Learning Log

Self-Assessment on Learning Targets 	**Pre-**				**Post-**			
	I can teach it	**I can explain it**	**I know a little**	**I have no clue**	**I can teach it**	**I can explain it**	**I know a little**	**I have no clue**
I can analyze my teams current progress with the NCTM Principles to Action and the connection to the MPs.								
I can describe the 10 High Leverage Team Actions and specifically how we engage in reflective practices.								
I can describe intentional steps to build collective capacity through a coaching model ***that works*** with high school teachers.								

Learning Outcome #1

What is my team's current progress with the NCTM Principles to Action and the connection to the MPs?
What are my next steps to build focus?

Mathematics Teaching Practices

from *Principles to Actions: Ensuring Mathematical Success for All,*
National Council of Teachers of Mathematics, 2014

Establish mathematics goals to focus learning.
Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.

Implement tasks that promote reasoning and problem solving.
Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solutions strategies.

Use and connect mathematical representations.
Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.

Facilitate meaningful mathematical discourse.
Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.

Pose purposeful questions.
Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.

Build procedural fluency from conceptual understanding.
Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.

Support productive struggle in learning mathematics.
Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.

Elicit and use evidence of student thinking.
Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

Why Focus on the connection between the SMP's and MTP's?

Choose an upcoming essential learning goal. Describe the tasks you would use to teach each if your focus was on one MTP and one SMP.

Standards for Mathematical Practice		Teacher Action Connections	Mathematics Teaching Practices	
SMP1	Make sense of problems and persevere in solving them	Mathematics lessons are aligned to the essential learning standards and are clearly communicate to students (MTP1). Lessons include complex tasks (MTP2) and opportunities for visible thinking (MTP8 and MTP4) and intentional questioning (MTP5) to promote deeper mathematical thinking (MTP6). Lesson design is planned from the student's perspective to provide multiple opportunities for students to make sense of the mathematics (MTP7).	**MTP1**	Establish mathematics goals to focus learning
SMP2	Reason abstractly and quantitatively		**MTP2**	Implement tasks that promote reasoning and problem solving
SMP3	Construct viable arguments and critique the reasoning of others		**MTP3**	Use and connect mathematical representations
SMP4	Model with mathematics		**MTP4**	Facilitate meaningful mathematical discourse
SMP5	Use appropriate tools strategically	To build SMP1, teachers focus on MTP7 and MTP2.	**MTP5**	Pose purposeful questions
SMP6	Attend to precision	To build SMP2, teachers focus on MTP 2 and MTP3.	**MTP6**	Build procedural fluency from conceptual understanding
		To build SMP3, teachers focus on MTP4 and MTP5.		
SMP7	Look for and make use of structure	To build SMP4, teachers focus on MTP3 and MTP8.	**MTP7**	Support productive struggle in learning mathematics
		To build SMP5, teachers focus on MTP 2 and MTP3.		
SMP8	Look for and express regularity in repeated reasoning	To build SMP6, teachers focus on MTP4 and MTP2.	**MTP8**	Elicit and use evidence of student thinking
		To build SMP7 and SMP8, teachers focus on tasks (MTP2)		

Standards for Mathematical Practice are part of the *Common Core State Standards for Mathematics* (CCSSO, 2010) and the Mathematics Teaching Practices are from *Principles to Actions: Ensuring Mathematical Success for All* (NCTM, 2014) (Barnes, Toncheff, in press)

Figure I.1:

High-Leverage Team Actions Aligned to the Four Critical Questions of a PLC

High-Leverage Team Actions	1. What do we want all students to know and be able to do?	2. How will we know if they know it?	3. How will we respond if they don't know it?	4. How will we respond if they do know it?
Before-the-Unit Team Actions				
HLTA 1. Making sense of the agreed-on essential learning standards (content and practices) and pacing	▭			
HLTA 2. Identifying higher-level-cognitive-demand mathematical tasks	▭	◧		
HLTA 3. Developing common assessment instruments	◧	▭		
HLTA 4. Developing scoring rubrics and proficiency expectations for the common assessment instruments		◧		
HLTA 5. Planning and using common homework assignments	◧	▭	◧	◧
During-the-Unit Team Actions				
HLTA 6. Using higher-level-cognitive-demand mathematical tasks effectively	◧	▭		
HLTA 7. Using in-class formative assessment processes effectively	◧	◧	▭	▭
HLTA 8. Using a lesson-design process for lesson planning and collective team inquiry	▭	▭	▭	▭
After-the-Unit Team Actions				
HLTA 9. Ensuring evidence-based student goal setting and action for the next unit of study			▭	▭
HLTA 10. Ensuring evidence-based adult goal setting and action for the next unit of study			▭	▭

▭ = Fully addressed with high-leverage team action

◧ = Partially addressed with high-leverage team action

Figure 1.14

Assessment Instrument Quality-Evaluation Tool

Assessment Indicators	Description of Level 1	Requirements of the Indicator Are Not Present	Limited Requirements of This Indicator Are Present	Substantially Meets the Requirements of the Indicator	Fully Achieves the Requirements of the Indicator	Description of Level 4
Identification and emphasis on essential learning standards (specific feedback to students)	Learning standards are unclear and absent from the assessment instrument. Too much attention is given to one target.	1	2	3	4	Learning standards are clear, included on the assessment, and connected to the assessment questions.
Visual presentation	Assessment instrument is sloppy, disorganized, difficult to read, and offers no room for work.	1	2	3	4	Assessment is neat, organized, easy to read, and well-spaced, with room for teacher feedback.
Balance of higher- and lower-level-cognitive-demand tasks	Emphasis is on procedural knowledge with minimal higher-level-cognitive-demand tasks for demonstration of understanding.	1	2	3	4	Test is rigor balanced with higher-level and lower-level-cognitive-demand tasks present.
Clarity of directions	Directions are missing and unclear. Directions are confusing for students.	1	2	3	4	Directions are appropriate and clear.
Variety of assessment task formats	Assessment contains only one type of questioning strategy, and no multiple choice or evidence of the Mathematical Practices. Calculator usage not clear.	1	2	3	4	Assessment includes a blend of assessment types and assesses Mathematical Practices modeling or use of tools. Calculator expectations are clear.
Tasks and vocabulary (attending to precision)	Wording is vague or misleading. Vocabulary and precision of language are a struggle for student understanding and access.	1	2	3	4	Vocabulary is direct, fair, accessible, and clearly understood by students, and they are expected to attend to precision in response.
Time allotment	Few students can complete the assessment in the time allowed.	1	2	3	4	Test can be successfully completed in the time allowed.
Appropriate scoring rubric (points)	Scoring rubric is not evident or is inappropriate for the assessment tasks presented.	1	2	3	4	Scoring rubric is clearly stated and appropriate for each task or problem.

Source: Adapted from Kanold, Kanold, & Larson, 2012, p. 94.

Figure 1.25

Collaborative Homework Assignment Protocol Discussion Tool

Directions: Use the following prompts to guide discussion of the unit's homework assignments.

Purpose of homework:

1. Why do we assign homework for each unit's lessons? What is the purpose of homework?

Nature of homework:

2. What is the proper number of mathematical tasks for daily homework assigned during the unit? In other words, how much time should students spend on homework?

3. What is the proper rigor (cognitive-demand expectations) of the mathematical tasks for homework assigned during the unit?

4. What is the proper distribution of tasks for homework to ensure spaced practice (cyclical review) for our students?

5. How do our daily homework assignments align to the learning standard expectations for the unit?

6. How will we reach consensus on unit homework assignments in order to ensure coherence to the student learning and practice expectations?

Use of homework:

7. How should we grade or score homework assignments?

8. What will we do if students do not complete their homework assignments?

9. How will we go over the homework in class?

10. How will we communicate the common unit homework assignments to students, parents, and support staff?

Learning Outcome #2

How do we engage teacher teams in the ***unit*** high leverage team actions?

PLC Schools Build *Shared* Knowledge

Team Learning	Individual Learning
▪ Focused work on 8 Teaching Practices from PtA ▪ Selecting, implementing, and supporting mathematical tasks ▪ Lesson Design ▪ Educator Toolkit to develop instructional strategies ▪ Lesson Study/ Instructional rounds ▪ PLC progression of learning ▪ Before, during and after unit of instruction artifacts ▪ Looking at student work ▪ Content discussions ▪ Curriculum training ▪ Assessment development ▪ Technology training ▪ Vertical alignment (cross grade-levels) ▪ Unit planning	▪ Lesson design and focused work on the instructional shifts ▪ Building math practices ▪ Practice-forward math tasks ▪ Student-to-student discourse ▪ Video self-reflection ▪ Common Core Look for observational feedback ▪ Content discussions- Curriculum training ▪ Assessment development ▪ Technology training ▪ Instructional resource training ▪ Model lessons and/or co-planning ▪ Collaborative coaching (Preparing, planning, teaching the lesson and observation, and debrief)

6 week coaching cycle

Team : _____ **PLC Focus:** *Implementing relevant and real world tasks.*

Monday	Tuesday	Wednesday	Thursday	Friday
		PLC meeting Plan a focus with the PLC and determine scheduling	**Pre conference teachers A and B**	
Observation and post conference teacher A	**Observation and post conference teacher B**		**Preconference teachers C and D**	
Observations and post conference teacher C	**Observation and post conference teacher D**		**Preconference teachers E and F**	
Observation and post conference teacher E	**Observation and post conference teacher F**		**Preconference teachers G and H**	
Observation and post conference teacher G	**Observation and post conference teacher H**			
		PLC Reflection		

Lesson Study Protocol for CCSS Lesson Plan Template

Phase 1: Plan the lesson.

Collaborative teams plan a lesson collaboratively incorporating the probing questions:

- Which instructional shift is a focus? How will the lesson elicit student evidence of the shift?
- Which mathematical practice is a focus? How will the lesson elicit student evidence of learning the practice with the mathematical content?
- How will students be engaged with the mathematical content during each portion of the lesson?

Phase 2: Review and Clarify the Lesson Plan

Prior to the observation, the team will meet to review the collaboratively planned lesson. The demonstration teacher will present the lesson and share pivotal points of the lesson design.

- How will the lesson begin and end?
- How will the teacher know students have learned?
- What are possible assessing and advancing questions to use with students?
- Which mathematical practice will students be developing as a habit of mind? How?
- What should observers look for as evidence students are engaged and learning at different points in the lesson?

Clarifying questions to understand the mathematical content, emphasis of the lesson, formative assessment procedures, or conceptual understanding of each point in the lesson can be asked and collectively answered. What will be looked at related to student engagement?

Observers need to have a copy of the observation form and a copy of the lesson plan.

Phase 3: Implementation and Observation

Those team members not teaching will observe the lesson in action and collect evidence. Focus on evidence of student thinking and learning the mathematical practices. The observers should not interfere with the lesson and should be assigned to watch 1-2 groups of students during different points in the lesson. The purpose of the observation is to listen to what students are saying to uncover their thinking. Observers can also take notes on the lesson plan itself (for revision lesson).

Phase 4: Lesson Debrief

(It is helpful to have a facilitator for this session, however, it is not necessary. Team members need to hold each other accountable for sticking to the norms of the conversation – the discussion should be focused on the collection of evidence related to student learning.)

For the debrief,

- the demonstration teacher and the observers will reflect on each element of the lesson.
- allow each team member an opportunity to comment on student data observations.
- the facilitator will summarize the element.
- the teachers will record the revisions on their lesson plan.
- this cycle continues until the last element of the lesson is discussed.

Possible facilitator questions to use include:

- How did this part of the lesson compare to the planned lesson?
- What were any strengths or weaknesses related to student learning during this element?
- What might need to be modified and why?
- To what degree did student learning show evidence of working to achieve the goal of the lesson study?

Teachers may want to use the following sentence frames in their discussion:

- This element was a strength of the lesson because…
- I noticed…
- I wonder if…

The teacher and facilitator will wait for all comments BEFORE commenting to avoid a point-volleying session. This allows all participants to voice and absorb feedback in a reflective manner.

Phase 5: Revision Lesson

The second demonstration teacher will reflect on the lesson, ask clarifying questions of the group as needed, and articulate modifications that will be made in the lesson. The teacher will also let the group know if there is any additional data to gather for a final debrief.

Repeat the Implementation and Observation and Debrief steps for the second lesson.

Lesson Study
Data Collection Tool

Date _____ Course _____

Learning Target _____

Lesson Design Components	Observations
Assessment (formative, embedded, summative)	
Questioning	
Mathematical Practice	
Beginning of class routine	
Activity/Task 1	
Activity/Task 2	
Activity/Task 3	
Student led closure	

Learning Outcome #3
What are your current challenges when coaching (peer leading) high school teachers?

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