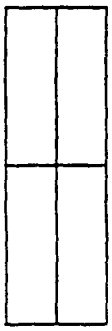
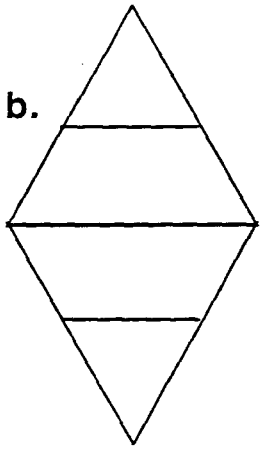
Which Show Fourths ?

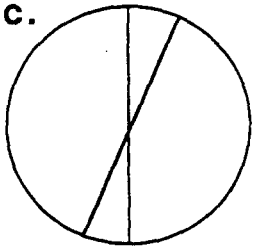
a.



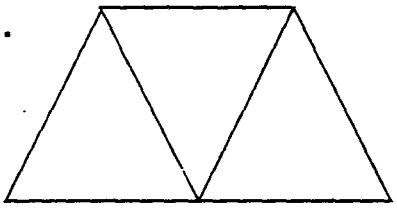
b.



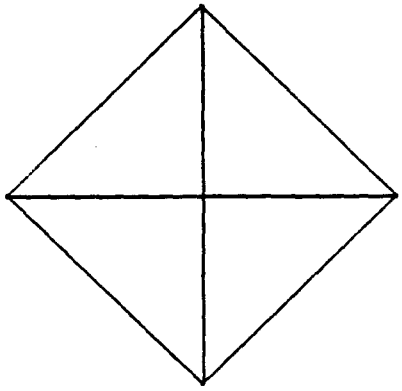
c.



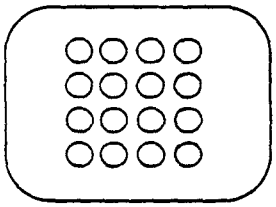
d.



e.

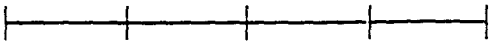


f.

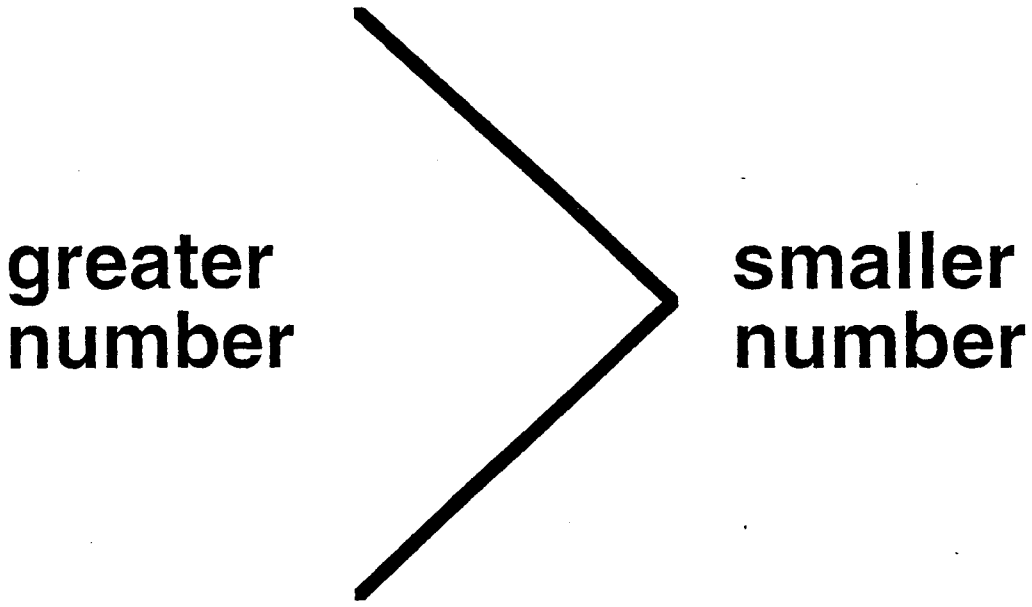


EXTENSION

g.

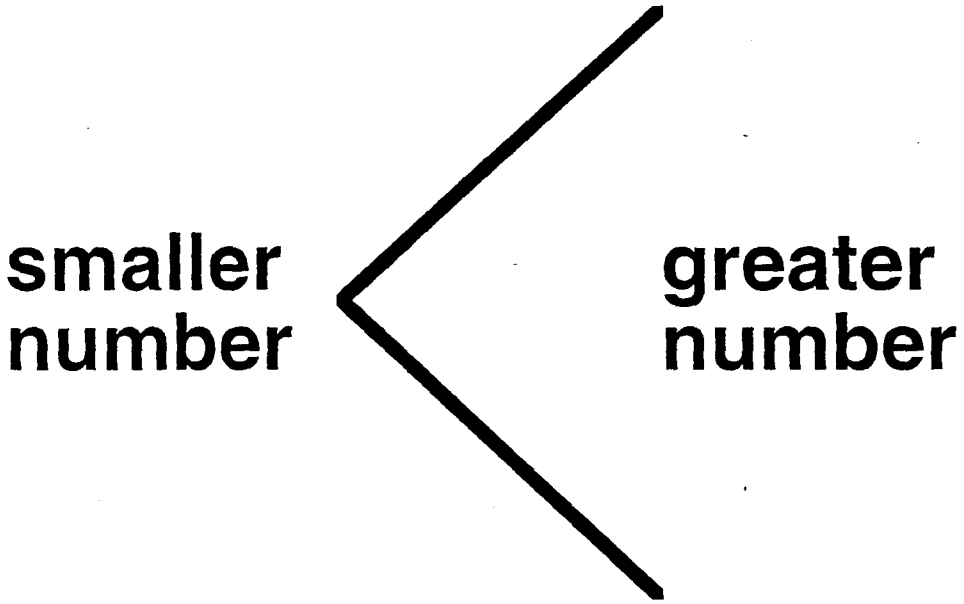


h.



"is greater than"

9 > 5



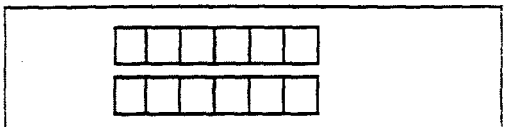
"is less than"

3 < 6

Name _____

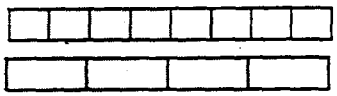
Comparing Fraction Bars

To compare fractions that have the same denominator, compare the numerators. If the denominators are different, compare the colored areas.



$\frac{5}{6} > \frac{4}{6}$ 5 is more than 4

"is greater than" >



$\frac{4}{8} < \frac{3}{4}$

"is less than" <

Compare these fractions. Write >, <, or = in the ◯ .
Remember: the open part of the symbol goes with the greater number.

1. $\frac{2}{4} \bigcirc \frac{3}{4}$	2. $\frac{5}{7} \bigcirc \frac{7}{7}$	3. $\frac{0}{5} \bigcirc \frac{3}{5}$
4. $\frac{4}{9} \bigcirc \frac{1}{9}$	5. $\frac{3}{3} \bigcirc \frac{2}{3}$	6. $\frac{5}{6} \bigcirc \frac{5}{6}$
7. $\frac{1}{8} \bigcirc \frac{1}{2}$	8. $\frac{2}{5} \bigcirc \frac{3}{4}$	9. $\frac{5}{6} \bigcirc \frac{3}{5}$

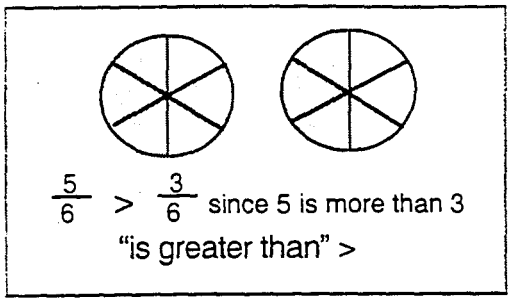
Draw fraction bars to represent the fractions. Write >, <, or = in the ◯ to compare them.

$\frac{3}{4} \bigcirc \frac{1}{6}$

Name _____
Date _____

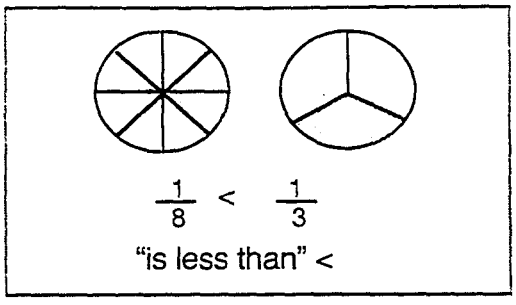
Comparing Fraction Circles

To compare fractions that have the same denominator, compare the numerators.
If the denominators are different, compare the colored areas.



$\frac{5}{6} > \frac{3}{6}$ since 5 is more than 3

"is greater than" >



$\frac{1}{8} < \frac{1}{3}$

"is less than" <

Compare these factions. Write >, <, or = in the ◯.
Remember: the open part of the symbol goes with the greater number.

1. $\frac{2}{5} \bigcirc \frac{3}{5}$	2. $\frac{6}{7} \bigcirc \frac{4}{7}$	3. $\frac{0}{4} \bigcirc \frac{3}{4}$
4. $\frac{8}{9} \bigcirc \frac{9}{9}$	5. $\frac{3}{5} \bigcirc \frac{2}{5}$	6. $\frac{5}{6} \bigcirc \frac{5}{6}$
7. $\frac{1}{7} \bigcirc \frac{1}{2}$	8. $\frac{4}{5} \bigcirc \frac{3}{4}$	9. $\frac{5}{8} \bigcirc \frac{3}{7}$

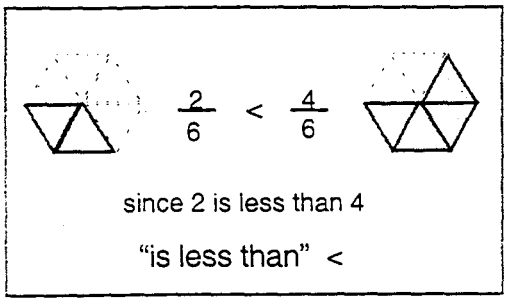
Draw fraction circles to represent the fractions. Write >, <, or = in the ◯ to compare them.

$$\frac{5}{7} \bigcirc \frac{2}{5}$$

Name _____

Comparing Pattern Block Fractions

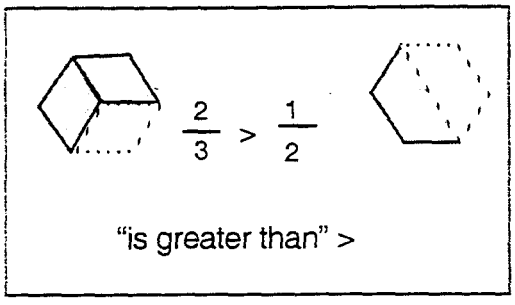
To compare fractions that have the same denominator, compare the numerators. If the denominators are different, compare the colored areas.



$\frac{2}{6} < \frac{4}{6}$

since 2 is less than 4

"is less than" <



$\frac{2}{3} > \frac{1}{2}$

"is greater than" >

Compare these fractions. Write >, <, or = in the ◯.
Remember: the open part of the symbol goes with the greater number.

1. $\frac{1}{2} \bigcirc \frac{0}{2}$	2. $\frac{5}{6} \bigcirc \frac{5}{6}$	3. $\frac{3}{3} \bigcirc \frac{2}{3}$
4. $\frac{0}{3} \bigcirc \frac{2}{3}$	5. $\frac{1}{2} \bigcirc \frac{2}{2}$	6. $\frac{6}{6} \bigcirc \frac{1}{6}$
7. $\frac{2}{2} \bigcirc \frac{3}{3}$	8. $\frac{1}{2} \bigcirc \frac{6}{6}$	9. $\frac{5}{6} \bigcirc \frac{2}{3}$

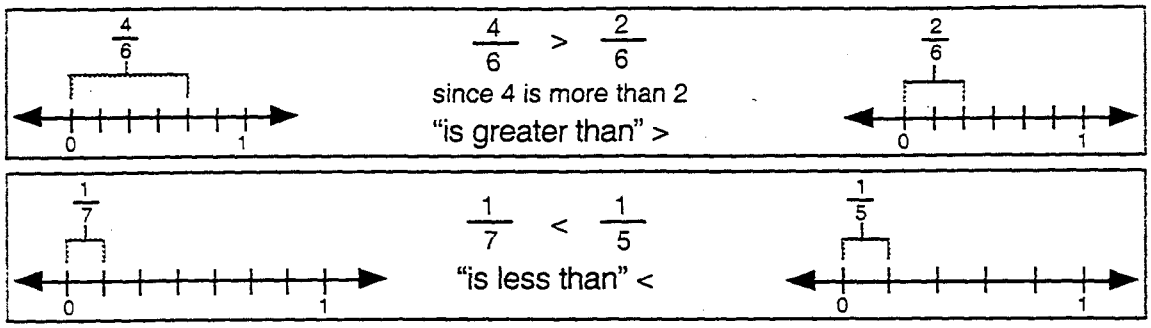
Draw pattern blocks to represent the fractions. Write >, <, or = in the ◯ to compare them.

$$\frac{1}{2} \bigcirc \frac{5}{6}$$

Name _____

Comparing Fraction Lines

To compare fractions that have the same denominator, compare the numerators. If the denominators are different, compare the length of the lines.



Compare these fractions. Write >, <, or = in the ◯
Remember: the open part of the symbol goes with the greater number.

1. $\frac{1}{5} \bigcirc \frac{4}{5}$	2. $\frac{3}{7} \bigcirc \frac{5}{7}$	3. $\frac{0}{4} \bigcirc \frac{3}{4}$
4. $\frac{5}{6} \bigcirc \frac{5}{6}$	5. $\frac{2}{9} \bigcirc \frac{7}{9}$	6. $\frac{5}{8} \bigcirc \frac{5}{8}$
7. $\frac{6}{7} \bigcirc \frac{1}{2}$	8. $\frac{2}{5} \bigcirc \frac{3}{4}$	9. $\frac{5}{9} \bigcirc \frac{4}{7}$

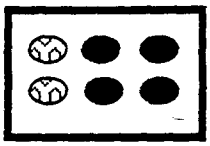
Draw fraction lines to represent the fractions. Write >, <, or = in the ◯ to compare them.

$$\frac{2}{9} \bigcirc \frac{4}{5}$$

Name _____

Comparing Collections

You can use fractions to compare parts of a whole collection.



$\frac{4}{6} > \frac{2}{6}$ since 4 is more than 2

Compare these fractions. Write >, <, or = in the ◯.
Remember: the open part of the symbol goes with the greater number.

1. $\frac{4}{5} \bigcirc \frac{1}{5}$	2. $\frac{2}{8} \bigcirc \frac{6}{8}$	3. $\frac{5}{6} \bigcirc \frac{1}{6}$
4. $\frac{1}{3} \bigcirc \frac{2}{3}$	5. $\frac{2}{7} \bigcirc \frac{5}{7}$	6. $\frac{4}{9} \bigcirc \frac{5}{9}$
7. $\frac{4}{6} \bigcirc \frac{2}{6}$	8. $\frac{2}{7} \bigcirc \frac{5}{7}$	9. $\frac{5}{8} \bigcirc \frac{7}{8}$

Draw a collection of things to represent the fractions. Write >, <, or = in the ◯ to compare them.

$$\frac{6}{7} \bigcirc \frac{2}{5}$$

Objective 17: Model, name, and write equivalent fractions. Express fractions in simplest form.

Vocabulary

equal = equivalent
whole
few
fewer
the fewest
simple
simplest form

Materials

colored markers or crayons
paper
fraction circles

Transparencies:

Equivalency Chart

Student Copies:

Fraction Bar Cutouts
prepared in envelopes
Equivalency Chart
Exploring Equivalent Fractions
Equivalent Fractions
Simplest Fractions

Language Foundation

1. Continue giving students lots of practice hearing and saying fraction words. Have students repeat after you as you say and write fractions on the overhead or chalkboard. As students become more confident in their ability to pronounce the words, let them practice saying the words on their own as you write fractions on the board, including words ending with "s", "th", and "ths" sounds.

2. Before teaching #5 (simplifying fractions), review *-er* and *-est* suffixes from Objective 9. Tell students that "few" refers to a small amount or number. "Fewer" refers to an even smaller number/amount. And **the fewest** means the smallest or the least number. Students should remember the term "least" from previous lessons. In this lesson, the fewest number of fractional pieces are used to show equivalent fractions.

3. Explain the term **simple** by using a graphic representation of two objects which are the same thing or by showing real objects. For example, show one pencil which is somehow decorated and another one which is plain (yellow). Explain that they are the same thing (pencils), but in different forms. One is simple (plain, yellow) and the other is decorated. This may facilitate a better understanding of writing equivalent fractions in **simplest form**.

Mathematical Component

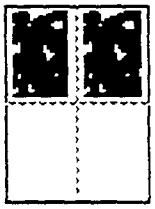
Warmup Option: Pass out Fraction Bar Cutouts for halves, fourths, and twelfths to groups of 3. You may want to cut each set apart before doing the activity. Have each student in the group take a different fraction bar, fold it in half, and color the bar on one side of the fold. Ask:

- How many halves are colored? Elicit and write $\frac{1}{2}$ on the overhead.
- How many fourths are colored? Elicit and write $\frac{2}{4}$ to the right of the $\frac{1}{2}$.
- How many twelfths are colored? Elicit and write $\frac{6}{12}$ to the right of the $\frac{2}{4}$.
- Do these fractions name the same amount of the bar? (Yes, they all have half of the bar colored.)

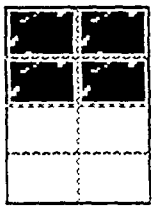
---

1. Pass out a sheet of paper and marker/crayon to each student. Have the students:

   - Fold the sheet of paper in half. Ask: How many parts do you have? (2)
   - Color $\frac{1}{2}$ of the paper. You may want to model this. Write $\frac{1}{2}$ on the overhead as you tell them "1/2 is colored."
   - Model folding the paper into fourths. Ask them to unfold the paper and tell you how many parts the paper is divided into (4) and how many are colored. (2) Write $= \frac{2}{4}$ to the right of $\frac{1}{2}$. Explain that the **same** amount of the paper is colored so they are **equal**. Write **equal** above the fractions.

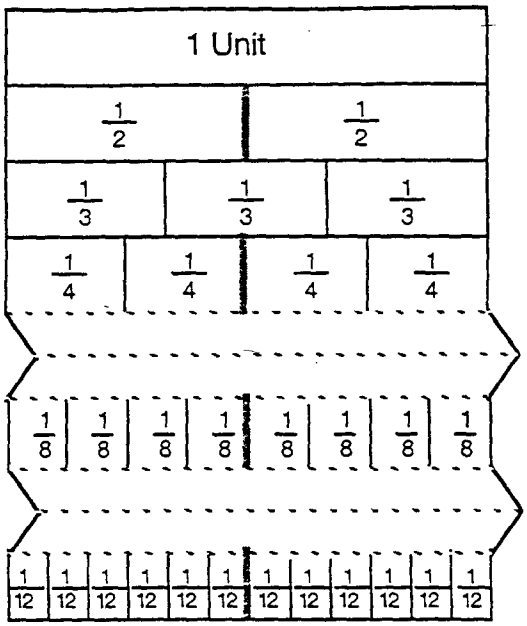


   - Model refolding the paper and folding it once more into eighths. Ask them to unfold the paper and tell you what part is now colored. Write $= \frac{4}{8}$ to the right of the $\frac{2}{4}$. Explain that 1/2 and 2/4 and 4/8 are **equivalent** fractions because they name the same amount. Write **equivalent** next to **equal** on the overhead. Point out the similarity in **equal** and **equivalent** by underlining the common letters.



2. Give each student an Equivalency Chart and six different markers. Use a transparency copy to point out that each bar is equal to the **whole** at the top of the chart. Tell the students that the chart can help us write **equivalent fractions**.
   - As you model, have the students use a marker to color the perpendicular line separating the halves. (See illustration below.) Tell the students that you are looking for other fractions that equal **one-half**. Write $\frac{1}{2}$ at the bottom of the chart.
   - Use your finger to trace the line down the chart and color the perpendicular line separating the
   - fourths. Ask: How many fourths equal one-half? Write $= \frac{2}{4}$ next to the $\frac{1}{2}$.
   - Continue marking and recording the fractions on the chart that are equivalent to one-half.

- Then say each as you point to the fractions equivalent to one-half.
- Repeat the procedure using a different color of marker to record fractions equivalent to one-third, another color to mark and record fractions equivalent to one-fourth, etc.



3. Pass out Fraction Circles to each pair of students.

   Have the students look at the $\frac{1}{2}$ piece as you model and record on the overhead:

   - How many $\frac{1}{4}$ pieces cover the $\frac{1}{2}$ piece?

     (2) Record: $\frac{1}{2} = \frac{2}{4}$
   - How many $\frac{1}{6}$ pieces cover the $\frac{1}{2}$ piece?

     (3) Record: $= \frac{3}{6}$ next to $\frac{1}{2} = \frac{2}{4}$
   - How many $\frac{1}{8}$ pieces cover the $\frac{1}{2}$ piece? (4)

     Record: $= \frac{4}{8}$ next to $\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$
   - Tell the students as you point to them that the fractions are equivalent to $\frac{1}{2}$.
   - Repeat the procedure for thirds and fourths.

Assign Exploring Equivalent Fractions and/or Equivalent Fractions after explaining the directions.

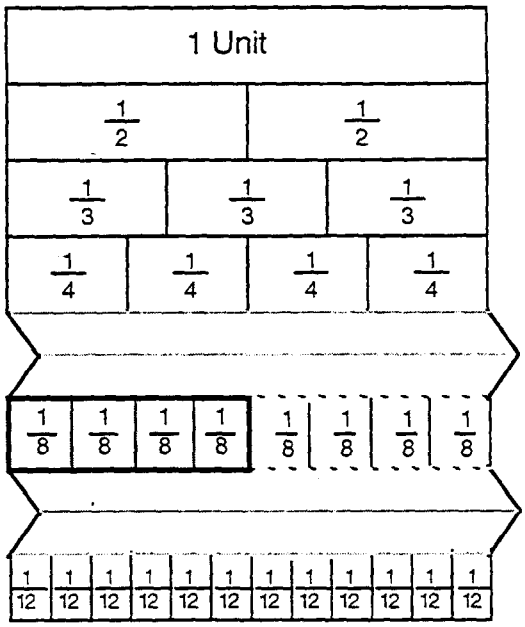
Alternative Approach: You can also use pattern blocks to model equivalent fractions for sixths. By changing the block used as the whole unit, you can model equivalent fractions for twelfths. For example, you can use two yellow hexagons as the whole unit.

$$1 = \frac{2}{2} = \frac{4}{4} = \frac{6}{6} = \frac{12}{12}$$

In this context, two yellow hexagons equal one; one yellow hexagon equals one-half; one red trapezoid equals one-fourth; one blue parallelogram equals one-sixth; and one green triangle equals one-twelfth.

Simplifying Fractions

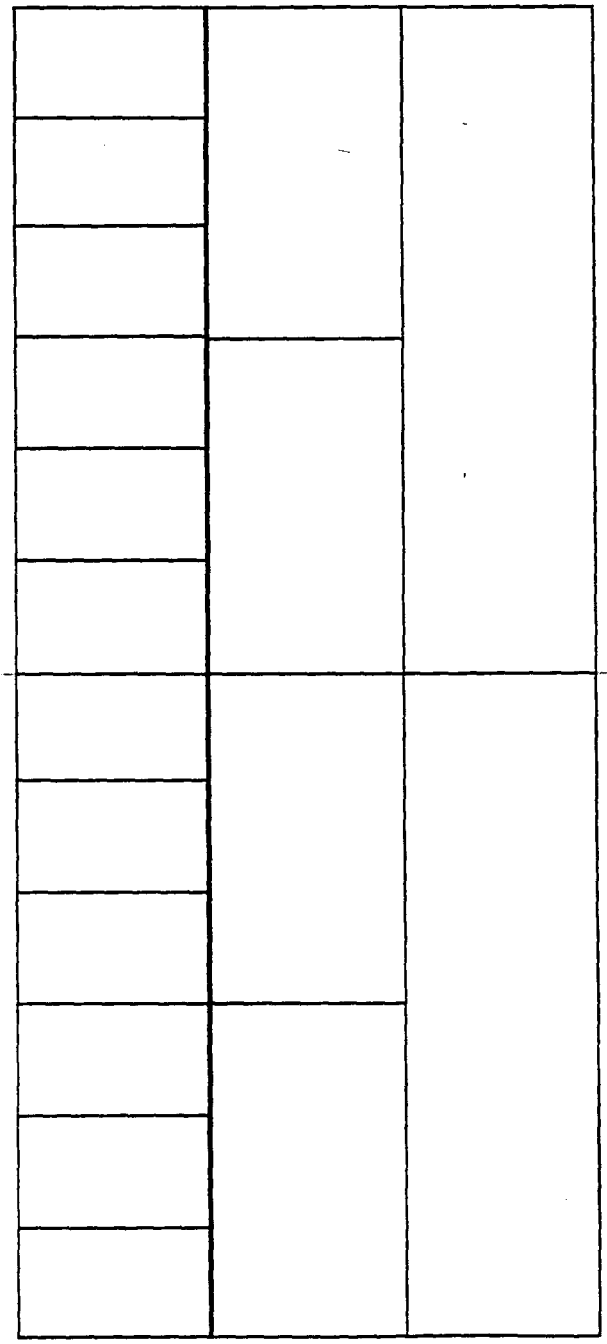
4. Pass out an Equivalency Chart and a Simplest Fraction chart to each pair of students. Tell the students that each of the bars represent the same amount. (a whole)



- Use your transparency copy of the Equivalency Chart, highlight 4/8 and ask how much of the bar is colored. Elicit $\frac{4}{8}$ as you write it on the Simplest Fraction wall poster.
- Tell the students to use the chart to find an **equivalent fraction** for $\frac{4}{8}$ using the **fewest** possible pieces. If necessary, model this then write $\frac{1}{2}$ on the Simplest Fraction chart next to the $\frac{4}{8}$.
- Repeat with other fractions that simplify. For example: **4/6**, **8/12**, etc.
- Now use a fraction that is already in its simplest form. Write $\frac{5}{7}$ on the Simplest Fraction wall poster. Show the students that you cannot find another equivalent fraction for five-sevenths using fewer pieces. Tell the students that $\frac{5}{7}$ is in its **simplest form.**
- Have the students work with a partner to chart all the possible fraction/simplest form combinations on the Equivalency Chart.

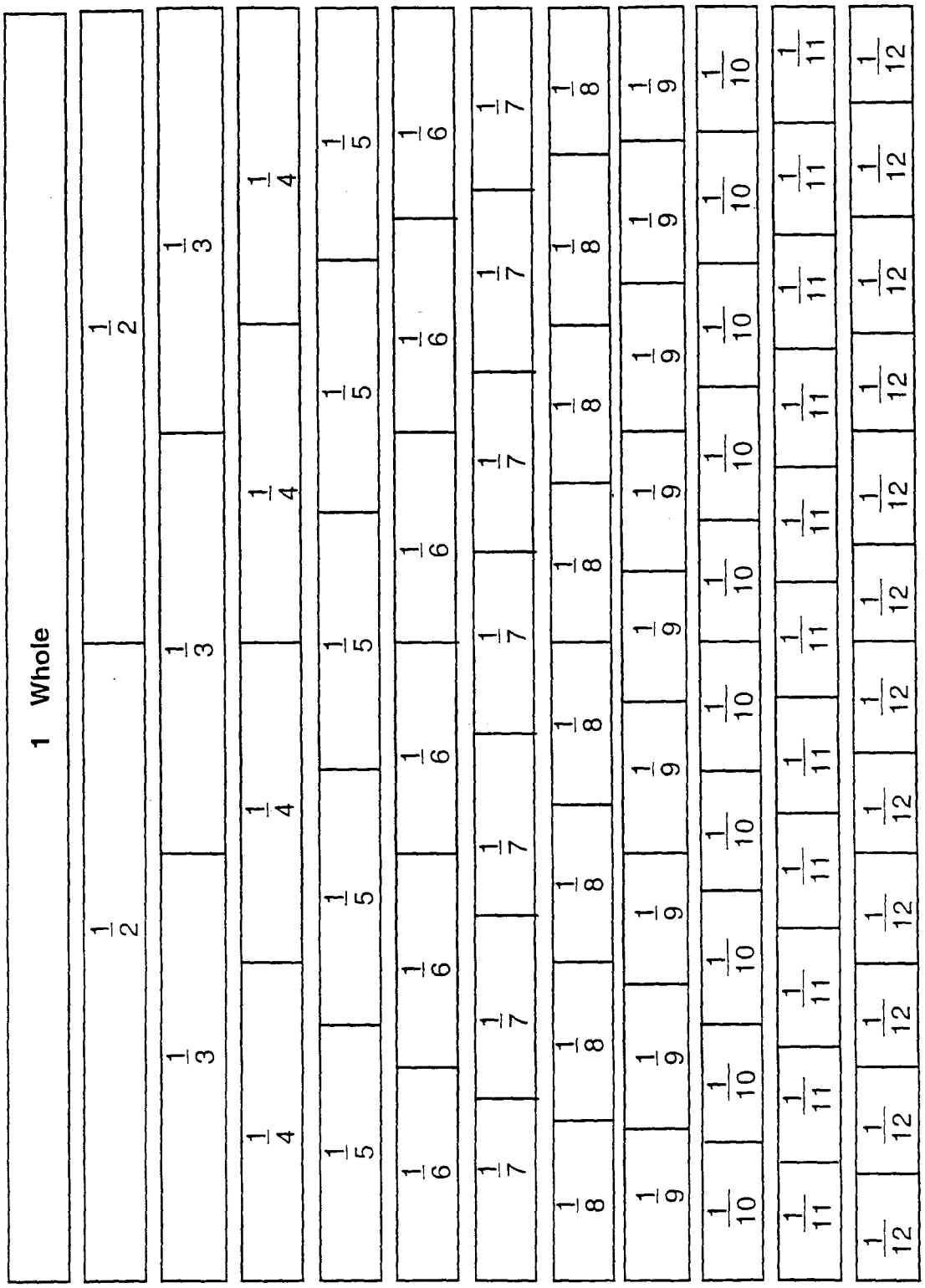
Simplest Fraction

Fraction	Simplest Form
$\frac{4}{8}$	$\frac{1}{2}$
$\frac{4}{6}$	$\frac{2}{3}$
$\frac{8}{12}$	$\frac{2}{3}$
$\frac{5}{7}$	$\frac{5}{7}$



Fraction Bar Cutouts

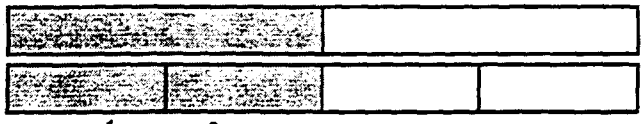
Equivalency Chart



Name_____

Exploring Equivalent Fractions

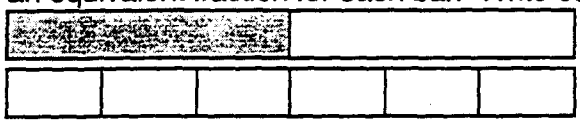
Fractions with different names can have the same value.



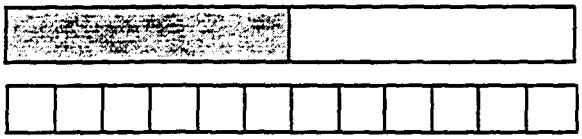
The colored part of each bar is the same size, so $\frac{1}{2}$ is equal to $\frac{2}{4}$.

$\frac{1}{2}$ and $\frac{2}{4}$ are **equivalent** fractions.

Color an equivalent fraction for each bar. Write each equivalent fraction.

1. 

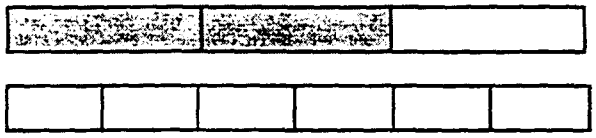
$\frac{1}{2} = \frac{\square}{6}$

2. 

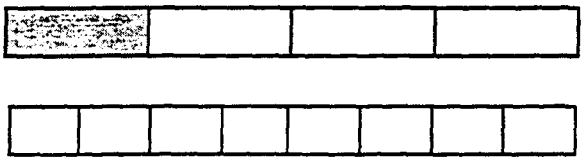
$\frac{1}{2} = \frac{\square}{12}$

3. 

$\frac{1}{3} = \frac{\square}{\square}$

4. 

$\frac{2}{3} = \frac{\square}{\square}$

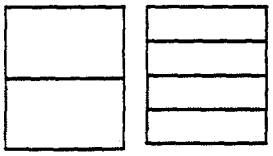
5. 

$\frac{1}{4} = \frac{\square}{\square}$

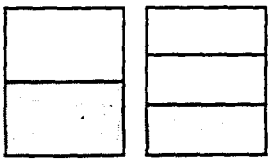
Name _____

Equivalent Fractions

Write true or false.

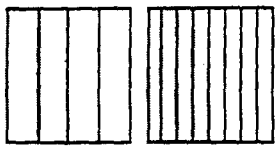
1. 

$\frac{1}{2} = \frac{2}{4}$ _____

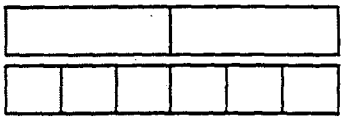
2. 

$\frac{1}{2} = \frac{1}{3}$ _____

Name the equivalent fraction.

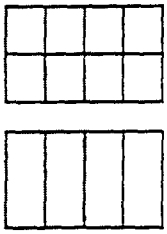
3. 

$\frac{2}{4} = \frac{\square}{8}$

4. 

$\frac{1}{\square} = \frac{\square}{\square}$

5. Write the equivalent fractions.



$\frac{\square}{\square} = \frac{\square}{\square}$

Name _____

Simplest Fractions

Fraction	Simplest Form

Objective 18: Order fractional parts of regions.

Vocabulary

>, <, = symbols
compare
order
equal
equivalency
denominator
numerator
greater
greatest
least

Materials

plain paper
wax paper
scissors
colored markers
overhead markers
Fraction Bars
Overhead Fraction Bars

Transparencies:

Equivalency Chart

Student Copies:

Equivalency Chart
Fractions in Order

Language Foundation

1. Review vocabulary as necessary. Students can relate **equivalency** to equivalent and equal, which were learned earlier.

2. A review of ordinal numbers might be appropriate now. Ask a student to name the classes or subjects they will have (or have had) today. Ask which is first, second, third, etc. In this lesson, they will be putting fractions in **order** according to size.

3. The Equivalency Chart can be found in the previous objective.

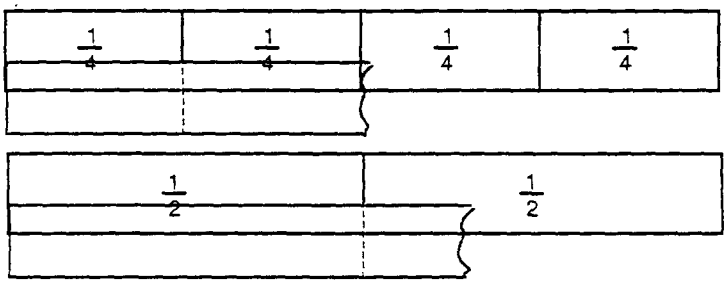
Mathematics Component

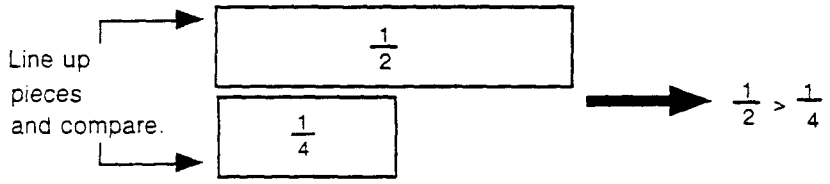
Spend a few minutes reviewing the <, >, and = symbols.

Note: To compare and order fractions, students can represent each value by laying a strip of paper on each fraction bar and cutting it the appropriate length. The fractions can then be compared by placing the strips next to each other.

1. Give each pair of students two copies of the Equivalency Chart, strips of paper, scissors, and markers.
   - Put your Equivalency Chart on the overhead. Spend some time comparing fractions with the same denominator. For example, compare 1/5, 2/5, and 4/5. Write comparisons using the appropriate symbols. (For example, 1/5 < 3/5.) **Lead students to understand that if the denominators are the same, the greater the numerator, the greater the fraction.**

2. Have the students color as you model coloring 1/2, 1/3, 1/4, ...1/12. Spend some time discussing the amount of space represented by different fractions with 1 as a numerator.
   - Model marking, cutting, and labeling a 1/2 and 1/4 fraction strip. (Wax paper strips are easy to measure, cut, and display on the overhead.)





   - Have the students write comparisons using the appropriate symbols.
   - Follow the same procedure to compare other fractions with 1 as a numerator.
     Lead the students to notice that the greater the denominator the smaller the fraction bar or piece.

- Write $\frac{1}{12}$ and $\frac{1}{9}$ on the overhead. Point to as you ask, "Is $\frac{1}{12}$ greater than or less than $\frac{1}{9}$?" Write the appropriate symbol between the two fractions. $(\frac{1}{12} < \frac{1}{9})$

3. Pass out Fraction Bars to each pair of students. Write $\frac{1}{12}$, $\frac{1}{6}$, $\frac{1}{10}$, $\frac{1}{3}$, and $\frac{1}{2}$ on the overhead. Tell the students that you want to put them in order from least to greatest.
   - Write ____ < ____ < ____ < ____ < ____ below the fractions.
   - Have the students find the Fractions Bars for $\frac{1}{12}$, $\frac{1}{6}$, $\frac{1}{10}$, $\frac{1}{3}$, and $\frac{1}{2}$. Use overhead Fraction Bars to model lining up each fraction bar in order from least to greatest and then writing the fractions on the lines.

4. - Using the Equivalency Chart, have students color fractions with different numerators **and** different denominators, as you model. Spend time discussing the amount of space represented by each.
   - Model marking, cutting, and labeling strips and have the students write comparisons.
   - Write $\frac{2}{4}$ and $\frac{4}{6}$ on the overhead. Point as you ask, "Is $\frac{2}{4}$ greater or less than $\frac{4}{6}$?" Model each of the fractions using fraction pieces or the equivalency chart. **Lead students to understand that the size of the numerator or denominator can not be used alone to compare fractions with different numerators and different denominators.**
   - Follow the same procedure as above to model comparing and ordering several fractions with different numerators and different denominators.
   - Read and explain Fractions in Order before assigning.

Name _____
Date _____

FRACTIONS IN ORDER

Use Fraction Bars or the Equivalency Chart to write the fractions in order from **least to greatest.**

1) $\frac{1}{4}, \frac{1}{2}, \frac{1}{7}$ _____

2) $\frac{1}{5}, \frac{1}{8}, \frac{1}{3}$ _____

3) $\frac{1}{9}, \frac{5}{9}, \frac{4}{9}$ _____

4) $\frac{3}{5}, \frac{4}{5}, \frac{2}{5}$ _____

5) $\frac{1}{5}, \frac{5}{6}, \frac{1}{2}$ _____

Use Fraction Bars or the Equivalency Chart to write the fractions in order from **greatest to least.**

6) $\frac{1}{3}, \frac{1}{2}, \frac{1}{6}$ _____

7) $\frac{5}{8}, \frac{1}{8}, \frac{3}{8}$ _____

8) $\frac{2}{5}, \frac{4}{7}, \frac{5}{6}$ _____

9) $\frac{4}{9}, \frac{7}{12}, \frac{2}{3}$ _____

10) $\frac{9}{11}, \frac{3}{4}, \frac{7}{8}$ _____

Objective 19: Model, name, and write mixed numbers. Analyze and rename mixed numbers to fractions in the form of a/b and do the reverse.

Vocabulary

whole
half
halves
thirds
mixed
equal
equivalent
greater than

Materials

pattern blocks
overhead pattern blocks

Student Copies:
Fractions Greater Than One

Optional

Fraction Strips

Language Foundation

1. Review vocabulary as needed.

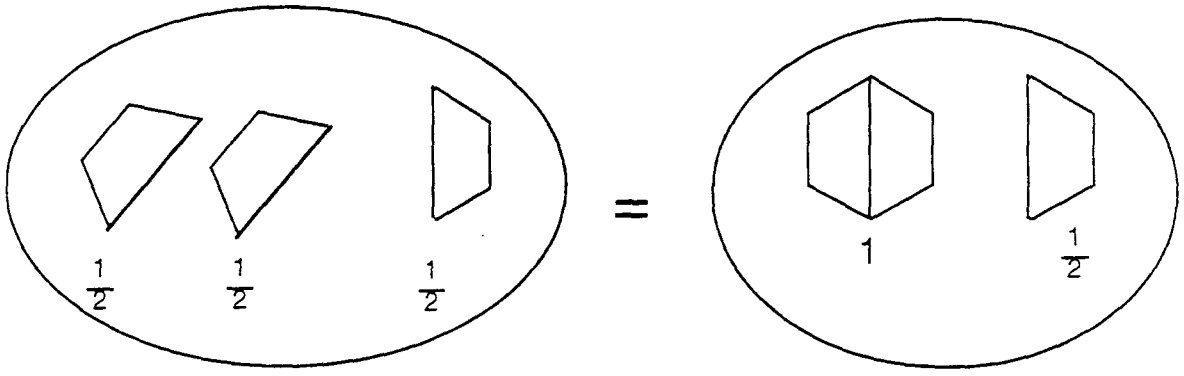
2. When working with pattern blocks, use both the *color* and the correct *geometric name* to refer to them. After hearing the term "yellow hexagon" many times, students will be able to use the word yellow to help them visualize the hexagon when they hear the term out of context or without the word "yellow".

3. First, explain that the word mix means to combine or put together. Then, refer to the word **mixed** as a combination of two or more things that are not exactly the same. For example, show some pencils of different lengths or different colors and say that you have *mixed pencils*. This way, students should be able to make the connection when learning about **mixed numbers** in this lesson.

Mathematics Component

1. Give each pair of students a set of pattern blocks. (Previous exploration with pattern blocks is assumed.) Put the transparent hexagon on the overhead and tell students that the yellow block equals a **whole**. Ask students:

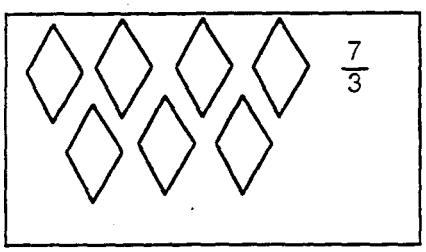
   - "How many red blocks are needed to cover the whole yellow block?" (2)
   - "What fraction of the whole yellow block is each red block?" (one-half)
   - Have the students get 3 red blocks as you put three red blocks on the overhead. Ask, "How many **halves** is this?" Say as you write $\frac{1}{2}$, $\frac{1}{2}$, and $\frac{1}{2}$ (under each block) are $\frac{3}{2}$ (under the blocks, as illustrated below).
   - Then as you model, have them put two of the halves together to make a whole. Point to each red block in the whole and say " $\frac{1}{2}$ and $\frac{1}{2}$ equals 1". (Write 1 below the whole.) Then move the third red block to the **right** of the whole and point as you say, "and this is $\frac{1}{2}$." Write $\frac{1}{2}$ below the block.
   - Tell the students as you write that $\frac{3}{2} = 1\frac{1}{2}$. (You may want to circle the blocks and the numbers for emphasis.) As you point to $1\frac{1}{2}$, explain that one and one-half is called a **mixed number** because it is made up of a whole number (point to 1) and a fraction (point to $\frac{1}{2}$). Label the mixed number. Then point to $\frac{3}{2}$ and lead the students to notice that the numerator is greater than the denominator. Tell students that we call this number a **fraction greater than one**. Label the fraction greater than one.

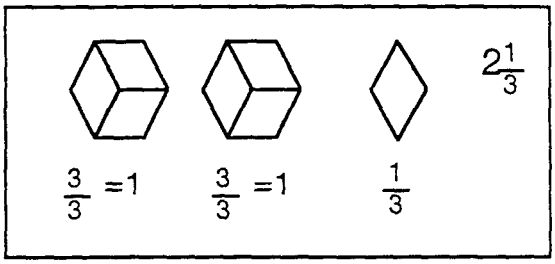


$\frac{3}{2}$ = $1\frac{1}{2}$

fraction greater than one = **mixed number**

2. Make sure that each student has a set of pattern blocks. Put the transparent hexagon on the overhead and tell the students that the yellow block equals a **whole**. Ask the students:
   - "How many blue blocks are needed to cover the whole yellow block?" (3)
   - "What fraction of the whole yellow block is each blue block?" (one-third)
   - Have the students get 7 blue blocks as you put 7 blue blocks on the overhead. Ask, "How many **thirds** is this?" Say as you write $\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}$ and $\frac{1}{3}$ (under each block) are $\frac{7}{3}$ (to the right of the seventh block).
   - Have the students put the blocks together to make a **whole**. They will probably discover that they can make a **whole** with three blue blocks and another whole with three blue blocks, that is $\frac{3}{3}$ and $\frac{3}{3}$. Write =1 next to each and then write $=2\frac{1}{3}$ under all the blocks.
   - Say as you write, $2\frac{1}{3}$ is equal to $\frac{7}{3}$. Tell the students that this mixed number and this fraction greater than one are equivalent. (Note: Remind the students that equal and equivalent mean the same.)





$2\frac{1}{3} = \frac{7}{3}$

mixed number **fraction greater than one**

If additional practice is needed, repeat the above procedure using the green pattern blocks. Each green block is $\frac{1}{6}$ of the whole yellow block. Put the figure for $1\frac{1}{6}$ on the overhead and have the students tell you the mixed number and/or the fraction greater than one.

3. As an alternative model, repeat the previous procedure using Fraction Strips.

4. Read and explain the directions before assigning Fractions Greater Than One.

Name_____
Date_____

Fractions Greater Than One

How many **whole** figures are colored?_____ 

Each whole figure is divided into _____ parts?
(how many)

How many parts of the third figure are colored? _____

Write a mixed number that describes **all the figures together**? _____

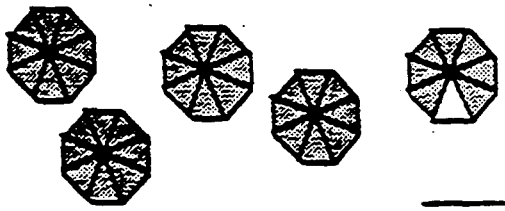
Write the mixed number for each picture.

1.  _____

2.  _____

3.  _____

4.  _____

5.  _____

Draw a picture for each mixed number or fraction greater than one.

6) $3\frac{2}{3}$	7) $\frac{9}{2}$	8) $2\frac{2}{4}$

Objective 20: Demonstrate that decimals and fractions are names for the same numbers. Convert one to the other through hundredths.

Vocabulary

decimal
decimal point
flat
rod
unit
tenth
hundredth
part
whole

Materials

base ten blocks
markers or colored pencils

Transparencies:

Money Place Value Board
Decimal Place Value Board
Decimal Squares - Tenths/Hundredths

Student Copies:

Decimal Place Value Board
Decimal Squares-Tenths/Hundredths
Decimal Squares - Tenths #2
Decimal Squares - Hundredths #2
Fractions and Decimals
Fraction - Decimal Table

Language Foundation

1. Students have seen and used the **decimal point** in a previous lesson. In this lesson, the meaning of a **decimal** number will be discovered as you teach #3 of the mathematics component. Allow students to verbalize a definition in their own words as you write it on the overhead.

2. When reading decimal numbers, say the word **and** when you get to the point. Saying "and" helps students understand that there is another **part** attached to the **whole** number. Allow students lots of opportunities to practice reading decimal numbers orally.

3. In many countries, a decimal point and a comma are used for the opposite purposes of the U. S. Check students' familiarity with the U. S. system by asking them to write some examples of amounts of money that you dictate.

Mathematics Component

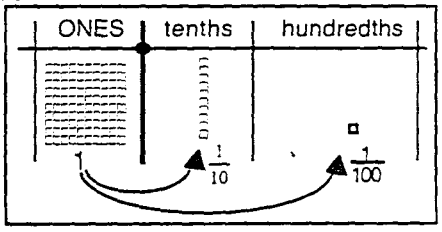
1. Place the Money Place Value Board transparency on the overhead. Put a 1 in the tens column, a 4 in the ones column, a 3 in the dimes column and a 7 in the pennies column. (See below.) Ask students to read the amount to you.

Tens	Ones	Dimes	Pennies
1	4	3	7

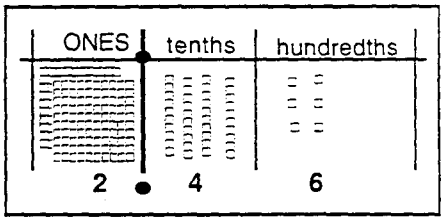
   - Point to the numbers as you say, "**We have <u>one</u> $10 bill, <u>four</u> $1 bills, <u>three</u> dimes**, and **<u>seven</u> pennies.** Remind the students that we separate dollars from cents with a decimal point.
   - Tell students there are are other numbers that are written with a decimal point that are not money.

2. Distribute base ten blocks and the Decimal Place Value Board to each pair of students. Quickly review that the flat is a hundred, the rod is ten, the unit (cube) is one. Use overhead blocks to review that ten rods make a flat and ten units make a rod. Tell the students that we can model numbers less than one on a place value mat, but if we use the unit as a **one** (hold up the unit) the blocks would be very small and difficult to handle. To make it easier, the blocks will have a new value.

   - Tell them that the flat is now "one".
   - Put the Decimal Place Value Board transparency on the overhead.
   - Put a flat in the "Ones" column and have students do the same.
   - Lead the students to notice that the rod equals **one tenth** of the flat and the unit **one hundredth** of the flat.

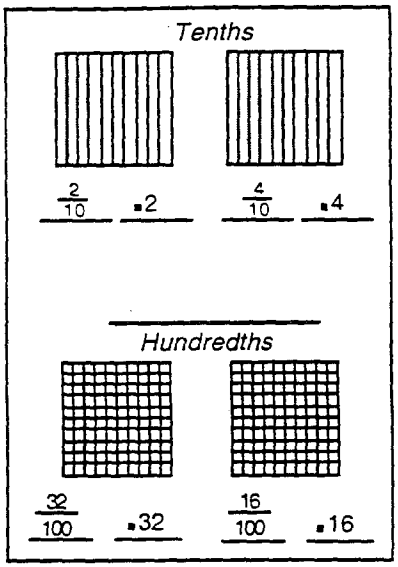


3. Model putting blocks for **2.46** on the mat.
   - Read the number as you write it beneath the blocks. Make sure to point to the decimal point when you say **and**.
   - Explain that whole numbers are on the **left** of the decimal point and heavy line; and "parts" of the whole ($\frac{1}{10}$ $\frac{1}{100}$ etc.) are on the **right** of the decimal point.
   - Repeat as necessary until students can easily represent other numbers on the mat.



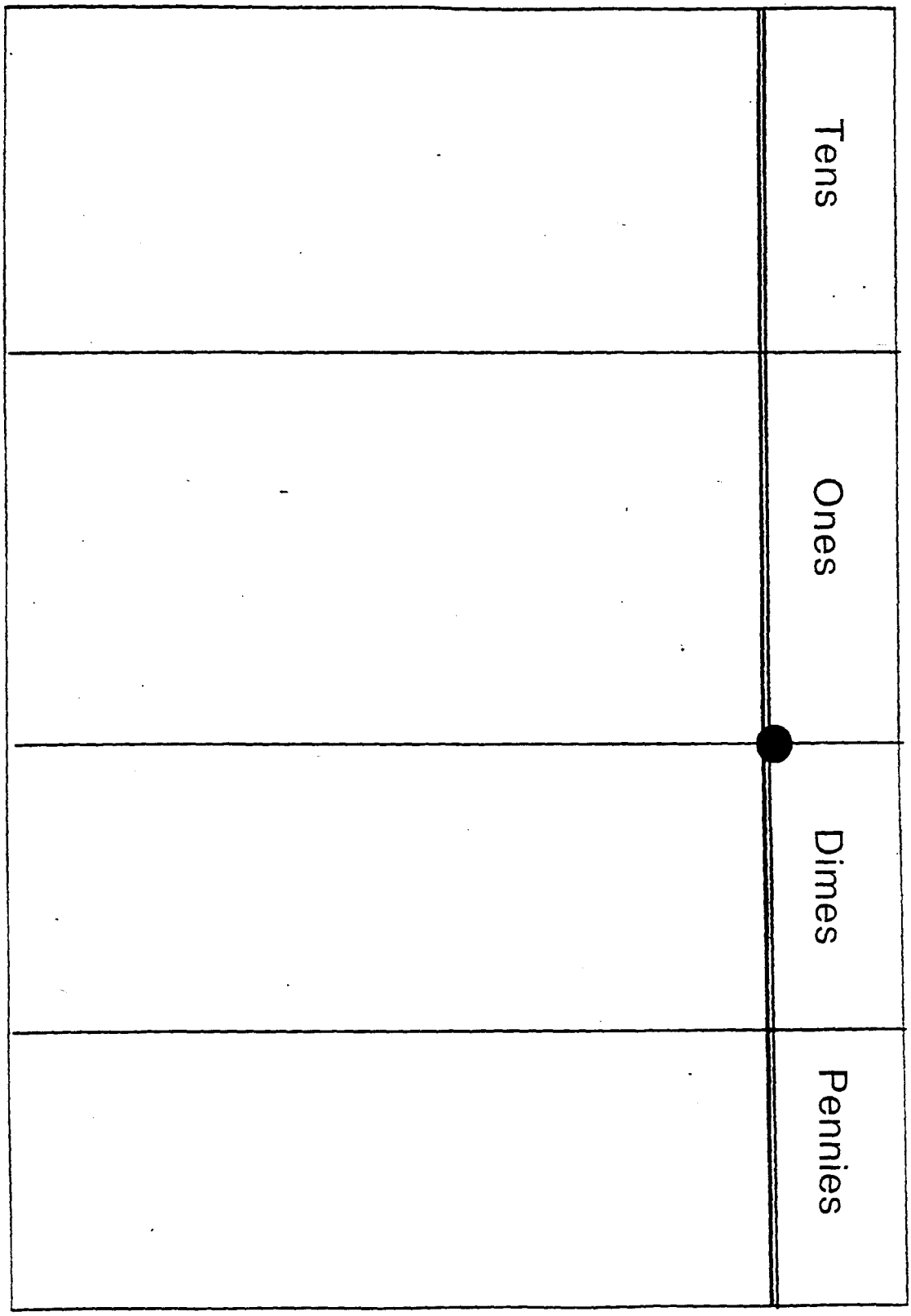
4. Pass out a copy of Decimal Squares-Tenths and a marker or colored pencil to each student.
   - Point to the two top squares as you ask, **"How many parts in each square?"** (10) Remind the students that ten equal parts are called "Tenths".

- Have the students color two parts. Ask, **"What fraction of the whole square is colored?** Write $\frac{2}{10}$ on the first line under the square.
- Tell the students that we can write two tenths another way. Write **.2** on the second line and read it to them.
- Have the students color 4 parts of the second square. Ask, **What fraction of the whole square is colored?** (Write $\frac{4}{10}$ under the second square. **"How can we write it using a decimal point?"** (Write .4 on the second line.)
- If necessary, use Decimal Squares -Tenths#2 for extra practice.

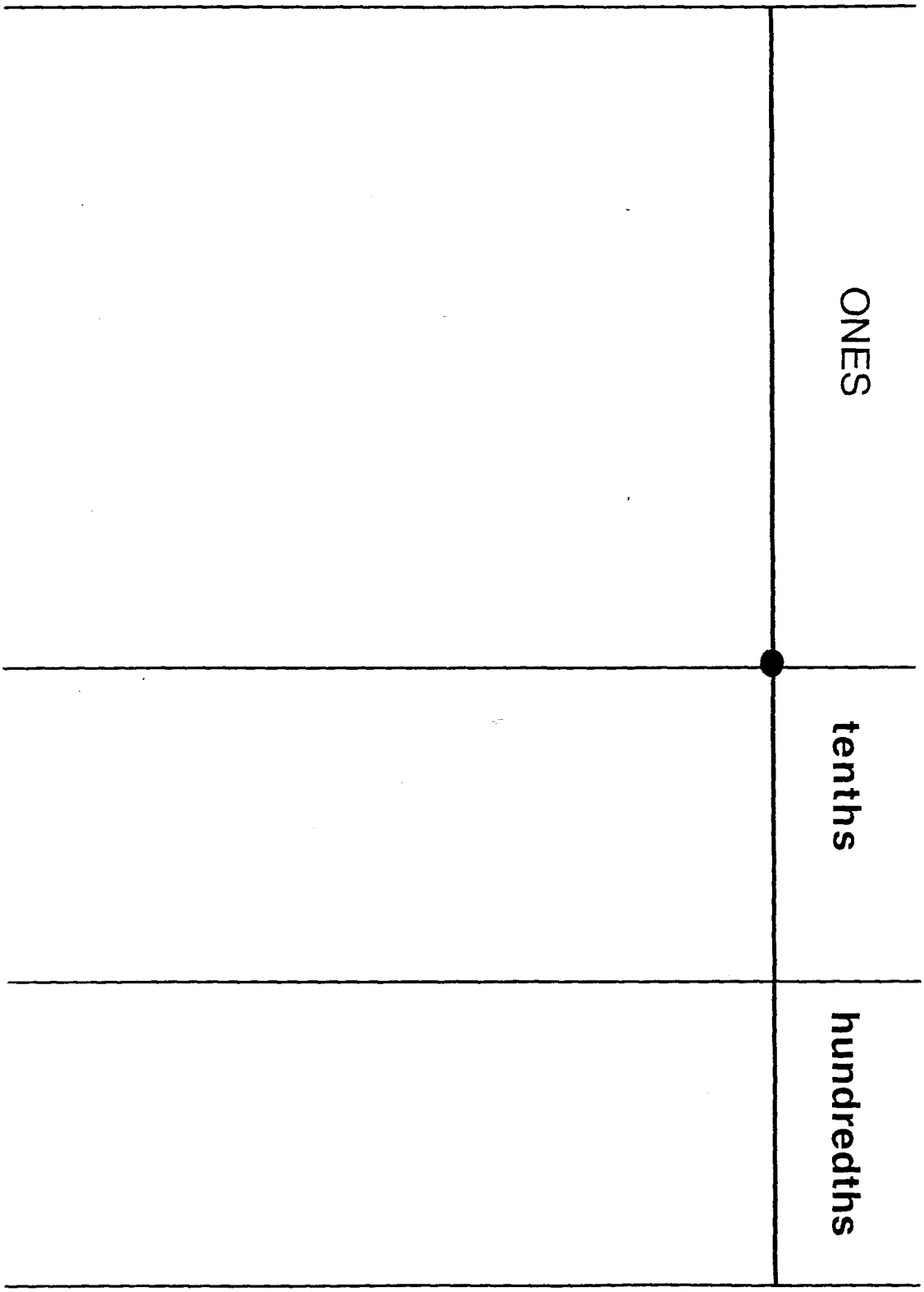


4. Point to the squares on the bottom of the page and ask, **"Each square is divided into how many equal parts?** (100) Tell the students that one hundred equal parts are called "Hundredths". Write "Hundredths" above the squares.
   - Have the students color 32 squares. Ask, **"What fraction of the whole square is colored?"** Write $\frac{32}{100}$ on the first line and **.32** on the second line. Tell the students that .32 is the decimal form of the fraction.
   - Have the students color 16 squares. Ask, **"What fraction of the whole square is colored?"** Write the fraction and the decimal under the second square.
   - Repeat procedure as necessary using Decimal Squares-Hundredths #2 for extra practice.
   - Explain and assign Fractions and Decimals and Fraction-Decimal Table. Allow students to use a place-value mat and blocks if needed.
     (**Note**: For additional practice, have the class create additional problems using the Fraction-Decimal Table.

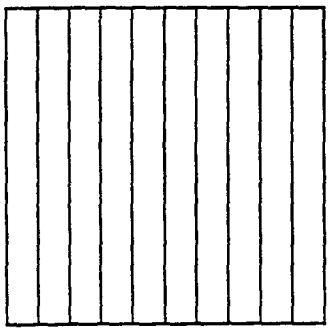
Money Place Value Board

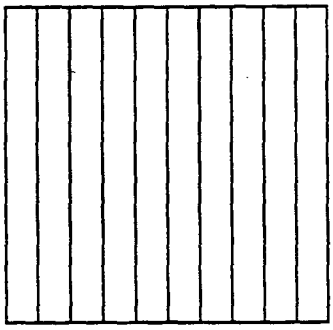


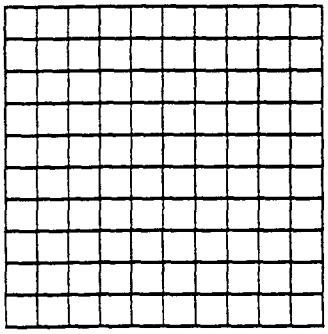
Decimal Place Value Board

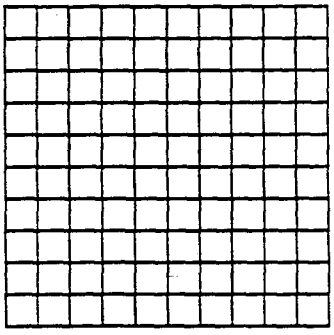


DECIMAL SQUARES-TENTHS



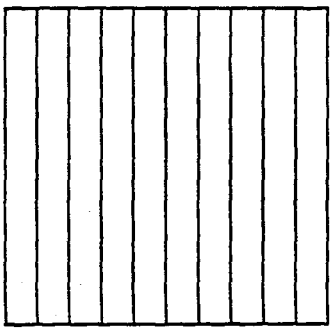


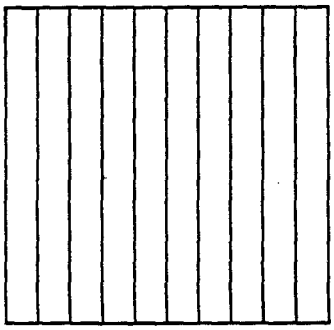




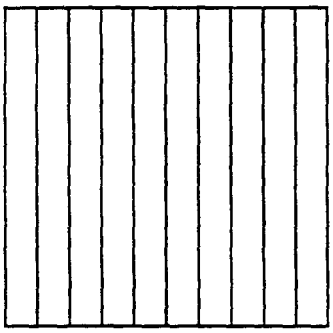
Name _____

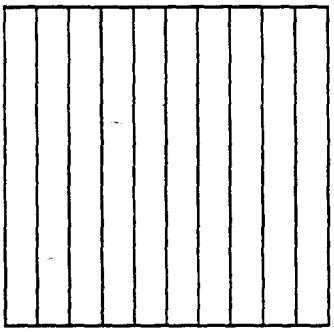
Decimal Squares-Tenths#2





_____ _____ _____ _____





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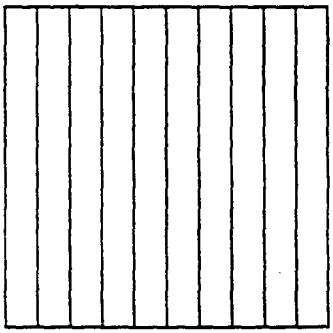
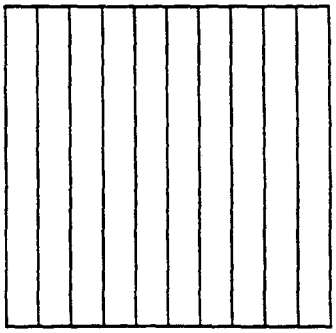
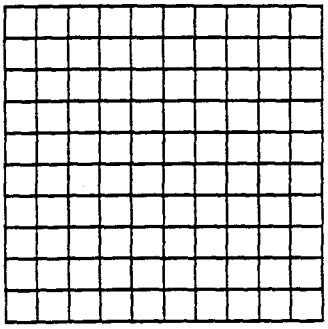




_____ _____ _____ _____

Name _____

(Decimal Squares-Hundredths#2)



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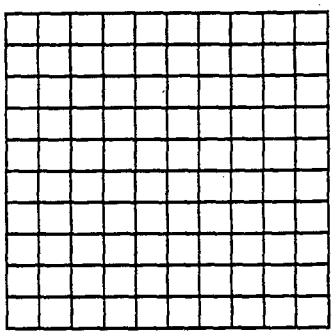

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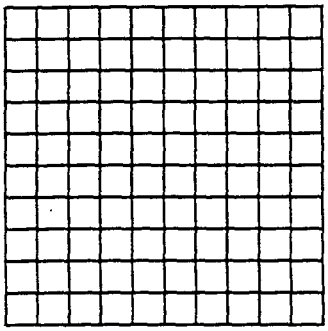

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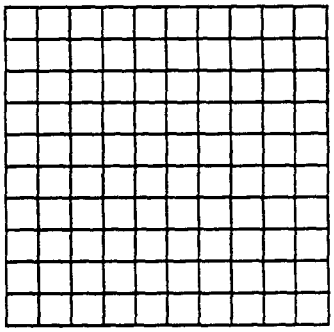

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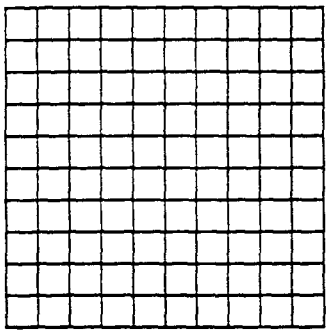

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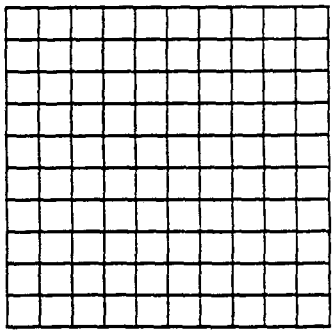
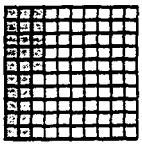


_____ _____

Name _____

FRACTIONS AND DECIMALS

Write the decimal for the colored part of each figure.

1. 

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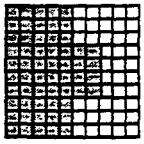
2. 

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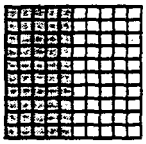
3. 

_____

Write each fraction as a decimal.

1) $\frac{4}{10}$ _____

2) $\frac{9}{10}$ _____

3) $\frac{29}{100}$ _____

4) $\frac{6}{100}$ _____

Write each decimal as a fraction.

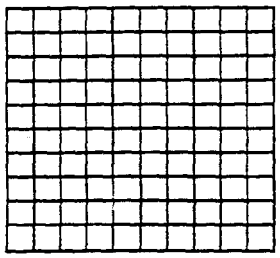
1) .3 _____

2) .51 _____

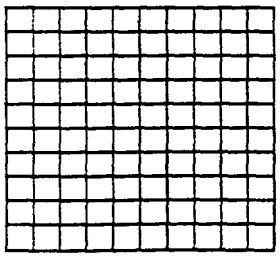
3) .17 _____

4) 3.21 _____

Color part of each figure. Write a fraction **and** a decimal for each colored part.

1) 

_____ _____

2) 

_____ _____

Name_____

FRACTION-DECIMAL TABLE

Words	Fractions	Decimals
four tenths		
seven tenths		
one tenth		
seventeen hundredths		
eighty-four hundredths		
six and seventy-three hundredths		

Answer Key
Obj. 20

Fractions and Decimals

Write the decimal for the colored part of each figure.

1) .25 2) .58 3) .50

Write each fraction as a decimal.

1) .4 2) .9 3) .29 4) .06

Write each decimal as a fraction.

1) 3/10 2) 51/100 3)17/100 4) 3 21/100

Answers will vary on the last two problems.

Objective 21: Read, write, compare, and order decimal numbers.

Vocabulary

>
<
=
digit
greatest
least
value

Materials

Base ten blocks
FM Decimal Squares (1 - 5)

Transparencies:

- Warmup
- Place Value Chart
- Decimal Recording Mat
- Decimal Place Value Mat

Student Copies:

- Decimal Recording Mat
- Compare and Order Decimals
- Compare and Order

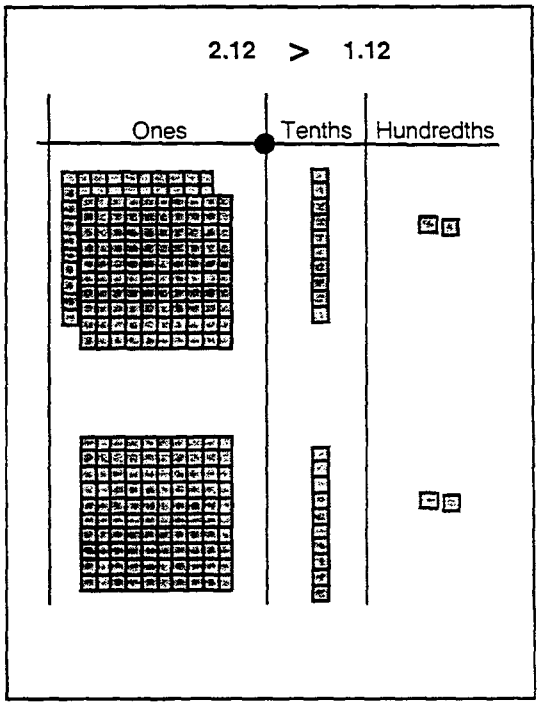
Language Foundation

1. Review words and symbols as necessary. If you teach students who have previously used the comma as a decimal point, remind them to use the period instead of the comma to represent decimal numbers.

Mathematics Component

Warmup: Spend a few minutes reviewing the <, >, and = symbols. Compare whole numbers of your choice or use the Warmup transparency. Model recording the first comparison on the Place Value Chart B (TR) and then using the appropriate symbol. Have the students work with a partner to solve, justify, and share the remaining comparisons.

1. Distribute base ten blocks or FM Decimal Squares and a Decimal Recording Mat to each pair of students. If using base ten blocks, remind the students that the blocks have a new value when they represent decimal numbers. Tell them the flat now represents "one whole", the rod is 1/10 of the flat, and the unit is 1/100 of the flat.
   - Put the Decimal Recording Mat transparency on the overhead and say "two and twelve hundredths" as you write **2.12** at the top. Use base ten blocks or FM Decimal Squares to represent the number on the mat.
   - Say "one and 12 twelve hundredths" as you write **1.12** to the right of 2.12. Put base ten blocks or FM Decimal Squares to represent the number below the first set of blocks/squares.
   - Ask, **"Which is greater?"** Have a student write the correct symbol between the two numbers at the top of the mat.
   - Clear the mat and repeat for other similar pairs of numbers.



2. Use the same procedure to compare **0.5** and **0.48**, **0.3** and **0.31**, etc.
   - Lead the students to develop a generalization for comparing decimals: begin at the place with the highest value. If the numerals are the same, compare the digits in the next highest place.
   - Repeat for other pairs of numbers and include pairs such as **0.26** and **0.31** where the smaller number requires more blocks/squares than the larger one; **2.4** and **2.04**; **0.10** and **0.01**; etc.

3. Write **1.39**, **1.46**, **1.20** at the top of a Decimal Place Value Mat transparency. Tell students that we will write the three numbers in order from **least** to **greatest** by comparing them.
   - Model writing each number on the mat.

Hundreds	Tens	Ones	Tenths	Hundredths
		1	3	9
		1	4	6
		1	2	0

1.20 < 1.39 < 1.46

- Tell the students to compare the three numbers. Remind them that you compare numbers from **left** to **right**.
- Compare the numbers in the Ones column. (**Same** number of ones.)
- Underline the digits in the tenths column.
- Have the students compare and order the tenths digits. (.2 < .3 < .4) Explain that 1.20 is the least because it has the least amount of tenths.
- Write 1.20 on the first line.
- Ask which number is next. Elicit**1.39** and allow students to verbalize why. (.3 < .4)
- Write 1.39 on the second line.
- Repeat for the last number. (**1.46**)
- Use the Decimal Place Value Mat to compare and order other numbers such as:

  1.26 and **1.06**

  12.13 and **12.31**

  0.70, **0.77**, **7.70**, and **7.07**
- Read and explain before assigning Compare and Order Decimals and/or Compare and Order.

< > =

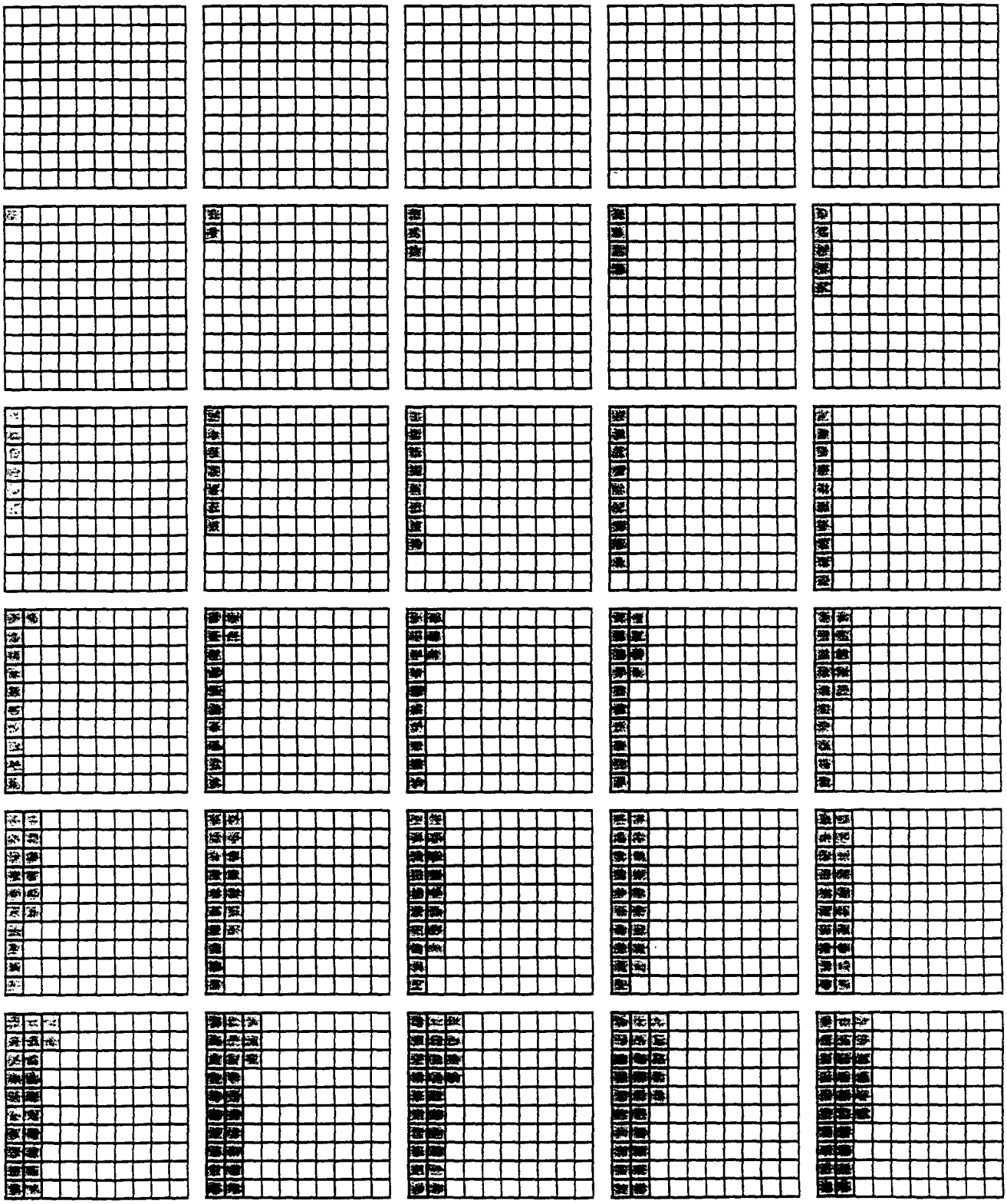
37 ◯ 73

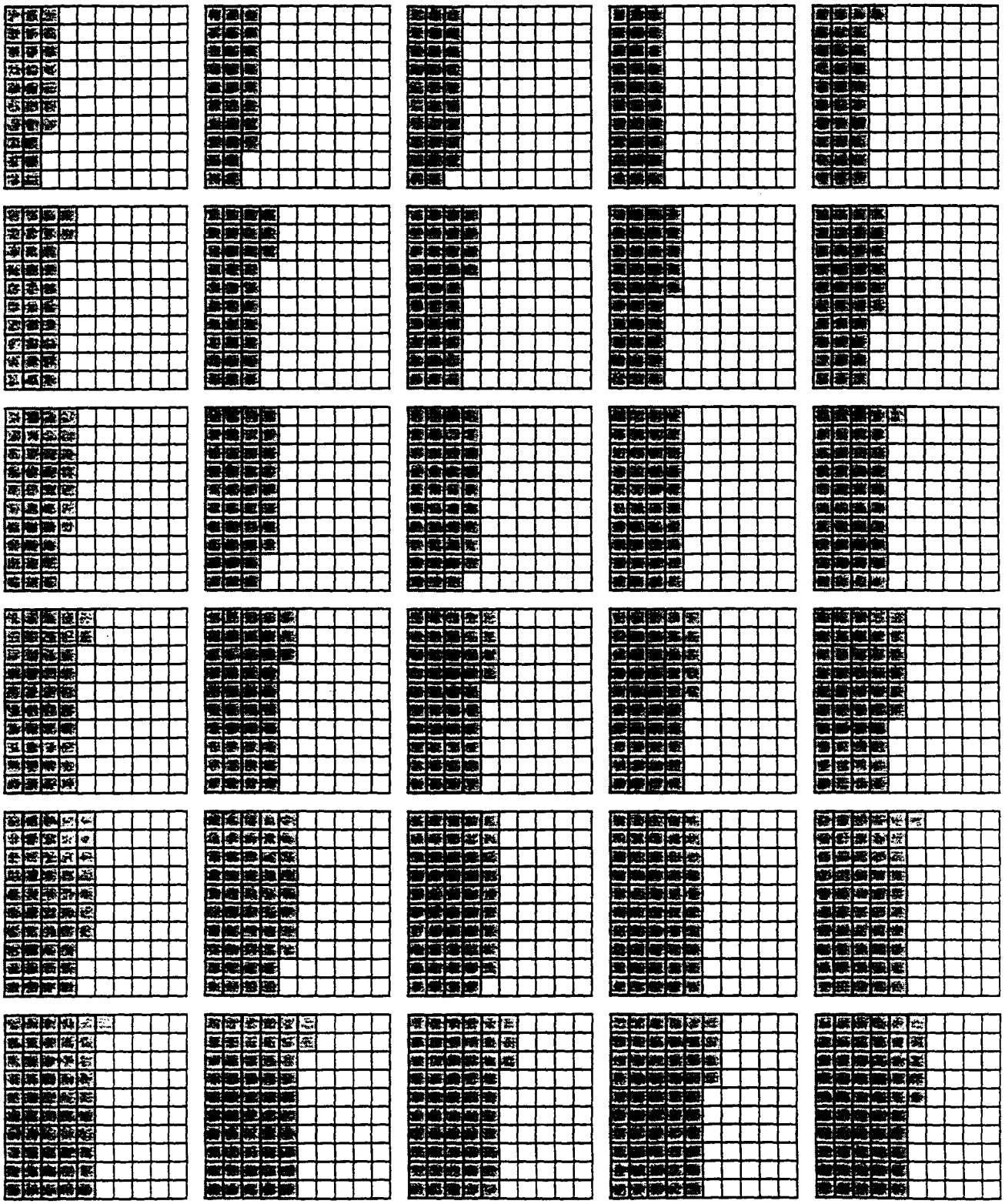
196 ◯ 169

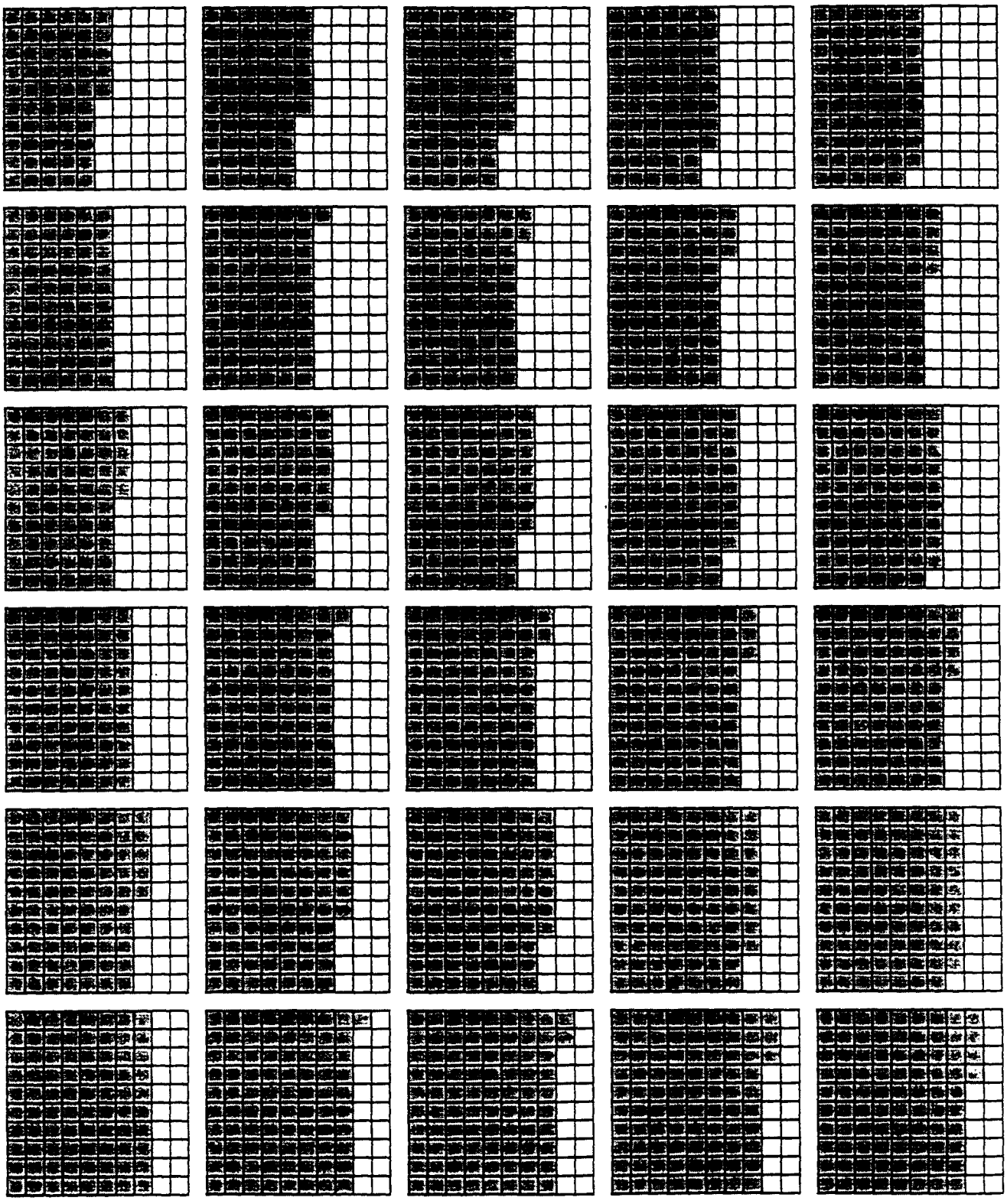
478 ◯ 536

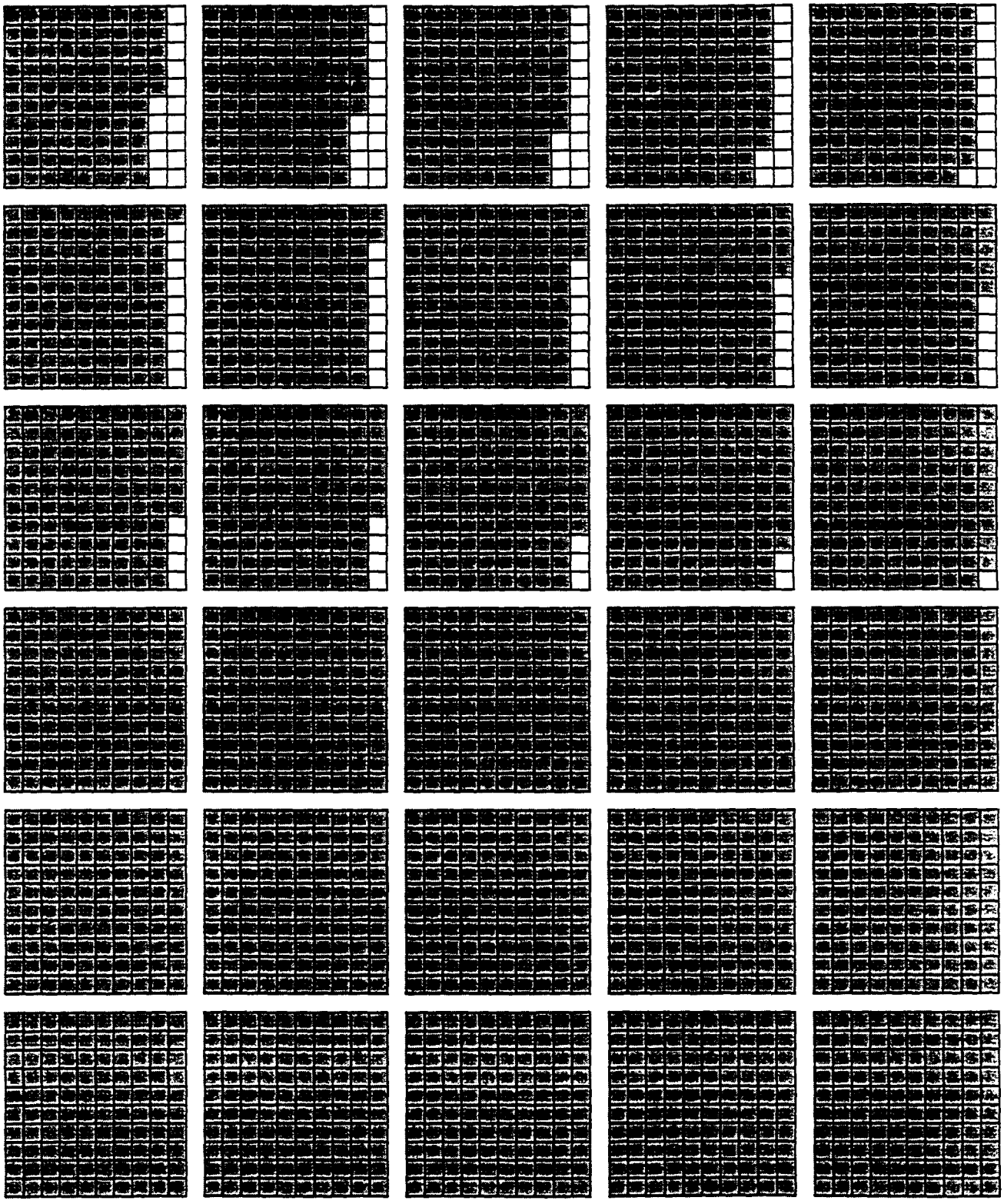
927 ◯ 1,174

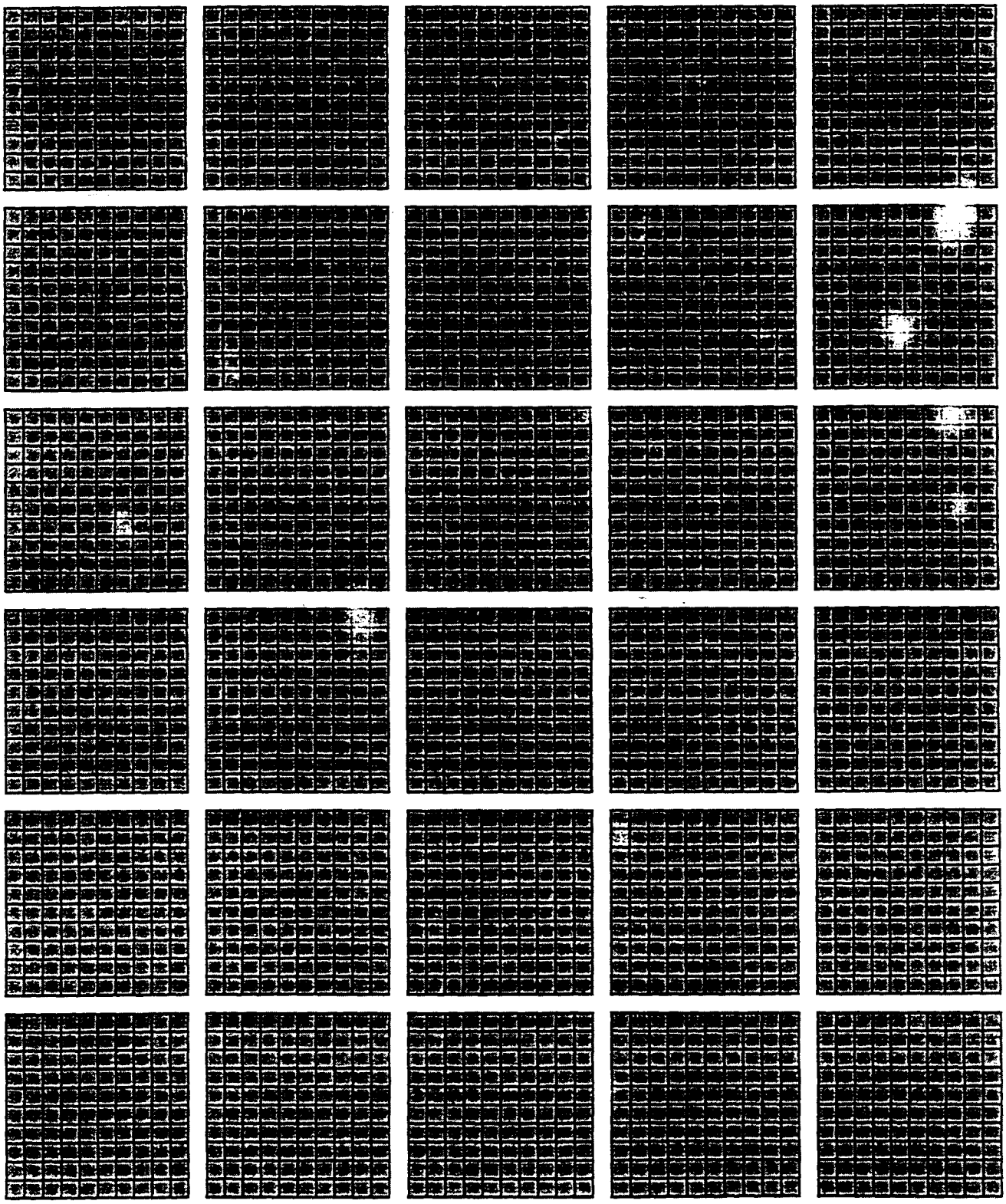
3,782 ◯ 3,871



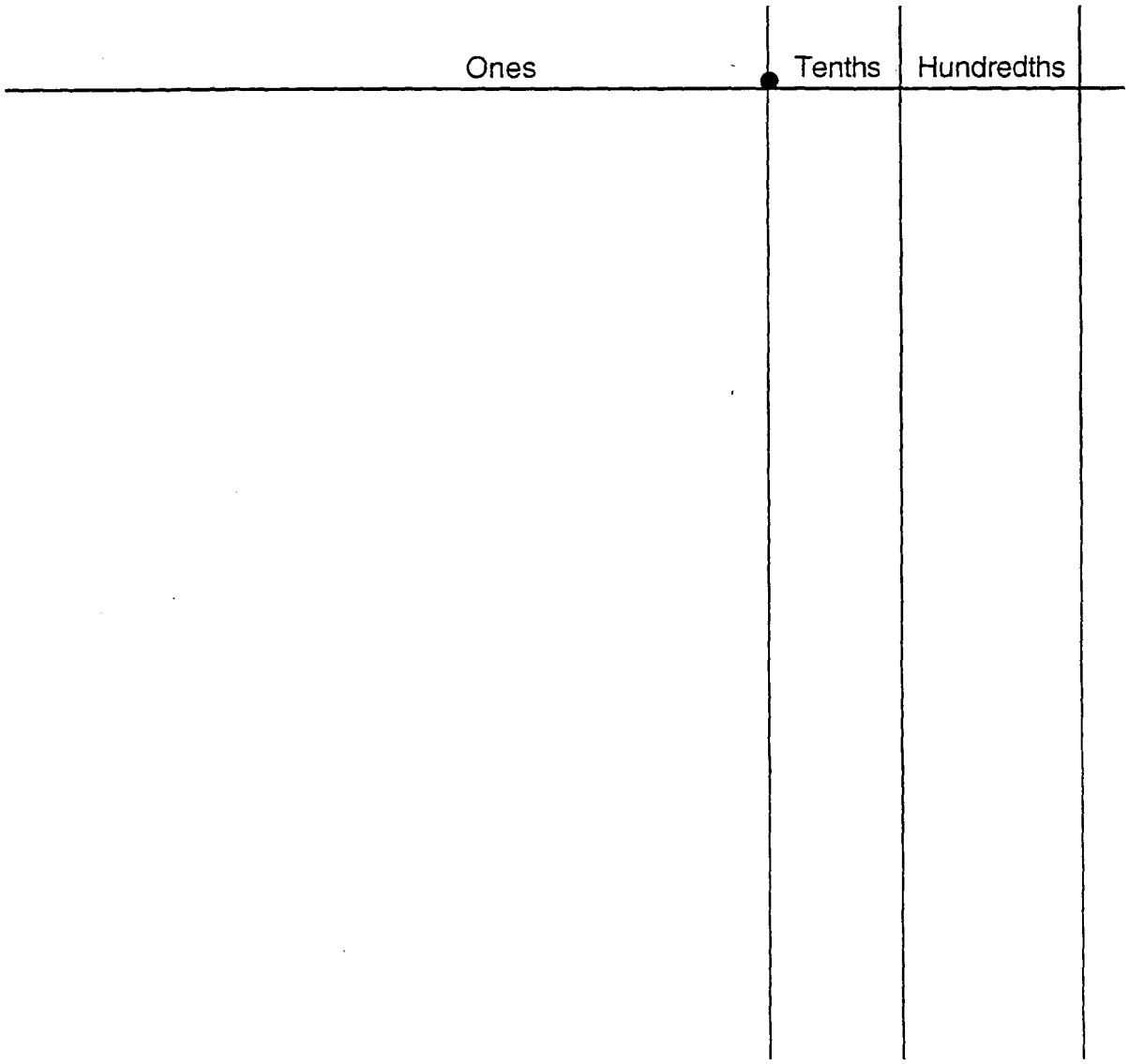




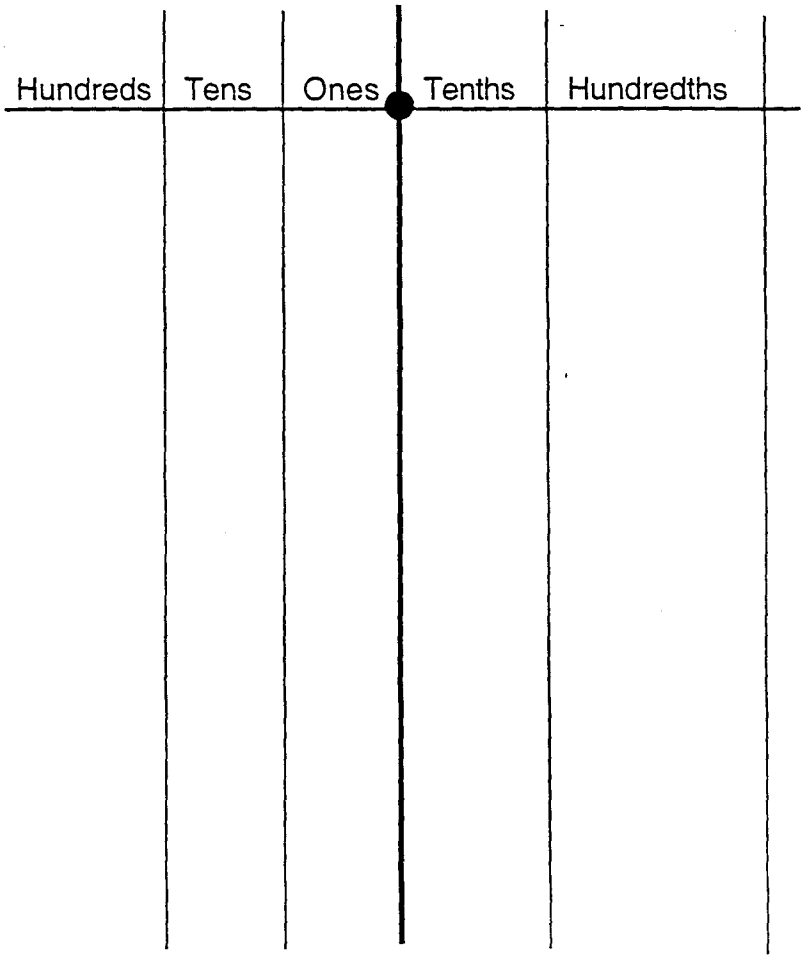




Decimal Recording Mat



Decimal Place Value Mat

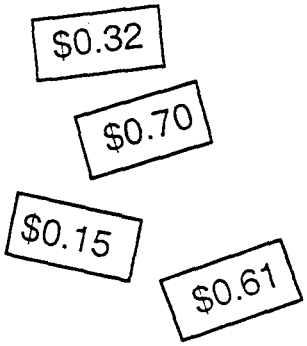


Name _____
Date _____

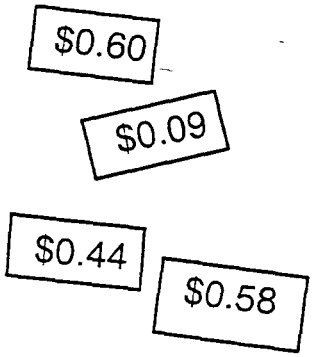
Compare and Order Decimals

Circle the money with the greatest value.

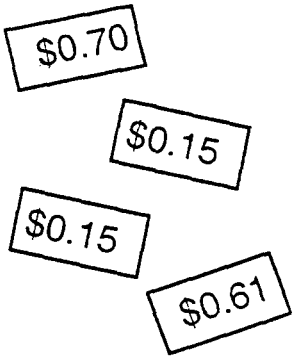
1)



2)

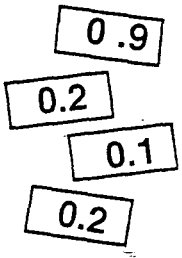


3)

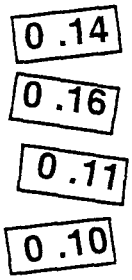


Circle the figure with the least value.

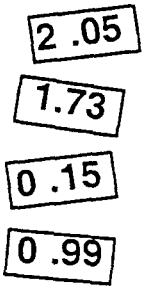
1.)



2)



3)



Look at the chart. Write the answers.

1) Which fruits cost the greatest?

2) Which fruits cost the least? _____

3) Which fruits cost more than one dollar? _____

and

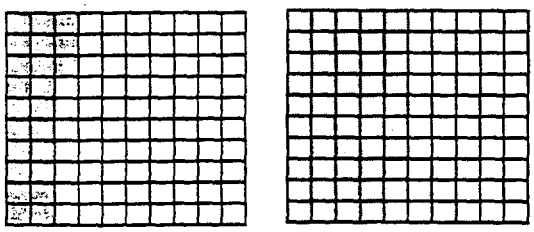
_____ _____

Fruit	Cost
4 mangoes	1.39
4 apples	0.47
4 oranges	0.99
4 bananas	1.09

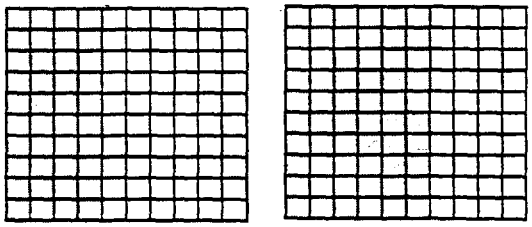
Name _____
Date _____

Compare and Order

Compare. Write <, >, or = in each ◯

1) 

_____ ◯ _____

2) 

_____ ◯ _____

3) 0.6 ◯ 0.7

4) 0.9 ◯ 0.9

5) 0.12 ◯ 0.34

6) 0.38 ◯ 0.32

7) 0.2 ◯ 0.7

8) 0.14 ◯ 0.14

9) 3.09 ◯ 4.16

10) 7.86 ◯ 4.29

11) 5.89 ◯ 5.89

Order the decimal numbers from **least to greatest**.

1) 6.5 6.7 5.9 6.2

___ < ___ < ___ < ___

2) 0.18 1.08 0.81 1.18

___ < ___ < ___ < ___

Order the decimal numbers from **greatest to least**.

1) 0.3 0.7 0.1 0.9

___ > ___ > ___ > ___

2) 6.12 4.15 3.99 0.26

___ > ___ > ___ > ___

Write 3 decimal numbers. _____ _____ _____

Put your numbers in order from **greatest to least**. _____ > _____ > _____

Objective 22: Explore percent and understand its relationship to fractions and decimals.

Vocabulary

%
per
percent
hundredths
parts
fraction
decimal

Materials

overhead markers
light colored markers, pencils, or crayons
red and blue markers, pencils, or crayons

Transparencies:

Fraction/Percent
Fraction/Decimal/Percent

Student Copies:

Fraction/Decimal/Percent
Decimals and Percents
Fractions to Percents
Three Numbers

Language Foundation

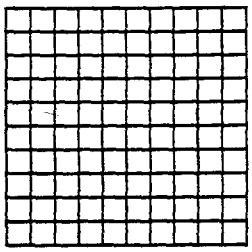
1. Break the word percent into 2 parts:
   per = part
   cent = hundred

   Percent can be thought of as "part of one hundred". The lesson will build upon this introduction.

Mathematics Component

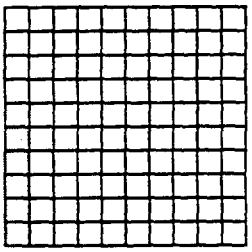
Note: Depending on the mathematical experiences of your students, you may need to teach this lesson over a few days, adding in more practice as you build each step of the lesson.

1. Put up the Fraction/Percent transparency.
   - Ask: **How many little squares are in the large square?** Write 100 next to the larger square.
   - Color one of the little squares. Ask: **What fraction of the whole have I colored?** Write $\frac{1}{100}$ on the first line under the larger square.
   - Tell students that when we have a denominator of 100, we can also name the fraction as a **percent**. Write **Percent** below the 100 as shown. Explain that **percent** means "per" hundred and that we use the symbol %.
   - Ask **"How many squares per hundred did I color?"** (1) Say as you write on the second line: **" I have colored 1% of the squares."**



$\frac{1}{100}$ 1%

2. Distribute the Fraction/Decimal/Percent activity sheet and two light colored markers or pencils to each student.
   - Color 5 squares on the Fraction/Decimal/Percent transparency. Ask **"What fraction of the hundred squares is colored now?"** Model writing $\frac{5}{100}$ on the first line and have students do the same.
   - Ask "**What percent is colored now?**" Model writing 5% on the second line as shown.
   - Ask **"What percent is not colored?"** Write $\frac{95}{100}$ and 95% on the lines.

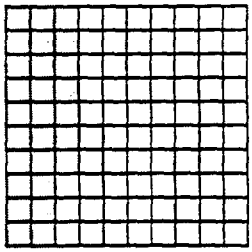


Colored $\frac{5}{100}$ 5%

Not Colored $\frac{95}{100}$ 95%

3. Have students color 27 squares on the second grid.
   - Ask "**What fraction of the whole is colored?**" Elicit and model writing this on the first line as shown.
   - Remind students that fractions can be written as decimals. Ask **"How can we write 27/100 as a decimal?"** Elicit and model writing 0.27 on the second line.
   - Ask "**What percent of the square is colored?**" Elicit and model writing 27% on the third line.

$\frac{27}{100}$

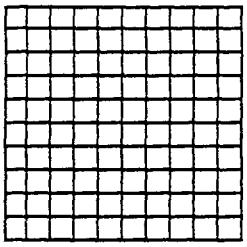


Colored $\frac{27}{100}$ 0.27 27%

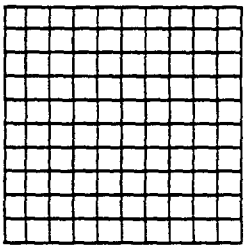
Not Colored $\frac{73}{100}$ 0.73 73%

- Tell students that 73 parts are not colored. Ask students how this amount can be written three different ways.
- Write $\frac{73}{100}$, 0.73, and 73% on the lines labeled Not Colored.
- Read and discuss the directions before you assign the Decimals and Percents, Fractions to Percents, and Three Numbers student activity sheets.

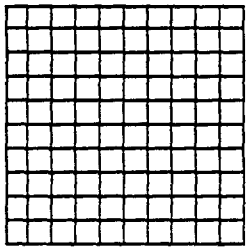
FRACTION/PERCENT



_____ _____

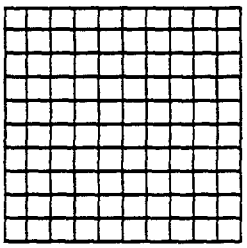


_____ _____

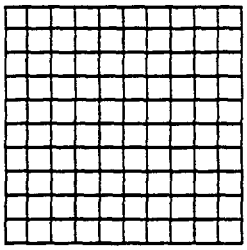


_____ _____

FRACTION, DECIMAL, PERCENT

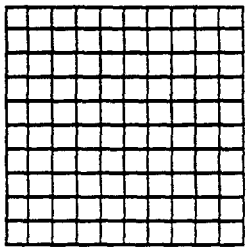


Colored _____ _____



Colored _____ _____

Not colored _____ _____



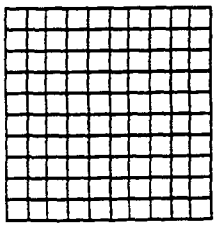
Colored _____ _____ _____

Not colored _____ _____ _____

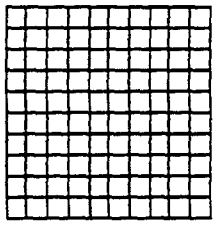
Name _____
Date _____

Decimals and Percents

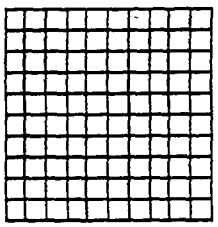
Color the squares.

1) 

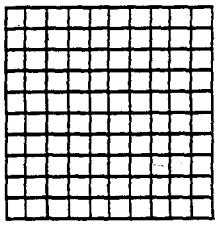
0.15

2) 

0.07

3) 

0.42

4) 

0.50

Write the percent.

1) 0.35 = _____ 2) 0.70 = _____ 3) 0.18 = _____

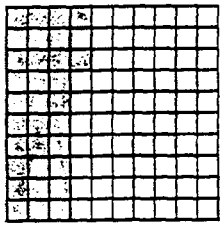
4) 0.74 = _____ 5) 0.08 = _____ 6) 0.52 = _____

Write the decimal.

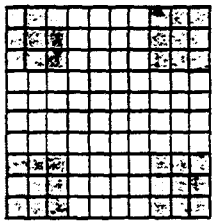
1) 20% = _____ 2) 50% = _____ 3) 11% = _____

4) 83% = _____ 5) 19% = _____ 6) 34% = _____

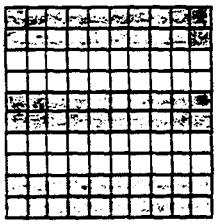
Write the percent and the decimal number for the colored area.

17) 

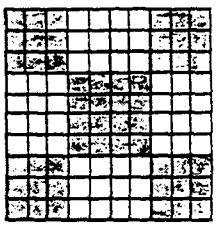
Percent _____
Decimal _____

18) 

Percent _____
Decimal _____

19) 

Percent _____
Decimal _____

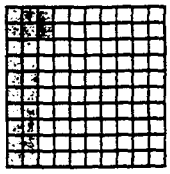
20) 

Percent _____
Decimal _____

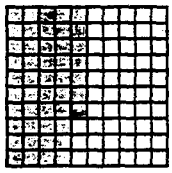
Name _____

FRACTIONS TO PERCENTS

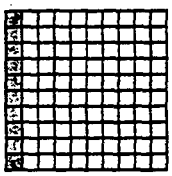
Write each as a fraction, a decimal, and a percent.

1) 

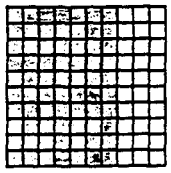
_____ _____ _____

2) 

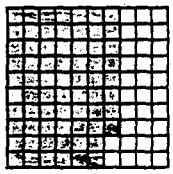
_____ _____ _____

3) 

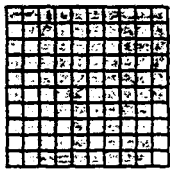
_____ _____ _____

4) 

_____ _____ _____

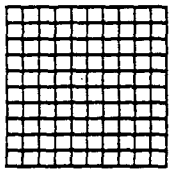
5) 

_____ _____ _____

6) 

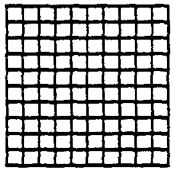
_____ _____ _____

7) Color 28% red.
Write the fraction and the decimal on the lines.



_____ _____

8) Color 54% blue.
Write the fraction and the decimal on the lines.



_____ _____

Write each number word as a percent, a decimal, and a fraction.

9) twelve hundredths

_____ _____ _____

10) twenty-one percent

_____ _____ _____

11) thirty-three percent

_____ _____ _____

Name _____

THREE NUMBERS

Complete the chart.

	Percent	Decimal	Fraction
1)	25%		
2)	52%		
3)	20%		
4)			$\frac{1}{100}$
5)	12%		
6)		0.75	
7)	8%		
8)		0.88	
9)	62%		
10)			$\frac{40}{100}$

Now write 2 of your own examples.

	Percent	Decimal	Fraction
11)			
12)			

Objective 23: Explain and write ratios.

Vocabulary

ratio
compare
comparison
height

Materials

colored counters
circle objects
pattern blocks (triangles)

Transparencies:

Ratios

Student Copies:

Ratio Identification
Mountains

Language Foundation

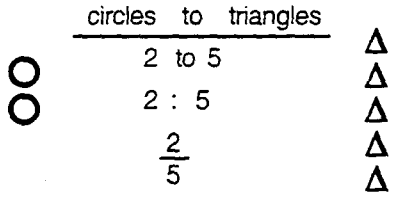
1. You may need to review the word **compare** meaning how things are the same and how they are different. In this lesson, students will be comparing numbers.

2. Students will learn to express **comparison** as a **ratio.** Explain what a ratio is as you model the activity in the lesson.

3. If students are unfamiliar with the word height, you may introduce it as part of this lesson. It will be taught in the Measurement Unit. Explain **height** by showing *how tall* a student is or *how high* something is in your classroom.

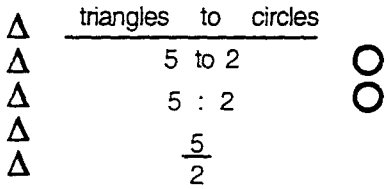
Mathematics Component

1. Tell students that we will be looking at a way of **comparing** two numbers or amounts, called **ratios.** Put 2 counters of one color/shape (circles) on the overhead with 5 counters of another color/shape (triangles) to the right (an arrow drawn under the counters may help some students remember the order in which we "read" the counters). Tell them that we are comparing *circles to triangles.* Write circles to triangles in between the counters/shapes. There are three ways that we can write the comparison:



We write the 2 first because we put the circles on the desk first and 5 second because we put the triangles on the desk second. Tell the students that the order in which you write a ratio is important.

Now *reverse the order of the shapes* and ask the students to *compare the counters/shapes now?* Write as the students respond: (We are comparing triangles to circles.)



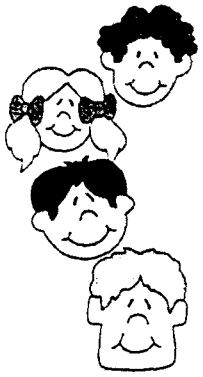
Put the Ratios transparency on the overhead. Read the definition for **ratio**. Guide the students through each item pointing out which group is listed first (possibly underline in green) and which is listed second (possibly underline in red). Remind them that the order of the comparisons is important.

Assign Ratio Identification and Mountains. Read the directions and model how to record the answers for each section.

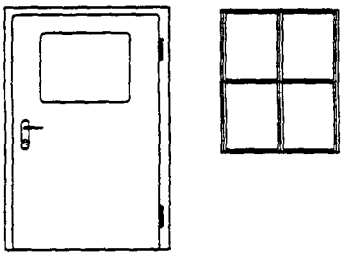
RATIOS

Definition: A ratio compares 2 numbers.

Write the following ratios.



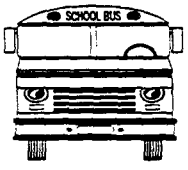
1. What is the ratio of girls to boys in this class?

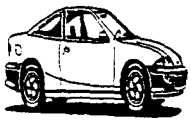


2. What is the ratio of windows to doors?

3. What is the ratio of students to teachers in this class?

4. What is the ratio of computers to students?





5. What is the ratio of students who come to school by car to students who ride the bus?

Name_____

Date_____

Ratio Identification

Use the shapes in the box for 1-6. Write the ratio in three different ways.

1. stars to circles

_____

_____

_____

2. squares to stars

_____

_____

_____

3. circles to squares

_____

_____

_____

4. circles to all shapes

_____

_____

_____

5. all shapes to stars

_____

_____

_____

6. all shapes to squares

_____

_____

_____

Draw a picture or shape for each ratio.

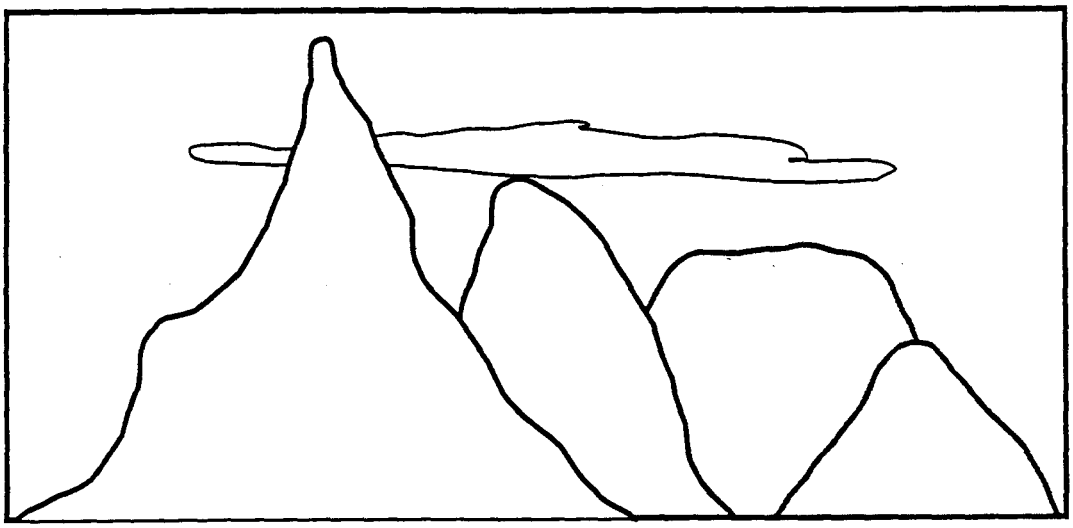
7. The ratio of red to green is $\frac{2}{9}$.

8. The ratio of fat to thin is 1:2.

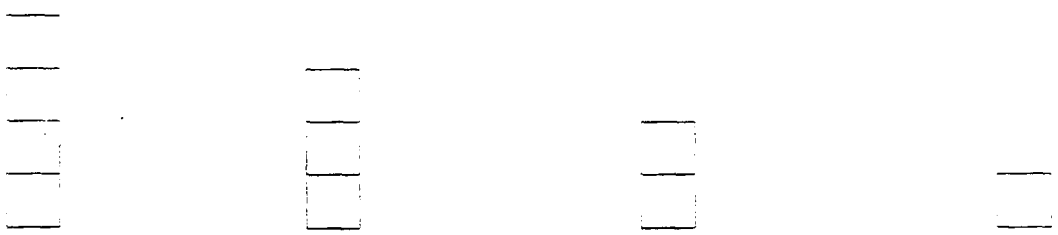
9. The ratio of red to all is $\frac{4}{11}$.

10. The ratio of small to all is 2:9.

MOUNTAINS



The heights of four mountains in the world are illustrated by the following squares.



Mt. Everest Mt. Aconcagua Mt. Kilimanjaro Mt. Blanc

The ratio of the height of Mt. Blanc to Mt. Aconcagua is $\frac{1}{3}$, 1 to 3, or 1:3.

Write each of the following ratios.

1. The ratio of the height of Mt. Aconcagua to Mt. Blanc is _____ .
2. The ratio of the height of Mt. Kilimanjaro to Mt. Aconcagua is _____ .
3. The ratio of the height of Mt. Blanc to Mt. Everest is _____ .
4. The ratio of the height of Mt. Everest to Mt. Aconcagua is_____ .
5. The ratio of the height of Mt. Aconcagua to Mt. Kilimanjaro is _____ .

Answer Key
Objective 23

Ratio Identification

1. stars to circles
   3 to 2
   3:2

2. squares to stars
   2 to 3
   2:3

3. circles to squares
   2 to 2
   2:2

4. circles to all shapes
   2 to 7
   2:7

5. all shapes to stars
   7:3
   7 to 3

6. all shapes to squares
   7:2
   7 to 2

Mountains

1. 3:1
2. 2:3
3. 1:4
4. 4:3
5. 3:2

Objective 24: Express positive and negative integers using the concept of opposites. Compare and order integers.

Vocabulary

integers
positive
negative
opposite
check
bill
right
left
least
greatest

Materials

red, black, green overhead pens

Transparencies:

- Warmup 1
- Number Line
- Integers
- Integers Practice
- Integer Number Line

Student Copies:

- Number Line
- Positive and Negative Numbers
- Opposites
- Integers
- Compare and Order Integers

Language Foundation

1. Many students may be familiar with the concept of a checking account and will therefore understand what a **check** is. If there are students who do not, take a few minutes to explain that this is another way of using money. It can be written on paper, called a check, and used just like cash. Explain "check" is another word for the total you must pay in a restaurant.

2. At this point, you will want to distinguish between a dollar bill and a **bill to pay**. Explain that in the restaurant, the waitress is presenting a piece of paper which shows how much money you need to pay for the meal.

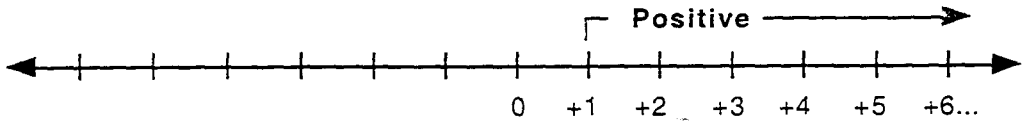
3. The math definitions for positive and negative integers will be presented in the lesson. This would be a good opportunity for you to talk about words and their opposites. Tell/remind students that these words are called antonyms. Ask students what antonyms they already know from previous lessons. (before/after, greatest/least, win/lose, even/odd). The words **positive** and **negative** are antonyms. Ask students what they already know about the meanings of these words.

Mathematics Component

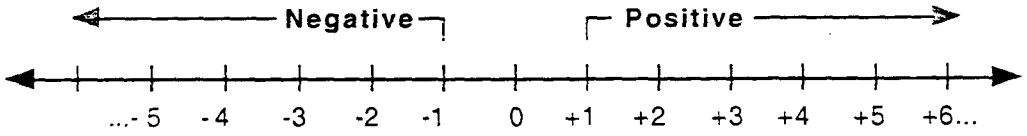
Warmup Option

Tell the students that yesterday morning your friend gave you a birthday check for $5. Show Warmup 1 transparency with the left side covered (B.C. Cafe bill). Write **+5** under the check. Tell them that at lunchtime the waitress at the restaurant gave you a bill for $5 (show the bill). Write **-5** under the bill. Ask them what the difference is in the 2 numbers. Tell them we read +5 (point to the number) as **positive 5** and -5 (point to the number) as **negative 5**. Tell them that today we are going to talk about **positive** and **negative numbers**.

1. Put the Number Line transparency on the overhead. Make a mark in the center and label it zero. Mark 1 at the first mark to the right of 0. Ask the students how to finish the number line and proceed to label the numbers to 10. Tell them the numbers we have been using are called **positive numbers** (use a black or green pen to write the word **positive** over the numbers). Add the + signs in front of the numbers as you say **positive 1**, **positive 2**, etc. to emphasize the concept.

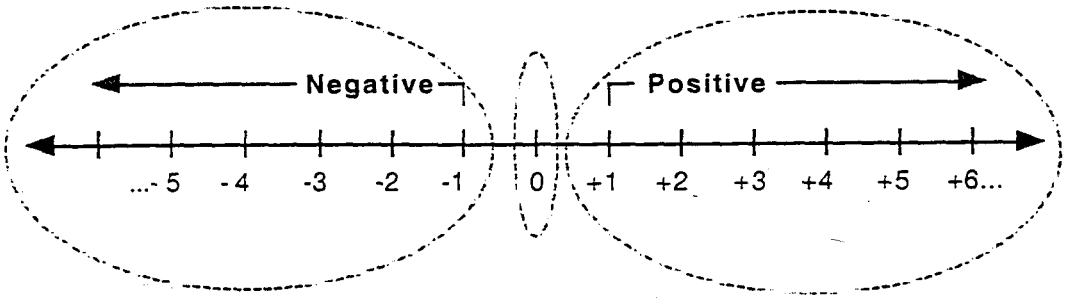


Tell the students that for every number you have put on the line, there is an **opposite** number called a **negative number**. Point to the +1 on the transparency. Tell the students that the **opposite** of +1 is **-1** (use a red pen to record it on the number line). Point to **+2** and ask the students for the **opposite** of +2. Write -2 on the line. Continue to add the numbers to -10 with their help. These numbers are called **negative numbers** (use a red pen to write the word **negative** over the numbers). Give students a copy of the Number Line to label from -15 to +15.



Read and explain the directions before assigning Positive and Negative Numbers and/or Opposites. Have students share their solutions.

2. Put the Integers transparency on the overhead (cover the words above the number line). Tell the students that this number line is labeled with **Negative Numbers, 0,** and the **Positive Numbers** (highlight/circle as you point to and say each).



Tell the students that these numbers are called **integers** (uncover the rest of the poster). Put the Integers Practice transparency on the overhead and have the students name the integers.

Note: The Integers page can be enlarged and used as a wall poster or copied and given to students to keep in their binders as reference.

3. Put the Integer Number Line transparency on the overhead: Talk about the value of numbers on the number line (become greater as you move to the **right** and decrease as you move to the **left**). Remind the students about using <, >, or = to compare numbers and then plot and compare a few numbers using <, >, or =. (1< 2, 5 > 1, etc.) As you plot each number, ask how the **value** changes as you move to the **right or left** on the number line. Do not erase comparisons.

- (Plot +5 and -2) Is +5 to the **right** or **left** of -2 on the number line? (to the right) Record +5 > -2 beneath the number line as you say it. (+5 is greater than -2)
- (Plot -10 and -2) Tell the students that -2 is to the **right** of -10. We know that the value of numbers to the **right** on a number line are greater so -10 < -2 . (Record the comparison)
- Ask which is greater in value on the number line -5 or -2. (-2)
- Continue plotting and comparing numbers until students understand the concept.

Write **-3, +7, +12, -15** on a blank transparency. Tell the students that you need to put the numbers in order from **least** to **greatest** (write the terms above the numbers). Tell them that you know that the the numbers are **not** in order because two of the numbers are **negative** (circle them in red) and two of the numbers are **positive** (circle in green/black) and that you have mixed positive and negative numbers. Use the Integer Number Line to plot and order the numbers from least to greatest. (-15< -3 <+7<+12) Continue comparing and ordering numbers until the students understand. Read and explain the directions before assigning Compare and Order Integers.

B.C. Cafe

Bill

Oct. 8 98

Value plate	$4.75
tax	.25
	$5.00

Jerry Smith
100 Gentle Lane
Alexandria, VA 20001

Oct. 8 19 98

Pay to the Order of Johanna Doe $5.00

Five dollars 00/100 DOLLARS

SAVINGS BANK
FAIRFAX, VIRGINIA 20000

FOR Birthday Jerry Smith

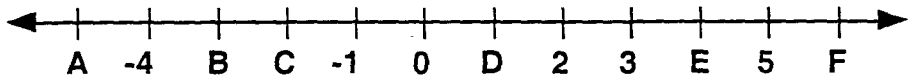
Number Line

Name_____

Date_____

Positive and Negative Numbers

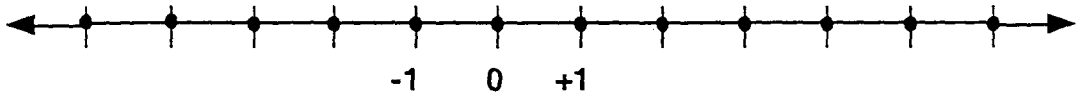
Write the number for each letter.



A = _____ B = _____ C = _____

D = _____ E = _____ F = _____

Write the missing numbers on the number line.



Name_____

Date_____

Opposites

Write the opposite of each word.

1) up _____

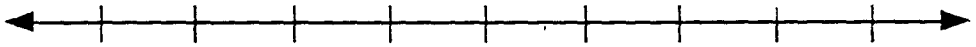
2) cold _____

3) open _____

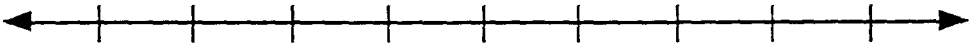
4) full _____

Plot each number on the number line.

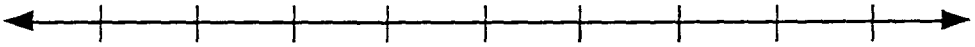
5) **0,2,4**



6) **-2,-4,-6**

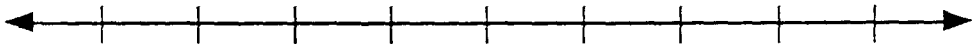


7) **-3,0,2**

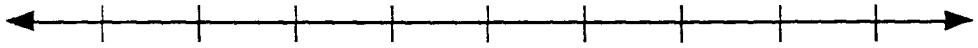


Plot the **opposite** of each number on the number line.

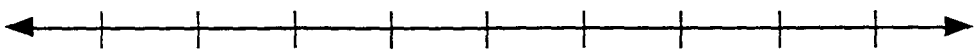
8) **2, 4,-1**



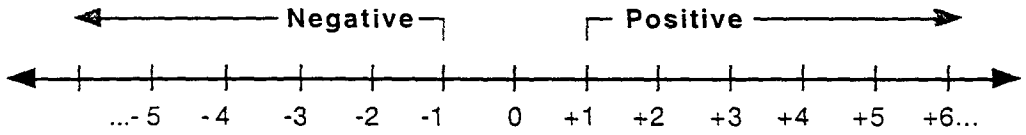
9) **-2,-4,-6**



10) **-3,- 2, 1**



Integers



Integers Practice

What integer represents the following?

3 steps forward

lose $1.00

a bank deposit of $10.00

6 degrees above 0

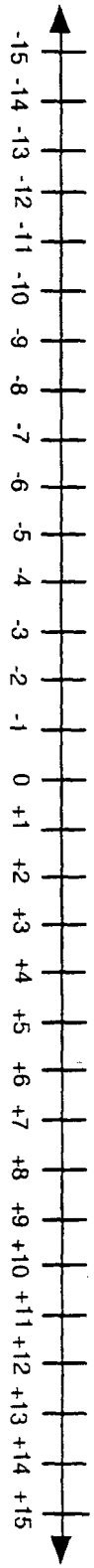
climb up 2 meters

a weight loss of 6 pounds

a gain of 5 yards in football

12 feet underground

Integer Number Line



Name_____

Date_____

Compare and Order Integers

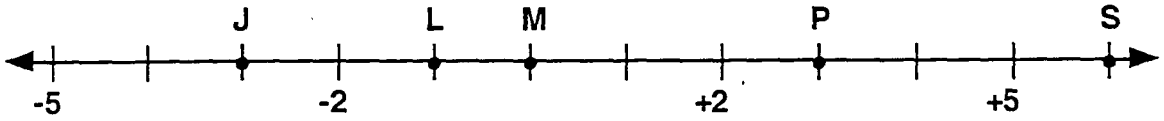
Write the number which is **greater**.

1) -5 or -3 _____ 2) -3 or 0 _____ 3) -8 or +3 _____

Write the **opposite** of the integer.

4) -9 _____ 5) +6 _____ 6) +12 _____ 7) -1 _____

Use the number line. Write an integer for the given point.



8) **P** _____ 9) **M** _____ 10) **J** _____ 11) **S** _____ 12) **L** _____

Compare using <, >, or = in the ◯

13) 6 ◯ 8 14) +1 ◯ -9 15) 0 ◯ -5 16) -6 ◯ -8

Order the integers from least to greatest. Use <.

17) 0, -4, +6, -2 _____

18) +8, -4, +5, -2 _____

19) +8, -8, +4, -2 _____

20) -2, +4, -1, +6 _____

21) +8, -5, -8, -6, +10 _____

22) +3, -2, 0, +1, -3 _____

Operations

Whole Numbers

Addition and Subtraction

Operations Objectives
(Draft)

Whole Numbers		**SOL Link**
	Addition and Subtraction:	
Obj. 1	Write and solve 1-digit addition and subtraction sentences written horizontally and vertically. Recognize and use language and symbols to represent addition and subtraction.	CE 1.8
Obj. 2	Mentally compute addition facts, sums to 18, demonstrating an understanding of strategies: commutative property, counting on, zero property, doubles, near doubles, sums to 10, ten and more.	CE 2.6
Obj. 3	Estimate (using compatible numbers) and add three or more addends.	CE 2.6
Obj. 4	Mentally compute subtraction facts to 18 and explain orally and/or concretely.	CE 2.6
Obj. 5	Use models and record addition and subtraction of 2-digit numbers without regrouping.	CE 2.7 CE 2.8
Obj. 6	Estimate (using lead digit) add, and subtract 2-digit numbers using symbolic notation.	CE 2.7 CE 2.8
Obj. 7	Add 2- and 3-digit numbers with regrouping.	CE 3.8
Obj. 8	Model, record, and subtract 2-and 3-digit numbers with regrouping.	CE 3.8
Obj. 9	Estimate (using rounding) and add 3-and 4-digit numbers with and without regrouping. Check addition by using subtraction.	CE 3.8 CE 4.6
Obj. 10	Model and use symbolic notation with 3- and 4-digit numbers to subtract across zeros.	CE 3.8

Obj. 11	Estimate (using a variety of strategies), add, and subtract any whole numbers and demonstrate strategies.	CE 3.8 CE 4.6
Obj. 12	Use a plan to solve problems adding and subtracting numbers.	CE 3.8
Obj. 13	Use calculators to solve problems adding and subtracting whole numbers.	CE 3.8

Objective 1: Write and solve 1-digit addition and subtraction sentences written horizontally and vertically. Recognize and use language and symbols to represent addition and subtraction.

Vocabulary

whole
part
group
add
addition
in all
all together
join
plus
sum
equal
take away
subtract
subtraction
horizontal
vertical
headline
How many are left?
number sentence

Materials

multilink cubes
2-sided counters
transparent tiles
large signs for addition, subtraction, equal
work mat
index cards
number line

Transparencies:
- Fruit
- Let's Think!

Student copies:
- Addition
- Learning About Addition
- Writing Addition Sentences

Language Foundation

1. Vocabulary words used in this lesson may have been taught previously in the NCT unit. Others may be new to students. You will need to tailor the language foundation to meet the needs of your students by reviewing familiar words and introducing new ones as they appear in the lesson.

2. You may group words which indicate an **addition** operation and those which indicate a **subtraction** problem as you introduce and use those words. A chart displaying words common to the various operations is included in this unit.

3. Give students real life examples of **horizontal** (laying in bed) and **vertical** (climbing a ladder). This will help students to recognize the different ways in which number sentences are written.

4. It is important to pose questions using a variety of vocabulary to signal an addition or subtraction operation. For example, "How many do we have **in all** or **all together**? What is the **sum** of ...? How many are **left**?" This will help students transition into solving story problems.

5. Help students think of **models, words**, and **symbols** as separate 'languages' used in math. These three 'languages' are beneficial in helping students gain exposure to a wide variety of meanings in operations. This will enable them to translate among the 3 languages.

model: 

symbols: 1 + 2 = 3

words: Juan has one cat. Maria has two cats. How many cats to they nave all together?