# Interpret and Communicate Math Ideas with Increasing Precision through the *Decide and Defend* Instructional Routine

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#DeciDefend #FosteringMPs #NCTMSD2019

# Goal

Learn how the specific designs for interaction in the *Decide and Defend* instructional routine support students as they work to read, write, speak, and listen to mathematical ideas and reasoning with increasing precision.

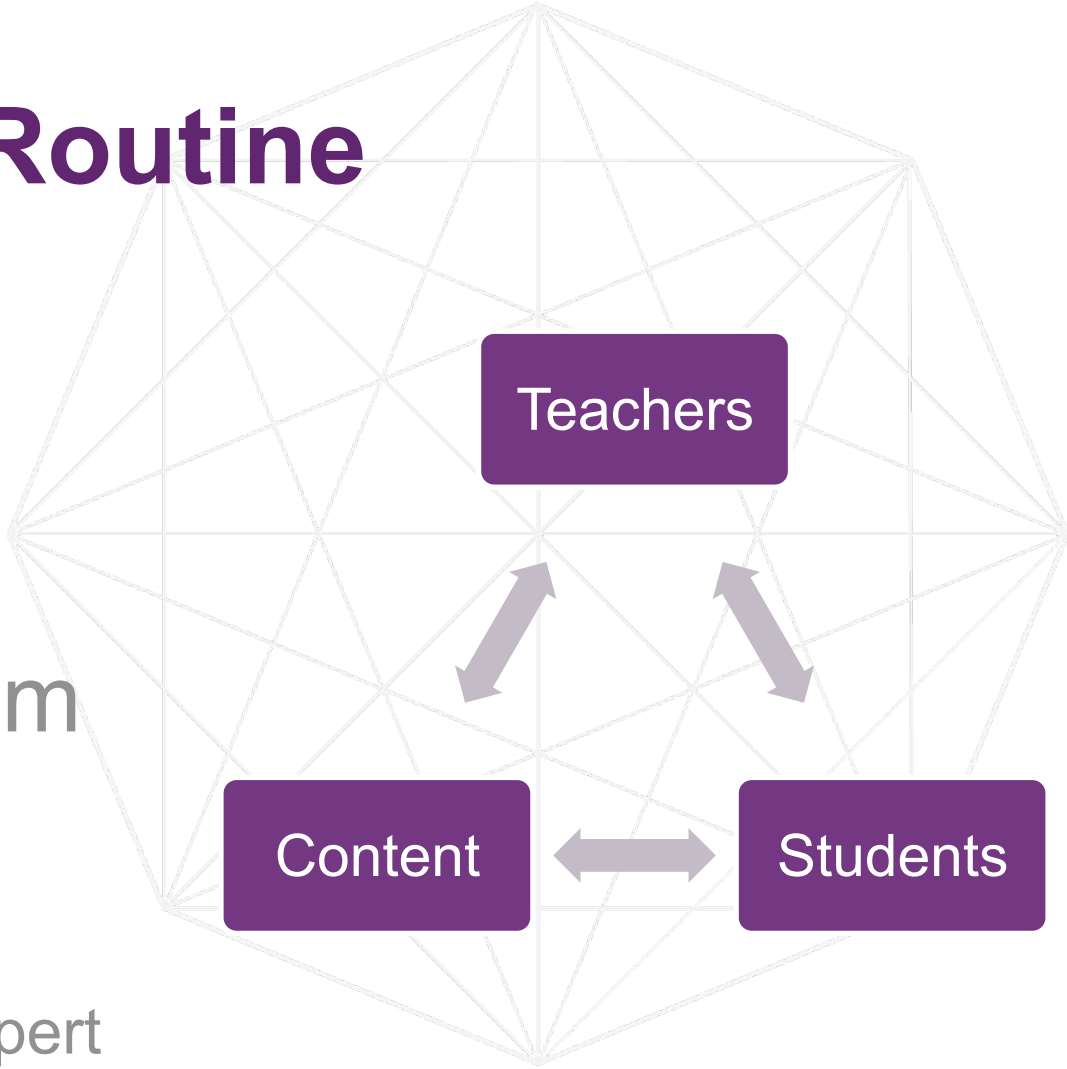
# Agenda

1. Framing
2. Experience the *Decide and Defend* Instructional Routine
3. Unpack communication designs in *Decide and Defend*
4. Plan for language support and development

# Instructional Routine

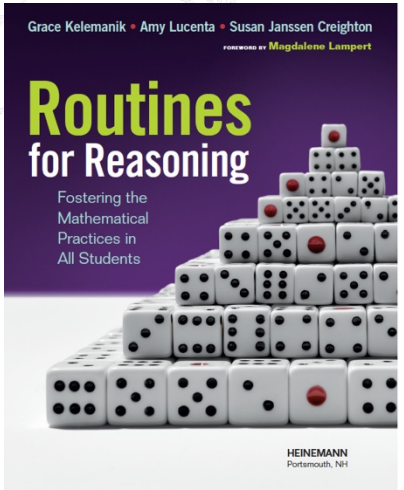
"Designs for interaction that organize classroom activities"

- Magdalene Lampert
NCSM 2015



# Instructional Routines that Develop Mathematical Practices

- Capturing Quantities (MP2)
- Connecting Representations (MP7)
- Recognizing Repetition (MP8)
- Three Reads (MP1)
- Contemplate then Calculate (MP7)
- Decide and Defend (MP3)

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# Critique the Reasoning of Others and Construct Viable Arguments (MP3)

Mathematically proficient students…

- distinguish correct logic or reasoning from that which is flawed, and if there is a flaw in an argument—explain what it is.
- justify their conclusions, communicate them to others, and respond to the arguments of others.
- can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

# Decide and Defend

## 1 Launch Routine


THINKING GOAL
**Critique and construct arguments**

## 2 Interpret the Work

Individual Think Time

Pairs

Share, Discuss, & Record

## 3 Decide if it is Correct

Individual Think Time

Pairs

Annotate

## 4 Draft Your Defense

Pairs

Annotate

## 5 Defend Your Decision

Partner Share

Think, Pair, Share

## 6 Reflect on Your Thinking

Individual Write Time

Pairs

Share & Record

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# Decide & Defend

**WHAT:** Interpret math work, decide if you agree or disagree, draft, and defend your decision.

**WHY:** To build the mathematical habits of interpreting, deciding and defending (i.e., to think and work like mathematicians)

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# Decide & Defend

Interpret the Work

Decide

Draft

Defend

Reflect on Learning

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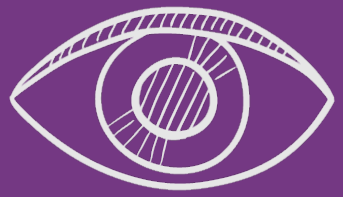

# Interpret the Work

Think – Pair - Share

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What is the question they are answering?

What did they do?

What did they find?

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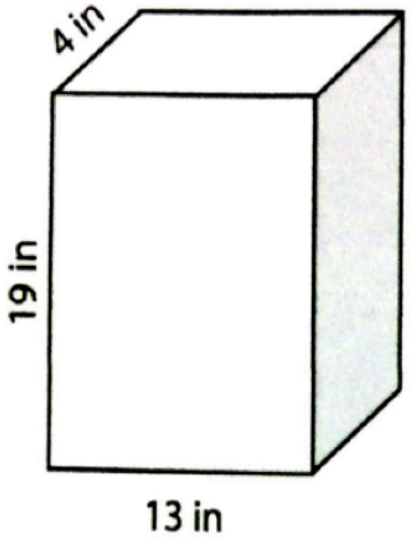
# What is the question they are answering?

Find the surface area.

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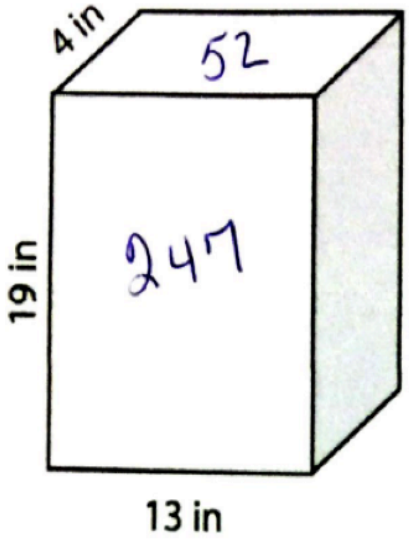


$247 \times 4 + 52 \times 2$

$988 + 104$

1092 sq units

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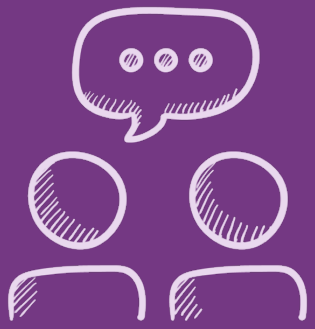
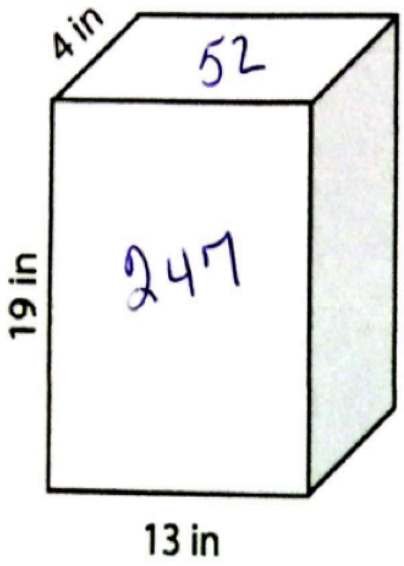


I think they …

What do you think they did?

Find the surface area.




247 x 4 + 52 x 2

988 + 104

1092 sq units

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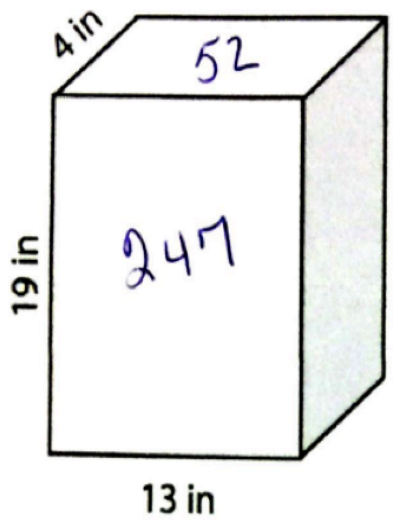
First they… next... then...

They found… by…

Find the surface area.




$247 \times 4 + 52 \times 2$

$988 + 104$

1092 sq units

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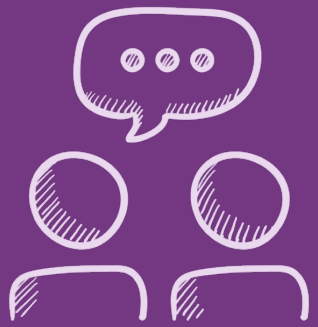
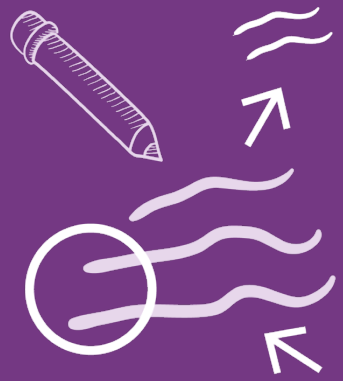
# Decide if the Work is Correct

Think

Pair





Annotate

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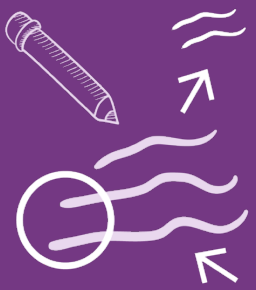
# Decide if the Work is Correct



Ask yourself…

Does the *answer* make sense?

Does the *process* make sense?

Are the *calculations* correct?

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# Decide if the Work is Correct

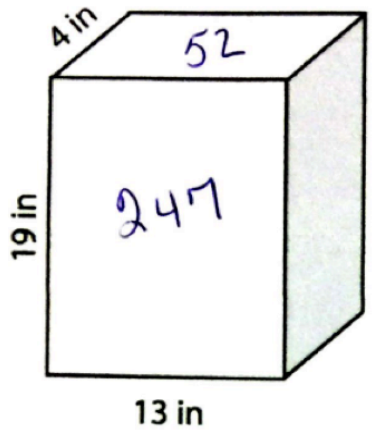
Ask yourself…

Does the *answer* make sense?

Does the *process* make sense?

Are the *calculations* correct?

Find the surface area.




$247 \times 4 + 52 \times 2$

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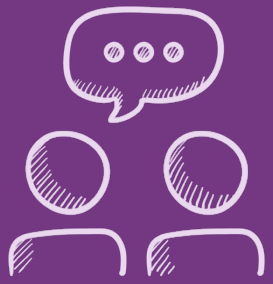
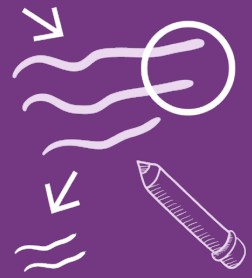


# Decide if the Work is Correct



I think the work is correct/incorrect because…

I'm not sure if the work is correct because…

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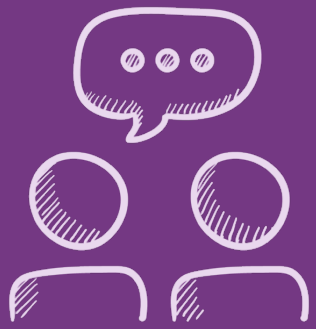
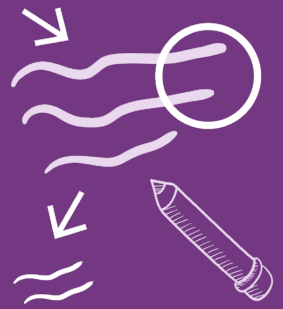


# Draft your Defense



- Prepare what you'll show
- Prepare what you'll say

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# Defend your Decision

## Defender

We decided the work is correct/ incorrect because…

We're still not sure about….

## Skeptic

I agree/disagree with your defense because…

A question I have is…

# Defend your Decision

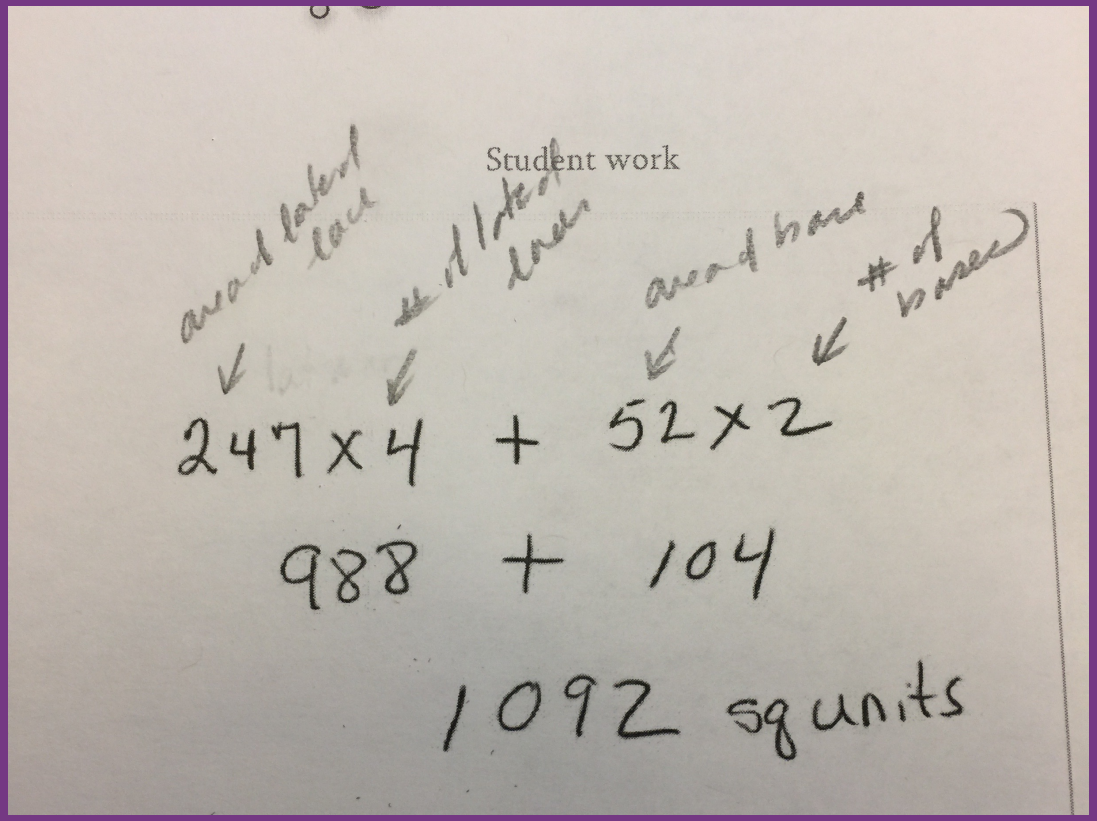
**Defender**

We decided the work is correct/incorrect because…
We're still not sure about….

**Skeptic**

I agree/disagree with your defense because…
A question I have is…

# Defend your Decision




**Defender**

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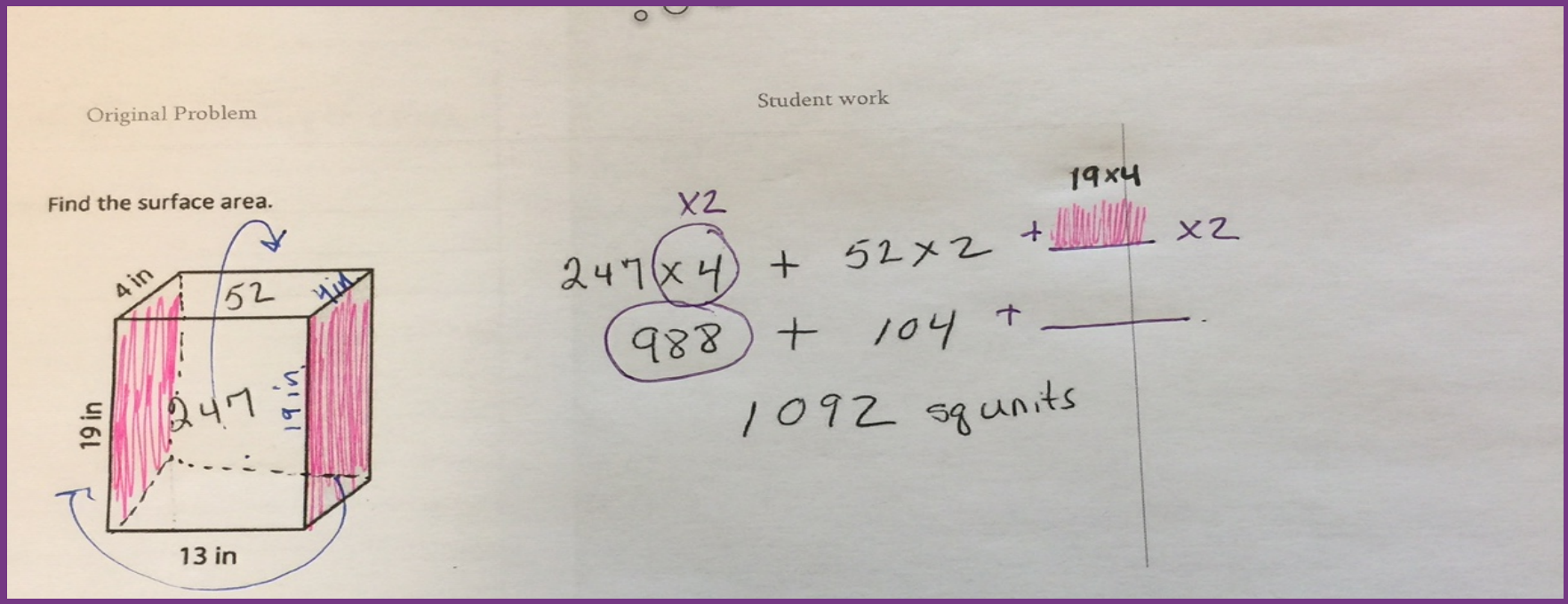
# Defend your Decision




**Defender**

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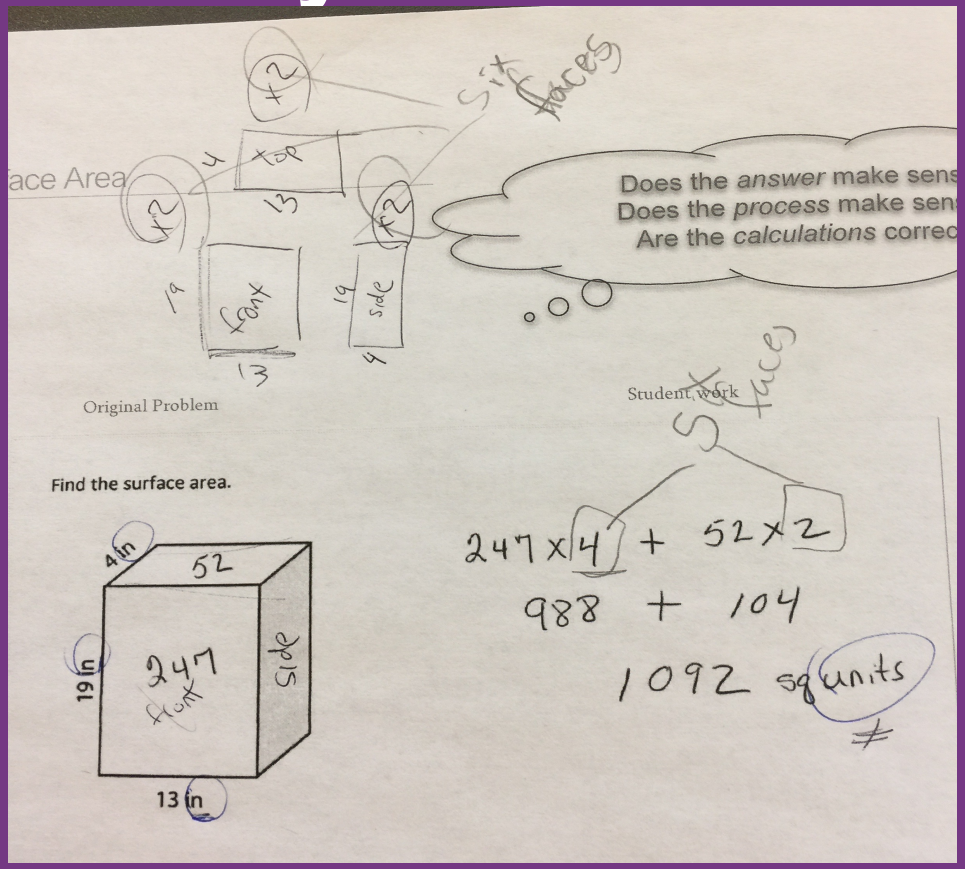
# Defend your Decision




**Defender**

We decided the work is correct/incorrect because…

We're still not sure about….

**Skeptic**

I agree/disagree with your defense because…

A question I have is…

# Reflect on learning

- Next time I interpret someone else's work, I will pay attention to…
- Next time I interpret someone else's work, I will ask myself…
- When convincing a skeptic, I learned to ….
- A new math idea I learned is…

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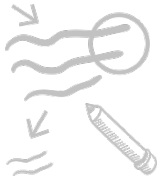
# Decide and Defend

- When/how were you communicating mathematically?
- What design features/teacher moves supported increased precision in math language and understanding?

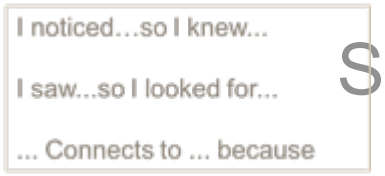
# 4 Essential Instructional Strategies

## Keeping the focus on the mathematical thinking while providing access for a wide range of learners

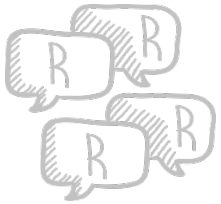
Ask-yourself questions



Annotation




Sentence frames and starters




The Four Rs – repeat, rephrase, reword, record

# Planning for language development in *Decide and Defend*

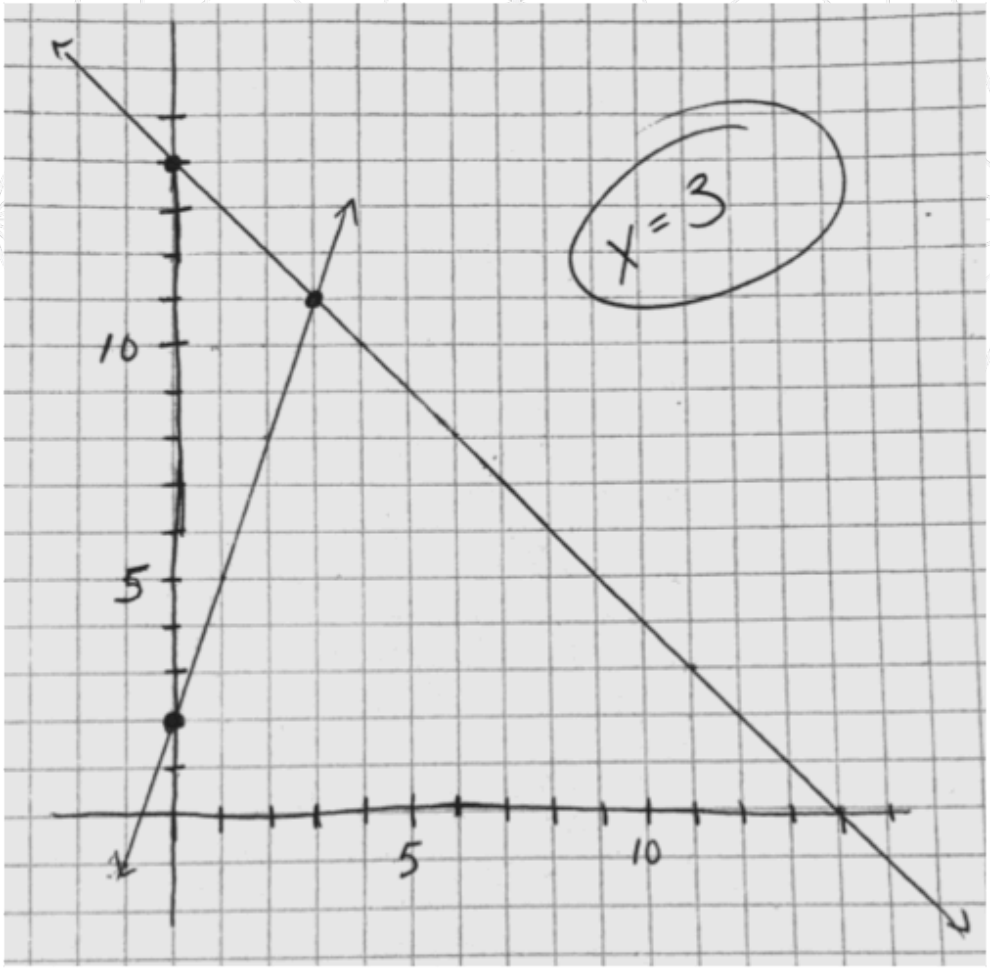
- Do the math
  - Make sense – question and work
  - Decide – answer, process, calculations
  - Defend – written, spoken
- Reflect on the language you used– words, symbols, visuals
- Identify language critical to communicating clearly
- Identify what critical language you will develop, and
- Identify when in the routine you will develop that language

# Planning for Language

- Do the Math.
- What language did you use?
- What was language was critical?
- What language would you develop?
- When in the routine?

Solve for X

$3X + 2 = 14 - X$



# For More on *Decide and Defend* and Other Instructional Routines

## Reach Out

AmyLucenta@gmail.com
GraceKelemanik@gmail.com

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## Join the Conversation

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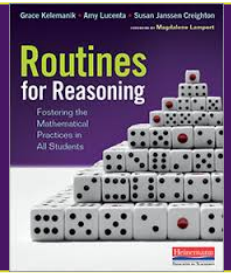
## Get the Book

www.heinemann.com



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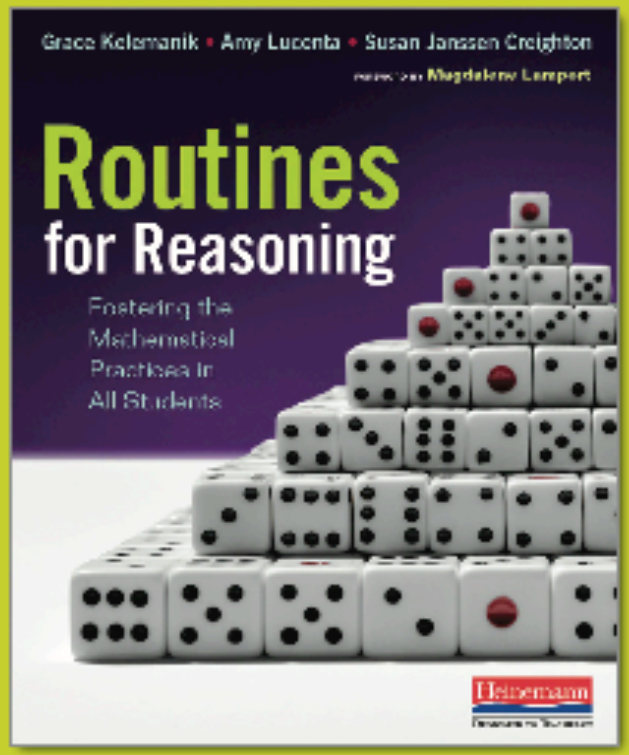


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# When selecting worked examples for *Decide and Defend,* ask yourself…

- Does the worked example highlight a common error students make?
- Does the worked example draw attention to a classic misconception students hold?
- Does the worked example contain a representation that will serve to deepen students' conceptual understanding?
- Does the worked example present a unique solution strategy that sparks consideration of underlying math concepts?

Decide and Defend Tasks – Fo

www.fosteringmathpractices.com/decide-and-defend/decide-and-defend-tasks/

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Avenues of Thinking | Special Populations | Routines for Reasoning | Related

## Three Composing/Decomposing Problems (Jose) 2.NBT.A

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## Clark's Gummy Bears: Best Buy

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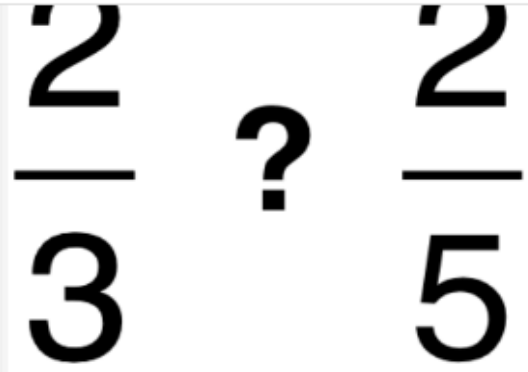


## Fraction Comparisons with Pictures 3.NF.A.3d

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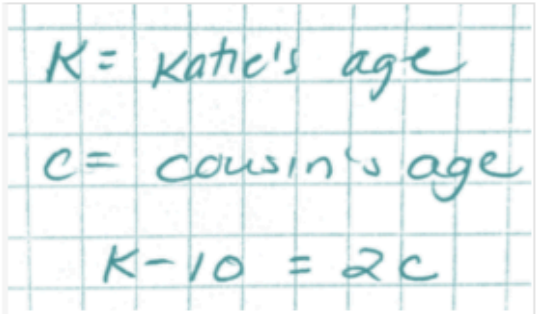


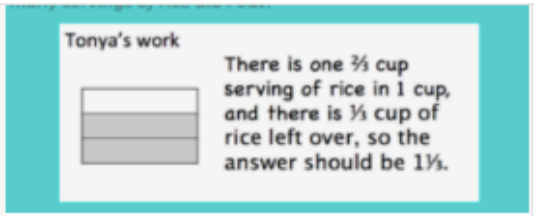


## Cup of Rice 6.NS.A.1, 5.NF.B.7

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