WEIE Instructional Study Observation Protocol

Instructions

1. This protocol is designed to help review the different activities that may take place during a technician education course at a community college (e.g., lecture, discussion, demonstration, hands-on/lab work, student presentation). The observer needs to answer the following seven questions for each activity he or she observes during the class session:

    Q1. What's going on during this activity? (based on your observation notes)
    Q2. Which kind of knowledge and skills was addressed in this activity? (content)
    Q3. What problem solving or trouble shooting skills did students use?
    Q4. Which mode/type of activity was used? (activity mode)
    Q5. How were the majority of students engaged with the content during this activity? (student engagement)
    Q6. Which type of questioning and feedback was evident when the instructor was interacting with students during this activity? (instructor's assessment practice)
    Q7. What technology and equipment (including tools, instruments, & machines) were used in this activity? (technology/equipment use)

2. Activities: Identifying when an activity begins and ends may be difficult. The start and finish of an activity can often be determined by **what** is happening in the class (a topic or objective change) or by **how** it is happening (such as a shift in student/teacher interaction or a change in the type of activity). Here are some indications of when an activity change is taking place:

    What is happening in the class-
    - The topic changes, signaled by movement to a different domain within a subject area,
    - A new instructional objective is introduced, eliciting new patterns of thinking, communicating, or acting (e.g. attention shifts from learning a new skill to using it)

    How it is happening in the class-
    - The participant structure changes, that is, there is a shift in the way the instructors and students interact (e.g. movement from whole group lecture to small group collaboration) or there is a change in the way roles are assigned among students (e.g. from collaboration to tutoring). The following are additional examples of structure changes that signify a new activity;
        - The spatial arrangements in the room shift, that is , people change places or physical objects in the room are re-configured to afford a different kind of activity,
        - The activity mode changes, for example the class moves from a teacher's lecture to hands-on work by the students (Note that sometimes a lecture may contain a demonstration, or a hands-on activity may include a brief introduction by the teacher. These instances should be considered part of a single activity, rather than each mode being a separate activity.)
        - The outcome or product of an instructional interaction changes, for example, instruction moves from coverage of a topic to producing something in the lab , or
        - The instructor or students make a bid to close a segment of classroom activity, signaled by specific instructions to students about wrapping up or by the instructor beginning to review just finished work or instructing students about rearranging space in the classroom.

    Ultimately, you must make a judgment in context to determine the boundaries of activities. Record the beginning and ending times of each activity you observe. (Use your own watch to keep time if you have one available.) Also note the duration of each activity.

3. During the class, use the *Classroom Observation Note Sheet* to record your observations.

4. Focus on observable behaviors rather than making inferences about what the teacher is trying to do or what students have in their mind.

5. Walk around the room and get a sense of what is going on in the class overall. It is probably a good idea to try to be near the teacher during the seatwork or group work to observe some student-teacher interactions.

6. After the observation, try to schedule a 15 to 20 minute meeting with the teacher to discuss the class you just observed and complete the *Instructor Post-Lesson Debriefing* form.

7. As soon as possible after the observation and teacher debriefing, complete the Background Information, the Overview of the Observed Class, and the seven questions presented on the *Classroom Activity Form* for every activity you observed during the class session. Use your Note Sheet to answer the questions.

Background Information

Observer:
Date: *(MM/DD/YYYY):*
Length of Observation *(minutes)*:
School Name:
Instructor Name:
Course Title:
Scheduled length of class: minutes **Length of Observation**: minutes
Physical Class Environment: ☐a In a regular classroom ☐b In a lab
(Describe the general layout of the observed class including seating arrangement, equipment and technology available, and other use of space. Is it arranged for lecture or for promoting group work?)

Total Number of Students	

Was a teaching assistant or other teaching staff in the class? ☐ yes ☐ no
Instructor's <u>Stated</u> Instructional Goals/Learning Objectives: (*If possible, ask the instructor about the lesson goals before class begins. If that is not possible, write down any goals that are stated, posted, or projected in the class. These may be different from the activities that you observe or what is achieved in class.)*

Overview of the Observed Class

A. What took place in the class? (Please complete this overview after you have observed the class and took notes for each activity).

	Activity 1	Activity 2	Activity 3	Activity 4
Activity Mode (e.g., Lecture, Lab, Student Presentation)	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other
Instructor or Student Focused	☐ Instructor ☐ Student	☐ Instructor ☐ Student	☐ Instructor ☐ Student	☐ Instructor ☐ Student
Start time	1112			
Finish time				
Duration				
During your observation, was the activity completed?	☐ Yes ☐ No ☐ Not Sure	☐ Yes ☐ No ☐ Not Sure	☐ Yes ☐ No ☐ Not Sure	☐ Yes ☐ No ☐ Not Sure
How often did the instructor interact with the students? (Refer to the tallies on your observation notes)	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+
How often did the instructor question the students using closed questions? (Refer to the tallies on your observation notes)	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+
How often did the instructor question the students using open-ended questions? (Refer to the tallies on your observation notes)	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+

	Activity 5	Activity 6	Activity 7	Activity 8
Activity Mode (e.g., Lecture, Lab, Student Presentation)	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other	☐ Lecture ☐ Demonstration ☐ Hands-on ☐ Lab ☐ Discussion ☐ Student Presentation ☐ Other
Instructor or Student Focused	☐ Instructor ☐ Student	☐ Instructor ☐ Student	☐ Instructor ☐ Student	☐ Instructor ☐ Student
Start time				
Finish time				
Duration				
During your observation, was the activity completed?	☐ Yes ☐ No ☐ Not Sure	☐ Yes ☐ No ☐ Not Sure	☐ Yes ☐ No ☐ Not Sure	☐ Yes ☐ No ☐ Not Sure
How often did the instructor interact with the students? (Refer to the tallies on your observation notes)	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+
How often did the instructor question the students using closed questions? (Refer to the tallies on your observation notes)	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+
How often did the instructor question the students using open-ended questions? (Refer to the tallies on your observation notes)	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+	☐ None ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10+

Classroom Activity Form

Activity 1

Start time:

End time:

Q1. What's going on during this activity? *Use your observation notes to briefly describe what the instructor and students were doing during this activity, including the flow of sub- activities, the content, and transitions to other activities.*

Briefly describe the goal of this activity based what you saw happening in the class. This is the goal from your point of view as an observer, not the stated goal by the instructor.

Briefly describe the activity you observed. Include the type(s) of technology used during the activity, the level of student involvement, and the degree of teacher/student interaction.

Was there more than one instructional activity taking place during the activity? ❒ Yes ❒ No

→ *If "yes", include the proportion of students engaged in this activity.*

Number of students engaged in this activity	**Number of students engaged in other activities**

Q2. Content: Which kind of knowledge and skills was addressed in this activity? *(Mark all that apply)*

Before you finalize your coding below, please verify with the instructor during the debrief interview about which type of knowledge was covered in the observed class.

Technical	☐ system knowledge (how it works) ☐ declarative knowledge (terminology) ☐ procedural knowledge (how to do it) ☐ strategic knowledge (when to do it; how to organize system & procedural knowledge into effective strategy or plan) (Steenberger & Gitomore 1996)
Social Technical	☐ technical communication (e.g., explain & justify technical approach)
Social	☐ teamwork ☐ project management

Q3. Problem Solving and trouble-shooting: First, rate the level of each problem solving classification (below) for this activity. Then, respond to the question at the bottom of this page.

Problem Features	Scale
Variety *No Variety:* *Students told how to solve problems or given only one way* *VS.* *Variety:* *Students allowed to use multiple ways to solve problems*	*No Variety* — *Variety* — *Not Observed* *0* *1* *2* *3* *4* *5*
Structuredness *Tight:* *All problem elements presented;* *Prescribed solution rules;* *Known solution* *VS.* *Loose:* *Problem elements not known;* *Uncertainty about rules;* *Multiple possible solutions*	*Tight* — *Loose* — *Not Observed* *0* *1* *2* *3* *4* *5*
Complexity *Complex:* *Multiple interconnected variables;* *Dynamic problem states* *VS.* *Simple:* *Low number of isolated variables;* *Stable problem state*	*Simple* — *Complex* — *Not Observed* *0* *1* *2* *3* *4* *5*
Domain Specificity *Specific:* *Problems dependent on the nature of the context* *Must solve with reasoning unique to domain* *VS.* *General:* *Problems grounded in general logic* *Can use general reasoning strategies*	*General* — *Specific* — *Not Observed* *0* *1* *2* *3* *4* *5*

Based on criteria described above, did this activity require students to use problem solving or trouble shooting skills?

☐ Yes (if yes, provide an example)
☐ No

Example of problem solving or trouble shooting used in this activity.

Q4. Activity Mode: Which mode/type of activity was used for this activity, and what was the level of student/teacher interaction? (*Select all the modes that apply. Also, select the size of the group involved, the level of student/teacher interaction for each selected mode [based on your observation tallies], then, select the mode used for the longest time in this activity*)

a☐	**Lecture:** The instructor gave instructions, lectured, reviewed assignments or tests, or otherwise gave information. The instructor did most of talking, although he or she may have asked some factual or recall questions. *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
b☐	**Demonstration/Modeling:** The instructor modeled or demonstrated procedures. (check the type of student audience below) ☐ whole class ☐ small group/ pair ☐ individual *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
c☐	**Hands-on in classroom:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
d☐	**Lab:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
e☐	**Discussion:** The instructor asked students to discuss a question or topic and responded to student comments. ☐ whole class ☐ small group/ pair *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
f☐	**Student Presentation** ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
g☐	**Other** (please briefly describe): ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
Dominant Activity Mode:	**(Please use letter code from above** to indicate what the instructor and students spent the most time doing during this activity).
What aspect of student performance is the focus of the instructor's comments? (For example -are the comments focused on procedural or strategic knowledge or related to project management or student teamwork?)	

If small group or pair is selected above, did students produce a group product or solution that includes contributions from each student?

☐ Yes

☐ No (students produced individual work or solutions)

Q5. Student Engagement: How were the majority of students engaged with the content during this activity? (*Select all that apply, then select the dominant in terms of the longest time spent*)

[Modified from Webb's Depth of Knowledge]

a☐	**No or little active engagement** (e.g., listen to lecture, read in a book, or watched a video; no or little student talk about the content; off-task behavior).
b☐	**Recall or recognition** of a fact, information, concept, or procedure
c☐	**Basic application of skills/concept**—followed given procedures, used suggested skills and knowledge to accomplish a simple or routine task
d☐	**Strategic thinking** – engaged in some decision making such as developing a plan or sequence of steps to approach problem; engaged in reasoning such as explanation and justification for a chosen approach; this often involves working on an open-ended and complex task that has more than one possible way to approach.
e☐	**Extended thinking** – engaged in an extended investigation or project to solve a real-world complex problem, which requires time to research, think, and process multiple conditions of the problem, and high level of problem solving, self-monitoring and reflection, and autonomy.
Dominant Student Engagement type:	**(Please use letter code from above** to indicate the type of engagement students spent the most time doing during this activity).

Q6. Instructor's Assessment Practices: In this section, please characterize (with examples) the types of questions that you tallied and provide more detail on the types of assessment practices that you observed *(Mark all that apply.)*

A. Questioning

If observed, give one or two examples of a **closed-ended (known-answer) question**

If observed, give one or two examples of an **open-ended question**

B. Monitoring

☐ Monitors student activities informally (walking around classroom or lab; posing questions to individuals or small groups)

☐ Observed students formally (using a checklist or rubric)

Provide one or two example of instructor's monitoring practices

C. Tests/Quiz/Performance Task

☐ Gave a pencil-and-paper quiz or test for students to complete

☐ Had students complete a graded performance task

D. Reflection

☐ Asked students to reflect (self-assess) on their own learning – may be done with other students (e.g., *Do you get it? What don't you understand?* The goal is to get students to internalize their own quality criteria. Peer assessment; students using rubric to assess their own work).

Provide one or two examples of student reflection

E. Other

☐ Please briefly describe

Q7. Technology/Equipment Use: What technology and equipment (including tools, instruments, & machines) were used in this activity?

Technology and equipment (including tools, instruments & machines) used:

- ☐ Computers (laptop, desktop, etc.)
- ☐ Printers
- ☐ Projectors (overhead and other projectors)
- ☐ Hand Tools (hammer, screwdriver, etc.)
- ☐ Power Tools (electric tools)
- ☐ Measurement instruments (both manual and digital)
- ☐ Lab Equipment (glassware, etc.)
- ☐ Industry-specific equipment and materials (i.e. solar panels)

Describe:

☐ Other

Describe:

The technology/equipment is used by: ☐ the instructor, ☐ students

(If students are using the technology/equipment)

Students were using computers … ☐ alone ☐ in pairs ☐ in groups ☐ whole class

Activity Form 2

Activity 2

Start time:

End time:

Q1. What's going on during this activity? *Use your observation notes to briefly describe what the instructor and students were doing during this activity, including the flow of sub- activities, the content, and transitions to other activities.*

Briefly describe the goal of this activity based what you saw happening in the class. This is the goal from your point of view as an observer, not the stated goal by the instructor.

Briefly describe the activity you observed. Include the type(s) of technology used during the activity, the level of student involvement, and the degree of teacher/student interaction.

Was there more than one instructional activity taking place during the activity? ❒ Yes ❒ No

→ *If "yes", include the proportion of students engaged in this activity.*

Number of students engaged in this activity	**Number of students engaged in other activities**

Q2. Content: Which kind of knowledge and skills was addressed in this activity? *(Mark all that apply)*

Before you finalize your coding below, please verify with the instructor during the debrief interview about which type of knowledge was covered in the observed class.

Technical	☐ system knowledge (how it works) ☐ declarative knowledge (terminology) ☐ procedural knowledge (how to do it) ☐ strategic knowledge (when to do it; how to organize system & procedural knowledge into effective strategy or plan) (Steenberger & Gitomore 1996)
Social Technical	☐ technical communication (e.g., explain & justify technical approach)
Social	☐ teamwork ☐ project management

Q3. Problem Solving and trouble-shooting: First, rate the level of each problem solving classification (below) for this activity. Then, respond to the question at the bottom of this page.

Problem Features	Scale
Variety *No Variety:* *Students told how to solve problems or given only one way* *VS.* *Variety:* *Students allowed to use multiple ways to solve problems*	*No Variety* — *Variety* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Structuredness *Tight:* *All problem elements presented;* *Prescribed solution rules;* *Known solution* *VS.* *Loose:* *Problem elements not known;* *Uncertainty about rules;* *Multiple possible solutions*	*Tight* — *Loose* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Complexity *Complex:* *Multiple interconnected variables;* *Dynamic problem states* *VS.* *Simple:* *Low number of isolated variables;* *Stable problem state*	*Simple* — *Complex* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Domain Specificity *Specific:* *Problems dependent on the nature of the context* *Must solve with reasoning unique to domain* *VS.* *General:* *Problems grounded in general logic* *Can use general reasoning strategies*	*General* — *Specific* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐

Based on criteria described above, did this activity require students to use problem solving or trouble shooting skills?

☐ Yes (if yes, provide an example)
☐ No

Example of problem solving or trouble shooting used in this activity.

Q4. Activity Mode: Which mode/type of activity was used for this activity, and what was the level of student/teacher interaction? (*Select all the modes that apply. Also, select the size of the group involved, the level of student/teacher interaction for each selected mode [based on your observation tallies], then, select the mode used for the longest time in this activity*)

a☐	**Lecture:** The instructor gave instructions, lectured, reviewed assignments or tests, or otherwise gave information. The instructor did most of talking, although he or she may have asked some factual or recall questions. *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
b☐	**Demonstration/Modeling:** The instructor modeled or demonstrated procedures. (check the type of student audience below) ☐ whole class ☐ small group/ pair ☐ individual *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
c☐	**Hands-on in classroom:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
d☐	**Lab:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
e☐	**Discussion:** The instructor asked students to discuss a question or topic and responded to student comments. ☐ whole class ☐ small group/ pair *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
f☐	**Student Presentation** ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
g☐	**Other** (please briefly describe): ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
Dominant Activity Mode:	**(Please use letter code from above** to indicate what the instructor and students spent the most time doing during this activity).
What aspect of student performance is the focus of the instructor's comments? (For example -are the comments focused on procedural or strategic knowledge or related to project management or student teamwork?)	

If small group or pair is selected above, did students produce a group product or solution that includes contributions from each student?

☐ Yes

☐ No (students produced individual work or solutions)

Q5. Student Engagement: How were the majority of students engaged with the content during this activity? (*Select all that apply, then select the dominant in terms of the longest time spent*)

[Modified from Webb's Depth of Knowledge]

a☐	**No or little active engagement** (e.g., listen to lecture, read in a book, or watched a video; no or little student talk about the content; off-task behavior).
b☐	**Recall or recognition** of a fact, information, concept, or procedure
c☐	**Basic application of skills/concept**—followed given procedures, used suggested skills and knowledge to accomplish a simple or routine task
d☐	**Strategic thinking** – engaged in some decision making such as developing a plan or sequence of steps to approach problem; engaged in reasoning such as explanation and justification for a chosen approach; this often involves working on an open-ended and complex task that has more than one possible way to approach.
e☐	**Extended thinking** – engaged in an extended investigation or project to solve a real-world complex problem, which requires time to research, think, and process multiple conditions of the problem, and high level of problem solving, self-monitoring and reflection, and autonomy.
Dominant Student Engagement type:	**(Please use letter code from above** to indicate the type of engagement students spent the most time doing during this activity).

Q6. Instructor's Assessment Practices: In this section, please characterize (with examples) the types of questions that you tallied and provide more detail on the types of assessment practices that you observed *(Mark all that apply.)*

A. Questioning

If observed, give one or two examples of a **closed-ended (known-answer) question**

If observed, give one or two examples of an **open-ended question**

B. Monitoring

☐ Monitors student activities informally (walking around classroom or lab; posing questions to individuals or small groups)

☐ Observed students formally (using a checklist or rubric)

Provide one or two example of instructor's monitoring practices

C. Tests/Quiz/Performance Task

☐ Gave a pencil-and-paper quiz or test for students to complete

☐ Had students complete a graded performance task

D. Reflection

☐ Asked students to reflect (self-assess) on their own learning – may be done with other students (e.g., *Do you get it? What don't you understand?* The goal is to get students to internalize their own quality criteria. Peer assessment; students using rubric to assess their own work).

Provide one or two examples of student reflection

E. Other

☐ Please briefly describe

Q7. Technology/Equipment Use: What technology and equipment (including tools, instruments, & machines) were used in this activity?

Technology and equipment (including tools, instruments & machines) used:

- ☐ Computers (laptop, desktop, etc.)
- ☐ Printers
- ☐ Projectors (overhead and other projectors)
- ☐ Hand Tools (hammer, screwdriver, etc.)
- ☐ Power Tools (electric tools)
- ☐ Measurement instruments (both manual and digital)
- ☐ Lab Equipment (glassware, etc.)
- ☐ Industry-specific equipment and materials (i.e. solar panels)

Describe:

☐ Other

Describe:

The technology/equipment is used by: ☐ the instructor, ☐ students

(If students are using the technology/equipment)

Students were using computers … ☐ alone ☐ in pairs ☐ in groups ☐ whole class

Activity Form 3

Activity 3

Start time:

End time:

Q1. What's going on during this activity? *Use your observation notes to briefly describe what the instructor and students were doing during this activity, including the flow of sub- activities, the content, and transitions to other activities.*

Briefly describe the goal of this activity based what you saw happening in the class. This is the goal from your point of view as an observer, not the stated goal by the instructor.

Briefly describe the activity you observed. Include the type(s) of technology used during the activity, the level of student involvement, and the degree of teacher/student interaction.

Was there more than one instructional activity taking place during the activity? ❒ Yes ❒ No

→ *If "yes", include the proportion of students engaged in this activity.*

Number of students engaged in this activity	**Number of students engaged in other activities**

Q2. Content: Which kind of knowledge and skills was addressed in this activity? *(Mark all that apply)*

Before you finalize your coding below, please verify with the instructor during the debrief interview about which type of knowledge was covered in the observed class.

Technical	☐ system knowledge (how it works) ☐ declarative knowledge (terminology) ☐ procedural knowledge (how to do it) ☐ strategic knowledge (when to do it; how to organize system & procedural knowledge into effective strategy or plan) (Steenberger & Gitomore 1996)
Social Technical	☐ technical communication (e.g., explain & justify technical approach)
Social	☐ teamwork ☐ project management

Q3. Problem Solving and trouble-shooting: First, rate the level of each problem solving classification (below) for this activity. Then, respond to the question at the bottom of this page.

Problem Features	Scale
Variety *No Variety:* *Students told how to solve problems or given only one way* *VS.* *Variety:* *Students allowed to use multiple ways to solve problems*	*No Variety* — *Variety* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Structuredness *Tight:* *All problem elements presented;* *Prescribed solution rules;* *Known solution* *VS.* *Loose:* *Problem elements not known;* *Uncertainty about rules;* *Multiple possible solutions*	*Tight* — *Loose* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Complexity *Complex:* *Multiple interconnected variables;* *Dynamic problem states* *VS.* *Simple:* *Low number of isolated variables;* *Stable problem state*	*Simple* — *Complex* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Domain Specificity *Specific:* *Problems dependent on the nature of the context* *Must solve with reasoning unique to domain* *VS.* *General:* *Problems grounded in general logic* *Can use general reasoning strategies*	*General* — *Specific* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐

Based on criteria described above, did this activity require students to use problem solving or trouble shooting skills?

☐ Yes (if yes, provide an example)
☐ No

Example of problem solving or trouble shooting used in this activity.

Q4. Activity Mode: Which mode/type of activity was used for this activity, and what was the level of student/teacher interaction? (*Select all the modes that apply. Also, select the size of the group involved, the level of student/teacher interaction for each selected mode [based on your observation tallies], then, select the mode used for the longest time in this activity*)

a☐	**Lecture:** The instructor gave instructions, lectured, reviewed assignments or tests, or otherwise gave information. The instructor did most of talking, although he or she may have asked some factual or recall questions. *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
b☐	**Demonstration/Modeling:** The instructor modeled or demonstrated procedures. (check the type of student audience below) ☐ whole class ☐ small group/ pair ☐ individual *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
c☐	**Hands-on in classroom:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
d☐	**Lab:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
e☐	**Discussion:** The instructor asked students to discuss a question or topic and responded to student comments. ☐ whole class ☐ small group/ pair *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
f☐	**Student Presentation** ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
g☐	**Other** (please briefly describe): ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
Dominant Activity Mode:	**(Please use letter code from above** to indicate what the instructor and students spent the most time doing during this activity).
What aspect of student performance is the focus of the instructor's comments? (For example -are the comments focused on procedural or strategic knowledge or related to project management or student teamwork?)	

If small group or pair is selected above, did students produce a group product or solution that includes contributions from each student?

☐ Yes

☐ No (students produced individual work or solutions)

Q5. Student Engagement: How were the majority of students engaged with the content during this activity? (*Select all that apply, then select the dominant in terms of the longest time spent*)

[Modified from Webb's Depth of Knowledge]

a☐	**No or little active engagement** (e.g., listen to lecture, read in a book, or watched a video; no or little student talk about the content; off-task behavior).
b☐	**Recall or recognition** of a fact, information, concept, or procedure
c☐	**Basic application of skills/concept**—followed given procedures, used suggested skills and knowledge to accomplish a simple or routine task
d☐	**Strategic thinking** – engaged in some decision making such as developing a plan or sequence of steps to approach problem; engaged in reasoning such as explanation and justification for a chosen approach; this often involves working on an open-ended and complex task that has more than one possible way to approach.
e☐	**Extended thinking** – engaged in an extended investigation or project to solve a real-world complex problem, which requires time to research, think, and process multiple conditions of the problem, and high level of problem solving, self-monitoring and reflection, and autonomy.
Dominant Student Engagement type:	**(Please use letter code from above** to indicate the type of engagement students spent the most time doing during this activity).

Q6. Instructor's Assessment Practices: In this section, please characterize (with examples) the types of questions that you tallied and provide more detail on the types of assessment practices that you observed *(Mark all that apply.)*

A. Questioning

If observed, give one or two examples of a **closed-ended (known-answer) question**

If observed, give one or two examples of an **open-ended question**

B. Monitoring

☐ Monitors student activities informally (walking around classroom or lab; posing questions to individuals or small groups)

☐ Observed students formally (using a checklist or rubric)

Provide one or two example of instructor's monitoring practices

C. Tests/Quiz/Performance Task

☐ Gave a pencil-and-paper quiz or test for students to complete

☐ Had students complete a graded performance task

D. Reflection

☐ Asked students to reflect (self-assess) on their own learning – may be done with other students (e.g., *Do you get it? What don't you understand?* The goal is to get students to internalize their own quality criteria. Peer assessment; students using rubric to assess their own work).

Provide one or two examples of student reflection

E. Other

☐ Please briefly describe

Q7. Technology/Equipment Use: What technology and equipment (including tools, instruments, & machines) were used in this activity?

Technology and equipment (including tools, instruments & machines) used:

- ☐ Computers (laptop, desktop, etc.)
- ☐ Printers
- ☐ Projectors (overhead and other projectors)
- ☐ Hand Tools (hammer, screwdriver, etc.)
- ☐ Power Tools (electric tools)
- ☐ Measurement instruments (both manual and digital)
- ☐ Lab Equipment (glassware, etc.)
- ☐ Industry-specific equipment and materials (i.e. solar panels)

Describe:

☐ Other

Describe:

The technology/equipment is used by: ☐ the instructor, ☐ students

(If students are using the technology/equipment)

Students were using computers … ☐ alone ☐ in pairs ☐ in groups ☐ whole class

Activity Form 4

Activity 4

Start time:

End time:

Q1. What's going on during this activity? *Use your observation notes to briefly describe what the instructor and students were doing during this activity, including the flow of sub- activities, the content, and transitions to other activities.*

Briefly describe the goal of this activity based what you saw happening in the class. This is the goal from your point of view as an observer, not the stated goal by the instructor.

Briefly describe the activity you observed. Include the type(s) of technology used during the activity, the level of student involvement, and the degree of teacher/student interaction.

Was there more than one instructional activity taking place during the activity? ❒ Yes ❒ No

→ *If "yes", include the proportion of students engaged in this activity.*

Number of students engaged in this activity	Number of students engaged in other activities

Q2. Content: Which kind of knowledge and skills was addressed in this activity? *(Mark all that apply)*

Before you finalize your coding below, please verify with the instructor during the debrief interview about which type of knowledge was covered in the observed class.

Technical	☐ system knowledge (how it works) ☐ declarative knowledge (terminology) ☐ procedural knowledge (how to do it) ☐ strategic knowledge (when to do it; how to organize system & procedural knowledge into effective strategy or plan) (Steenberger & Gitomore 1996)
Social Technical	☐ technical communication (e.g., explain & justify technical approach)
Social	☐ teamwork ☐ project management

Q3. Problem Solving and trouble-shooting: First, rate the level of each problem solving classification (below) for this activity. Then, respond to the question at the bottom of this page.

Problem Features	Scale
Variety *No Variety:* *Students told how to solve problems or given only one way* *VS.* *Variety:* *Students allowed to use multiple ways to solve problems*	*No Variety* — *Variety* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Structuredness *Tight:* *All problem elements presented;* *Prescribed solution rules;* *Known solution* *VS.* *Loose:* *Problem elements not known;* *Uncertainty about rules;* *Multiple possible solutions*	*Tight* — *Loose* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Complexity *Complex:* *Multiple interconnected variables;* *Dynamic problem states* *VS.* *Simple:* *Low number of isolated variables;* *Stable problem state*	*Simple* — *Complex* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Domain Specificity *Specific:* *Problems dependent on the nature of the context* *Must solve with reasoning unique to domain* *VS.* *General:* *Problems grounded in general logic* *Can use general reasoning strategies*	*General* — *Specific* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐

Based on criteria described above, did this activity require students to use problem solving or trouble shooting skills?

☐ Yes (if yes, provide an example)
☐ No

Example of problem solving or trouble shooting used in this activity.

Q4. Activity Mode: Which mode/type of activity was used for this activity, and what was the level of student/teacher interaction? (*Select all the modes that apply. Also, select the size of the group involved, the level of student/teacher interaction for each selected mode [based on your observation tallies], then, select the mode used for the longest time in this activity*)

a☐	**Lecture:** The instructor gave instructions, lectured, reviewed assignments or tests, or otherwise gave information. The instructor did most of talking, although he or she may have asked some factual or recall questions. *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
b☐	**Demonstration/Modeling:** The instructor modeled or demonstrated procedures. (check the type of student audience below) ☐ whole class ☐ small group/ pair ☐ individual *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
c☐	**Hands-on in classroom:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
d☐	**Lab:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
e☐	**Discussion:** The instructor asked students to discuss a question or topic and responded to student comments. ☐ whole class ☐ small group/ pair *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
f☐	**Student Presentation** ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
g☐	**Other** (please briefly describe): ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
Dominant Activity Mode:	**(Please use letter code from above** to indicate what the instructor and students spent the most time doing during this activity).
What aspect of student performance is the focus of the instructor's comments? (For example -are the comments focused on procedural or strategic knowledge or related to project management or student teamwork?)	

If small group or pair is selected above, did students produce a group product or solution that includes contributions from each student?

☐ Yes

☐ No (students produced individual work or solutions)

Q5. Student Engagement: How were the majority of students engaged with the content during this activity? (*Select all that apply, then select the dominant in terms of the longest time spent*)

[Modified from Webb's Depth of Knowledge]

a☐	**No or little active engagement** (e.g., listen to lecture, read in a book, or watched a video; no or little student talk about the content; off-task behavior).
b☐	**Recall or recognition** of a fact, information, concept, or procedure
c☐	**Basic application of skills/concept**—followed given procedures, used suggested skills and knowledge to accomplish a simple or routine task
d☐	**Strategic thinking** – engaged in some decision making such as developing a plan or sequence of steps to approach problem; engaged in reasoning such as explanation and justification for a chosen approach; this often involves working on an open-ended and complex task that has more than one possible way to approach.
e☐	**Extended thinking** – engaged in an extended investigation or project to solve a real-world complex problem, which requires time to research, think, and process multiple conditions of the problem, and high level of problem solving, self-monitoring and reflection, and autonomy.
Dominant Student Engagement type:	**(Please use letter code from above** to indicate the type of engagement students spent the most time doing during this activity).

Q6. Instructor's Assessment Practices: In this section, please characterize (with examples) the types of questions that you tallied and provide more detail on the types of assessment practices that you observed *(Mark all that apply.)*

A. Questioning

If observed, give one or two examples of a **closed-ended (known-answer) question**

If observed, give one or two examples of an **open-ended question**

B. Monitoring

☐ Monitors student activities informally (walking around classroom or lab; posing questions to individuals or small groups)

☐ Observed students formally (using a checklist or rubric)

Provide one or two example of instructor's monitoring practices

C. Tests/Quiz/Performance Task

☐ Gave a pencil-and-paper quiz or test for students to complete

☐ Had students complete a graded performance task

D. Reflection

☐ Asked students to reflect (self-assess) on their own learning – may be done with other students (e.g., *Do you get it? What don't you understand?* The goal is to get students to internalize their own quality criteria. Peer assessment; students using rubric to assess their own work).

Provide one or two examples of student reflection

E. Other

☐ Please briefly describe

Q7. Technology/Equipment Use: What technology and equipment (including tools, instruments, & machines) were used in this activity?

Technology and equipment (including tools, instruments & machines) used:

☐ Computers (laptop, desktop, etc.)
☐ Printers
☐ Projectors (overhead and other projectors)
☐ Hand Tools (hammer, screwdriver, etc.)
☐ Power Tools (electric tools)
☐ Measurement instruments (both manual and digital)
☐ Lab Equipment (glassware, etc.)
☐ Industry-specific equipment and materials (i.e. solar panels)
Describe:

☐ Other
Describe:

The technology/equipment is used by: ☐ the instructor, ☐ students

(If students are using the technology/equipment)
Students were using computers … ☐ alone ☐ in pairs ☐ in groups ☐ whole class

Activity Form 5

Activity 5

Start time:

End time:

Q1. What's going on during this activity? *Use your observation notes to briefly describe what the instructor and students were doing during this activity, including the flow of sub- activities, the content, and transitions to other activities.*

Briefly describe the goal of this activity based what you saw happening in the class. This is the goal from your point of view as an observer, not the stated goal by the instructor.

Briefly describe the activity you observed. Include the type(s) of technology used during the activity, the level of student involvement, and the degree of teacher/student interaction.

Was there more than one instructional activity taking place during the activity? ❒ Yes ❒ No

→ *If "yes", include the proportion of students engaged in this activity.*

Number of students engaged in this activity	**Number of students engaged in other activities**

Q2. Content: Which kind of knowledge and skills was addressed in this activity? *(Mark all that apply)*

Before you finalize your coding below, please verify with the instructor during the debrief interview about which type of knowledge was covered in the observed class.

Technical	☐ system knowledge (how it works) ☐ declarative knowledge (terminology) ☐ procedural knowledge (how to do it) ☐ strategic knowledge (when to do it; how to organize system & procedural knowledge into effective strategy or plan) (Steenberger & Gitomore 1996)
Social Technical	☐ technical communication (e.g., explain & justify technical approach)
Social	☐ teamwork ☐ project management

Q3. Problem Solving and trouble-shooting: First, rate the level of each problem solving classification (below) for this activity. Then, respond to the question at the bottom of this page.

Problem Features	Scale
Variety *No Variety:* *Students told how to solve problems or given only one way* *VS.* *Variety:* *Students allowed to use multiple ways to solve problems*	*No Variety* — *Variety* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Structuredness *Tight:* *All problem elements presented;* *Prescribed solution rules;* *Known solution* *VS.* *Loose:* *Problem elements not known;* *Uncertainty about rules;* *Multiple possible solutions*	*Tight* — *Loose* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Complexity *Complex:* *Multiple interconnected variables;* *Dynamic problem states* *VS.* *Simple:* *Low number of isolated variables;* *Stable problem state*	*Simple* — *Complex* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Domain Specificity *Specific:* *Problems dependent on the nature of the context* *Must solve with reasoning unique to domain* *VS.* *General:* *Problems grounded in general logic* *Can use general reasoning strategies*	*General* — *Specific* — *Not Observed* *0 1 2 3 4 5* ☐ ☐ ☐ ☐ ☐ ☐ ☐

Based on criteria described above, did this activity require students to use problem solving or trouble shooting skills?

☐ Yes (if yes, provide an example)
☐ No

Example of problem solving or trouble shooting used in this activity.

Q4. Activity Mode: Which mode/type of activity was used for this activity, and what was the level of student/teacher interaction? (*Select all the modes that apply. Also, select the size of the group involved, the level of student/teacher interaction for each selected mode [based on your observation tallies], then, select the mode used for the longest time in this activity*)

a☐	**Lecture:** The instructor gave instructions, lectured, reviewed assignments or tests, or otherwise gave information. The instructor did most of talking, although he or she may have asked some factual or recall questions. *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
b☐	**Demonstration/Modeling:** The instructor modeled or demonstrated procedures. (check the type of student audience below) ☐ whole class ☐ small group/ pair ☐ individual *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
c☐	**Hands-on in classroom:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
d☐	**Lab:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
e☐	**Discussion:** The instructor asked students to discuss a question or topic and responded to student comments. ☐ whole class ☐ small group/ pair *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
f☐	**Student Presentation** ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
g☐	**Other** (please briefly describe): ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
Dominant Activity Mode:	**(Please use letter code from above** to indicate what the instructor and students spent the most time doing during this activity).
What aspect of student performance is the focus of the instructor's comments? (For example -are the comments focused on procedural or strategic knowledge or related to project management or student teamwork?)	

If small group or pair is selected above, did students produce a group product or solution that includes contributions from each student?

☐ Yes

☐ No (students produced individual work or solutions)

Q5. Student Engagement: How were the majority of students engaged with the content during this activity? (*Select all that apply, then select the dominant in terms of the longest time spent*)

[Modified from Webb's Depth of Knowledge]

a☐	**No or little active engagement** (e.g., listen to lecture, read in a book, or watched a video; no or little student talk about the content; off-task behavior).
b☐	**Recall or recognition** of a fact, information, concept, or procedure
c☐	**Basic application of skills/concept**—followed given procedures, used suggested skills and knowledge to accomplish a simple or routine task
d☐	**Strategic thinking** – engaged in some decision making such as developing a plan or sequence of steps to approach problem; engaged in reasoning such as explanation and justification for a chosen approach; this often involves working on an open-ended and complex task that has more than one possible way to approach.
e☐	**Extended thinking** – engaged in an extended investigation or project to solve a real-world complex problem, which requires time to research, think, and process multiple conditions of the problem, and high level of problem solving, self-monitoring and reflection, and autonomy.
Dominant Student Engagement type:	**(Please use letter code from above** to indicate the type of engagement students spent the most time doing during this activity).

Q6. Instructor's Assessment Practices: In this section, please characterize (with examples) the types of questions that you tallied and provide more detail on the types of assessment practices that you observed *(Mark all that apply.)*

A. Questioning

If observed, give one or two examples of a **closed-ended (known-answer) question**

If observed, give one or two examples of an **open-ended question**

B. Monitoring

☐ Monitors student activities informally (walking around classroom or lab; posing questions to individuals or small groups)

☐ Observed students formally (using a checklist or rubric)

Provide one or two example of instructor's monitoring practices

C. Tests/Quiz/Performance Task

☐ Gave a pencil-and-paper quiz or test for students to complete

☐ Had students complete a graded performance task

D. Reflection

☐ Asked students to reflect (self-assess) on their own learning – may be done with other students (e.g., *Do you get it? What don't you understand?* The goal is to get students to internalize their own quality criteria. Peer assessment; students using rubric to assess their own work).

Provide one or two examples of student reflection

E. Other

☐ Please briefly describe

Q7. Technology/Equipment Use: What technology and equipment (including tools, instruments, & machines) were used in this activity?

Technology and equipment (including tools, instruments & machines) used:

☐ Computers (laptop, desktop, etc.)
☐ Printers
☐ Projectors (overhead and other projectors)
☐ Hand Tools (hammer, screwdriver, etc.)
☐ Power Tools (electric tools)
☐ Measurement instruments (both manual and digital)
☐ Lab Equipment (glassware, etc.)
☐ Industry-specific equipment and materials (i.e. solar panels)
Describe:

☐ Other
Describe:

The technology/equipment is used by: ☐ the instructor, ☐ students

(If students are using the technology/equipment)
Students were using computers … ☐ alone ☐ in pairs ☐ in groups ☐ whole class

Activity Form 6

Activity 6

Start time:

End time:

Q1. What's going on during this activity? *Use your observation notes to briefly describe what the instructor and students were doing during this activity, including the flow of sub- activities, the content, and transitions to other activities.*

Briefly describe the goal of this activity based what you saw happening in the class. This is the goal from your point of view as an observer, not the stated goal by the instructor.

Briefly describe the activity you observed. Include the type(s) of technology used during the activity, the level of student involvement, and the degree of teacher/student interaction.

Was there more than one instructional activity taking place during the activity? ❒ Yes ❒ No

→ *If "yes", include the proportion of students engaged in this activity.*

Number of students engaged in this activity	**Number of students engaged in other activities**

Q2. Content: Which kind of knowledge and skills was addressed in this activity? *(Mark all that apply)*

Before you finalize your coding below, please verify with the instructor during the debrief interview about which type of knowledge was covered in the observed class.

Technical	☐ system knowledge (how it works) ☐ declarative knowledge (terminology) ☐ procedural knowledge (how to do it) ☐ strategic knowledge (when to do it; how to organize system & procedural knowledge into effective strategy or plan) (Steenberger & Gitomore 1996)
Social Technical	☐ technical communication (e.g., explain & justify technical approach)
Social	☐ teamwork ☐ project management

Q3. Problem Solving and trouble-shooting: First, rate the level of each problem solving classification (below) for this activity. Then, respond to the question at the bottom of this page.

Problem Features	Scale
Variety *No Variety:* *Students told how to solve problems or given only one way* *VS.* *Variety:* *Students allowed to use multiple ways to solve problems*	*No Variety* — *Variety* — *Not Observed* *0* *1* *2* *3* *4* *5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Structuredness *Tight:* *All problem elements presented;* *Prescribed solution rules;* *Known solution* *VS.* *Loose:* *Problem elements not known;* *Uncertainty about rules;* *Multiple possible solutions*	*Tight* — *Loose* — *Not Observed* *0* *1* *2* *3* *4* *5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Complexity *Complex:* *Multiple interconnected variables;* *Dynamic problem states* *VS.* *Simple:* *Low number of isolated variables;* *Stable problem state*	*Simple* — *Complex* — *Not Observed* *0* *1* *2* *3* *4* *5* ☐ ☐ ☐ ☐ ☐ ☐ ☐
Domain Specificity *Specific:* *Problems dependent on the nature of the context* *Must solve with reasoning unique to domain* *VS.* *General:* *Problems grounded in general logic* *Can use general reasoning strategies*	*General* — *Specific* — *Not Observed* *0* *1* *2* *3* *4* *5* ☐ ☐ ☐ ☐ ☐ ☐ ☐

Based on criteria described above, did this activity require students to use problem solving or trouble shooting skills?

☐ Yes (if yes, provide an example)
☐ No

Example of problem solving or trouble shooting used in this activity.

Q4. Activity Mode: Which mode/type of activity was used for this activity, and what was the level of student/teacher interaction? (*Select all the modes that apply. Also, select the size of the group involved, the level of student/teacher interaction for each selected mode [based on your observation tallies], then, select the mode used for the longest time in this activity*)

a☐	**Lecture:** The instructor gave instructions, lectured, reviewed assignments or tests, or otherwise gave information. The instructor did most of talking, although he or she may have asked some factual or recall questions. *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
b☐	**Demonstration/Modeling:** The instructor modeled or demonstrated procedures. (check the type of student audience below) ☐ whole class ☐ small group/ pair ☐ individual *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
c☐	**Hands-on in classroom:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
d☐	**Lab:** ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
e☐	**Discussion:** The instructor asked students to discuss a question or topic and responded to student comments. ☐ whole class ☐ small group/ pair *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
f☐	**Student Presentation** ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
g☐	**Other** (please briefly describe): ☐ whole class ☐ small group/ pair ☐ individual work *Student/Teacher Interaction* ☐ None ☐ Some ☐ A lot
Dominant Activity Mode:	**(Please use letter code from above** to indicate what the instructor and students spent the most time doing during this activity).
What aspect of student performance is the focus of the instructor's comments? (For example -are the comments focused on procedural or strategic knowledge or related to project management or student teamwork?)	

If small group or pair is selected above, did students produce a group product or solution that includes contributions from each student?

☐ Yes

☐ No (students produced individual work or solutions)

Q5. Student Engagement: How were the majority of students engaged with the content during this activity? (*Select all that apply, then select the dominant in terms of the longest time spent*)

[Modified from Webb's Depth of Knowledge]

a☐	**No or little active engagement** (e.g., listen to lecture, read in a book, or watched a video; no or little student talk about the content; off-task behavior).
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d☐	**Strategic thinking** – engaged in some decision making such as developing a plan or sequence of steps to approach problem; engaged in reasoning such as explanation and justification for a chosen approach; this often involves working on an open-ended and complex task that has more than one possible way to approach.
e☐	**Extended thinking** – engaged in an extended investigation or project to solve a real-world complex problem, which requires time to research, think, and process multiple conditions of the problem, and high level of problem solving, self-monitoring and reflection, and autonomy.
Dominant Student Engagement type:	**(Please use letter code from above** to indicate the type of engagement students spent the most time doing during this activity).

Q6. Instructor's Assessment Practices: In this section, please characterize (with examples) the types of questions that you tallied and provide more detail on the types of assessment practices that you observed *(Mark all that apply.)*

A. Questioning

If observed, give one or two examples of a **closed-ended (known-answer) question**

If observed, give one or two examples of an **open-ended question**

B. Monitoring

☐ Monitors student activities informally (walking around classroom or lab; posing questions to individuals or small groups)

☐ Observed students formally (using a checklist or rubric)

Provide one or two example of instructor's monitoring practices

C. Tests/Quiz/Performance Task

☐ Gave a pencil-and-paper quiz or test for students to complete

☐ Had students complete a graded performance task

D. Reflection

☐ Asked students to reflect (self-assess) on their own learning – may be done with other students (e.g., *Do you get it? What don't you understand?* The goal is to get students to internalize their own quality criteria. Peer assessment; students using rubric to assess their own work).

Provide one or two examples of student reflection

E. Other

☐ Please briefly describe

Q7. Technology/Equipment Use: What technology and equipment (including tools, instruments, & machines) were used in this activity?

Technology and equipment (including tools, instruments & machines) used:

☐ Computers (laptop, desktop, etc.)
☐ Printers
☐ Projectors (overhead and other projectors)
☐ Hand Tools (hammer, screwdriver, etc.)
☐ Power Tools (electric tools)
☐ Measurement instruments (both manual and digital)
☐ Lab Equipment (glassware, etc.)
☐ Industry-specific equipment and materials (i.e. solar panels)
Describe:

☐ Other
Describe:

The technology/equipment is used by: ☐ the instructor, ☐ students

(If students are using the technology/equipment)
Students were using computers … ☐ alone ☐ in pairs ☐ in groups ☐ whole class