FACILITATOR & PARTICIPANT GUIDES

Mathematical Practice #6 Collaborate Mathematically

Digging Deeper into the Mathematical Practice (MP) Standards (2026)

This series, developed by the Montana Office of Public Instruction's Math Instructional Coordinator, serves to support educators in understanding the 2026 mathematical practice standards.

In this guide, you will find facilitator and participant materials that accompany the videos created for Mathematical Practice (MP) #6: Collaborate Mathematically

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Digging Deeper MP#6

Attaining and Providing Professional Development Unit (PDU) Certificates

To utilize this video and its materials as a professional learning opportunity, consider the following recommendations and guidelines:

The Administrative Rules of Montana (ARM) define legal parameters for professional development of educators in the following items:

- 10.55.714
- 10.57.215
- 10.57.216

Although informational, the video does not meet the requirements outlined in ARM and therefore does not qualify for Professional Development Unit Certificates. There are, however, many ways in which the video could be utilized strategically by a facilitator in order to elevate it to a professional learning opportunity. Here are some suggestions for how this may work:

FOR ADMINISTRATORS AT PUBLIC SCHOOLS:

- Consider using this video with the adjoining facilitator outline (page 3) as a school-wide professional learning opportunity for your staff. Some appropriate groups include:
  - all elementary educators;
  - mathematics department educators (6-12 appropriate);
  - curriculum coordinator or instructional coaches (PK-12 appropriate); and
  - special-education teachers (PK-12 appropriate);
- At a minimum, this video, paired with 30 minutes of discussion and activity engagement, could be translated to a 1 PDU certificate. However, there are examples where this could be extended into further professional learning. Some examples include:
  - an ongoing participation in each math practice deep-dive by staff members;
  - educators meeting to develop rich learning tasks that emphasize the practice standard; or
  - a follow-up group discussion and check-in where conversations around the challenges and successes in applications of the Math Practice Standard in the classroom setting take place.
- If you are a registered provider of professional development for your school, you can issue professional development unit certificates to educators who have completed the session in compliance with your expectations, district policies, and the Administrative Rules of Montana items provided above. If you are not yet a provider and would like to become one, please visit the "Become a Professional Learning Provider" webpage

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FOR EDUCATORS WORKING IN PUBLIC SCHOOLS:

- Submit a request to your building administrators to see if they can issue you a professional development unit certificate for completing this work. Consider sharing this facilitator guide with them and review any relevant district policies for submitting such requests.
- With your administrator, consider potential applications for this professional learning. Some suggestions include:
  - An independent professional learning experience where you watch the video, complete the activities, reflect on the prompts, and participate in a conversation with your administrator about the topic, what you learned, some key resources you discovered, and some ways you'd like to experiment with this topic in your classroom instructional practice.
  - A department-wide professional learning experience where you share this video with your department and discuss its content during your regularly scheduled PLC time, following the facilitator outline on page 3.
  - A professional learning event where you practice your teacher-leader skills and host a session for interested individuals in your school or district.

FOR EDUCATORS NOT CURRENTLY WORKING IN PUBLIC SCHOOLS OR THOSE WHO ARE BUT WHOSE REQUESTS HAVE BEEN DENIED BY THEIR ADMINISTRATORS:

- Unfortunately, a pathway does not yet exist for these individuals to receive OPI Professional Development Unit Certificates for watching this video. However, keep an eye out on the Teacher Learning Hub and the Math Standards Webpage for new updates and opportunities.
- Although they may not receive formal units for this, educators can still learn from this video by simply watching and reflecting on the prompts. We hope these educators will still consider engaging in this learning for the intrinsic value it presents.

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GENERAL GUIDANCE

PREPARATION BEFORE THE SESSION:

- Verify the approved provider that will issue the certificates to participants (Pages 2 - 3)
- Review the Facilitator Outline (Pages 5-10)
- Confirm access to all required materials:
  - Video links (Pages 5-10)
  - Participant Guide copies (Pages 11 - 19)
  - Writing implements and activity materials (pens, markers, etc.)
  - Digital or physical collaborative workspace tools (sticky notes, whiteboards, etc.)
  - Audio/video equipment
  - Feedback survey (created by the facilitator)
- Test audio/video equipment
- Print copies of the Participant Guide
- Familiarize yourself with district Integrated Strategic Action Plan (ISAP) goals to align discussions.
- Familiarize yourself with the knowledge and expertise of the educators in attendance.
- Take attendance to facilitate issuing Professional Development Unit (PDU) Certificates.

FOLLOWING THE SESSION:

- Issue the feedback survey provided by OPI, referred to in “Closing” (Page 10)
- Issue your own feedback survey to reflect on your strengths and opportunities as a facilitator of professional learning, and to better understand the impact and efficacy of your session.
- Issue PDU certificates to educators and retain attendance records in alignment with ARM (Page 2-3)

MATERIALS NOTE:

Please keep an eye out for these great materials, currently in development:

- Teacher Learning Hub Course
- Additional Math Practice Deep Dive Webinars

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OPENING & PART 1:

The following outline is recommended for instances where 'traditional' professional learning is taking place. That is - where a 'instructor' or 'facilitator' is conducting a professional learning event for participants in alignment with the ARM. Please note that this is a recommendation, but facilitators are free to modify the activities as appropriate for the audience. It is estimated that completion of all these activities may take 1-2 hours depending on application.

OPENING (~ 2 minutes)

- Open the session, welcome educators, and provide background information on the mathematical practice standards and their application in instruction.
- Ensure each teacher has access to the 2026 Montana Mathematical Practice Standards.
- Pass out the participant materials located on **pages 11 - 19**
- Check pre-existing knowledge of the audience and make any last-minute adjustments to the training as appropriate.
- Review the objectives for your session.

PART 1: IDENTIFYING DIFFERENCES (~ 25 minutes)

- Show the first video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 1 Identifying Differences & Opportunities**
- **Pause the video at 1:55** and allow participants the opportunity to respond (Page 11).
  - Activity Option #1: Think-Pair-Share - Ask participants to record their thoughts on the participant guide, then have them pair with someone nearby, and discuss. Finally, participants should share what they noticed with the group.
  - Activity Option #2: Weighty Words - Have participants highlight 2-3 words that stand out to them within the math practice. Ask them to share these words with a partner or their table. Wrap up with a discussion around how these key elements, the 'weighty words', add to the student learning experience.
  - Activity Option #3: Choose your own engaging and collaborative activity.
- **Start the video and play as far as needed**. Have participants complete the **Analysis** provided on the screen and in their participant handout (Page 11) using an activity.
  - Activity Option #1: Gallery Walk - Split participants into four groups. Have each group address one component of the analysis. Then have groups rotate and add additional thoughts. Discuss as a large group.
  - Activity Option #2: Stakeholder Analysis - Assign each group a stakeholder focus (e.g., "teachers", "students", "community members", etc.) that might be affected by this shift. Each group will conduct the analysis with this audience in mind, then use a share out, Jigsaw, or Gallery Walk protocol to share with the group.

PARTS 2 & 3

PART 2: UNPACKING THE STANDARD (~ 15 minutes)

- Show the second video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 2 Unpacking the Standard.**

- **Pause the video at 2:04** and allow participants the opportunity to respond (Page 12)
  - Activity Option #1: Provide some reflection time for participants to record their thinking, then ask for volunteers to share skills they see embedded in the standard.
  - Activity Option #2: Provide the standard in written or printed form, ask educators to bold the verbs and underline the nouns. Have participants then record the verbs and nouns on a sticky note or virtual word cloud.
  - Activity Option #3: Use a Round Robin Protocol and ask participants to each share one skill they noticed in small groups. Discuss as a larger group.
  - Activity Option #4: Choose your own engaging and collaborative activity.

- Restart the video and play to the end. Have participants answer the final question, identifying a strength in students and an opportunity for growth. Allow self-reflection time for participants to record their thoughts in the participant guide, Page 12.

PART 3: PROFICIENCY (~ 10 - 25 minutes)

- Show the third video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 3 Proficiency**

- **Pause the video at 02:06** and allow participants the opportunity to respond (Page 13).
  - Activity Option #1: Utilize a self-reflection.
  - Activity Option #2: Employ a Think-Pair-Share Protocol and have educators reflect, pair up, then share out to the entire group.
  - Activity Option #3: Utilize technology to capture responses virtually, such as a word cloud, virtual whiteboard, or short response record. Discuss results as a group.

Directions for this activity continue on the next page.

PARTS 3 & 4:

PART 3: PROFICIENCY CONTINUED

- **Restart the video and stop at 05:05.** Have participants respond to the reflection question, identifying the key behaviors they see in proficient students and students who are not yet at proficiency in this mathematical practice standard. (Page 13)
  - Activity Option #1: Provide some reflection time for participants to record their thinking, then ask for volunteers to share their thoughts.
  - Activity Option #2: Provide giant sticky notes or poster boards for each category - Mastery, Proficient, Developing, and Beginning - then assign each group one category. Have each group write down comments regarding what it may be defined as in the context of the mathematical practice standard. Ask groups to place their findings somewhere visible, then employ a Gallery Walk or Jig Saw Protocol for reflection and review.
  - Activity Option #3: Provide giant sticky notes or poster boards for each category - Mastery, Proficient, Developing, and Beginning - then ask educators to freely rotate among these, adding thoughts they have to each. Encourage educators to revisit each category to reflect on the group's thinking.
  - Activity Option #4: Choose your own engaging and collaborative activity.

PART 4: IDENTIFYING EMERGING AND PROFICIENT LEARNERS (~10 - 15 minutes)

- Show the fourth video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 4 Identifying Emerging and Proficient Learners**

- Stop the video at time 04:30 and ask teachers to consider norms, routines, or behaviors that should be in place for students to engage in this math practice efficiently. (Page 14)
  - Activity Option #1: Provide an opportunity for self-reflection and ask volunteers to share.
  - Activity Option #2: Record participant responses using a digital workspace such as a whiteboard, Menti, Padlet, Canva, or other virtual space.
  - Activity Option #3: Split participants into three groups. Have one group discuss the instructional conditions that should be in place, another to discuss the environmental conditions that should be in place, and the last group will discuss the behavioral conditions that must be in place, in order for students to be able to collaborate mathematically.

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Directions for this activity continue on the next page.

PART 4: IDENTIFYING LEARNERS CONTINUED

- **Restart the video and pause at 07:14**. Provide participants the opportunity to respond.
  - Activity Option #1: Provide self-reflection time for educators to record their thinking, then ask for volunteers to share. (Page 14)
  - Activity Option #2: Use a Round Robin Protocol to facilitate a small group discussion around this question.
  - Activity Option #3: Structure participants into two concentric circles. Have the inner circle rotate, and ask the outer circle to stay. Rotate 2-3 times, letting paired individuals share how they would add to their instruction or classroom structures to support mathematical collaboration among students.
  - Activity Option #4: Choose your own engaging and collaborative activity.

PART 5: BUILDING RICH TASKS (~25 minutes)

- Show the fifth video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 5 Building Rich Tasks**
- **Pause the video at 01:11** and allow participants the opportunity to respond. (Page 15)
  - Activity Option #1: Provide some reflection time for participants to record their thinking, then ask for volunteers to share what they do in their class. You can share these responses using sticky notes, vocal sharing, or by utilizing technology tools to virtually display responses.
  - Activity Option #2: Choose your own engaging and collaborative activity.

Directions for this activity continue on the next page.

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PART 5: BUILDING RICH TASKS CONTINUED

- **Restart the video and pause at 03:55**. Allow participants the opportunity to respond and engage in the activity provided on the screen. (Pages 15 - 16)
  - Activity Option #1: Ask participants to complete parts 1-3 and reflect on their responses. Consider using a Turn-and-Talk, Think-Pair-Share, or other protocol to facilitate discussion.
  - Activity Option #2: Break participants into groups by grade level or course. Have them agree on a single task to evaluate (this is particularly effective if you have multiple teachers teaching the same course or grade). Ask them to work through parts 1-3 collaboratively.
  - Activity Option #3: Provide lesson plan examples from the curriculum used at your school (but not written by your teachers, unless consent was provided), ask educators to pair up to analyze the lesson and make modifications that strengthen collaboration among students.
  - Activity Option #4: Choose your own engaging and collaborative activity.

- **Restart the video and pause at 04:40**. Provide participants with time to respond. (Page 16)
  - Activity Option #1: Provide some reflection time for participants to record their thinking, then ask for volunteers to share what they do in their class. You can share these responses using sticky notes, vocal sharing, or by utilizing technology tools to virtually display responses.
  - Activity Option #2: Choose your own engaging and collaborative activity.

- **Restart the video and pause at 06:00.** Allow participants the opportunity to respond. (Page 16)
  - Activity Option #1: Provide some reflection time for participants to record their thinking, then ask for volunteers to share what they do in their class. You can share these responses using sticky notes, vocal sharing, or by utilizing technology tools to virtually display responses.
  - Activity Option #2: Choose your own engaging and collaborative activity.

PART 6 & CLOSING

PART 6: CONSOLIDATING LEARNING (~20 - 25 minutes)

- **Display the prompts shown at 1:50** during the video Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 6 Consolidating Learning

- Allow participants the opportunity to respond using the participant guide. You may choose to make this an engaging and collaborative activity or keep this as an individual reflection. (Page 17)

- **Skip to time 02:01** in the video to display the culminating activity for this session. Direct participants to use the participant guide to work through these steps. Provide opportunities to share and reflect on key takeaways. (Pages 18 - 19)

Please note that these tasks provide the opportunity for educators to put what they learned into action. If time does not allow for these activities to be concluded within the session you are facilitating, consider setting up a follow-up professional learning opportunity to conduct this work (e.g., during a PLC or department meeting).

CLOSING (~ 3-5 minutes)

- Thank participants for their attention and participation.

- Display the QR code to the feedback survey provided in video #6 at time **03:30.** Provide your own feedback using this survey. This evaluation will help support the development and improvement of these facilitator and participant guides in the future.

- Consider sharing your own feedback survey to evaluate the effectiveness of your facilitation and assess the impact of the learning.

- Collect all necessary information from participants required to issue professional development unit certificates for completion of this training. Issue professional development unit certificates to all educators who completed the training.

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This page is structured to allow participants in an independent or facilitated activity to record their thinking. If participating in a facilitated course, please follow any additional instructions from your facilitator.

PART 1: IDENTIFYING DIFFERENCES

Watch the video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 1 Identifying Differences and Opportunities**

Record your thinking in response to the question at **01:55** here:

Analysis: Use the questions shown at time 02:01 to conduct an analysis.

STRENGTHS	RESOURCES

OPPORTUNITIES	EXTERNAL FACTORS

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PART 2: UNPACKING THE STANDARD

Watch the video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 2 Unpacking the Standard.**

Record your thinking in response to the question at **02:04** here:

In response to the question at **04:35,** which embedded skills do your students already show strength in? Why?

In response to the question at **04:35**, which skill presents the greatest opportunity for growth in your classroom? Why?

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PART 3: PROFICIENCY

Watch the video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 3 Proficiency.**

Record your thinking in response to the question at **02:06** here:

Record your thinking in response to the question at **05:05** here:

This page is structured to allow participants in an independent or facilitated activity to record their thinking. If participating in a facilitated course, please follow any additional instructions from your facilitator.

PART 4: IDENTIFYING LEARNERS

Watch the video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 4 Identifying Emerging and Proficient Learners**

Record your thinking in response to the question at **04:30** here:

Record your thinking in response to the question at **07:14** here:

Record one key takeaway from video #4:

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This page is structured to allow participants in an independent or facilitated activity to record their thinking. If participating in a facilitated course, please follow any additional instructions from your facilitator.

PART 5: BUIDLING RICH TASKS

Watch the video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 5 Building Rich Tasks**

Record your thinking in response to the question at **01:11** here:

Complete the activity at **03:55**, "Think of a math task you have used or observed recently. How well does it support the collaborative behaviors we just explored?

Step 1: Individually or in pairs, jot down or briefly describe a math task you've used.

Step 2: Use the following questions to evaluate the task:

- Does the task require students to interact and rely on one another to solve it?
- Are there opportunities for multiple strategies or approaches to emerge?
- Will students need to explain, build on, or challenge one another's ideas to move forward?
- Is there a meaningful reason to work together rather than individually?
- Does the structure allow all voices to be heard?

Use the space provided on the next page to record your thinking.

PART 5: BUILDING RICH TASKS CONTINUED

Record your thinking in response to **Step 2** of the activity here:

Step 3: Share out or reflect - What did you notice about your task? What might you tweak to strengthen collaboration?

Record your thinking in response to the activity at **04:40** here:

Record your thinking in response to the activity at **06:00** here:

This page is structured to allow participants in an independent or facilitated activity to record their thinking. If participating in a facilitated course, please follow any additional instructions from your facilitator.

PART 6: CONSOLIDATING LEARNING

If participating in learning individually, watch the video **Digging Deeper into Mathematical Practice #6: Collaborate Mathematically (2026) - PT. 6 Consolidating Learning.**

Pick one reflection to respond to:

REFLECTION #1:

Think about your own classroom: What barriers might your students face when engaging in rich mathematical collaboration—and what intentional moves can you make to remove or reduce those barriers?

REFLECTION #2:

Choose one routine, structure, or instructional move you can implement in the next week to foster deeper mathematical collaboration. How will you introduce it, and how will you know it's making a difference?

REFLECTION RESPONSE:

This page is structured to allow participants in an independent or facilitated activity to record their thinking. If participating in a facilitated course, please follow any additional instructions from your facilitator.

PART 6: CONSOLIDATING LEARNING CONTINUED

Step 1 - Select a Task or Lesson You Already Teach: Choose a math task, lesson, or unit you regularly use (or plan to use soon). This should be a task that could support student discussion or collaboration, even if it hasn't been designed with that in mind.

Step 2 - Analyze: Analyze the Task Through the Lens of MP6 - Use these guiding questions to reflect or discuss:

- Does this task require students to interact or build on one another's ideas?
- Are students offered opportunities to debate ideas and engage in collaborative inquiry?
- What opportunities exist for shared understanding or consensus-building?
- How are students encouraged to listen actively and value other perspectives?

Analysis Response Space:

Digging Deeper MP#6

Participant Guide Continued

PART 6: CONSOLIDATING LEARNING CONTINUED

Step 3 - Adapt the Task for Deeper Collaboration:

- Brainstorm one or two concrete changes you could make to strengthen mathematical collaboration.

Step 4 - Plan for Implementation - Complete this statement:

"I will strengthen mathematical collaboration in my classroom by _____, so that students can _____."

Step 5 - (Option for Group-Facilitated Sessions):

- Share your idea with a peer or small group. Offer one suggestion or question to help refine a colleague's plan.