**QuarkNet: Classroom Observation Protocol**

**2012-13**

Observer(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date of Observation: \_\_\_\_\_\_\_\_\_\_

Instructor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Start: \_\_\_\_\_ End: \_\_\_\_\_\_

Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class/Level: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Students

Number of students present: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Number of students normally in class: \_\_\_\_\_\_

Gender of students present: males \_\_\_\_\_\_\_ females \_\_\_\_\_\_\_\_\_\_\_

Number of minorities present: \_\_\_\_\_\_\_\_\_\_\_\_

***Physical Environment:***

What is the physical space of the class like? How are the tables set up? What resources are available?

(e.g., computers, lab stations, equipment)

***Lesson***

1. Topic(s):

2. Placement within unit or overall topic (*you may have to ask the instructor*):

3. Intended outcomes-3-4

(*what does the instructor expect the students to know and be able to do--according to the instructor*):

4. How was the lesson introduced--Introduction emphasis: (*Indicate all that apply*)

O Provide overview

O Explain activity

O Relate this lesson/activity to previous lessons/activities

O Provide rationale for doing the activity

O Assess prior knowledge

O Other (describe):

5. What modes of instruction were used during this lesson? (*Indicate all that apply.*)

O Lecture

O Demonstration by instructor

O Whole class discussion

O Peer instruction

O Review homework

O Students solving (addressing) problems or questions in small groups

O Students working in groups to answer teacher-posed problem; reporting out

O Students solving (addressing) problems or questions independently

O Students developing questions or problems

O Recitation/drill/practice

O Other (describe):

6. What activities did students engage in during this lesson? (*Indicate all that apply.*)

O Listen and take notes

O Complete worksheets or do practice problems in class

O Give presentations

O Write in journals or logs

O Take a test/quiz/exam

O Self-assessment

O Read a textbook, other book, article, or hand-out in class

O Laboratory or hands-on activity

O Develop laboratory investigations

O Work on computer

O Out-of-class activity (including fieldwork)

O Other (describe):

7. What assessment strategies were used during the lesson? (*Indicate all that apply.*)

O Test or quiz (check one of the following) \_\_\_short-answer questions \_\_\_essay-type questions

O Group quiz or test

O Discussion responses

O Recitation responses

O Observations of group work (assessing students' understandings; facilitating)

O Journals or log entries

O Oral reports or presentations by students

O Report out after small-group discussions

O Peer review

O Other (describe):

8. What happens at the end of the class—Closure emphasis (*Indicate all that apply.*)

O Whole class discussion of day’s lesson

O Teacher summary of day’s lesson

O Teacher relates day’s lesson to what comes next

O Teacher assigns homework related to day’s lesson

O No closure

O Other (describe):

9. Place and ‘X’ next to the major ways students were structured, indicate what activity was related to each, and circle if *approximately* less than or greater than 20 minutes (about half a class period).

O whole group; activity:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; less than greater than

O individuals; activity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; less than greater than

O small groups; activity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; less than greater than

O pairs; activity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; less than greater than

10. What materials were used during the lesson? (*Circle or underline all that apply*)

Published materials: textbook, workbook/worksheets, lab book, reading materials, test booklet; other (describe):

Teacher-developed: worksheets, laboratory investigation; other (describe):

Technology-based: computers, microcomputer-based laboratory, smart screen, videos/CD; other (describe):

Instrumentation: laboratory equipment, manipulatives, demonstration models; other (describe):

Presentation equipment: overhead projector, LCD projector, chalkboard, whiteboard; other (describe):

TYPOLOGY: INQUIRY-BASED TEACHING AND LEARNING

(***Fill out after the observation. Please place a number on the line to indicate your rating***)

Use operational definitions for typology.

|  |  |  |
| --- | --- | --- |
| **Students:**  look for correct  answer | ------------------------------------------------------- | accept or revise  their "hypothesis"  based on evidence |
| do not reflect on  others' ideas | ------------------------------------------------------- | reflect on others'  comments/ideas |
| seek information  to complete the  assigned work | ------------------------------------------------------- | seek clarification of  conceptual  understanding |

|  |  |  |
| --- | --- | --- |
| **Teacher Role:**  source of  knowledge | ------------------------------------------------------- | facilitator |
| questions or comments  seek memory/facts | ------------------------------------------------------- | questions or comments  seek comprehension/  opinion |

|  |  |  |
| --- | --- | --- |
| **Classroom Activities:**  algorithms | ------------------------------------------------------- | heuristics |

|  |  |  |
| --- | --- | --- |
| **Emphasis:**  abstract | ------------------------------------------------------- | connected to real-world |

|  |  |  |
| --- | --- | --- |
| **Instructional Strategies:**  unbalanced content and process | ------------------------------------------------------- | balanced content  and process |
| reflected individual achievement | ------------------------------------------------------- | reflected collaborative working relationships |

|  |  |  |
| --- | --- | --- |
| **For Discussions:**  Amount of time observed:  Percent of students contributing to the discussion: | |  |
| closed questions | ------------------------------------------------------- | open-ended questions |
| teacher seeks  facts | ------------------------------------------------------- | teacher seeks student  understanding |
| students do not  use evidence to  support claims | ------------------------------------------------------- | students use evidence to support claims |
| teacher talks | ------------------------------------------------------- | students talk |
| students talk only to teacher | ------------------------------------------------------- | students talk to one another |
| teacher provides  reasoning | ------------------------------------------------------- | teacher helps students reason through thinking process |

|  |  |  |
| --- | --- | --- |
| **For Laboratory/Hands-On/Fieldwork:**  Amount of Time Observed: Part of a project (Yes, no):  Grouping (pairs, threes, fours):  Cooperative/collaborative (yes, no): | | |
| students follow a procedure to answer a question or conduct an investigation | ------------------------------------------------------- | students answer a question or solve a problem using open-ended instructions |
| students take measurement or determine facts to answer questions  (one answer possible)  i.e cookbook approach | ------------------------------------------------------- | students collect and manipulate data in order to answer questions (several answers possible)  i.e. open-ended approach |

REFLECTIONS AND INTERPRETATIONS

**(*Fill this out as soon as possible after the observation.*)**

1 - What relationship did the lesson have to QuarkNet? How effective was the implementation particularly with regard to particle physics or cutting-edge physics?

2 - What could have happened but didn't?

(e.g., students didn't grasp the idea of the lesson, or…other?)

3 - What would have made the lesson more effective, especially what inquiry-based strategies would have helped?

4 - Characterize students and their attitudes toward the subject matter and the teacher:

5 - Surprises/concerns, especially related to the extent of inquiry-based teaching

and learning:

6 - Note here what support the QuarkNet Center might provide for this teacher:

QUESTIONS TO ASK TEACHERS FOLLOWING AN OBSERVATION

*Reminder to interviewees: This will take only a few minutes of your time, and your responses are kept anonymous. The information we gather is provided to QuarkNet Staff to help them improve the program, and to funding agencies.*

Date:

Interviewer Name:

Teacher Name:

Center:

1. **What course(s), grade(s) and level(s) do you teach? Please indicate if the courses are General, Conceptual, Honors, AP, Regents. Check all that apply.**

**Course Grade Level**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **7-8** | **9** | **10** | **11** | **12** | **General** | **Conceptual** | **AP** | **Honors** | **Regents** |
| **Physics** |  |  |  |  |  |  |  |  |  |  |
| **Chemistry** |  |  |  |  |  |  |  |  |  |  |
| **Biology** |  |  |  |  |  |  |  |  |  |  |
| **Mathematics** |  |  |  |  |  |  |  |  |  |  |
| **Research** |  |  |  |  |  |  |  |  |  |  |
| **Other science** |  |  |  |  |  |  |  |  |  |  |
| **Non-science** |  |  |  |  |  |  |  |  |  |  |

1. **How many years have you been involved in QuarkNet?**
2. **a. In the past two years what workshops, including summer institutes or get-togethers during the school year, have you participated in at your QuarkNet Center?**

**b. What type of activity was provided; what happened at the workshop(s) /gathering(s)?**

**c. What types of direct connections for how to use this in your classroom were introduced at the workshop(s)?**

1. **Which QuarkNet activities have you participated in at the national level?**

**If they need information about national programs visit:** [**http://quarknet.fnal.gov/**](http://quarknet.fnal.gov/)

\_\_\_\_ a. Masterclass

\_\_\_\_ b. Boot Camp

\_\_\_\_ c. Cosmic Ray e-lab

\_\_\_\_ d. CMS e-lab

\_\_\_\_ e. LIGO e-lab

\_\_\_\_ f. Teaching & Learning Fellows

\_\_\_\_ g. LHC Fellows

\_\_\_\_ h. Other: which one(s)

1. **What are you implementing in the classroom and how often?**

**Also, when asking this question, consider:** (i.e. deep understanding by students of major physics concepts or principles, development of skills and "scientific habits of mind”; a scientific inquiry instructional approach that includes student investigation, discovery and application, using particle physics examples when discussing physics principles such as conservation of energy.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Topics** | **1-2 lessons** | **3-5 lessons** | **1-2 weeks** | **Long-term Projects** |
| **e-lab** |  |  |  |  |
| **Masterclass** |  |  |  |  |
| **Particle Adventure** |  |  |  |  |
| **Standard Model** |  |  |  |  |
| **“Sprinkling” Examples (especially conservation momentum & energy)** |  |  |  |  |
| **Research with a Detector** |  |  |  |  |
| **Other:** |  |  |  |  |

1. **In what ways has your participation in QuarkNet events been helpful to your implementing QuarkNet (using resources, sprinkling HEP topics, using a Cosmic Ray Detector, etc.) in the classroom?**
2. **Do you see an effect on students from using QuarkNet activities and topics? (do they have a greater interest in science/physics/research, change in goals)**
3. **Since Participation in QuarkNet, have you:**

**a. been involved in giving workshops to other teachers, and what was the topic?**

**b. given a presentation and where?**

**c. attended meetings of professional organizations? (national, local)?**

**d. been involved in leadership at the school or district level (curriculum committee, technology committee, department chair, teacher liaison, etc.), and in what ways?**

1. **a. Do participants at your center meet regularly?**

**b. How often?**

**c. What kind of meetings?**

1. **Is there a learning community?**

**(i.e., do you and other teachers work together to improve teaching and learning of science at your schools and/or conduct outreach to others)?**

1. **a. Who is in a leadership role at your center? (state the leader’s name and role, e.g. mentor or teacher)**
2. **Explain the roles (what tasks related to the QuarkNet center and institute) and what your interactions are with each of the following:**

* **Who is the Mentor/Faculty/Scientist/Researcher, what are their tasks and how do you interact?**
* **Who is the Teacher Leader, what are their tasks and how do you interact?**
* **Who is the QuarkNet Staff Teacher assigned to your center, what are their tasks and how do you interact?**

**Also consider the following when asking this question:** (i.e. Staff provides specific support such as set up detectors, communication with teachers, attendance at institutes/events).

1. **Is there other feedback you would like us to give to QuarkNet that might help improve the experience in the future?**