Virtual Lesson Study Facilitator Playbook

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- Dr. Kyndall Brown, PhD, Executive Director of the California Mathematics Project Statewide Office
- Karen Cerwin, K12 Alliance/WestEd Regional Director
- Kathy DiRanna, K12 Alliance/WestEd Statewide Director
- Dr. Rebecca Perry, PhD, WestEd Senior Program Associate
- Dave Tupper, Lakeside Union School District, NGSS Instructional Coach

Dedication

The authors would like to dedicate this Lesson Study Facilitator Playbook to all of the science educators and champions who work tirelessly to improve their instruction by working with others and participating in processes like lesson study to enrich their students' lives.

About the Authors

Dr. Anita Kreide is a scientist and educator with a doctorate in leadership for social justice. Dr. Kreide started Discovery Learning Partners to support the implementation of STEM Education in K-12 schools. Through her company, she currently teaches for UCLA's Cal Teach Program, implements NGSS in urban and rural schools across California, and works with the California Science Project through California State University Northridge (CSUN) to research, develop, support, and promote lesson study implementation and sustainability. In each facet of her work, she utilizes lesson study as an equitable and accessible tool to personalize and support NGSS implementation for all stakeholders.

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Introduction to the Playbook

This Lesson Study Facilitator Playbook provides access to background information, tools and processes, examples and other resources to help design, implement and facilitate lesson study cycles for science in a virtual setting as seen in Figure 1 below. Using examples from different implementation models, lesson study facilitators will be able to learn and adapt the steps of the lesson study cycle to best meet their context. As a facilitator you are a key component for implementing lesson study.

Throughout the Playbook, an equity lens will be applied at multiple levels to place into focus best facilitation practices that provide equitable access and participation of all educators during the steps of the lesson study cycle. Additionally, the equity lens will be prompted as educators develop their lessons with a common vision for equitable student-centered learning.

Whether you are new to lesson study or a veteran, we hope you will find this Playbook simple and easy to read, while still offering fresh and new ideas to help you successfully implement lesson study in a virtual setting. Lesson study is complex and for some using this Playbook will be a new and enriching professional learning experience. The authors have all observed and experienced the success and positive impact on student learning and teacher growth that exists when the lesson study process is implemented successfully. As a lesson study teacher commented in Lewis and Hurd's lesson study book,[1]

> *"I would advise (those) just beginning to consider lesson study to forge ahead slowly. Lesson study is not something that one can jump into. Understand what it entails. Don't skip any steps...Understand that lesson study is about the process."*

To help you start your lesson study implementation journey, this Playbook identifies the necessary skills and knowledge of the facilitators and how to obtain them. The lesson study journey is not just a one-time cycle of implementation, but it represents a continuous, iterative, and collaborative process of professional growth for teams of educators.

There is a section on how to organize your lesson study teams and the steps for implementing lesson study cycles. The Playbook concludes with how the facilitators should reflect on their process and determine their next steps. We hope that you have a successful process and experience as a result of following the steps outlined in our Playbook.

[1] Lewis and Hurd, Lesson Study Step-by-Step (2011) https://lessonresearch.net/library/lesson-study-step-by-step/

Figure 1. Playbook Overview

FACILITATOR VIRTUAL LESSON STUDY GUIDE

PREPARATION

FACILITATORS (STEPS)

STEP 1: Facilitator Preparation

- equity and access awareness and tools
- group and counseling techniques
- science content knowledge
- pedagogical knowledge
- technological knowledge particularly online tools for learning

STEP 2: Group Preparation

- Recruiting
- Group logistics
- Materials
- Agreements

IMPLEMENTATION

PARTICIPANTS (STAGES)

STEP 3:

STAGE 1: Identify

- NGSS standard/s
- Phenomena
- Learning targets
- Evidence of Learning
- Resources

STEP 4:

STAGE 2: Plan

- Lesson flow and activities
- Scaffolds for equity and access
- Student data to collect showing student thinking and learning

STEP 5:

STAGE 3: Microteaching

- Review lesson with group
- Make revisions as necessary

STEP 6:

STAGE 4:
a) T1 Implement
b) Analyze

4/5a: Teacher Implement
- Teach lesson
- Record lesson
- Collect student data
- Script observation
- Review student data

*(repeat w/ T2 in Stage 5)

4/5b: Analysis
- Analyze observation data
- Analyze student work data
- Data driven revisions to lesson
- Reflection

*(repeat w/ T2 in Stage 5)
(possible 3 implementation after T2)

STEP 7:

STAGE 5:
a) T2 Implement
b) Analyze

REFLECTION

STEP 8: Facilitator Reflection

- Review process
- Review teacher surveys
- Reflect on future implementation

Lesson Study Playbook Overview

Guiding Question: What is the purpose and outcomes of lesson study? How do you use this Playbook to prepare to facilitate lesson study in virtual environments?

Goal: In this section, you will learn about the origins of lesson study and why and how it can support professional growth.

What is Lesson Study?

Lesson study is a process that fosters deep intellectual involvement of teachers in the learning of their students by analyzing with a critical lens the practice of teaching and its outcomes on students. Through lesson study the quality of the teaching practice is improved as teachers are provided the opportunity to work with fellow teachers in a highly focused effort centered on evidence of student learning.

For more than a century in Japan, lesson study is well established as an effective practice although it is not as familiar in the United States of America (U.S.). The lesson study practice is central to the Japanese teaching and learning improvement process and it is at the core of being a professional educator in Japan. In the Japanese model, part of the professional day for teachers is spent collaborating on building and refining lessons with an emphasis on student learning. Looking at student work as an outcome of that learning guides Japanese educators to collaboratively review their lessons, so as to improve student learning at their next lesson implementation.

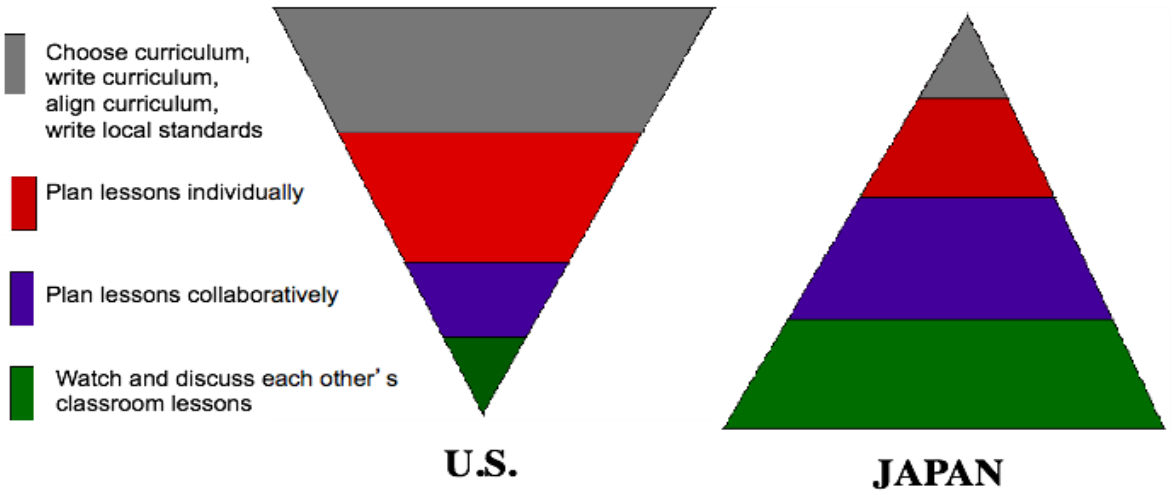
Starting in 1997, lesson study was formally introduced to the English-speaking world, including the U.S., by the published work of Dr. Catherine Lewis and Dr. Ineko Tsuchida, and it received further widespread attention via the TIMSS research.[2] Figure 2 outlines the most significant differences in the time traditionally used to improve instruction between teachers in the U.S. and teachers in Japan. Not only do the teachers in Japan plan collaboratively, but they also observe each others' classrooms with a lens towards watching what the students are doing. Their primary focus is to observe, define, and refine strategies that are effective in increasing student learning.

While it won't be possible to completely change the current U.S. education model, the use of the lesson study cycle gives U.S. educators the opportunity to expand "the tip of the U.S. triangle" by increasing the opportunity for educators to collaboratively observe, discuss, and refine instruction that leads to increased student learning. For additional background and research notes related to lesson study, please visit the *Lesson Study Group* website at Mills College,[3] curated by Professor Lewis.

[2] TIMMS research website: https://nces.ed.gov/timss/

[3] Lesson Study Group at Mills College: https://lessonresearch.net

Figure 2. Education Model Comparison



Source: Lesson Study Step-by-Step https://lessonresearch.net/library/lesson-study-step-by-step/

In the traditional lesson study cycle, teachers work together to:

- Formulate goals for student learning and long-term development;
- Collaboratively plan a "research lesson" designated to bring to life the selected goals;
- Conduct the lesson, with one team member teaching and others gathering evidence on student learning;
- Discuss the evidence gathered during the lesson, using it to further improve the student learning outcomes and/or the details of instruction more generally;
- Teach the revised lesson with another group of students; and
- Collaboratively discuss evidence of student learning and improve the lesson again.

Traditionally, the lesson study cycle is composed of 4 stages: 1. Study, 2. Plan, 3. Teach, and 4. Reflect, as developed by Lewis and Hurd from Mills College.[4] The stages of the lesson study cycle described in this Playbook are derived from the Lewis and Hurd model with the

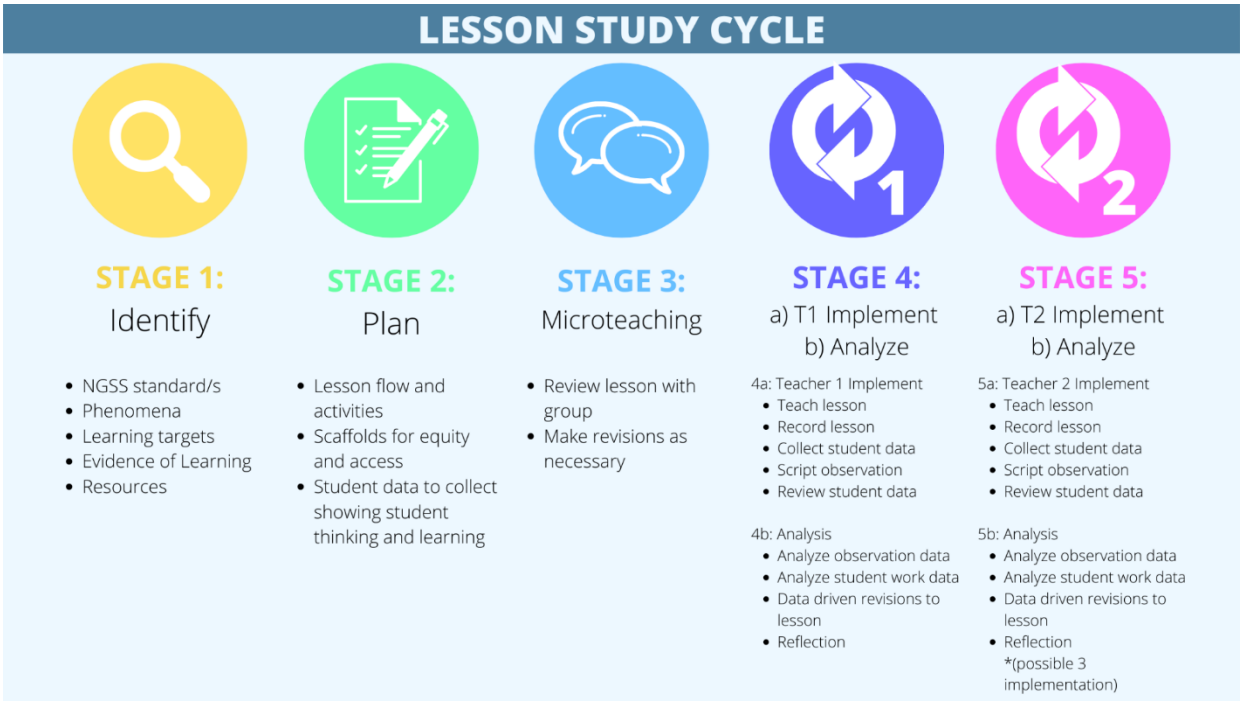
CAUTION: Follow all steps in the Playbook.

When shortcuts or significant changes are made to this process, the depth of the planning and the subsequent lesson implementation and outcomes are diminished to the point that educators no longer perceive the benefits to engage in this process.

[4] Lesson Study Group at Mills College: https://lessonresearch.net

addition of a microteaching[5] component (see Figure 3). This stage occurs between the last planning stage and the first lesson implementation (teach) stage, and allows for the further revision of the lesson by receiving constructive feedback from the other educators involved in the lesson study process. Regardless of whether the lesson study cycle is conducted in-person or in a virtual environment, following all the stages of the cycle is essential to the success of the process.

Figure 3. Lesson Study Cycle



Notes: Figure 3 illustrates the 5 stages of the Lesson Study cycle described in this document. Stages 1, 2, 4, and 5 are the same as in the traditional cycle proposed by Lewis and Hurd. Stage 3 (microteaching) is a new stage introduced to further revise the lesson before teaching based on other educator feedback.

Frequently cited **beneficial outcomes** for educators who participate in lesson study include:

- Deepening of subject-matter knowledge through the discussion of the academic content included in the lesson;
- Opportunity to reflect about students' long-term learning goals and how to progressively support them to achieve those goals;
- Developing deeper capacity to observe student thinking and learning in the classroom and evidence of that learning in the collected data;

[5] Microteaching is the opportunity for a teacher to describe their lesson and get constructive feedback from their peers.

- Establishing and/or reinforcing a collaborative culture and supportive environment for educators to reflect and improve on their practice;

- Embedded professional learning in the work that teachers do which makes it relevant, timely, and includes the local school context to increase equity and access for student learning;

- Strengthening the capacity of educators to learn, design, and implement lessons which incorporate effective pedagogical approaches, strategies, and tools, that would benefit a variety of learners such as English learners, special education students, etc.; and

- Seeing teaching through the eyes and experience of students' and colleagues' learning experiences.

What makes lesson study different from traditional professional learning and more aligned with action research is that throughout the lesson study cycle, teachers collaboratively identify research questions about their own practice, collect and analyze classroom-based data, and engage in intense evidence-based discussions about teaching and student learning. The systematic and intentional inquiry about teaching and learning carried out by teachers in their school and classroom settings raises the bar in terms of commitment to instructional improvement. In lesson study teams, teachers raise questions about what they think and observe about their teaching and their students' learning. Teachers work in teams to develop lessons that generate student work that is used as evidence to understand identified areas of interest or needs. During the lesson study cycle, teachers analyze student work to examine the teaching and learning that produced it, justifying or challenging their claims on student learning. In this respect, the lesson study process elevates the professionalism of educators and puts them in charge of their own instructional inquiry and instructional actions as a result of their collaborative reflection. When educators increase student learning outcomes as a result of the lesson study process, this leads to instructional shifts that increase equitable access for students. Furthermore, conceptualized in this way, lesson study is a process customizable to the learning experience of each participating teacher and each student in their learning contexts, thus providing equity and access to both teacher and student to understanding student thinking and learning.

The lesson study process also offers a model in which the specific context of each school and classroom environment is authentically brought into the professional learning, with each participating teacher contributing from their own practice to the learning of all other educators. This approach is significantly different from other forms of professional learning in which all educators might receive the same predetermined training on a specific topic rather than being engaged in selecting and deepening understanding of a topic of personal interest to the teachers. While the alternative professional learning approach may consider the equality of the learning materials offered to teachers, lesson study provides a venue to engage teachers equitably by valuing the teachers' and students' experiences.

Role of School/District Administrators in Lesson Study

While there is evidence that lesson study is a professional learning practice that could be initiated by a small group of educators at their school sites, research also indicates that the leadership and support of school/district administrators significantly impact the engagement of educators in the process and the ongoing sustainability of the learning process (see for example, *Greatness by Design*, CDE 2013 and Chapter 12 of the *CA Science Curriculum Framework*, CDE 2016). In fact, implementing the rigorous instructional demands of Next Generation Science Standards (NGSS) requires significant shifts for every member of the education system in schools and districts (WestEd Report 2018). The lesson study process offers one way to design learning opportunities for everyone in the system to systematically develop an understanding of the standards and the changes that are required for student learning, instruction, assessment, and effective professional learning.

More specifically, the involvement of school and district administrators in the lesson study process contributes to:

- Establish and/or reinforce the time infrastructure necessary to schedule planning and reflection meetings;
- Reinforce a culture and expectations of collaborative professionalism for improving student learning and the teaching practice;
- Elevate the value of looking at instruction and student learning through an evidence-based lens;
- Develop a better understanding of student learning needs and challenges;
- Advocate for the ongoing support of the lesson study process by collecting evidence of benefits for educators and students;
- Clear and consistent communication to establish identified physical space for debriefs and reflections in a hybrid or in-person context; and
- Site buy-in by all stakeholders.

Framework and Considerations for Implementing the Lesson Study Process in a Virtual Environment

Adapting the lesson study process to an on-line environment in which the team engages virtually and not physically face-to-face requires two main considerations:

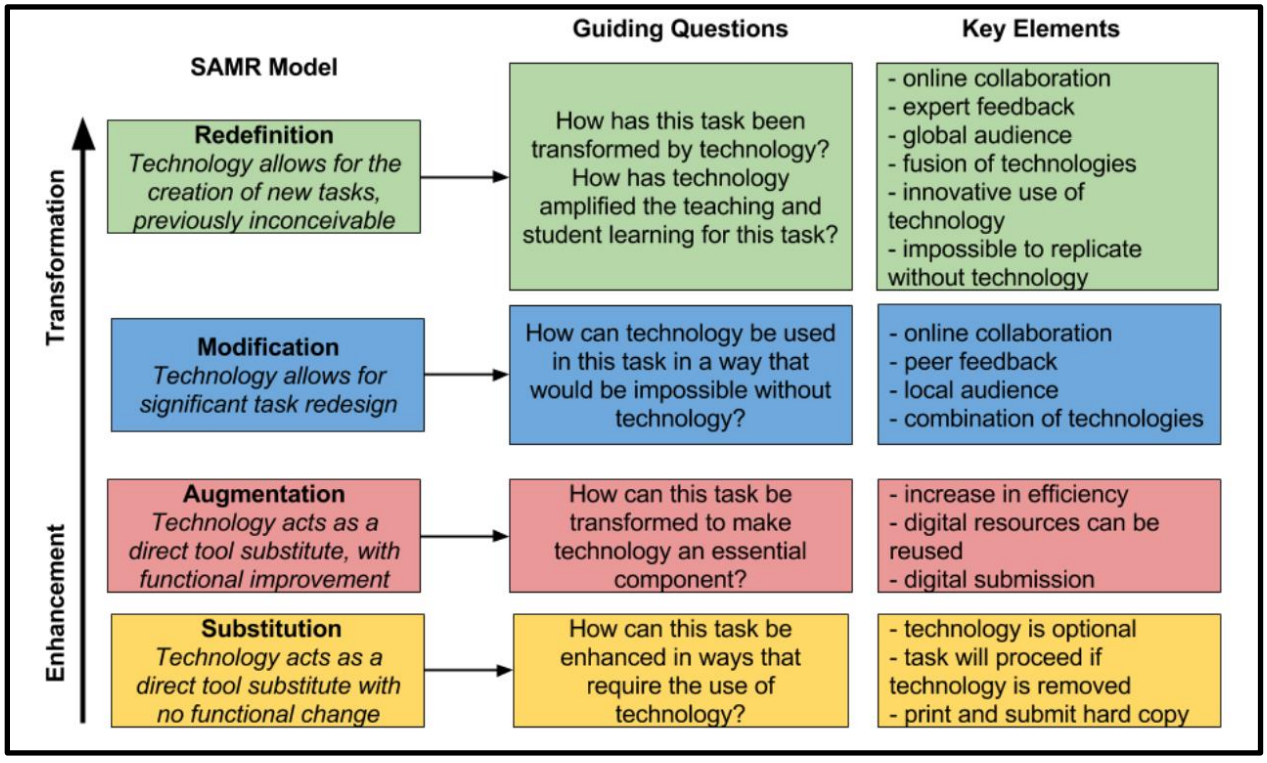
1. **Maintain the integrity of the lesson study process** by remaining closely aligned to the design principles of the 5-stage lesson study cycle so that the overall process, even in a virtual environment, becomes the catalyst for

educators to engage in deep conversations about student learning and teaching;

2. **Develop knowledge to integrate, leverage, and utilize digital and technological tools** not just as a replacement to face-to-face interactions, but to support and enhance the needs of educators for communication, collaboration, and sharing. In this respect, the use of technology in lesson study should be seen as an asset with the capacity to create more flexible interaction opportunities among educators thus enhancing and extending the power of the lesson study collaborative effort.

With respect to **technology integration and use in the lesson study process**, the two following interconnected frameworks are relevant:[6] SAMR and TPACK.

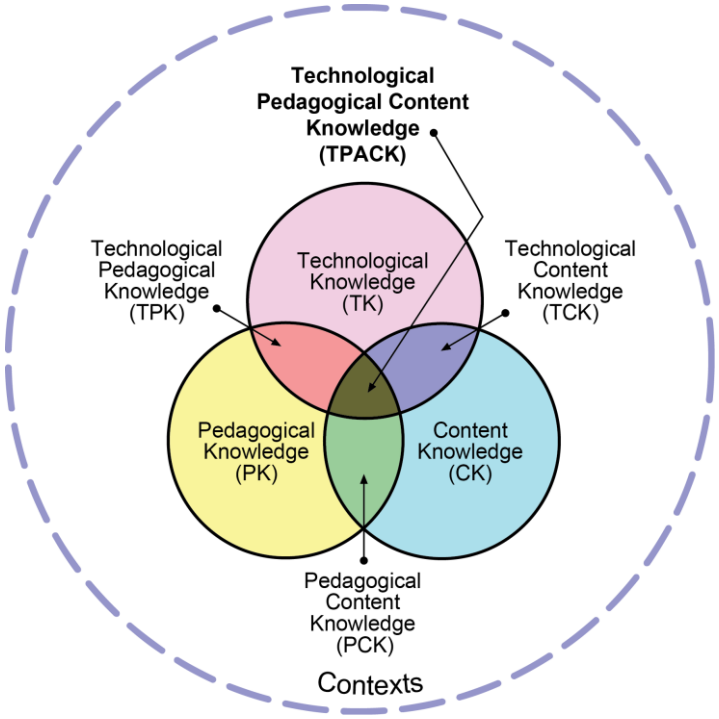
The SAMR framework (2015), developed by Dr. Ruben Puentedura,[7] provides guidelines for technology integration according to 4 levels of complexity that move a task from Enhancement to Transformation through the use of technology: Substitution, Augmentation, Modification, and Redefinition (SAMR). The Guiding Questions in the picture below illustrate the workflow process for integrating tasks with technology.Figure 4. SAMR Framework[8]



6 https://link.springer.com/article/10.1007/s40692-014-0024-8
7 Hippasus Consulting Website by Dr. Puentedura: http://hippasus.com/
8 http://hippasus.com

The Technological Pedagogical Content Knowledge (TPACK)[9] provides educators with a framework to expand their overall teaching knowledge and capacity by helping them identify and develop their technological knowledge (TK) and effectively integrating it into classroom practice alongside other forms of knowledge that teachers already possess. Within the context of virtual lesson study, participants will be exposed to a variety of technological tools such as Google Slides to receive information or present information, Peardeck for slide collaboration, Google Jamboard as a space to collaboratively share ideas that are visible to everybody, or Google Docs to use as a personal digital note-taking or planning tool. In all examples, it is important to ask if the selected technological tool is the most appropriate to achieve the intended goal (following the SAMR model) and if the use of the tool with participants is the most effective for their learning (following the TPACK framework).

Figure 5. TPACK Framework[10]



[9] Mishra P. and Koehler M.J. (2006) *Technological pedagogical content knowledge: A framework for teacher knowledge*. Teachers College Record, 108(6), 1017–1054. http://www.tpack.org/

[10] https://educationaltechnology.net/technological-pedagogical-content-knowledge-tpack-framework/ used with permission from author.

Both the SAMR and TPACK frameworks should be used to support the design of the learning experiences for educators as they engage in lesson study in a virtual environment and to analyze if the use of technology was successful in the learning engagement. Noticing the successful engagement of participants determines the need to modify the selected technology (for example switching from Jamboard to Slides or Peardeck) and/or the use of the technology (switching from whole group interaction to small group discussion in breakout rooms).

Selecting Technology to Support Lesson Study

Group discussion and sharing of ideas is an essential part of the lesson study process and learning. To create a safe, equitable space for fostering collaboration, a facilitator might select Jamboard as a technology tool to allow participants to share their ideas. Jamboard allows lesson study teachers to write down their ideas using digital sticky notes and posting them for other lesson study participants to read.

In this Playbook, we emphasize several components that are essential to **maintain the integrity of the lesson study process for educators in a virtual environment.** Within each of the lesson study steps outlined below, there are iterations and adaptations that might exist to accommodate different needs and contexts, including virtual contexts. It is important to remember, however, that if any of the steps or the essential components within the steps are removed or significantly changed from the original version, then the outcomes of the lesson study process **will be compromised**. In the following sections, we describe the lesson study steps and the **essential components within each step**, and suggest different models for a virtual environment.

Step 1: Facilitator Preparation

Guiding Question: How can I self assess the knowledge and skills necessary to facilitate the lesson study process?

Timing: 1 hour or more and will vary by facilitator

Goal: In this section, you will prepare yourself with the necessary knowledge and skills to facilitate the lesson study stages.

Materials:

- Step 1 Resource Folder Digital Link
  - ✓ S1a: K-12 Alliance Facilitator Toolkit WestEd
  - ✓ S1b: Lesson Study Self-Assessment Survey

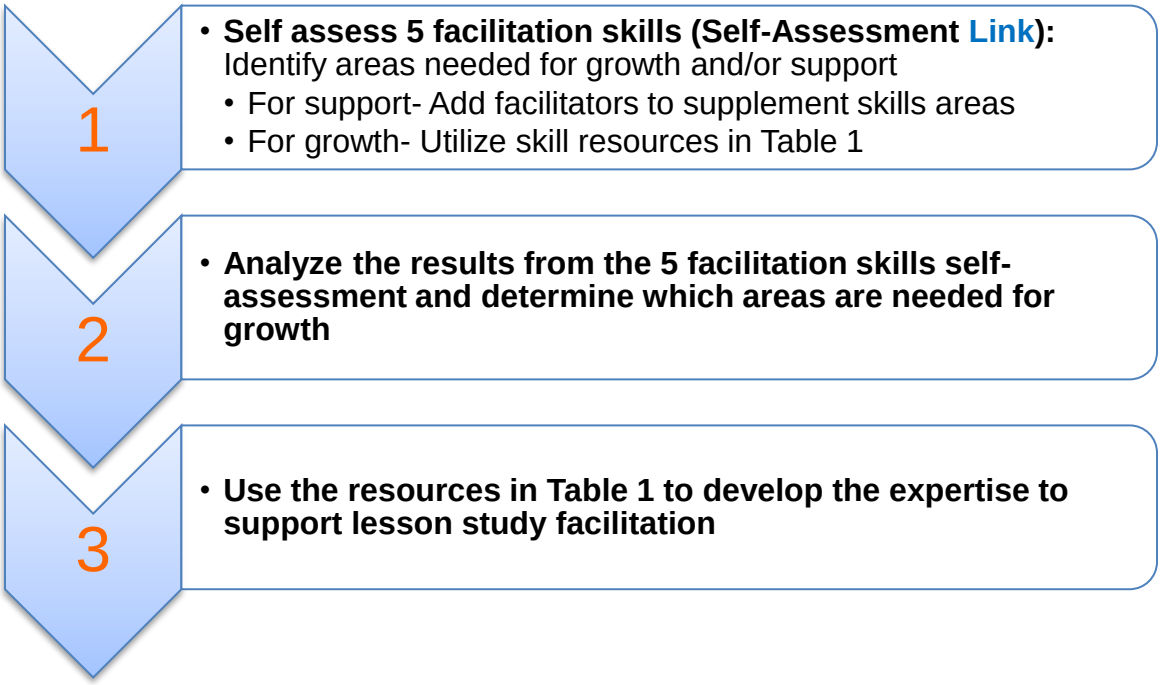
Assessing Your Professional Learning Needs

Facilitating a virtual lesson study process necessitates personal reflection and self-analysis around a key set of skills. This section will identify these skills and provide resources to help you assess and develop your own expertise in how to support equitable access to student learning, facilitation skills, science content understanding, pedagogical knowledge, and technological awareness.

In some cases, a facilitator may not feel confident or cannot gain the specific skills required to facilitate a specific skill set of the lesson study. It is not uncommon for a second facilitator who has these skills, or who specializes in a specific area, to also participate in the lesson study process as a co-facilitator. In the California Mathematics Project Lesson Study model, for example, one facilitator might specialize in guiding conversations around math content and pedagogy knowledge, while a second facilitator focuses on leading conversations around math equity and access. There are clearly benefits of having more than one facilitator to help implement a lesson study. When more than one facilitator is involved, there are more perspectives and diverse approaches available that can be shared with the lesson study participants and this may lead to an increase in the quality of lesson revisions, instructional shifts, and depth of conversation and reflections. When more than one facilitator is present during a lesson study, it is important to meet in advance to select norms for productive collaboration that is further described in Step 2 to ensure equity in voice and participation.

During the lesson study process, as a facilitator you will need the following expertise: equity and access, group facilitation strategies, science content understanding, pedagogical knowledge, and technological awareness.

The following flow chart illustrates the steps to complete in this section before moving on to the next steps.



To assess your knowledge and skills in these different areas, reflect on your responses to the self-assessment survey (Self-Assessment Link). The self-assessment will send an email with your responses to the survey questions. After completing the self-assessment survey, consider sharpening your understanding of each area by accessing the resources indicated in Table 1. The resources identified in the table are just a few of the many robust resources that exist to help deepen your understanding of each area.

Table 1. Lesson Study Facilitator Self-Assessment Links and Resources				
Equity and Access	**Group Facilitation Strategies**	**Science Content Understanding**	**Pedagogical Knowledge**	**Technological Awareness**
▪ Edutopia ▪ Building Equitable Learning Environments ▪ Collaborative for Academic, Social, and Emotional Learning ▪ BELE Framework	▪ Adaptive Schools ▪ Cognitive Coaching ▪ K-12 Alliance Facilitator Toolkit	▪ Next Generation Science Standards ▪ CA Science Framework ▪ NGSS Evidence Statements ▪ NGSS SDCOE	▪ NGSS Best Practice Shifts ▪ Using Phenomena in NGSS-Designed Lessons and Units ▪ Three-Dimensional Instruction: Using a new type of teaching in the science classroom ▪ How can teachers guide classroom conversations to support students' science learning ▪ Ambitious Science Teaching	▪ Edutopia ▪ TPACK ▪ SAMR ▪ Blended Learning

It might be helpful to visualize how you see yourself utilizing these skills during the lesson study process and with teams of participants after reviewing each resource. Determine if you have enough tools, resources, and skills to confidently address each of the areas when necessary during the lesson study process. The discussion topics, questions, and challenges that a facilitator might encounter will vary from lesson study to lesson study, so it is important that the facilitator is prepared and equipped with a range of strategies to implement and keep the lesson study process productive. If necessary, seek out another facilitator who compliments your existing suite of knowledge and skill-sets to help with your lesson study implementation.

Although all of the knowledge and skills identified in the table are equally important, one of the overarching and essential skills that leads to a successful lesson study implementation is effective facilitation. We encourage all facilitators to read the K-12 Alliance Facilitator Toolkit. Reading this support guide will equip the facilitator with the basic skills for facilitating each stage of the lesson study cycle as well as suggest ways to support specific group situations. We encourage facilitators to practice and/or attend professional learning focused specifically in growing these skills before working with participants. The facilitation videos at the end of each lesson study stage will also help to visualize facilitation strategies in specific and common lesson study situations.

In order to facilitate a virtual lesson study team, it is essential to reflect upon one's own tendencies when working in a group. To assess group participation habits it is recommended to take a personal inventory of the way one approaches collaboration. Understanding one's own approach will add cognizance to area(s) of focus to ensure full self-awareness for smooth facilitation. Please take the self-assessment survey here.

As you take the self-awareness survey, reflect on the areas of pausing, paraphrasing, posing questions, putting ideas on/off the table, providing data to structure discourse, paying attention to self and others, and presuming positive intentions. Reflect on where you currently stand within each category, where you would like to be, and how you will direct your attention in the moment to achieve that balance. Placing focus and intention with a plan in each area will help support success with the teams. It is also imperative to stress that the lesson study focus is solely from an asset-based lens centered on student thinking and learning, not centered on the teacher. It is important to be continually conscious of language use such that student learning is at the forefront of the facilitation process.

Self preparation sets a strong foundation for the implementation of the subsequent stages. Step 1 is intended to require the most time of all the stages and is tailored by you to meet your specific needs.

Step 2: Group Preparation

Guiding Question: How can I organize the logistics of the lesson study process for each team?

Timing:

- Preparation: 2 to 3 hours (depending on the number of participating teams)

Goals: In this step, the goal is to invest time into organizing the logistics of lesson study and to think through exactly how you will support your teams to set them up for success and maximize their professional growth. You will want to consider the following components in the suggested order before starting your lesson study implementation:

- Selecting Tools for Measuring Lesson Study Outcomes;
- Grouping Participants into Teams;
- Establishing Lesson Study Schedules;
- Framing Team Norms of Collaboration;
- Defining Lesson Study Implementation Team Roles;
- Selecting Digital Tools for Lesson Study Implementation;
- Planning and Implementing an Information Session; and
- Determining Options for Lesson Study Sharing and Collaboration.

Materials:

- Step 2 Resource Folder Digital Link
  - ✓ S2a: Sample Email Templates
  - ✓ S2b: Group Scheduling Dates
  - ✓ S2c: Information Session Virtual Lesson Study Template
  - ✓ S2d: Norms of Collaboration Examples (S2d1 – S2d3)

Selecting Tools for Measuring Lesson Study Outcomes

The growth in instructional improvement is documented during the lesson study process by analyzing student work. Ultimately, when student learning improves after participants revise their lessons and approach, this is evidence of success. However, you may want to consider additional measures during your lesson study implementation. For example, a regional team of several districts participated in lesson study and the facilitators wanted

to measure if there was any growth in educator confidence in teaching the NGSS science and engineering practices as a result of lesson study. For this purpose, participating teachers were asked to complete a pre- and post-teacher confidence survey to identify any changes in their confidence in this particular area. Consider the following if you want to measure other outcomes of lesson study:

- Teacher confidence implementing 3-dimensions: cross-cutting concepts;
- Teacher content knowledge;
- Pedagogical knowledge associated with implementing NGSS shifts; and
- Engagement of student participation as a result of introducing phenomenon that is local and/or relevant to students.

This list is just a starting point for what to measure during your lesson study implementation. It is recommended that your lesson study participants, site administrators, and/or district leadership help identify a specific goal that you want to work towards and measure before designing the pre- and post-surveys. To see examples of surveys, please see Step 2 Resource Folder.

In order to share information about reminders, resources, links, and schedules, clear communication is essential. Sample emails can be found in the Step 2 Resource Folder.

Grouping Participants into Teams

The facilitator is responsible for determining the number of participants who will participate in the lesson study. It is recommended to have teams of two to four participants and one or two facilitators for optimal outcomes. A team of two participants maximizes the participation in every aspect of the lesson study process. A larger team with four participants increases the experience and knowledge that is contributed during the analysis and refinement of the lessons, leading to potentially richer conversations. A lot depends on who is part of each team rather than how many are in the team.

Alternative Approach

A school district was able to successfully implement lesson study with teachers who taught different courses, as these teachers focused on supporting each other by analyzing a common shift of practice.

The purposeful formation of a team of teachers is essential to the success of the lesson study implementation. When working with elementary teachers who are participating in lesson study, try to create teams of teachers within the same grade level or subject. This will allow instructional strategies and resources recommended by participating teachers to be developmentally appropriate when adapting the lesson during implementation. Secondary science content specific teachers should be grouped by the same or similar course. The teachers benefit more when they

can co-plan a lesson that will be implemented in their own classroom or grade level. Ideally, participants will be at the same point in the sequence of units they are teaching so that they can agree on a common performance expectation(s) to plan and teach during the lesson study cycles.

Variations to Grouping

You can consider grouping participants by a science and engineering practice (SEP) or disciplinary core idea (DCI). A team might focus on an engineering standard from the NGSS grade bands K-2, 3-5, 6-8, 9-12, where a 3rd and 5th grade teacher can implement a lesson centered around the same engineering standard. This is an example of grouping by standard. Another variation can include focusing on an NGSS Disciplinary Core Idea across grade bands. For example, an 8th grade and 9th grade teacher can plan a lesson together around the core idea of embryological development MS-LS4-3[11] and HS-LS4-1[12] focusing on a common phenomenon and initial student exploration of the lesson. This 8th and 9th grade lesson collaboration also allows the 8th grade students to see the transition of thought and extension of the core idea as they transition into high school. **Note- In each of the two sample variations, the same lesson is being implemented twice with revisions made based on analysis of student data.**

Establishing Lesson Study Schedules

Lesson study requires careful and deliberate planning while remaining flexible and adaptable to the various school schedules. It is helpful to identify the dates and time that the different parts of lesson study will occur and it is recommended to create a calendar that is shared with participating teachers to stay organized. There are different options and models for scheduling the different parts of lesson study. Each schedule will need to identify the date when Teacher A implements the co-planned lesson. Following the implementation of the lesson, the team will need to schedule a date and time for debriefing the lesson. The next important schedule component includes identifying the date and time for Teacher B to implement the revised lesson. Following the implementation of the revised lesson, a second debrief will need to be scheduled. Table 3 offers a few examples and models for scheduling the lesson study implementation.

An important part of the lesson study cycle includes observing and scripting the lesson. In remote teaching, the lesson can be recorded with the permission of the parents, district and/or school. The team can review the recording at any time to script the lesson. In a hybrid environment, the team might implement the lesson during in-person instruction. In this case, the team will observe the lesson in real-time during in-person instruction. It is recommended that Teacher B's implementation of the revised lesson be implemented in the same context as Teacher A's implementation, either remotely or in-person. The

[11] Analyze displays of pictorial data to compare pattern of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed

[12] Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence

scripting process is the same regardless of where the observation takes place. More details about the scripting process will be described in Step 6: Teach, Analyze, and Revise 1st Cycle (Lesson Study Stage 4a).

A detailed description of each stage of the lesson cycles is provided in Steps 6 and 7 of the Playbook and is summarized below in Table 2. You can find more examples of site schedules in Step 2 Resource Folder.

Table 2. Lesson Study Cycle Activities and Descriptions			
Lesson Study Activity	**Lesson Study Stages (Described in Steps 3 – 6 of the Playbook)**	**Approximate Time Allotted**	**Dates (Varies based on Virtual, Hybrid, In-Person)**
Planning	Stage 1: Identify standard	1 hour	
	Stage 2: Plan the lesson sequence	2 to 3 hours	
	Stage 3: Microteaching	1 to 1.5 hours	
Lesson 1 Implementation & Debrief	Stage 4: Teacher A video review and analysis	2 hours	
	Revisions and Reflection	3 hours	
Revised Lesson Implementation & Debrief	Stage 5: Teacher B video review and analysis	2 hours	
	Reflections	2.5 to 3 hours	

Variations to Schedule

The schedule for lesson study participants to meet will vary and is based on the availability of the teachers.

Framing Team Norms of Collaboration

In order to implement lesson study successfully, it is important to build a productive, meaningful and supportive learning environment for your participants through Norms of Collaboration which includes these important frames for discussion during your meetings:

- **Inclusion Framing:** It is important to recognize that everyone in the room has a voice and should have the opportunity to be heard and contribute to the learning. You will want to foster a safe environment for participants to be honest and vulnerable so they can share and reveal diverse perspectives and ideas. You can emphasize that there are no right answers to approaching the revision as long as the goal of improving student learning is at the forefront, and even cite how Hattie suggests in his research that there are few instructional strategies that are

"harmful" to learning, there are just some that are more effective and have the potential for greater gains in learning.[13]

- **Asset Framing:** The participants need to recognize their own knowledge and expertise as well as the expertise of other team members in order to grow and shift their instructional beliefs and practices. In a coaching model, the participants must identify their own solutions to the situations. Facilitating lesson study leverages this same approach to help participants reflect on what revisions in the lesson might lead to greater student learning. It is equally important to recognize the collective knowledge, expertise, and assets of the participants of the process including the facilitator. You can highlight and elevate the voices of all participants in a respectful way to recognize the contribution of others to the discussion. In some cases, you will need to encourage team members who are hesitant to contribute to the conversation by creating a safe space to share if others are dominating the analysis and reflection process. Pay close attention to recognizing student assets as well and shift conversations in this direction. In many cases you will need to remind participants that students' funds of knowledge exist and the revisions in the lesson are intended to reveal student understanding rather than fill missing learning.

- **Equity Framing:** One of the fundamental shifts that can be achieved during a lesson study implementation is an increase in learning by students who have traditionally been underrepresented and marginalized in the classroom. As a facilitator, you have a responsibility to challenge participants in a safe and inclusive environment to consider who is doing the thinking and learning during the lesson. OpenSciEd identifies some features of classroom culture that support equitable sensemaking.[14] These features can guide possible revisions to the lesson to include strategies or moves aimed at increasing more student participation during learning.

Tips for Selecting Norms

If you are short on time, consider pre-selecting some common norms that you can present to the team, while asking the team for additional ideas. It is important to reach group agreement on these norms before moving forward.

Included in the Step 2 Resource Folder are a few examples of norms that have been used for facilitating lesson study cycles that have been helpful to establish an inclusive, asset-focused, and equity lens during the process. One consideration is that most effective norms are ones that are created by the team. This process will require sufficient time for the team to share their ideas.

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[13] Almarode, J., Fisher, D., Frey, N., and Hattie, J. Visible Learning for Science, Grades K-12: What Works Best to Optimize Student Learning; Corwin (2018)

[14] https://www.openscied.org/wp-content/uploads/2019/07/Copy-of-Handout-Features-of-Classroom-Culture-OpenSciEd-2.pdf

Defining Lesson Study Implementation Team Roles

All members of the team will develop one lesson together for implementation. A minimum of two teachers in the team will implement the co-developed lesson, one going first and the other second after revisions from the first implementation are made. If there are more than two teachers, the additional teacher(s) can act as contributing observers, or a third teacher can implement the lesson revised after the second implementation. **Note- Three revisions can be made to the lesson, but this approach will add approximately five hours to the lesson study.**

Table 4. Team Members and Roles

Participant	Role
Teacher A implements lesson first	Co-develops lesson with all teacher participants. Implements the lesson first.
Teacher B implements revised lesson	Co-develops lesson with all teacher participants. Implements the revised lesson.
Teacher C (optional) implements revised lesson or acts as an observer	Co-develops lesson with all teacher participants. Can implement a second revision of the lesson.
Teacher D (optional) implements revised lesson or acts as an observer	Co-develops lesson with all teacher participants.
Facilitator A (minimum for lesson study)	Focuses on all of the following facilitation components: ▪ equity and access awareness and tools ▪ group and counseling techniques ▪ science content knowledge ▪ pedagogical knowledge ▪ technological knowledge particularly online tools for learning
Facilitator B (optional)	Specializes in one or more of the facilitation components.
Facilitator C (maximum for lesson study)	Specializes in one or more of the facilitation components.

Selecting Digital Tools for Lesson Study Implementation

There are a variety of digital applications that can help you stay organized during your virtual lesson study implementation. Selecting which digital application to use will depend on several factors such as the cost, familiarity, and access. In many cases, it is best to use what is most accessible and available to your participants. There are several activities that will be assisted by technology for virtual implementation such as meetings, co-planning lessons, scripting lesson observation, storing lessons, and recordings. It is important to have permissions in place for recording in the classroom based on your site's protocols.

Table 5. Digital Tools	
Lesson Study Activity	**Application Example**
Virtual Meetings	Zoom or Google Meet
Co-Planning Lesson	Google document or Microsoft 360 Word
Scripting Lesson Observation	Google document or Microsoft 360 Word
Storing Lessons, Resources, and Schedules	Google Folders or Microsoft 360
Recording Lesson	Zoom, Google, Screencastify, or Phone

Planning and Implementing an Information Session

It is important to host a session with your lesson study participants to build a community of learners, share important information about lesson study, and identify the required activities. An informational meeting is the first opportunity for the team to meet. The first part of the session should include an inclusion exercise as a best practice to help create your community of learners. This is an opportunity to identify why individuals are participating and what expectations exist. The inclusion activity can also be an opportunity for participants to share something personal such as an unique hobby or something fun they do outside of work.

An overview of the lesson study cycle is necessary knowledge for the participants to understand the process, which will help students to achieve their learning goals. At a minimum, you should review the information provided in the introduction of this Playbook. In addition, it is important to describe each of the stages of the lesson study cycle, which are further described in detail in Steps 3 through 7 of the Playbook. During the overview of the lesson study cycle, it is important to emphasize that each team is investigating a shift of practice, with the goal to improve student learning as a result of the lesson study process. Remind the participants that the emphasis is not on "*my lesson or your lesson,*" but rather "*our lesson,*" and the instructional changes that can be made to the lesson implementation to improve student learning.

The logistics and schedule of activities will be shared at this time. An electronic team folder (see Table 5 for examples of platforms) should be created and shared with sample templates. This folder should contain a document/table that has a schedule for filling in dates and includes the number of hours that will be required for lesson study (see example in the Step 2 Resource Folder). No matter which format you use (virtual, hybrid or in-person), it is important to identify when activities will be synchronous, such as the planning and reflection stages, or asynchronous. For example, watching and scripting the teaching videos, capturing the student interactions, or evaluating student work can be completed asynchronously. If time allows, filling in the schedule of dates and times when the lesson will be implemented is helpful.

Resources and reference materials should be organized in digital folders and shared with the participants. These folders should include a place to upload recordings, student work, and planning documents. You will establish these folders ahead of time and share them during the informational meeting.

Determining Options for Lesson Study Sharing and Collaboration

It is important to communicate to the participants how they will have the opportunity to share their collective experience and learning. In some lesson study models, facilitators will organize an event where each participating team will share their experience with each other during a "showcase." The benefits of organizing a showcase includes the opportunity for each participating team to formalize their learning by creating a presentation, while learning about different or similar foci of the lesson studies and how they were addressed by other teams. Allowing for some time during the showcase for lesson study participants to ask questions, share strategies, and collaborate are important components of a successfully planned and executed event that supports professional growth. An additional strategy for sharing the lesson study learning is to create a webpage or digital folder that houses the various lessons, lesson sequences, and units that were refined during the lesson study experience.

Steps 3 through 7 of the Playbook will elaborate on the five stages of the lesson study cycle shown in Figures 1 and 3. Using our lessons learned, these stages have been modified from the four steps of a lesson study cycle outlined by Lewis and Hurd. Each stage has guiding questions and specific goals that the facilitator will utilize to assist teacher participants.

Step 3: Identify the Standard

LESSON STUDY STAGE 1

Guiding Question: How can I identify a team shift of practice for virtual lesson study?

Timing:

- Preparation: 1 to 2 hours
- Implementation: 1.5 to 2 hours

Goals: At the end of Stage 1, teachers will have:

- Agreed upon a lesson level learning goal aligned with an NGSS performance expectation(s);
- Decided who teaches and who observes the lesson (see Table 4 in Step 2); and
- Selected dates for all remaining stages of the lesson study process (see sample calendar in Step 2).

Materials:

- Step 3 Resource Folder Digital Link
  - ✓ S3a: Step 3 Video Examples
  - ✓ S3b: Sample Slide Deck Template
  - ✓ S3c: 5E Lesson Template 1 (In-Person Version)
  - ✓ S3d: 5E Lesson Template 2 (Online Version)
  - ✓ S3e: 5E Lesson Template 3
  - ✓ S3f: Team Schedule Example

Facilitation Focus

In this session, the first synchronous session with your team, it is essential to build a culture focused on equity and access for your teachers and their students. Teachers need to feel validated, supported, and welcomed into the professional learning community of their lesson study team. Stage 1 is one of the most essential components for facilitation, as it grounds the team through inclusion activities and framing of norms towards collaborative work where the sole focus on student learning is established. It cannot be stated enough that teachers must feel safe to share ideas in their team, free from

perceived judgement, and provided the opportunity to grow through their own metacognitive process. One way to provide a supportive environment is to stress that the focus of lesson study is on student thinking rather than the individual teacher. The intentional and cognizant use of inclusive language begins with this first meeting.

Implementation

Welcome and recognize each participant as they log onto the synchronous session. Verify pronunciation of names, nicknames, and preferred pronouns. Announce if the session is being recorded, or if any component is being used for research purposes. If research is part of the process and Institutional Review Board for Human Subjects (IRB) approval has been given, then this should be mentioned in the invitational email and participants should be reminded of the IRB protocol.[15] Provide any necessary documentation either prior to the session or at the beginning of the session. Be prepared to send a gentle reminder email to missing participants around the 5 minute mark of the session and include the meeting link.

Begin with an inclusion activity to ground the session (refer to Sample Slide Deck example). Allow each member to participate, ending with the facilitators' response. Feel free to ask clarifying questions during that time, but do so equally for all members. Allow members to make connections by sharing similar commonalities they have with each other and the facilitators. A team can feel more cohesive and supportive of one another when sharing their stories. It is important as a facilitator to strike a balance between team building and extraneous conversation. If necessary, refer to an agenda with a set time indicated for inclusion. End the activity with outcomes and a reminder of the time frame for the session. It is important to adhere to the times for each session. Honoring participants' time is key to building a culture of respect within the team.

Note: It is important to ask each teacher in the team if they have permission to record the synchronous student session for professional learning purposes only. If the team is a compilation of varying sites, take note of who can record the lesson. If a teacher cannot record the lesson, they have the option of becoming an observer.

The next step is to understand the context of each teacher's site, teaching assignment, and their planned sequence of science units. Allow each teacher to share information about their site, grade level and/or subject, as well as current and upcoming NGSS standards to be taught. Use focusing questions to guide teachers to identify commonalities related to their learning sequence, and work together to decide on an NGSS aligned lesson learning goal. It is important as a facilitator during this step to ensure that all voices are heard and in agreement. This is a good point to let teachers know that they will not be recording an entire lesson unit, but rather a focused piece of the unit (usually a single period of class). The team can decide if they will teach parts of the lesson unit before and after the recorded

[15] IRB protocol allows lesson study participant/s to consent and the data to be published.

parts based on what makes sense for the student learning. Within the performance expectation, teams can choose a specific focus such as, but not limited to:

- A specific part of the 3 dimensions such as a cross-cutting concept, science and engineering practice, or disciplinary core idea; and
- A specific aspect of teaching such as student-driven learning, peer-to-peer discourse, inquiry sequence, project-based learning, student reflection, and assessment such as claim, evidence, and reasoning.

Capture the chosen performance expectation on a shared document such as the 5E lesson template example in the folder for the team. This is a suggested lesson template that will be referred to throughout this Playbook. If your site has their own lesson template, you are welcome to modify it for this lesson study cycle. Sharing necessary folder links and meeting links should be done in team emails before Stage 1 (see Step 2: *Planning and Implementing an Information Session*). Once a performance expectation is identified, teachers will decide the order of who is teaching first, second, and third (if applicable).

At this point, a review of the stages will take place so that teachers can take into account the timing of the synchronous and asynchronous sessions. This will allow intentional time to be given to review student data asynchronously between each implementation of the lesson. Establishing the session schedule will provide an opportunity to begin to discuss dates for the stages. It is important during Stage 1 to establish dates for all of the subsequent stages (see sample calendar in Step 2). Be sure that teachers understand that the same lesson will be taught multiple times with revisions being made based on student data. Ask teachers to bring lesson ideas that relate to the identified performance expectation(s) to the next session.

Facilitator Reflection

At the end of each stage, take time to immediately reflect around the following questions (with facilitator colleagues, if present):

1. What went well? What can I/we take away from this session and apply to future lesson studies?
2. Were there any obstacles in the facilitation? Did I/we meet the goals of this stage?
3. What could be modified in the future to make this stage even more impactful?

Step 4: Planning the Lesson

LESSON STUDY STAGE 2

Guiding Question: How can I support the planning of an NGSS lesson?

Timing:

- Preparation: 30 minutes, varies based on facilitator
- Implementation: 3 hours lesson planning time

Goals: To facilitate teachers in developing a 3-dimensional lesson sequence that will be analyzed during the lesson study. While an entire 5E sequence can be brainstormed onto the template, only one class period of the lesson is being taught– generally about 1 hour of class time. The 5E lesson can be captured conceptually on the planning template, but does not need to be entirely planned out down to each detail. Instead, for this stage only, the lesson to be taught needs to be entirely complete, with each detail ready to be taught in the classroom.

- Complete the 5E lesson template;
- Complete slide deck and or teaching resources in preparation for teaching; and
- Choose which student assessment will be collected to capture individual student thinking around what students should know and be able to do by the end of the lesson.
- Complete an exemplar student response and add it to the top of the "Student Data Tally" form.

Materials:

- Step 4 Resource Folder Digital Link
  - ✓ S4a: Step 4 Video Examples for Lesson Study Stage 2
  - ✓ S4b: Virtual Lesson Study Stage 2 Template
  - ✓ S4c: Student Data Tally

Facilitation Focus

This step requires a heavy cognitive load on the facilitator. Depending on the team, ideas can align or oppose. This is where facilitation skills come into play. It is key to not form any opinions on the lesson or apply judgement to lesson ideas. The facilitator must remain neutral and supportive of all team members. Teachers will reach best practice on their

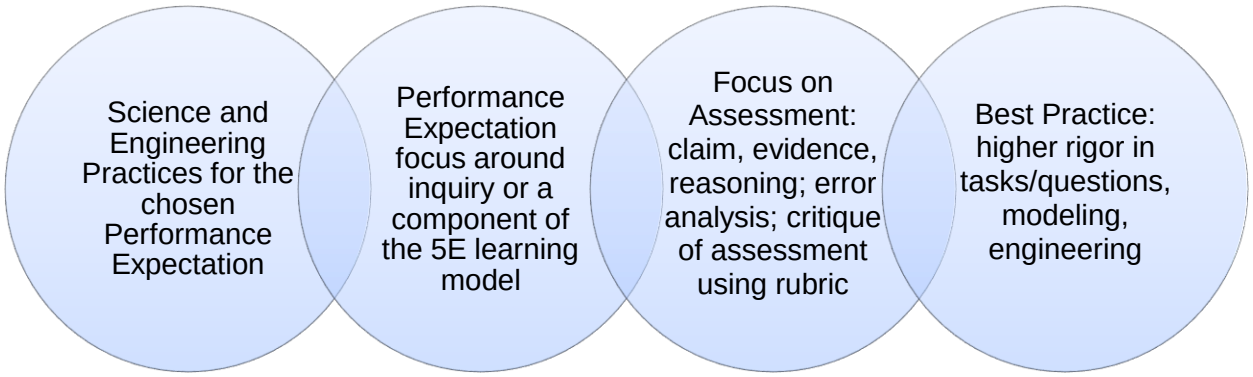
own and should only be guided through questions around learning. Ask clarifying and focusing questions around teacher ideas when ideas are not necessarily aligned to best practice, keeping in mind to stay asset based and focused on student learning. Point out moments of team agreement as items that should be added to the 5E planning document. Focus on equity of voice and sharing of ideas among all team members, not just the teachers implementing the lesson. Generally, in this stage the two teachers implementing the lesson will be the main planners of the lesson. However, it is imperative that all team members have a role and engage in the lesson planning. This stage of the planning will generally begin with a macro overview driven by the standard and end in a lesson for one class session. Focus on what the student should know and be able to do by the end of the lesson. Ask how students will get to that point through their own inquiry. This session is one of the longest, and it is important to give teachers a 5 minute break after each 45 minute segment to process information and step away if needed.

Implementation

Begin the session by asking the team to share what NGSS standard they are choosing to develop during this stage and why they chose it. This is important to ground, as sometimes not all teachers have fully committed to the standard agreed upon in the last stage. Share the 5E template with the teachers. As the team shares the selected standard, have a team member or yourself record the standard onto the document so all are working from the same content. Once the standard is recorded, have the teachers read the 3 dimensions of the performance expectation and the evidence statements for the standard. A framing of the lesson around the standard is essential. This may also be the first time teachers have seen evidence statements. Ask how these evidence statements could be helpful to the planning of the lesson. On the 5E template there is a section for learning targets based on the evidence statements. This section can be completed at this time or later in the session once more ideas for the lesson are developed. **Note- There is no right order by which to use the template as long as the components are reviewed for the lesson.**

After the team reviews the evidence statements, the facilitator can open up team discussion. The teachers have been asked to come to this stage with ideas for the standard and this is the perfect time for each person in the team to share their thoughts. This brainstorming session will generally lead to a starting point for the lesson. There are two options the team can choose from: (1) they can build a lesson from scratch, or (2) they can build upon a lesson that they have done in the past. Either is fine, and members should be open to the creativity and headspace of the team. Anchoring phenomena should also be discussed and agreed upon early in the planning as a storyline for the lesson.

Regardless if the lesson is created new or revised from an existing one, the lesson planning begins around the chosen NGSS performance expectation(s). Depending on the needs identified by the team, different elements of the lesson could become the focus of practice. Some examples of NGSS focus of practice for lessons include the following:



The examples below illustrate how different grade levels focused on NGSS skills and tools around student thinking. The key is to begin with a performance expectation (PE) and come to an agreement around which aspect of the PE would represent the greatest challenge and/or show the most student thinking.

- A high school biology team chose the NGSS PE HS-PS1-3 which is to "plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles." (NGSS PE HS-PS1-3) The team chose the anchor phenomenon of socks sticking to clothes in the dryer, and the investigative phenomenon of the mixture of ethanol and water losing volume. The students ran the investigation and collected and interpreted the data. However, the team wanted to focus on student sense making through the use of modeling. As a result, within the PE chosen, the team wanted to develop student thinking around modeling in science and chose a lesson specifically around the creation and refinement of a model that would help explain the investigative phenomenon.

- A middle school team, after choosing their PE, were lamenting how student assessment scores were low for their current unit. As a team, they decided to focus on student error analysis and used the lesson to capture student revision to their thinking after a unit assessment on the common PE.

- An elementary team wanted to focus on student inquiry with their chosen PE. This team captured student thinking after a series of virtual stations which included a simulation, a card sort, and an investigative phenomenon.

The facilitator generally listens and can offer resources for participants if ideas are not free-flowing from the team (please refer to Table 1). It is also critical at this stage to engage each member to share their ideas and thoughts around the lesson. If facilitation models equity in team voices, the participants will continue to perpetuate that equity, setting a culture continually promoted by all the members. Continue facilitating equity of voice until the team begins to manage the process on their own through the facilitator modeling.

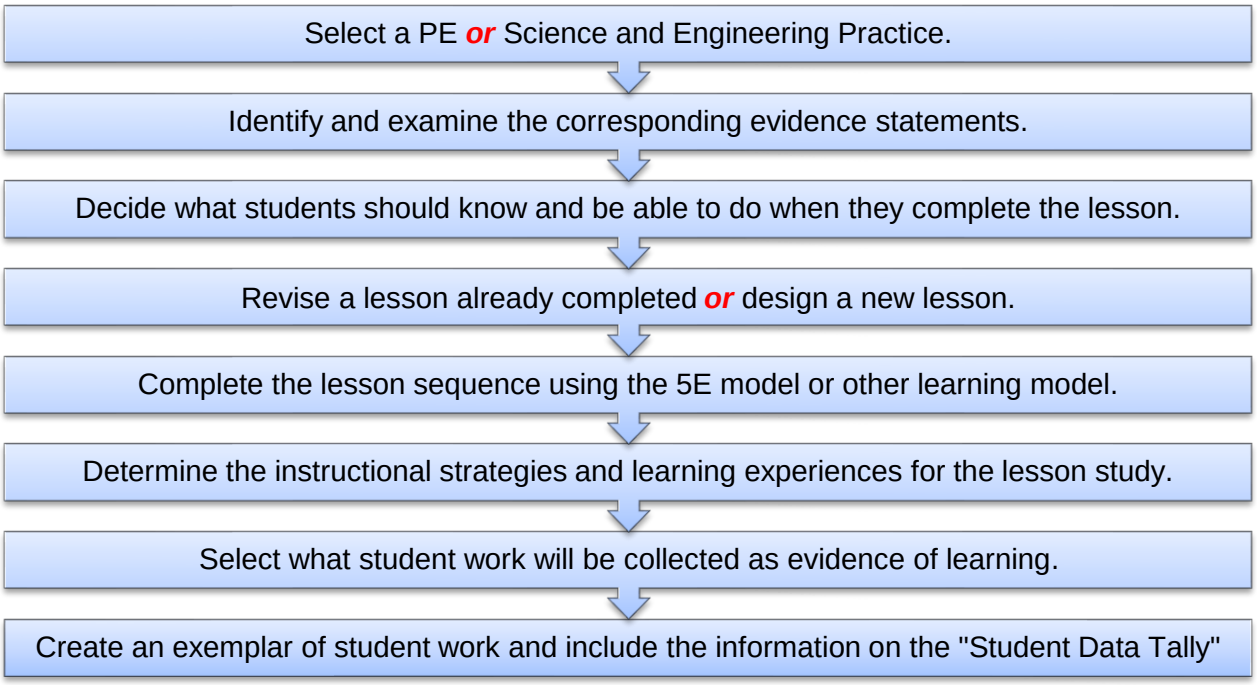
During this stage, the participants are using the 5E planning template as a guide to organize their thinking. Sketching out a complete 5E is not necessary, but often gives participants a road map of the overarching lesson sequence. Groups can approach the 5E and plan backwards, thinking about the final assessment (the elaborate and/or evaluate part of a 5E cycle), from which they can scaffold the lessons to ensure students have what they need to be successful. Another direction is to start with the engage and explore pieces of the 5E lesson sequence. The facilitator should keep the participants on track and encourage them to share resources and ideas. As the planning continues, the participants should shift their focus on a single lesson they can teach in a single period in their classroom (generally this is 50 to 90 minutes).

On the planning template, the participants can start to put together a more detailed script that outlines what the teacher does and what the learner does for the lesson that will be observed during the lesson study stages. The facilitator should guide the participants to focus on the instructional strategies that the teacher plans to implement to influence student thinking. A shared slide deck for teaching can be started once consensus is reached on what students will do based on the intended instructional strategies implemented during the lesson, and what student work and evidence will be collected to show that students' sensemaking is moving towards the selected NGSS PE. The facilitator should keep track of time and guide the conversation to keep the participants on schedule during the planning step. In many cases, a full, detailed lesson sequence will not be developed, but it is important that the lesson that will be observed during the lesson study is fully completed including all supporting resources such as a slide deck, activities, and/or materials.

It is important that the lesson chosen for the study displays student thinking. For example, choosing to record student thinking through group discussions after a lab, as opposed to capturing the steps during a lab, will reveal more student thinking. Have the team ask themselves where is the most student thinking and idea-grappling taking place, and capture that moment for the lesson. Students reading a text or watching a video will not reveal as much student thinking as peer-to-peer discussion around an inquiry activity or group development of a model after inquiry. A common misstep at this stage in the planning occurs when the PE chosen does not match what the students will know and be able to do at the end of the lesson, and/or the student work samples to be collected.

Before the end of the session, the participants should complete the top of the “Student Data Tally” form by describing an exemplar student response.

By the end of the session, the participants should have a clear idea of what the students will do, what they will know, and how they will show this knowledge. Below is a flow chart indicating the key points to reach during the planning session.



Facilitator Reflection

At the end of each stage, take time to immediately reflect around the following questions (with facilitator colleagues if present):

1. What went well? What can I/we take away from this session and apply to future lesson studies?

2. Were there any obstacles in the facilitation? Did I/we meet the goals of this stage?

3. What could be modified in the future to make this stage even more impactful?

Step 5: Microteaching

LESSON STUDY STAGE 3

Guiding Question: How can I implement microteaching to support lesson study?

Timing:

- Preparation: 15 minutes
- Implementation: 1 to 1.5 hours

Note: Step 5 can be combined with Step 4 and done immediately after the planning of the lesson. The additional time for a Step 4/ Step 5 combination can take up to 4 hours in one session. This is only recommended if time permits, the team is driven and onboard, and dates are scarce for scheduling.

Goals: At the end of Stage 3 teachers will have:

- Micro-taught the lesson to the facilitators, mentors and/or observers;
- Shared the assessment along with an exemplar response being collected from the students;
- Received feedback on the lesson:
  - Equity and access lens
  - Content lens
  - Pedagogy lens
- Incorporated feedback by revising the lesson;
- Have all components of the lesson ready for the first teacher implementation; and
- Implementing teacher will have emails of team members to notify them when video and student data are loaded into the folder for asynchronous review for Stage 4.

Materials:

- Step 5 Resource Folder Digital Link
  - ✓ S5a: Step 5 Video Examples for Lesson Study Stage 3
  - ✓ S5b: Virtual Lesson Study Stage 3 Template

Facilitation Focus

Microteaching is defined in this Playbook as an oral method for teachers to receive feedback around the lesson before it is implemented in the classroom with students. The key is for the facilitator to focus on student equity in the lesson and the NGSS pedagogical shifts that must occur for student centered learning as well as the overall flow of the lesson. Are all students given the opportunity to share their thinking? Is there opportunity for peer to peer discussions? How is all student thinking being captured and supported? These are important questions to keep in mind while in this stage. It is also important for the facilitator to remember that the feedback should be centered on student learning and should be worded to the team through a positive, asset-focused lens.

Implementation

The microteaching session begins with providing the team an opportunity to review their lesson as a team and agree on who will microteach which sections of the entire lesson. Generally, anywhere from 15 to 30 minutes is needed for the team to discuss the lesson and ensure agreement around the components and flow. The lesson is presented in the same format the students will be receiving it, which is most commonly a Google slide deck or other presentation context such as Keynote. Virtually, the delivery of slide decks through Pear Deck or Nearpod is also used to make the presentations more interactive for the students.

The lesson study team then articulates and takes turns sharing the lesson (screen-sharing) as if it was being delivered in the classroom; this includes all components, such as any lesson activities, graphic organizers, virtual student notebooks, videos, etc. The lesson does not have to be fully taught for an hour, but rather talked through. Presenters are encouraged to have the mentors and observers try some of the activities. The team will share the assessment they plan to collect from every student as a way to measure what students should know and be able to do by the end of the lesson. They will talk through an exemplar response that will be used to evaluate student work in Step 6. The facilitators, mentors and/or observers will take notes on areas of strength, areas of growth, and any clarifying questions around the lesson, but refrain from any feedback until the lesson is complete. This is important so that the flow of the lesson is maintained.

Feedback in facilitation focuses solely on anticipated student learning and is delivered through an asset-based lens. The facilitator will allow each observer (ending with the facilitator) to share areas of student learning strength in the lesson. Next, each teacher observer and facilitator will share areas for lesson growth to improve student learning. It is suggested that the facilitator go first to model an asset-based lens and demonstrate how to frame lesson critiques in the form of a suggestion towards improving the lesson for student learning. Also, critiques framed through the “lens of wondering” supports revision towards best practice. For example, “I wonder how all students can share their ideas around the question?” If there is more than one facilitator for the lesson, this step is where the strengths of each facilitator will be utilized to ensure equity, access, content knowledge, and pedagogy are being addressed.

The team is given time to discuss the feedback and agree upon what lesson revisions to incorporate. If time remains in the session, the team will revise the slide deck and any teaching materials, etc. to ensure the lesson is ready to teach for the implementing teacher. However, if time is short, the teachers can divide the items to revise prior to the implementation date of the lesson.

If time permits, review with the team the observation and student data tally document and how to collect and report student data on each. Otherwise, videos can be emailed out to the team with instructions on how to script and tally student data from the lesson. Details of this step are below in Stage 4a.

Variations for Microteaching

In-person: At the end of the microteaching, teachers will complete a scheduling template with the plan for lesson implementation at the school site. It is imperative to notify the site administration ahead of time to gain support and possible participation in the lesson study. Obtaining administrative approval will be essential to securing support for substitutes and facilitator assignments for lesson study.

Facilitator Reflection

At the end of each stage, take time to immediately reflect around the following questions (with facilitator colleagues if present):

1. What went well? What can I/we take away from this session and apply to future lesson studies?

2. Were there any obstacles in the facilitation? Did I/we meet the goals of this stage?

3. What could be modified in the future to make this stage even more impactful?

Step 6: Teach, Analyze, and Revise 1st Cycle

LESSON STUDY STAGE 4A

Guiding Question: How can I capture and process student data during implementation?

Stage 4a Timing:

- Preparation: 30 minutes
- Implementation: 1.5 to 2 hours asynchronous. Can be done synchronously by adding another session to the team scheduling table.

Stage 4a Goals for Implementing Teacher: At the end of Stage 4a, the first implementing teacher (Teacher A) will have:

- Implemented the lesson;
- Recorded the implemented lesson (Zoom recorded session or video of in-person or hybrid instruction);
- Collected a class set of student data;
- List at the top of the observation script template and student data tally template "what students should know and be able to do;"
- Analyzed student data based on tally rubric and exemplar student response; and
- Shared the observation and student data with the lesson study team (Google folder).

Stage 4a Goals for Team Members: At the end of Stage 4a, team members including facilitators will have:

- Scripted recorded observation;
- Analyzed observation script based on 4 categories; and
- Analyzed student data based on tally rubric and exemplar student response.

Stage 4a Materials:

Materials:

- Step 6, Stage 4a/b-5a/b Resource Folder Digital Link
  - ✓ S6a: Step 6 Video Examples for Lesson Study Stage 4a/b-5a/b
  - ✓ S6b: Data Analysis Template

Stage 4a Facilitation Focus

In this session, the first asynchronous session with your team, it is essential to remind teachers of the need to have the data ready for the debrief of the lesson. Ensuring all team members come prepared with scripted observation and student data analysis is essential for this stage to develop virtually. Reminder emails sent by both the implementing teacher (i.e., Teacher A) and the facilitator will help remind and impress its importance upon the team. Without the data, the debrief around lesson revisions (a goal of lesson study) cannot take place. Preparation of teachers for this stage is key. Refer to the list of Stage 4a Materials, above, for documents and tips to prepare the team.

Stage 4a Implementation

Teacher A implements and records the co-planned lesson. Teacher A will communicate with the team by email when the class recording is ready for review and student data sets are uploaded into the team's shared folder. An agreed upon amount of time is given to the team to process the data asynchronously before the synchronous debrief of the lesson. Usually 3 to 5 days is given to process the data, but this varies by team (it is suggested that at least 24 hours be given). The facilitator also sends out an email at the end of Step 5 (Lesson Study Stage 3) with instructions and video on how to implement and process the data.

Observation script

The facilitator and any observers will script the recorded lesson as indicated in the instructions (see Stage 4a Materials above). Teacher A is not required, but may choose to script, and will summarize at the top of the "Data Analysis Template" and the "Student Data Tally" forms what the students should know and be able to do by the end of the lesson. After scripting, each individual will provide evidence from the video for each of the following four categories, which will guide the observation data analysis component:

1. Level of rigor for student tasks and questions;
2. Peer-to-peer discourse in minutes,
3. Student learning strengths; and
4. Student learning areas to grow.

It is important to remember to script the lesson from an asset-based lens centered on student thinking and learning rather than focused on the teacher perspective. Some examples of how a teacher focused script can be translated into a student focused script are below:

Shifting teacher focused script into ⟶ Student focused script	
Teacher calls out student name when sharing their example with the class.	Student hears their name along with their example shared with their peers.
Teacher places students in groups for 10 minutes on task.	Students experience 10 minutes of interaction with their peers on a task.
Teacher waits approximately 15 minutes for task completion within 6 student group.	Approximately 2 students within each of the 6 student groups are off task for approximately 15 minutes.

Student work data

The team reviews the exemplar student response to the assessment at the end of the lesson, which is found at the top of the student data tally document. This will help to norm the teams rubric scoring of the student responses. It can also bring to the surface the alignment of the student learning outcomes, the lesson activities, and the scored assessment. Articulation of what exemplar student learning looks like for this lesson will be a powerful tool in guiding the team thinking towards best practice shifts.

Next the teachers and facilitator will tally the student data according to its rubric score and indicate any patterns or trends seen in the data. The sample rubric provided is a 4-point rubric that is scored as follows:

1 = No answer/ nonsense response

2 = Missing multiple components

3 = Missing a component in the exemplar

4 = An exemplar response

Student Work Data Example

A middle school team collected claim, evidence, and reasoning (CER) data and team members noticed that evidence was coming from the video and not the article source. Also, evidence was being utilized without reasoning linked back to the claim. As a result of this, data revisions were made to the next implementation to provide scaffolds into CER writing.

The rubric scores are tallied and placed into a consensus table by each member of the team including Teacher A. In addition to the rubric scores, all team members and facilitators list any trends, sticking points, and current understanding trends seen in the data. All team members will come prepared to the second part of Step 6 (Lesson Study Stage 4b) having watched and scripted any video components and scored student work on the rubric.

Variations for Virtual Format

In some situations, the asynchronous component in Lesson Study Stage 4a may not be sanctioned according to the teacher contract or may require the addition of a stipend for work outside of school hours. In this case, Stage 4a can be handled in three ways:

1. Additional preparation time given during school hours;
2. Stipend given for additional work; or
3. Data analyzed by the team during site professional learning or professional learning community time.

Variations for In-Person Format

When completed in-person, the timing and data review will vary from the virtual format. Once the lesson planning is complete, the team will have established a schedule of sites and implementation times. The facilitator is required to provide information about the site, parking instructions, etc. for team members joining from other sites. Any district or site permissions and contact with administration should be made prior to working with lesson study teams.

Teacher A's implementation will take place in Teacher A's classroom at their site. Teacher A will remind the team what students should know and be able to do by the end of the lesson. With that goal in mind, observers will be asked to script their observation of student thinking onto the observation form. Focus of the observation should be on students, their progress in the lesson, peer-to-peer conversation in groups, participation in the lesson, etc. It is up to the facilitator if team members can interact with the students during the lesson. If team members interact, it should be to ask questions to students around their learning only. For example, some teachers like to ask, "Are you having fun?", "What do you know for sure from this lesson?", and "What questions or wonderings do you think your classmates have about the lesson?" Results from such questions should be shared with the team as evidence of student thinking around the lesson.

Stage 4a Facilitator Reflection

At the end of each stage, take time to immediately reflect around the following questions (with facilitator colleagues if present):

1. What went well? What can I/we take away from this session and apply to future lesson studies?
2. Were there any obstacles in the facilitation? Did I/we meet the goals of this stage?
3. What could be modified in the future to make this stage even more impactful?

LESSON STUDY STAGE 4B

Guiding Question: How do I effectively analyze and revise a lesson for lesson study?

Stage 4b Timing:

- Preparation: 10 minutes
- Implementation: 2.5 to 3 hours synchronous

Stage 4b Goals: At the end of Stage 4b the team will:

- List observation trends for 4 categories on “Data Analysis” template;
- List student data trends from student work on “Student Data Tally” template;
- Utilize student observation and work data to drive lesson revisions;
- Revise the lesson based on the data;
- Individual reflection on first implementation; and
- Complete Midway Survey.

Stage 4b Materials:

- Step 6, Stage 4a/b-5a/b Resource Folder Digital Link
  - ✓ S6a: Step 6 Video Examples for Lesson Study Stage 4a/b-5a/b
  - ✓ S6b: Data Analysis Template

Stage 4b Facilitation Focus

Teachers may be nervous and fear they will be judged based on their lesson especially when reviewing and analyzing their student work and data. To relieve any anxiety during the lesson debrief, the facilitator should focus the discussion on student thinking, student learning, and asset-based ways of knowing. If metacognition is to take place by the teacher, a positive team culture must exist and is fostered from the very first session. Start the discussion with the positive student learning that was seen in the observation. Model asset-based statements for the team, and redirect if a team member makes a negative comment by shifting to a positive comment about student learning. This session is where Teacher A is commended for their bravery to go first and their willingness to share. Any and all deficit thinking must be reworded and refocused to an asset-based analysis of student learning. Equity here is represented through an asset-only lens. Review the K-12 Alliance Facilitator Toolkit section on how to reframe and refocus group

discussions towards positive intentional conversations around student learning. A review of group norms as part of the framing and grounding components for Stage 4b are extremely important to emphasize at the onset of this stage.

Stage 4b Data analysis

Observational data

For the data analysis section, there are two types of data to be analyzed that will provide evidence for lesson revision; observational and student work data. This synchronous review session begins with clear and explicit language stating that the lesson focus is on student learning and asset-based understanding. Provide the teachers with the link to the observation, analysis, and lesson revision document. Ask teachers to use the "lens of equity and access to learning for all students" to frame their observations and student work data analysis. Announce to the team that each team member will share their thoughts before proceeding on to the next category. Next, ask Teacher B to read the summary of what students should know and be able to do from this lesson. At this point, any clarifying questions are asked about the student learning intent of the lesson. On the observation document, begin in the team member order from left to right, and have each teacher begin by sharing the student learning strengths of the lesson. Always begin each question response with the strengths from the observation and maintain the asset-based focus throughout the data analysis. If a teacher continues on to another question, thank them for their eagerness to share and that you look forward to hearing their thoughts, but remind the team that each person will share their observations on the same question before moving on. After the strengths the same order is followed for areas to grow, peer to peer interaction, and rigor level of tasks and questions. **Indicate the two-minute limit** per teacher and per question to keep the team focused.

While the team members are sharing, summarize their thinking around the observation in bullet points lower on the document in the "Analyzing Evidence. What are the major patterns and tendencies in the observation evidence?" section. Discuss key observations or representative examples of student learning and thinking from observation notes. **Guidance:** Once the summaries for the observation are captured, have team members review summaries to determine if anything is missing or if any changes need to be made. Next, have Teacher B (implementing teacher) share how they felt about student learning in their lesson. Be supportive and point out the strengths in student learning in the lesson. Always end this section with expressed gratitude for Teacher B's implementation of the lesson and sharing their students' learning with the team.

Student work data

For the student work data, share the “Student Data Tally” with the team. Remind team members of the lesson intent by again reviewing what students should know and be able to do from this lesson. Also, review the agreed upon student data exemplar for reference for rubric scores as a team. Have teachers share their rubric scores and any patterns and/or trends they saw in the student work. Again, focus only on student evidence seen in the work. Avoid opinions or negative assumptions and always focus on the student work as evidence of learning. While the team is sharing, summarize their thinking around the patterns and trends in student data in bullet points lower on the document in the “What are the major patterns and tendencies in the student data evidence?” Discuss key examples of student learning and thinking from the student data. Have all team members review the bullet summaries from the observation to determine if anything is missing or if any changes need to be made. At this point, main themes from the observation and student work data have been captured onto the document. It is quite common to see student understanding misaligned with scientific concepts as well as teacher content knowledge come to the forefront in the data section.

Data summary

All team members with the exception of the facilitators are asked to write their response on the virtual document to summary question 3, “What does the evidence suggest about student thinking such as their misconceptions, difficulties, confusion, insights, surprising ideas, etc.?” Go around the team in the same order as the previous tally and ask team members to share their written responses. Participants may form an opinion about student thinking not based on evidence from the observation and work data provided. Clarifying and/or focusing questions can help to ground the responses in student evidence and eliminate bias/opinion from the analysis. Ask questions in a kind, positive manner seeking clarification for what is recorded on the document.

All team members with the exception of the facilitators are asked to write their response on the virtual document to summary question 4, “In what ways did students demonstrate what they should know and be able to do?” Go around the team in the same order as the previous tally and ask team members to share their written responses. Again, use clarifying and focusing questions to ensure evidence from the lesson supports their claim about student learning. If the process is taking too long or a participant is dominating the conversation, refer back to the two-minute time limit set at the beginning of the analysis section and praise the high level of engagement in the analysis. Also, refer to the need to honor the team’s presence by not exceeding the set meeting time.

Stage 4b Lesson Revision

Allow approximately 60 minutes for lesson revision. The “Data Analysis” will drive the team revisions to the lesson. Ask teachers to use the “lens of equity and access to learning for all students” to frame their recommended lesson revisions. Begin by giving time to the participants to review the analysis data on the document (the responses to the

four questions) and ask each team member with the exception of the facilitators to write one or more lesson revision(s) supported by the data they would recommend to increase student learning.

Guiding Question:

1. Based on the observation notes and student data analysis, what modifications will increase student learning for the second implementation/future implementation?

Each teacher goes in the same order as before and shares their lesson revision(s) and the data that supports its implementation. The facilitators' role here is key as they must keep in mind the multiple lenses of equity and access, NGSS pedagogy, content knowledge, and technology knowledge at the forefront when thinking about lesson revisions to improve student learning. This is why it is important to have more than one facilitator present during the lesson study.

Generally, teams will agree on revisions that support best practice aligned with NGSS implementation. However, there may be instances where no revision is suggested for an aspect that has come out in the data, or the suggested revision is not in line with research-based best-practice. In both cases, the facilitator should use focusing questions to guide the team towards those areas, such that the team can add revisions or shift revisions to align with NGSS best practice.

Once revisions have been agreed upon by all team members and facilitators, the facilitator steps back and asks the team how they would like to handle the revisions. There are three options for handling the revisions: (1) the revisions can be divided out into pairs of team members working in breakout rooms; (2) each team member can work on a revision separately; or (3) the team can participate in all revisions. The team then works to revise the lesson materials to reflect the revisions which may include adaptation to the slide deck, assessment forms, handouts, creation of new materials, etc. The goal is a revised lesson with all components ready for Teacher B to implement. The role of the facilitator is to act as a time keeper to make sure the revisions are complete at the 2.5-hour mark in the session, as the last 30 minutes will be needed for the implementation reflection. If the lesson revisions are not made by the end of the 2.5-hour mark, the team can decide how the revisions will be completed outside of the synchronous session before Teacher B's implementation.

The key is to maintain equity of participant voice in the revisions. It is recommended to review this section in the K-12 Alliance Facilitator Toolkit for tools on how to maintain equal participation in the revisions.

Stage 4b Reflection

Team Reflection

Allow approximately 30 minutes for team reflection. Once the revisions are complete, the team is given 5 to 10 minutes to complete the three reflection questions that are included in the Data Analysis Worksheet.

1. What learning/takeaways do you want to take with you to future situations?

2. What do you want to stay mindful of from now on, based on your reflections?

3. What are some specific next steps?

Each teacher, mentor and/or observer writes on the same document and includes their name with their response. Participants should each have a specific font color for their writing. Each participant then shares their response in the order written on the document for the first question. After the participant responds, the facilitator mirrors back what they heard the participant say and ends with, “Did I get it? Is there more?” The mirroring offers the participant a view of their own thinking and an opportunity to add or clarify a response. It is an important step as it gives the participant the opportunity to more deeply process their experience and learning. While it can feel repetitive for the facilitator, team members generally add to their initial thoughts once they hear the facilitator mirror back their responses. The facilitator captures in writing the additional components added by the team members next to their original response on the document. Once written on the document, it is important for the facilitator to ask if they captured their thinking correctly or if any modifications or clarifications are needed to clearly express their ideas.

Once each participant has shared responses to all three questions, the next date and time is reviewed for Teacher B’s implementation, and the time is set for the asynchronous analysis of the observation and student work data. Give positive feedback to the team on their asset-based analysis and evidence-based lesson revisions. Teacher B is reminded to send an email out to the team once their observation and student work data have been entered into the team’s folder. Last, respond to any final questions or comments before the session is ended. At the end of this session, send out the midway survey via email to each participant. Evaluate and look for patterns to their responses in the survey to see if there is anything that should be kept in mind for facilitating Stage 5.

Facilitator Reflection

At the end of each stage, take time to immediately reflect around the following questions (with facilitator colleagues if present):

1. What went well? What can I/we take away from this session and apply to future lesson studies?

2. Were there any obstacles in the facilitation? Did I/we meet the goals of this stage?

3. What could be modified in the future to make this stage even more impactful?

Step 7: Teach, Analyze, and Revise 2nd Cycle

LESSON STUDY STAGE 5A

Stage 5a Guiding Question: How can I capture and process student data during the second implementation?

Stage 5a Timing:

- Preparation: 30 minutes
- Implementation: 1.5 to 2 hours asynchronous. Can be done synchronously by adding another session to the team scheduling table.

Stage 5a Goals for Implementing Teacher: At the end of Stage 5a, the second implementing teacher (Teacher B) will have:

- Implemented the lesson;
- Recorded the implemented lesson (Zoom recorded session or video of in-person or hybrid instruction);
- Collected a class set of student data;
- List at the top of the "Data Analysis" template and "Student Data Tally" template "what students should know and be able to do";
- Analyzed student data based on "Student Data Tally" template; and
- Shared the observation and student data with the lesson study team (Google folder).

Stage 5a Goals for Team Members: At the end of Stage 5a, team members including facilitators will have:

- Scripted recorded observation;
- Analyzed observation script based on 4 categories; and
- Analyzed student data based on tally rubric.

Stage 5a Materials:

- Step 6, Stage 4a/b-5a/b Resource Folder Digital Link
  - ✓ S6a: Step 6 Video Examples for Lesson Study Stage 4a/b-5a/b
  - ✓ S6b: Data Analysis Template

Stage 5a Facilitation Focus

In this second asynchronous session with your team, it is essential to remind teachers of the need to have the student data ready for the debrief of the lesson. Ensuring all team members come prepared with scripted observation and student data analysis is essential for this stage to develop virtually. Without student data to discuss, the debrief around lesson revisions (a goal of lesson study) cannot take place. Therefore, reminder emails sent by both Teacher B and the facilitator will help impress upon the team the importance of preparing for this second session. Also, preparation of teachers for this stage is key. Refer to the list of Stage 5a Materials, above, for documents and tips to prepare the team.

Stage 5a Implementation

Teacher B implements and records the revised lesson. Teacher B will communicate with the team by email when the class recording is ready for review and student data sets are uploaded into the team's shared folder. An agreed upon amount of time is given to the team to process the data asynchronously before the synchronous debrief of the lesson. Usually 3 to 5 days is given to process the data, but this varies by team. The facilitator also sends out the same email from the first implementation with instructions and video on how to implement the revised lesson and process the student data.

Observation script

Once the teachers have the instructions, they will script the class observation recording as indicated in the instructions and video (see Stage 5a Materials above). Teacher B is the only member not scripting, although there is a value in having Teacher B watch themselves and script too. Teacher B will summarize what the students should know and be able to do by the end of the lesson at the top of both the observation and data tally forms. The facilitator and any observers will also script the lesson. After scripting, each individual will provide evidence from the video for each of the following four categories, which will guide the observation data analysis component:

1. Rigor level of teacher task and questions;
2. Peer-to-peer discourse in minutes;
3. Student learning strengths; and
4. Student learning areas to grow.

Student work data

The team begins at the top of the student data tally document which asks for the team to create an exemplar student response to the assessment based on what the students should know and be able to do at the end of the lesson. This will help to norm the team's rubric scoring of the student responses. It can also bring to the surface the alignment of

the student learning outcomes, the lesson activities, and the scored assessment. Articulation of what exemplar student learning looks like for this lesson will be a powerful tool in guiding the team thinking towards best practice shifts.

Next the teachers and facilitator will tally the student data according to its rubric score and indicate any patterns or trends seen in the data. The sample rubric provided is a 4-point rubric that is scored as follows:

1 = No answer/ nonsense response

2 = Missing multiple components

3 = Missing a component in the exemplar

4 = An exemplar response

The rubric scores are tallied and placed into a consensus table by each member of the team. In addition to the rubric scores, all team members and facilitators list any trends, sticking points, and current understanding trends seen in the data. All team members will come prepared to the second part of Step 7 (Lesson Study Stage 5b) having watched and scripted any video components and scored student work on the rubric.

Variations for Virtual Format

In some situations, the asynchronous component in Lesson Study Stage 5a may not be sanctioned according to the teacher contract or may require the addition of a stipend for work outside of school hours. In this case, Stage 5a can be handled in three ways:

1. Additional preparation time given during school hours;
2. Stipend given for additional work; or
3. Data analyzed by the team during site professional learning or professional learning community time.

Variations for In-Person Format

When completed in-person, teaching and analysis of the second lesson study implementation will vary from the virtual format. Please refer to Lesson Study Stage 4a Implementation (under Step 6) for a description of an in-person format that can be implemented for Lesson Study Stage 5a.

Stage 5a Facilitator Reflection

At the end of each stage, take time to immediately reflect around the following questions (with facilitator colleagues if present):

1. What went well? What can I/we take away from this session and apply to future lesson studies?

2. Were there any obstacles in the facilitation? Did I/we meet the goals of this stage?

3. What could be modified in the future to make this stage even more impactful?

LESSON STUDY STAGE 5B

Stage 5b Guiding Question: How do you effectively analyze and revise for the second time a lesson for lesson study? What final learning can we summarize at the end of the lesson study process?

Stage 5b Timing:

- Preparation: 10 minutes
- Implementation: 2.5 to 3 hours synchronous.

Stage 5b Goals: At the end of Stage 5b, the team will:

- List observation trends for 4 categories on “Data Analysis” template;
- List student data trends from student work on “Student Data Tally” template;
- Utilize student observation and work data to drive lesson revisions;
- Revise the lesson based on the data;
- Individual reflection on second implementation;
- Have a final collaborative discussion regarding the benefits of their lesson study experience; and
- Complete Final Survey.

Stage 5b Materials:

- Step 6, Stage 4a/b-5a/b Resource Folder Digital Link
  - ✓ S6a: Step 6 Video Examples for Lesson Study Stage 4a/b-5a/b
  - ✓ S6b: Data Analysis Template

Stage 5b Facilitation Focus

The framing of the student data review and the lesson debrief is focused on the language of the facilitator to stay solely directed on student thinking, student learning, and asset-based ways of knowing. Teachers may be nervous and fear they will be judged based on their lesson. If teacher metacognition is to take place, any form of anxiety must be relieved through a positive team culture that is fostered from the very first session. Start the discussion with the positive student learning that was seen in the observation. Model asset-based statements for the team, and redirect if a team member makes a negative comment by shifting to a positive comment about student learning. This session is where Teacher B is commended for their bravery and willingness to share. Any and all deficit

thinking must be reworded and refocused to an asset-based analysis of student learning. Equity here is represented through an asset-only lens. Review the facilitator WestEd handbook section on how to reframe and refocus group discussions towards positive intentional conversations around student learning. A review of group norms as part of the framing and grounding components for Stage 5b are extremely important to emphasize at the onset of this stage.

Stage 5b Data analysis

Observational data

For the data analysis section, there are two types of data to be analyzed that will provide evidence for lesson revision; observational and student work data. This synchronous review session begins with clear and explicit language stating that the lesson focus is on student learning and asset-based understanding. Provide the teachers with the link to the observation, analysis, and lesson revision document. Ask teachers to use the “lens of equity and access to learning for all students” to frame their observations and student work data analysis. Announce to the team that each team member will share their thoughts before proceeding on to the next category. Next, ask Teacher B to read the summary of what students should know and be able to do from this lesson. At this point, any clarifying questions are asked about the student learning intent of the lesson. On the observation document, begin in the team member order from left to right, and have each teacher begin by sharing the student learning strengths of the lesson. Always begin each question response with the strengths from the observation and maintain the asset-based focus throughout the data analysis. If a teacher continues on to another question, thank them for their eagerness to share and that you look forward to hearing their thoughts, but remind the team that each person will share their observations on the same question before moving on. After the strengths the same order is followed for areas to grow, peer to peer interaction, and rigor level of tasks and questions. **Indicate the two-minute limit** per teacher and per question to keep the team focused.

While the team members are sharing, summarize their thinking around the observation in bullet points lower on the document in the “Analyzing Evidence. What are the major patterns and tendencies in the observation evidence?” section. Discuss key observations or representative examples of student learning and thinking from observation notes. **Guidance:** Once the summaries for the observation are captured, have team members review summaries to determine if anything is missing or if any changes need to be made. Next, have Teacher B (implementing teacher) share how they felt about student learning in their lesson. Be supportive and point out the strengths in student learning in the lesson. Always end this section with expressed gratitude for Teacher B’s implementation of the lesson and sharing their students’ learning with the team.

Student work data

For the student work data, share the “Student Data Tally” with the team. Remind team members of the lesson intent by again reviewing what students should know and be able to do from this lesson. Also, review the agreed upon student data exemplar for reference for rubric scores as a team. Have teachers share their rubric scores and any patterns and/or trends they saw in the student work. Again, focus only on student evidence seen in the work. Avoid opinions or negative assumptions and always focus on the student work as evidence of learning. While the team is sharing, summarize their thinking around the patterns and trends in student data in bullet points lower on the document in the “What are the major patterns and tendencies in the student data evidence?” Discuss key examples of student learning and thinking from the student data. Have all team members review the bullet summaries from the observation to determine if anything is missing or if any changes need to be made. At this point, main themes from the observation and student work data have been captured onto the document. It is quite common to see student understanding misaligned with scientific concepts as well as teacher content knowledge come to the forefront in the data section.

Data summary

All team members with the exception of the facilitators are asked to write their response on the virtual document to summary question 3, “What does the evidence suggest about student thinking such as their misconceptions, difficulties, confusion, insights, surprising ideas, etc.?” Go around the team in the same order as the previous tally and ask team members to share their written responses. Participants may form an opinion about student thinking not based on evidence from the observation and work data provided. Clarifying and/or focusing questions can help to ground the responses in student evidence and eliminate bias/opinion from the analysis. Ask questions in a kind, positive manner seeking clarification for what is recorded on the document.

All team members with the exception of the facilitators are asked to write their response on the virtual document to summary question 4, “In what ways did students demonstrate what they should know and be able to do?” Go around the team in the same order as the previous tally and ask team members to share their written responses. Again, use clarifying and focusing questions to ensure evidence from the lesson supports their claim about student learning. If the process is taking too long or a participant is dominating the conversation, refer back to the two-minute time limit set at the beginning of the analysis section and praise the high level of engagement in the analysis. Also, refer to the need to honor the team’s presence by not exceeding the set meeting time.

Stage 5b Lesson Revision

Allow approximately 60 minutes for lesson revision. The Data Analysis Worksheet will drive the team revisions to the lesson. Ask teachers to use the “lens of equity and access to learning for all students” to frame their recommended lesson revisions. As facilitator, you should keep in mind that this is a final opportunity for the team members to experience

the positive effect of revising lessons in light of analyzing data about student learning. The focus of the conversation needs to be on the positive outcome of the first two cycles rather than on “wrong” lessons that needed to be fixed.

Begin by giving time to the participants to review the analysis data on the Data Analysis Worksheet and ask each team member with the exception of the facilitators to write one or more lesson revision(s) supported by the data they would recommend to increase student learning.

Guiding Question:

1. Based on the observation notes and student data analysis, what modifications will increase student learning for the second implementation/future implementation?

Each teacher goes in the same order as before and shares their lesson revision(s) and the data that supports its implementation. The facilitators’ role here is key as they must keep in mind the multiple lenses of equity and access, NGSS pedagogy, content knowledge, and technology knowledge at the forefront when thinking about lesson revisions to improve student learning. This is why it is important to have more than one facilitator present during the lesson study.

Generally, teams will agree on revisions that support best practice in NGSS implementation. However, there may be instances where no revision is suggested for an aspect that has come out in the data, or the suggested revision is not in line with research-based best practice. In both cases, the facilitator should use focusing questions to guide the team towards those areas, such that the team can add revisions or shift revisions to align with NGSS best practice.

Once revisions have been agreed upon by all team members and facilitators, the final revision suggestions and data evidence to support revisions are listed on the observation document. However, given that there is not a third implementation, actual revisions to the lesson materials will not need to be made. Therefore, the final session may be shorter in length.

Stage 5b Reflection

After the second cycle of lesson observation, student data analysis, evidence-based discussion, and revision, this concluding session in the lesson study process not only allows participants to take a final moment to discuss the lesson that was the object of the study, but also provides all team members to reflect on the learning opportunities provided by collaboratively engaging in the process.

Participants are invited to collaboratively reflect more broadly on the implications of this experience to future planning and teaching. Furthermore, as a facilitator you should take this moment to highlight the growth of the team into a professional community centered in improving instruction based on evidence of student learning. In short, you observed the

team's learning and progress towards meeting the goals identified in Step 3, and you are now providing them evidence of this learning. Key reflection ideas that could be brought up to the team members at this time as evidence of their collective learning include:

- The deepening of their pedagogical and subject matter knowledge;
- The development of their capacity to make careful observations of student learning and analysis of student work; and
- The strength in their capacity to utilize evidence to improve student learning.

Once the revisions are complete, the team is given 5 to 10 minutes to complete the following three reflection questions:

1. What learning/takeaways do you want to take with you to future situations?
2. What do you want to stay mindful of from now on, based on your reflections?
3. What are some specific next steps?

Each teacher writes on the same document and includes their name with their response. Participants should each have a specific font color for their writing. Each participant then shares their response in the order written on the document for the first question. After the participant responds, the facilitator mirrors back what they heard the participant say and ends with "Did I get it? Is there more?" The mirroring offers the participant a view of their own thinking and an opportunity to add or clarify a response. It is an important step as it gives the participant the opportunity to more deeply process their experience and learning. While it can feel repetitive for the facilitator, team members generally add to their initial thoughts once they hear the facilitator mirror back their responses. The facilitator captures in writing the additional components added by the team members next to their original response on the document. Once written on the document, it is important for the facilitator to ask if they captured their thinking correctly or if any modifications or clarifications need to be made to clearly express their ideas.

Once each participant has shared responses to all three questions, the facilitator reminds the team to complete the midway survey if they have not done so already and informs them of the final survey at the end of this session. Acknowledge the engagement and hardwork of the team, continuing to place positive feedback to the team on their asset-based analysis and evidence-based lesson revisions. Respond to any final questions or comments before the session is ended. At the end of this session, share the survey link and send the final survey via email to each participant. Thank each team member for sharing their observations and input with the team.

Variations for Third Implementation

If time permits and another teacher is willing to implement, the revised lesson could be implemented a third time. After the second implementation, the revisions to all of the lesson materials must be made prior to the third teacher's implementation.

Facilitator Reflection

At the end of each stage, take time to immediately reflect around the following questions (with facilitator colleagues if present):

1. What went well? What can I/we take away from this session and apply to future lesson studies?

2. Were there any obstacles in the facilitation? Did I/we meet the goals of this stage?

3. What could be modified in the future to make this stage even more impactful?

Step 8: Facilitator Reflection

Guiding Question: What outcomes from the lesson study process would I disseminate to my administrators to sustain future implementations? What did I learn about my facilitator role?

Timing:

- Preparation: 30 minutes, varies based on facilitator
- Implementation: 3 hours lesson planning time

Goals:

- Summarize key learning opportunities for the teachers as a result of their participation in the lesson study process;
- Think about a plan for disseminating key learning opportunities to administrators; and
- Reflect on your growth as a facilitator of the lesson study process.

In Step 8, you are asked to reflect both professionally and personally regarding the outcomes of the lesson study process.

For your professional reflection, gather data from the following sources:

1. Data Analysis Worksheets including responses from teachers to the reflection questions from your first and second lesson implementation.
2. Midway and final survey data.

Reflect on the information and look for patterns provided by the data analysis worksheets and teacher reflections. Looking at the trends in the data you can identify clear patterns of growth in specific instructional practices by participating teachers. It is especially important to highlight one or two of the positive outcomes and benefits to student learning as a result of changes in instructional practices. Examples of positive shifts for educators could include:

- The deepening of their pedagogical and subject matter knowledge;
- The development of their capacity to make careful observations of student learning and analysis of student work;
- The strength in their capacity to utilize evidence to improve student learning; and
- The growth of the team as an authentic professional learning community centered in improving instruction based on evidence of student learning.

These highlights will help you develop a clear message for your administrators of the positive impacts and changes that occurred because of the lesson study process.

In-Depth Data Analysis Tool

In order to provide an in-depth analysis of shifts occurring over the lesson implementation process, consider utilizing the best practice shifts table. This tool is a way for your lesson study teams to capture the overall changes in instructional practices as a result of the lesson study process. A detailed explanation of how to use the tool and create the table for your teams is found in **Appendix A: Creation of Best Practice Shifts Table**.

Facilitator Reflection and Next Steps

For your personal reflection, consider taking some time to answer the following questions about your own experience in facilitating the lesson study process:

1. What learnings/ takeaways do you want to apply to future situations?
2. What do you want to stay mindful of from now on, based on your reflections?
3. What are some specific next steps?

In light of your responses, it may be helpful for you to also revisit the K-12 Alliance Facilitator Toolkit document and note strategies you want to develop in the future. In addition, you may want to explore the research about lesson study. You can search the resources available through the Lesson Study Group at Mills College,[16] which includes examples of step-by-step resources for lesson study in a face-to-face context, instructional approaches, research, and content resources to deepen your lesson study practice.

[16] https://lessonresearch.net/resources/research/

Appendix A: Creation of Best Practice Shifts Table

Appendix Materials Resource Folder

- Appendix A Resource Folder Digital Link
  - ✓ A1: Template Best Practice Shifts Table
  - ✓ A2: Sample Best Practice Shifts Table

Background

You can measure the quality of the virtual lesson study model for professional learning by collecting qualitative data of the changes that occur during the lesson study implementation. The data that you are collecting are from the observations of the lesson components as they move closer towards modeling the best practices in NGSS. The shifts from each team can be categorized by a high-impact approach to show the significant effect size on student learning in a virtual lesson study. A shift or increase in modeling the best practice of a high-impact approach from participating in lesson study is an important strategy for identifying quality professional learning.

Visible Learning for Science[17] defines best practices as the implementation of high-impact approaches that help produce visible learners. High-impact approaches were identified in a meta-analysis of 1,400 studies with the impact quantified through effect size of a specific approach on student learning.

Creating the table

The Best Practice Shifts Table is a tool for your lesson study teams to collect data to measure the overall instructional shifts as a result of the lesson study. To complete the Best Practice Shifts Table, refer to the sample table located in **Appendix A Resource Folder** and complete the template called Best Practice Shifts Table.

To begin, review the data analysis worksheets and lesson revisions after Lesson Study Stage 4b. Fill in the Table column labeled "FIRST LESSON: Group Revision(s)" and add one revision that is consistent with a best practice that implements a high-impact approach.

Next, list observations and/or data analysis of student work in the Table column labeled "FIRST LESSON-TEACHER 1: Reason/s for Revision" as evidence for the revision.

Repeat the process for the revised lesson (Stage 5b) by completing the columns labeled as "SECOND LESSON – TEACHER 2 Data: Revision/s Implemented" and "SECOND LESSON: Impact of Revision/s." You will want to use the data analysis worksheet,

[17] Almarode, J., Fisher, D., Frey, N., and Hattie, J. (2018). *Visible learning for Science: Grades K-12: What works best to optimize student learning.* Thousand Oaks, California: Corwin, A Sage Company

classroom observations, and data from student work from the revised lesson to assist you in completing the columns for the second lesson.

If a third revision has been suggested for a high-impact approach, list the revision under the Table column labeled “THIRD LESSON: Revision suggestions. Not implemented.” List the “OVERALL TREND” illustrated between the first and second lesson implementation. For example, a team might recommend adding multiple activities that support the explore phase of learning using a 5E framework or implementing a strategy to scaffold the production of academic language for English Learners.

The last step is to identify the overall trend in high impact approaches and add it to the Table column labeled “OVERALL TREND.” The overall trend is based on the type of revision identified and implemented during the lesson study process. Using the description of best practices from Visible Science Learning[17], identify the best practice that aligns to the overall trend that was observed in the lesson study process. Insert this best practice under the first Table column. The effect size for each Visible Science Learning high-impact approach is included to highlight the potential impact caused by the instructional shift implemented. A sample of a completed Best Practice Shifts Table is provided in the **Appendix A Resource Folder.**