Formative Assessment

Presented by the UIndy Teach (STEM)³ Scholars

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Agenda for the Session

- Overview of UIndy Teach (STEM)³
- Outcomes for the session
- Formative assessment overview
- Formative assessment strategies
- Wrap-up
UIndy Teach (STEM)³

• A one-year residency MAT program

• Prepares candidates with an undergraduate STEM degree for a career in teaching middle and secondary mathematics or science

• Candidates are immersed in partner schools from the first day of the school year to the 2nd week of May

• Curriculum includes education, and mathematics and science content, with an emphasis on PBL (delivered by School of Education and College of Arts and Sciences faculty)

• Full tuition stipends are available for qualified applicants!
Outcomes for the Session

As a result of participating in this session, participants will:

1. be able to articulate why the use of formative assessments is important

2. leave with a variety of formative assessments that are designed to actively engage students while also providing data about student learning.
A Pre-Assessment

Peak and Valley Graph Self-Assessment

Create a peak and valley graph to show your current knowledge level for each strategy listed below.

<table>
<thead>
<tr>
<th>Knowledge Level</th>
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<td>Odd One Out</td>
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<td>CSI Color, Symbol, Image</td>
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Formative Assessment Overview

What is formative assessment?

“Formative assessment refers to a wide variety of methods that teachers use to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or course.”

The Glossary of Education Reform
edglossary.org/formative-assessment/
April 29, 2014
Why is formative assessment important?

In a research project by Black and William (1998), the improvement of formative assessment resulted in learning gains larger than one-half a standard deviation which equates to an average student moving from the 50th percentile to the 85th percentile.
Clone the Author / 5-3-1

Think of your 5 favorite cereals as a kid.

Compare your list to one person around you.

Narrow your lists down to the 3 best cereals.

Find another group of 2 people and compare your lists.

Narrow your list down to the ONE best cereal.
Clone the Author / 5-3-1

This strategy is great for:

- Literacy
  - Pulling out main ideas from texts
- Summarizing Learning
  - Coming up with key points and main ideas from a unit or lesson

Students will need to justify why things are important in order to narrow their choices, leading to deeper understanding.
Fact First Questioning

“Valence electrons are involved in bonding. Why are valence electrons involved in bonding?”

“Methane (cow farts) is bad for the environment. In what ways are cow farts bad for the environment?”

- Moves from a simple recall question to one that promotes deeper understanding
- Ensure there is enough wait time!
- Listen carefully to answers to guide discussion
Laura Gardner

Concept Card Mapping
1. Students are provided with topics, vocabulary and phrases on cards in small groups

1. Students work together to arrange cards into a concept map

1. Groups then share their concept maps and explain the rationale behind their connections

Laura Gardner

Human Graphs
A game played on ice between two teams of 4. Each team takes turns “throwing” a polished granite stone, also called a “rock” towards four concentric circles known as the “house”. Each team member gets to throw two rocks towards the house during a round, or an “end”. The rock closest to the house center, known as the “button”, after the end is awarded points.

The curling sheet - or field of play - is sprayed with water droplets to give it a bumpy texture. The trajectory of the rock across the curling sheet is influenced by the sweepers who polish the ice in front of the rock to lessen the friction.

The rock must land between two designated lines on the curling sheet; the hogline and the backline. Strategic throws (known as deliveries) can be made to knock other rocks out of the house. Two main types of delivery dominate the sport - the flat-foot deliver or the controversial Manitoba Tuck deliver.

Currently Curling is most popular in Canada but is gaining more recognition after each winter olympics.
Rate your knowledge of Curling from 1-5


5. I’m ready to coach the Olympic team!
1. At the end of a lesson, students are asked a multiple choice question or asked to assess their understanding of a topic.

1. Students then create a graph by standing at a designated location (left side of room for 0 - I do not understand, right sigh of the room for 5 - I could teach this to someone else).

1. This assessment informs the teacher of student's learning.

image accessed from: https://twitter.com/mlle_mcintyre/status/642030219549917184 2/11/19
Gabby Madriz

Commitment Circles
Commitment Circles

1. Students form a circle
2. Make a statement
3. If a student . . .
   a. Agree - Move to the center of the circle
   b. Disagree - Stay on the outside of the circle
4. The groups discuss the statement
5. Students may switch groups
Gabby Madriz

Be the Teacher
Be the Teacher

1. Have students ‘Give Five’
2. Students pair-up based on number
3. Student with low number explains POC
4. Student with high number teaches the student
5. Partners thank one another
### Statement

1. **Cats and dogs can perceive higher frequency sounds than humans can.**

   - [ ] agree
   - [ ] disagree
   - [ ] it depends on
   - [ ] not sure

   My thoughts:
1. students respond individually
   a. choose to agree, disagree, or indicate that they are unsure about the statement
   b. describe their thinking
   c. explain how they can investigate the statement
2. students discuss their ideas in small groups
3. students design a way to test or research information and investigate the statements.

- inquiry based
- chance for metacognition
- provides common experience for discussion
- encourage scientific discussion and argumentation
Kelly Reed
Interest Scale
How interesting is this topic?

Highly Interesting

Not so interesting
1. students discuss what they think topic is about, how much it interests them, and why
2. students place post-it note on scale that matches interest level
3. revisit and have students reposition post-it note
Odd One Out
Odd One Out

1) Tokyo  
2) Houston  
3) Seattle  
4) California

Category:

1) Hammer  
2) Nail  
3) Saw  
4) Wrench

Category:
1. Combines similar items and challenges students to choose which item in the group does not belong

1. Ask the students to justify their reason for selecting the item that does not fit with the others.

Optional
- You can provide the category or let the students come up with the category
Miriam Mawi

CSI

(Color-Symbol-Image)
1. Introduce a new concept

2. Have students think about the concept and jot down what they know. Then, complete the following:
   a. Select a **color** that represents the concept
   b. Create a **symbol** that represents the concept
   c. Create an **image** that represents the concept.
      The image can be a simple sketch.

3. After students create their visual, they provide a justification for each of the visual representations.
Chemical bond

- Color -

- Symbol -

- Sketch -
1. Pick a formative assessment strategy
2. Color
3. Symbol
4. Image

Volunteer?
What questions do you have?
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A Post-Assessment

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Color, Symbol, Image
A couple of resources you might find helpful...


AN

EXTRA BONUS

STRATEGY
Aiming for Success

I can name the 8 moon phases in order and explain why they happen.

Beginner
This is very NEW to me.

Capable
I can do this with some help.

Confident
I can do this on my own.

Expert
I can teach to others.

Quick way to re-connect with your learning goal at the end of class!

tinyurl.com/go6d57g