

# CRMT<sup>2</sup> Framework (Zavala & Aguirre, 2021)

## Knowledges & Identities

Cultural and  
Community  
Funds of  
Knowledge

(Re) Humanizing

Student Thinking  
and Ideas

## Rigor & Support

Cognitive  
Demand

Scaffolding  
Up

Affirming  
Multilingualism

## Power & Participation

Distributing  
Intellectual  
Authority

Disrupting Status  
and Power

Analyzing and  
Taking Action

# CRMT<sup>2</sup> Area 1: Knowledges & Identities

**Cultural and  
Community  
Funds of  
Knowledge**

*How does my lesson help students connect mathematics with relevant/authentic issues or situations in their lives?*

**(Re) Humanizing**

*How does my lesson support creativity, broaden what counts as mathematical knowledge, and affirm positive math identities for all students?*

**Student Thinking  
and Ideas**

*How does my lesson create opportunities to elicit, express, and build on student mathematical thinking in multiple ways? (e.g., through gesture, pictures, words, symbols)*

(Zavala & Aguirre, 2021)

# CRMT<sup>2</sup> Area 2: Rigor & Support

## Cognitive Demand

*How does my lesson enable all my students to closely explore and analyze math concepts(s), procedure(s), and problem-solving/reasoning strategies?*

## Scaffolding Up

*How does my lesson maintain high rigor with high support for all students?*

## Affirming Multilingualism

*How does my lesson make space for multilingual learners (MLL) to be central participants in mathematics activities?*

(Zavala & Aguirre, 2021)

# CRMT<sup>2</sup> Area 3: Power & Participation

**Distributing  
Intellectual  
Authority**

*How does my lesson distribute mathematics authority and make space for multiple forms of knowledge and communication?*

**Disrupting  
Status and  
Power**

*How does my lesson disrupt status differences, entrenched stereotypes and inequitable power relationships present in all mathematics classrooms?*

**Analyzing and  
Taking Action**

*How does my lesson support student use of mathematics to analyze, critique, and address power relationships and injustice in their lives?*

(Zavala & Aguirre, 2021)

# Posing a Modeling Problem

Elicit student connections to the situation including understandings, cultural and community experiences, and diverse math ideas; Encourage curiosity, and support students to pose meaningful problems.

**Elicit and honor students' diverse ideas, experiences, and questions related to the situation**

What this sounds like:

- What do you notice?
- What do you wonder?
- What do you know about this situation?
- Who has an experience to share?
- What math questions can you ask?
- Why are these questions important?
- Who might care about the answers to these questions?

**Build on students' curiosities and questions to define a modeling problem to investigate.**

What this sounds like:

- Several people wondered about \_\_\_\_\_ and \_\_\_\_\_.
- We are going to investigate these questions as we work on our problem.
- This is our problem for today: [state problem]. How does this problem connect to your questions and wonders?
  - We need to figure out \_\_\_\_\_. Which of the questions that you posed can help us?

**Provide varied opportunities and modalities for students to contribute ideas.**

What this sounds like:

- Before we share wonders with the class, talk to a partner about your ideas.
- You can share your questions in English or [another language].
- Everyone write down one thing you notice in your notebook. Then we'll share.
- Who has a story to share about this situation?
- You can share drawings of your ideas.

**Ensure that multiple students have opportunities to pose problems, and to refine / add to problems posed by the teacher.**

What this sounds like:

- We are going to work together to pose a problem. I need everyone's help to make our problem better. What can we add?
- \_\_\_\_\_ just shared a really interesting wonder. Let's see if we can build on their idea to decide on our problem.
- [student], you helped us understand why this situation is important. What questions should we ask?

# Listing Quantities and Making Assumptions

Elicit students' ideas about important quantities and assumptions, while supporting students to explain how each quantity/assumption relates to the problem posed

**Invite students to identify important quantities and explain how they relate to the problem posed**

What this sounds like:

- What do you know that will help us with this question?
- What do we need to know, or find out?
- \_\_\_\_\_ said that we know how many students are in our class. How can that help us with our problem?
- \_\_\_ said we need to find know \_\_\_\_\_. How can that help us?

**Provide just in time information in response to key quantities that students identify**

What this sounds like:

- You mentioned that you need to know \_\_\_\_\_. Here is a table with some information that might help.
- \_\_\_\_\_ said that we need more information about \_\_\_\_\_. I did some research and this is what I found out.
- \_\_\_\_\_ said we need to know how many students are in \_\_\_'s class. Let's find out.

**Use targeted prompts and graphic organizers to help distinguish key components of the situation.**

What this sounds like:

- You said \_\_\_\_\_ is important . Is that something we already know, or something to find out?
- \_\_\_\_\_ said we need to know \_\_\_\_\_. Is this something we can find out, or do we need to make an assumption / best guess?
- Let's use a chart to organize our ideas. This column is what we already know, and this one for decisions we need to make.

**Ensure that students have opportunities to make (and revise) assumptions and decisions**

What this sounds like:

- You get to make an assumption here. What seems reasonable?
- \_\_\_ has an assumption will help us answer our question. Let's listen.
- You get to make decisions with your group. It is ok to make different decisions.
- \_\_\_\_\_ had an idea about a decision we need to make.
- It's ok to revise your assumptions/ choices. What do you want to change?

# Representing & Exploring with Mathematics

Monitor to support and highlight diverse approaches and representations (i.e., drawings, equations, physical models, verbal and written explanations)

**Look for different ways that students relate quantities and assumptions to build models. Prompt students to explain their ideas**

What this sounds like:

- [Name] has a different idea for how many we need. Let's all listen to their idea.
- I see that [name] decided to use addition here. Can you tell us more about that idea?
- [Name] just said we also have to think about students who are absent. How can we include that in our model?

**Honor students' strengths and build on their ideas; Communicate that students' experiences are valuable intellectual resources.**

What this sounds like:

- Who has experienced this situation and can share what they know?
- [Name] has experience with this situation and has an idea for what number we should use.
- [Name] has experience with this situation. Can you help us decide if the solution is reasonable?

**Encourage students to try out their ideas. Offer tools to represent their ideas.**

What this sounds like:

- You said that each person gets 3. Can you show that with numbers? pictures? cubes?
- Here is a picture of \_\_\_\_\_. How could you use this picture to show your idea?
- Can these cubes help you test your idea?

**Support students to clarify and label their models**

What this sounds like:

- What does this number represent?
- Can you add words or drawings to clarify each part of your model?

**Ensure that some representations of models (e.g., equations) are not privileged over others (e.g., drawings, objects).**

What this sounds like:

- Let's look at a variety of models.
- Has everyone shared in your group?
- I see you created a picture of the situation. Can you tell us what this part of the picture represents?
- This is a really unique way to represent a model. Let's all learn from these ideas.
- How does each of these representations (drawings, objects, equations) help us better understand the situation?

# Sharing and Interpreting Modeling Solutions

Select, sequence and connect strategies; Orient students to others' reasoning; Distribute math authority

**Support students to compare models, and to learn from their classmates' ideas**

What this sounds like:

- What do you notice about \_\_\_\_\_'s model?
- How is your model similar or different from \_\_\_\_\_'s model?
- How could \_\_\_\_\_'s idea help you with your model?
- Let's look at a picture of \_\_\_\_\_ model. They have really important ideas.

**Highlight both partial and complete models in group discussions**

What this sounds like:

- This is a great start! Tell us about how you started your strategy.
- We can always improve and refine on our models. Who would like to share how they might improve on their model the next time?
- It seems like this part of your model works really well. What do you want to work on next?

**Invite students to share ideas in multiple ways (pictures, words, multiple languages)**

What this sounds like:

- Show us your picture. Can you point out key parts of your model?
- You can share your ideas in Spanish, or in multiple languages.
- Can you and your partner work together to explain your model?
- Can you give us an example of how your model works?

**Support opportunities for students who share less frequently, or have different ideas**

What this sounds like:

- I really like how you solved this problem. Can you share your strategy with the class? We learn from your ideas.
- Let's hear from someone we have not heard from. Who would like to share?
- \_\_\_\_\_'s solution was different. Let's listen and think about the different decisions they made.



# Viewing lens for Knowledge and Identities

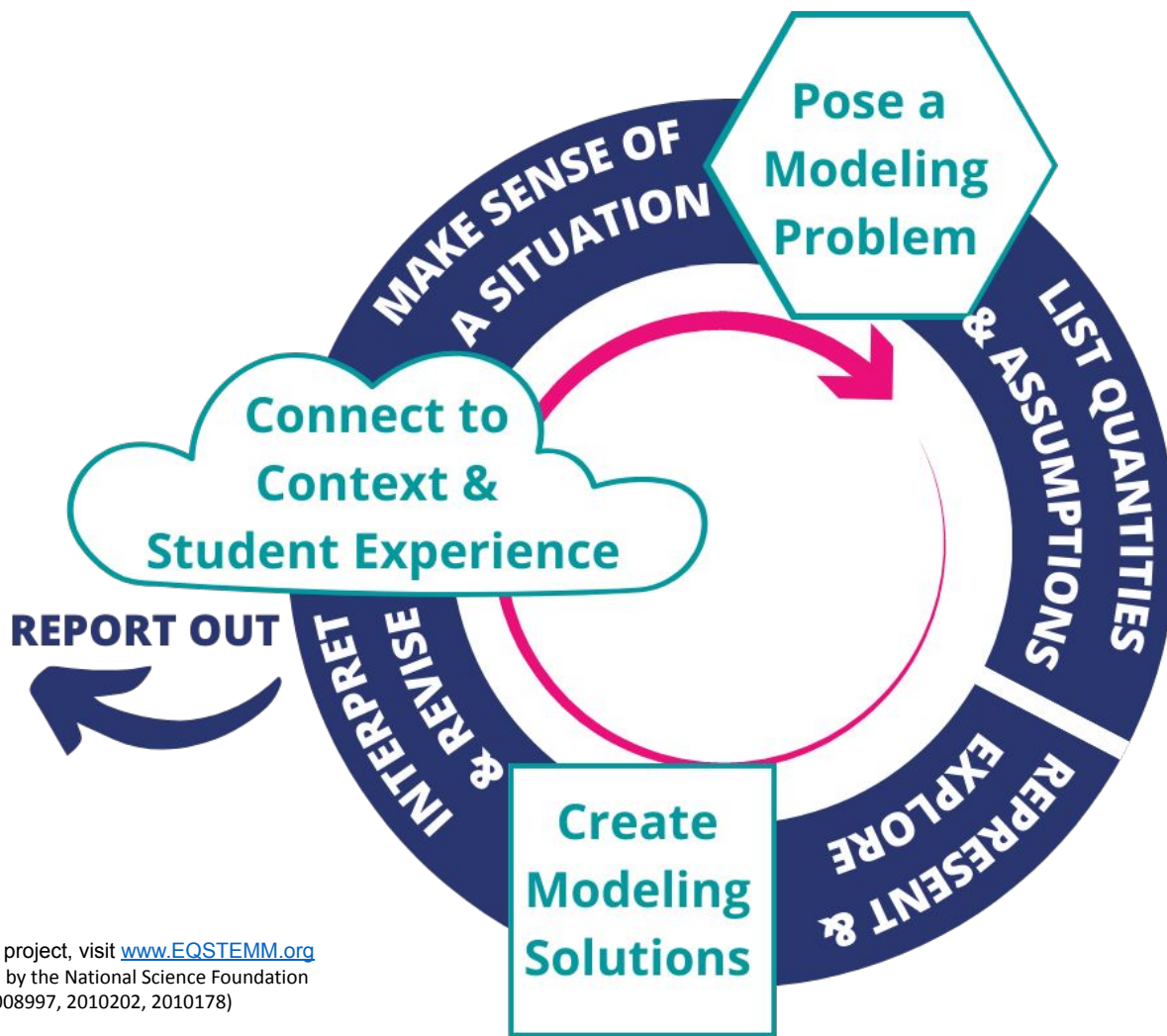
<b>Knowledge and Identities</b>	
<b>Cultural and Community Funds of Knowledge</b> Helping students connect mathematics with relevant/Authentic issues or situations in their lives	
<b>(Re)humanizing</b> Supporting creativity, broaden what counts as mathematical knowledge and affirms positive math identities for all student	
<b>Student thinking and ideas</b> Creating opportunities to elicit, express and build on student Mathematical thinking in multiple ways parentheses (through gestures pictures words and symbols)	

# Viewing lens for Rigor and Support

<b>Rigor and Support</b>	
<b>Cognitive demand</b> Enabling all students to closely explore and analyze math concepts procedures and problem solving reasoning strategies	
<b>Scaffolding up</b> Maintaining High rigor with high support for all students	
<b>Affirming multilingualism</b> Making space for multilingual Learners to be central participants in math mathematics activities	

# Viewing lens for Power and Participation

Power and participation	
<p><b>Distributing intellectual Authority</b> Distributing mathematics Authority and making space for multiple forms of knowledge and communication</p>	
<p><b>Disrupting power status and power</b> Disrupt status differences, entrenched stereotypes and inequitable power relationships present in all mathematics classroom</p>	
<p><b>Analyzing and taking action</b> Supporting students use of mathematics to analyze critique and address power relationships and Injustice in their lives</p>	



To learn more about our project, visit [www.EQSTEMM.org](http://www.EQSTEMM.org)  
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