Formative Assessment Processes Through the Disciplines

ELEMENTARY MATH - SAMANTHA CHOFFIN
MIDDLE SCHOOL MATH - HESPER PETERSEN
HIGH SCHOOL MATH - SHARMIN KHAN
My journey towards implementing FA in my classroom.

**YEAR 1** – Participant in FAI online course

**YEAR 2** – Co-facilitator of hybrid face-to-face/online FAI course

**YEAR 3** – Participant in hybrid face-to-face/online SAIL course
My journey towards implementing FA in my classroom.

Recommitting to a year(s) of learning by thinking about my “why”:

- How do I reach all my students?
- How do I increase student autonomy in my classroom?

Focus on student involvement in the learning with a focus on student feedback through VSGs.

Focus on clear Learning targets/success criteria, Eliciting Evidence and Deliberate Acts of Teaching through VSGs.

Getting familiar with learning targets, success criteria, and getting students involved.
Learning Goals & Success Criteria – How do I communicate or work with students to create learning goals/targets and success criteria in math class?

- **Learning Goals**
- **Success Criteria (mine)**
- **Success Criteria (co-created)**
- **Referring to the learning goals and success criteria constantly**

**Learning Target: 7.G.B.5** - Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure.

<table>
<thead>
<tr>
<th>Learning Goal</th>
<th>Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Know the properties of vertical angles, adjacent</td>
<td>□ I can describe the properties of vertical angles, adjacent angles, complementary angles, supplementary angles, and angles on a point. (Lesson 1, Lesson 2)</td>
</tr>
<tr>
<td>angles, complementary angles, supplementary angles and</td>
<td></td>
</tr>
<tr>
<td>angles on a point.</td>
<td></td>
</tr>
<tr>
<td>2. Understand how properties of angles are used to write</td>
<td>□ I can use the properties of angles to write and solve algebraic equations. (Lesson 1, Lesson 2)</td>
</tr>
<tr>
<td>and solve algebraic equations.</td>
<td></td>
</tr>
</tbody>
</table>
Struggles: Creating Learning Goal and Success criteria (HS)

- Co-create Learning goals
- Co-create Success Criteria
  - Students need some scaffolding (Very Important for HS)
  - They understand the logic and the flow of the unit.

- Periodical revisit of the success criteria list through out the unit and use it as self assess tool.
Learning Goals – My Big Challenge

- Learning Goals and Success Criteria in Math has been my biggest challenge as I moved into 5th grade!

- Addressing my misconceptions and filling my own learning gaps as I begin to write Learning Goals
  - Reading AZCCRS Standards - Mathematical Practices - Explanations and Examples
  - Taking any assessments myself that students will be taking later on
  - Looking at Performance Level Descriptors
Success Criteria – How do I communicate learning goals and create success criteria with students in math class?

Co-creating Success Criteria in math was my goal this year:

- Student work time first, then posting an exemplar (pictured) and creating criteria through that.
- I model/think aloud and have students create from that.
- Look at a finished task and think of skills we need to complete it.

(Student Exemplar)
# Mathematical Practices and Formative Assessment

## Construct viable arguments and critique the reasoning of others

**I can make conjectures and critique the mathematical thinking of others.**

<table>
<thead>
<tr>
<th>Students:</th>
<th>Teachers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Make reasonable guesses to explore their ideas</td>
<td>- Provide opportunities for students to listen to or read the conclusions and arguments of others</td>
</tr>
<tr>
<td>- Justify solutions and approaches</td>
<td>- Establish and facilitate a safe environment for discussion</td>
</tr>
<tr>
<td>- Listen to the reasoning of others, compare arguments, and decide if the arguments of others makes sense</td>
<td>- Ask clarifying and probing questions</td>
</tr>
<tr>
<td>- Ask clarifying and probing questions</td>
<td>- Avoid giving too much assistance (e.g., providing answers or procedures)</td>
</tr>
</tbody>
</table>

- **I can construct, justify, and communicate arguments by...**
  - considering context
  - using examples and non-examples
  - using objects, drawings, diagrams and actions

- **I can critique the reasoning of others by...**
  - listening
  - comparing arguments
  - identifying flawed logic
  - asking questions to clarify or improve arguments
Lesson Planning in Math with FA

Math Lesson Plan: 5/9/19

Standard Focus: 6.G.A.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

Connection to future learning - tomorrow’s lesson will build on the strategies students identified and practiced today but with parallelograms

Mathematical Practice: #3 (Critique reasoning of others and justify thinking) and #4 (model with math)

Learning Goal(s) What is the learning intended by the end of this lesson?

I am learning how to find the area of a polygon by using different reasoning strategies

Success Criteria What will it look like when students meet the Learning Goal(s)?

*I can identify different strategies to find the area of polygons by reasoning about the shape
*I can explain my chosen strategy and how it represents the area
*I can justify why I used a strategy using academic vocabulary

Lesson Activities to Elicit Evidence

What will students do to progress towards the Learning Goal and meet the Success Criteria during the lesson? Structure activities to enable you to notice student progress and elicit evidence of learning.

- Review learning from lesson 2, review our class created definition of area from yesterday

Opener: Warm-Up & Class Discussion

Is the area of Figure A greater than, less than, or equal to the area of the shaded region in Figure B? Be prepared to explain your reasoning.
Gathering Evidence – What ways do I currently gather evidence in math of student learning or student struggles with math? How has my evidence gathering changed as I grow in my implementation of formative assessment.

- Collaborative work/discussions
- Class discussions
- Individual work/reasoning
- Peer Feedback
- Self-Assessment
Gathering Evidence

- Students engaging in content through academic talk
- Feedback (peer and self-assessment)
- Conferencing
- Noticing (tasks and talk)
- Questioning

Questions to elicit evidence during Opener:
What do you think 'decompose' means? What rearranging took place with these figures? Why did you decide to decompose the shape this way? What did decomposing and rearranging allow you to do? Do you see a connection between what we learned about area in 3rd grade? What was different about how you found the area of A and B? Why?

Questions to elicit evidence during Main Task:
How does your solution relate to or differ from another student's? Explain how you know or why decomposition is important. Explain how you know or why rearranging is important.
How have the formative assessment processes improved the teaching and learning of math for me and my students?

- Learning is more focused
- Success criteria is clearer and more intentional
- Deliberate teacher moves to move learning forward
- Feedback is constant part of teaching and learning
How have the formative assessment processes improved the teaching and learning of math for me and my students?

● I...
  ○ have a deeper understanding of math standards and content
  ○ have a clearer picture of where my students fall on each standard
  ○ have more evidence and data on student learning in math than ever before

● Students...
  ○ justify their thinking in math (not perfect, but definitely getting there!)
  ○ are able to tackle more complex math tasks and ideas
  ○ math identity has shifted
  ○ who struggle feel more success
Resources

**Conferencing schedule** - keeps me accountable with my students and helps me give consistent feedback and close gaps daily.

**Co-created Questions** - promotes academic discourse throughout lessons and used to create an equitable environment for ELL students.

**Reflection Form** - keeps students accountable when learning routines of self-assessing and giving feedback (temporary).
Questions?
Contact Us!

Hesper Petersen, hpetersen@fusd1.org
Mount Elden Middle School
Flagstaff Unified School District
Accelerated Math 6/7 & 7/8 Teacher
Math Department Chair

Samantha Choffin
samanthac@susd12.org
5th Grade Teacher
Summit View Elementary School
Sunnyside Unified School District

Sharmin Khan
khan.sharmin@cusd80.com
High School Math
Chandler Unified School District