

CREA

# The Growing Mistrust of Science: What can we do in K – 12 Education?

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September 28,2021





# What lead to this mistrust of science?

A look at how learners in K- 12 experience science:

- Taught as a body of knowledge
- Tests have right and wrong answers
- The use of repeatable, observable evidence to support a scientific claim is not a focus
- Don't experience that models which explain phenomena can change as a result of new evidence. Rather, they are given models that work.
- Seldom experience what it means to do science.
  - Empirical nature of science – based on evidence
  - Tentative nature of science
  - Consensus nature of science (experts agree with the evidence-based claims and models)
  - Replication



# What can we do?

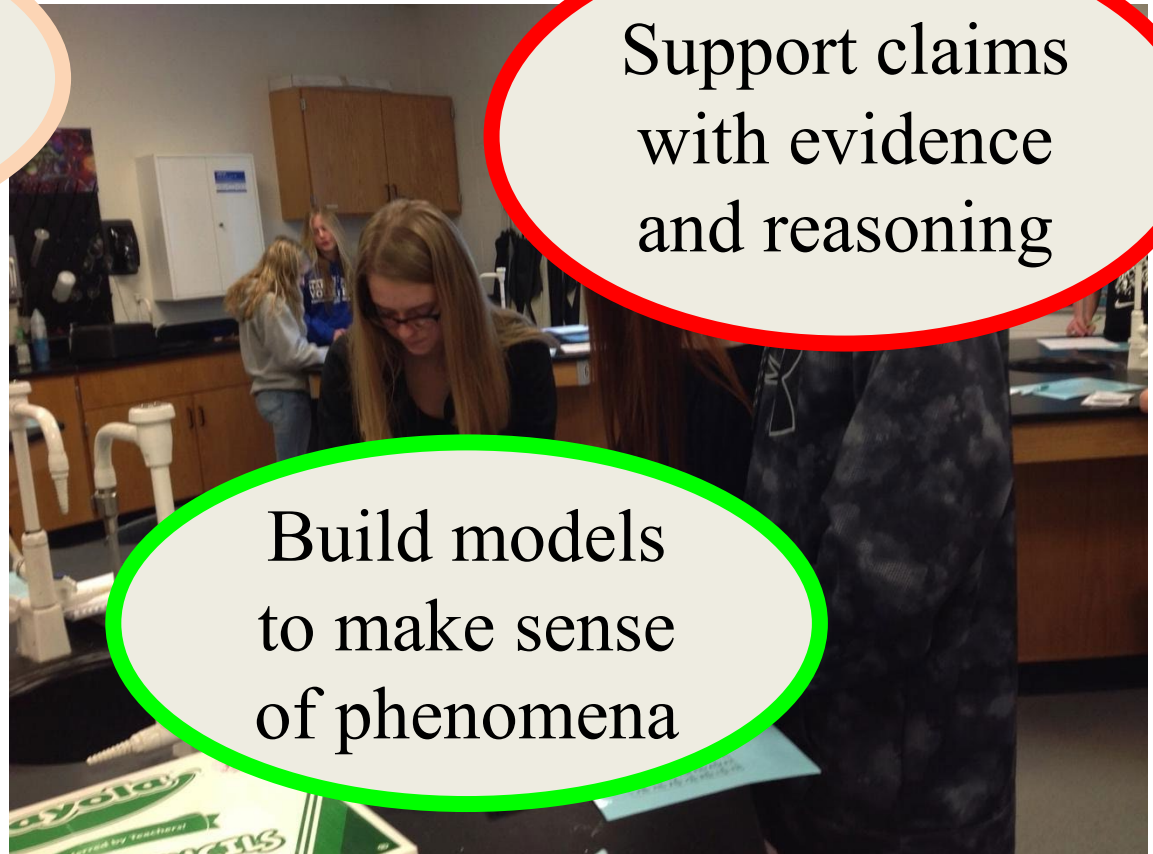
## Learn Science by Doing Science

Experience the dynamic nature of science



Debate the validity of evidence

Support claims with evidence and reasoning

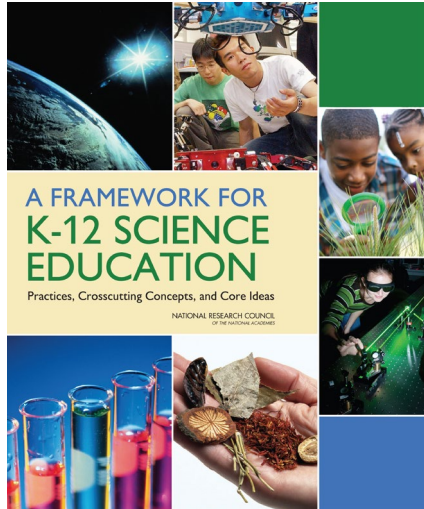


Build models to make sense of phenomena



## Need to fundamentally change how students learn science

A new vision  
for teaching  
and learning  
science

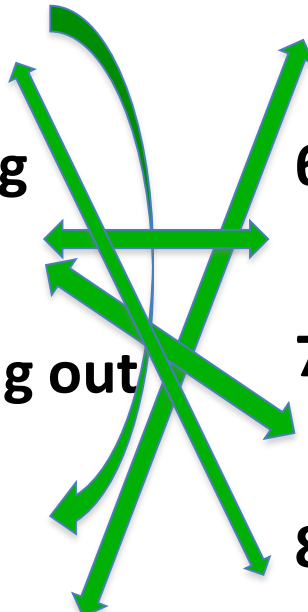


1. Focus on explaining phenomena or designing solutions to problems
2. 3-Dimensional Learning
  1. Organized around disciplinary core explanatory ideas
  2. Central role of scientific and engineering practices
  3. Use of crosscutting concepts
3. Coherence: building and applying ideas across time
4. Learning science is for all students



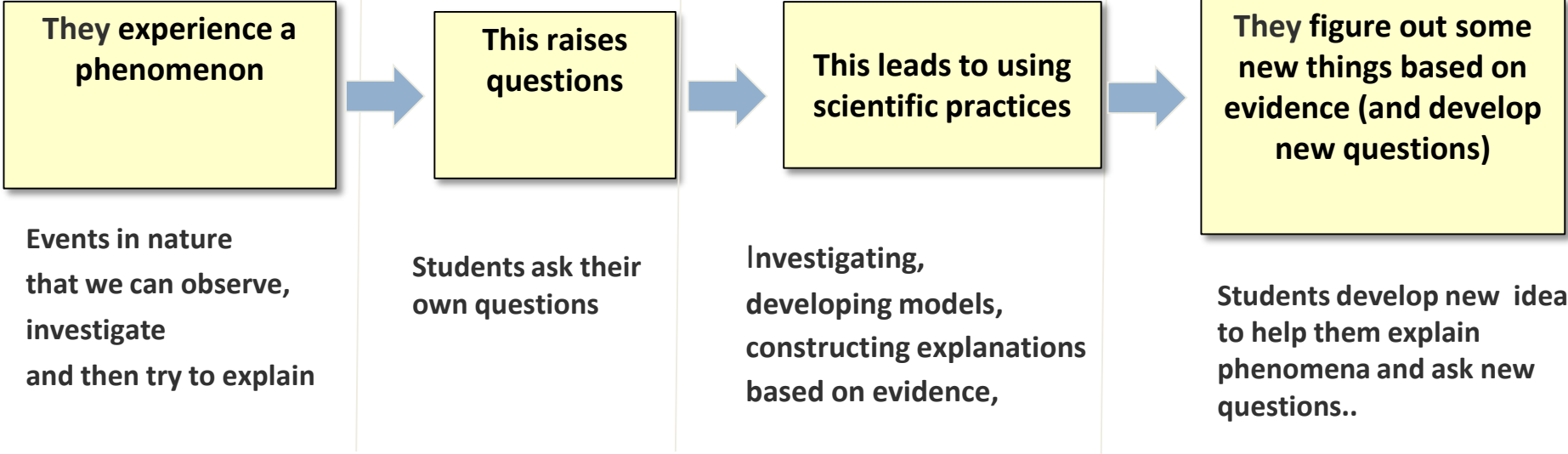
# Science and Engineering Practices

The multiple ways of knowing and doing that scientists and engineers use to study the natural world and design world.

1. Asking questions and defining problems
  2. Developing and using models
  3. Planning and carrying out investigations and designing solutions
  4. Analyzing and interpreting data
  5. Using mathematics and computational thinking
  6. Constructing explanations and designing solutions
  7. Engaging in argument from evidence
  8. Obtaining, evaluating, and communicating information
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*The practices work together – they are not separated!*

The “figuring out” process, driven by phenomena and use of evidence can bring about the changes needed in science education,



# Thank you!

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