

Table 27
Summary of Center-level Assessment and Individual Teacher-levels Responses to:
Opportunities for Teachers to Engage as Active Learners, as Students

Center	Center-level Assessment			Individual Teacher-level Responses					Center-level Assessment	
	Engage Teachers as Active Learners, as Students			QN provides opportunities for teacher to engage as an active learner, as a student					QN's Influence on Teachers (on this behavior)	
	Almost All	Most	Some	Excellent	Good	Average	N/A	Total	Very High	High
Boston Area/ Brown University ^a		✓		11	2	0	0	13		✓
Brookhaven National Laboratory/Stony Brook ^a	✓			9	4	0	0	13	✓	
Catholic University of America	✓			7	3	0	0	10	✓	
Colorado State University	✓			10	1	0	0	11	✓	
Fermilab/University of Chicago ^a	✓			31	1	0	1	33		✓
Florida State University/	✓			10	1	0	0	11		✓
Johns Hopkins University	✓			11	2	0	0	13	✓	
Kansas State University	✓			12	2	0	0	14		✓
Oklahoma State/University of Oklahoma ^a	✓			13	3	0	0	16	✓	
Rice University/University of Houston ^a	✓			16	0	0	0	16		✓
Southern Methodist University	✓			18	3	1	0	22		✓
Syracuse University		✓		7	4	0	1	12		✓
University of Cincinnati			✓	11	2	1	0	14		✓
University of Illinois at Chicago ^a	✓			8	2	0	0	10		✓
University of Iowa/Iowa State University ^a	✓			9	4	0	0	13	✓	
University of Minnesota	✓			11	0	0	0	11	✓	
University of Notre Dame	✓			14	2	0	0	16	✓	
University of Puerto Rico – Mayaguez		✓		14	1	0	0	15	✓	
Vanderbilt University	✓			6	2	2	0	10		✓
Virginia Center	✓			7	3	0	0	10		✓
Virtual Center	✓			11	2	0	0	13		✓
Total	17	3	1	246 (83.1%)	44 (14.8%)	4 (1.4%)	2 (0.7%)	296 (100%)	9	12

Note. Percents are used only for the grand total across centers because the responses within an individual center are too small to justify percentages. ^aCombined center (28 total).

Table 30
Summary of Center-level Assessment and Teacher-levels Responses to:
Opportunities for Teachers to Engage with Mentors and Other Scientists and Other Teachers

Center	Center-level			Center-level			Individual Teacher-level Responses					Center-level Assessment			Center-level Assessment		
	Teachers engage interact with Mentors and other scientists			Teachers engage/interact with other teachers			Opportunities for Teachers to interact with other Scientists and collaborate with each other					QN's influence on Teacher interaction with Mentor/ Scientists			QN's influence on teacher engagement/ interaction with other Teachers		
	Almost All	Most	Some	Almost All	Most	Some	Excellent	Good	Average	N/A Mis.	Total	Very High	High	Mod-erate	Very High	High	Mod-erate
Boston Area/Brown University			✓	✓			9	3	0	2	14		✓		✓		
Brookhaven National Laboratory/Stony Brook University	✓			✓			11	1	1	0	13	✓			✓		
Catholic University of America	✓			✓			9	1	0	0	10	✓			✓		
Colorado State University		✓		✓			10	1	0	1	12	✓			✓		
Fermilab/U of Chicago		✓		✓			29	3	0	4	36		✓			✓	
Florida State University/ University of Florida	✓			✓			10	1	0	1	12						
Idaho State University																	
Johns Hopkins University	✓			✓			10	2	1	0	13	✓			✓		
Kansas State University		✓		✓			11	3	0	0	14		✓			✓	
Lawrence Berkeley National Laboratory																	
Oklahoma State/ University of Oklahoma	✓			✓			14	2	0	0	16	✓			✓		
Rice University/ University of Houston	✓			✓			15	1	0	1	17		✓			✓	
Southern Methodist University	✓			✓			17	6	0	0	23	✓				✓	
Syracuse University ^a							6	2	2	3	13						✓
University of Cincinnati			✓			✓	12	1	1	0	14		✓				✓
University of Illinois at Chicago	✓			✓			9	1	0	0	10	✓				✓	
University of Iowa/Iowa State University	✓			✓			12	1	0	1	14	✓			✓		
University of Minnesota	✓			✓			12	0	0	0	12	✓			✓		
University of Notre Dame	✓			✓			14	2	0	0	16	✓				✓	
University of Puerto Rico – Mayaguez	✓			✓			15	0	0	1	16	✓			✓		
Vanderbilt University		✓				✓	9	0	0	1 ^b	10	✓				✓	
Virginia Center	✓			✓			6	4	0	0	10	✓				✓	
Virtual Center	✓			✓			10	3	0	0	13	✓			✓		
Total	14	4	2	18	0	2	250	38	5	15	308	14	5	0	10	8	2
							81.1%	12.3%	1.6%	4.9%	100%						

^aNot able to reach consensus on these ratings. ^bRated as “fair.” Note. Percents are used only for the grand total across centers because the responses within an individual center are too small to justify percentages.

Table 31
 Summary of Center-level Assessment and Teacher-levels Responses to:
 Opportunities for Teachers and Mentors to **Form Lasting Collegial Relationships**

Center	Center-level Assessment				Teacher-level Responses					Center-level Assessment		
	Form lasting collegial relationships locally and nationally				Provide opportunities for teachers and mentors to build a local (or regional) learning community					QN's Influence on forming these relationships		
	Almost All	Most	Some	A Few	Excellent	Good	Average	Fair	Total	Very High	High	Moderate
Boston Area/Brown University		✓			8	3	2	0	13		✓	
Brookhaven National Laboratory/Stony Brook University			✓		0	8	3	0	11			✓
Catholic University of America		✓			8	1	1	0	10	✓		
Colorado State University		✓			11	0	0	0	11	✓		
Fermilab/University of Chicago		✓			24	8	0	0	32		✓	
Florida State University/University of Florida			✓		11	0	0	0	11			✓
Johns Hopkins University	✓				10	1	0	2 ^a	13	✓		
Kansas State University	✓				9	4	1	0	14			✓
Oklahoma State/University of Oklahoma		✓			10	4	2	0	16	✓		
Rice University/University of Houston	✓				14	2	0	0	16	✓		
Southern Methodist University			✓		14	8	0	1 ^a	23			✓
Syracuse University				✓	5	5	0	0	10			✓
University of Cincinnati			✓		10	3	1	0	14		✓	
University of Illinois at Chicago	✓				9	1	0	0	10			
University of Iowa/Iowa State University	✓				11	1	1	0	13	✓		
University of Minnesota	✓				12	0	0	0	12	✓		
University of Notre Dame	✓				12	3	1	0	16	✓		
University of Puerto Rico – Mayaguez			✓		13	2	0	0	15		✓	
Vanderbilt University	✓				7	2	1	0	10	✓		
Virginia Center	✓				5	5	0	0	10	✓		
Virtual Center	✓				6	3	1	1	11	✓		
Total	10	5	5	1	209 71.8%	64 22.0%	14 4.8%	4 1.4%	291 100%	12	4	5

Note. Percents are used only for the grand total across centers because the responses within an individual center are too small to justify percentages. 21 (combined 28) centers.

Table 32
Summary of Center-Level Success Factors: A Self-assessment by QuarkNet Centers

Effective Practices/Success Factors ^a	QuarkNet Centers										
	A	B	C	D	E	F	G	H	I	J	K
1. <i>Program provides opportunities for a strong teacher leader.</i> (Teacher provides leadership in areas of content and/or is a technical expert; models exemplary pedagogical skills; able to provide organizational skills. These characteristics may be present in one or a team of teacher leaders.)	Yes	Yes	Yes	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	Yes, but ¹	Yes, but ¹ /No
2. <i>Program provides opportunities for a strong mentor.</i> (Mentor provides leadership skills mainly of content and/or technical expertise; understands education and professional development -- working with teacher leaders as needed; models research.)	Yes, but ¹	Yes	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes/Unsure
3. <i>Participants meet regularly.</i> (QuarkNet model is for a summer session with follow-up during the academic year or sessions during the academic year. Follow up includes working with the national staff and collaboration within and across centers. Mentors and teachers have flexibility to set the annual program locally.)	Yes	Yes, but ¹	Yes, but ¹	Yes, but ¹	Yes, but ¹	Yes	Yes, but ¹ /Yes	Yes, but ¹	Yes, but ¹	No	Yes, but ¹
4. <i>Meaningful activities</i> (The standard for meaningful activities is focusing topics in modern physics, discussing how to implement this content in classrooms, conducting research and discussing scientific inquiry methods; using Data Activities Portfolio instructional materials.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes/Yes, but ¹	Yes	Yes	Yes	Yes
5. <i>Directly addresses classroom implementation of instructional materials for all teachers.</i> (Time for teachers to discuss Data Activities Portfolio instructional materials and pathways; to consider NGSS, AP, IB or other science standards; presentation(s) from veteran teachers on classroom implementation experiences or similar engagement.)	Yes	Yes	Yes	Yes, but ¹	Yes	Yes	Yes/Yes, but ¹	Yes	Yes	Yes	Yes, but ¹ /Yes
6. <i>Program is able to provide regular contact and support with teachers.</i> (Specific support and or follow up from staff; staff teachers are available and/or volunteers who support teachers, especially related to classroom implementation.)	Yes	Yes, but ¹	Yes, but ¹	Yes	Yes, but ¹	Yes	Yes	Yes	Yes, but ¹	Unsure	Yes, but ¹ /Yes
7. <i>Money for additional activities or additional grants.</i> (Seeking additional funding to fulfill the mission/objectives of the center; providing supplemental or complementary support for QuarkNet e.g., providing transportation, lodging, buying equipment; providing food.)	Yes, but ¹	Yes	Yes	Yes	Yes, but ¹	No	Yes, but ¹	Yes, but ¹	No	No	No
8. <i>Stable participant base.</i> (A stable participant base can provide an expert group that can help other teachers, support outreach, and provide organizational leadership.)	Yes	Yes	Yes	Yes, but ¹	Yes, but ¹	Yes	Yes/Yes, but ¹	Yes	Yes	Yes	Yes
9. <i>Addresses teacher professionalism.</i> (The standard is to provide opportunities for at least a few teachers to attend professional meetings; support teachers taking leadership roles in their school, school districts, outreach, and highlight PD opportunities for continuing development.)	Yes	Yes	Yes	No	Unsure	Yes	Yes/Yes, but ¹	Yes	Yes, but ¹	Yes	No/Yes
10. <i>Establish a learning community.</i> (The standard is forming a cohesive group where teachers learn from one another; engage with mentors and other scientists; provide outreach to other teachers.)	Yes	Yes	Yes	Yes, but ¹	Yes, but ¹	Yes	Yes/Yes, but ¹	Yes	Yes	Yes, but ¹	Yes, but ¹ /No

^aThis section of the protocol has been adapted from M.J. Young & Associates (2017, September). *QuarkNet: Matrix of Effective Practices*. ¹Needs work or fine tuning; or, there are notable caveats.

¹Needs work or fine tuning; or, there are notable caveats. A= Boston Area/ University of Boston. B= Catholic University of America. C= Colorado State University. D = Fermilab/University of Chicago. E = Florida State University/University of Florida. F = Johns Hopkins University. G = Kansas State University. H = Oklahoma State/University of Oklahoma. I= Rice University/ University of Houston. J=Southern Methodist University. K= Syracuse University. Note. Not all centers reached consensus in their ratings; this is reflected by multiple responses for these centers.

Table 32 (con't.)
Summary of Center-Level Success Factors: A Self-assessment by QuarkNet Centers

Effective Practices/Success Factors ^a	QuarkNet Centers									
	L	M	N	O	P	Q	R	S	T	U
1. <i>Program provides opportunities for a strong teacher leader.</i> (Teacher provides leadership in areas of content and/or is a technical expert; models exemplary pedagogical skills; able to provide organizational skills. These characteristics may be present in one or a team of teacher leaders.)	Yes	Yes	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. <i>Program provides opportunities for a strong mentor.</i> (Mentor provides leadership skills mainly of content and/or technical expertise; understands education and professional development -- working with teacher leaders as needed; models research.)	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes, but ¹	Yes
3. <i>Participants meet regularly.</i> (QuarkNet model is for a summer session with follow-up during the academic year or sessions during the academic year. Follow up includes working with the national staff and collaboration within and across centers. Mentors and teachers have flexibility to set the annual program locally.)	Yes, but ¹	Yes	Yes, but ¹	Yes	Yes	Yes, but ¹	Yes	Yes	Yes	Yes
4. <i>Meaningful activities</i> (The standard for meaningful activities is focusing topics in modern physics, discussing how to implement this content in classrooms, conducting research and discussing scientific inquiry methods; using Data Activities Portfolio instructional materials.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5. <i>Directly addresses classroom implementation of instructional materials for all teachers.</i> (Time for teachers to discuss Data Activities Portfolio instructional materials and pathways; to consider NGSS, AP, IB or other science standards; presentation(s) from veteran teachers on classroom implementation experiences or similar engagement.)	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	Yes, but ¹	Yes	Yes, but ¹	Yes
6. <i>Program is able to provide regular contact and support with teachers.</i> (Specific support and or follow up from staff; staff teachers are available and/or volunteers who support teachers, especially related to classroom implementation.)	Yes	Yes	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	No	Yes
7. <i>Money for additional activities or additional grants.</i> (Seeking additional funding to fulfill the mission/objectives of the center; providing supplemental or complementary support for QuarkNet e.g., providing transportation, lodging, buying equipment; providing food.)	Yes, but ¹	No	Yes, but ¹	Yes	Yes	No	Yes, but ¹	No	Yes	Yes
8. <i>Stable participant base.</i> (A stable participant base can provide an expert group that can help other teachers, support outreach, and provide organizational leadership.)	Yes, but ¹	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9. <i>Addresses teacher professionalism.</i> (The standard is to provide opportunities for at least a few teachers to attend professional meetings; support teachers taking leadership roles in their school, school districts, outreach, and highlight PD opportunities for continuing development.)	Yes	Yes	Yes, but ¹	Yes	Yes	Yes	Yes	Yes	Yes, but ¹	Yes
10. <i>Establish a learning community.</i> (The standard is forming a cohesive group where teachers learn from one another; engage with mentors and other scientists; provide outreach to other teachers.)	Yes, but ¹	Yes	Yes	Yes	Yes	Yes, but ¹	Yes	Yes	Yes	Yes

^aThis section of the protocol has been adapted from M.J. Young & Associates (2017, September). *QuarkNet: Matrix of Effective Practices*. ¹Needs work or fine tuning; or, there are notable caveats. L = University of Cincinnati. M = University of Iowa/Iowa State University. N = University of Minnesota. O = University of Norte Dame. P = University of Puerto Rico, Mayaguez. Q = Vanderbilt University. R = Virginia Center. S = Virtual Center. T = Brookhaven National Laboratory/Stony Brook University. U= University of Illinois at Chicago Note. Not all centers reached consensus in their ratings; this is reflected by multiple responses for these centers. ¹Yes but defined as *Needs work or fine tuning; or, there are notable caveats*.