

Estimation. What's it "about"?

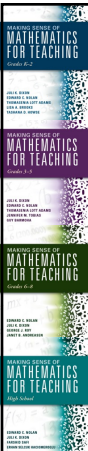
Juli K. Dixon, Ph.D.

JuliDixonMath@gmail.com



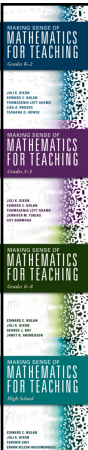
Handout:
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What words come to mind when you think about estimation?

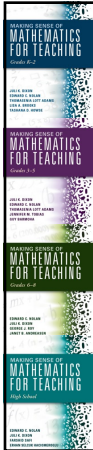
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Session Goals

- Discuss perceptions related to estimation.
- Engage in tasks that are enhanced by estimation.
- Connect estimation to conceptual understanding.

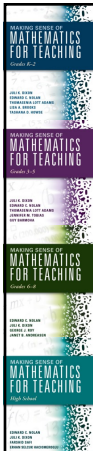
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Estimate the following:

$$5 \times 23$$

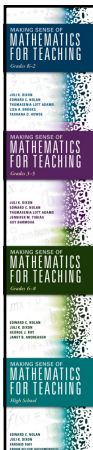
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Estimate the following:

$$157 + 624$$

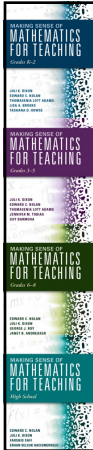
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Estimate the following:

$$624 - 157$$

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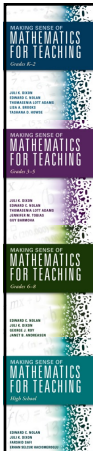


Estimate the following:

$$624 - 157$$

Did you use the same values as you did in the last problem?

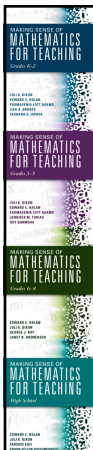
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With what do we estimate?

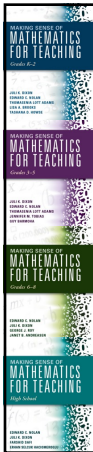
- Quantities
- Computation
- Whole Numbers
- Decimals
- Fractions
- Measurement
- Time
- Length
- Area
- Volume

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Estimating Quantities

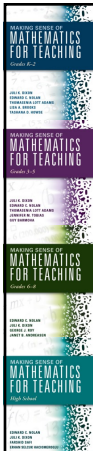
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How many buttons?



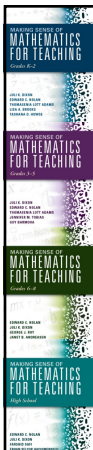
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How many buttons?



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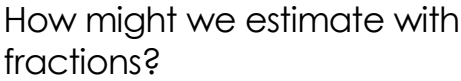


How many buttons?



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About how much melon?



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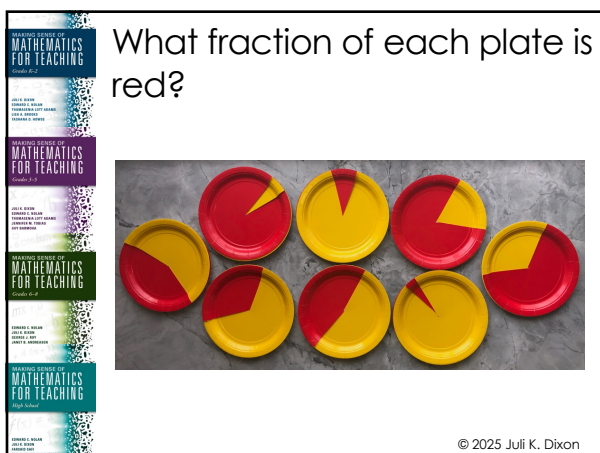
High School

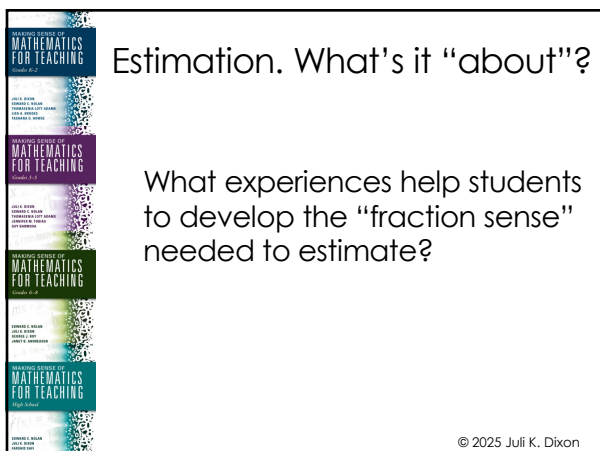
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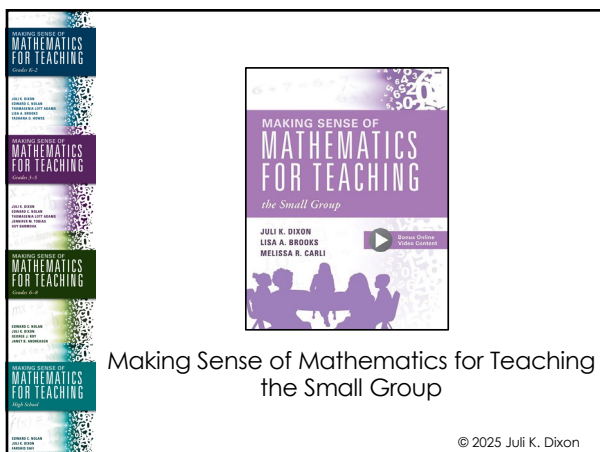
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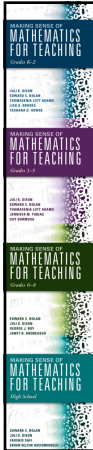


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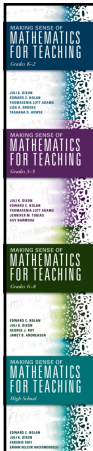


Estimation. What's it "about"?

How do we extend early understandings of fractions?

Consider comparing fractions.

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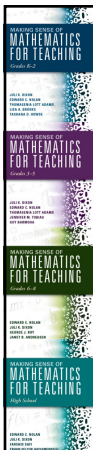


Estimation. What's it "about"?

Why do we compare fractions?

We compare fractions to develop a foundational understanding of the magnitude of fractions (if we do it right).

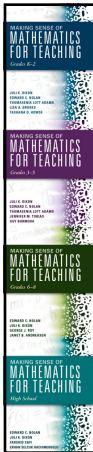
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Estimation. What's it "about"?

Compare $\frac{4}{7}$ and $\frac{4}{5}$

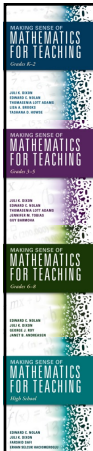
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Estimation. What's it "about"?

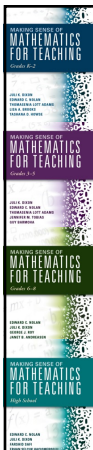
Compare $\frac{3}{5}$ and $\frac{4}{9}$.

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Estimating Computations

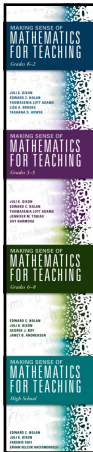
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Estimate the following:

$$\frac{1}{2} + \frac{2}{5}$$

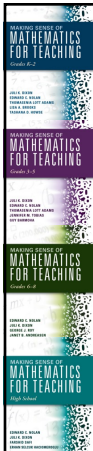
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Estimate the following:

$$\frac{2}{7} + \frac{3}{11}$$

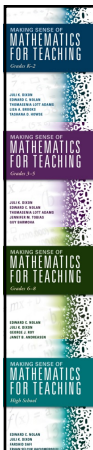
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Estimate the following:

$$3\frac{4}{5} + 1\frac{1}{3}$$

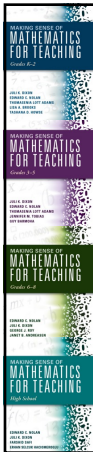
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Estimate the following:

$$1\frac{7}{8} - \frac{1}{2}$$

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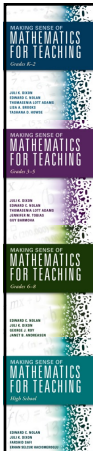


Estimation. What's it "about"?

How did that feel?

And how can we make it
feel better?

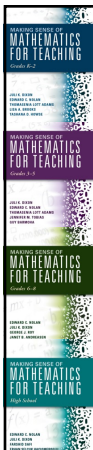
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We need to focus on:

- Developing general understanding of fractions.
- Estimating fractions by using "friendly" fractions.
- Connecting whole number operations to operations with fractions through context.

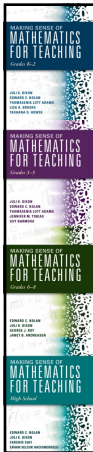
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Estimation. What's it "about"?

Consider $\frac{3}{5} \times \frac{7}{8}$.

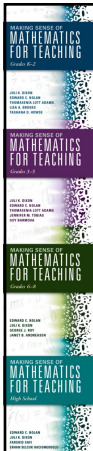
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Estimation. What's it “about”?

Now consider 3×4 .

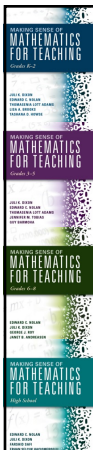
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Estimation. What's it “about”?

Now consider $\frac{3}{5} \times 4$.

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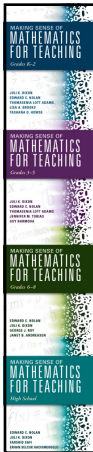


Estimation. What's it “about”?

Reconsider $\frac{3}{5} \times \frac{7}{8}$.

What does this mean? Put it in the context of cookies?

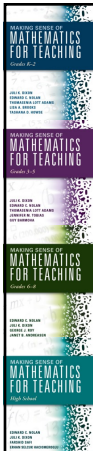
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Estimate the following:

$$1\frac{2}{3} \times \frac{3}{5}$$

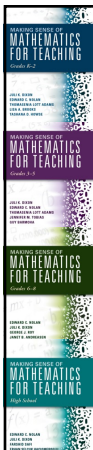
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Estimate the following:

$$\frac{7}{8} \times 9$$

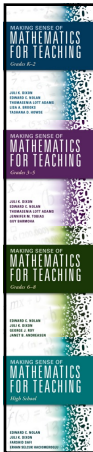
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Estimate the following:

$$5\frac{1}{4} \div \frac{8}{9}$$

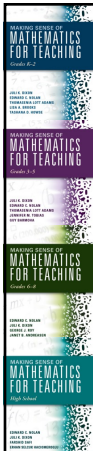
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Estimate the following:

$$\frac{5}{6} \div \frac{1}{4}$$

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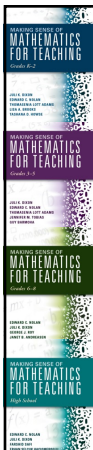


Estimation. What's it "about"?

Consider $12 \div 4$.

"I have 12 cookies. If I share them among 4 friends, how many cookies will each friend get?"

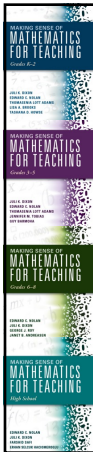
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Making Sense of Division
Problem Types

Problem Structure	Number of Groups (a)	Number of Objects in Each Group (b)	Total Number of Objects (c)
Multiplication	a	b	?
Sharing Division	a	?	c
Measurement Division	?	b	c

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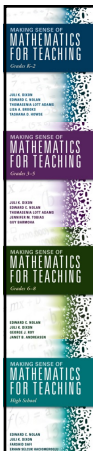


Estimation. What's it "about"?

Consider $12 \div 4$.

"I have 12 cookies. If I give 4 cookies to each friend, how many friends will get cookies?"

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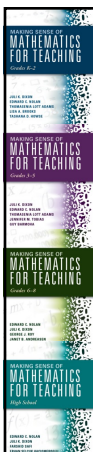


Estimate the following:

$$\frac{5}{6} \div \frac{1}{4}$$

I have $\frac{5}{6}$ of a cookie. If I give $\frac{1}{4}$ of a cookie to each friend, how many friends will get itty bitty pieces of cookie?

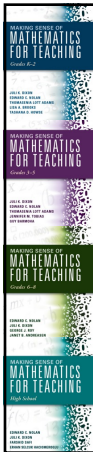
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Estimation. What's it "about"?

The problem type AND the quantities matter when making sense of fraction division problems.

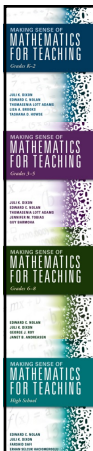
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Estimate the following:

$$\text{Consider } \frac{5}{6} \div 4$$

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Analyze this:

$$1\frac{3}{4} \div \frac{1}{2}$$

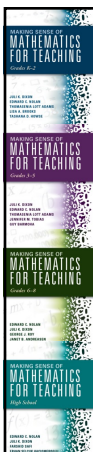
a) $\frac{7}{8}$

c) $\frac{4}{14}$

b) $3\frac{1}{4}$

d) $3\frac{1}{2}$

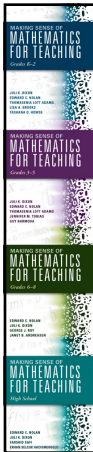
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Estimation. What's it "about"?

Estimation provides a more valuable return on the investment of time we spend on multiple choice problems.

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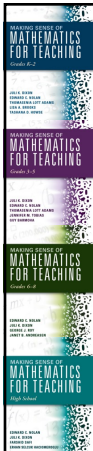


Estimate the following:

$$5 \times 23$$

- a) 100 c) 120
b) 115 d) 125

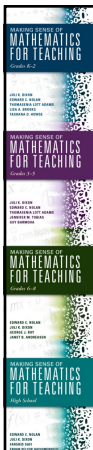
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What words come to
mind when you think
about estimation?

friendly numbers
reasonable meaning
guess

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