



QuarkNet

Infusing 21st Century Physics into the Classroom Using QuarkNet Data Activities Portfolio

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www.QuarkNet.org

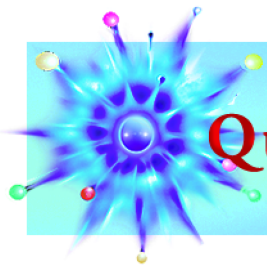


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Data Activities Portfolio

Select: *Data Activities*



Data Activities Portfolio

The Data Portfolio is a compendium of particle physics classroom activities organized by data strand and level of student engagement. Follow the links provided for information about using the Data Portfolio to plan your students' experience. **Level descriptions** explain the data analysis skills that students apply at each level: tasks in Level 0 are simpler than those in Levels 1 and 2. While each level can be explored individually, students who start in one level and progress to more complex levels experience increasingly engaging and challenging tasks. These activities are aligned with **NGSS Standards**, particularly NGSS Practices.

Your students can follow a path through activities in a data strand to better understand practices that lead to discovery. Each pathway provides connections between topics routinely covered in physics class and particle physics content and methods. Use the pulldown menus (Pathway and Strand) to find activities related to the content you are currently covering.

Data Strand	Level	Curriculum Topics	NGSS Practices	
- Any -	- Any -	- Any -	- Any -	Apply



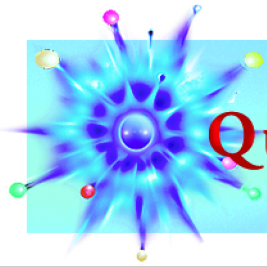
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Data Strand	Level	Curriculum Topics	NGSS Practices	
<input checked="" type="checkbox"/> - Any - Cosmic Ray LHC Neutrino	- Any -	- Any -	- Any -	<input type="button" value="Apply"/>



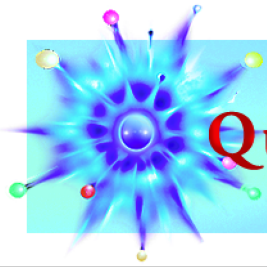
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Your students can follow a path through activities in a data strand to better understand practices that lead to discovery. Each pathway provides connections between activities that are frequently covered in physics class and particle physics content and methods. Use the pulldown menus (Pathway and Strand) to filter activities related to the content you are currently covering.

Data Strand **Curriculum Topics** **NGSS Practices**

Level 0
Level 1
Level 2
Level 3
Level 4



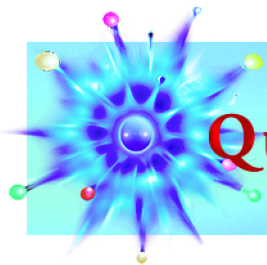
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Data Activities Portfolio

Select: *Curriculum Topics*

Data Activities Portfolio

The Data Portfolio is a compendium of part engagement. Follow the links provided for **descriptions** explain the data analysis skill 2. While each level can be explored individually, increasingly engaging and challenging task

Your students can follow a path through activities provides connections between topics routinely menus (Pathway and Strand) to find activities

- ✓ - Any -
- Conservation Laws
- Electricity & Magnetism
- Half-Life/Mean Lifetime
- Instrumentation
- Kinematics
- Nature of Matter
- Quantum Mechanics
- Special Relativity
- Standard Model
- Skill: Coding
- Skill: Developing Models
- Skill: Graphing
- Skill: Histograms
- Skill: Uncertainty

organized by data strand and level of student Portfolio to plan your students' experience. **Level** el: tasks in Level 0 are simpler than those in Levels 1 and level and progress to more complex levels experience with **NGSS Standards**, particularly NGSS Practices. understand practices that lead to discovery. Each pathway particle physics content and methods. Use the pulldown currently covering.

Data Strand **Level** **NGSS Practices**

- Any - - Any - - Any - - Any - **Apply**

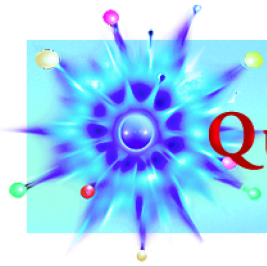


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Select: *NGSS Standard*

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Your students can follow a path through activities in a data strand to better understand the content and methods. Use the pulldown menus (Pathway and Strand) to find activities related to the content you are currently studying.

Data Strand **Level** **Curriculum Topics**

- Any - - Any - - Any -

1
2
3
4
5
6
7
8

- Any -

Apply



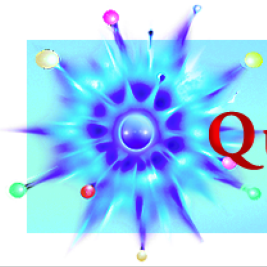
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Select: *An Activity*

Example 1

- Strand – *Any*
- Level – *0*
- Topic – *Skill: Histograms*

Then press APPLY



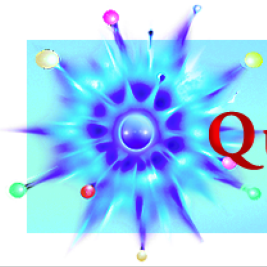
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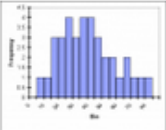
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Data Activities Portfolio

Example 1 Results

ACTIVITY NAME	DATA STRAND	LEVEL	CURRICULUM TOPICS	NGSS PRACTICES
 <p>Mass of U.S. Pennies Students create and interpret a histogram of penny masses.</p>	Cosmic Ray, LHC	Level 0	Skill: Developing Models, Skill: Histograms, Skill: Uncertainty	1, 3, 4, 7
 <p>Dice, Histograms & Probability Students roll dice, record the resulting individual values as well as the sum of the values, create histograms of the data and develop insight into the concept of "degrees of freedom."</p>	Cosmic Ray, LHC	Level 0	Skill: Developing Models, Skill: Histograms, Skill: Uncertainty	1, 2, 3, 4, 5, 6, 7, 8
 <p>Histograms: The Basics Students build basic histogram skills required in many of the other activities in the Data Activities Portfolio.</p>	Cosmic Ray, LHC, Neutrino	Level 0	Skill: Histograms, Skill: Uncertainty	4, 5



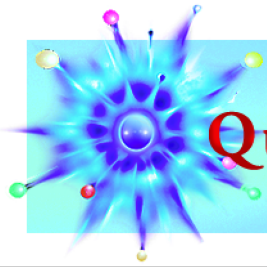
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A Look Inside an Activity

Follow this link to the Activity Page:

<https://quarknet.org/data-portfolio/activity/mass-us-pennies>



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Select: *Your Turn*

TRY 2:

- Strand – *Any*
- Level – *Any*
- Topic – *Electricity & Magnetism*

TRY 3:

- Strand – *Any*
- Level – *Any*
- Topic – *Half-life/Mean Lifetime*

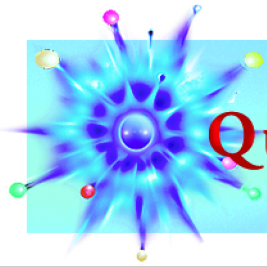


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Thank you for listening!

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