Lesson Plans: Fifth-Grade Fractions
KIPP DC Key Academy, Washington, D.C.

**Topic:** National Math Panel: Critical Foundations for Algebra

**Practice:** Mathematics Preparation for Algebra

The KIPP lesson plan approach is illustrated in these two examples from grade 5. The first lesson is about identifying fractions on a number line; the second lesson is about writing equivalent fractions.

In each case, the teacher’s key questions to students and student worksheets are included.
<table>
<thead>
<tr>
<th>5th Math Lesson Plan</th>
<th>MIXED NUMBERS ON NUMBER LINE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agenda</strong></td>
<td></td>
</tr>
<tr>
<td>• Do Now</td>
<td>We will be able to name locations on a number line as fractions or mixed numbers by shading and counting the spaces.</td>
</tr>
<tr>
<td>• HW Check</td>
<td>5 min—timer</td>
</tr>
<tr>
<td>• Part of a whole...on a line?</td>
<td>Review as a class</td>
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<tr>
<td></td>
<td>Check PS 37, Assign PS 38</td>
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<tr>
<td></td>
<td>Pass out sheets—CAN YOU Split this up? So can you split this up? HOW?</td>
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<tr>
<td></td>
<td>We’ve got it...now who can tell me what this is a picture of? Show picture of number line marked with arrow pointing to ¼ on the overhead. Well, how many total parts are there? And how many are shaded? (shade the spaces up until the arrow) 1! SO, this is a picture of what fraction? ¼.</td>
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<tr>
<td></td>
<td>It turns out fractions can be shown on number lines as well. We’re going to practice reading fractions on a number line now.</td>
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<tr>
<td></td>
<td>Pass notes out to students—they shade in ¼ and ¼.</td>
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<td></td>
<td>Try 4 examples together on front.</td>
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<tr>
<td></td>
<td>Fill in notes:</td>
</tr>
<tr>
<td></td>
<td>Write the last <strong>whole number</strong> that the arrow has passed</td>
</tr>
<tr>
<td></td>
<td>Count the <strong>total</strong> number of spaces between whole numbers. This is the <strong>denominator</strong></td>
</tr>
<tr>
<td></td>
<td>Count how many <strong>spaces</strong> past the <strong>whole number</strong> the arrow is pointing. Ths is the numerator.</td>
</tr>
<tr>
<td>• Show Off! (8 min)</td>
<td>Students try three—partner check as they go.</td>
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<tr>
<td></td>
<td>On back of Do Now, students solve 4 number line problems. Turn in for assessment</td>
</tr>
</tbody>
</table>
FRACTIONS are PARTS of a whole!

Split this square into 4 equal parts:

Can you split the space in between 0 and 1 into 4 equal parts?

Split this square into 3 equal parts:

Can you split the space in between 0 and 1 into 3 equal parts?

Can you shade in \( \frac{3}{4} \) squares?

Can you point to where \( \frac{3}{4} \) would be on the number line?

Where is the arrow pointing?

Where is the arrow pointing?
AIM: ____________________________________________________________

Steps:
1. Write the last _whole number_ that the arrow passed.
2. Shade the _total spaces_ between whole numbers on the BOTTOM. This is the _denominator_.
3. Shade how many _spaces_ past the _whole number_ the arrow is pointing on top. This is the _numerator_.

Ex 1: Where is the arrow pointing?

![Diagram of Ex 1]

Ex 2: Where is the arrow pointing?

![Diagram of Ex 2]

Ex 3: Where is the arrow pointing?

![Diagram of Ex 3]

Ex 4: Where is the arrow pointing?

![Diagram of Ex 4]
Do Now!!

1) $5.28 + 6 =

2) There are 240 students in the gym. \(\frac{1}{3}\) of them are fifth graders. How many students are fifth graders?

3) ESTIMATE how many degrees this angle measures:

[Diagram]

Why do you think so?

4) Write the factors of 28:
<table>
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<th><strong>5th Math Lesson Plan</strong></th>
<th><strong>WRITING EQUIVALENT FRACTIONS</strong></th>
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<tbody>
<tr>
<td><strong>Aim</strong></td>
<td>We will be able to find equivalent fractions by multiplying by a magic 1!</td>
</tr>
<tr>
<td><strong>Agenda</strong></td>
<td>Check MS L PS, Assign MS L PS</td>
</tr>
</tbody>
</table>
| • Do Now! (5 min + 4 min) | - Notes—Shade in one third, Then shade in an equal amount of sixths.  
                            - Shade in an equal amount of ninths  
                            - Shade in an equal amount of twelfths  
                            - So, I know 1/3 = 2/6, 1/3 = 3/9, and 1/3 = 4/12  
                              They’re the same amount. They are EQUAL!  
                            - There must be another way to do this tough, without drawing pictures.  
                              Here’s a brain teaser for you… |
| • HW Check (6 min)      | If I multiply a number by _____, my answer equals the number I started with.  
                            - What goes in the blank?  
                              Do a few examples. 5 x 1, 11 x 1, 420,938 x 1  
                              Okay, so if I multiply 1/3 x 1…I still get 1/3. I didn’t get 2/6  
                            - HOW CAN I GET 2/6?  
                              I can’t add to make an equal number, the only thing I can do is multiply by 1!  
                              (If no one picks up that we could use a magic one, drop hints about it)  
                            - Right, I could multiply by a fraction that equals 1 couldn’t I? Couldn’t I multiply by a magic one?  
                              What happens if I multiply 1/3 x 2/2? Students do on their paper I get 2/6!  
                              What happens if I multiply 1/3 x 3/3? I get 3/9!  
                              1/3 x 4/4? I get 4/12! SO, I can multiply a fraction by a Magic One, and I will get a fraction that is equal to it!  
                              Test it! |
| • How else can I make this picture? | Let’s write this down  
                            Making Equivalent Fractions  
                            When you multiply by one, the size of the number stays the same.  
                            ex: 5 x 1 = 5 or 1/3 x 1 = 1/3  
                            If you multiply by a fraction that equals ONE, the size of the number stays the same, but it gets a different name.  
                            ex: 1/2 x 2/2 = 2/4 |
| • Brain Teaser          | On back of Do Now |
| • Equivalent Fraction Notes | |
| • Show Off!            | |
AIM:

\[
\frac{1}{3} = \frac{2}{6} \quad \frac{1}{3} = \frac{3}{9} \quad \frac{1}{3} = \frac{4}{12}
\]

Why does this work???

\[
4 \times 1 = \quad 5 \times 1 = \quad 11 \times 1 = \quad 13 \times 1 =
\]

When I multiply any number by ___________, my answer equals ____________.

When I multiply any fraction by a ___________ __________, my answer still equals the original fraction!

PROVE IT!!

\[
\frac{1}{2} \times \underline{x} = \quad \frac{1}{4} \times \underline{x} =
\]

Write 3 different fractions equivalent to \(\frac{2}{3}\):

\[
\frac{2}{3} \times \underline{x} = \quad \frac{2}{3} \times \underline{x} = \quad \frac{2}{3} \times \underline{x} =
\]
Write a fraction equal to $\frac{2}{3}$ that has a denominator of 12:

$$\frac{2}{3} \times \frac{x}{12}$$

Write a fraction equal to $\frac{1}{4}$ that has a denominator of 16:

$$\frac{1}{4} \times \frac{x}{16}$$

Try these:

A) \( \frac{3}{4} \times \frac{x}{12} = \frac{9}{12} \)

B) \( \frac{2}{3} \times \frac{x}{6} = \frac{4}{6} \)

C) \( \frac{2}{5} \times \frac{x}{10} = \frac{10}{10} \)

D) \( \frac{1}{2} \times \frac{x}{20} = \frac{20}{20} \)

Write a fraction equal to $\frac{1}{4}$ that has a denominator of 12:

Write a fraction equal to $\frac{2}{5}$ that has a denominator of 10:

Write a fraction equal to $\frac{3}{8}$ that has a denominator of 24: