Illustrative Mathematics®
LEARN MATH FOR LIFE

KIDDOM

Beyond Boundaries: Breaking Through Modern-day Math Barriers

#LearnWithIM

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Kiddom

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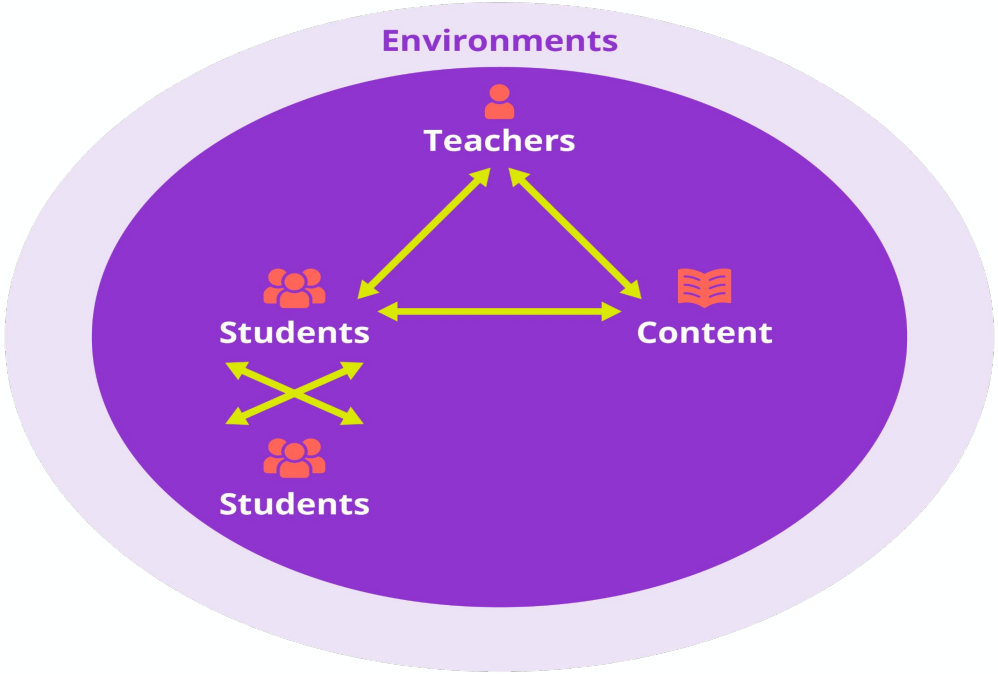
What makes up a classroom community?



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“Students learn mathematics as a result of solving problems. Mathematical ideas are the *outcomes* of the problem-solving experience rather than the elements that must be taught before problem solving.”

Hiebert, J., et. al. (1996)

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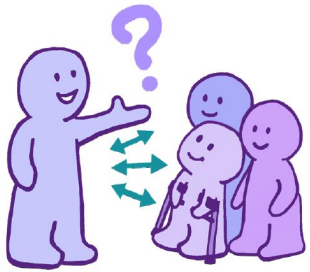
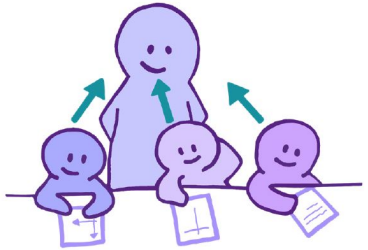
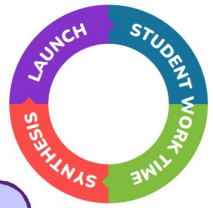
Students learn math by doing math

1. Teacher ensures students understand the question.



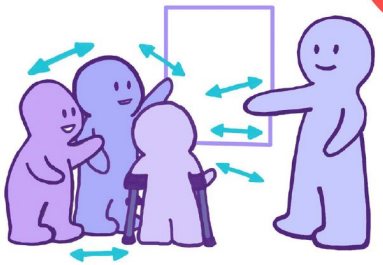
2. Students work individually. Teacher monitors, listens, questions.



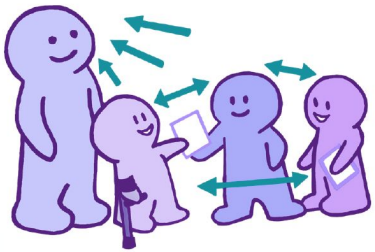


Teacher monitors, listens, and asks questions to understand students' thinking.

4. Teacher helps students synthesize their learning.



3. Students work in groups. Teacher monitors, listens, and asks questions to understand students' thinking.



The IM Classroom

The IM Classroom is Illustrative Mathematics' wraparound support model for school districts.

CURRICULUM

Teachers and students use an IM Certified® curriculum and practice IM's problem-based instructional model with integrity.

LEARNING

Teachers participate in IM Certified® Professional Learning and have access to implementation support.

LEADERS

School and district leaders understand and support the systemic changes that are necessary to change teachers' practice.

COMMUNITY

Families and communities are engaged with and support their students' learning.

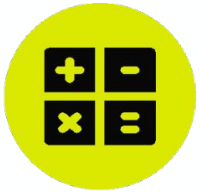
The IM Classroom

The IM Classroom: 4 Pillars

Successful implementation of the IM curriculum happens when:

CURRICULUM

Teachers and students use an IM **Certified**® curriculum and practice IM's problem-based instructional model with integrity.



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Instructional Routines

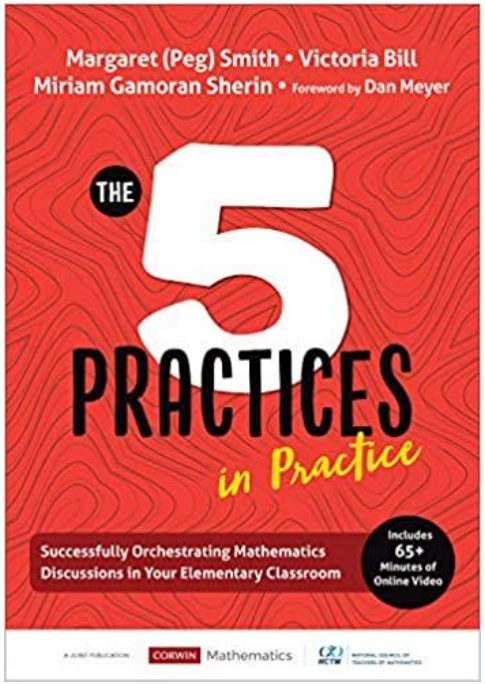
- give structure to time and interactions
- predictable format lets students know what to expect
- provide all students opportunities to do mathematics
- reduce cognitive load for teachers

Examples of Instructional Routines

- Notice and Wonder
- Which One Doesn't Belong
- True or False Number Talks
- Number talks
    - build computational fluency by encouraging students to use what they know about structure, patterns, and properties of operations to mentally solve a problem.

Orchestrating productive mathematics discussions in the classroom community

- Anticipate
- Monitor
- Select
- Sequence
- Connect



Warmup: Dividing by 4 (Grade 6, Unit 5, Lesson 12)

Find each quotient mentally.

- $80 \div 4$

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- $12 \div 4$

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- $1.2 \div 4$

Warmup: Dividing by 4 (Grade 6, Unit 5, Lesson 12)

Find each quotient mentally.

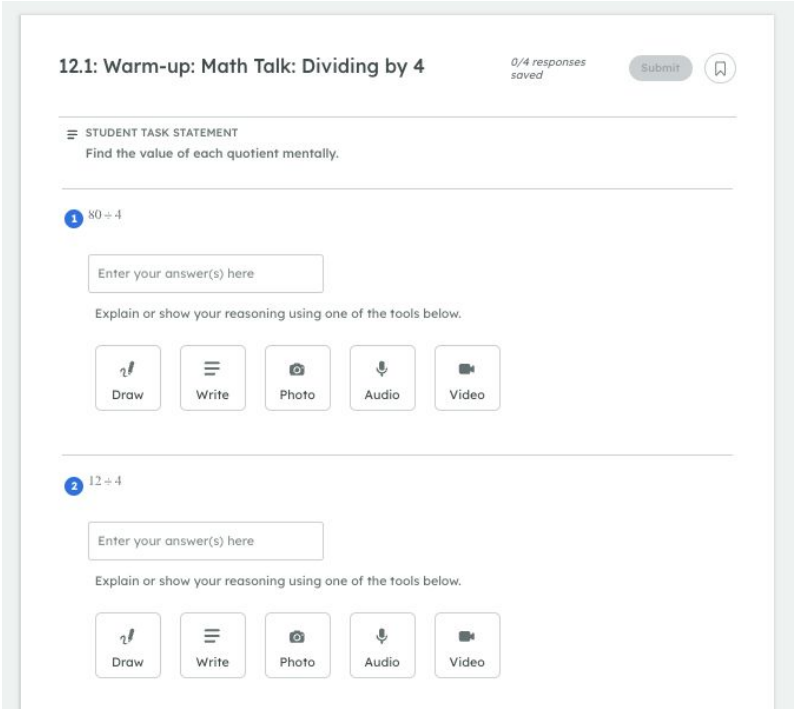
- $80 \div 4$
- $12 \div 4$
- $1.2 \div 4$
- $81.2 \div 4$

Warmup: Dividing by 4

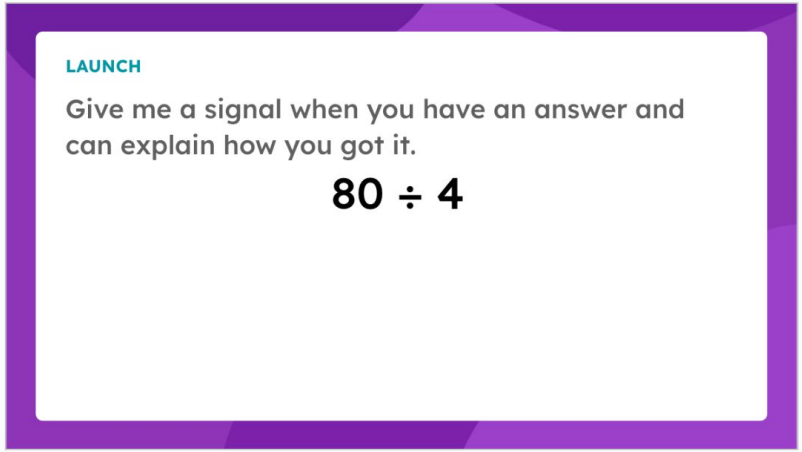
Find each quotient mentally.

$80 \div 4$	Base-ten structure, relation between multiplication and division
$12 \div 4$	Multiplication fact
$1.2 \div 4$	Base-ten structure, relation between multiplication and division
$81.2 \div 4$	Distributive property

Choice and Voice in Response-making



Teacher Ease



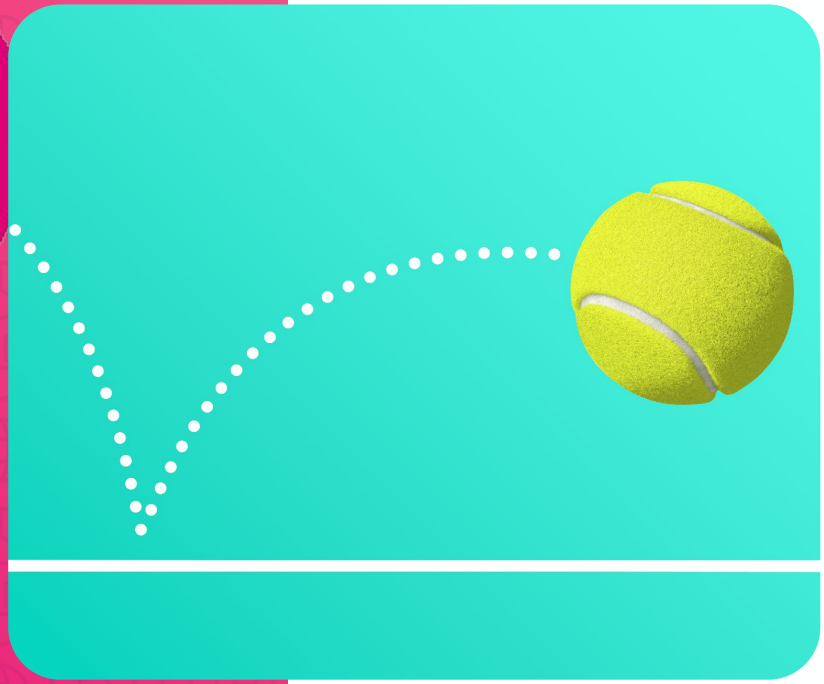
Launch
Tell students to close their books or devices (or to keep them closed). Reveal one problem at a time. For each problem:

- Give students quiet think time, and ask them to give a signal when they have an answer and a strategy.
- Invite students to share their strategies, and record and display their responses for all to see.
- Use the questions in the Activity Synthesis to involve more students in the conversation before moving to the next problem.

Keep all previous problems and work displayed throughout the talk.

Access for Students with Disabilities
Action and Expression: Internalize Executive Functions. To support working memory, provide students with sticky notes or mini whiteboards.
Supports accessibility for: Memory, Organization

Access for Language Learners



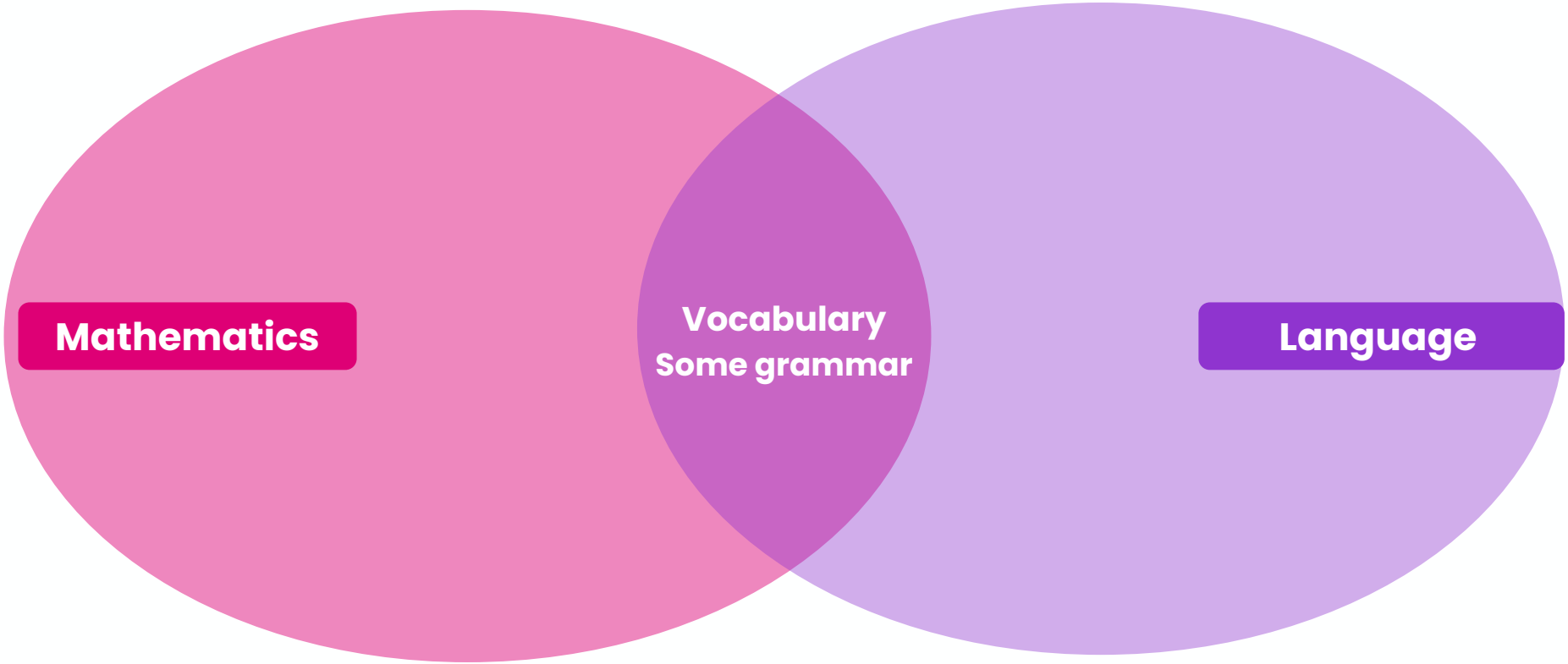
The Challenge

“[M]ost students—and especially students of color, those from low-income families, those with mild to moderate disabilities, and English language learners—spent the vast majority of their school days missing out on four crucial resources:

- grade appropriate assignments
- deep engagement
- strong instruction
- teachers with high expectations”

Source: The Opportunity Myth TNTP (2018)

Common Conception



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> Mathematical understandings and language competence develop interdependently. Deep conceptual learning is gained through language.

Illustrative Mathematics, *Supporting English-language Learners*

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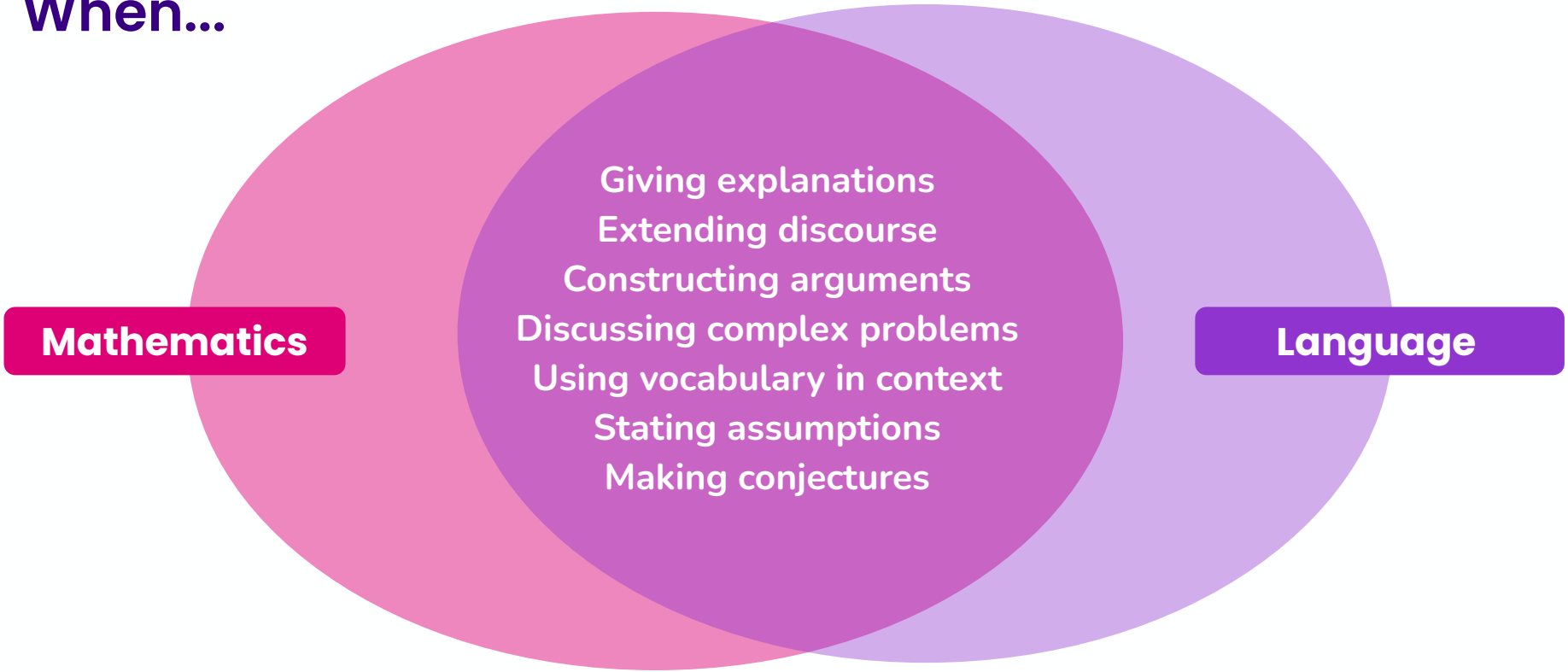
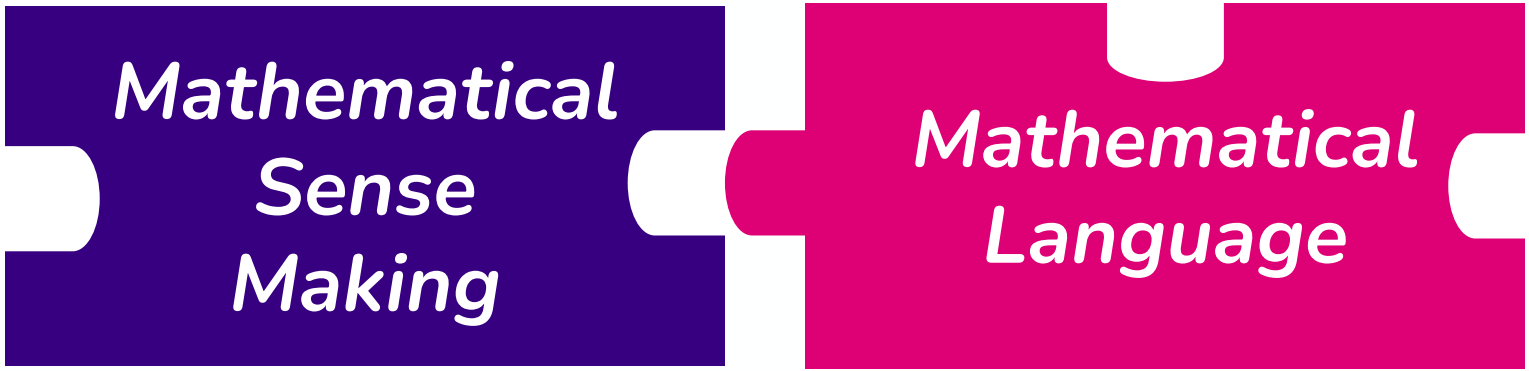
Students are Engaged in Mathematical Language When...



Advancing Mathematical Language



develop simultaneously

Amplify rather than *simplify* language

Mathematical Language Routines

MLR1 Stronger and Clearer Each Time
MLR2 Collect and Display
MLR3 Clarify, Critique, Correct
MLR4 Information Gap
MLR5 Co-Craft Questions
MLR6 Three Reads
MLR7 Compare and Connect
MLR8 Discussion Supports

Understanding Language | Stanford Graduate School of Education

SCALE
Stanford Center for Assessment, Learning, & Equity

MLR5: Co-Craft Questions

Purpose:

- To allow students to get inside of a context before feeling pressure to produce answers
- To create space for students to produce the language of mathematical questions themselves, and
- To provide opportunities for students to analyze how different mathematical forms and symbols can represent different situations.

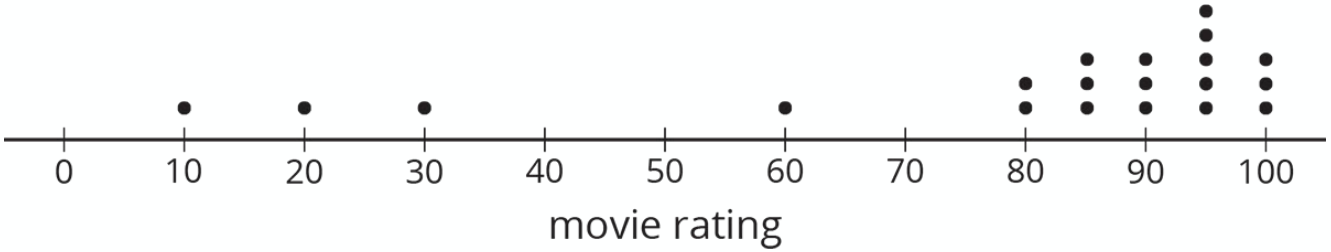
MLR5: Co-Craft Questions

How it works:

- **Hook:** Present a context or a stem for a problem. The hook can also be a picture, video, or list of interesting facts.
- **Students Write Questions:** Students write down possible *mathematical* questions that could be asked about the situation.
- **Students Compare Questions:** Students compare questions with a partner. Select questions to share and discuss with the whole class.
- **Actual Question(s) Revealed:** Reveal the questions students are expected to work on. *Alternatively*, select from the list of student generated questions.

Co-Craft Questions: Movie Reviews

A movie rating website has many people rate a new movie on a scale of 0 to 100. Here is a dot plot showing a random sample of 20 of these reviews.



What mathematical questions can be asked about this situation?

Co-Craft Questions: Movie Reviews

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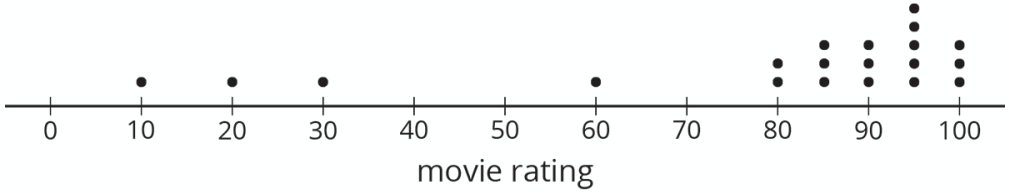


- Would the mean or median be a better measure for the center of this data? Explain your reasoning.
- Use the sample to estimate the measure of center that you chose for all the reviews.
- For this sample, the mean absolute deviation is 19.6, and the interquartile range is 15. Which of these values is associated with the measure of center that you chose?
- Movies must have an average rating of 75 or more from all the reviews on the website to be considered for an award. Do you think this movie will be considered for the award? Use the measure of center and measure of variability that you chose to justify your answer.

Co-Craft Questions: Movie Reviews

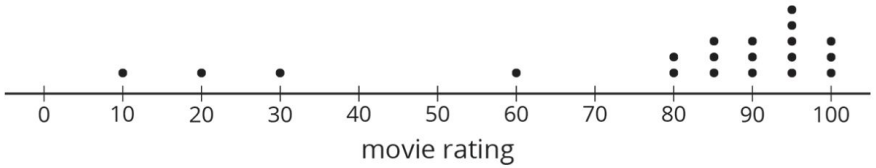
15.4: Movie Reviews

0/6 responses saved

Submit

STUDENT FACING TASK STATEMENT

A movie rating website has many people rate a new movie on a scale of 0 to 100. Here is a dot plot showing a random sample of 20 of these reviews.



1 What mathematical questions can be asked about this situation?

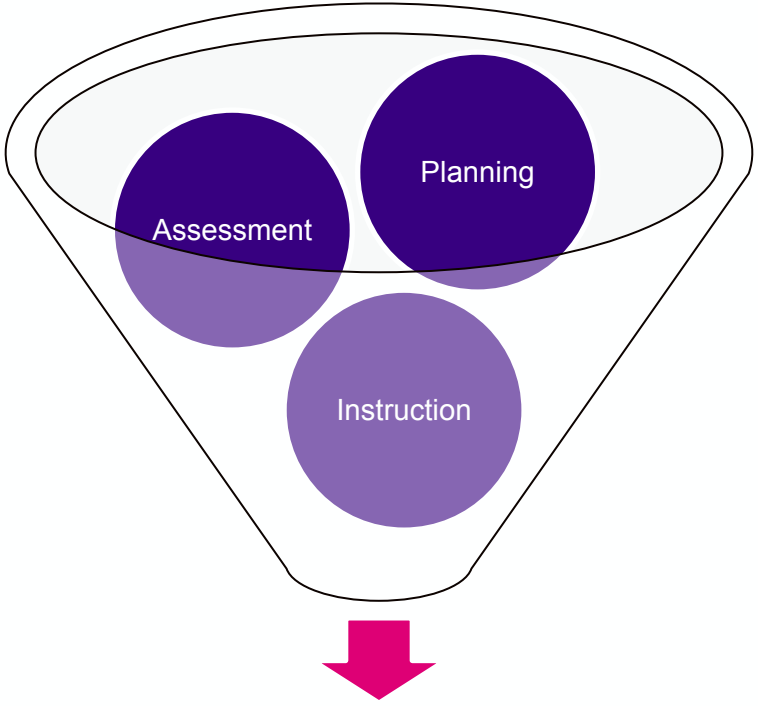
Enter your answer(s) here

Explain or show your reasoning using one of the tools below.

Draw | Write | Photo | Audio | Video

- Equitable access to the right tools at the right time
- Supports for students extend learning, not reduce it
- I have the data that I need to make decisions, big and small

- Planning
- Instruction
- Assessment



Learning

One spot. Many choices.

Curriculum Management/Personalization
Review, edit, and personalize *all* curriculum and assessments.

Communication Tools
Chat,Threaded messages, emoji responses, virtual white board, Kiddom Live for audio/video.

Classwork
Deliver presentations and engage students live during lesson with activities.

Assessment & Reporting Tools
Real-time observations, assignment and standards data reports to monitor progress.

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Thank You

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