Designing Workshops: Teacher Planning Questions

Before

Purpose: What is the learning goal of this activity? How does this relate to a big idea?

Engage: What is the relevance of what we are studying?

Scaffold: How can I break the activity into small steps with checkpoints along the way?

Model: What will I need to model in order for students to be successful?

During

Confer: What questions will I ask students while they are working?

What will I be looking for to assess students' understanding?

After

Reflect: How can I invite reflection and sharing as we work on and conclude this task?

Assess: How will I know what students learned from this experience?

Dobetter Workshop

Ms. Dobetter had always used a water temperature exploration activity to introduce her thermal energy unit with her seventh-grade physical science class. In it, she asked students to follow directions on a worksheet, observe and record changes to the temperature of containers of hot and cold water over time, and to answer some questions about their explanations based on the evidence they gathered. In the past, she noticed that the activity did not really seem effective in introducing the unit, and that the students' completed worksheets did not reflect much thought. This year she considered searching out a new activity, but instead decided to stick with the old one yet implement the workshop model in an effort to bring it to life. Here is how she thought through the planning of her day's lesson using the workshop planning questions.

Before

Purpose: *What is the learning goal of this activity? How does this relate to a big idea?*

My goal is for students to understand how water temperatures can change over time based on environmental conditions.

Really the purpose of this activity—it is not really a lab, just an activity—is to get the students thinking about temperature and thermal energy, engage them in an experience that will hopefully help them to see where this next unit is heading, and motivate them to start thinking about the big idea: patterns of change.

Engage: *What is the relevance of what we are studying?*

We just always have done the thermal energy unit before the kinetic energy unit, but now that I think about it, thermal energy is really important to the students and their lives; cooking, for example, or running a car—these are times in our lives when we can benefit from an understanding of thermal energy. So I think it is highly relevant, but that the kids will not really see that unless I make a point of it. I am thinking I can tell some stories from my own kitchen to bring it to life for them: deciding how to defrost frozen stew on the stovetop—two small pots or one big one?

Model: *What will I need to model in order for students to be successful?*

Well, based on my past experiences with this activity, there are a few things the students don't always get that they should. Measuring with a graduated cylinder is a challenge for some, and if they don't do it correctly it can really throw off their results. I need to explain the meniscus. Also, reading thermometers is important to review. You would be surprised how many confuse Centigrade and Fahrenheit, and how unfamiliar they are with reading the mercury level. Those are the two skills that can really make or break this activity.

The one other thing I would like to convey is my expectations for quality in their written work. So often, these guys just turn in brief, shoddy things . . . a few words in answer to each question. I am looking for at least a sentence!

Scaffold: *How can I break the activity into small steps with checkpoints along the way?*

I am thinking that before they really get to do the activity they need to show me that they can read a meniscus and a thermometer. I think I will do a quick lab skills practical exam at each table before I hand over their materials. That would go a long way toward ensuring their success.

Also, I would like students to finish the whole task before they run ahead to the reflection questions; sometimes, they seem to think that those are all that really counts. So my new idea is to put the questions on a separate page, not on the back of that activity sheet, so that I can give questions out only after they are done collecting data.

During

Confer: *What questions will I ask students while they are working? What will I be looking for to assess students' understanding?*

I think I will ask them about their measurements, what they are finding, what they are thinking about how the change in temperature in the hot beaker compares to the change in temperature in the cold. Really, this will just give me a baseline on their thinking about thermal energy. I do not really know what they know yet since this is just the beginning of the unit, so conferring during this activity will be a great opportunity for me to preassess their understanding.

After

Reflect: *How can I invite reflection and sharing as we work on and conclude this task?*

I think I need to ask good, specific questions: What do you understand now about temperature? What patterns of change did you notice? How did this activity help you develop your understanding? What are you still wondering? I will give them each time to write, then ask students to pair and share their thinking.

Assess: *How will I know what students learned from this experience?*

In addition to assessing their lab skills and thinking about thermal energy during the activity, I will read all of their reflection answers and use those to make decisions about what to do next. If this task accomplishes our learning goal, we can move on. If students remain fuzzy, I will have to look for more ways to reinforce these key concepts before we take the next steps in our unit.

What Happens

Before

Ms. Dobetter's students file in, taking their seats with a modicum of enthusiasm. Rather than starting with the usual question of the day on the board, she elects to begin with a story about what happened at her house last night: her cousin was coming to dinner. Ms. Dobetter's cat had gotten sick and so she had rushed to the vet after school and, by the time she got home, she felt too tired to cook. She searched the freezer and found some delicious chickpea and artichoke heart stew she had made last summer and knew this was just the time to thaw and serve it. Here was the dilemma: she had two small Ziploc bags, both frozen solid. To defrost all of it, was she better off putting it together in one big pot or separating the stew into two small vessels on the stove?

She stops her tale there and invites the class to share their thoughts. Despite students' insistence, Ms. Dobetter does not tell them how she proceeded, but rather implores them to test their theories at home, then draw their own conclusions.

At this point, Ms. Dobetter introduces the purpose of today's work: "We are going to be looking at a pattern of change. Do you remember any examples of that big idea?" Students recall studying angiosperm life cycles and the cell theory last year as examples of this big idea. They review these topics for a few minutes, recalling the meaning of a "pattern of change."

"You can be thinking about how temperature changes relate to those concepts you studied in life science . . . my goal is that by the time the bell rings, you will understand how and why water temperatures change over time based on environmental conditions. If you can explain that in detail, we will each have done our job today."

The defrosting the stew story proves to be an engaging leaping off point for her brief explanation of thermal energy, its utility and import. Ms. Dobetter chooses not to belabor her point but instead leaps right into an introduction of the day's activity: on the overhead, she flashes a copy of the handout students are being given. She asks them to turn to their lab partners and read the activity sheet aloud to one another. When the classroom quiets, she points out a couple of things they will need to know in order to succeed at the task.

She had sketched a graduated cylinder on the board and invites a student up to explain what he remembers about the meniscus. Other students pipe up, and pretty soon the whole class seems to be recalling what they learned in elementary school about measuring fluid. She invites students to model the measurement strategies rather than doing so herself: she requests a volunteer to come up to the other sketch on the board and explain how thermometers are used; one girl, then another, comes forth to review the rudiments of measuring temperature using the mercury's meniscus. The class as a whole, Ms. Dobetter realizes, remembers a lot.

She explains that to ensure each person—not just the collective—is ready with these skills, she will go around quickly and quiz each pair aloud. While she visits with each team, she expects the remainder of the students to be getting out their homework from last night, and writing down the assignment for the next two days from the homework box on the board.

During

Once she checks their measuring skills, Ms. Dobetter invites each team to go to the back counter, pick up their materials, and get started. Students sit in pairs, watching the clock, reading thermometers, recording temperatures. Ms. Dobetter quickly makes her rounds and finds that she only has to reexplain these skills to two people in the room. She gathers all the homework on her way through the rows. Once work time commences, she is ready to confer with the teams at work.

"What are you finding?"

"The cold one is warming, and the hot one is cooling."

"Why do you think so?"

"Because it's too cold and too hot."

"What does that mean, *too* cold?"

"Well, it's colder than the room, so it is warming up from the room."

"Do you think so? How?"

"Well, everything likes to be room temperature. That is why the hot one is cooling off."

"Why? What is the pattern of change?"

By the time Ms. Dobetter has spoken with half of the groups, she starts noticing most teams are done gathering evidence, recording temperatures in their data tables, and have started to clean up their materials.

She calls the class's attention to the analysis questions designed to guide learners in developing their own explanations based on the evidence gathered from this activity. Ms. Dobetter spends another minute at the overheard modeling the kinds of thinking she is looking for in a quality analysis. She refers back to the conversation above where a student thought carefully about the cause of an observed temperature change, explaining that orally this girl demonstrated a great depth of understanding but what a darn shame it would be if all she wrote on the paper was, "Because." In this way, Ms. Dobetter conveys her expectations before again releasing the students to work.

After

With ten minutes left before the forty-five-minute bell, Ms. Dobetter asks students to break the studious silence, turn to a partner, choose any two analysis questions of the eight, and each share how they answered those. Ms. Dobetter encourages kids to change or add to their answers if the conversation changes their thinking or deepens their understanding in any way. The room is again abuzz with voices as students turn and talk.

Lastly, she asks students to flip their papers over and reflect on the day's work. On the overhead, she writes, "Assess your own progress toward today's learning goal. How did the task help you understand? What are you still wondering? Did you notice a pattern of change? How does this learning relate to what you already know about the big idea?"

As closure to the class, Ms. Dobetter grabs her can of Popsicle sticks and pulls out two. She calls on the students whose names are on those two to each share their "aha" for the day.

Evelyn says, "I had forgotten that whole thing about the meniscus, and so you reminded me of that. I guess that was the biggest thing."

Sabre explains, "I realized from collecting the data that everything tries to get back to the middle. Temperatures are temporary."

Ms. Dobetter acknowledges the class for their good work, stands at the door and collects their papers. As she glances down at the top of her pile, she is glad to see sentences rather than phrases and single words used to fill in the spaces after each analysis question. "Definitely better than last year," she thinks to herself.

So What?

In the example above, we see how Ms. Dobetter enlivened a mundane worksheet activity by utilizing the workshop model. Her class enjoyed an engaging opening discussion, was prepared for success during work time, and had an opportunity to reflect on their learning before the bell rang. Using the workshop model, she succeeded in getting the majority of her class thinking carefully about the content.

As you read each chapter in the "Variables" section, you will see a range of examples of how the workshop model could be employed—whether students are reading *On The Origin of the Species*, building egg-drop devices, or constructing rocket ships to the moon.

"Yah, but . . ."

- *My classes are only forty-two minutes long."*

We can think of the workshop model as contained in one class period, one day, one week, or one entire unit. While block scheduling offers ideal opportunities to implement all aspects of the workshop model on a daily basis, teachers with shorter classes can condense the "before, during, after" to fit into a daily lesson, or spread different parts of their workshops over several days, preserving just a couple of minutes to review yesterday and wrap up before tomorrow in each class period.

- *"When I sit down to confer, the rest of the class goes crazy."*

Independent work is a learned skill. When students have the purpose, modeling, and scaffolding they need in order to be successful, they are more likely to use the independent work time wisely. Still, you can start small with short chunks—just a few minutes—of conferring time. Remind students of your expectations and the value you place on conferring. Let them know that when they are doing the right thing, everyone benefits because their responsible participation means that you get to spend your time