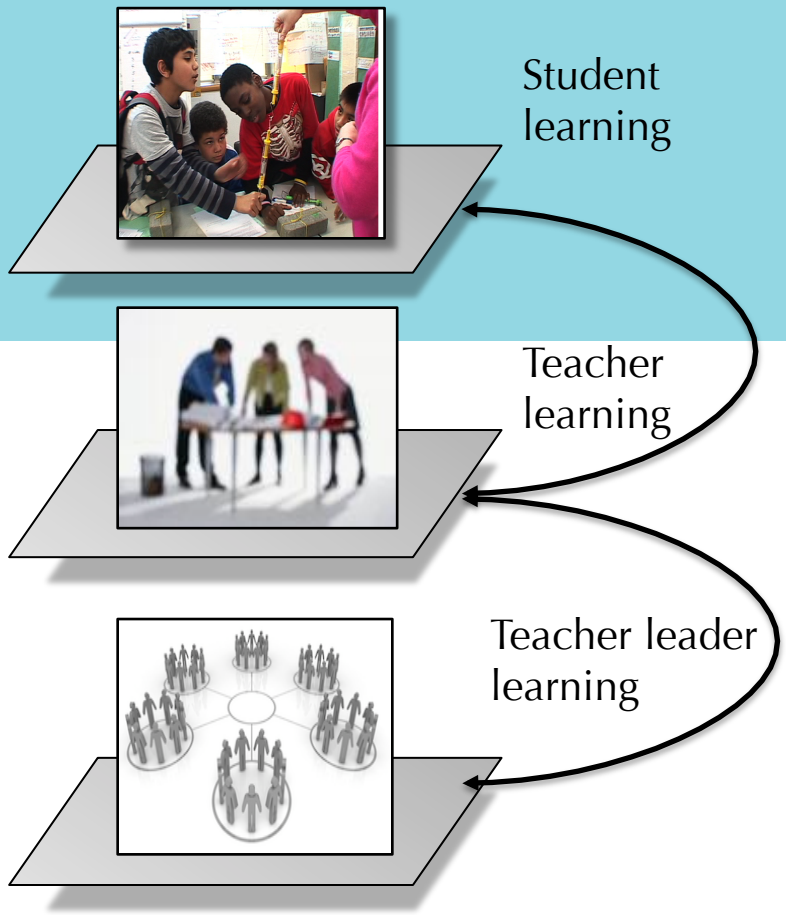
UNIVERSITY of WASHINGTON

Mobilizing a Community for Learning

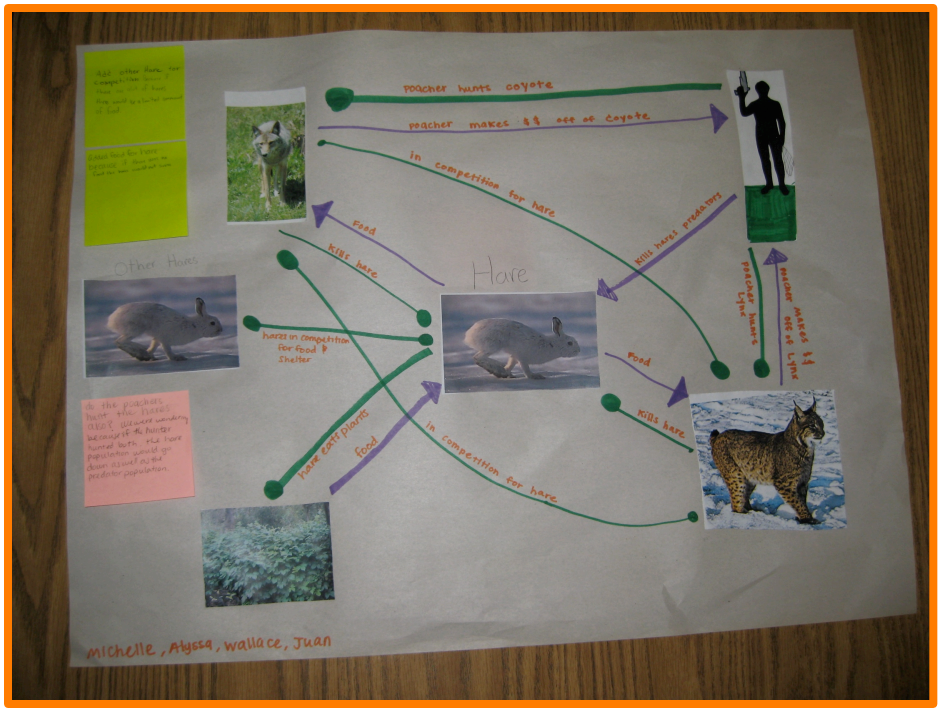
South Carolina's Academic Standards for Science and Engineering



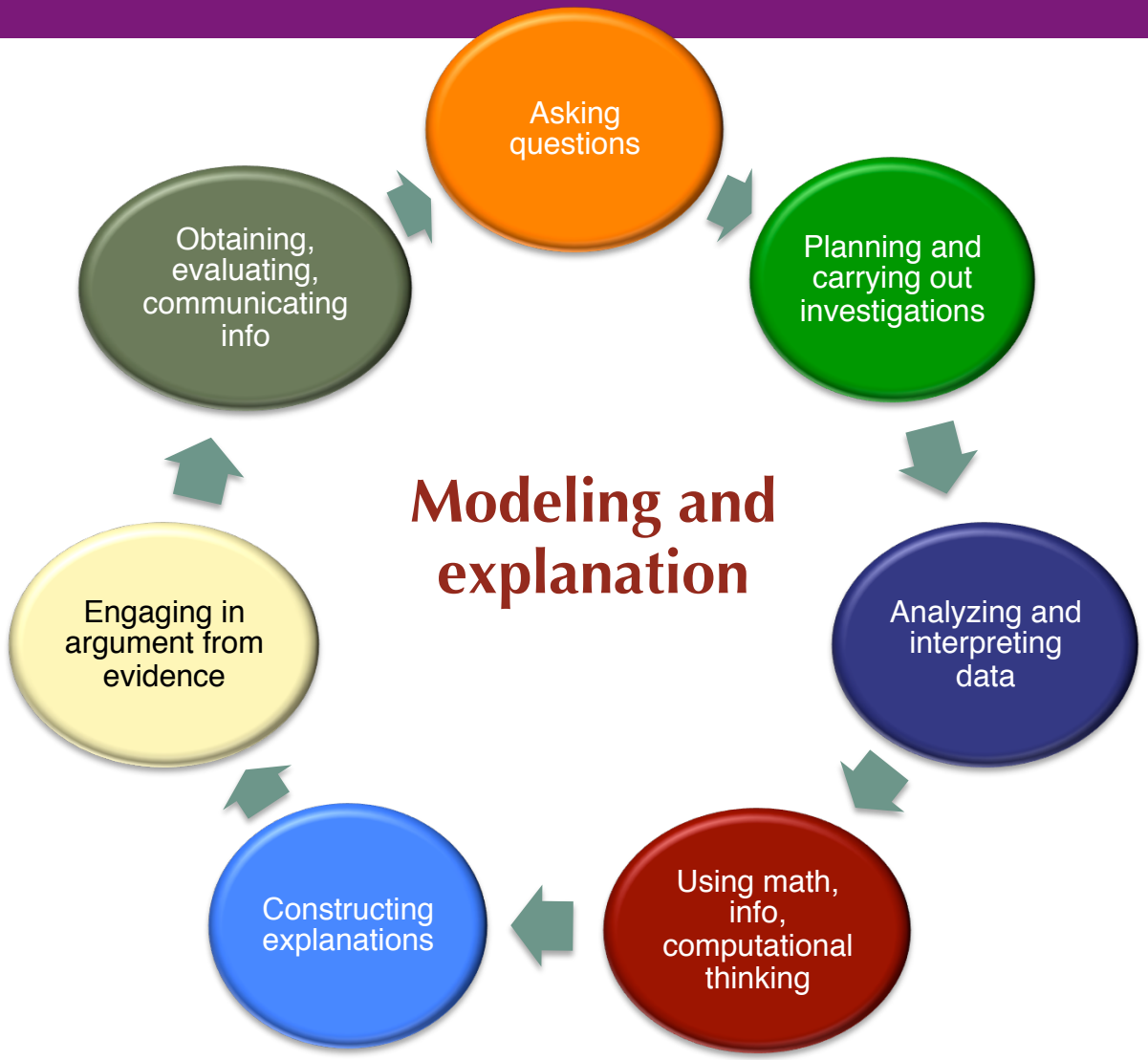
LESS
is more, and…

- Performances by students = scientific practices + core content ideas

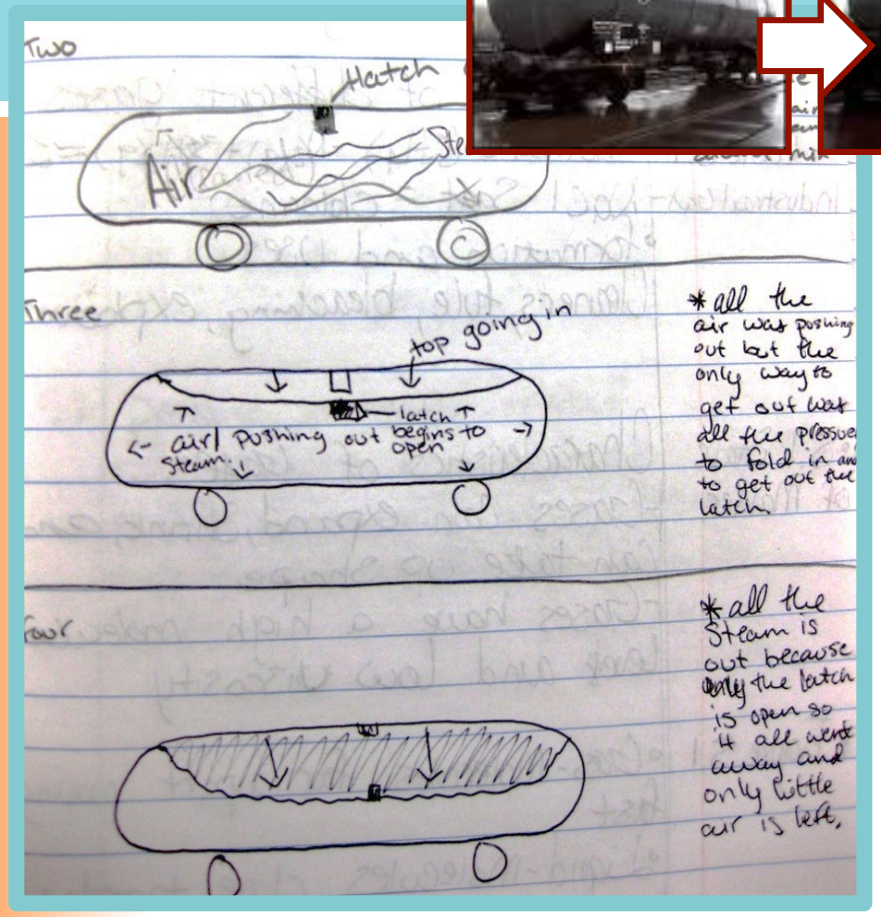
- **"Develop and use a model to support explanations about the transfer of matter and energy into and out of ecosystems."**

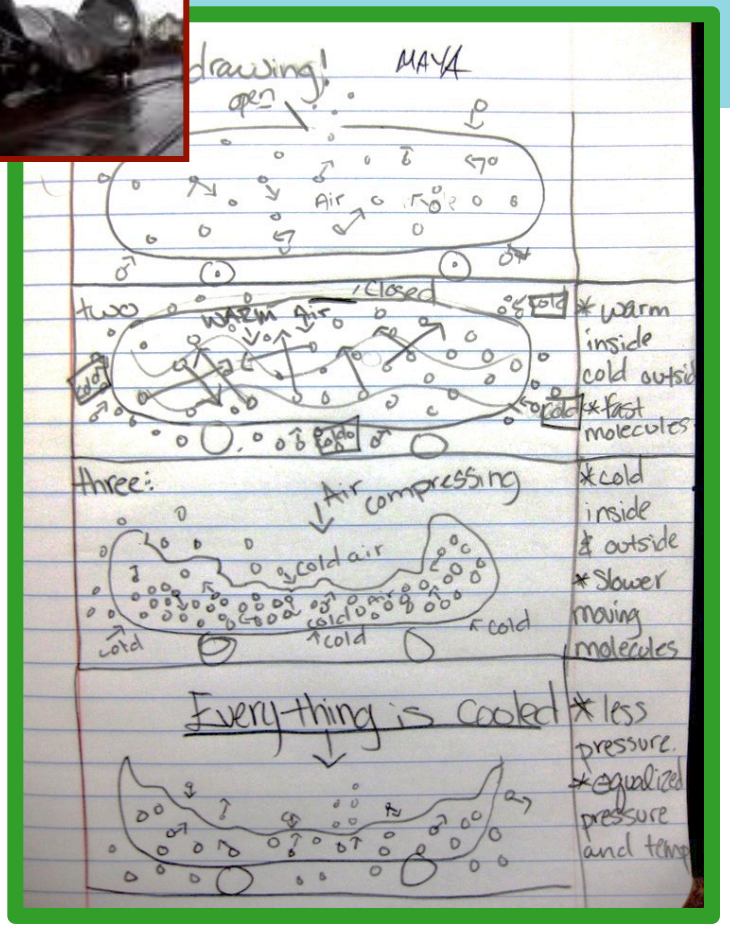


Not all science practices are "equal"



Models are externalized ideas that change over time in response to evidence—pushing towards explanation



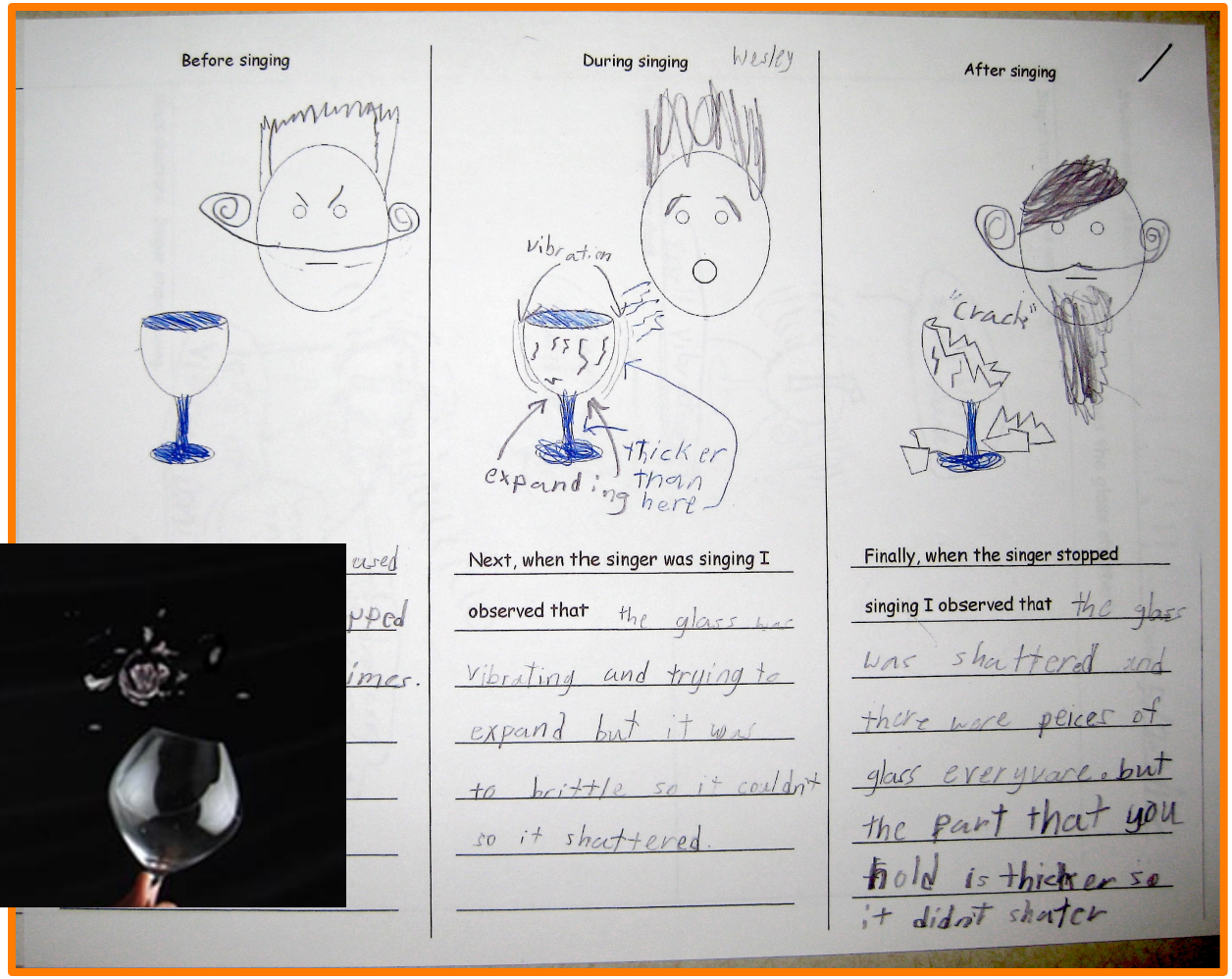


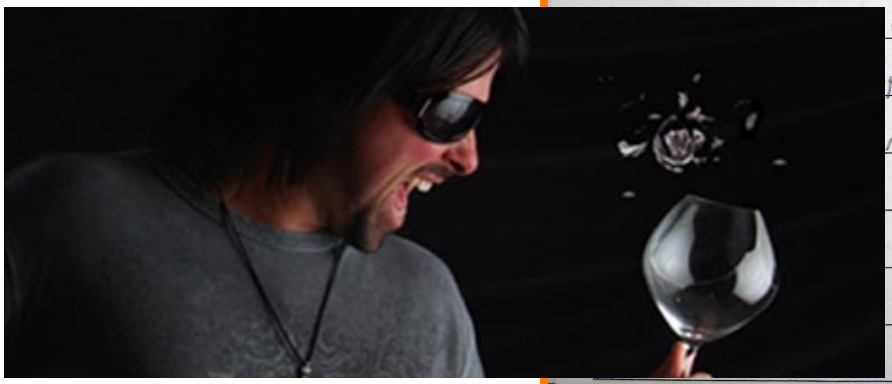
OK, but what does this look like in the classroom?

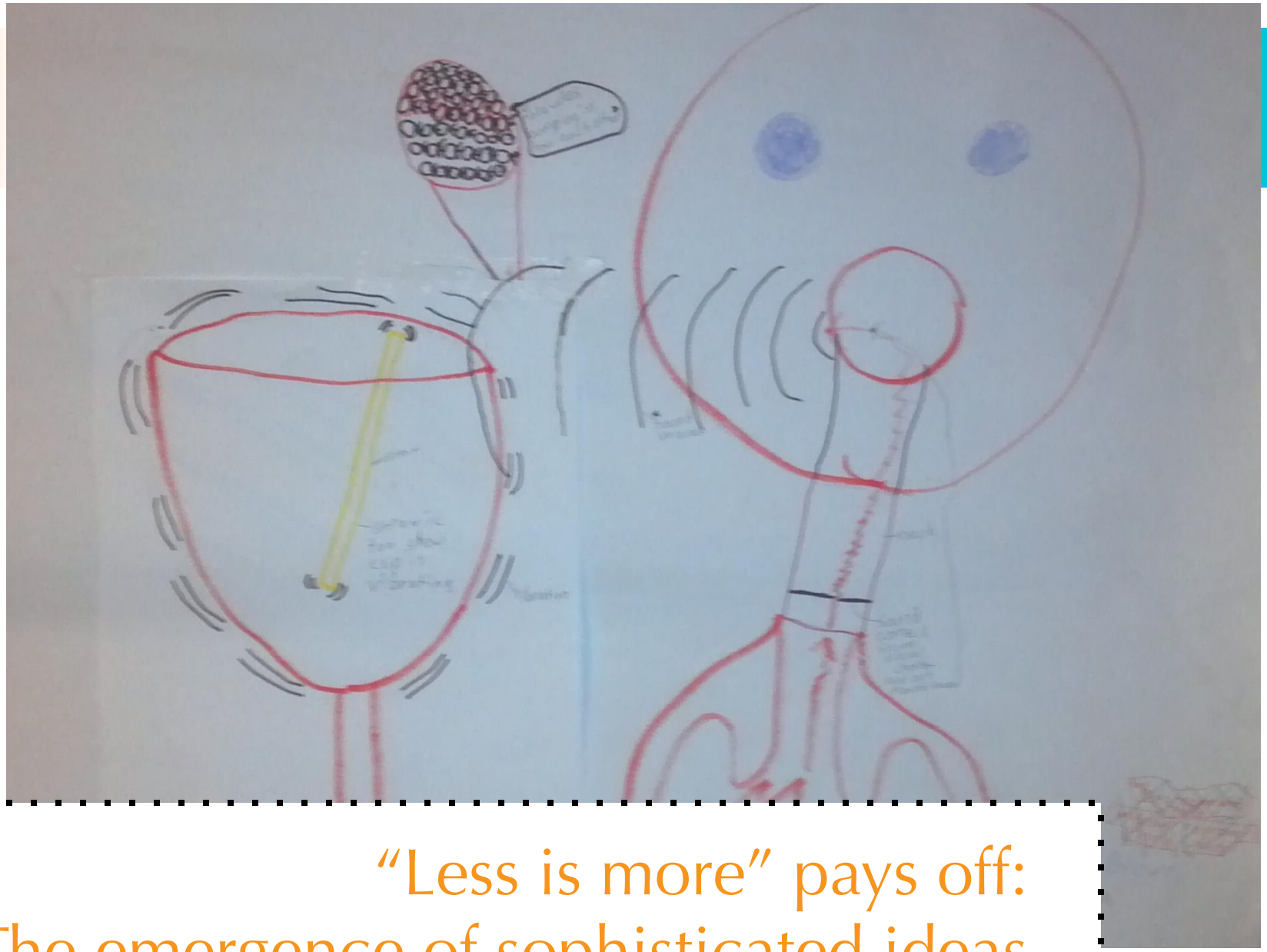
Teaching 3rd graders about sound

Will we see:

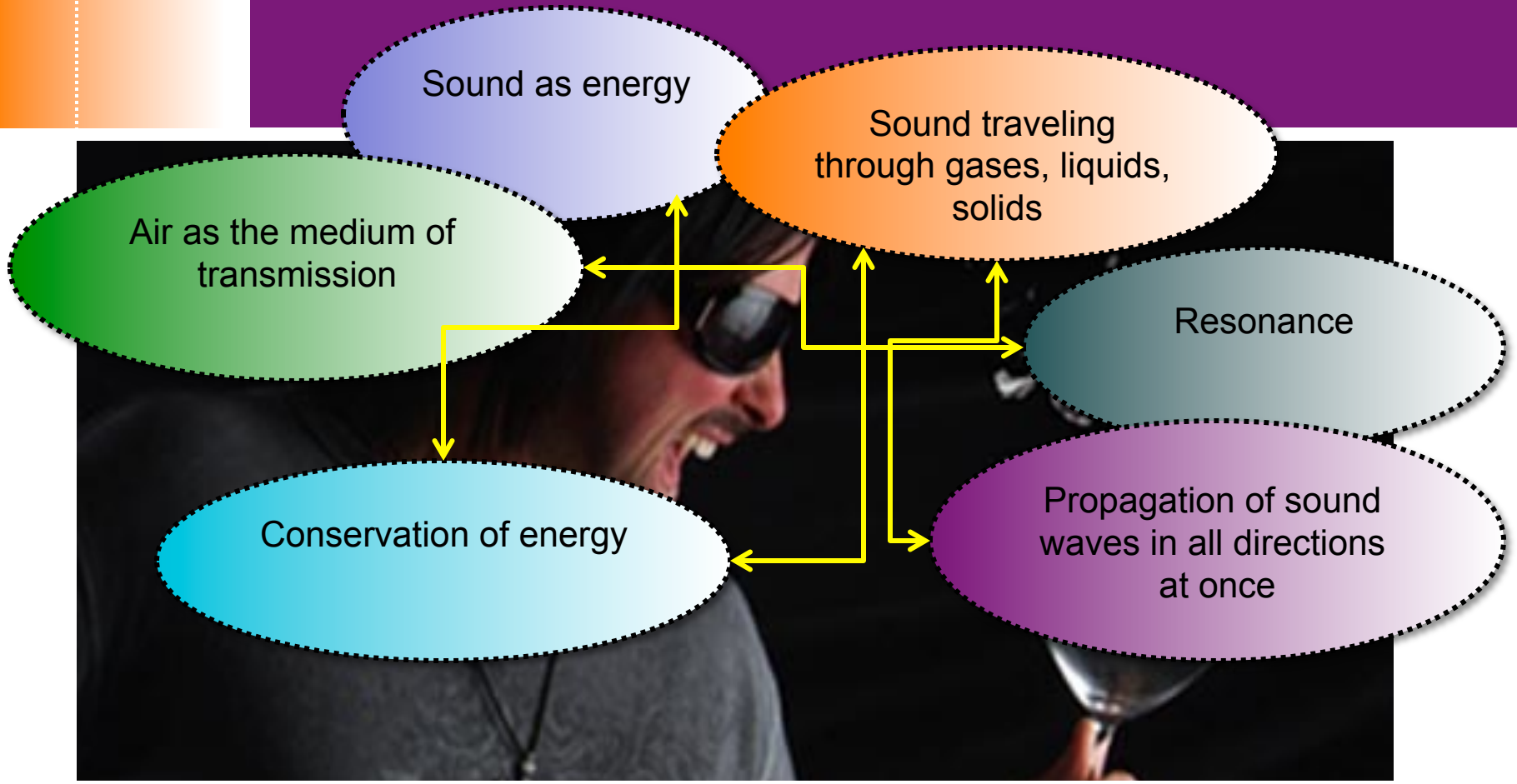
- Hypothesizing?
- Asking questions?
- Modeling?
- Explanation?
- Arguing with evidence?
- Designing studies?
- Analyzing data?







"Less is more" pays off:
The emergence of sophisticated ideas



What science ideas have to be "pulled together" by our 3rd graders?

What new teaching will demand

Some of this teaching will be very familiar:

- Lab activities
- Experiments
- Readings

Some will seem very different:

- Basing a unit on one complex phenomenon
- Emphasis on evidence-based explanations
- Asking students to make their thinking public
- Revising ideas in response to new evidence
- Using talk differently in the classroom

The 5 tasks of the teacher leader community

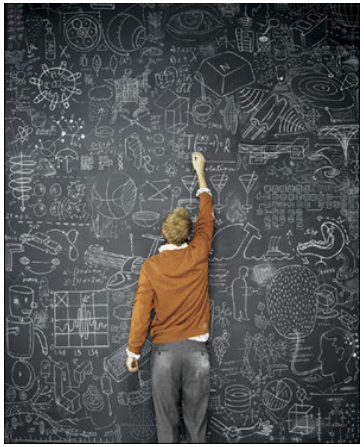
1. Assembling colleagues who can work towards a shared vision of instructional excellence
2. Becoming familiar with the Standards + with ambitious forms of teaching
3. Imagining how all these ideas about practice get represented to teachers
4. Developing tools to help teachers "take the first steps"
5. Arranging for teachers to observe each other taking risks to improve instruction

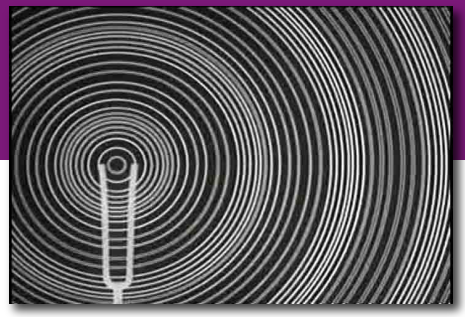
5

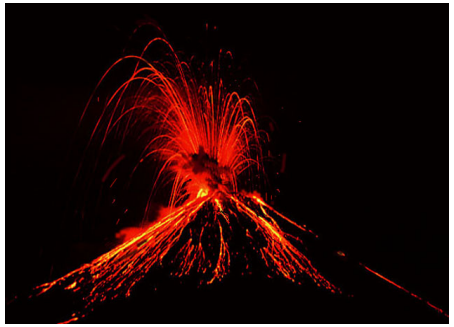
Just following the Standards will not ensure good teaching

What students are capable of	Trends in teaching
• Can reason about abstractions	• Lack of student engagement
• Can construct and revise scientific models	• Content presented as facts, definitions, algorithms
• Can defend, adapt, theories based on evidence	• Few connections between activity and science ideas
• Can design experiments that include sophisticated controls for external variables)	• Student ideas not used as resources, no challenging of ideas
• Can monitoring own progress towards deep understanding	• Questioning and discourse the weakest aspect of classroom practice

Corcoran & Gerry, 2011; Kane & Staiger, 2012; Pasley, 2002; Roth et al., 2006; Weiss et al., 2003







Engagement in practices

For scientists, practices are the means to:

- Discovery
- Innovation
- New puzzles

For students, engagement in practices:

- Fosters deep understanding of content
- Engages them with evidence and argument
- Not just "imitating scientists"