## 2015 Data Camp – Examples of meeting criteria

*General Best Practice for all Professional Development*
2. Have an agenda but be flexible—stick to the agenda especially breaks; leave time for discussion/reporting out.

MET TO A GREAT EXTENT = 3

Facilitators shared the agenda electronically in advance and daily, and reviewed it as needed to keep the schedule on track. Periodically, facilitators drew participants together for discussions, either about their activities or other topics of interest. They also adjusted the schedule for presentations of implementation plans so that everyone had time to present their plans to the group.

3. Create a risk-free environment in which questions can be freely asked and participants are treated with respect (e.g., list/listen to all ideas—but be pragmatic about it such as respecting time for each participant to respond—don't let one person dominate).

MET TO A GREAT EXTENT = 3

It was obvious that the facilitators put a lot of thought and effort into making the participants comfortable with what can be, especially in the case of data analysis, a very frustrating and stressful experience. They assessed the participants' experience along the way, and emphasized that they want everyone to learn, most importantly from each other. It appeared that the group dynamics were evenly balanced and respectful. Participant comments support the idea that the facilitators are respectful of everyone, and good at managing the interactions.

4. Collaboratively develop group norms (cell phones, accessing email, respecting others' time, etc.); have a clear *stated* purpose overall and for each agenda item.

MET TO A GREAT EXTENT = 3

Group norms were stated at the beginning of the workshop and reiterated during the week. Participants did not seem distracted away from other group members and their tasks, as has been seen in the past.

5. Determine/assess prior knowledge so as to build on what participants already know; make outside presenters aware of the level of learners.

MET TO A GREAT EXTENT = 3

Historically for Boot Camp and now Data Camp, prior knowledge has been assessed with a pre-camp survey that includes specific questions about experience with/knowledge of particle physics. With Data Camp, an activity has been added for the night of arrival to overcome barriers seen in the past with developing histograms, and also to allow the facilitators to have conversations with campers about their backgrounds, and assess how they work together.

## Data Workshops – examples of not meeting criteria

*General Best Practice for all Professional Development*
5. Determine/assess prior knowledge so as to build on what participants already know; make outside presenters aware of the level of learners.

NOT MET = 0

There were a few occasions during the workshop that indicated the facilitator was not mindful of the different levels of background among participants. Some of the content he presented was very complex and at times participants asked him to explain things more than once. The new teachers worked together and the experienced teachers worked together so there was little opportunity for the long-term QuarkNet participants to share their knowledge and skills with the

less-experienced teachers. Considering there were two teachers who were new to QuarkNet, and others appeared lost at times, it would be helpful to make an effort to gauge their understanding and make them comfortable with the content.

6. The workshop should be conducted so participants are acting as learners then provided opportunities to reflect as teachers—appropriate for adult learners.

MET TO SOME EXTENT = 1

The facilitator stressed the importance of the experience with data but did not mention that participants would "act as learners." There was no differentiation between the roles of 'student' and 'teacher.' Participants were encouraged to explore the activities and reflect on how they would implement things in their class.

*Specifics for Science Education/QuarkNet*
5. Follow the QN Data Portfolio Model and conceptual framework – make it explicit to participants (simple to complex use of data- starting with their current levels of understanding).

MET TO SOME EXTENT = 1

The template for the Data Workshop is organized so that participants explore activities from simple to complex. This structure was followed, though the simple to complex approach was not emphasized. One Level 1 activity (Rolling with Rutherford) and one Level 3 activity (CMS e-Lab) were neither introduced nor explored by participants as part of the Conceptual Framework.
(Note that the conceptual framework was developed during spring 2014, but has not been integrated into the Data Workshop structure.)