Instructional Quality Assessment
Classroom Observation Tool

COVER PAGE – COMPLETE FOR EACH LESSON AND ATTACH TO FIELD NOTES, COPY OF INSTRUCTIONAL TASK, AND SCORE SHEET

Background Information

Date of observation: _____ Observer: _____

Start Time: _____ End Time: _____

District: _____ School: _____

Grade: _____ Day 1 or Day 2 _____

Classroom Context

Total number of students in the classroom: _____
_____ Boys _____ Girls

Sketch of seating arrangement(s):

Mathematical Topic of the Lesson:

Field Notes (attach).

Part 1: Documents Needed During the Observation

Accountable Talk Function Reference List

Most of these moves will be made by the teacher, but in some cases, students might make them. In recording the actual moves, note T for Teacher move, S for Student move.

1. Accountability to the Learning Community

- Keeping everyone together so they can follow complex thinking
  - "What did she just say?"
  - "Can you repeat what Juan said in your own words?"

- Getting students to relate to one another's ideas
  - "Jay just said…and Susan, you're saying…"
  - "Who wants to add on to what Ana just said?"
  - "Who agrees and who disagrees with what Ana just said?"
  - "How does what you're saying relate to what Juan just said?"
  - "I agree with Sue, but I disagree with you, because…"
  - "I agree with Fulano because…"

- Revoicing/Recapping
  - "Can you repeat what Juan said in your own words?"
  - "So what I'm hearing you say is…"

- Marking
  - "That's a really important point."
  - "Jenna said something really interesting. We need to think about that."

2. Accountability to Knowledge and Rigorous Thinking

- Pressing for accuracy
  - "Where could we find more information about that?"
  - "Are we sure about that? How can we know for sure?"
  - "What evidence is there?"
  - "How do you know?"
  - "How did you get 50?"

- Building on prior knowledge / recalling prior knowledge
  - "How does this connect with what we did last week?"
  - "Do you remember when we talked about slope?"

- Pressing for reasoning
  - "What made you say that?"
  - "Why do you think that?"
  - "Can you explain that?"
  - "Why do you disagree?"
  - "Say more about that."
  - "What do you mean?"

Academic Rigor 2: Implementation Lesson Checklist:

A ↑ The Lesson provided opportunities for students to engage in high-level thinking:	B ↓ The Lesson DID NOT provide opportunities for students to engage in high-level thinking:
▫ Students ○ engaged with the task in a way that addressed the teacher's goals for high-level thinking and reasoning. ○ communicated mathematically with peers. ○ had appropriate prior knowledge to engage with the task. ○ had opportunities to serve as mathematical authority in classroom ○ had access to resources that supported their engagement with the task. ▫ Teacher ○ supported students to engage with the high-level demands of the task while maintaining the challenge of the task ○ provided sufficient time to grapple with the demanding aspects of the task and for expanded thinking and reasoning. ○ held students accountable for high-level products and processes. ○ provided consistent presses for explanation and meaning. ○ provided students with sufficient modeling of high-level performance on the task. ○ provided encouragement for students to make conceptual connections.	▫ The task ○ expectations were not clear enough to promote students' engagement with the high-level demands of the task. ○ was not complex enough to sustain student engagement in high-level thinking. ○ was too complex to sustain student engagement in high-level thinking (i.e., students did not have the prior knowledge necessary to engage with the task at a high level). ▫ The teacher o Allowed classroom management problems to interfere with students' opportunities to engage in high-level thinking. o provided a set procedure for solving the task o shifted the focus to procedural aspects of the task or on correctness of the answer rather than on meaning and understanding. o Gave feedback, modeling, or examples that were too directive or did not leave any complex thinking for the student. o Did not press students or hold them accountable for high-level products and processes or for explanations and meaning. o Did not give students enough time to deeply engage with the task or to complete the task to the extent that was expected. o Did not provide students access to resources necessary to engage with the task at a high level.

C	The **Discussion** provides opportunities for students to engage with the high-level demands of the task. Students:

▫ use multiple strategies and make explicit connections or comparisons between these strategies, or explain why they choose one strategy over another.
▫ use or discuss multiple representations and make connections between different representations or between the representation and their strategy, underlying mathematical ideas, and/or the context of the problem
▫ identify patterns or make conjectures, predictions, or estimates that are well grounded in underlying mathematical concepts or evidence.
▫ generate evidence to test their conjectures. Students use this evidence to generalize mathematical relationships, properties, formulas, or procedures.
▫ (rather than the teacher) determine the validity of answers, strategies or ideas.

Academic Rigor Q: Questioning Types:

Question Type	Description	Examples
Probing	• Clarifies student thinking • Enables students to elaborate their own thinking for their own benefit and for the class	• *"How did you get that answer?"* • *"Why did you use that scale for your graph?"* • *"Why did you use that formula to solve the problem?"* • *"Explain to me how you got that expression."*
Exploring mathematical meanings and relationships	• Points to underlying mathematical relationships and meanings • Makes links between mathematical ideas	• *"What does 'n' represent in terms of the diagram?"* • *"How does the 'x' in your table related to the 'x' in your graph?"* • *"How would your expression work for any "function?"* • *"What is staying the same in your equation? Why is it staying the same?"*
Generating discussion	• Enables other members of class to contribute and comment on ideas under discussion	• *"Explain to me what John was saying."* • *"What else did you notice about the graph of the parabola?"* • *"Who agrees with what Sue said? Why do you agree?"*
Procedural or factual	• Elicits a mathematical fact or procedure • Requires a yes/no or single response answer. • Requires the recall of a memorized fact or procedure	• *"What is the square root of 4?"* • *"What is a co-efficient?"* • *"What is 3 x 5?* • *"Does this picture show ½ or ¼ ?"*
Other mathematical	• Related to teaching and learning mathematics but do not request mathematical procedures or factual knowledge, probe students' thinking, press for explanations, or generate discussion.	• *"How could you use this in the real world?"* • *'Which problem was the most difficult?"*
Non-mathematical	• Does not relate to teaching and learning mathematics	• *" Why didn't you use graph paper?"* • *"Who has ever seen a caterpillar?"*

Adapted from Boaler & Humphries (2005).

Part 2: IQA Mathematics Rubrics

Accountable Talk

Consider talk from the whole-group discussion only.

I. How effectively did the lesson-talk build <u>Accountability to the Learning Community</u>?

Participation in the Learning Community

Was there widespread participation in teacher-facilitated discussion?

Rubric 1: Participation	
4	Over 75% of the students participated throughout the discussion.
3	50-75% of the students participated in the discussion.
2	25-50% of the students participated in the discussion.
1	Less than 25% of the students participated in the discussion.
0	None of the students participated in the discussion.
N/A	Reason:

_____ Number of students in class

_____ Number of students who participated

Teacher's Linking Contributions
Does the teacher support students in connecting ideas and positions to build coherence in the discussion?

Rubric 2: Teacher's Linking	
4	The teacher consistently (at least 3 times) connects (or provides opportunities for students to connect) speakers' contributions to each other and shows (or provides opportunities for students to show) how ideas/positions shared during the discussion relate to each other.
3	At least twice during the lesson the teacher connects (or provides opportunities for students to connect) speakers' contributions to each other and shows (or provides opportunities for students to show) how ideas/positions relate to each other.
2	At one or more points during the discussion, the teacher links speakers' contributions to each other, but does not show how ideas/positions relate to each other (weak links). No follow-up questions are asked after speakers' contributions OR teacher revoices or recaps only, but does not show how ideas/positions relate to each other OR only one strong effort is made to connect speakers' contributions to each other (1 strong link).
1	Teacher does not make any effort to link or revoice speakers' contributions.
0	No class discussion OR Class discussion was not related to mathematics.
N/A	Reason:

Students' Linking Contributions Do student's contributions link to and build on each other?

Rubric 3: Students' Linking	
4	The students consistently connect their contributions to each other and show how ideas/positions shared during the discussion relate to each other. (e.g. I agree with Jay because…")
3	At least twice during the lesson the students to connect their contributions to each other and show how ideas/positions shared during the discussion relate to each other. (e.g. I agree with Jay because…")
2	At one or more points during the discussion, the students link students' contributions to each other, but do not show how ideas/positions relate to each other. (e.g., "I disagree with Ana.") OR only one strong effort is made to connect their contributions with each other.
1	Students do not make any effort to link or revoice students' contributions.
0	No class discussion OR Class discussion was not related to mathematics.
N/A	Reason:

II. How effectively did the lesson-talk build Accountability to Knowledge and Rigorous Thinking?

Asking: Were students pressed to support their contributions with evidence and/or reasoning?

Rubric 4: Asking (Teachers' Press)	
4	The teacher consistently (almost always) asks students to provide evidence for their contributions (i.e., press for conceptual explanations) or to explain their reasoning. (There are few, if any instances of missed press, where the teacher needed to press and did not.)
3	Once or twice during the lesson the teacher asks students to provide evidence for their contributions (i.e., press for conceptual explanations) or to explain their reasoning. (The teacher sometimes presses for explanations, but there are instances of missed press.)
2	Most of the press is for computational or procedural explanations or memorized knowledge OR There are one or more superficial, trivial efforts, or formulaic efforts to ask students to provide evidence for their contributions or to explain their reasoning (i.e., asking everyone, "How did you get that?").
1	There are no efforts to ask students to provide evidence for their contributions, AND there are no efforts to ask students to explain their thinking.
0	Class discussion was not related to mathematics OR No class discussion
N/A	Reason:

Providing: Did students support their contributions with evidence and/or reasoning? (This evidence must be appropriate to the content area—i.e., evidence from the text; citing an example, referring to prior classroom experience.)

Rubric 5: Providing (Students' Responses)	
4	Students consistently provide evidence for their claims, OR students explain their thinking using reasoning in ways appropriate to the discipline (i.e. conceptual explanations).
3	Once or twice during the lesson students provide evidence for their claims, OR students explain their thinking, using reasoning in ways appropriate to the discipline (i.e. conceptual explanations).
2	Students provide explanations that are computational, procedural or memorized knowledge, OR What little evidence or reasoning students provide is offered to back up claims is inaccurate, incomplete, or vague.
1	Speakers do not back up their claims, OR do not explain the reasoning behind their claims.
0	Class discussion was not related to mathematics OR No class discussion
N/A	Reason:

Academic Rigor

RUBRIC 1: Potential of the Task

Did the task have potential to engage students in rigorous thinking about challenging content?

4	**The task has the potential to engage students in exploring and understanding the nature of mathematical concepts, procedures, and/or relationships, such as:** • Doing mathematics: using complex and non-algorithmic thinking (i.e., there is not a predictable, well-rehearsed approach or pathway explicitly suggested by the task, task instructions, or a worked-out example); OR • Procedures with connections: applying a broad general procedure that remains closely connected to mathematical concepts. The task must explicitly prompt for evidence of students' reasoning and understanding. For example, the task **MAY** require students to: • solve a genuine, challenging problem for which students' reasoning is evident in their work on the task; • develop an explanation for why formulas or procedures work; • identify patterns and form and justify generalizations based on these patterns; • make conjectures and support conclusions with mathematical evidence; • make explicit connections between representations, strategies, or mathematical concepts and procedures. • follow a prescribed procedure in order to explain/illustrate a mathematical concept, process, or relationship.
3	**The task has the potential to engage students in complex thinking or in creating meaning for mathematical concepts, procedures, and/or relationships. However, the task does not warrant a "4" because:** • the task does not explicitly prompt for evidence of students' reasoning and understanding. • students may be asked to engage in doing mathematics or procedures with connections, but the underlying mathematics in the task is not appropriate for the specific group of students (i.e., too easy or too hard to promote engagement with high-level cognitive demands); • students may need to identify patterns but are not pressed for generalizations or justification; • students may be asked to use multiple strategies or representations but the task does not explicitly prompt students to develop connections between them; • students may be asked to make conjectures but are not asked to provide mathematical evidence or explanations to support conclusions
2	The potential of the task is limited to engaging students in using a procedure that is either specifically called for or its use is evident based on prior instruction, experience, or placement of the task. **There is little ambiguity about what needs to be done and how to do it.** The task does not require students to make connections to the concepts or meaning underlying the procedure being used. **Focus of the task appears to be on producing correct answers rather than developing mathematical understanding (e.g., applying a specific problem solving strategy, practicing a computational algorithm).** **OR** There is evidence that the mathematical content of the task is at least 2 grade-levels below the grade of the students in the class.
1	**The potential of the task is limited to engaging students in memorizing or reproducing facts, rules, formulae, or definitions. The task does not require students to make connections to the concepts or meaning that underlie the facts, rules, formulae, or definitions being memorized or reproduced.**
0	**The task requires no mathematical activity.**
N/A	Students did not engage in a task.

ATTACH OR DESCRIBE THE TASK.

RUBRIC 2: Implementation of the Task

At what level did the teacher guide students to engage with the task in implementation?

4	**Students engaged in exploring and understanding the nature of mathematical concepts, procedures, and/or relationships, such as:** • Doing mathematics: using complex and non-algorithmic thinking (i.e., there is not a predictable, well-rehearsed approach or pathway explicitly suggested by the task, task instructions, or a worked-out example); OR • Procedures with connections: applying a broad general procedure that remains closely connected to mathematical concepts. There is explicit evidence of students' reasoning and understanding. For example, students may have: • solved a genuine, challenging problem for which students' reasoning is evident in their work on the task; • developed an explanation for why formulas or procedures work; • identified patterns, formed and justified generalizations based on these patterns; • made conjectures and supported conclusions with mathematical evidence; • made explicit connections between representations, strategies, or mathematical concepts and procedures. • followed a prescribed procedure in order to explain/illustrate a mathematical concept, process, or relationship.
3	**Students engaged in complex thinking or in creating meaning for mathematical concepts, procedures, and/or relationships. However, the implementation does not warrant a "4" because:** • there is no explicit evidence of students' reasoning and understanding. • students engaged in doing mathematics or procedures with connections, but the underlying mathematics in the task was not appropriate for the specific group of students (i.e., too easy or too hard to sustain engagement with high-level cognitive demands); • students identified patterns but did not make generalizations; • students used multiple strategies or representations but connections between different strategies/representations were not explicitly evident; • students made conjectures but did not provide mathematical evidence or explanations to support conclusions
2	Students engaged in using a procedure that was either specifically called for or its use was evident based on prior instruction, experience, or placement of the task. **There was little ambiguity about what needed to be done and how to do it. S**tudents did not make connections to the concepts or meaning underlying the procedure being used. **Focus of the implementation appears to be on producing correct answers rather than developing mathematical understanding (e.g., applying a specific problem solving strategy, practicing a computational algorithm).** OR There is evidence that the mathematical content of the task is at least 2 grade-levels below the grade of the students in the class.
1	**Students engage in memorizing or reproducing facts, rules, formulae, or definitions. Students do not make connections to the concepts or meaning that underlie the facts, rules, formulae, or definitions being memorized or reproduced.**
0	The students did not engage in mathematical activity.
N/A	**The students did not engage with a mathematical task.**

RUBRIC 3: Student Discussion Following Task

To what extent did students show their work and explain their thinking about the important mathematical content?

4	Students show/describe written work for solving a task and/or engage in a discussion of the important mathematical ideas in the task. During the discussion, students provide complete and thorough explanations of why their strategy, idea, or procedure is valid; students explain why their strategy works and/or is appropriate for the problem; students make connections to the underlying mathematical ideas (e.g., "I divided because we needed equal groups"). OR Students show/discuss more than one strategy or representation for solving the task, provide explanations of why the different strategies/representations were used to solve the task, *and/or make connections between strategies or representations. [Thorough presentation and discussion <u>across</u> strategies or representation.]*
3	Students show/describe written work for solving a task and/or engage in a discussion of the important mathematical ideas in the task. During the discussion, students provide explanations of why their strategy, idea, or procedure is valid and/or students begin to make connections BUT the explanations and connections are not complete and thorough (e.g., student responses often require extended press from the teacher, are incomplete, lack precision, or fall short making explicit connections). OR Students show/discuss more than one strategy or representation for solving the task, and provide explanations of how the different strategies/representations were used to solve the task *but do not make connections between different strategies or representations. [Thorough presentation and/or discussion of <u>individual</u> strategies or representations, but no talk or questioning across different strategies)]*
2	Students show/describe written work for solving the task (e.g., the steps for a multiplication problem, finding an average, or solving an equation; what they did first, second, etc) but do not engage in a discussion of why their strategies, procedures, or mathematical ideas work; *do not make connection to mathematical concepts. [Procedural explanations only]* OR Students show/discuss only one strategy or representation for solving the task, OR Students make presentations of their work with no questioning or prompting from the teacher (to the presenters or to the class) to explain the mathematical work, make connections, etc. [*Presentations with no discussion*]
1	Students provide brief or one-word answers (e.g., fill in blanks); OR **Student's responses are non-mathematical.**
0	There was no discussion of the task.
N/A	Reason:

Rigor of Teachers' Questions

Rubric AR-Q: Questioning	
4	The teacher **consistently** asks academically relevant questions that provide opportunities for students to elaborate and explain their mathematical work and thinking (probing, generating discussion), identify and describe the important mathematical ideas in the lesson, or make connections between ideas, representations, or strategies (exploring mathematical meanings and relationships).
3	At least 2 times during the lesson, the teacher asks academically relevant questions (probing, generating discussion, exploring mathematical meanings and relationships).
2	There are one or more superficial, trivial, or formulaic efforts to ask academically relevant questions probing, generating discussion, exploring mathematical meanings and relationships) (i.e., every student is asked the same question or set of questions) or to ask students to explain their reasoning; OR only one (1) strong effort is made to ask academically relevant questions.
1	The teacher asks procedural or factual questions that elicit mathematical facts or procedure or require brief, single word responses.
0	The teacher did not ask questions during the lesson, or the teacher's questions were not relevant to the mathematics in the lesson.
N/A	Reason:

Under Development: Mathematical Residue Rubric

Extent to which the whole-group discussion builds new, important mathematical ideas

4	The discussion following students' work on the task surfaces the important mathematical ideas, concepts, or connections embedded in the task and serves to extend or solidify students' understanding of the main mathematical goals/ideas/concepts of the lesson. The discussion leaves behind important mathematical residue.
3	During the discussion following students' work on the task, the important mathematical ideas, concepts, or connections begin to surface, are wrestled with by students, but are not pursued in depth or have not materialized/solidified by the close of the lesson. The lesson is beginning to amount to something mathematically but the mathematics is only partially developed; perhaps due to time or student readiness.
2	During the discussion following students' work on the task, the important mathematical ideas, concepts, or connections in the task are explained or made explicit by the teacher primarily (i.e., the teacher is telling students what connections should have been made; students take notes or provide brief answers but do not make meaningful mathematical contributions to the discussion, students make superficial contributions that are taken over by the teacher). The discussion is mathematical, but does not address the concepts, ideas, or connections embedded in the task (random or not consistent with the mathematical goal) OR the discussion is about mathematics that is not relevant/important for the group of students.
1	Important mathematical ideas do not surface during the discussion following students' work on the task. There is no apparent mathematical goal; the discussion does not focus on developing (or building up) students' understanding of the important mathematical ideas. The discussion was about non-mathematical aspects of the task and did not leave behind mathematical residue.
0	There was no discussion following the task.

Part 3: Scoring Sheet

COMPLETE A SCORING SHEET FOR EACH OBSERVATION.
CONNECT TO COVER SHEET.

Observer: _____ Lesson Code: _____

Academic Rigor

Dimension	Rater 1	Rater 2
Rubric 1: Potential of the Task		
Rubric 2: Implementation of the Task		
Rubric 3: Student Discussion Following the Task		
Rubric AR-Q: Questioning		
Rubric AR-X: Mathematical Residue		

Accountable Talk

Dimension	Rater 1	Rater 2
Rubric AT1: Participation		
Rubric AT2: Teacher's Linking		
Rubric AT3: Students' Linking		
Rubric AT4: Asking (Teacher Press)		
Rubric AT5: Providing (Student Responses)		