Formative Assessment
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"If I had to reduce all of educational psychology to just one principle, I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him [or her] accordingly” (Ausubel, 1968)
Assessments and Inferences

• “If something exists, it must exist in some quantity and that quantity can be measured.”

• Cognitive assessments are meant to measure things we cannot see
  – Math ability
  – Reading level
  – Narcissism
  – IQ
Assessments and Inferences

• Because it is unseen, difficult to measure
  – Even seen objects are difficult to measure without error
  – Unseen has more error
  – Assessments attempt to quantify error mathematically, Standard Error of Measurement (SEM)
Assessments and Inferences

• All data is meaningless until we apply mean, or give the number value
  – I scored a 10- meaningless
  – It was out of 100- I didn’t do well
  – Highest grade in the group- I did good
  – The group was filled with 5 year olds- not so good
Scientific Method

• To understand the data we make a hypothesis
  – Johnny is extremely low in math. He is hard to understand verbally, but any written work and homework comes back completely incoherent.
Scientific Method

• We then test the hypothesis
  – Ask Johnny a question
  – Give everyone homework and see how Johnny does
  – Call Johnny to the board to walk through the assignment
  – All result in incoherent difficult to decipher responses verbally or written
Scientific Method

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  – Call Johnny to the board to walk through the assignment
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• Other variables? Can we control for them?
Scientific Method

• Timing is everything to uncover what is really taking place
• Most curriculum builds
• If we miss foundational skills, the overall knowledge structure is weaker
• Need to test and retest hypothesis with a fairly rapid turn around
Scientific Method

1. Ask Question
2. Do Background Research
3. Construct Hypothesis
4. Test with an Experiment
5. Analyze Results
   - Draw Conclusion
     - Hypothesis Is True
     - Hypothesis Is False or Partially True
6. Report Results
7. Think! Try Again
Summative and Formative Assessments

• Summative Assessment: evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program.

• Formative Assessment: a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students’ achievement of intended instructional outcomes.
Summative and Formative Assessments

“Formative Assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students’ achievement of intended instructional outcomes” (Wiley, 2013)
Classroom-Based Formative Assessment Techniques

- Interviews
- Show Me
- Hinge Questions
- Exit Tasks

Wray, 2016
Observations

“We know it is more informative to observe a student during a mathematical activity than to grade his papers.” (Freudenthal, 1973)
Observations

1. What would you hope to observe?
2. How would you know “it” if you saw it?
3. How might you record/note the observation?
4. What misconceptions might you observe?

(Fennell, Kobett, Wray, 2015)
# Observations

<table>
<thead>
<tr>
<th>Intent of the Observation</th>
<th>Brief Description/Comments</th>
<th>Observed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Content</td>
<td>Yes</td>
<td>Partially</td>
</tr>
<tr>
<td>Mathematical Practice(s)</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Student Engagement</td>
<td>Some</td>
<td></td>
</tr>
<tr>
<td>General Comment:</td>
<td>FEW</td>
<td></td>
</tr>
<tr>
<td>Feedback to Students:</td>
<td>ALL</td>
<td></td>
</tr>
</tbody>
</table>

Fennell, Kobett, Wray, 2015, p. 53
Interviews

• What prompts one?
• What do you want to know?
• What do you anticipate to hear and how should you respond?
## Interviews

<table>
<thead>
<tr>
<th>Assessing</th>
<th>Student Response</th>
<th>Feedback to Student(s)</th>
<th>Teacher Comments/Observations</th>
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</thead>
<tbody>
<tr>
<td>Conceptual Understanding</td>
<td></td>
<td></td>
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<tr>
<td>Procedural Fluency</td>
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<tr>
<td>Strategies Used</td>
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<tr>
<td>Student Prerequisites and Misconceptions</td>
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<tr>
<td>Disposition</td>
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<td></td>
<td></td>
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<tr>
<td>General Comment:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fennell, Kobett, Wray, 2015, p. 55
Show Me’s

• Stop-and-drop activity to show how something works
• Combines elements of observation and interview
• Often used to validate information from an observation or interview
• May be administered individually, small group, or as whole group

Fennell, Kobett, Wray, 2015
Hinge Questions

• ‘Hinge-Point’ to your lesson
• Was the lesson successful or not?
• Efficiency
  – Less than one minute to respond
  – A matter of seconds to check
• Inform and shape the following day’s lesson

Fennell, Kobett, Wray, 2015
Hinge Questions Considerations

- Will the hinge question assess important mathematical understandings of the day?
- Will students understand the question?
- Will students be able to respond in about 1 minute?

Fennell, Kobett, Wray, 2015
Hinge Questions Considerations

• Can responses be analyzed and interpreted quickly?
• Will responses assist in shaping planning for tomorrow’s lesson? How?

Fennell, Kobett, Wray, 2015
Exit Tasks

• “Meaningful exit tasks are not trivial, as they serve as a barometer of the students’ understandings.” (Fennell, 2015)

• Informs or potential differentiation and groupings for the following day

• Should be the capstone to the major learning objective of the day

(Fennell, Kobett, Wray, 2015)
Daily Considerations

- **Interviews**
- **Show Me**
  - As needed 1-1 or small group; “I want to know more about what I just observed.”
- **Hinge Questions**
  - Every lesson’s “deal breaker”
  - An explicit performance of what I would like to see demonstrated.
- **Observations**
  - Recorded; used to guide/monitor what’s going on...
- **Exit Tasks**
  - Hinge Question + Exit task (next day’s plan!)

Wray, 2016
The Formative Process

Using the Formative Assessment Rubrics, Reflection and Observation Tools to Support Professional Reflection on Practice

Commissioned by the Formative Assessment for Teachers and Students (FAST) State Collaborative on Assessment and Student Standards (SCASS) of the Council of Chief State School Officers (CCSSO)

Member States: Arkansas, Connecticut, Hawaii, Illinois, Iowa, Kansas, Kentucky, Maryland, Michigan and North Carolina

By Caroline Wylie and Christine Lyon, Educational Testing Service
May 2013

www.ksdetasn.org/mtss
The Formative Process

• 2 Sections (1 of my choosing one of yours)
  – 15 min conversation with group
  – 3 min shareout
  • Greatest established practice?
  • Greatest way to maximize a current practice?
Further Reading

• Full Resource in handouts

• *The Formative 5* – Skip Fennel, Beth Kobett, John Wray
Thank you!

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