APPENDIX 3

Classroom Observation Instrument

IMD Product
Classroom Observation Protocol

Background Information

IMD Product:

Site:_____ Date of Observation:_____

Subject/Grade Level:_____ Time of Observation:_____

Observer:_____ Start:_____ End:_____

Section One: Contextual Background and Activities

In this section, please fill in the circles that best describe the class. For each item, be sure to fill in all responses that apply.

I. Classroom Demographics

A. What is the total number of students in the class at the time of the observation?

- ○ 15 or fewer
- ○ 16-20
- ○ 21-25
- ○ 26-30
- ○ 31 or more

B. What is the approximate percentage of white (not Hispanic origin) students in the class?

- ○ 0–10 percent
- ○ 11-25 percent
- ○ 26-50 percent
- ○ 51-75 percent
- ○ 76-100 percent

C. Indicate the gender and race/ethnicity of the *teacher*?

○ Male ○ Female

- ○ African-American (not Hispanic origin)
- ○ American Indian or Alaskan Native
- ○ Asian or Pacific Islander
- ○ Hispanic
- ○ White (not Hispanic origin)
- ○ Other

D. Indicate the gender and race/ethnicity of the *teacher's aide*?

○ Male ○ Female

- ○ African-American (not Hispanic origin)
- ○ American Indian or Alaskan Native
- ○ Asian or Pacific Islander
- ○ Hispanic
- ○ White (not Hispanic origin)
- ○ Other

II. Classroom Context

A. Rate the adequacy of the physical environment.

1. Classroom resources:

○	○	○	○	○
1	2	3	4	5
Sparsely equipped				Rich in resources

2. Classroom space:

○	○	○	○	○
1	2	3	4	5
Crowded				Adequate space

3. Room arrangement:

○	○	○	○	○
1	2	3	4	5
Inhibited interactions among students				Facilitated interactions among students

B. In a few sentences, describe the lesson you observed. Include where this lesson fits in the overall unit of study, if you know this.

III. Lesson Focus

A. Indicate the *major* content area(s)* of this lesson or activity.

- ○ Numeration and number theory
- ○ Computation
- ○ Estimation
- ○ Measurement
- ○ Pre-algebra
- ○ Algebra
- ○ Patterns and relationships
- ○ Geometry and spatial sense
- ○ Functions (including trigonometric functions) and pre-calculus concepts
- ○ Data collection and analysis
- ○ Probability
- ○ Statistics (e.g., hypothesis tests, curve fitting, and regression)
- ○ Topics from discrete mathematics (e.g., combinatorics, graph theory. recursion)
- ○ Mathematical structures (e.g.. vector spaces; groups, rings, fields)
- ○ Calculus

*"Major" means, was used, or addressed for a substantial portion of the lesson; if you were describing the lesson to someone, this feature would help characterize it.

- ○ Life science
- ○ Physical science
- ○ Earth and space science
- ○ Environmental science

- ○ Engineering and design principles
- ○ Technology (calculators, computers) in support of science/mathematics
- ○ History of science/mathematics

- ○ Other disciplines (please specify:)

_____

_____

IV. Classroom Instruction

A. Indicate the *major instructional resource(s)* used in this lesson. Please specify the names of any published teacher guides,. textbooks, or kits used in this lesson.

- ○ Print Materials:
  - ○ Published teacher guide/manual for hands-on unit:

    _____
  - ○ Published textbook(s):

    _____
  - ○ Teacher-created print materials
  - ○ Other published materials (e.g., trade books, magazines)

- ○ Hands-on/Manipulative Materials/ Models:
  - ○ Tools and instruments
  - ○ Objects specimens, or models
  - ○ Commercially-produced manipulatives
  - ○ Commercially-produced kits:

    _____
  - ○ Other hands-on/laboratory supplies

- ○ Outdoor Resources
  - ○ Garden
  - ○ Nature trail
  - ○ Other outdoor area

- ○ Technology/Audio-visual Resources:
  - ○ Computers
  - ○ Calculators
  - ○ Videotape/film/filmstrip/TV program
  - ○ Multimedia
  - ○ Telecommunications

- ○ Other Resources
  - ○ Chalkboard
  - ○ Overhead Projector
  - ○ Charts
  - ○ Maps

B. Indicate the *major way(s)* in which student activities were structured.

- ○ As a whole group
- ○ As small groups
- ○ As pairs
- ○ As individuals

---

*"Major" means, was used, or addressed for a substantial portion of the lesson if you were describing the lesson to someone, this feature would help characterize it.

C. Indicate the *major *way(s)* in which students engaged in class activities.**

- ○ Entire class was engaged in the same activities at the same time.
- ○ Groups of students were engaged indifferent activities at the same time (e.g.. centers).

V. Use of Material

A. Indicate the *major *activities* of teachers and students in this lesson. When choosing an "umbrella" category, be sure to indicate subcategories that apply as well. (For example, if you mark "formal presentations by teacher," indicate what kind).**

- ○ Formal Presentations by Teacher:
  - ○ Disciplinary content/process information
  - ○ Demonstration of a principle or phenomenon
  - ○ Procedural instructions
  - ○ Other (please specify)

    _____
- ○ Students Presenting and/or Defending Work Orally
- ○ Guest Speaker/"Expert" Serving as a Resource
- ○ Discussions/Seminars:
  - ○ Whole group led by teacher
  - ○ Whole group led by student(s)
  - ○ Small groups/pairs
- ○ Students Engaged in Hands-on/Investigative/Research/Field Activities:
  - ○ Followed prescribed steps in a science/mathematics activity or investigation
  - ○ Designed or implemented their *own* investigation in science/mathematics
  - ○ Worked on an extended investigation/project (a week or more in duration)
  - ○ Recorded, represented, and/or analyzed data
  - ○ Interpreted data to draw conclusions
  - ○ Worked on a model or simulation
  - ○ Designed objects within constraints (e.g., egg drop, toothpick bridges. aluminum boats)
  - ○ Participated in fieldwork
  - ○ Engaged in role play or debate
  - ○ Played a game to build or review knowledge/skills
- ○ Students Engaged in Problem-Solving Activities:
  - ○ Practiced routine computations/algorithums
  - ○ Determined if a problem was well defined
  - ○ Reflected on examples of problems and their solutions
  - ○ Recognized patterns, cycles, or trends
  - ○ Worked on solving a real-world or abstract problem
  - ○ Applied scientific/mathematical principles or strategies in solving new problems
  - ○ Formulated conjectures to generalize problems
- ○ Students Focused on Proof and Evidence:
  - ○ Reflected on methods of proof in science/mathematics
  - ○ Evaluated the validity of arguments or claims
  - ○ Tested a hypothesis or conjecture
  - ○ Developed a formal argument or proof
- ○ Students Engaged in Reading/Reflection/Written Communication:
  - ○ Read (or listened to a story) about science/mathematics
  - ○ Answered textbook/worksheet questions
  - ○ Reflected on readings, activities, or problems individually or in groups

*"Major" means, was used, or addressed for a substantial portion of the lesson; if you were describing the lesson to someone, this feature would help characterize it.

- ○ Wrote a description of a plan, procedure, or problem solving process
- ○ Wrote a reflections in a notebook or journal
- ○ Prepared a written product (e.g., report. story, poem)

○ Students and/or Teacher Used Technology/Audio visual Resources:

- ○ To develop conceptual understanding
- ○ To learn or practice a skill
- ○ To collect data (e.g., probeware)
- ○ As an analytic tool (e.g., spreadsheets or data analysis)
- ○ As a presentation tool
- ○ For word processing
- ○ As a communication tool (e.g., e-mail, Internet, Web)

○ Other activities (please specify):

_____
_____
_____
_____
_____

○ Students participated in assessment:

- ○ Homework/worksheet review
- ○ Informal assessment (e.g., questioning for understanding)
- ○ Short-answer tests (e.g., multiple choice, true/false, fill-in-the-blank)
- ○ Tests requiring open-ended responses (e.g., explanations, descriptions, or justifications of solutions)
- ○ Performance-based assessment
- ○ Embedded assessment (using class activities/projects for assessment purposes)
- ○ Portfolios

E. Comments

Please provide any additional information you consider necessary to capture the activities or context of this lesson. Include comments on any feature of the class that is so salient that you need to get it "on the table" right away to help explain your ratings; for example, the class was interrupted by a fire drill, the kids were excited about an upcoming school event, or the teacher's tone was so warm (or so hostile) that it was an overwhelmingly important feature of the lesson.

Section Two: Ratings

In Section One of this form, you documented what occurred in the lesson. In this section, you are asked to rate each of a number of key indicators from 1 (not at all) to 5 (to a great extent) in four different categories by circling the appropriate response. You may list any additional indicators you consider important in capturing the essence of this session and rate these as well. Use your "Ratings of Key Indicators" (Part A) to inform your 'Synthesis Ratings' (Part B) and indicate in "Supporting Evidence for Synthesis Ratings" (Part C) what factors were most influential in determining your synthesis ratings. Note that any one lesson is not likely to provide evidence for every single indictor: use 6, "Don't Know" when there is not enough evidence for you to make a judgment. Use 7, "N/A" (Not Applicable) when you consider the indicator inappropriate given the purpose and context of the session. Section Two concludes with ratings of the likely impact of instruction, and a capsule description of the lesson.

I. Implementation of Key Strategies Embedded in the Curriculum Product

A. Ratings of Key Indicators

	Not at all				To a great extent	Don't Know	N/A
1. The implementation of instructional strategies was consistent with investigative science/ mathematics.	1	2	3	4	5	6	7
2. The teacher appeared confident in his/her ability to use the materials.	1	2	3	4	5	6	7
3. The teacher's classroom management style/strategies enhanced the quality of the lesson.	1	2	3	4	5	6	7
4. The pace of the lesson was appropriate for the developmental levels/needs of the students and the purposes of the lesson, as embedded in the materials.	1	2	3	4	5	6	7
5. The teacher was cognizant of prior knowledge of students	1	2	3	4	5	6	7
6. The teacher's questioning strategies were likely to enhance the development of student conceptual understanding (e.g., emphasized higher order questions, appropriately used "wait time").	1	2	3	4	5	6	7
7. Teacher used assessment strategies appropriate to the lesson and materials.	1	2	3	4	5	6	7
8. _____	1	2	3	4	5	6	7

B. Synthesis Rating

1	2	3	4	5
Implementation of lesson not at all reflective of best practice				Implementation of lesson extremely reflective of best practice

C. Supporting evidence for Synthesis Rating

II. Content

A. Ratings of Key Indicators

		Not at all				To a great extent	Don't Know	N/A
1.	The content was appropriate for the purposes of the lesson and developmental level of the class.	1	2	3	4	5	6	7
2.	The science/mathematics content was significant and worthwhile.	1	2	3	4	5	6	7
3.	Teacher-presented information was accurate.	1	2	3	4	5	6	7
4.	The teacher was familiar with the materials and their intentions.	1	2	3	4	5	6	7
5.	The content was relevant for the needs/interests of most students.	1	2	3	4	5	6	7
6.	Science/mathematics was portrayed as a dynamic body of knowledge that involves conjecture, investigation, analysis, and proof/justification.	1	2	3	4	5	6	7
7.	Appropriate connections were made to other areas of science/mathematics, to other disciplines, and/or to real-world contexts.	1	2	3	4	5	6	7
8.	The degree of closure or resolution of conceptual understanding was appropriate for the developmental levels/needs of the students and the purposes of the lesson.	1	2	3	4	5	6	7
9.	The materials were used in the lesson.	1	2	3	4	5	6	7
10.	_____	1	2	3	4	5	6	7

B. Synthesis Rating

1	2	3	4	5
Content of lesson not at all reflective of current standards for science/ mathematics education				Content of lesson extremely reflective of current standards for science/ mathematics education

C. Supporting evidence for Synthesis Rating

III. Classroom Culture/Equity

A. Ratings of Key Indicators

	Not at all				To a great extent	Don't Know	N/A
1. Active participation of all was encouraged and valued.	1	2	3	4	5	6	7
2. There was a climate of respect for students' ideas, questions, and contributions.	1	2	3	4	5	6	7
3. Interactions reflected collaborative working relationships among students (e.g., students worked together, talked with each other about the lesson).	1	2	3	4	5	6	7
4. Interactions reflected collaborative working relationships between teacher and students.	1	2	3	4	5	6	7
5. The teacher's language and behavior demonstrated sensitivity to issues of gender, race/ethnicity, special needs, limited English proficiency, culture, and socio-economic status.	1	2	3	4	5	6	7
6. Opportunities were taken to recognize and challenge stereotypes and biases that became evident during the lesson.	1	2	3	4	5	6	7
7. Students were intellectually engaged with important ideas relevant to the focus of the lesson.	1	2	3	4	5	6	7
8. Students were encouraged to generate ideas, questions, conjectures, or propositions.	1	2	3	4	5	6	7
9. Intellectual rigor, constructive criticism, and the challenging of ideas were valued.	1	2	3	4	5	6	7
10. _____	1	2	3	4	5	6	7

B. Synthesis Rating

1	2	3	4	5
The classroom culture interferes with student learning				The classroom culture facilitates the learning of all students

C. Supporting evidence for Synthesis Rating

IV. Overall Ratings of the Lesson

A. Likely Impact of Instruction on Students' Understanding of Science/Mathematics

While the impact of a single lesson may well be limited in scope, it is important to judge whether it is helping move students in the desired direction. For this series of ratings, consider all available information (i.e., your previous ratings of design, implementation, content, and culture/equity and the pre-and post-observation interviews with the teacher) as you assess the probable impact of this lesson. Feel free to elaborate on ratings with comments in the space provided.

Circle the response that best describes your overall assessment of the *likely effect* of this lesson in each of the following areas.

	Negative effect		Neutral effect		Positive effect	Don't Know	N/A
1. Students' understanding of science as a dynamic body of knowledge generated and enriched by investigation.	1	2	3	4	5	6	7
2. Students' understanding of mathematics by the use of multiple approaches.	1	2	3	4	5	6	7
3. Students' understanding of important science/mathematics concepts.	1	2	3	4	5	6	7
4. Students' capacity to carry out their own inquiries.	1	2	3	4	5	6	7
5. Students' ability to apply or generalize skills and concepts to other areas of science/mathematics, other disciplines, and/or real-life situations.	1	2	3	4	5	6	7
6. Students' self-confidence in doing science/mathematics.	1	2	3	4	5	6	7
7. Students' interest in and/or appreciation for the discipline	1	2	3	4	5	6	7

Comments (optional):

B. Capsule Description of the Quality of the Lesson

In this final rating of the lesson, consider all available information about the lesson, its context and purpose and your own judgment of the relative importance of the ratings you have made. Select the capsule description that best characterizes the lesson you observed. Keep in mind that this rating is not intended to be an average of all the previous ratings, but should encapsulate your overall assessment of the quality and likely impact of the lesson. Feel free to comment on or modify the capsule description in the space provided for comments.

○ Level 1: Ineffective Instruction
There is little or no evidence of student thinking or engagement with important ideas of science/mathematics. Instruction is unlikely to enhance students' understanding of the discipline or to develop their capacity to successfully "do" science/mathematics. Lesson was characterized by either (mark one below):

  ○ Passive Learning
  Instruction is pedantic and uninspiring. Students are passive recipients of information from the teacher or textbook; material is presented in a way that is inaccessible to many students.

  ○ Activity for Activity's Sake
  Students are involved in hands-on activities or other individual or group work, but it appears to be activity for activity's sake. Lesson lacks a clear sense of purpose and/or a clear link to conceptual development.

○ Level 2: Elements of Effective Instruction
Instruction contains some elements of effective practice, but there are *substantial problems* in the design, implementation, content, and/or appropriateness for many students in the class. For example, the content may lack importance and/or appropriateness; instruction may not successfully address the difficulties that many students are experiencing, etc. Overall, the lesson is *quite limited* in its likelihood to enhance students' understanding of the discipline or to develop their capacity to successfully 'do" science/mathematics.

○ Level 3: Beginning Stages of Effective Instruction
Instruction is purposeful and characterized by quite a few elements of effective practice. Students are, at times, engaged in meaningful work, but there are *some weaknesses* in the design, implementation, or content of instruction. For example, the teacher may short-circuit a planned exploration by telling students what they "should have found," instruction may not adequately address the needs of a number of students, or the classroom culture may limit the accessibility or effectiveness of the lesson. Overall, the lesson is somewhat limited in its likelihood to enhance students' understanding of the discipline or to develop their capacity to successfully "do" scicnce/mathematics.

○ Level 4: Accomplished. Effective Instruction
Instruction is purposeful and engaging for most students. Students actively participate in meaningful work (e.g., investigations, teacher presentations, discussions with each other or teacher, reading). The lesson is well-designed and the teacher implements it well, but adaptation of content or pedagogy in response to student needs and interests is limited. Instruction is *quite likely* to enhance most students' understanding of the discipline and to develop their capacity to successfully "do" science/mathematics.

○ Level 5: Exemplary Instruction
Instruction is purposeful and all students arc highly engaged most or all of the time in meaningful work (e.g., investigations, teacher presentations, discussions with each other or teacher, reading). The lesson is well-designed and artfully implemented, with flexibility and responsiveness to student needs and interests. Instruction is highly likely to enhance most students' understanding of the discipline and to develop their capacity to successfully "do" science/mathematics.

Comments (optional):

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