


**Transforming Teaching:**

**From Dissonance to Depth**

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**Intent...**

Cause dissonance (or at least provide examples that could be used to create dissonance in others).

Share authentic examples used to initiate “transforming” conversations.

Focus on topics in number such as comparing fractions and multiplying, dividing, and adding whole numbers.

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**Perspective...**

**When asked to compare  $\frac{4}{5}$  and  $\frac{2}{3}$  a student said,**

“I know that  $\frac{4}{5}$  is greater than  $\frac{2}{3}$ .”

**How would you respond?**

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**Perspective...**

**The student said,**

“I made both fractions using manipulatives. I knew that  $\frac{4}{5}$  was bigger because  $\frac{4}{5}$  has 4 pieces and  $\frac{2}{3}$  only has 2 pieces and since 4 is greater than 2 then  $\frac{4}{5}$  is greater than  $\frac{2}{3}$ .”

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**Perspective...**

Would you ask this student to compare  $\frac{22}{23}$  and  $\frac{26}{27}$ ?

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**Perspective...**

Would you ask this student to compare  $\frac{22}{23}$  and  $\frac{26}{27}$ ?

If students understand strategies for comparing fractions with depth, this problem should be appropriate for a student in grade 3.

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**Tell which fraction is greater**

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

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**Premise...**

If we provide authentic examples that cause disequilibrium...

Teachers will be more likely to adjust their practices to teach for depth.

The goal, then, is to create cognitive dissonance.

(Festinger, 1957; Zaslavsky, 2005)

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**Think about this...**

Alex and Jessica are racing their bicycles.

Alex is  $\frac{3}{7}$  of the way to the finish line and Jessica is  $\frac{2}{3}$  of the way to the finish line.

Which racer is closer to the finish line? How do you know?

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**A new perspective...**

Would you ask a student to compare  $22/23$  and  $26/27$ ?

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**A new perspective... on fluency**

What does it mean to compare fractions fluently?

What does it mean to multiply fluently?

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**What does it mean to multiply fluently?**

Multiply  $15 \times 23$ .

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Understanding vs. memorizing:  
Which should come first?

Consider  $6 \times 7$ .

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How should problems be presented?

Multiply this:

1	9	6
x		2

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How should problems be presented?

Multiply this:

1	9	6
x		2

Now multiply  $3 \times 298$ .

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Can we be too efficient?

Consider the case of long division.

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What comes to mind when you see this?

$$\begin{array}{r} 134 \\ 4 \overline{) 536} \\ \underline{-4} \phantom{0} \\ 13 \phantom{0} \\ \underline{-12} \phantom{0} \\ 16 \phantom{0} \\ \underline{-16} \\ 0 \end{array}$$

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Cognitive dissonance can be created using primary grade examples as well.

Consider basic addition facts.

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What do you see?

○	○	○	○
○	○	○	○
○	○	○	○
		○	

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What do you see?

○	○	○	○
○	○	○	○
○	○	○	

23

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What do you see?

○	○	○	
○	○	○	
○	○	○	
○	○		
○			

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Solve.

$$9 + 7 = \underline{\quad}$$

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Solve.

$$8 + \underline{\quad} = 13$$

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**Making the journey...**  
Focus on relevant content. Number should be a focus area in elementary grades (National Research Council, 2009).

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**Making the journey...**

Focus on relevant content. Number should be a focus area in elementary grades (National Research Council, 2009).

Provide examples that lull teachers into a sense of security so that they use common procedures they have used over time without thinking about connections to other concepts (Zaslavsky, 2005).

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**Making the journey...**

Focus on relevant content. Number should be a focus area in elementary grades (National Research Council, 2009).

Provide examples that lull teachers into a sense of security so that they use common procedures they have used over time without thinking about connections to other concepts (Zaslavsky, 2005).

Create cognitive dissonance by contrasting common practices with teaching for depth (Festinger, 1957).

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**Thank you**

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