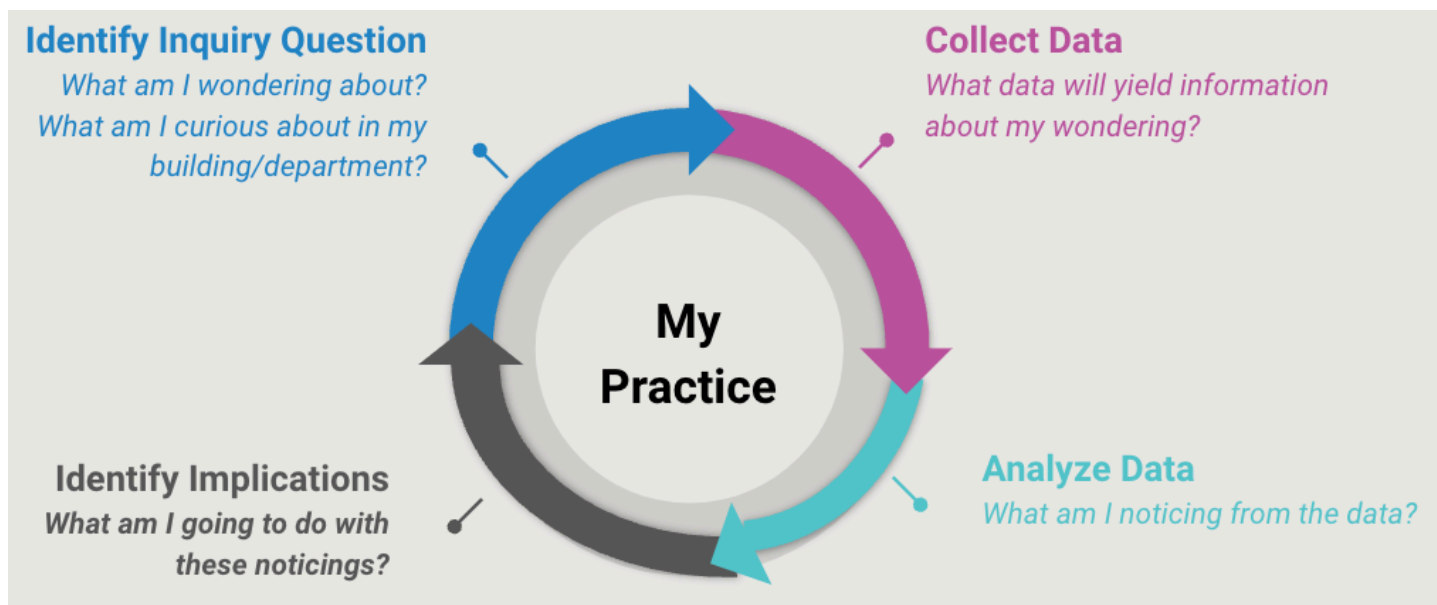# Collaborative Inquiry

Collaborative inquiry supports teachers in working together to interrogate their teaching and strengthen equitable practices that support meaningful, deep mathematical learning for all students. Each part of the collaborative inquiry process, from creating collaborative relationships to choosing data to examine, is designed around learning what students know and think and then using that information to make instructional decisions.

Identify Inquiry Question
What am I wondering about?
What am I curious about in my building/department?

Collect Data
What data will yield information about my wondering?

My Practice

Analyze Data
What am I noticing from the data?

Identify Implications
What am I going to do with these noticings?

To begin, identify a wondering or question. Then identify a small group of people (we recommend 1-3 additional people) to help you analyze your data. You may choose to collect your data by yourself or enlist the help of a colleague. Using the Data Analysis Protocol as a group allows you to learn from your data by intentionally considering perspectives that are present and missing in the data, the impact of student and teacher identity on the data, and potential next steps towards achieving your goal. The suggested timings and sentence stems are good starting points and can be modified to fit your context and needs. This protocol can be used with data that is produced by students, such as written work or reflections, and with data produced by educators, such as teacher reflections or observations. We encourage you to start this work, even if you are unsure about the quality of your data because we have seen important changes come from data sets that the presenters were initially unsure about.

Data Analysis Protocol

Focus Question:

Sharing the Data

8 min	**Critical Friends** familiarize themselves with the data.
	● **Read** the teaching replay.
	● **Find** evidence to address the focus question (warm & cool).
	● **Be Prepared** to share your findings with your group.

→ *Record your notes.*

Describing the Data

5 min	***What do you see in the data?***
	<u>Share noticings aloud</u> related to the inquiry question without judgment or interpretation.
	During this period the group gathers as much information as possible from the data.
	● Describe what you see/hear in descriptive terms, without making judgments or offering suggestions. *Only share noticings. Interpreting the data is the next step!*
	● It is helpful to identify where the observation is being made — e.g., "On page one in the second paragraph, third sentence..."
	● If judgment emerges, members should push to refocus first on the evidence: What did you see that makes you say that?

→ *Record your notes. You will refer to them in the next step.*

Interpreting the Data

5 min	**What does the data suggest?** During this period, the group tries to make sense of what the data says and why. *Now you can interpret and make meaning of the data!* ● The group should try to find as many different interpretations as possible and evaluate them against the kind and quality of evidence. ● From the evidence gathered, try to infer: What is happening and why? ● Think broadly and creatively. Assume that the data, no matter how confusing, makes sense to some people; your job is to see what they may see. ● As you listen to each other's interpretations, ask questions that help you better understand each other's perspectives. Possible starters include: ● It seems like *[data observation]* is related to *[the inquiry question]* because… ● I wonder how *[data observation 1]* and *[data observation 2]* affect *[the inquiry question]*. ● *[Data observation]* means *[xxx]* which means *[xxx in the context of the inquiry question].* ● Now that I know … it's making me think/wonder … ● In relation to *[the inquiry question]* I now *[wonder/know/think]* … ● I wonder how *[some aspect of equitable teaching practices]* would change if … ● *[Groups of students]* would benefit from *[specific knowledge or wondering]* because… ● *[Specific act of collaboration with colleagues or sharing learnings/wonderings publicly]* might impact this inquiry work because …

→ *Record your notes.*

	Implications from the Data
5 min	**What are the implications for next steps?** Discuss the next steps for the inquiry. Here is where you can discuss implications as they relate to her focusing or larger inquiry. GIven your analysis- what are the implications for her next steps? Possible starters include: ● *[This type of data*] could help you learn more about *[this specific part of the inquiry question]*. ● You could take *[specific action around equitable practices]* to support *[part of inquiry question]* and you could collect *[type of data]* to explore that. ● You could enlist the support of *[planning partner, department member,...]* at school to help you explore *[specific part of inquiry question]* by …

Data Source: Teaching Replay

BACKGROUND:

I have been working since the beginning of the year to establish a community of mathematical learners within my classroom. I feel like my students are feeling comfortable talking during class – I know this because when I give students an in-class assignment, I hear them talking to each other about the assignment. At the same time that I hear them talking about the assignment, I am not confident that my interactions with them are working well to encourage their participation in the classroom community.

TEACHING REPLAY:

I introduced the hexagon trains lesson to my class. In this activity, students were given the first of 4 hexagon trains in a series; they were asked to determine the perimeter of the 10th train of the series, without drawing it. They needed to justify their answer. They were also invited to determine the perimeter for the nth figure.

Students were encouraged to work on the task within their established seat groups. As students were working on the task, I was walking around the room, monitoring their work. As I was monitoring their work, I was listening to them and trying to record their talk on my class participation chart, but I'm not sure that the record is accurate because I couldn't listen to all of the groups at the same time. As I was walking and listening, I sometimes got side-tracked by a particular group. When I tried to go back to check my participation chart by watching the video, I was still unable to hear all talk well.

Two things have been gnawing at me from this lesson: First, I am distressed by Amanda's strongly held incorrect idea, and I am not sure that I provided enough or the correct feedback to support her re-examination of her idea. Second, I am still frustrated by William's lack of verbal participation during the group work. So, I'm going to tell you a bit about those 2 distressing interactions.

Amanda's Strongly Held Beliefs - How could I have better supported her?

I noticed that Amanda's answer was wrong, so I tried to help her realize her mistake. I didn't tell her that her answer was incorrect. I just told her that she should try her logic with smaller numbers. But, when I made that suggestion, she just reiterated her logic. So, I once again told her that she should try her method with the hexagon trains that were on the paper. Then, she told me that she wasn't going to use those numbers. When I asked her why not? She said that she couldn't because they were all odd numbers; when I pointed out that there were even numbers, I wanted to leave her so that she could try the

numbers given in the task.

I think by that point, I had kind of changed mindsets. When I originally started talking to Amanda, I was confident that I could get her to see that her answer wasn't right and that she should try something else. And then I realized that we were speaking different languages. Hearing her say: "But those aren't my numbers … But this is an even number … this is an odd number …" All of her assertions just didn't make any sense to me. And unfortunately, my interactions with her seemed to really keep her rooted in her misconception.

But, I had also noticed that another member of her group had a different method that does work. So, I wanted to get them talking. Hers was more of a proportional thing, but his was more like a structural thing; he understood that you needed to take the connections out. That's what I needed her to understand. So, before I left them, I told them that they should explain their methods to each other.

After I left them, I saw that they were talking to each other, so I figured that Amanda would figure out her mistake by seeing his method. I was really shocked when we started the whole-class discussion – she still thought that her idea was right.

I don't understand why Amanda was still holding onto her idea after she talked to Collin. I think that me telling them to talk to each other wasn't specific enough. Maybe I should have asked something like: "Hey Amanda, could you explain why Collin's saying that there's only four sides here? Why is he saying four and not six?" If I had asked her about his method, maybe she would have had a chance to really think about how his method was different than hers.

I think I should have directed them more, but I was worried about telling them too much. Which is actually what I wound up doing – I tried to take Amanda and say, OK, let me try to show you how your reasoning is not going to work. Let me try to show you that for two, to double that, that's not really going to work out. I really wanted her to discover that it didn't work, but she really didn't trust what I was saying.

I want them to learn from each other, not just from me. So, they need to talk to each other. But, maybe I need to guide how they talk to each other. Speaking of talking to each other … that brings me to my second dilemma.

William's Lack of Verbal Contribution - How could I have better supported him?

When I was interacting with William's group, he did not offer any verbal contributions to his group until the very end of our interactions. Before I approached the group, I noticed that he was the only person that remained seated at his table; the other 3 boys were standing and pointing at the figures on the poster as they talked. When I went over to check on them, I noticed that they had some really good ideas going, and I immediately became involved in their discussion because I was intrigued by what they were discussing. While I was standing with them, I knew that William was paying attention by the way that his eye contact was following the speaker and by his facial expressions. However, he didn't share his thinking with his group until they all answered a question in unison. As I was preparing to leave the group, he answered a question that I directly posed to the group. However, once I left the group, he returned to being quiet - and he did not volunteer to share his ideas at the board during our whole-class sharing. I feel so guilty that I didn't involve him in the question(s) earlier, so that he could have chosen to speak earlier. I wonder how I can authentically challenge him to verbally participate in his group's discussions!