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

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*[www.QuarkNet.org](http://www.QuarkNet.org)*

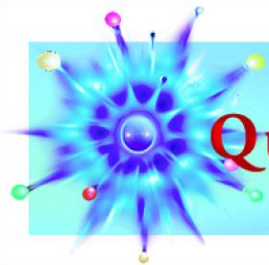


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# Data Activities Portfolio

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 pull-down 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



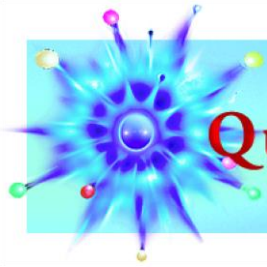
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# Data Activities Portfolio

Select: *Data Strand*

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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"/>



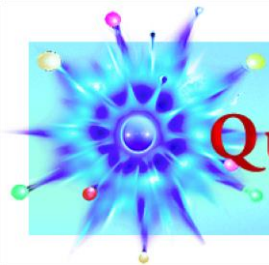
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# Data Activities Portfolio

Select: *Level*

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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.

- Any -  
Level 0  
Level 1  
Level 2  
Level 3  
Level 4

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



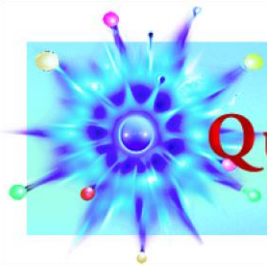
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# Data Activities Portfolio

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**



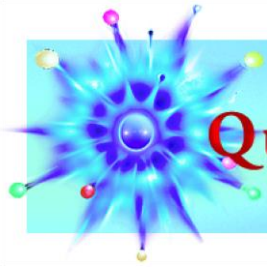
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# Data Activities Portfolio

Select: *NGSS Standard*

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

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

- Any -      - Any -      - Any -

1  
2  
3  
4  
5  
6  
7  
8

- Any -

Apply



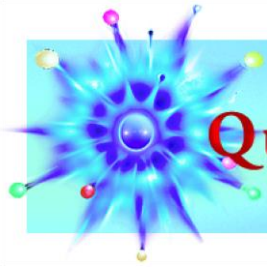
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# Data Activities Portfolio

Select: *An Activity*

*Example 1*

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

*Then press APPLY*



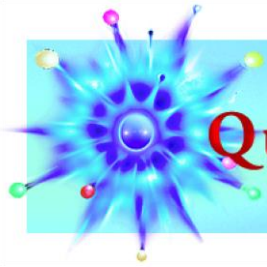
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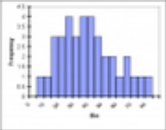
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# Data Activities Portfolio

## Example 1 Results

ACTIVITY NAME	DATA STRAND	LEVEL	CURRICULUM TOPICS	NGSS PRACTICES
 <p><b>Mass of U.S. Pennies</b> Students create and interpret a histogram of penny masses.</p>	<b>Cosmic Ray, LHC</b>	<b>Level 0</b>	<b>Skill: Developing Models, Skill: Histograms, Skill: Uncertainty</b>	<b>1, 3, 4, 7</b>
 <p><b>Dice, Histograms &amp; Probability</b> 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>	<b>Cosmic Ray, LHC</b>	<b>Level 0</b>	<b>Skill: Developing Models, Skill: Histograms, Skill: Uncertainty</b>	<b>1, 2, 3, 4, 5, 6, 7, 8</b>
 <p><b>Histograms: The Basics</b> Students build basic histogram skills required in many of the other activities in the Data Activities Portfolio.</p>	<b>Cosmic Ray, LHC, Neutrino</b>	<b>Level 0</b>	<b>Skill: Histograms, Skill: Uncertainty</b>	<b>4, 5</b>



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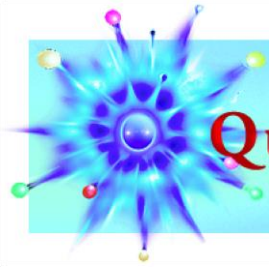
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# Data Activities Portfolio

A Look Inside and Activity

*Follow this link to the Activity Page:*

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



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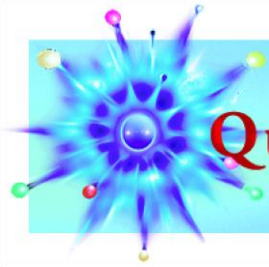
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# Data Activities Portfolio

Select: *Your Turn*

## TRY 2:

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

## TRY 3:

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

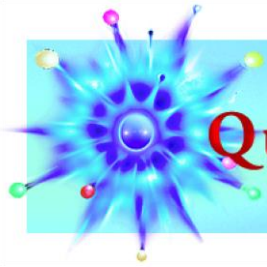


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Thank you for listening!

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