

Assessing Student Learning of the Next Generation Science Standards: Reflections from RILS 2017

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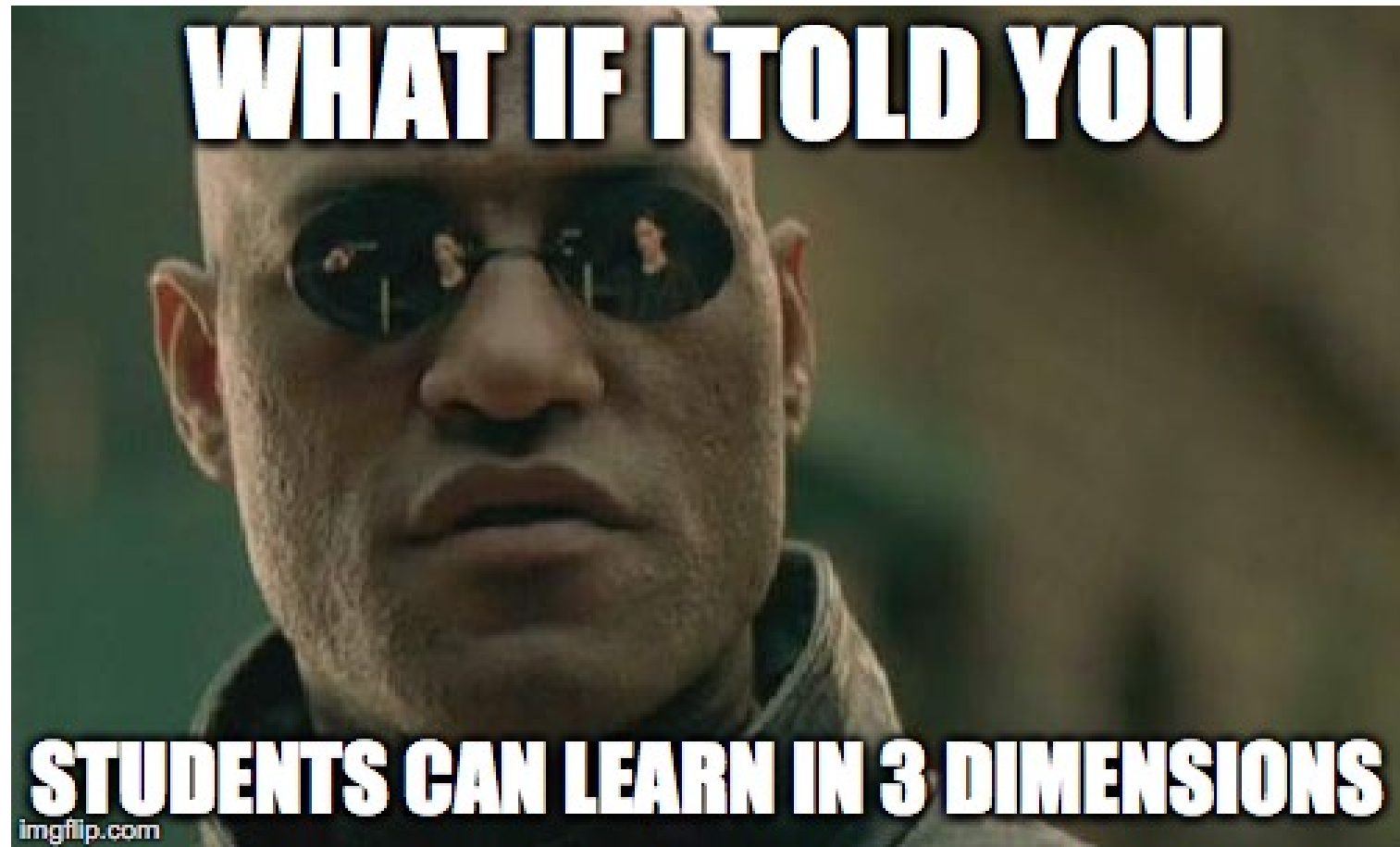
#RILS2017 Reidy Interactive Lecture Series

Portsmouth, NH

September 28-29, 2017

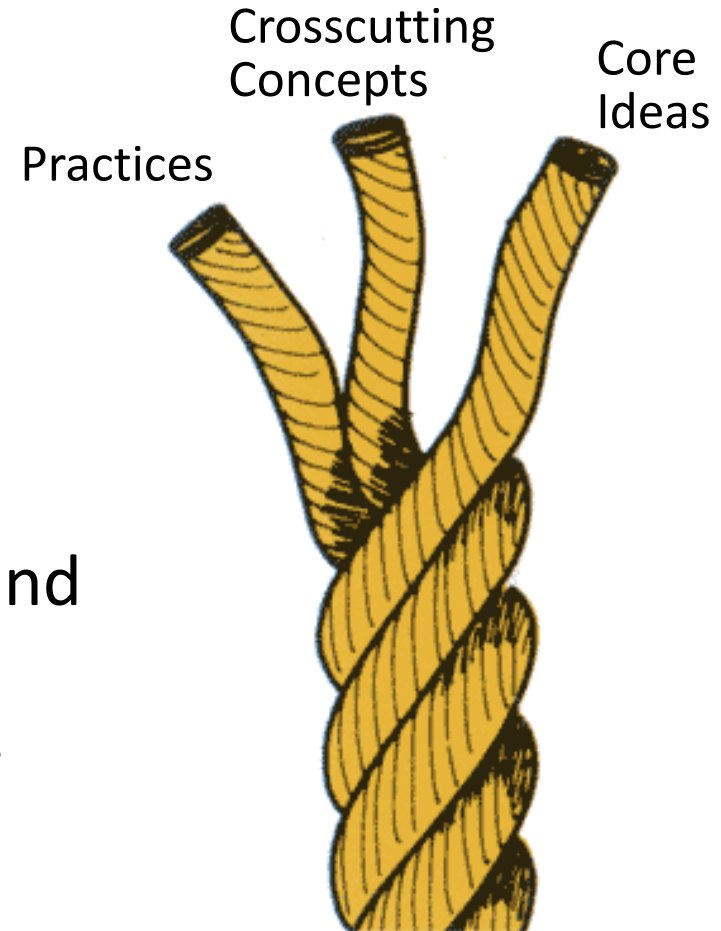


Teaching and learning the NGSS



3 Dimensional Learning and Assessment

- Students engage deeply with phenomena
 - Develop questions
 - Use practices, concepts, and core ideas to build and test models and theories
- This is a substantial shift from learning discrete knowledge and skills
- Requires that we break out of the summative accountability mindset



Domain specification



Domain specification

- $SEP \times DCI \times CCC$ = an astonishing number of assessment targets!
- Prioritization important
 - Document approach and rationale
 - Must have a 'bridge' between standards and specifications
- Matrix sampling as a promising solution

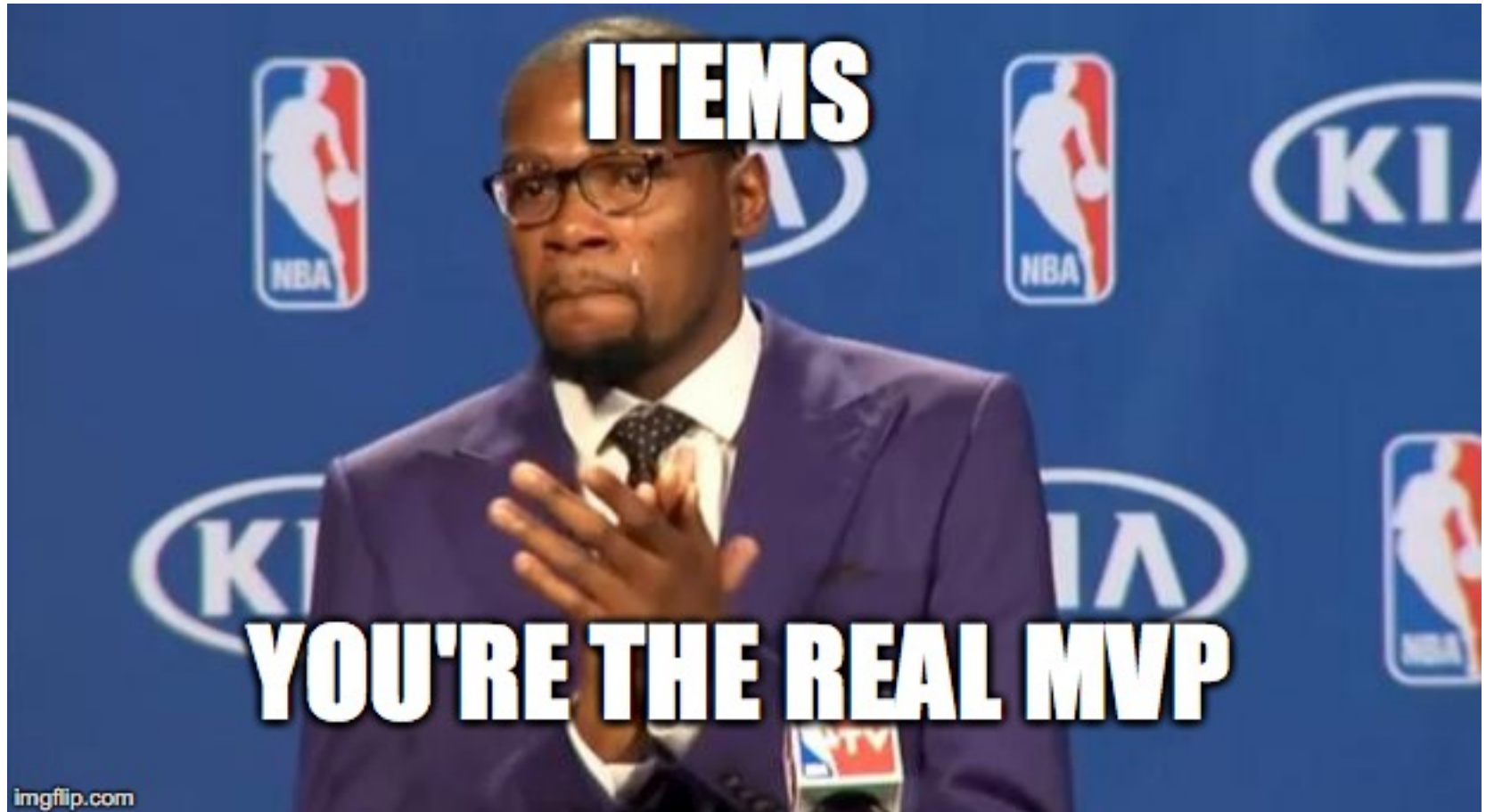
Reporting



Reporting

- Many challenges with reporting to include
 - Providing adequate information to support each claim
 - Avoiding narrowing the curriculum
 - Staying true to the intent of the NGSS

Item Walk



Item walk

- The quality of any assessment is only as good as its items
- Items and tasks signal what is valued and influence instruction
- In the best case
 - Items and tasks incorporate multiple dimensions of the NGSS
 - Task models, which address how design supports intended cognition, guides development
 - Attention to rubrics and scoring in design

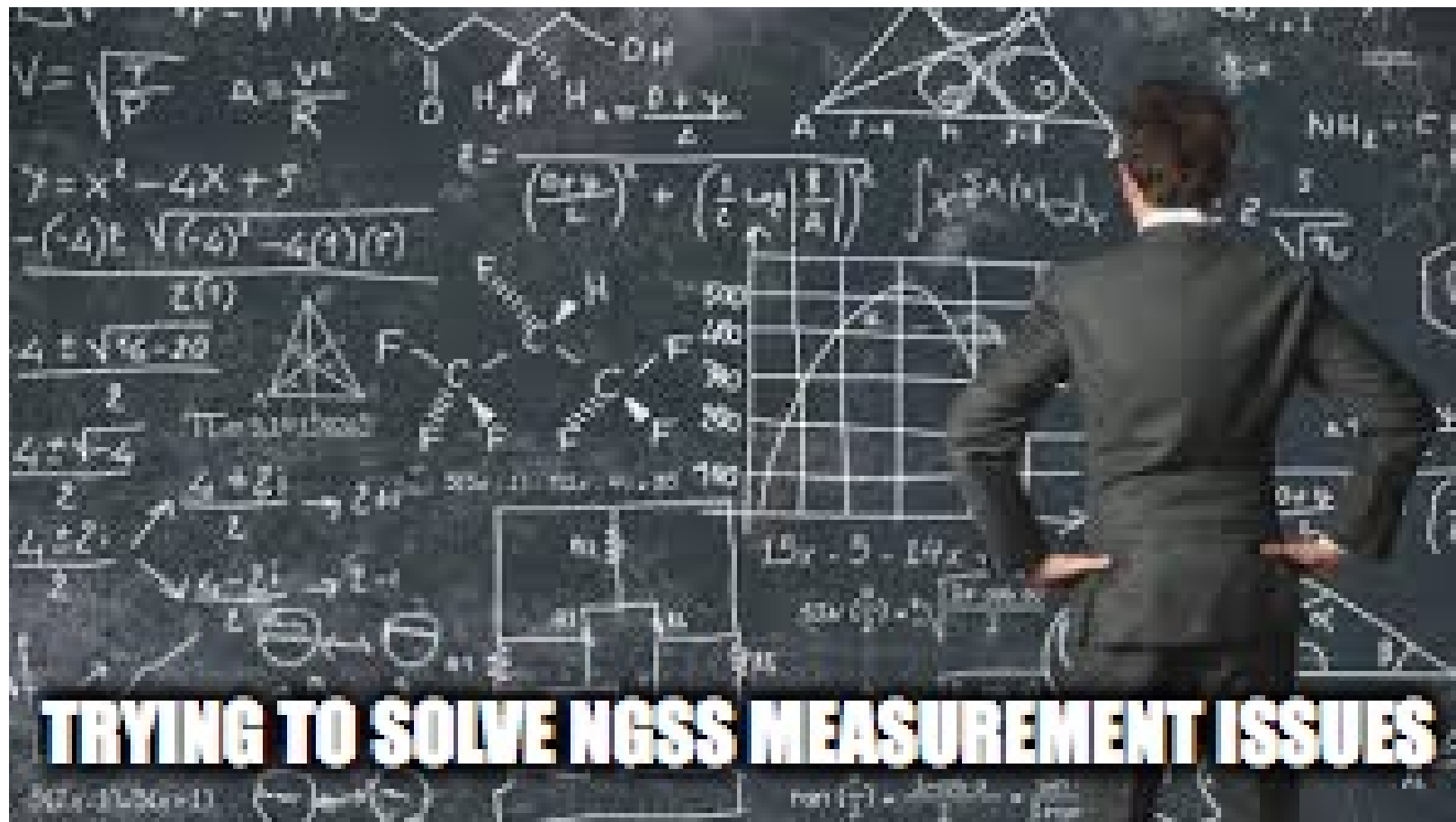
Alignment



Alignment

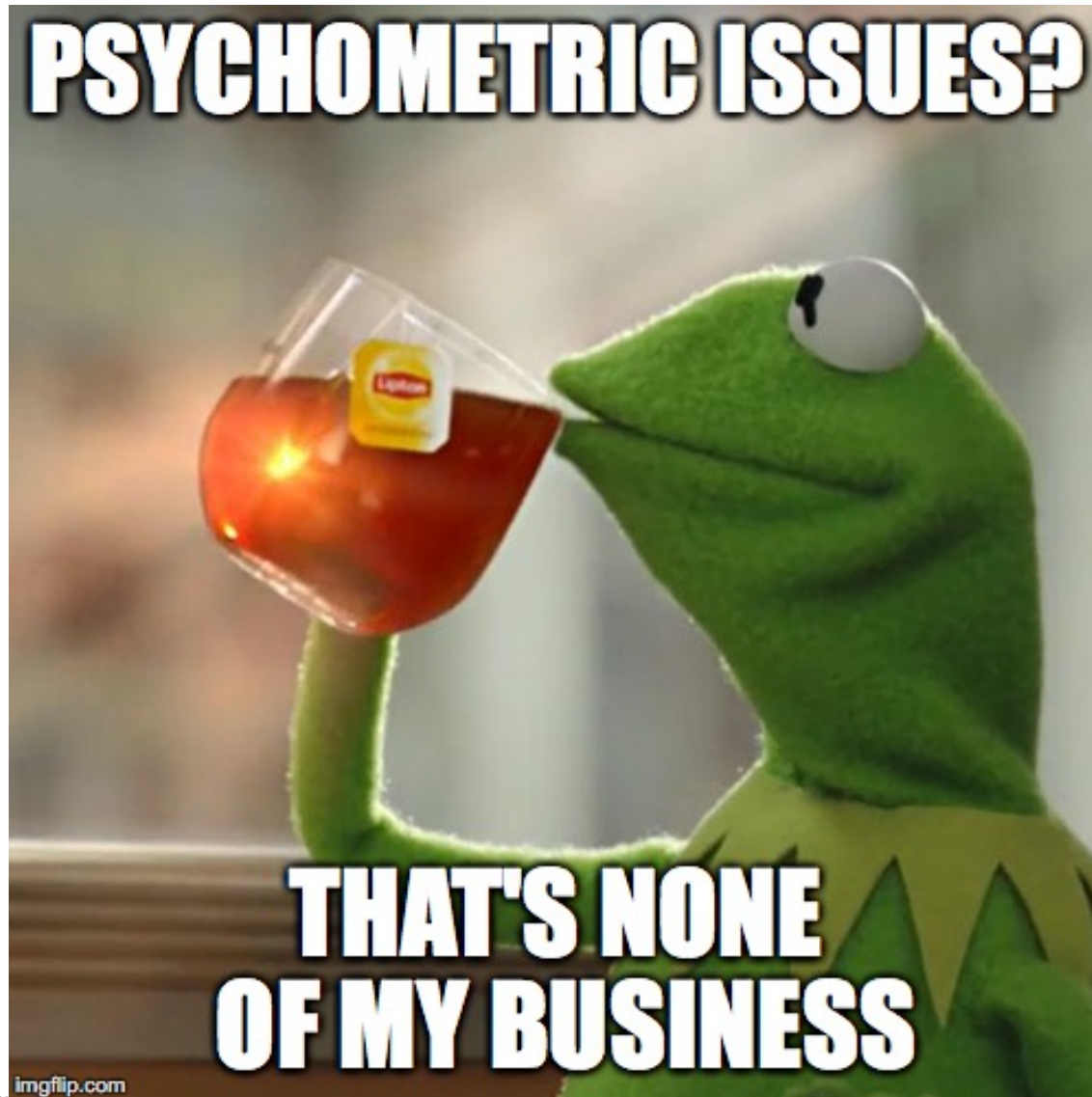
- The multidimensional nature of the NGSS suggests traditional approaches to alignment must be adapted or expanded to honor the intent of the NGSS
- Notwithstanding, we have a strong base from which to draw to apply alignment strategies

Measurement



TRYING TO SOLVE NGSS MEASUREMENT ISSUES

Measurement



Measurement

- Don't let the tail wag the dog: ensure decisions are guided by
 - priorities for interpretations and use (e.g. signaling as priority)
 - Practical constraints (e.g. testing time, cost)
- Verify assumptions along the way (e.g. unidimensionality, independence)
- Clarify comparability claims (e.g. across form, time, mode, unit)

Validity



*If measurement (or assessment) is our religion
no one can question that we have established
validity as our god.*

Living in a Post-Validity World: Cleaning Up Our Messick

Charles A. DePascale

Validation

- We can and should build from a robust (if not entirely unified) base of validity approaches
- Sources of evidence from the 2014 Joint Standards
 - Evidence based on test content
 - Evidence based on response process
 - Internal structure
 - Relationship to other variables
 - Consequences

American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. Standards for Educational and Psychological Testing. Washington, DC: 2014.

Validation

- *Traditional external forms of validation, which emphasize consistency with other measures, as well as the search for indirect indicators that can show this consistency statistically, should be supplemented with evidence of the cognitive and substantive aspects of validity*
- Emphasize fairness and opportunity to learn

National Research Council. (2014). *Developing Assessments for the Next Generation Science Standards*. Committee on Developing Assessments of Science Proficiency in K-12. Board on Testing and Assessment and Board on Science Education, J.W. Pellegrino, M.R. Wilson, J.A. Koenig, and A.S. Beatty, *Editors*. Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Implementation

BRACE YOURSELF



imgflip.com

Implementation

- Beware of Pyrrhic ‘victories’
- Summative assessment can’t and shouldn’t shoulder a disproportionate burden
- Don’t underestimate the support necessary to provide adequate opportunity to learn.
 - In particular, how are we supporting traditionally underserved groups?
- What will it take to get ‘buy-in’ particularly when (if?) initial results are not particularly encouraging?
- QA at every step is critical.
 - Little things become big things.

For more information:

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