What to bring to class:
Ask students to bring PM 4A and 5A.

6.1 Fraction Basics

Fractions are used when there is a standard unit, but we want to measure using another (usually) smaller unit called the fractional unit

$\frac{3}{4}$ mile

numerator = # of fractional units; it is used to count.

denominator describes the fractional unit; it equals the # of fractional units in the standard one.

Ex 4 laps around a track = 1 mile.

std unit: mile

fractional unit: lap = $\frac{1}{4}$ mile

$\frac{3}{4}$ miles = 3 laps.

Notes

(1) Fractional unit usually does not have its own name (like "lap" above):

[SAY: It is defined by the denominator.]

(2) Must always know the std. unit. ("I have $\frac{3}{4}$ water," does not make sense.)

This notation is confusing. Common Errors:

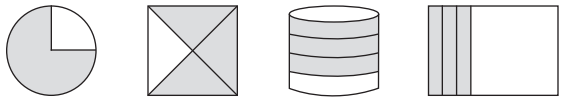
- Thinking of $\frac{3}{4}$ as 2 numbers, not 1.
- Thinking larger denominator means larger #.

$(\frac{1}{5} \times \frac{1}{3})$.

Teaching Sequence [SAY: Done carefully to avoid misconceptions above] :

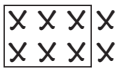
I. (Grade 2B) Fractions are introduced informally in grades 1 – 2 using "one-half", "3 quarters" and

Area Models:



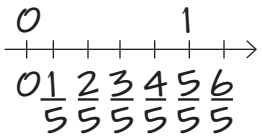
Not 3/4's!

Measurement Models:

Set models (not so good) 

[Have class look at pages 2B pg 52–57 in Handout (from Sing 2B).]

II. (Grade 3B) Notation with

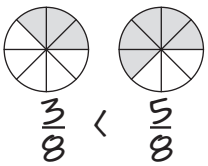
·Counting 

etc.

·Comparison. Easy when

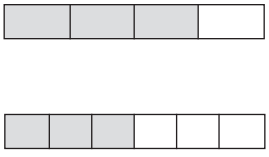
denominators same:

-or-



numerators same:

(Prepares students for $\frac{3}{x^2} > \frac{3}{x^2+3}$)



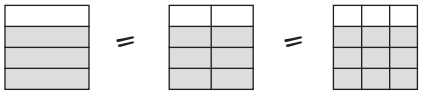
(same # of smaller units)

Prim Math 3B
pg 51-53
[Look at Handout pages pg 54-56]

III. (Grade 3B) Renaming fractions. Fractions can be represented in many equivalent ways (numerals).

(a) Fraction strips – [see pages 57-58 of Hand out]

(b) Subdivide areas



$\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \cdots\cdots$

$\frac{3}{4} \xrightarrow{\times 2} \frac{6}{8}$ illustrates

[Handout, pages 38, pg 59.]

Fraction Rule 1: $\frac{a}{b} = \frac{an}{bn}$ for any whole # $n > 0$.

(c) Transition From picture $\Rightarrow$ abstract

$\frac{3}{5} = \frac{\square}{10}$; $\frac{2}{3} = \frac{8}{\square}$

IV. (Grade 4A) Simple adding and subtracting.

(a) Same denomination: [see Handout pg 42-43] P.M. 4A

2 fifths + 2 fifths = 4 fifths

3 sevenths + 2 sevenths = 5 sevenths

General Principle:

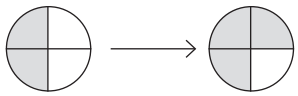
"Once you have the same fractional unit addition is the same as before."

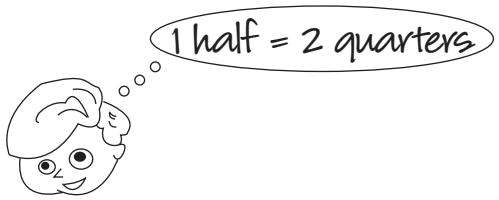
Fraction Rule 2: $\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$

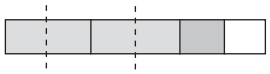
(b) Closely related denominators:

count using smallest fractional unit.

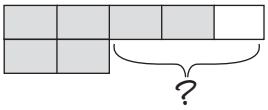
(i) $\frac{1}{2}+\frac{1}{4}=\frac{2}{4}+\frac{1}{4}=\frac{3}{4}$



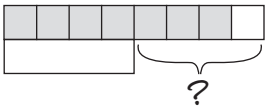


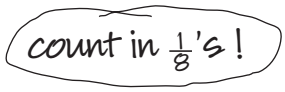
(ii) $\frac{2}{3}+\frac{1}{6}=$ 

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

(iii) $\frac{4}{5}-\frac{2}{5}$ 

Comparison model.

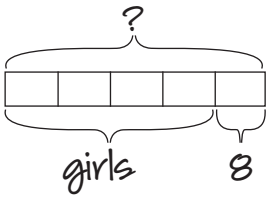
(iv) $\frac{7}{8}-\frac{1}{2}$ 



$=\frac{7}{8}-\frac{\square}{8}=\frac{\square}{8}$

V. Word problems.

$\frac{4}{5}$ of children in a choir are girls. If 8 are boys, how many children are there altogether?



1 unit = 8

5 units = 40

There were 40 children.

Note that 1 unit = $\frac{1}{5}$ of the class.

Standard unit

fractional unit

HW Read § 6.1 very carefully. [Fractions are generally a weak point for prospective teachers.]

Do HW set 24.

Bring 4A & 5A to class