

Getting Started with Lesson Study

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This document was produced in 2009 by the Mills College Lesson Study Group (MCLSG), with funding by the Institute of Education Sciences, U.S. Department of Education (Grant No. R305A070237) to develop and test lesson study resources in collaboration with lesson study groups across the United States. Any opinions, findings, and conclusions or recommendations expressed in these materials are those of the authors and do not necessarily reflect the views of the U.S. Department of Education. Portions of this guide are based on *Lesson Study: Step by Step Guide* (by Catherine Lewis and Jacqueline Hurd, published by Heinemann: 2012) © Adaptation of original document, Mills College, 2012; May not be reproduced without written permission.

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Introduction To This Guide

Professional development that is going to make a difference to students in the classroom must be teacher driven and student focused. Lesson Study is both of these things.

Lynn Liptak, Principal Emeritus, Paterson Public School
Number Two

This guide provides a brief introduction to lesson study and some key tools to support the process, such as a suggested agenda for your first meeting, guidelines for observing and discussing the research lesson, and a template for writing the lesson plan.

This guide is divided into five sections. This introductory section provides a sample schedule for the lesson study cycle and briefly outlines the information we are asking each lesson study group to collect.

Section 1, “Getting Started,” suggests an agenda for your first lesson study meeting, and a format that may be useful for beginning and ending each subsequent lesson study meeting.

Section 2, “Select and Study Your Topic” focuses on setting goals and choosing and studying your topic. It suggests some activities and guiding questions that may be helpful in this process. Note that for the Teaching Through Problem-Solving (TTP) project, we will be focusing on two topics: area of polygons and fractions. Your individual research focus for these units may be somewhat different from other groups in the project.

Section 3 “Developing the Teaching-Learning Plan” provides a template for planning the research lesson and highlights some of the differences between the Teaching-Learning Plan and the lesson plans familiar to many of us from daily teaching.

Section 4 includes things to think about in preparation for teaching, observing, and discussing the research lesson.

As you think about how to schedule your group’s work, the rough timeline in Figure 1 may be useful. It includes a blank column that may be helpful for scheduling your meeting dates.

Figure 1. Sample Schedule for Lesson Study Cycle

Time Allocation	Meeting Date	Activities
1-2 hours		<i>For all groups:</i> Develop or revisit group norms; organize group roles; develop or revisit “main aim” of lesson study; begin to focus your lesson study topic
		<i>For groups new to lesson study:</i> Become acquainted with lesson study
6-8 hours (or more if time is available)		Study the topic of your lesson study work (3-4 hours) Develop a teaching-learning plan for the research lesson (3-4 hours)
1 class period		Teach the research lesson
1 hour		Conduct the post-lesson discussion (usually the same day as the research lesson)
1-2 hours		Reflect on what was learned from the entire lesson study cycle.

As shown in the sample schedule in Figure 1, near the end of your work, you should devote some time to summarizing and discussing what was learned from the whole lesson study cycle.

During your lesson study work that is a part of the TTP grant, you are asked to provide the Mills College Lesson Study Group with information to help us learn about your work. We ask that *each* time your group meets, you:

1. Videotape the meeting.
2. Keep any artifacts from the meeting, such as student work (e.g., copies or photographs) and lesson plan drafts. Also, keep any documents you used that are not in this guide, such as other curriculum materials and standards (a copy of the relevant pages or a reference if the material is available on-line).
3. Keep track of the time devoted to each lesson study meeting and note it on a meeting log.
4. Gather the video data card (the electronic record of your meeting), and any meeting artifacts, and submit to our office. We have provided paid, pre-addressed FedEx envelopes that can be deposited in any Fedex box.
5. Post a summary of the meeting on the TTP Network – questions that came up, a-ha’s your group had, etc.
6. At least two weeks prior to when the lesson will be taught, have one group member post a version of your research lesson on the TTP Network for feedback.

If you have not already done so, you may need to designate a group representative to keep track of collecting and submitting these materials. Please feel free to contact your site representative with any questions about the study materials.

Section 1 Getting Started

Improving something as complex and culturally embedded as teaching requires the efforts of all the players, including students, parents, and politicians. But teachers must be the primary driving force behind change. They are the best positioned to understand the problems that students face and to generate possible solutions.

James Stigler and James Hiebert, *The Teaching Gap*¹

Lesson study asks that teachers take part in activities that are unfamiliar to many U.S. teachers, such as *collaborative* planning of a lesson. To support the challenging work of lesson study, it is worth investing some time upfront in developing norms and productive routines for your group's work. The process we suggest for getting started is modeled on effective groups we have observed in the San Mateo-Foster City School District, California.

Meeting 1 (or Meetings 1-2 for groups new to lesson study)

Figure 2 provides a sample agenda for the first lesson study meeting. Agreeing on roles (such as notetaker, facilitator, etc.) and rotating these each meeting will help group members share the workload. To work well together, it will also be useful for your group to develop norms (ground rules) for your work together. A process for setting group norms is provided at the end of this section (p. 11).

Some concrete examples of norms (from teachers in Fresno and Berkeley, California) may provide a useful start to think about the kinds of norms that will be useful for *your* group.

- Listen thoughtfully, with an open mind
- Share the air
- Give 100%!
- Stay on task
- Be punctual
- Have a positive outlook toward self and others
- Be student-focused always
- Show respect for each other's ideas...yet challenge!

¹ Stigler, J.W. & Hiebert, J. (1999). *The teaching gap*. New York: Free Press, p.135.

Figure 2: Sample Agenda for First Meeting (First 1-2 Meetings for Groups New to Lesson Study)

Time (Minutes)	Experienced or new lesson study groups?	Agenda Item [Remember to Start Video Camera before Starting Meeting]
5	All groups	<p>Choose Roles Use roles that have worked for you in the past, or roles such as: Facilitator; 2 Notetakers (1 electronic, 1 for writing in public view); Timekeeper Rotate roles each meeting, and add roles as needed (e.g., researcher to track down materials, lesson plan recorder to update and circulate research lesson plan, convener to send out reminders and arrange room and refreshments).</p>
15-20	All groups	<p>Develop Group Norms <i>Develop norms (ground rules) and identify a norm to monitor at today's meeting</i> See "Setting Norms" (p. 10) for suggested process.</p>
45-70	New to lesson study	Become Familiar With Lesson Study
10	New to lesson study	<p>Examine Your Ideas About Professional Development In your view, what are the characteristics of effective professional development? Write lists individually and then share with the group.</p>
20-40	New to lesson study	<p>Build Shared Understanding of Lesson Study Consider watching "How Many Seats?" video about lesson study. If meeting time is limited, you can do this ahead of time in preparation for the meeting. Discuss: What are the key characteristics of lesson study?</p>
10	New to lesson study	<p>Revisit Ideas about Effective Professional Development How do characteristics of lesson study fit/not fit with ideas about effective professional development generated by this group?</p>
5-10	New to lesson study	Surface Concerns About Lesson Study
10-20	All groups	<p>Consider Your Long-Term Goals and "Main Aim" See "Choosing a Research Theme" (p. 13) for suggested process</p>
variable	All groups (as time permits)	Begin to Focus Your Lesson Study Topic

Figure 2 (cont.)

Time (Minutes)	Experienced or new lesson study groups?	Agenda Item [Remember to Start Video Camera before Starting Meeting]
10	All groups	Meeting Review and Reflection Share out reflections as desired and summarize. Summarize decisions, any assignments (including posting a summary of your meeting on the TTP Network), build tentative agenda for next meeting Reflect on norm(s) selected to monitor today: Did we uphold norm(s)? What do we need to do differently next meeting?

Figure 3: Sample Beginning and Ending Agenda Items for All Lesson Study Meetings

Time (Min.)	Agenda Item [Remember to Start Video Camera before Starting Meeting]
1-5	<p>Beginning of Meeting:</p> <p>Choose Roles Choose roles (such as electronic and public notetakers, facilitator, timekeeper, etc.); systematic rotation (by birthday or some other means) develops the capacity of all group members</p> <p>Choose a Norm(s) to monitor this meeting Choose one or more norms to monitor this meeting; group members will pay attention to whether the selected norm is being upheld, and share their ideas at the end of the meeting</p> <p>Review Notes From Last Meeting and Today's Agenda Refresh your memory about the last meeting, and make any needed adjustments to today's agenda, before launching into your work for today</p>
	<i>[substance of meeting]</i>
10-15	<p>End of Meeting:</p> <p>Meeting Reflection Share out individual reflections as desired, notetaker keeps record. Assign one person (or more, if desired) to provide a summary of what you discussed and learned at your meeting on the TTP network.</p> <p>Meeting Review Summarize today's decisions, any assignments Build tentative agenda for next meeting</p> <p>Norm Reflection Reflect on norm(s) selected to monitor today: Did we uphold norm(s)? What do we need to do differently next meeting?</p> <p>Submit Materials Collect and FedEx and meeting artifacts and video memory card</p>

Setting Norms in Your Lesson Study Group

What would make this lesson study group a supportive and productive site for your mathematical learning?

- Jot down a list of characteristics important to you. (It may help to think about characteristics of groups that have functioned well – or poorly – to support your mathematical learning in the past.) You may want to consider some general norms (such as listening and taking responsibility) and some that have been identified as especially important to mathematics, such as
 - Exploring and “unpacking” mathematical connections, being curious;
 - Explaining and justifying solutions, agreeing on what constitutes an adequate justification
 - Evaluating solution strategies for correctness, efficiency, and insight
 - Expressing agreement or disagreement (Ball & Bass, 2000a, 2000b; Ball, Bass, Hill, & Thames, 2006; Cobb, Yackel, & Wood, 1989; Cobb, Stephan, McClain, & Gravemeijer, 2001).
- Share and discuss ideas as a group the ideas generated by each member, taking particular care to identify and discuss any possible contradictions. For example, if one group member asks for “safe” and another for “challenging my thinking,” talk about how both can be honored.
- Synthesize members’ ideas to a group list of about 5 key norms you all support.
- Record the norms for future reference.
- At the beginning of each meeting, choose one norm to monitor that day. At the end of your meeting, discuss whether you upheld it and what can be improved.

Section 2 Select and Study Your Topic

My lesson planning has changed this year because of lesson study. I'm moving away from "What are the activities I'm doing?" to "What is it that I want kids to get?"

Jacqueline Hurd, Teacher, California

This section and the next suggest a process for you to consider your goals for students, select a topic of focus for your lesson study work, study the topic in some depth, and develop a lesson plan that builds on existing research and curriculum. While no two groups do these activities in exactly the same way, some of the strategies we explore in this section and the next are to:

- Consider your pressing questions about student learning, and your key challenges in teaching, to help identify a topic for your research lesson. Note that for the Teaching Through Problem-Solving (TTP) project, we will be focusing on two topics: area of polygons and fractions. Your individual research focus for these units may be somewhat different from other groups in the project.
- Investigate your students' current thinking and bring it back to the group
- Read the Step-By-Step guide or teacher's edition that illuminates student thinking about the topic of interest, or consult member(s) of the TTP Network
- Try out (as adults) a challenging problem or task that you would like students to learn to solve; share and discuss your solutions in order to anticipate student thinking

Consider Your Long-term Goals for Students and Agree on a "Main Aim" of Lesson Study

Lesson study often begins by considering your long-term goals for students – for example, the qualities you hope they will have as adults. The document entitled "Choosing a Research Theme" at this end of this section outlines a process for thinking about your long-term goals and using them to develop a "research theme" or "main aim" for lesson study. Even if you don't have time for the activity described in that document, you might want to quickly consider the two basic questions:

- **Ideally**, what qualities will students have when they graduate from our school?
- What are the **actual** qualities of our students now?

By reflecting on the gap between the ideal and the actual, you can quickly remind yourself of the long-term goals of importance to you. The research theme or main aim of lesson study is a broad goal, positively stated, that is compelling to teachers from all grade levels and many points of view, such as to build students' desire to learn, responsibility as

learners, or habits of supporting one another’s learning. Developing a “research theme” or “main aim” for lesson study work reminds us that our long-term goals are achieved through the accumulation of individual lessons.

Choose a Topic

Teachers report that the task of choosing a unit and lesson for the focus of lesson study can be very easy or very difficult. To help all members of the TTP Network learn together about teaching through problem-solving, your topics will all be the same for both lesson study cycles. However, each group’s research focus for these units may be somewhat different from other groups in the project.

To maximize the feeling of working together on “our lesson,” many U.S. lesson study groups defer the decision of who will teach the research lesson until just before the research lesson is taught. Ideally, you want to spend most of your time studying the topic, as discussed next, (not choosing it or focusing on the minutiae of the lesson design). As you study the topic, an interesting focus for your research lesson is likely to emerge.

Study the Topic

Lesson study is most productive when educators build on the best existing lessons and research, rather than reinventing the wheel. The point of the lesson study cycle is not simply to produce a lesson, but to study the topic and student thinking related to that topic in some depth. To deepen knowledge of the topic you are studying, it will be useful for your lesson study group to:

- Carefully study the K curriculum and standards, especially any supporting materials in the teacher’s edition designed to build in-depth content knowledge
- Communicate with your TTP Network colleagues about the topic.

Select some material to collectively read and discuss. The following questions may help guide your study of curriculum and research.

- What are the important understandings students need to develop about this topic, and how do they develop?
- How do other curricula treat this topic, and what are the advantages and disadvantages of each? What might be the impact of the models, examples or representations used by different curricula?

Ask for Feedback

Another element that may greatly enhance your lesson study is feedback on your plans by an outsiders, such as your TTP network colleagues. Ask questions about the subject matter, how to teach it, or both. Asking questions earlier rather than later may help you avoid some problems down the road. The role of our TTP Network collaborators is to raise questions, add new perspectives, and be co-researchers, not to tell others what to do.

Choosing a Research Theme (Main Aim) for Lesson Study

Think about the students you serve.

Your Ideals:

Ideally, what qualities would you like these students to have five years from now (or alternately, when they graduate your institution)?

The Actual:

List their qualities now.

The Gap:

Compare the ideal and the actual. What are the gaps that you would most like to work on?

The Research Theme: (The goal, research focus or main aim of lesson study)

By comparing the ideal and actual student qualities, select a focus for your lesson study. State *positively* the ideal student qualities you choose to work on. For example teachers in a Japanese school serving a low-income, diverse community that had historically been subjected to discrimination chose the following goal:

For students to develop fundamental academic skills that will guarantee their advancement, and a rich sensibility about human rights.

Your research theme:

Section 3 Develop a Teaching-Learning Plan

It is challenging – to try and think about the students’ solutions to the problem before they do it, and to try and get all of the answers they might come up with. You have to think about things from the student’s point of view and that is a big change. ⁱ

Heather Crawford, Teacher, New Jersey

Develop the Teaching-Learning Plan

Phase 2 of lesson study is concerned with developing the Teaching-Learning Plan for the research lesson (a template is provided at the end of this section). For lesson plan examples, refer to the Step-by-Step guide to find lessons by Dr. Takahashi and by Bill Jackson, from the lessons we saw together at the Summer Institute. You can find Step-by-Step guide on the TTP Network, under Key Resources. A Teaching-Learning plan for lesson study differs from an ordinary lesson plan because it is designed to stimulate, capture, and share your group’s learning, as well as to guide the lesson. Here we discuss some elements of the Plan Template that may need comment.

Goals

Often, three different levels of goals are found in a teaching-learning plan.

First, you can note your “Research Theme”(or Main Aim”) if you developed one, or perhaps some phrases from your mission statement that will remind you of the long-term goals for your students that you want to remember during this work.

Specific goals for this lesson and more general goals for student learning of the subject area also go under “goals”. Some examples of each level of goal for students follow.

Research Theme or Main Aim

- Take initiative to learn and to support the learning of classmates
- Are curious, persistent learners
- Enjoy challenges

Goal for the Subject Area

- Make reasoned conjectures
- Enjoy looking at problems from several perspectives
- Use journals to reflect on and revise their ideas
- Use prior knowledge to solve challenging problems
- Develop a strong repertoire of representations for thinking about problems

Goal for the Lesson

- Notice that the area of an unfamiliar figure can be found by transforming it into a familiar figure with the same area
- Notice that a mathematical pattern can make it easy to solve a problem
- Discover that it can be convenient to count objects by 2’s and 5’s

- Realize that a hidden number in a number chart can be found by looking at the surrounding numbers

Lesson Background and Rationale

Why is it useful to do a research lesson on this topic? For example, what do you notice about students' current learning that makes this topic interesting? What led you to design the lesson as described in your "Flow of the Lesson" section? While the activities in Section 2 (the prior section of this guide) should enable you to make an initial statement about the lesson rationale, you may want to revisit your lesson rationale at the end of lesson planning, after you further develop your ideas about how to best teach this topic. The lesson rationale helps the reader understand the journey that led your group to this lesson design.

How Does Student Understanding of This Topic Develop?

While US educators often think of lesson study as focusing on a single lesson, in fact it focuses on the whole unit, even though just one lesson is typically observed. The teaching-learning plan explains how the research lesson fits within the unit – for example, whether the primary function of the lesson is to motivate students to study the topic in subsequent lessons, to help students learn a new concept, or to help students consolidate and apply what they have learned in prior lessons. The teaching-learning plan also notes how the research lesson topic connects with material taught in prior or subsequent years of schooling. For example, if students are learning to add single digit numbers that sum over ten, it is essential to notice whether they re-activate their knowledge of decomposing five, so they see, for example, $8 + 5$ as $8 + (3+2)$

Lesson Design

The following list of questions may be helpful as you plan the research lesson:

1. What do students currently understand about this topic?
2. What do we want them to understand at the end of the lesson and unit?
3. What is the "drama," or sequence of experiences and questions that will propel students from their initial understanding to the desired understanding?
4. How will students respond to the questions and activities in the lesson? What kinds of thinking, problems and misconceptions will arise? How will the teacher use these ideas and misconceptions to advance the lesson?
5. What will make this lesson motivating and meaningful to students?
6. What evidence should we gather and discuss about student learning, motivation, and behavior? What data collection forms are needed to do this?

The lesson design is usually written out in three or four parallel columns that contain:

- The questions, problems, and activities to be posed by the teacher
- The anticipated student responses
- The teacher’s planned responses to the students and things for the teacher to remember
- Points to notice during the lesson (or “evaluation”)

A New Jersey teacher contrasts research lesson planning with the lesson planning that previously occurred at her school:

[Now] we think a lot more about the motivation for the lesson and making sure that the kids have the prior knowledge that they need before we teach each lesson...Before we did lesson study we really didn’t think about what the student responses would be to the questions. When we posed a problem we never really thought about what the kids would come up with. It was... ‘Well, we hope they get the right answer and if we don’t then we will deal with it.’ Now we are really thinking about, ‘Well, what if this answer were to come up? How would we deal with it?’

What helps groups anticipate student thinking?

As the opening quote at the beginning of this section points out, lesson study groups often find it hard to anticipate student thinking. The following experiences support thoughtful anticipation of student thinking.

1. Try the lesson task yourselves. It is useful for each member of your team to solve the problem or try the task(s) you’re considering for the lesson (as if you were students) and to share your responses, using your own and colleagues’ solutions to expand your thinking about possible student responses. You may also want to try a task similar to that in the lesson, but more challenging for adults, so that you need to struggle with some of the same challenges your students will face. Another variant that may be useful is “microteaching” in which one member of your group teaches the lesson to the other group members, who serve as students. In any of these activities, be sure to save time to discuss different responses that did (or did not) arise, and to notice and discuss any responses that are unexpected or puzzling.
2. Have group members try the lesson task (or a related task) with students not in the research lesson class, and bring student responses back to the group, to expand your knowledge of student thinking.
3. Consult research and knowledgeable others (such as coaches, university-based researchers, or your TTP Network colleagues). If you need support beyond the curriculum materials, get recommendations about research and curriculum materials that provide further information about student thinking with respect to your topic of choice, and about the experiences that may help students move along a trajectory of understanding.

Student Learning Activities

The left-hand column of the teaching-learning plan lists the major activities of the lesson. You may want to note on the plan the time allocated to each part of the lesson. (Needed materials may also be listed here or elsewhere).

Points of Evaluation

The column of “points of evaluation” alerts observers about what to look for as they are observing each stage of the lesson. The “points of evaluation” will provide evidence about how and what students are learning in light of the lesson your group has designed. For example, observers might be cued to notice whether students are eager to investigate a problem introduced by the teacher, what models they draw, whether and how they use the tools or manipulatives provided to them, what changes their thinking (or fails to!), and what evidence they use to persuade their peers.

Data Collection Points

What data will tell you how students are grappling with the major ideas of the lesson? Well-designed data collection during the lesson supports a rich post-lesson discussion. In addition to the points listed in the “points of evaluation” column, members of the lesson study group usually have specific data collection assignments and forms to support data collection, which might include a seating chart, list of members of each student group, records of students’ prior thinking, checklists for noting features of student work, forms for recording the participation of each member of a small group, or forms to collect other relevant data of interest to the lesson study group. Other lesson observers (from the school or outside) may also be given data collection assignments. While lesson study novices are often tempted to roam the classroom and see what every student is doing during the research lesson, it is often more fruitful if most team members follow selected students or small groups over the entire lesson, in order to see the moment the light bulb goes on (or doesn’t) and to understand the key supports or barriers to the learning of the observed students. You may want to designate one team member to gather data across the class (for example, how many students used each type of solution) if you cannot obtain this information from student work.

Avoid Micro-Managing

As you plan the research lesson, avoid the temptation to micro-manage each move and comment of the lesson instructor. Teacher moves are what we know best, and it may be more comfortable to plan teacher moves than to deeply explore the disciplinary content. However, studying the content and curriculum may yield implications for teaching more naturally. If a lesson element is likely to affect students’ understanding and response to the lesson task in important ways, then it is probably legitimate territory for group discussion. Problem wording and content, choice of manipulatives, and design of graphic organizers and worksheets are all examples of lesson elements that may affect student learning. On the other hand, decisions such as whether to have a discussion at desks or gathered on the rug may best be left to the instructor, unless someone makes the case that these relate to the aspects of student learning under study by the group – for example, that it is important to be at desks so that students can record their thinking in notebooks.

If your group is getting bogged down in what seem to be minor decisions, you might want to consider setting a time limit for discussion of a decision, or solving it by a means such as flipping a coin.

Summary: Uses of the Teaching-Learning Plan

In summary, the teaching-learning plan represents the thinking of the whole lesson study group about three concentric layers of practice: the lesson itself, the larger unit and subject area of which it is part, and the even larger domain of students' long-term development. As you move from planning to doing the research lesson, the teaching-learning plan will serve many functions. It will:

- Support the research lesson instructor, by providing a detailed outline of the lesson and its logistical details (such as time, materials, and wording of key questions or problems)
- Help your group anticipate problems that may occur and how they will be handled (for example, how calculation errors will be handled).
- Tell observers what to look for during each part of the lesson and what data to collect, and provide needed forms (for example a student seating chart, prior work from each "focus child" of interest, or note-taking forms specifically designed to collect data of interest).
- Capture your best collective thinking about how to teach this particular topic to these students, so that you can share it with others (for example, any lesson observers) and revisit it in your later reflection.

Blank Lesson Template (3 pages)
Lesson Plan for [grade and topic, e.g. Kindergarten, Comparing Sizes of Groups]

For the lesson on [date]
At [name of the school], [teacher's name] class
Instructor: [name]
Lesson plan developed by: [names]

Experienced lesson study practitioners use a variety of formats for presenting the thinking behind their lessons. We offer this template as a tool to support your thinking during lesson study. Italicized text briefly describes what the sections are for; it should be deleted during preparation of the actual lesson plan.

1. Title of the Lesson: <a descriptive title>

2. Brief description of the lesson

Just a sentence or two...

3. Goals of the Lesson:

Include long-range or thematic goals as well as short-term ones. EXAMPLE:

- a. For students to understand that, by counting two groups of objects, they can determine whether one group contains more objects, fewer objects, or the same number of objects as the other group.*
- b. For students to appreciate the usefulness of mathematics for helping them accomplish tasks of value to them.*

4. Relationship of the Unit to the Standards

This section typically describes how this unit should move students from what they have previously learned toward new skills or concepts, in terms of the standards. It is usually done graphically, like this:

<p><i>Related prior learning standards (topics/objectives)</i></p> <p><i>Example:</i></p>
<p>K. CC 1: Count to 100 by ones and tens.</p> <p>K. CC 2: Count forward from a given number within the known sequence (instead of having to begin at 1).</p> <p>K. CC 3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).</p>

↓

<p style="text-align: center;">This unit <i>[don't change this]</i></p>



Targeted learning standards (topics/objectives). The standards for the current grade usually go here.

Example:

K. CC 6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

K. CC 7. Compare two numbers between 1 and 10 presented as written numerals.

5. Background and Rationale

This section typically discusses:

(a) what the students need to learn according to standards or the curriculum;

(b) difficulties students have had in the past with the subject matter

(c) the thematic focus of this lesson study, i.e. larger (perhaps non-mathematical) goals the team will try to address, and why.

6. Research and Kyozaikenkyu

This section describes the research findings of the planning team, including findings from the primary and alternative curricula, and consideration of materials that might be used to facilitate learning.

7. About the Unit and the Lesson

This section typically describes how the unit and lesson are designed to help students meet the standards, and how the unit and lesson address the Common Core State Standards for Mathematical Practice 1-8 (pp. 7-8).

8. Flow of the Unit

Shows how the research lesson fits into a larger unit. Briefly describes what students learn before and after the research lesson.

Lesson	Learning objective(s)	# of lesson periods
	EXAMPLE	
1	Identify whether the number of objects in one group is greater or less than the number of objects in another group, using a matching strategy (up to 5 objects).	2 x 30min.
2	Identify whether the number of objects in one group is greater or less than the number of objects in another group, using a counting strategy (up to 10 objects)..	3 x 30min.
3	Identify whether the number of objects in one group is greater than, less than, <u>or equal to</u> the number of objects in another group.	2 x 30 min. (#2 = research)

		lesson)
4	Compare two numbers, 1-10, written as numerals.	3 x 30 min.
5	Summary and exercises	1 x 30 min.

9. Flow of the Lesson

The sections of this lesson plan are just a guide. "Anticipated student responses," however, should always be included.

Steps, Learning Activities Teacher's Questions and Expected Student Reactions	Teacher's Support	Points of Evaluation
<i>This column shows the major events and flow of the lesson.</i>	<i>This column shows additional moves, questions, or statements that the teacher may need to make to help students.</i>	<i>This column identifies what the teacher should look for to determine whether to proceed, and what observers should look for to determine the effectiveness of the lesson.</i>
1. Introduction <i>This section may review ideas from a prior lesson or discuss a simple problem designed to prepare students for work on the main problem.</i>		
2. Posing the Task <i>This section describes a problem or task as it will be presented to students.</i>		<i>How do we know if students understand the task?</i>
3. Anticipated Student Responses <i>This section describes how students might respond to the task, including incorrect solutions and places where students might get stuck. It can be helpful to tag different responses in some way, e.g. "R1" for Response 1 etc.</i> R1: $2 + (3 * 5)$ [correct] R2: $3 * 5 = 15; 2 + 15 = 17$	<i>Here the plan might describe how the teacher will handle the different student responses, especially incorrect solutions, students who get stuck, or students who finish early.</i>	
4. Comparing and Discussing	<i>What are the ideas to</i>	<i>What will</i>

<i>This section may identify which student solution methods should be shared and in what order, or generally how to handle the discussion.</i>	<i>focus on during the discussion?</i>	<i>indicate that students are benefiting from the discussion?</i>
<i>(If needed, repeat 2, 3, & 4 above for additional tasks.)</i>		
5. Summing up <i>This section may describe how the teacher will summarize the main ideas of the lesson. It may also include an assessment activity.</i>		

10. Evaluation

This section often includes questions that the planning team hopes to explore through this lesson and the post-lesson discussion.

11. Board Plan

This section contains a diagram showing how work on the blackboard will be organized.

12. Post-lesson reflection

To be filled out later.