Activity Summary Table

What We Did	How We Did It	Why We Did It
[Breakout #1] **Identity Mapping** Students represent their own identities through an open-ended identity mapping activity. Students are encouraged to include any aspect of their life, culture, personality and/or priorities that they think are an important part of their identity. Students then are introduced to diverse scientists and identify how these scientists involve their identity in the science they do. Class closes with the creation of a whole-class identity map and a "science in my life" survey.	• **Individual Identity Map**: Who are you? What people, places, languages, cultures and priorities shape who you are? • **Scientist Identity Maps:** What can we learn from diverse scientists about bringing our whole selves to the science we do in this class? • **Whole-Class Identity Map:** What do we each bring to this community of scientists that we can draw on as we work as a team? • **Science In My Life Survey:** How has science impacted your life? What environmental, health, or other science-related topics impact you or your community?	• **Meaningfully getting to know students::** Creating a justice-centered, empowering science classroom begins by understanding your students. • **Challenging notions of "who does science"**: Learning about modern diverse scientists who study phenomena important to their identity and communities. • **Prioritizing classroom belonging:** Intentional recognition that everyone is a generative member of our scientific community. • **Assessing student curiosities and scientific priorities:** Collecting information that can be used throughout the year to keep science class relevant and meaningful.
[Breakout #2] **Localized Anchoring Phenomenon:** Students are introduced to a local data set related to a shared experience- the COVID-19 pandemic. They make noticings and wonderings about the anonymized data then it is revealed that they know (and even live in!) the communities. They then develop a public question board to drive further investigations.	• **Introducing the Anchoring Phenomenon:** The COVID-19 pandemic is experienced differently by different people and communities, why? • **Analyzing Local Data:** What similarities and differences are there among communities? Why might that be? • **Creating a Driving Question Board:** What investigable questions can we make public?	• **Planning for a purpose:** Students draw on their own experiences to access science and envision change. • **Examining the intersections between science and social inequities:** Students engage in making observations about relevant and localized data to begin to examine intersecting systems of oppression. • **Creating routines to return to:** Students are asked to think about why and how we do science.
[Breakout #3] **Modeling Phenomena in Context:** All students represent their thinking and current understanding of the phenomena through labeled drawings and written text. Our model for the culture-setting unit asks students to discuss the role that in/equity plays in our phenomenon, in addition to the scientific explanation. Student models are revised several times throughout the unit as they figure out more about the anchoring phenomenon.	• **Initial Model**: What prior experiences and knowledge do we bring to the table? • **Model Consensus**: What do we all agree should be in our model? Are there drawing conventions we can all agree on? • **Gotta-Have Checklist**: What are the core components our model needs to make sense of our phenomenon? • **Model Revisions**: How has our thinking changed based on what we have figured out so far?	• **Showcase student sensemaking:** Students represent their thinking with text and drawings in a language and format that makes sense to them. • **Science in context**: Scientific decision-making is embedded in complicated socio-political contexts. • **Hear all voices**: All student ideas matter and are valued through consensus. • **Nurture revision as a good and necessary practice**: Emphasis is on the development of understanding, not on a single correct answer. Students will revise their models to show changes in thinking over time.
[Breakout #4] **Experiment Design:** Stemming from questions curated on a driving question board, students identified testable questions, designed and carried out experiments, analyzed data, and shared their finidngs.	• **Testable vs. Groundwork Questions:** What is a testable question? • **Experiment Design:** How do we answer our questions through experiments? • **Sharing information:** What can others learn from my study, and what can I learn from others'?	• **We can all do science:** Honoring student curiosity and questions with scientific experimentation. • **Modeling Scientific Practices**: Students experience how science is performed.
[Breakout #5] **Community Connections:** Students co-constructed FAQ sheets using credible information from experiences in class, medical mentors, and peer-reviewed online research. We printed the FAQs for students to post around school and to bring home to their communities.	• **Mythbusters:** How do we locate trustworthy information? • **Medical Mentors:** What are other experts saying, and how do we "pull them in" to have conversations with us? • **Peer Review:** In what way(s) does my information resonate with my community? • **FAQ Sheet:** How do I communicate what I learned to and for people I care about?	• **Empowering Students:** Students advocate for issues that matter to them and to the global community! • **Honor Community Expertise:** Students engage with diverse perspectives and honor community contributions! • **Data-Driven:** Replacing 8 unit tests with authentic assessments increased students passing statewide assessments by 12.2%!

Created by the JuST Lab Contact: april.luehmann@rochester.edu
Supported in part by the National Science Foundation (Award 210217)

Breakout Room # 3: Modeling Phenomena in Context

How do the scientific models in our culture-setting unit attend to equity?
Stem Teaching Tool 67: "Justice-centered science pedagogy addresses inequities as components of larger oppressive systems."
Stem Teacher Tool 15: "Engage your students in understanding how scientific practices and knowledge are always developing as a part of human cultural activity, and how their own community histories, values, and practices have and continue to contribute to science."

STEP 1. Initial Model: What prior experiences and knowledge do we bring to the table?

- Encourage students that all ideas are valued and that it is okay to not know. Try not to evaluate ideas, but push students to explain their reasoning and affirm their own thinking without needing teacher validation.

Preventer

1. Use your drawings to write an explanation about the differences in behaviors & resulting impacts of a preventer on the spread of COVID-19

Spreader

2. Use your drawings to write an explanation about the differences in behaviors & resulting impacts of a spreader on the spread of COVID-19

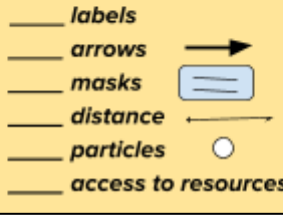
3. Individuals and communities have been impacted differently by COVID-19. **Equity** is when all people are treated fairly and **inequity** is when there are unfair or unjust conditions that negatively impact individuals or communities.
   a. Explain ways that individuals or communities have experienced **equity** or **inequity** during COVID-19
   b. How might inequity affect the preventer and spreader in your model?

STEP 2. Model Consensus: What do we all agree should be in our model? Are there drawing conventions we can all agree on?

STEP 3. Gotta-Have Checklist: What are the core components our model needs to make sense of our phenomenon?

Our Gotta-Have Checklist

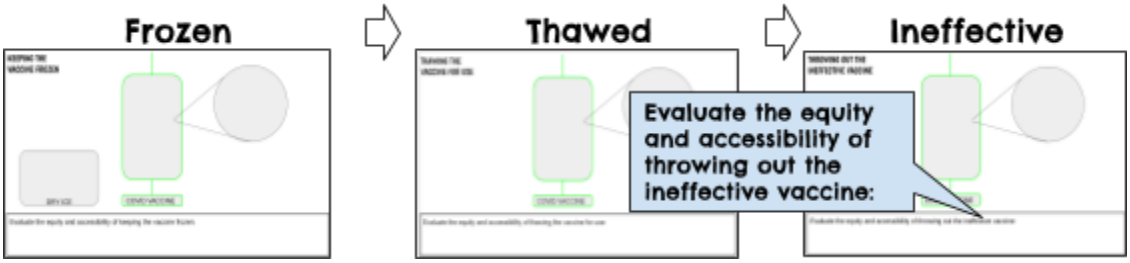
We decided as a class that we must include these specific components to our models. Check off each component below once you've included it in your model.



STEP 4. Model Revisions: How has our thinking changed based on what we have figured out so far?

- After engaging in these activities (ie. investigation, reading, simulation, discussion, etc), we have figured out... Let's add to our original model to show our understanding of the phenomenon so far! **Repeat steps 2 and 3**

Alternative Chemistry Culture-Setting Unit Model: Anchoring Phenomenon... While people were trying to get their COVID-19 vaccine, hospitals were throwing them out!



Challenges	Ideas for your classroom
Student talk (peer to peer, small group, whole class)	• Scientist circle- consensus discussion, equitable talk • Gallery walk with post-it notes, then engage in conversation • Post-it notes for all to write an idea and post them before students verbally share out
Making time to model and revise	• Exit ticket - add 1-2 more pieces to your model based on what we have figured out so far • Partner models instead of individual models • Model scaffold- template to help students get started, a key of possible images to represent different ideas or words
Giving students guiding questions to push their thinking instead of answers	• "Can you say more about...?" • "What do you understand so far? What could that look like?" • "What does this part of your drawing represent? How can you make that more clear?" • "If you were not allowed to verbally explain your model, what else might you add?"

Created by the JuST Lab Contact: april.luehmann@rochester.edu
Supported in part by the National Science Foundation (Award 210217)