Inquiry Instruction
The Catholic University of America QuarkNet Center

	Motivation Support/NGSS	Example - QuarkNet	Example - Classroom
1. The Hook– Get their attention	Relevance ⇨ Intrinsic Motivation	Cosmic Ray Presentation	Demonstration Field Trip Video
2. **K**WL – Activate Background Knowledge		What do you already know about particle physics?	Pre-assessment quiz Journal entries Discussion
3. K**W**L – Ask Questions	Choice ⇨ Autonomy	What do you want to know about particle physics?	Post-its Journal entries Question Wall
4. Select research topic		Mentor-guided selection	Teacher-guided selection
5. Research/Refine questions	NGSS: Evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design. Evaluate the validity and reliability of multiple claims that appear in scientific and technical texts or media reports, verifying the data when possible.	Research Mentors Colleagues	Scaffolded research Peers
6. Investigate/Explore	NGSS: Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.	Cosmic Ray Detector	Labs – experiment, build, demonstrate

7. Form Conclusions	NGSS: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.	Concept Map	Concept Map
8. KW**L** – Summarize what you have learned	Concept Knowledge ⇨ Mastery Orientation NGSS: Use mathematical representations of phenomena to describe explanations.	QuarkNet Report	Research Paper Journal entries
9. Reflection – What worked well? What didn't?	Concept Knowledge ⇨ Mastery Orientation	Journal entries Discussion	Journal entries Discussion
10. Repeat steps 2 - 9			
11. Presentation – Share your product	Competence ⇨ Self efficacy NGSS: Communicate scientific and technical information in multiple formats (including orally, graphically, textually, and mathematically). Develop a model based on evidence to illustrate the relationships between systems or between components of a system.	Share with Team/Colleagues	Science Fair Classroom Presentation

Further reading:

Next Generation Science Standards

Science Self-Efficacy Research Study

Mastery Orientation Support

Intrinsic Motivation in Science - Research Study