Beam Balance

Name(s): _____ **Date:** _____

NGSS GOALS	 BRONZE	 SILVER	 GOLD	 PLATINUM
1. Student work related to this Crosscutting Concept: In this project, we completed the measurements and calculations to show the proportional relationship between mechanical advantage, load weight and load distance.				
Scale, Proportion, and Quantity: Use proportional relationships to gather information about the magnitude of properties.	• We built the beam balance. • We completed the predictions and measurements for beam balance A. ☐	• We met Bronze. • We completed the predictions and measurements for beam balance B. ☐	• We met Silver. • We completed the predictions and measurements for beam balance C. ☐	• We met Gold. • We used our work on the beam balance activity to plan a solution to the 'How much does it weigh?' challenge. ☐
2. Student work related to this Practice: In this project, we tested our beam balance under different loads and completed calculations such as mechanical advantage and effort x length of effort arm = load x length of load arm. We completed the 'How much does it weigh?' challenge.				
Using Mathematics and Computational Thinking: Apply mathematical concepts such as ratio, rate, percent, basic operations and simple algebra to scientific and engineering problems.	• We wrote down the mechanical advantage for the beam balances as a ratio. ☐	• We met Bronze. • We used the formula: effort x length of effort arm = load x length of load arm for all three beam balance set-ups. ☐	• We met Silver. • We calculated a prediction for the weight of assembly A. • •We calculated our percentage of accuracy. ☐	• We met Gold. • We built two additional sets of weights to measure using our beam balance. • We calculated a prediction for their weights. • We calculated our percentage of accuracy. ☐
3. Student work related to this Practice: In this project, we used our beam balance to measure the weight of different LEGO® part assemblies. We explained what we discovered.				
Constructing Explanations: Construct an explanation that includes quantitative relationships between variables that predicts phenomena.	• We explained what we discovered. • Our explanation included at least one example calculation. ☐	• We met Bronze. • Our explanation used more than two example calculations. ☐	• We met Silver. • Our explanation outlined how we used equations to predict the weights of LEGO Assemblies. ☐	• We met Gold. • Our explanation included our percentage of accuracy results. • We described ideas for improving the accuracy of our beam balance. ☐
Notes:				