Formative Assessment of Modeling Practice Throughout a Physical Science Course for Prospective Elementary Teachers

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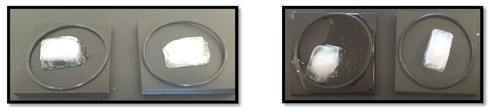
How can we assess prospective elementary teachers' modeling practice as they investigate and make sense of a phenomenon?

Phenomenon



Why does one ice cube melt faster than the other?

Investigations

Initial Models

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OBSERVATIONS

WRITE about what you see.

What questions do you have about the phenomenon?

DRAW what you see.

INFERENCES

WRITE about how/why you think the phenomenon occurs. Describe the process.

DRAW to describe the mechanisms that cause the phenomenon to occur. (Draw what we can't see.)

After We've Explored Models

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Exhibition Model & Scientific Explanation

Scientific Explanation: CER

QUESTION

CLAIM(S) — This statement should answer the question.

EVIDENCE — This statement should include data as evidence of your claim.

REASONING

Connect the evidence to the claim. Use scientific concepts to reason about why the evidence supports the claim.

Exhibition Model

Agree/Disagree w/ Features of Others' Models

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Provisional Model & Scientific Explanation

Agree and disagree based on scientific evidence, viewing other exhibition models, and peer discourse.

CONCEPTUAL REPRESENTATIONS from other exhibition models.

Claim (Write out someone's claim). **Agree or Disagree? Explain.**

VISUAL REPRESENTATIONS from other exhibition models.

Representation 1: **Agree or Disagree? Explain.**

Representation 2: **Agree or Disagree? Explain.**

Representation 3: **Agree or Disagree? Explain.**

Representation 4: **Agree or Disagree? Explain.**

Our Best Thinking Models

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Provisional Model

Question

Claim

Evidence

Reasoning

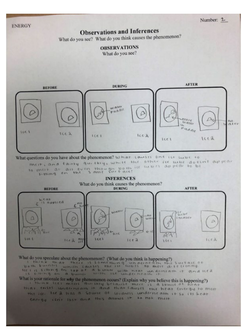
#__

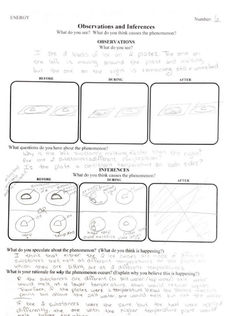
Provisional Model

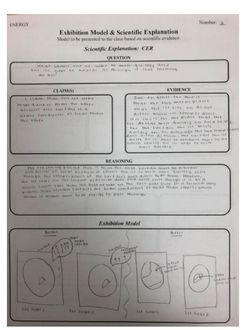
QUESTION

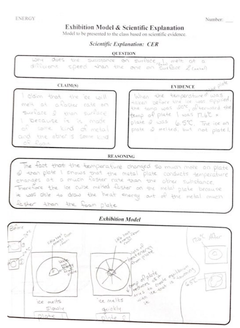
Provisional Model

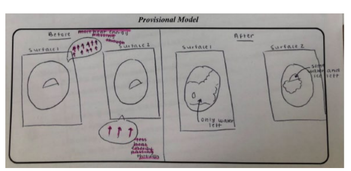
EXAMPLES

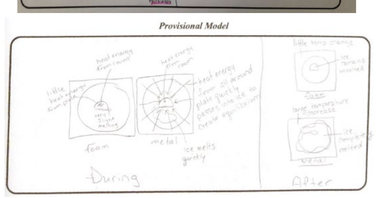


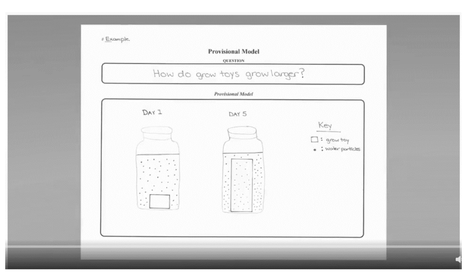












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