Name _____ Class _____ Date _____

Reteaching 3-1

Each number in a pattern is a *term*. Find the next three terms in the pattern.

> 3, 9, 15, 21, ?, ?, ?

Look at how the second term can be found from the first.

3, 9, 15, 21   or   3, 9, 15, 21

× 3 $3 \times 3 = 9$ + 6 $3 + 6 = 9$

Look at how the third term can be found from the second.

3, 9, 15, 21   or   3, 9, 15, 21

× 3 9×3 is not 15.   + 6 + 6 $9 + 6 = 15$

Try adding 6 to the third term.

3, 9, 15, 21

+ 6 + 6 + 6 $15 + 6 = 21$

Now you can write a rule to describe the pattern. The rule is *Start with the number 3 and add 6 repeatedly.*

3, 9, 15, 21, 27, 33, 39

+6 +6 +6 +6 +6 +6

The next three terms in the pattern are 27, 33, and 39.

Write a rule for each number pattern. Then write the next three terms.

1. 2, 5, 8, 11, _____, _____, _____

2. 3, 6, 12, 24, _____, _____, _____

3. 9, 18, 27, 36, _____, _____, _____

4. 64, 56, 48, 40, _____, _____, _____

5. 1, 4, 16, 64, _____, _____, _____

6. 75, 70, 65, 60, _____, _____, _____

Name _____ Class _____ Date _____

Practice 4-2

Write each expression using an exponent. Name the base and the exponent.

1. $3 \times 3 \times 3 \times 3$

2. $7 \times 7 \times 7 \times 7 \times 7 \times 7$

3. $9 \times 9 \times 9$

Write each number in expanded form using powers of 10.

4. 98,364

5. 20,351,401

6. 875,020

Simplify each expression.

7. 9^2

8. 6^4

9. 5^3

10. $156 + (256 \div 8^2)$

11. $32 + 64 + 2^3$

12. $53 + 64 \div 2^3$

13. $(3 \times 4)^2$

14. $60 \div (8 + 7) + 11$

15. $2^2 \times 5^2 + 106$

16. $4 + 7 \times 2^3$

17. $60 + (5 \times 4^3) + 2^2 \times 55$

18. $7^2 + 4$

19. $7^2 - 7 \times 2$

20. $48 \div 4 \times 5 - 2 \times 5$

21. $(4^2 - 4) \times 10$

22. $(4 + 3) \times (2 + 1)$

23. $2^4 \times 2^5$

24. $12 \times (30 + 37)$

25. $(3 + 2) \times (6^2 - 7)$

26. $5 \times (9 + 4) + 362 \div 2$

27. $3^4 + 405 \div 81$

Practice 4-2

Exponents

Write each expression using an exponent. Name the base and the exponent.

1. $3 \times 3 \times 3 \times 3$

2. $7 \times 7 \times 7 \times 7 \times 7 \times 7$

3. $9 \times 9 \times 9$

Write each number in expanded form using powers of 10.

4. 98,364

5. 20,351,401

6. 875,020

Simplify each expression.

7. 9^2

8. 6^4

9. 5^3

10. $156 + (256 \div 8^2)$

11. $32 + 64 + 2^3$

12. $53 + 64 \div 2^3$

13. $(3 \times 4)^2$

14. $60 \div (8 + 7) + 11$

15. $2^2 \times 5^2 + 106$

16. $4 + 7 \times 2^3$

17. $60 + (5 \times 4^3) + 2^2 \times 55$

18. $7^2 + 4$

19. $7^2 - 7 \times 2$

20. $48 \div 4 \times 5 - 2 \times 5$

21. $(4^2 - 4) \times 10$

22. $(4 + 3) \times (2 + 1)$

Reteaching 4-2

An *exponent* tells how many times a number is used as a factor.

$3 \times 3 \times 3 \times 3$ shows the number 3 is used as a factor 4 times.

$3 \times 3 \times 3 \times 3$ can be written 3^4.

In 3^4, 3 is the *base* and 4 is the exponent.

Read 3^4 as "three to the fourth power."

- To *simplify* a power, first write it as a product.

$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

- When you simplify expressions with exponents, do all operations inside parentheses first. Then simplify the powers.

Example: $30 - (2 + 3)^2 = 30 - 5^2$
$$= 30 - 25$$
$$= 5$$

Name the base and the exponent.

1. 3^6

   base _____

   exponent _____

2. 6^2

   base _____

   exponent _____

3. 8^4

   base _____

   exponent _____

Write each expression using an exponent. Name the base and the exponent.

4. $9 \times 9 \times 9$

   _____

5. $6 \times 6 \times 6 \times 6$

   _____

6. $1 \times 1 \times 1 \times 1 \times 1$

   _____

Simplify each expression.

7. 6^2

   _____

8. 3^5

   _____

9. 10^4

   _____

10. $4^2 + 5^2$

    _____

11. $2 \times 6 - 2^3$

    _____

12. $6^2 + 4^2$

    _____

13. $5 + 5^2 - 2$

    _____

14. $24 \div 4 + 2^4$

    _____

15. $9 + (40 \div 2^3)$

    _____

16. $(4^2 + 4) \div 5$

    _____

17. $10 \times (30 - 5^2)$

    _____

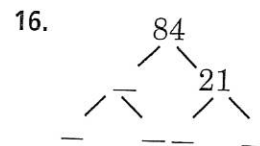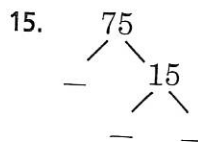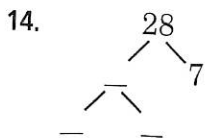18. $12 + 18 \div 3^2$

    _____

Practice 4-3

Prime Numbers and Prime Factorization

1. Make a list of all the prime numbers from 50 through 75 _____

Tell whether each number is prime or composite.

2. 53 _____

3. 86 _____

4. 95 _____

5. 17 _____

6. 24 _____

7. 27 _____

8. 31 _____

9. 51 _____

10. 103 _____

11. 47 _____

12. 93 _____

13. 56 _____

Complete each factor tree.

14.

15.

16.

Find the prime factorization of each number.

17. 58 _____

18. 72 _____

19. 40 _____

20. 30 _____

21. 144 _____

22. 310 _____

Find the number with the given prime factorization.

23. $2 \times 2 \times 5 \times 7 \times 11$ _____

24. $2 \times 3 \times 5 \times 7 \times 11$ _____

25. $2 \times 2 \times 13 \times 17$ _____

26. $7 \times 11 \times 13 \times 17$ _____

27. There are 32 students in a class. How many ways can the class be divided into groups with equal numbers of students? What are they?

_____

Subtracting 2-Digit Numbers (J)

Name: _____   Date: _____

Calculate each difference.

83 − 63	50 − 26	93 − 90	58 − 25	42 − 29
63 − 43	96 − 10	89 − 75	79 − 75	97 − 56
87 − 22	63 − 59	78 − 56	21 − 16	63 − 35
43 − 28	89 − 26	58 − 46	80 − 28	73 − 45
81 − 23	56 − 16	57 − 36	89 − 86	83 − 24

Division Facts (J)

Find each quotient.

$5 \div 1 =$	$5 \div 5 =$	$10 \div 2 =$	$6 \div 3 =$
$8 \div 4 =$	$12 \div 4 =$	$2 \div 2 =$	$15 \div 3 =$
$4 \div 2 =$	$8 \div 2 =$	$10 \div 5 =$	$4 \div 4 =$
$1 \div 1 =$	$3 \div 1 =$	$20 \div 4 =$	$16 \div 4 =$
$9 \div 3 =$	$20 \div 5 =$	$12 \div 3 =$	$6 \div 2 =$
$3 \div 3 =$	$25 \div 5 =$	$4 \div 1 =$	$15 \div 5 =$
$2 \div 1 =$	$8 \div 4 =$	$20 \div 5 =$	$6 \div 3 =$
$10 \div 5 =$	$4 \div 2 =$	$20 \div 4 =$	$3 \div 1 =$
$12 \div 4 =$	$15 \div 5 =$	$16 \div 4 =$	$9 \div 3 =$
$4 \div 4 =$	$5 \div 1 =$	$25 \div 5 =$	$4 \div 1 =$
$5 \div 5 =$	$12 \div 3 =$	$3 \div 3 =$	$10 \div 2 =$
$15 \div 3 =$	$8 \div 2 =$	$1 \div 1 =$	$2 \div 2 =$
$2 \div 1 =$	$6 \div 2 =$	$2 \div 1 =$	$5 \div 5 =$
$20 \div 5 =$	$15 \div 5 =$	$6 \div 2 =$	$10 \div 5 =$
$25 \div 5 =$	$10 \div 2 =$	$20 \div 4 =$	$4 \div 2 =$
$6 \div 3 =$	$5 \div 1 =$	$9 \div 3 =$	$8 \div 2 =$
$3 \div 3 =$	$2 \div 2 =$	$1 \div 1 =$	$16 \div 4 =$
$15 \div 3 =$	$4 \div 4 =$	$12 \div 4 =$	$4 \div 1 =$
$8 \div 4 =$	$3 \div 1 =$	$12 \div 3 =$	$12 \div 3 =$
$8 \div 2 =$	$6 \div 2 =$	$5 \div 5 =$	$2 \div 2 =$
$3 \div 3 =$	$1 \div 1 =$	$12 \div 4 =$	$4 \div 2 =$
$9 \div 3 =$	$20 \div 4 =$	$10 \div 2 =$	$6 \div 3 =$
$15 \div 5 =$	$2 \div 1 =$	$10 \div 5 =$	$5 \div 1 =$
$4 \div 4 =$	$15 \div 3 =$	$25 \div 5 =$	$16 \div 4 =$
$8 \div 4 =$	$4 \div 1 =$	$20 \div 5 =$	$3 \div 1 =$

Multiplying by 0, 1, 2, 5 and 10 (J) Answers

Name: _____

Date: _____

Calculate each product.

3 × 10 30	11 × 10 110	7 × 10 70	1 × 1 1	9 × 2 18	11 × 0 0	10 × 5 50	1 × 0 0	5 × 5 25	5 × 2 10
9 × 5 45	7 × 5 35	4 × 10 40	7 × 2 14	11 × 2 22	12 × 2 24	6 × 10 60	2 × 10 20	6 × 0 0	10 × 10 100
4 × 1 4	11 × 5 55	6 × 2 12	3 × 5 15	3 × 0 0	7 × 1 7	2 × 5 10	5 × 0 0	8 × 10 80	1 × 10 10
12 × 0 0	12 × 1 12	3 × 1 3	6 × 1 6	8 × 2 16	1 × 2 2	5 × 10 50	11 × 1 11	2 × 0 0	3 × 2 6
1 × 5 5	7 × 0 0	4 × 0 0	5 × 1 5	10 × 2 20	6 × 5 30	9 × 1 9	2 × 1 2	10 × 1 10	10 × 0 0
8 × 0 0	4 × 2 8	12 × 10 120	9 × 10 90	8 × 5 40	4 × 5 20	8 × 1 8	12 × 5 60	9 × 0 0	2 × 2 4
10 × 10 100	12 × 2 24	11 × 10 110	4 × 10 40	12 × 1 12	11 × 2 22	8 × 1 8	10 × 1 10	6 × 10 60	2 × 5 10
1 × 10 10	5 × 2 10	3 × 0 0	12 × 5 60	11 × 1 11	5 × 1 5	7 × 1 7	6 × 0 0	10 × 0 0	9 × 5 45
3 × 10 30	3 × 1 3	7 × 0 0	2 × 2 4	3 × 5 15	7 × 2 14	5 × 10 50	11 × 0 0	4 × 1 4	4 × 2 8
1 × 1 1	9 × 10 90	7 × 5 35	10 × 5 50	6 × 2 12	5 × 0 0	12 × 10 120	1 × 0 0	4 × 0 0	7 × 10 70

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Column Addition (J)

Find each sum.

```
    1          4          3          4          4
    4          7          5          5          9
    1          9          9          4          7
+   5      +   9      +   9      +   2      +   9
_____    _____    _____    _____    _____


    5          8          3          3          5
    1          3          3          4          9
    3          6          7          8          3
+   5      +   7      +   7      +   1      +   9
_____    _____    _____    _____    _____


    2          3          3          6          4
    6          8          4          3          5
    3          7          5          4          3
+   2      +   7      +   2      +   9      +   7
_____    _____    _____    _____    _____


    3          3          4          2          5
    4          5          7          3          2
    9          8          5          2          5
+   8      +   4      +   7      +   2      +   7
_____    _____    _____    _____    _____


    7          9          6          8          1
    3          4          6          2          5
    2          7          4          5          6
+   2      +   1      +   3      +   5      +   2
_____    _____    _____    _____    _____
```

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Skills Worksheet

Directed Reading A

Section: What Is Matter?
MATTER

1. What characteristic do a human, hot soup, the metal wires in a toaster, and the glowing gases in a neon sign have in common?

_____

2. What is matter?

_____

_____

MATTER AND VOLUME

_____ 3. What unit would you use to measure the amount of water in a lake?
   a. grams (g)   c. meters (m)
   b. liters (L)   d. milliliters (mL)

_____ 4. What unit would you use to measure the volume of soda in a can?
   a. centimeters (cm)   c. liters (L)
   b. grams (g)   d. milliliters (mL)

5. What is volume?

_____

6. Things with _____ cannot share the same space at the same time.

7. To measure a volume of water in a graduated cylinder, you should look at the bottom of the curve at the surface of the water called

the _____.

8. The volume of solid objects is commonly expressed

in _____ units.

9. What three dimensions are needed to find the volume of a rectangular solid?

_____

_____

_____

10. How could the volume of a 12-sided object be found using water and a graduated cylinder?

_____

_____

11. Why can you express the volume of the 12-sided object measured by this method in cubic units?

_____

MATTER AND MASS

_____**12.** The amount of matter in an object is its
    a. volume.   **c.** meniscus.
    b. length.   **d.** mass.

_____**13.** The SI unit of mass is the
    a. newton.   **c.** kilogram.
    b. liter.   **d.** pound.

_____**14.** The SI unit of weight is the
    a. newton.   **c.** kilogram.
    b. liter.   **d.** pound.

_____**15.** One newton is equal to the weight of an object that has
    a. a mass of 100 g on the moon.
    b. a volume of 1 m^3 on Earth.
    c. a mass of 1,000 g on Earth.
    d. a mass of 100 g on Earth.

16. What is the only way to change the mass of an object?

_____

_____

For each description, write whether it applies to mass or to weight.

_____**17.** is always constant no matter where the object is located

_____**18.** is a measure of the gravitational force on an object

_____**19.** is measured using a spring scale

_____**20.** is expressed in grams (g), kilograms (kg), or milligrams (mg)

_____**21.** is expressed in newtons (N)

_____**22.** is less on the moon than on Earth

_____**23.** is a measure of the amount of matter in the object

Name _____ Class _____ Date _____

INERTIA

_____ **24.** The tendency of an object to resist a change in motion is known as
   a. mass.
   b. gravitation.
   c. inertia.
   d. weight.

25. What is needed in order to cause an object at rest to move, or an object in motion to change its direction or speed?

_____

_____

26. How does mass affect the inertia of an object?

_____

_____

_____

27. Why is it harder to get a cart full of potatoes moving than one that is empty?

_____

_____

_____

_____

Name _____ Class _____ Date _____

Directed Reading A

Section: Physical Properties
PHYSICAL PROPERTIES

_____ 1. A characteristic of matter that can be observed or measured without changing the identity of the matter is a
  a. matter property.   **c.** chemical property.
  b. physical property.   **d.** volume property.

_____ 2. Some examples of physical properties are
  a. color, odor, and age.   **c.** color, odor, and magnetism.
  b. color, odor, and speed.   **d.** color, odor, and anger.

Match the correct example with the correct physical property. Write the letter in the space provided.

_____ 3. Aluminum can be flattened into sheets of foil.

_____ 4. An ice cube floats in a glass of water.

_____ 5. Copper can be pulled into thin wires.

_____ 6. Plastic foam protects you from hot liquid.

_____ 7. Flavored drink mix dissolves in water.

_____ 8. An onion gives off a very distinctive smell.

_____ 9. A golf ball has more mass than a table tennis ball.

a. state
b. solubility
c. thermal conductivity
d. malleability
e. odor
f. ductility
g. density

10. Density is the _____ that describes the relationship between mass and volume.

11. Objects such as a cotton ball and a small tomato can occupy similar volumes but vary greatly in _____.

12. If you pour different liquids into a graduated cylinder, the liquids will form layers based upon differences in the _____ of each liquid.

13. Which layer of liquid would settle on the bottom of a graduated cylinder?

_____

14. Where will the least dense liquid be found?

_____

15. Why would 1 kg of lead be less awkward to carry around than 1 kg of feathers?

_____

_____

_____

16. What will happen to a solid object made from matter with a greater density than water when it is dropped into water?

_____

_____

_____

17. How will knowing the density of a substance help you determine whether an object made from that material will float in water?

_____

_____

_____

18. What is the equation for density?

_____

19. What do D, V, and m stand for in the equation for density?

_____

_____

_____

20. The units for density take the form of a mass unit divided by a(n)

_____ unit.

21. What are two reasons why density is a useful property for identifying substances?

_____

_____

_____

PHYSICAL CHANGES DO NOT FORM NEW SUBSTANCES

22. A change that affects only the physical properties of a substance is

known as a(n) _____.

23. What kind of changes are melting and freezing?

_____

_____

Identify which of the following activities represent physical changes by writing PC in the space provided if they cause only physical changes. Put an X beside any that do not.

_____**24.** sanding a piece of wood

_____**25.** baking bread

_____**26.** crushing an aluminum can

_____**27.** melting an ice cube

_____**28.** dissolving sugar in water

_____**29.** molding a piece of silver

30. When a substance undergoes a physical change,

its _____ does not change.

31. What is changed when matter undergoes a physical change? Give an example to explain your answer.

_____

_____

_____

_____

_____

_____

_____

Prime Factors (B)

Use a tree diagram to find the prime factors of each number.

182   159   54

214   124   206

169   153   209

Division Facts (J)

Find each quotient.

5 ÷ 1 =	5 ÷ 5 =	10 ÷ 2 =	6 ÷ 3 =
8 ÷ 4 =	12 ÷ 4 =	2 ÷ 2 =	15 ÷ 3 =
4 ÷ 2 =	8 ÷ 2 =	10 ÷ 5 =	4 ÷ 4 =
1 ÷ 1 =	3 ÷ 1 =	20 ÷ 4 =	16 ÷ 4 =
9 ÷ 3 =	20 ÷ 5 =	12 ÷ 3 =	6 ÷ 2 =
3 ÷ 3 =	25 ÷ 5 =	4 ÷ 1 =	15 ÷ 5 =
2 ÷ 1 =	8 ÷ 4 =	20 ÷ 5 =	6 ÷ 3 =
10 ÷ 5 =	4 ÷ 2 =	20 ÷ 4 =	3 ÷ 1 =
12 ÷ 4 =	15 ÷ 5 =	16 ÷ 4 =	9 ÷ 3 =
4 ÷ 4 =	5 ÷ 1 =	25 ÷ 5 =	4 ÷ 1 =
5 ÷ 5 =	12 ÷ 3 =	3 ÷ 3 =	10 ÷ 2 =
15 ÷ 3 =	8 ÷ 2 =	1 ÷ 1 =	2 ÷ 2 =
2 ÷ 1 =	6 ÷ 2 =	2 ÷ 1 =	5 ÷ 5 =
20 ÷ 5 =	15 ÷ 5 =	6 ÷ 2 =	10 ÷ 5 =
25 ÷ 5 =	10 ÷ 2 =	20 ÷ 4 =	4 ÷ 2 =
6 ÷ 3 =	5 ÷ 1 =	9 ÷ 3 =	8 ÷ 2 =
3 ÷ 3 =	2 ÷ 2 =	1 ÷ 1 =	16 ÷ 4 =
15 ÷ 3 =	4 ÷ 4 =	12 ÷ 4 =	4 ÷ 1 =
8 ÷ 4 =	3 ÷ 1 =	12 ÷ 3 =	12 ÷ 3 =
8 ÷ 2 =	6 ÷ 2 =	5 ÷ 5 =	2 ÷ 2 =
3 ÷ 3 =	1 ÷ 1 =	12 ÷ 4 =	4 ÷ 2 =
9 ÷ 3 =	20 ÷ 4 =	10 ÷ 2 =	6 ÷ 3 =
15 ÷ 5 =	2 ÷ 1 =	10 ÷ 5 =	5 ÷ 1 =
4 ÷ 4 =	15 ÷ 3 =	25 ÷ 5 =	16 ÷ 4 =
8 ÷ 4 =	4 ÷ 1 =	20 ÷ 5 =	3 ÷ 1 =

Subtracting 2-Digit Numbers (J)

Name: _____   Date: _____

Calculate each difference.

83	50	93	58	42
− 63	− 26	− 90	− 25	− 29

63	96	89	79	97
− 43	− 10	− 75	− 75	− 56

87	63	78	21	63
− 22	− 59	− 56	− 16	− 35

43	89	58	80	73
− 28	− 26	− 46	− 28	− 45

81	56	57	89	83
− 23	− 16	− 36	− 86	− 24

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Column Addition (J)

Find each sum.

95	63	49	55	10
67	40	27	33	77
+ 27	+ 99	+ 67	+ 44	+ 98

18	26	38	97	52
10	46	53	93	92
+ 98	+ 39	+ 78	+ 70	+ 88

82	21	76	97	46
96	87	59	15	55
+ 18	+ 19	+ 16	+ 61	+ 59

88	67	38	76	98
11	69	59	22	38
+ 48	+ 86	+ 17	+ 90	+ 96

72	60	45	51	25
92	49	97	92	47
+ 86	+ 88	+ 22	+ 18	+ 66

Multiplying by 0, 1, 2, 5 and 10 (J)

Name: _____

Date: _____

Calculate each product.

3 × 10	11 × 10	7 × 10	1 × 1	9 × 2	11 × 0	10 × 5	1 × 0	5 × 5	5 × 2
9 × 5	7 × 5	4 × 10	7 × 2	11 × 2	12 × 2	6 × 10	2 × 10	6 × 0	10 × 10
4 × 1	11 × 5	6 × 2	3 × 5	3 × 0	7 × 1	2 × 5	5 × 0	8 × 10	1 × 10
12 × 0	12 × 1	3 × 1	6 × 1	8 × 2	1 × 2	5 × 10	11 × 1	2 × 0	3 × 2
1 × 5	7 × 0	4 × 0	5 × 1	10 × 2	6 × 5	9 × 1	2 × 1	10 × 1	10 × 0
8 × 0	4 × 2	12 × 10	9 × 10	8 × 5	4 × 5	8 × 1	12 × 5	9 × 0	2 × 2
10 × 10	12 × 2	11 × 10	4 × 10	12 × 1	11 × 2	8 × 1	10 × 1	6 × 10	2 × 5
1 × 10	5 × 2	3 × 0	12 × 5	11 × 1	5 × 1	7 × 1	6 × 0	10 × 0	9 × 5
3 × 10	3 × 1	7 × 0	2 × 2	3 × 5	7 × 2	5 × 10	11 × 0	4 × 1	4 × 2
1 × 1	9 × 10	7 × 5	10 × 5	6 × 2	5 × 0	12 × 10	1 × 0	4 × 0	7 × 10