## Dear Colleague

Students now learn the fifth Comparing Fractions Toolkit strategy-compare this strategy builds on the focus on $\frac{1}{2}$ introduced in the fractions to $\frac{1}{2}$. $h$. What aplying this new strategy for comparing fractions, previous lessons. When applying students also make use of the other strategies they have learned. The pairs of fractions that students compare in these lessons were specicaly comple, to so that more than one strategy is userut $\frac{5}{8}$ is greater by using the strategy compare $\frac{5}{12}$ and $\frac{5}{8}$, students can decide the $\frac{5}{8}$ is strategy of compare fractions隹 with common numerators.
In Lessons 16-20, students...
Compare fractions using benchmarks, common numerators, common denominators, and fractions one unit fractio
from 1 whole. from 1 whole.
Identity equivalen
fractions. fractions.

- Communicate ideas with key math vocabulary: numerator, common numerator, denominator, unit fraction, equivalent,
and common denominato

udents extend their fraction work from the previous lessons with two-color cube trains, now comparing fractions to the benchmark of $\frac{1}{2}$. They consider real-world situations that involve fractly half, about half,


In addition, students encounter fractions that are o $\frac{1}{2}$ and have denominators that are odd numbers, for example $\frac{2 \frac{1}{5}}{5}$ and $\frac{4 \frac{1}{2}}{2}$. While the odd numbers, for typically included in ele these complex fractions aren't they emerge naturally from tary mathematics instruction, the students, naturally from these lessons, are accessible to the students, build their number sense, and deepen their understanding of fractions. whether each fraction can best be described as exactly less than half, or greater than half. Students learn a new symbol, $\approx, w$ of $\frac{1}{2}$, means about equal to. Along with supp to estimating with fractions. these experiences

## 66 students consider

 real-world situations that involve fractions and decide whether each can best be described as exactly half, about half, less than half, or greater than half. 99Fractions B: Equivalence and Comparison Reduced Teacher Guide, pages 72-73


| LESSON (16) Using a new | mparing Fractions Toolkit strategy | Last Lesson Students demonstrate understanding of the objectives of essons 11-14. | Lesson (16) Stu for the Comparing compare fractions | arn a new strategy ns Toolkit- | Next Lesson Students transform two-color cube trains that are not half blue, half yellow to half-and-half trains. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Lesson Summary <br> Students learn a new strategy for the Comparing Fractions Toolkit-compare fractions to $\frac{1}{2}$. | Students practice toolkit strategy |  |  | Oifil WhoLe STEP | GROUP <br> Introduce the compare fractions to $\frac{1}{2}$ strategy. |
| Objectives <br> - Compare fractions to $\frac{1}{2}$. <br> - Identify fractions equivalent to $\frac{1}{2}$. <br> - Communicate ideas with key math vocabulary: numerator, common numerator, denominator, unit fraction, equivalent, and common denominator. | (1) Introduce the lesson. Today you will learn a new strategy for the Comparing Fractions Toolkit. It's called the compare fractions to $\frac{1}{2}$ strategy. to $\frac{1}{2}$ strategy. <br> (2) Present two fractions to compare. | (3) Relate the problem to the Comparing Fractions Toolkit. <br> Refer to the Comparing Fractions Toolkit and read Strategy 1: compare unit fractions. I don't think this strategy helps. Why not? ( $\frac{4}{8}$ and $\frac{4}{16}$ are not unit fractions) |  | (1) Explain the new strategy. <br> PHere's a new strategy to try. It is called comparing fractions to $\frac{1}{2}$. Which of the two fractions we are comparing is equivalent to $\frac{1}{2} ?\left(\frac{4}{8}\right)$ Have students think, pair, share to explain why $\frac{4}{8}=\frac{1}{2} \cdot\left(4\right.$ is half of 8 , so $\frac{4}{8}=\frac{1}{2}$ ) |  |
| Materials <br> - WorkSpace pages 1 and 27 <br> T $=$ Teacher Bag <br> - fraction strips <br> - magnetic fraction strips $T$ <br> Comparing Fractions Toolkit chart | Write $\frac{4}{8}$ and $\frac{4}{16}$ on board. <br> Have students read each fraction aloud. Display magnetic fraction strips. | I think this strategy helps. Why? ( $\frac{4}{8}$ and $\frac{4}{16}$ have the same numerator) <br> Read Strategy 3: compare fractions with |  | Have students think, pair, share to explain why. Have students think, pair,$\left(\frac{8}{16}=\frac{1}{2}\right.$ and $\frac{4}{16}$ is less than $\left.\frac{8}{16}\right)$$\qquad$ know that $\frac{4}{8}$ is greater than $\frac{4}{16}$. |  |
| Language Development | $\frac{4}{8} \quad \frac{4}{16}$Compare these two fractions. Use your fraction pieces and talk with your partner. Give students time to confer.Let's say aloud which fraction is greater. $\left(\frac{4}{8}\right)$ Let's say aloud which fraction is less. (4, 1 ) Write > between the fractions. Point at the board and have students read aloud with you: $\frac{4}{8}$ is greater than $\frac{4}{16}$.$\frac{4}{8}>\frac{4}{16}$1    <br> $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ <br> $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ | SUPPORTING INSTRUCTION A new element is now added to the procedure focomparing fractions. For each pair of fractions, students refer to the strategies they've learned to see if any of them prove useful. They practice this procedure from now on when comparing fractions and learn that sometimes more than one strategywill apply. For example, for $\frac{4}{4}$ and $\frac{4}{4}$, both Strategy 2 and Strategy 5 can be used to establish that $\frac{4}{8}>\frac{4}{16}$. |  | Strategy 3: compare fractions with common denominators $\frac{1}{4}<\frac{2}{4}$ <br> Strategy 4: compare fractions that are one unit fraction from 1 whole $\frac{7}{8}>\frac{5}{6} \quad \frac{2}{3}<\frac{5}{4}$ <br> Strategy 5: compare fractions to $\frac{1}{2}$ $\frac{4}{8}>\frac{4}{16}$ |  |
| 76 Compare Fractions to One-Half |  |  |  | $\text { Lesson } 16$ |  |

## Lesson Summary <br> Students learn a new strategy for the

 Comparing Fractions Toolkit-compareObjectives

- Compare fractions to $\frac{1}{2}$.
- Identify fractions equivalent to $\frac{1}{2}$.
vocabulary: numerator, common numerator
denominator, unit fraction, equivalent, and common denominator.


## WorkSpace pages 1 and $27 \quad$ T $=$ Teacher Bag <br> fraction strips <br> - Comparing Fractions Toolkit char <br> Nevage <br> eneush common denominator common numera denominator <br> merator <br> Academic Vocabulary <br> ENGLISH $\quad$ SPANISH <br> eater than <br> Cognates are shown in intaics; pointing out the similarity <br> Sthese worrst to their Engish equivalants will hel

ompare Fractions to One-Half

Relate the problem to the Comparing Fractions Toolkit
Refer to the Comparing Fractions Toolkit and read fraction

Read Strategy 2: compare fractions with I think this strategy helps. Why? ( $\frac{4}{8}$ and $\frac{4}{16}$ have Ithe same numerator) Read Strategy 3: compar
common denominators.
I don't think this strategy helps. Why not?
(4 $\frac{4}{8}$ and $\frac{4}{15}$ do not have thy same denominator)
Read Strategy 4: compare froctions that are unit fraction from 1 whole.

I don't think this strategy helps. Why not? (both
fractions are much less than a whole; also neither fractions is a unit fraction away from 1 whole)
fraction Just one of the strategies-Strategy 2-helps us that can help us compare these two fractions.

## SUPPORTING INSTRUCTION

A new element is now added to the procedure for
students refer to the stracesics they've lemed to see if any of them prove useful. They practice this procedure from now on when comparing fractions will learn that sometimes more than one strategy will apply. For example, for $\frac{4}{8}$ and $\frac{4}{16}$, both Strategy 2
and Strategy 5 can be used to estabbish that $\frac{4}{8}>\frac{4}{45}$.

(1) Introduce the lesson.

Today you will learna new strategy for the Comparing
Fractions Toolkit. It's called the compare fractions to $\frac{1}{2}$ strategy.

Here are two fractions to compare.
Write $\frac{4}{8}$ and $\frac{4}{16}$ on board.
Have students read each fraction aloud.

## $\frac{1}{16}$

Compare these two fractions. Use your fraction pieces Give students time to confer.
Let's say aloud which fraction is greater. (敦)

Write > between the fractions. Point at the board and have ud why. $\frac{8}{8}$ is greater than


## LESSON 16 Using a new Comparing Fractions Toolkit strategy

Ninif whole group
GTEP Guide students to use
the Comparing Fractions Toolkit．
（1）Present two fractions to compare． We can also use this new strategy when neither We can also use this new strategy when neither
fraction is equivalent to one－half．Here are two fraction is equiva
other fractions．
Write $\frac{5}{12}$ and $\frac{3}{4}$ on the board．
Call on students to read each fraction aloud．
Compare these fractions．Use your fraction pieces and talk with your partner．
Give students time to confer
Let＇s say aloud which fraction is greater．（3）
Let＇s say aloud which fraction is less．（ $\left(\frac{5}{8}\right)$
Display magnetic fraction strips．Write $<$ between Display magnetic fraction strips．Write $<$ betwe
the fractions．Point to the board and have
students read aloud with you：$\frac{5}{12}$ is less than $\frac{3}{4}$ ．噱

（2）Use the Comparing Fractions Toolkit strategies to compare the fractions． Let＇s see if we can use our Comparing Fractions
Toolkit strategies to reason． Tookkit strategies to reason． Follow the same process used in Step 1．Go
through the first four strategies to see if any can through the first four strategies to see if any can
be used to compare $\frac{5}{\frac{5}{12}}$ and $\frac{3}{4}$ ．For each，have a student read the strategy，and then have students think，pair，share about why it is or isn＇t useful．

Here are possible answers for each Strategy 1：No，$\frac{5}{12}$ and $\frac{3}{4}$ are not unit fractions． Strategy 2：No，$\frac{5}{12}$ and $\frac{3}{4}$ don＇t have the same numerators．
Strategy 3：No，$\frac{5}{12}$ and $\frac{3}{4}$ don＇t have the same denominators．
Strategy $4:$ No，$\frac{3}{4}$ is a is a
1 whole，but fraction $\left(\frac{1}{4}\right)$ away from 1 whole，but $\frac{5}{12}$ is not．
Let＇s try Strategy 5：compare fractions to $\frac{1}{2}$ ． I know that $\frac{5}{1}$ is less than $\frac{1}{2}$ ．Why？（ $\frac{6}{12}$ is equal to $\frac{1}{2}$
and and $\frac{5}{12}$ is less than $\frac{6}{12}$ ）
And I know that $\frac{3}{4}$ is greater than $\frac{1}{2}$ ．Why？（2 is
equal to $\frac{1}{2}$ and $\frac{3}{4} \frac{1}{4}$ greater than
$\frac{5}{12}$ is less than $\frac{1}{2}$ and $\frac{3}{4}$ is greater than $\frac{1}{2}$ ，so $\frac{5}{12}$ is
less than $\frac{3}{4}$ ． less than $\frac{3}{4}$
Strategy 5 works for two situations．It works when you are comparing two fractions with one greater than $\frac{1}{2}$ and the other less than $\frac{1}{2}$ ．It also
works when one of the fractions is equal to $\frac{1}{2}$ and the other is less than or greater than $\frac{1}{2}$ ．

7 Compare Fractions to One－Hals

9⿵冂䒑 whole group
Guide students to use the Comparing Fractions Toolkit．
（1）Present two fractions to compare． Here are two more fractions to compare． Write $\frac{5}{12}$ and $\frac{5}{8}$ on the board．

## $\frac{5}{12} \quad \frac{5}{8}$

（2）Show that two strategies can be used to compare the fractions．
Explain how to use Strategy 5 to compare these $t w o$ fractions．
Have students think，pair，share．Choose a student to explain．（5 is less than $\frac{1}{2}$ and $\frac{5}{8}$ is greater than $\frac{1}{2}$ ， so $\frac{5}{21}<\frac{5}{8}$ ）
I can also compare these fractions using
Strategy 2. Explain how I can use that strate stratgy 2．tum how can use that strategy． Have students to explain．（They have a
is less than $\frac{1}{8}$, so $\left.\frac{5}{12}<\frac{5}{8}\right)$
When you compare fractions，sometimes you can use more than one strategy to decide which is greater or less．
SUPPORTING INSTRUCTION
The fractions chosen for these introductory The fractions chosen for these intoductory
examples are fractions that students can verify using their fraction pieces．In later lessons，students will also apply the compare fractions to $\frac{1}{2}$ strat to fractions that are not in the fraction pieces．

## If indiviouals

## Students use the Comparing Fractions

 Toolkit strategies．（1）Students complete WorkSpace page 27.
page 27.
Explain the directions to the Workspace Explain the directions to the Workspace pase


## Lesson Summary

Students demonstrate understanding of the
objectives of Lessons 16 -19 by completing WorkSpace pages independently.

## Objectives

- Compare fractions using benchmarks, common numerators, common denominators, and fractions one unit fraction from 1 whole.

Communicate ideas with key math vocabulary: numerator, denominator, and common denominator

Materials
WorkSpace pages 1, 32, 33, 49 (5) $=$ Student Bag

- connecting cubes ©
- iraction strips
- red and blue fractions


## Language Development

Key Math Vocabulary
Encush
numerator
Academic Vocabulary
еляиян
about
exactly
compare
greater than
ess than strategy Cognates are shown in tialics: pointing out the similarity Sthese wordst to their Engisis equivalents will hel


Compare Fractions to One-Half

| Last Lesson Students compare fractions to $\frac{1}{2}$ in real-world situations. | $\begin{aligned} & \text { Lesson 20) Students demonstrate } \\ & \text { understanding of the objectives of } \\ & \text { Lessons 16-19. } \end{aligned}$ | Next Lesson Students learn the sixth strategy for the Comparing Fractions Toolkit-change fractions to equivalent tractions. |
| :---: | :---: | :---: |

## Pindividuals

$\square$ Students complete an assessment.
(1) Students complete WorkSpace pages 32 and 33
Explain the directions to the WorkSpace pages, and tell students that they may use connecting cubes and fraction pieces as they work on the assessment. Have students complete the pages independently.


(2) Students play Uncover or Roll Five. As students finish the assessment, they can play either of the games. If they choose to play Roll Five, have them record their equations on one
the recording pages that start on Workspace page 49.

$\qquad$ Use the annotated pages to correct WorkSpace pages
32 and 33 . 32 and 33 .


Note the progress of each student in the appropriate rows on the tracking chart on page 147.

Compare Fractions to One-Har

## Show What You Know

$$
\begin{array}{|l|}
\hline \text { DIRECTIONS } \\
\hline
\end{array}
$$

Fractions B: Equivalence and Comparison Reduced Teacher Guide, page 94
> Write the fraction
> Decide if the fraction is greater than, equal to, or less than $\frac{1}{2}$.
$>$ Write the comparison using one of the symbols $>,=$, or $<$.


Work one-on-one with the student, using blue and yellow
connecting cubes. Have the student make several trains that connecting cubes. Have the student make several trains that
are $\frac{1}{2}$ blue and $\frac{1}{2}$ yellow. Choose one of the trains, and ask are $\frac{1}{2}$ blue and $\frac{1}{2}$ yellow. Choose one of the trains, and ask
the student to make several trains of the same length that are not $\frac{1}{2}$ blue and $\frac{1}{2}$ yellow. Work with the student to record several comparisons that compare the fractions represented several comparisisns by those trains to $\frac{1}{2}$.
For Students Ready for a Challenge

- Provide a student who needs a challenge a spimner with the numbers $11,2,2,3,4,8$, ands 6 (tind onge in the reproducible
section of the Teacherspaceal $C D$-ROM). Have the student section of the TeacherSpace ${ }^{\text {m }}$ CD-ROM). Have the
draw several fraction bars on a sheet of paper. Then have the student spin the spinner two times for each fraction bar. The first spin is the denominator and the second is the numerator
The student scores one point for any fraction that is less
than $\frac{1}{2}$ two points for any fraction that is equal to than $\frac{1}{2}$, two points for any fraction that is equal to $\frac{1}{2}$, and zero than $\frac{1}{2}$, two points for any fraction that is equal
points for any fraction that is greater than $\frac{1}{2}$.

| $\frac{\mathbf{2}}{\mathbf{1 6}}$ | $\frac{\mathbf{4}}{\mathbf{8}}$ | $\frac{\mathbf{4}}{\mathbf{3}}$ |
| :---: | :---: | :---: |
| This score so far is $1+2+0=3$ points. |  |  |

Differentiating Instruction Although the lessons are carefully scaffolded and paced at a rate more likely to give students a chance
for optimal learning, there will be instances when for optimal tearning, there witl ei instances when
some students are still struggling and need extra support. Likewise, there will be instances when some students would benefit from additional challenges or practice. Try the teaching ideas below.
For Students Who Need More Support
(32) Lesson 20 Home Note: Your child deternines fractional parts

