Curriculum Associates®

Leadership Look Fors to Assure Student Learning

In this interactive session, we will provide templates and guidance for leaders to guide teachers and evaluate learning during classroom visits. We will provide insight into successful instructional strategies to inform teachers and allow leaders to easily evaluate effective teaching practices. In order for leaders to thrive, they need tools to provide insight into successful teaching.

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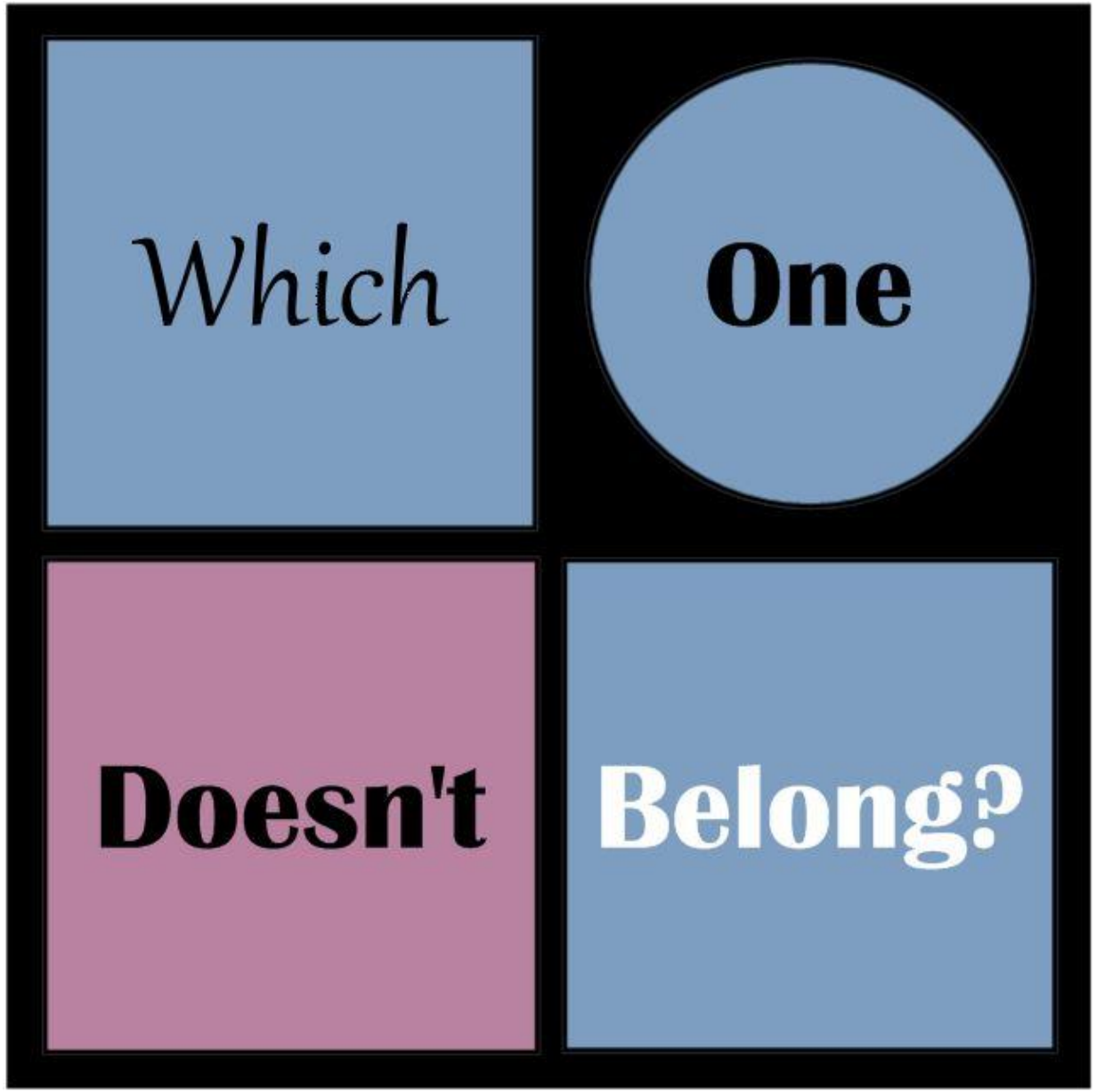

Book by
Christopher Danielson

Website that replicates the idea:
http://wodb.ca/index.html


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Try–Discuss–Connect Teaching and Learning Framework

TRY IT

Make sense of the problem.

Students solve and support their thinking.

DISCUSS IT

Students share their thinking with a partner.

Students compare their strategies.

CONNECT IT

Students make connections and reflect on what they have learned.

Students apply their thinking to a new problem.

Agenda

- Explore Try It and Resources
- Explore Discuss It & Resources
- Explore Connect It & Resources
- Debrief and Questions

Why?

Humans come pre-wired for two things:

basic mathematical understanding

basic communication

Student Engagement!

Equity!

TRY IT

DISCUSS IT

CONNECT IT

Standards for Mathematical Practice

Mathematically proficient students…

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Choose appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

NCTM Teaching Practices

Effective mathematics educators…

1. Establish mathematical goals that focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Support productive struggle in learning mathematics.
4. Elicit and use evidence of student thinking.
5. Facilitate meaningful mathematical discourse.
6. Pose purposeful questions.
7. Use and connect mathematical representations.
8. Build procedural fluency from conceptual understanding.

Anticipating

- Determine possible student solution strategies (correct and incorrect)
- Decide how student approaches relate to the learning goal
- Consider how you will respond to various student approaches

Monitoring

- Attend to what students are saying and doing
- Make note of particular strategies, representations, and ideas
- Prepare questions to assess and advance student thinking

Selecting

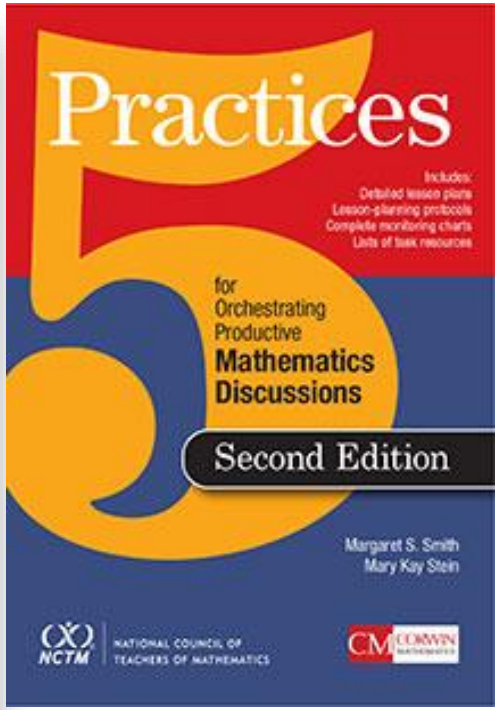
- Decide which responses to share in order for key ideas to be discussed
- Determine if additional strategies not used by students should be introduced
- Decide if a common misconception should be analyzed

Sequencing

- Determine what order will allow you to best meet the goals
- Incorrect → Correct (or vice versa)
- Successive presentation to allow for comparison

Connecting

- Help students make judgements about accuracy and efficiency
- Help students see the same mathematical ideas embedded in different strategies
- Help students analyze similarities and differences in different approaches



The sum of 1/12 and 7/8 is closest to

A. 20
B. 8
C. 1/2
D. 1

Explain your answer.

Connections

$24 \div 4 = 6$

$24 \div 2 = 12$

$24 \div 1 = 24$

$24 \div 1/2 = ??$

For Leaders

Using the Continuum to Support the Try–Discuss–Connect Instructional Framework

Leaders leverage the continuum to foster teachers' development of the Try–Discuss–Connect framework, focusing on the basics of facilitation first before developing and refining teacher practice.

Supporting Teacher Facilitation of Try It

The Try It section begins with one of four language routines that guide students in making sense of the problem, helping students slow down to recognize and understand the important information in the problem before they begin solving.

The Try It section continues as students apply what they learned in Make Sense of the Problem to represent the situation and begin solving it.

Building a Foundation	Strengthening Practice	Enhancing Practice
Teachers new to the framework use the basics to establish routines and facilitate math discourse.	Teachers build on their facilitation of the framework, engaging students in more meaningful conversations and sense making.	Teachers have found their own rhythm with facilitation of the framework and are ready to receive more individualized support.

Try–Discuss–Connect Classroom Visit Tool

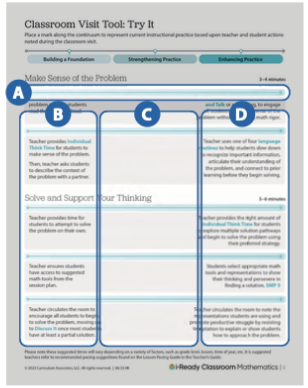
Identify an area of focus for classroom visits, including explicit teacher and student actions to look for during the visit.

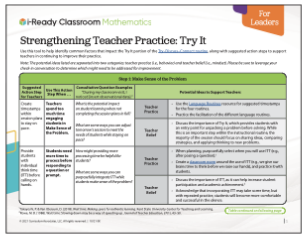
A. **Try–Discuss–Connect Continuum:** Mark where teachers fall on the continuum after each classroom visit, identify schoolwide trends, and celebrate instructional growth over time.

B. **Building a Foundation:** Identify two to three basic actions to focus on during classroom visits throughout the first six weeks of school.

C. **Data Collection and Notes:** Use the blank middle space to record teacher and student actions aligned to the focus area(s).

D. **Enhancing Practice:** As teacher facilitation of the framework is strengthened and their actions evolve, they are ready for more individualized support.





Strengthening Teacher Practice

Analyze and reflect on information gathered during classroom visits to identify collective bright spots and prioritize growth opportunities. Use this tool to help determine the best next steps and resources to strengthen teacher practice.

Try–Discuss–Connect Teaching and Learning Framework

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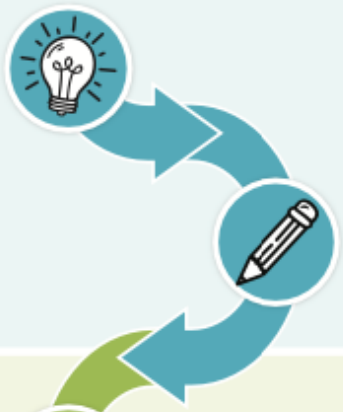
Supports for Language in the **Try-Discuss-Connect Routine**

1 Try



Language Routines
Three Reads
Co-Craft Questions
Notice and Wonder
Say It Another Way
Teacher Moves
Turn and Talk
Individual Think Time

2 Discuss

Language Routines
Compare and Connect
Collect and Display
Teacher Moves
Turn and Talk
Individual Think Time
Four Rs
Conversation Tips

3 Connect

Language Routines
Collect and Display
Compare and Connect
Teacher Moves
Turn and Talk
Individual Think Time
Four Rs
Conversation Tips

Language Routines
Three Reads
Co-Craft Questions
Notice and Wonder
Say It Another Way
Teacher Moves
Turn and Talk
Individual Think Time

TRY IT

Make sense of the problem

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is $160.

- What is the problem about?
- What questions can you ask that mathematics can answer?

PB

TRY IT

Make sense of the problem

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is $160. At which store is the guitar less expensive? How much less expensive?

- What information is important based on what you need to find?

Make Sense of the Problem

3–4 minutes

Teacher displays the **Try It** problem and has students read the problem aloud.

Teacher uses **talk moves**, such as **Turn and Talk** or rephrasing, to engage all students in making sense of the problem without reducing math rigor.

Teacher provides **Individual Think Time** for students to make sense of the problem.

Then teacher asks students to describe the context of the problem with a partner.

Teacher uses one of four **language routines** to help students slow down to recognize important information, articulate their understanding of the problem, and connect to prior learning before they begin solving.

Why is it important to spend time making sense of the problem?

From Robert Kaplinsky based on research from Kurt Reusser, 1986

TRY IT

Solve and support your thinking

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is $160. At which store is the guitar less expensive? How much less expensive?

Math Toolkit double number lines, grid paper

Solve and Support Your Thinking

5–6 minutes

Teacher provides time for students to attempt to solve the problem on their own.

Teacher provides the right amount of **Individual Think Time** for students to explore multiple solution pathways and begin to solve the problem using their preferred strategy.

Teacher ensures students have access to suggested math tools from the session plan.

Students select appropriate math tools and representations to show their thinking and persevere in finding a solution. **SMP 5**

Teacher circulates the room to encourage all students to begin to solve the problem, moving on to **Discuss It** once most students have at least a partial solution.

Teacher circulates the room to note the representations students are using and promote productive struggle by resisting temptation to explain or show students how to approach the problem.

Try–Discuss–Connect Teaching and Learning Framework

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Using the Continuum to Support the Try–Discuss–Connect Instructional Framework

Leaders leverage the continuum to foster teachers' development of the Try–Discuss–Connect framework, focusing on the basics of facilitation first before developing and refining teacher practice.

Supporting Teacher Facilitation of Discuss It

The Discuss It section begins when students work in pairs to share their thinking, analyze their strategies, and reason about the problem.

The Discuss It section continues as teachers facilitate the whole class discussion by selecting previously identified students to present and explain their strategy as the class listens to and critiques the reasoning of others.

DISCUSS IT Share your thinking with a partner

Ask: How is each percent represented in your solution?

Share: In my solution each percent is represented by . . .

Share Your Thinking with a Partner

1–2 minutes

Teacher poses and displays a sentence starter or question to support partner conversations.

Students take ownership of discourse by using established structures for sharing that promote productive and equitable conversations. **SMP 3**

Students take turns sharing their strategy with a partner and show they are actively listening during the conversation. **SMP 3**

Students explain and defend their strategy to a partner, using representations to support their thinking. **SMP 1, 2, 3, 6, 8**

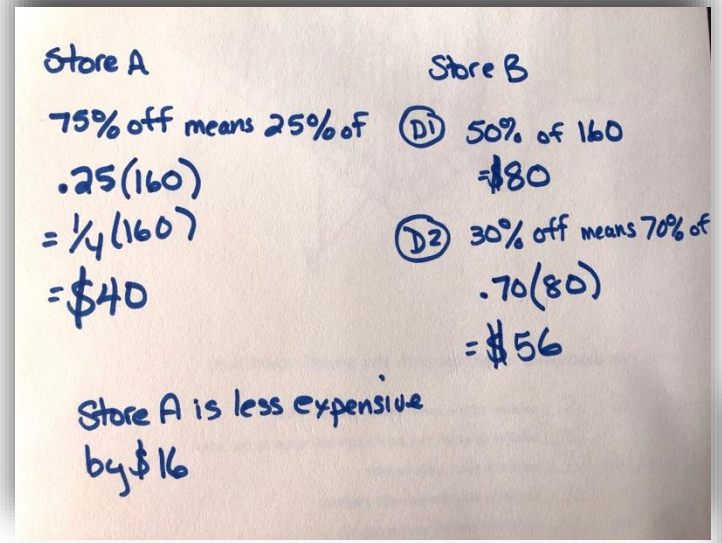
Students listen to, rephrase, and ask questions as they discuss how strategies are the same and different. **SMP 3, 6, 8**

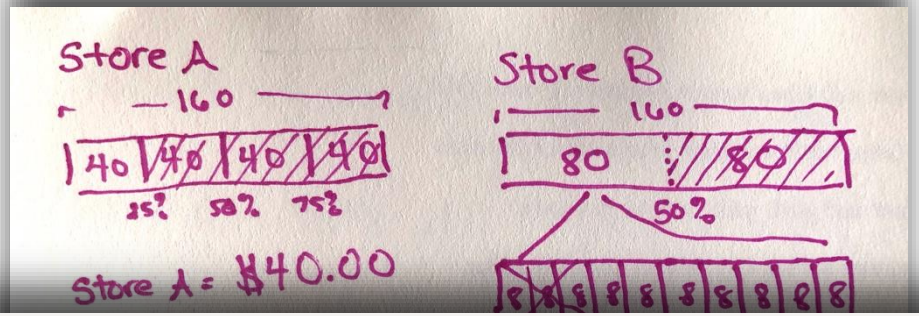
Teacher circulates the room to listen to student conversations.

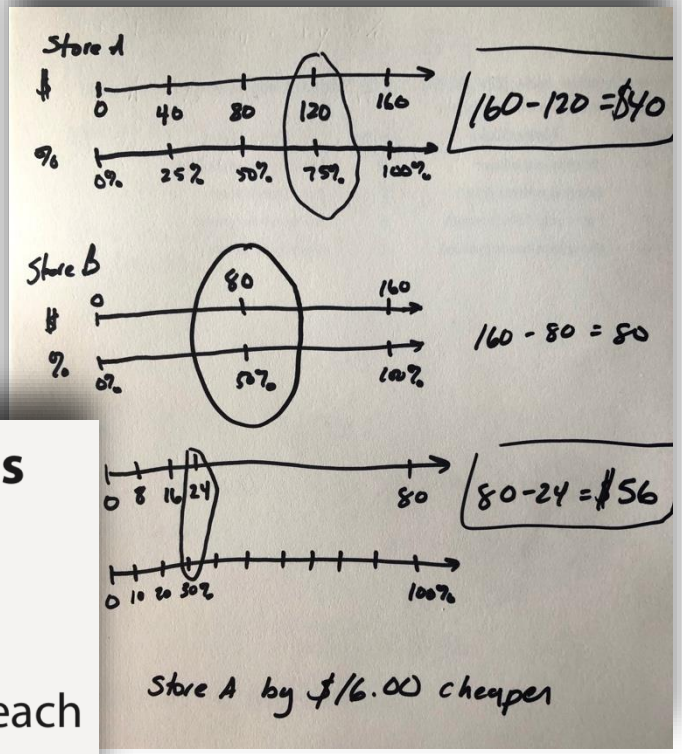
Teacher circulates to observe student work, listen to discussions, and select and sequence the strategies to discuss as a class.

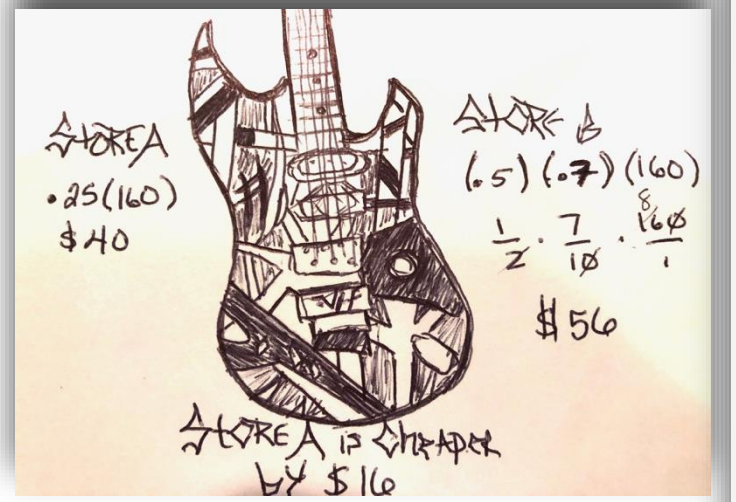
DISCUSS IT Compare class strategies

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is $160. At which store is the guitar less expensive? How much less expensive?





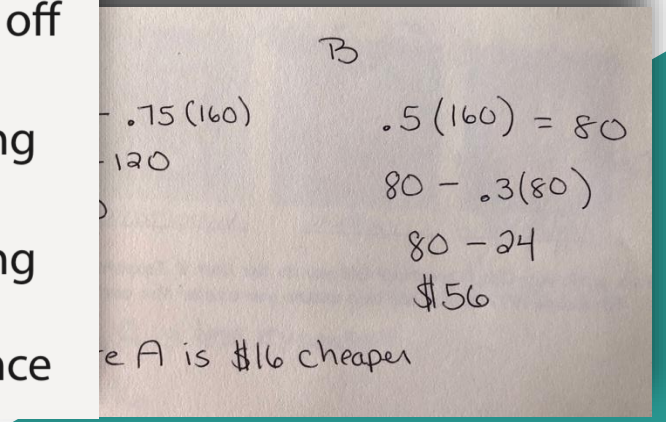




Select and Sequence Student Strategies

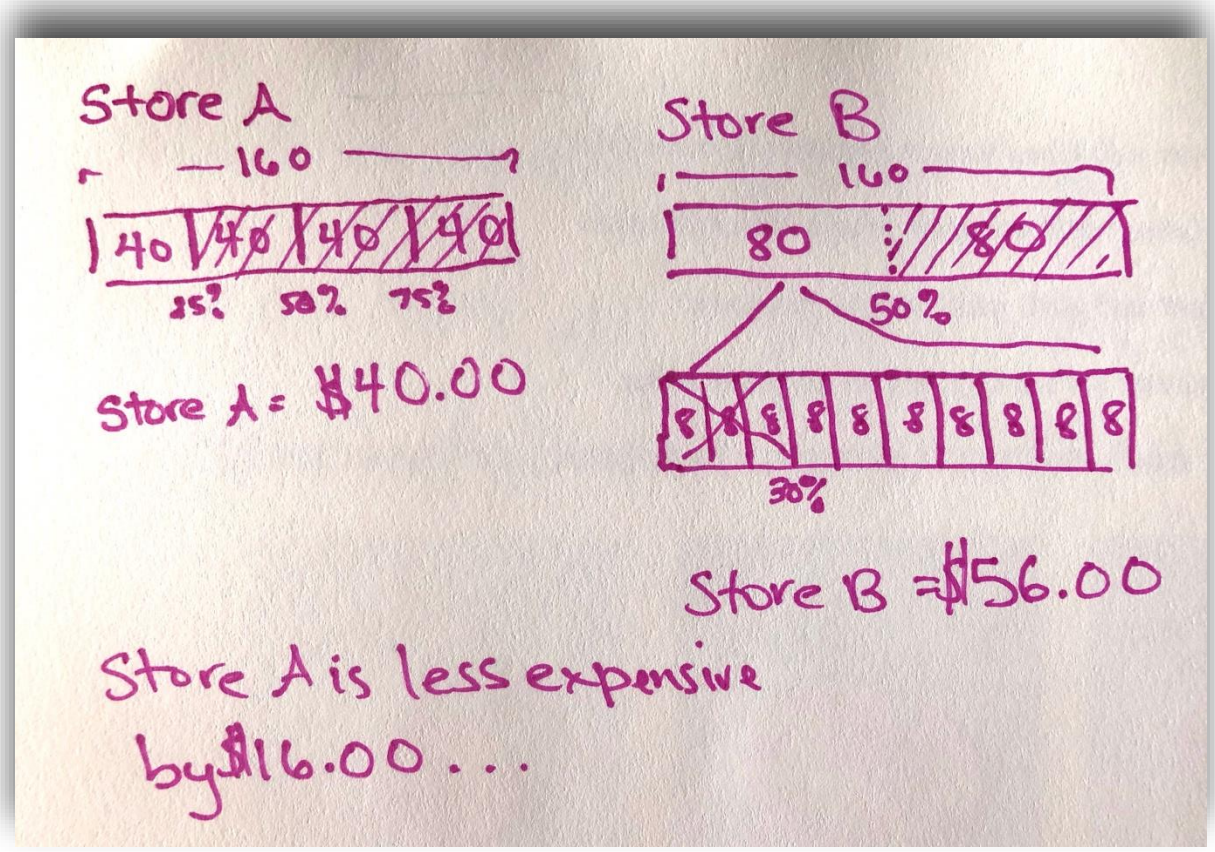
Select 2–3 samples that represent the range of student thinking in your classroom. Here is one possible order for class discussion:

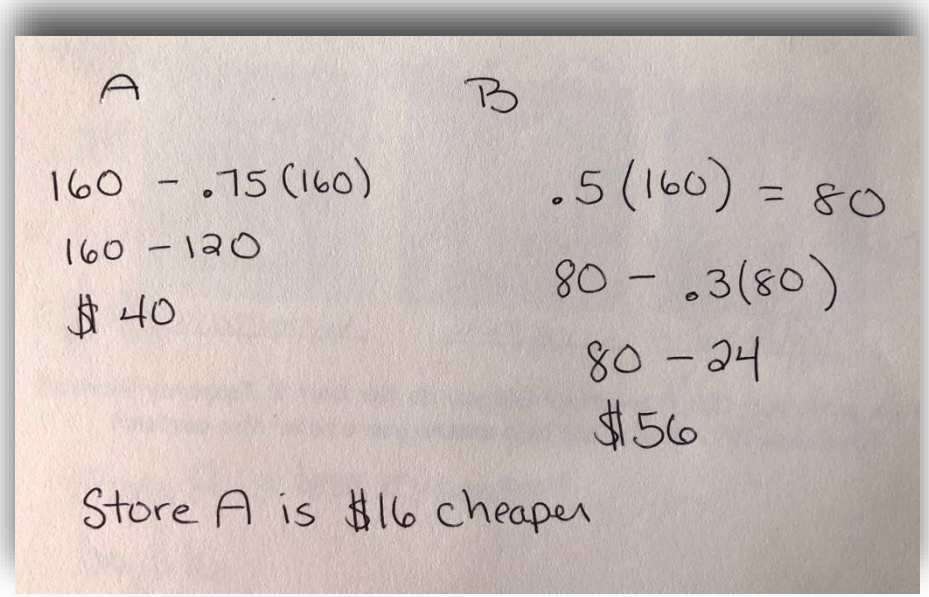
- use double number lines to find the price at each store and subtract to find the difference
- **(misconception)** add the discount percents for Store B and find the discounted price as 80% off the original price
- use equations to find each sale price, including two steps to find Store B, and then subtract
- use equations to find each sale price, including calculating multiple percents at one time for Store B, and then subtract to find the difference



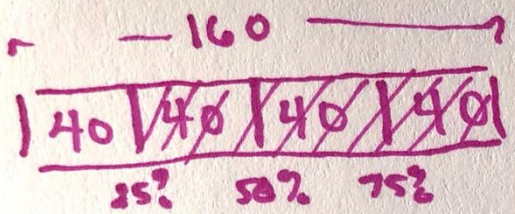
Compare class strategies

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is $160. At which store is the guitar less expensive? How much less expensive?



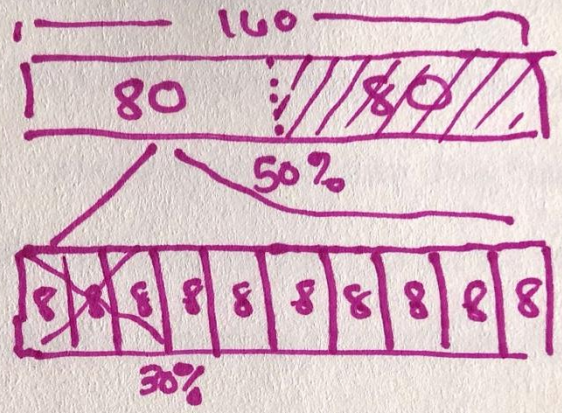


Store A



Store A = $40.00

Store B



Store B = $56.00

Store A is less expensive by $16.00 . . .

A

160 − .75(160)

160 − 120

$40

B

.5(160) = 80

80 − .3(80)

80 − 24

$56

Store A is $16 cheaper

Store A

75% off means 25% of

.25(160)

= ¼(160)

= $40

Store B

(D1) 50% of 160

= $80

(D2) 30% off means 70% of

.70(80)

= $56

Store A is less expensive by $16

DISCUSS IT Compare class strategies

The guitar Francisca wants is on sale at two different stores. The original price of the guitar at both stores is $160. At which store is the guitar less expensive? How much less expensive?

Store A

75% off means 25% of

.25(160)

= 1/4(160)

= $40

Store B

(D1) 50% of 160

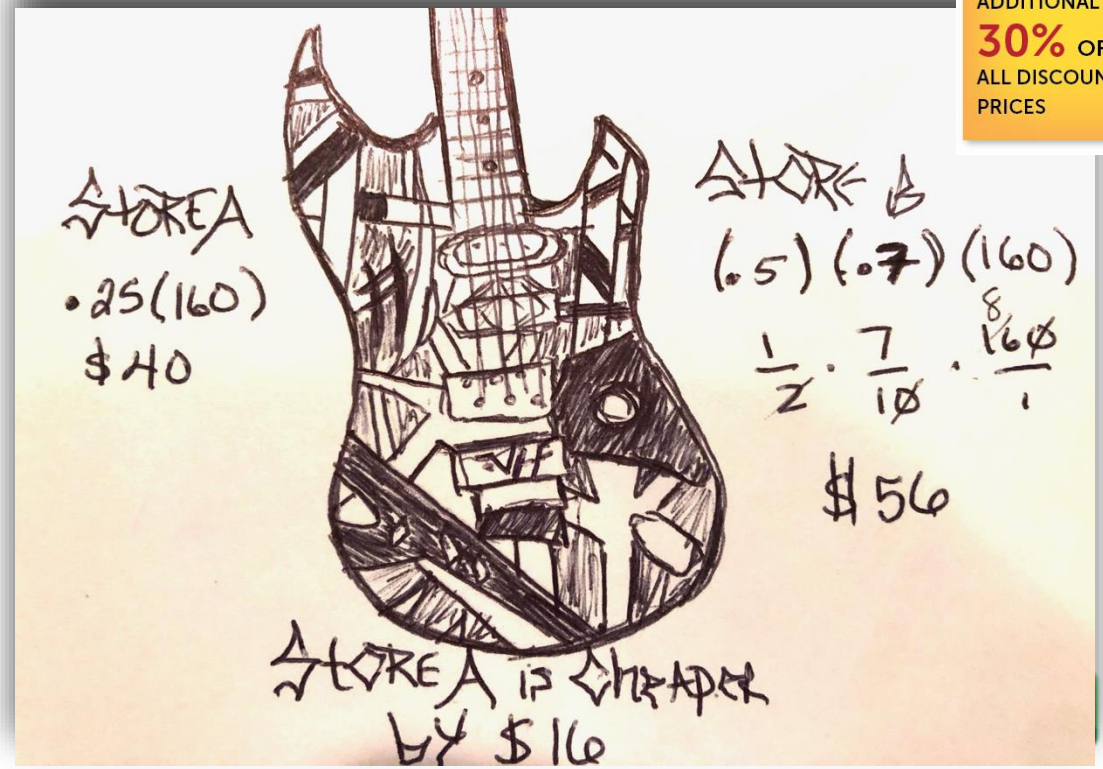
= $80

(D2) 30% off means 70% of

.70(80)

= $56

Store A is less expensive by $16



Compare Strategies

8–12 minutes

Teacher asks students to show their work and explain their thinking to the class.

Teacher facilitates discussion to highlight new strategies, leverage misconceptions as learning opportunities, and make connections between the strategies shared.

Teacher asks students to use **hand signals** to show if they agree/ disagree with the strategy shared.

Teacher uses **talk moves**, such as **Four Rs**, to help students build on other's thinking and explain flawed reasoning in a solution strategy.

Students tell a partner how their own strategy is the same or different from one of the strategies shared. **SMP 3, 7**

Students ask classmates questions, explain the strategies of others, and notice patterns/relationships. **SMP 3, 7, 8**

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Supporting Teacher Facilitation of Connect It

In the Connect It section, teachers and students connect representations and strategies using a combination of individual work time and partner and whole class discourse.

The Connect It section ends as students apply their understanding from the discussion and Connect It questions to a new set of carefully selected problems.

Model It

You can find each percent separately.

Store A

A discount of 75% is the same as paying 25% of the original price.

$$25\% \text{ of } 160 = (0.25)(160)$$
$$= 40$$

Store B

The 50%-off price is 100% – 50%, or 50%, of the original price.

$$50\% \text{ of } 160 = (0.5)(160)$$
$$= 80$$

An additional 30% discount is applied to the 50%-off price of the guitar.

A discount of 30% is the same as paying 70% of the price.

$$70\% \text{ of } 80 = (0.7)(80)$$
$$= 56$$

You can find multiple percents at one time.

Store A

$$25\% \text{ of } 160 = (0.25)(160)$$
$$= 40$$

Store B

$$70\% \text{ of } 50\% \text{ of } 160 = (0.7)(0.5)(160)$$
$$= (0.7)(80)$$
$$= 56$$

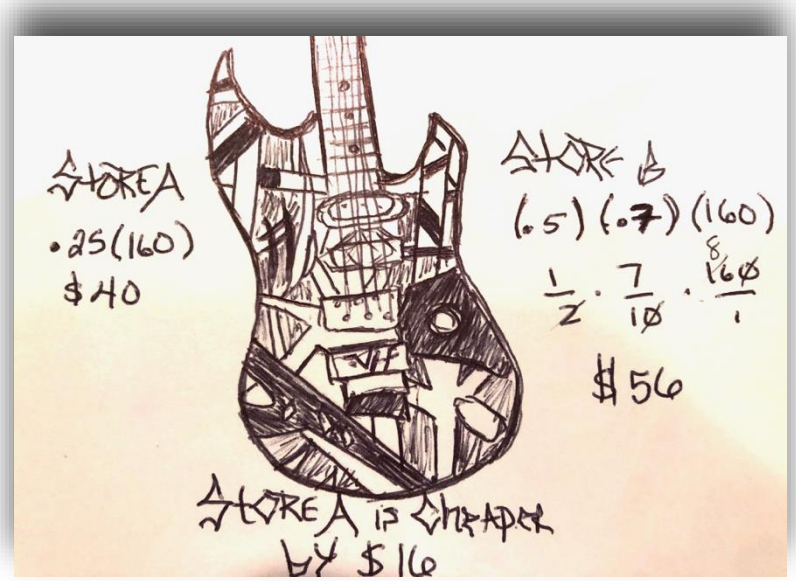
CONNECT IT

1. At which store is the sale price of the guitar less? How much less?

2. Look at the **Model Its**. Why does the expression (0.7)(0.5)(160) represent the price of a guitar at Store B?

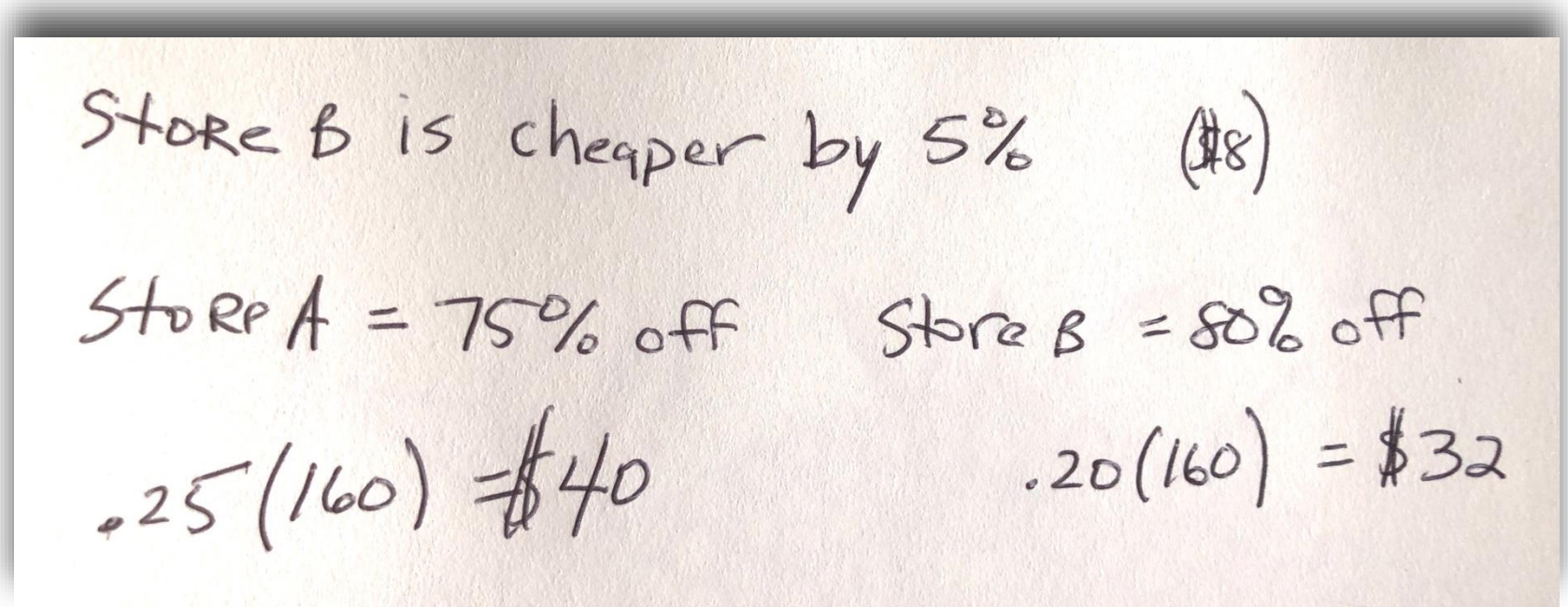
3. Look at the second **Model It**. Explain why the sale price at Store B is 35% of the original price.

4. Would the amount Francisca would pay at Store B change if the sale were 30% off the price of the guitar, with an additional 50% off all sale prices? Explain.



CONNECT IT

5 Explain why a 75% discount followed by an additional 25% discount is not the same as a 100% discount.



Make Connections and Reflect on What You Have Learned

5–8 minutes

Teacher displays the **Picture It** or **Model It** slides and asks the aligned questions in the Teacher's Guide.

Teacher uses data collected during **Discuss It** to flexibly use the **Connect It** questions to deepen student understanding.

Teacher asks students to complete **Connect It** questions verbally and/or in writing.

Teacher selects one to two **Connect It** questions to summarize key ideas related to the learning goal and uses **talk moves** to support students in refining strategies into more generalizable and efficient procedures.

Teacher asks students to reflect on a strategy they will use and/or would like to try during **Apply It**.

Students reflect on their learning, refine their strategies, and monitor their progress toward the lesson goals. **SMP 1, 3**

Apply your thinking to a new problem

7 A bookstore has 120 science fiction books. It has 30% fewer mysteries than science fiction books. It has 25% more biographies than mysteries. How many biographies are in the bookstore? Show your work.

SOLUTION _____

Apply Your Thinking to a New Problem

Varies by instructional schedule

Teacher asks students to practice what they learned by answering the **Apply It** problems.

Students persist in solving problems by recognizing errors, asking questions, and revising their strategy/approach in an effort to make progress. **SMP 1, 3, 5, 8**

Teacher provides access to, and encourages the use of, various math tools, manipulatives, and strategies.

Students independently select appropriate tools and apply strategies of their choice to solve new problems. **SMP 1, 2, 5**

Teacher circulates the room to look at student work and uses questions/prompts to encourage students who might be stuck.

Teacher provides differentiated support to individual students and/or small groups to reinforce and extend the learning.

Count to 20

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

1. Take turns with a partner.
2. You can say up to 3 consecutive numbers in a row starting with the number 1.
3. The person who says 20 wins.

Thank You

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