Student Planning Document

Name _____ Group # _____

A-Head of the Game: Concussions a Scientific Concern
Engineering Design Challenge: 100pts.

Ask: Which group will develop the best helmet design? Which helmet design will have the lowest forward and rearward impact force?

Imagine: Develop a 1:2 scale drawing of your individual helmet design.

- See attached graph paper sheets. Each student should complete a scaled drawing of their helmet designs.

Plan: Work with your group to choose the best design and to determine the materials necessary for building your helmet prototype.

- Cite 2-3 points of claims and evidence on the chosen and explain your reasoning for choosing this design.

Building Materials List

Testing Materials List
1 Styrofoam head
1 Triax SIM-P: Wearable Head Impact Monitor for All Sports
1 bowling ball pendulum

Create: Work with your group to build your helmet according to the group approved 1:2 scale drawing. Set up a controlled experiment sheet to test the force of impact using your helmet prototype.

Scientific Question: Which helmet design will have the lowest forward and rearward impact force?
Variables (IV, DV, and controls):
Prediction:
Procedure:

Data Table:

Graph:

Analysis (claim, evidence, and reasoning):
Conclusion:

Improve: As a group complete the reflection questions identifying the points of success with your helmet designs as well as areas for improving your helmet design.

Our design was a success for the following reasons:	We could improve our design by:

Communicate: complete a quad chart on a separate sheet of paper with your group to share in the class poster session reviewing our helmet design challenge.

Description of helmet design and benefits	Picture/ Graphic representing your design
Representation of testing data	Estimated cost to build Team member names

A-Head of the Game: Legacy Cycle Rubric

	10	8	5	2
Ask	Group developed helmet with the lowest impact force	Group developed helmet with the 2nd and 3rd place impact force	Group developed helmet with the 4th and 5th place impact force	Group ranked in 6th through 8th place in the helmet impact force testing.
Imagine	All individual designs are complete on time and include labels and metric measurements.	Missing one element: on time, measurements, or labels.	Missing two elements.	Missing three elements.
Plan	Worked collaboratively to choose design and recorded reasons for design choice. Completed experimental design sheet	Missing one element: collaboration, documented reasons, design sheet.	Missing two elements.	Missing three elements.
Create	Worked collaboratively to complete project on time follow design sketch and build according to planned materials list	Missing one element: on time, following sketch, following established materials list.	Missing two elements.	Missing three elements.
Improve	Worked collaboratively to include claims and evidence about project success and areas of improvement.	Missing one claim or evidence statement.	Missing two claim or evidence statements,	Missing more than two claims or evidence statements.
Communicate	Completed quad chart on time with all four areas complete.	Did not complete on time or has one area incomplete.	Did not complete on time and or more than one incomplete chart components.	Did not complete one time and or has two or more incomplete chart areas.