Physics   Name_____

QuarkNet Masterclass Data Analysis Worksheet

Briefly explain how you identified each of the following particles from the data provided by the CMS detector.

1. Electron / Positron

2. Muon / Antimuon

3. Neutrino

4. W+ / W- Boson

5. Neutral Particle (Z Boson)

6. Neutral Particle (Higgs Boson)

7. Summarize the data collected by the Manhattan Masterclass group

# of Muons	# of Electrons	# of W Bosons	# of W+ Bosons	# 0f W- Bosons	# of Z Bosons

# of Higgs Bosons	# of Zoo Particles	# of Events Analyzed	e/mu ratio	W+/W- ratio	

8. Sketch the histogram of particle mass vs # of events for the Manhattan Masterclass group. Identify the three most common mass ranges.
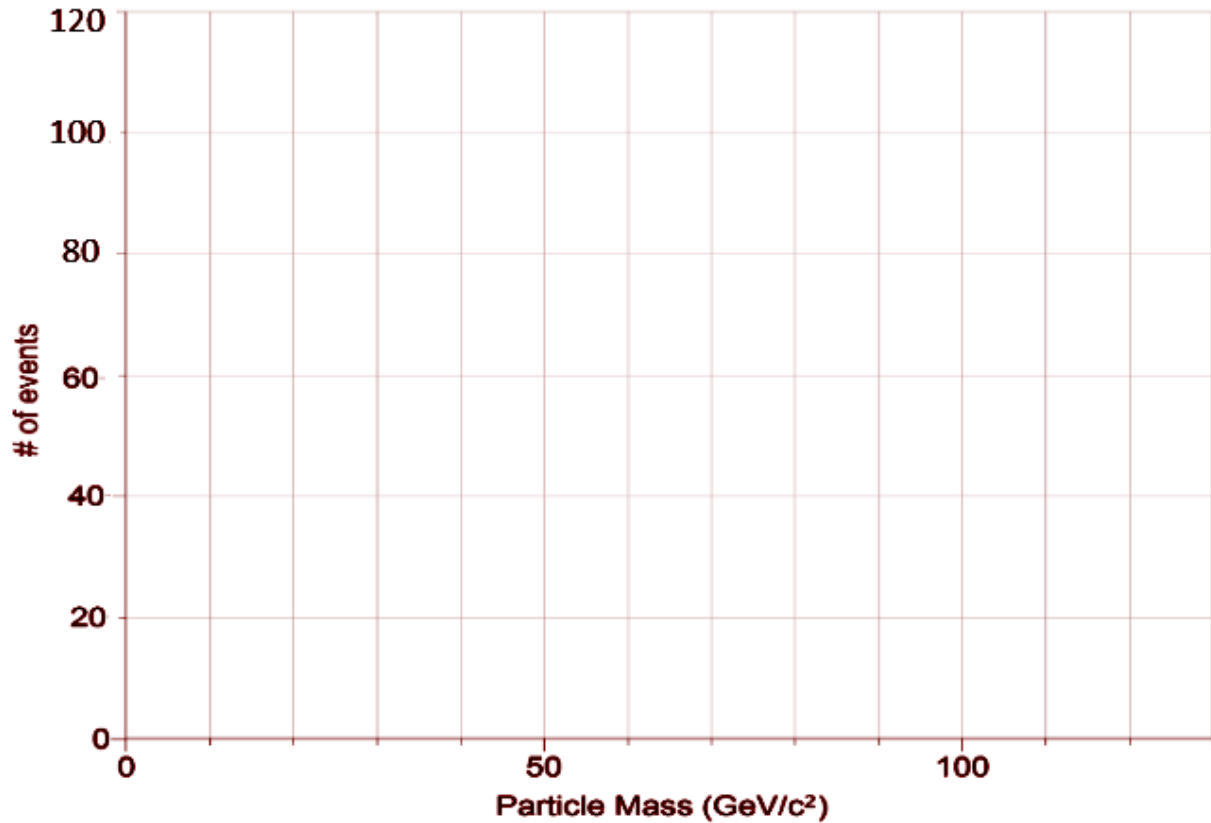
9. Look up the mass of the Z and Higgs Bosons. Identify the mass of these particles on the histogram.

10. How does the # Z and Higgs of bosons identified compare to the number of each in the histogram. Explain any differences.

11. Why is the W+/W- ratio larger than one? (Hint - The CMS experiment is colliding two protons).