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:

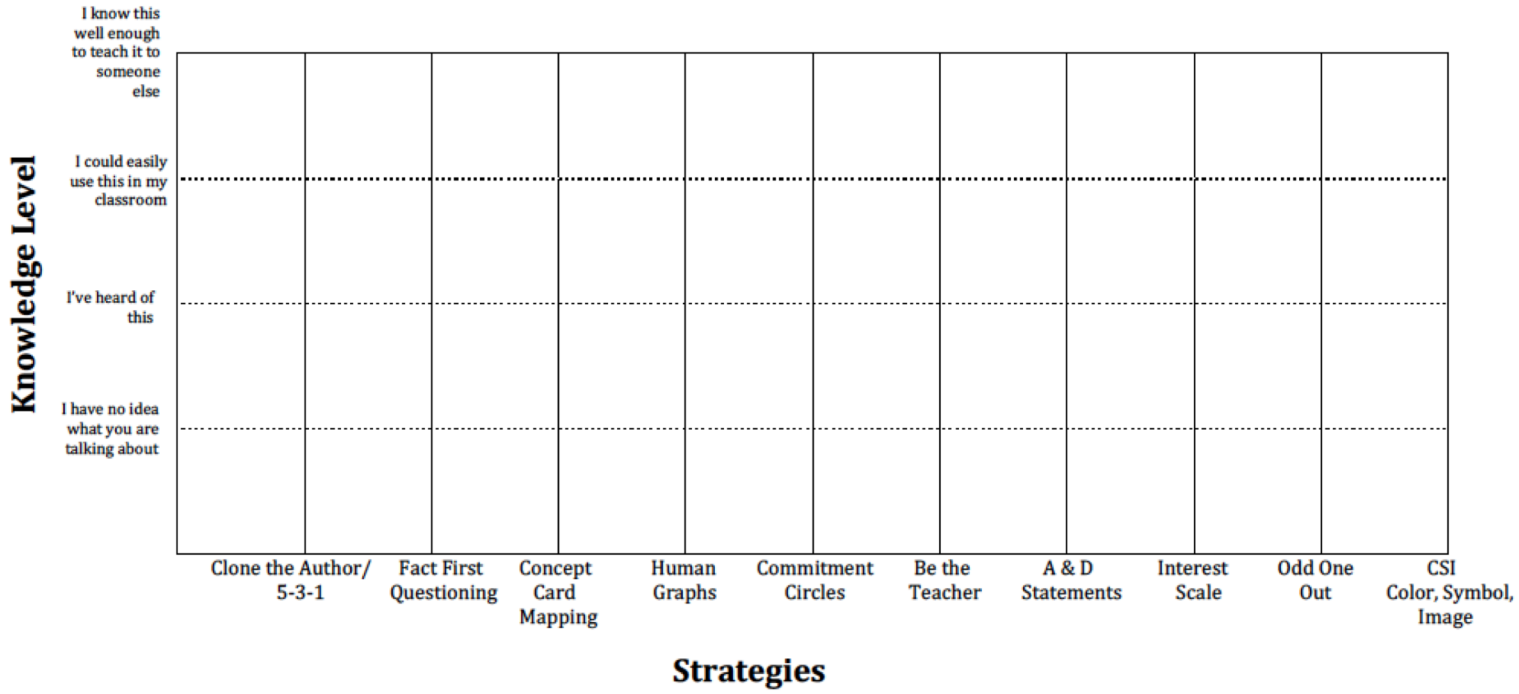
1. be able to articulate why the use of formative assessments is important

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.



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

Formative Assessment Overview

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 5oth percentile to the 85th percentile.

Zach Burkhardt

Clone the Author / 5-3-1

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

Zach Burkhardt

Fact First Questioning

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

image accessed from: http://www.meldstudios.com.au/2013/06/24/concept-mapping/ on 2/11/19

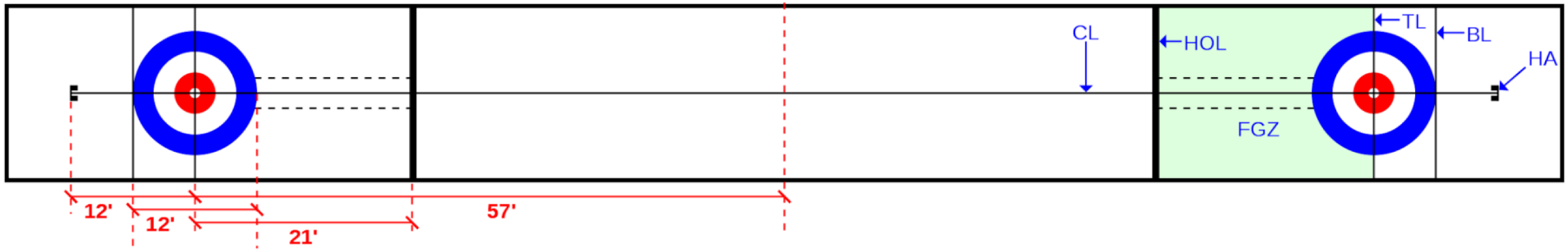
Laura Gardner

Human Graphs

Curling 101

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

1. Curling? Never heard of it.

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.

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.

.

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

Kelly Reed

A&D Statements

Statement	How Can You FInd Out?
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.

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inquiry based

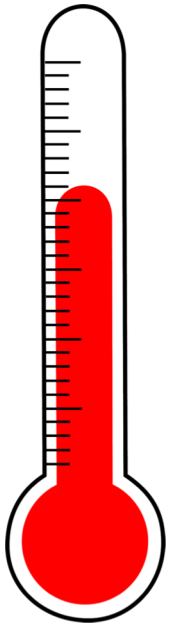
chance for metacognition

provides common experience for discussion

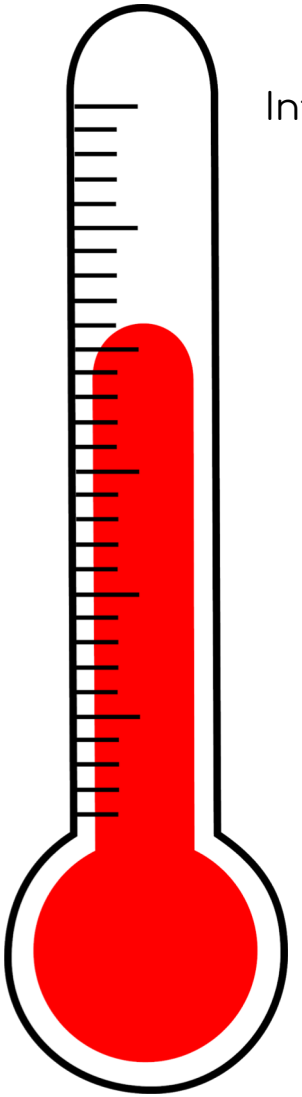
encourage scientific discussion and argumentation

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

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gauge student interest

help identify disengaged students

modify lessons to make them more engaging and relevant

Miriam Mawi

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)

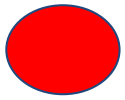
1. Introduce a new concept

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 .

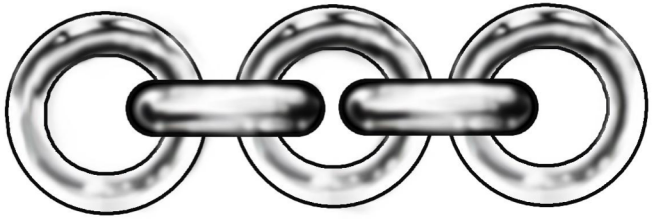
3. After students create their visual, they provide a justification for each of the visual representations.

Chemical bond

- Color -



- Symbol -



- Sketch -

Fotosearch

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

   Volunteer?

What questions do you have?

Question mark created by D3images – Freepik.com

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A Post-Assessment

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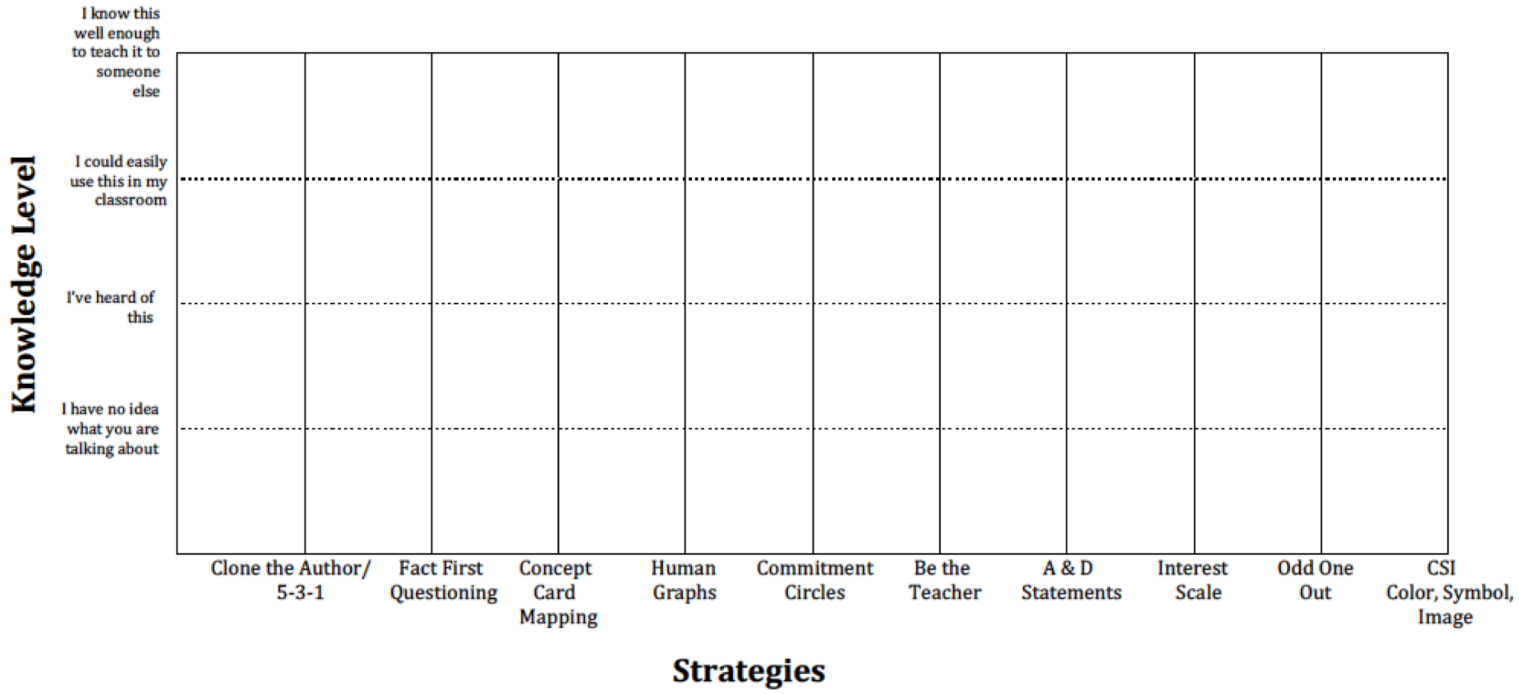


A couple of resources you might find helpful...

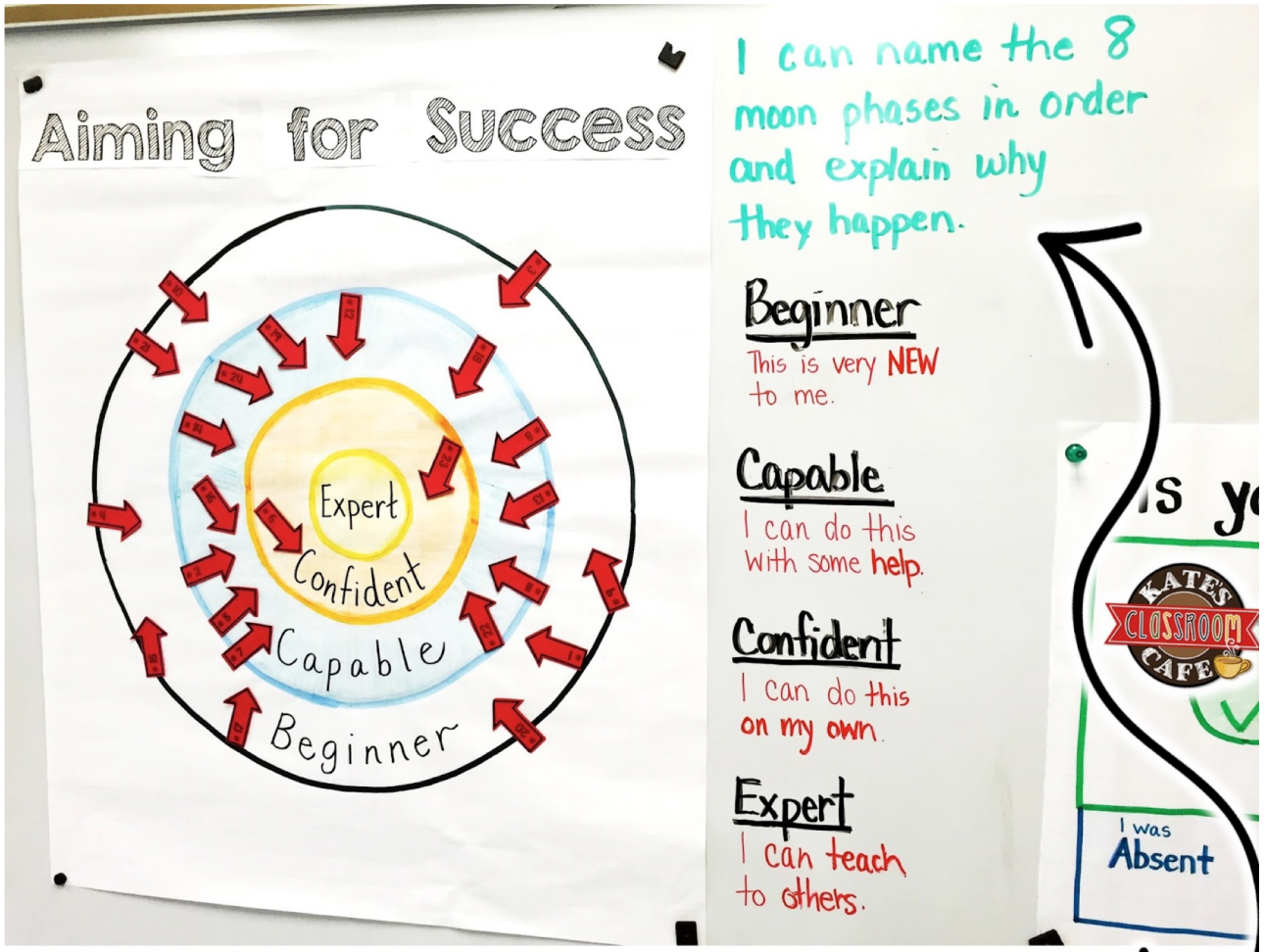
Keeley, P. (2008). *Science Formative Assessment: 75 Practical Strategies for Linking Assessment, Instruction, and Learning.* Thousand Oaks: Corwin.

Keeley, P. (2014). *Science Formative Assessment, Volume 2: 50 More Strategies for Linking Assessment, Instruction, and Learning.* Thousand Oaks: Corwin.

Book graphic created by Macrovector – Freepik.com

AN

STRATEGY



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

tinyurl.com/go6d57g


THE END