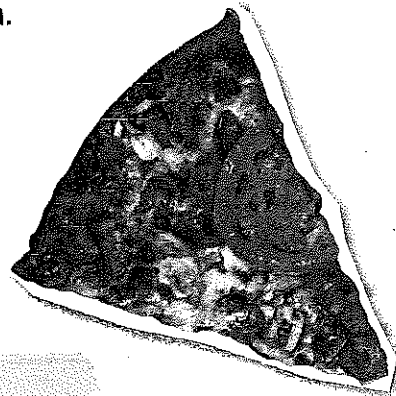
HOT Problems

15. Mathematical PRACTICE **Plan Your Solution** Write an expression using only multiplication and subtraction so that its value is 25.

16. Building on the Essential Question When and why does order matter?

MY Homework

Homework Helper [eHelp]

Need help? connectED.mcgraw-hill.com

Evaluate $\{5^3 \div [1 \times (10 - 5)]\} - 20$.

Write the expression.	$\{5^3 \div [1 \times (10 - 5)]\} - 20$	parentheses 1st
Subtract 5 from 10.	$\{5^3 \div [1 \times 5]\} - 20$	brackets 2nd
Multiply.	$\{5^3 \div 5\} - 20$	
Find 5^3.	$\{125 \div 5\} - 20$	braces 3rd
Divide.	$25 - 20$	
Subtract.	5	

So, $\{5^3 \div [1 \times (10 - 5)]\} - 20 = 5$.

Practice

1. Evaluate $64 \div [4 \times (27 - 5^2)]$.

Write the expression.	$\rule{1cm}{0.15mm} \div [4 \times (\rule{1cm}{0.15mm} - 5^2)]$	
Find 5^2.	$64 \div [4 \times (27 - \rule{1cm}{0.15mm})]$	parentheses 1st
Subtract.	$64 \div [4 \times \rule{1cm}{0.15mm}]$	brackets 2nd
Multiply.	$64 \div \rule{1cm}{0.15mm}$	
Divide.	$\rule{1cm}{0.15mm}$	

So, $64 \div [4 \times (27 - 5^2)] = \rule{1cm}{0.15mm}$.

Problem Solving

2. **Mathematical** **PRACTICE 4** **Model Math** Kishauna rode her bike for 35 minutes each on Monday, Wednesday, and Saturday and 55 minutes each on Tuesday and Thursday. Write an expression that shows the total amount of time she spent riding her bike. Then evaluate the expression.
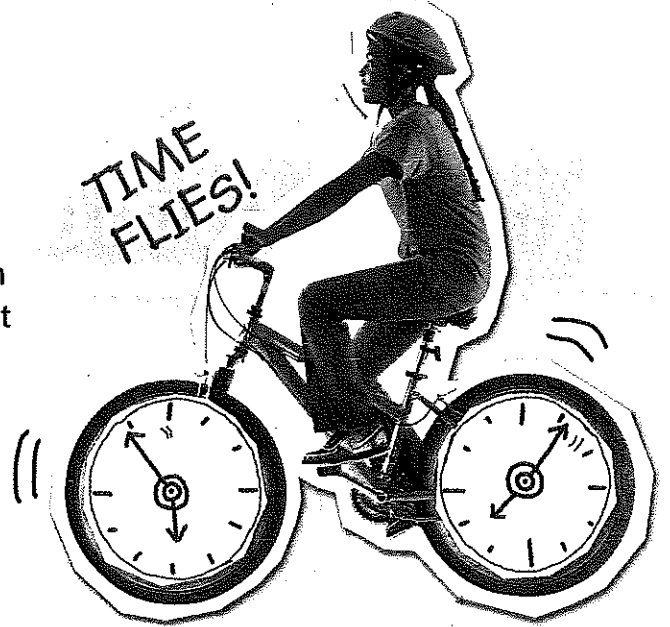
3. Sarah evaluated the expression $[(2^3 \times 4) \div 2] + 2$. What was her answer?

4. Kylie and her three friends equally divided the cost to rent a movie for $4 and order sandwiches for a total of $15. They also have a coupon for $3 off the sandwiches. Evaluate $[(4 + 15) - 3] \div 4$ to find the cost each person will pay.

Vocabulary Check

Vocab

5. Fill in each blank with the correct word to complete the sentence.
The rules of the order of operations tells you to multiply

and divide in order from _____ to _____ .

Test Practice

6. Keiko's class collected money to donate to charity. When Keiko counted the money, there were 140 five-dollar bills, and 255 one-dollar bills. What expression could he use to find out how much money was collected?

Ⓐ $(140 \times \$5) + (255 \times \$1)$

Ⓑ $(140 \times \$1) + (255 \times \$5)$

Ⓒ $(140 + \$5 \times 255 + \$1)$

Ⓓ $140 + \$5 + 255 + \$1$

Name

Write Numerical Expressions

Lesson 3

ESSENTIAL QUESTION
How are patterns used to solve problems?

Math in My World [Tutor]

Example 1

Terrell went to dinner with his friends and ordered 3 tacos. Each taco costs $2 and he has a coupon for a dollar off his purchase. The total cost in dollars of Terrell's purchase is represented by the phrase **multiply three by two, then subtract one.** Write the total cost as a numerical expression.

CHECK PLEASE!
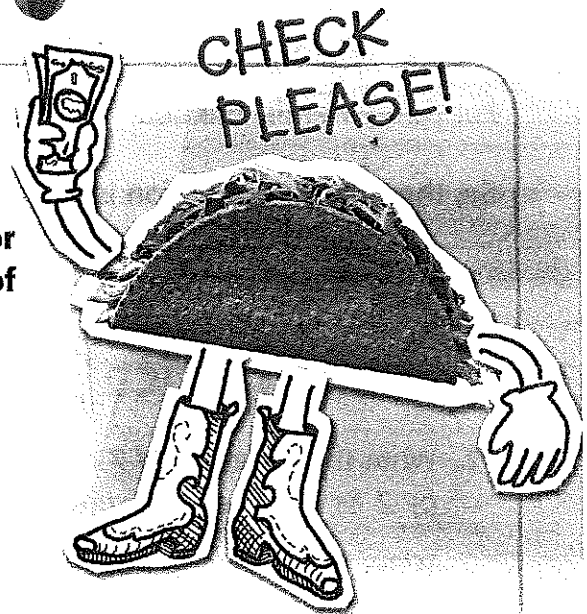
1 Write the phrase in parts.

Part 1 multiply three by _____

Part 2 then subtract _____

2 Write each part as a numerical expression.

Part 1 multiply three by two ⟶ _____

Part 2 then subtract one ⟶ _____

3 Combine the numerical expressions to represent the total cost in dollars. Add parentheses if needed.

Example 2

A ticket to a baseball game costs $25 and popcorn is $8. Three friends bought tickets and popcorn. The expressions below give the cost for one friend and for three friends. Compare the two expressions without evaluating them.

One Friend	Three Friends
$25 + 8$	$(25 + 8) \times 3$

Both expressions contain the same addition expression. Write the addition expression. _____

For three friends, the addition expression is multiplied by _____.

So, the second expression is _____ times as large as the first expression.

Guided Practice ✓Check

1. Write the phrase *add 7 and 11, then divide by 2* as a numerical expression.

Write the phrase in parts.

Part 1 _____

Part 2 _____

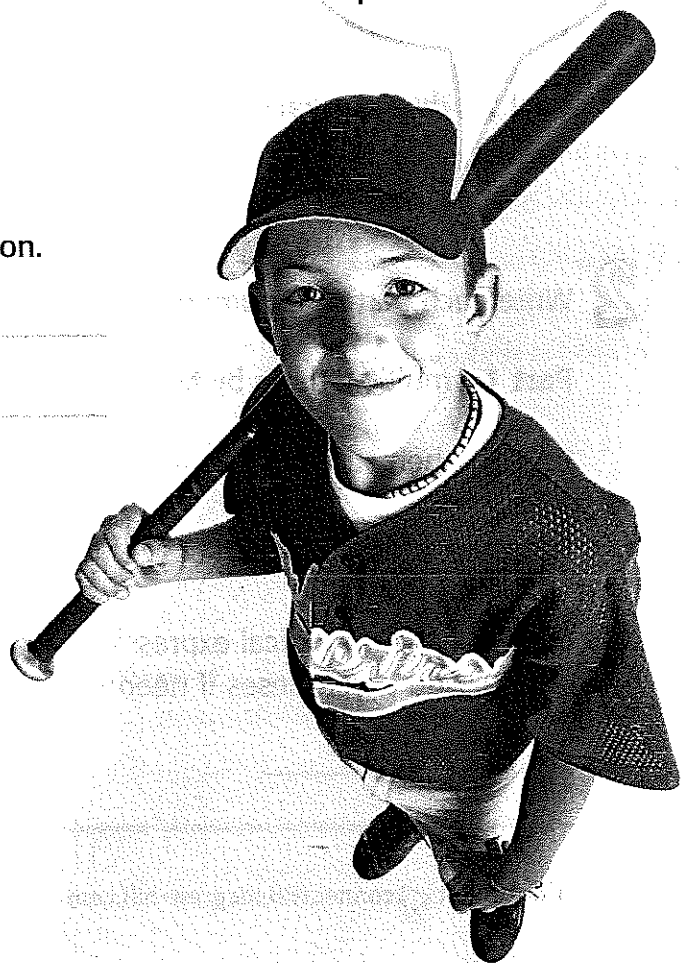Write each part as a numerical expression.

Part 1 add 7 and 11 ———➤ _____

Part 2 then divide by 2 ———➤ _____

Combine the numerical expressions. Add parentheses if needed.

_____

Talk MATH

Write a real-world problem that could be represented by a numerical expression.

Independent Practice

Write each phrase as a numerical expression.

2. divide 15 by 3, then add 13 _____

3. subtract 4 from 20, then divide by 2 _____

4. add 9 and 4, then multiply by 2 _____

Mathematical
PRACTICE ➡ **Make Sense of Problems** Compare each pair of numerical expressions without evaluating them.

5. Expression 1   **Expression 2**
   $(7 \times 4) \div 2$ 7×4

Both expressions contain the same multiplication expression.

Write the multiplication expression. _____

In Expression 1, the product is divided by _____ .

So, Expression 1 is _____ as large as Expression 2.

6. Expression 1   **Expression 2**
   $2 + 5 + 8$ $4 \times (2 + 5 + 8)$

Both expressions contain the same addition expression. Write the addition expression. _____

In Expression 2, the addition expression is multiplied by _____ .

So, Expression 2 is _____ times as large as Expression 1.

Problem Solving

7. Robin wants to find the area of the triangle below. To find the area of a triangle, multiply the base times the height and then divide by 2. The base and height of the triangle are shown. Represent the area of the triangle with a numerical expression.

My Work!

height: 3 in.

base: 4 in.
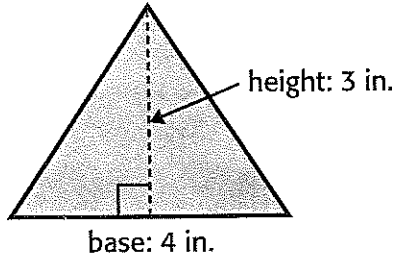
8. Deirdre doubled her savings account balance of $100. Then she withdrew $30 to buy some new clothes. Represent this situation with a numerical expression.

HOT Problems

Mathematical
9. **PRACTICE 2** **Use Number Sense** Explain why the numerical expression 3 less than 16 is written as $16 - 3$ and not $3 - 16$.

Mathematical
10. **PRACTICE 7** **Identify Structure** Circle the numerical expression that is four times as large as $52 - 9$.

$52 - (9 \times 4)$ $(52 - 9) + 4$ $(52 - 9) \times 4$ $(52 - 9) \div 4$

11. **Building on the Essential Question** How do I compare numerical expressions without calculating them?
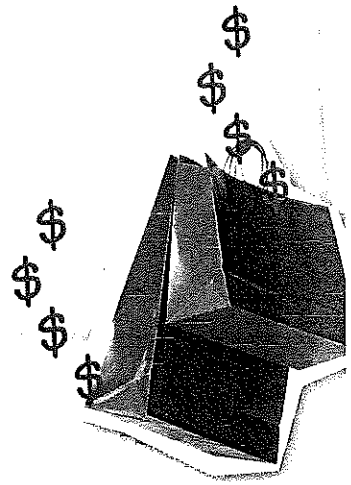
MY Homework

Homework Helper

Need help? connectED.mcgraw-hill.com

Admission to a county fair is $10 for adults and $6 for children. The total cost in dollars of admission for 1 adult ticket and 4 children's tickets is represented by the phrase four multiplied by six, then add ten. Write the total cost of admission as a numerical expression.

1 Write the phrase in parts.

Part 1   four multiplied by six

Part 2   then add ten

2 Write each part as a numerical expression.

Part 1   four multiplied by six ⟶ 4×6

Part 2   then add ten ⟶ $+ 10$

3 Combine the numerical expressions to represent the total cost in dollars. Add parentheses if needed.

$4 \times 6 + 10$

Practice

1. Compare the two numerical expressions without evaluating them.

Expression 1	**Expression 2**
$8 - 3$	$(8 - 3) \times 4$

Both expressions contain the same subtraction expression.

Write the subtraction expression. ....

In Expression 2, the difference is multiplied by ....

So, Expression 2 is .... times as large as Expression 1.

Problem Solving

2. Jeffrey purchased and downloaded 12 songs on Monday. He purchased an additional 3 songs on Tuesday. The cost to download each song is $2. Write a numerical expression to represent this situation.

_____

3. Mora bought 3 bags of apples for her class. One full bag has 8 apples, and each apple weighs 6 ounces. Write a numerical expression to represent this situation.

_____

Mathematical
4. PRACTICE **Use Number Sense** Jane wants to find the area of the trapezoid. To find the area of a trapezoid, add the two bases, multiply by the height, then divide by 2. The bases and height of the trapezoid are shown. Represent the area of the trapezoid with a numerical expression.

base: 3 m

height: 3 m

base: 7 m
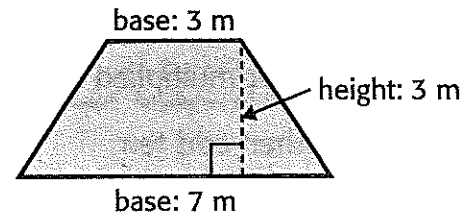
Vocabulary Check

5. Fill in the blank with the correct term or number to complete the sentence.

A _____ expression like $(3 + 5) \times (4 - 1)$ is a combination of numbers and at least one operation.

Test Practice

6. Denzel and three friends go to the movies. Each person buys a movie ticket for $8, a snack for $4, and a drink for $2. Which numerical expression represents the total cost of the trip to the movies for Denzel and his friends?

Ⓐ $4 + (\$8 \times \$4 \times \$2)$ Ⓒ $(4 \times \$8) + (\$4 \times \$2)$

Ⓑ $4 \times (\$8 + \$4 + \$2)$ Ⓓ $(4 \times \$8 + \$4) + (4 \times \$4 + \$2)$

Read the article "Make a Model of the Water Cycle" before answering Numbers 1 through 5.

Make a Model of the Water Cycle

You can volunteer with three or four friends to do a team experiment. It will show you how heat evaporates water, changes it into droplets, and then turns it back to water. First, you need to know a little about the water cycle. Water moves from the oceans into the air. From the air, it falls as rain or snow back into the ocean or onto land. If it falls on land, it eventually works its way back into the ocean as an overflow of water called runoff. (See the diagram below.)

The water cycle starts when the sun heats ocean water. The sun converts the water into small, invisible particles of moisture called water vapor. The sun and wind cause the water vapor to rise into the air, where it cools off in the atmosphere, or the air that surrounds Earth. Then it changes to drops of water that cluster, or hold together, forming a cloud.

The water in the cloud falls as rain or snow. It may fall back into the ocean, or it may fall on land and eventually work its way back to the ocean as a water overflow called runoff. One way water does this is by falling into tributaries, which are rivers and streams that flow into larger bodies of water. The water may also collect in an underground layer of earth or rock. The rock must be porous enough to let the water flow through it. This water is called groundwater, and it, too, eventually finds its way to the ocean. Then the water cycle starts over again.

THE WATER CYCLE
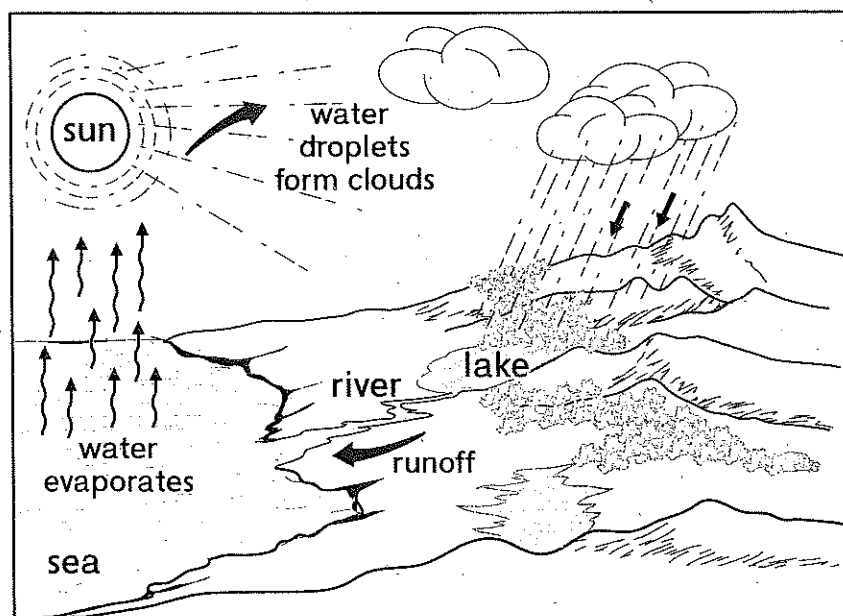
GO ON →

As you begin your experiment, remember this amazing fact. The amount of water on Earth now is the same as it was in the past and will be in the future. This means that the water you drank yesterday may once have been the water in the Delaware River when General Washington's troops crossed it during the Revolutionary War. About 71% of Earth's surface is water. This includes not only the water in oceans, rivers, and lakes. It also includes the water in clouds, rain, snow, and groundwater and in the icy regions at the North and South Poles.

Make a model of the water cycle with a partner or small group. Use the instructions below.

Water Cycle Baggie

Materials:

A plastic bag that seals

A small, clear plastic cup

Water

Red food color

A permanent marker

Steps:

1. Fill cup about halfway with water. Add red food color to the water. Stir. Use the marker to show water level.
2. Place the cup in the baggie. Seal the bag.
3. Place the baggie in a sunny window.

Observe what happens to the water in the cup. Check the mark showing the water level. You should see that the water level becomes gradually lower. You should also begin to see droplets of water on the sides and bottom of the bag. The water is evaporating from the heat and then changing from the gas created by evaporation to water drops on the sides of the bag. The drops run down the sides and will begin to collect at the bottom. This is what happens when the sun heats the ocean. Particles of moisture rise and form clouds. The drops running down the sides of the bag are like rain falling on Earth.

GO ON →

Now answer Numbers 1 through 5. Base your answers on "Make a Model of the Water Cycle."

1 This question has two parts. First, answer part A. Then, answer part B.

Part A: Read the sentence from the text.

The sun <u>converts</u> the water into small, invisible particles of moisture called water vapor.

The Latin root of <u>converts</u> is *vert*, meaning "to turn." What does <u>converts</u> mean?

(A) allows

(B) changes

(C) helps

(D) repeats

Part B: Which other word includes the same root as <u>converts</u>?

(A) convict

(B) overtime

(C) revert

(D) very

GO ON →

2 This question has two parts. First, answer part A. Then, answer part B.

Part A: Which sentence **best** summarizes the main idea of the article?

(A) You can do an experiment with a baggie, cup, water, food color, and a marker.

(B) When the water in a cloud falls as precipitation, it may fall on land or water.

(C) In the water cycle, water evaporates, condenses, and falls as precipitation.

(D) Water is about 71% of Earth's surface and needed by plants and animals.

Part B: Which evidence from the text **best** supports the main idea?

(A) "You can volunteer with three or four friends to do a team experiment."

(B) "The amount of water on Earth now is the same as it was in the past and will be in the future."

(C) "This includes not only the water in oceans, rivers, and lakes."

(D) "The drops running down the sides of the bag are like rain falling on Earth."

3 Read the sentence from the article.

One way water does this is by falling into <u>tributaries</u>, which are rivers and streams that flow into larger bodies of water.

The Latin root of <u>tributaries</u> is *trib*, meaning "pay." Which word is **most likely** to come from the same root as <u>tributaries</u>?

(A) allowance

(B) contribute

(C) salary

(D) tribe

GO ON →

4 Choose one sentence that states the main idea of the section titled "Water Cycle Baggie." Then choose **two** sentences that support the main idea and write them in the chart. Write the number of each sentence in the chart.

Main Idea of "Water Cycle Baggie"	Supporting Details

Sentences:

1 – An important part of the experiment is adding the food color before putting the sealed plastic bag in a warm place.

2 – You need a plastic bag, clear cup, water, red food color, and a marker before setting up the experiment.

3 – An experiment with a plastic bag, cup, and water can show how water evaporates and then turns back to water.

5 How did the author organize the steps to make the water cycle model? Select **two** choices.

(A) by including numbered directions

(B) by asking and answering questions

(C) by showing the cause of evaporation

(D) by listing the steps in the order they should be done

(E) by solving the problem of what causes condensation

(F) by comparing and contrasting water and water vapor

GO ON →