

Impact Collisions (Protect Your Head!)

Short Performance Assessment

Introduction:

Due to increased awareness about global warming, more students are likely to ride their bike/ scooter/ skateboard in the future. This will likely increase the amount of impact collisions. The City of San Francisco has created a coalition, Vision Zero SF, to reduce the amount of collisions in the city to zero and make streets safer.

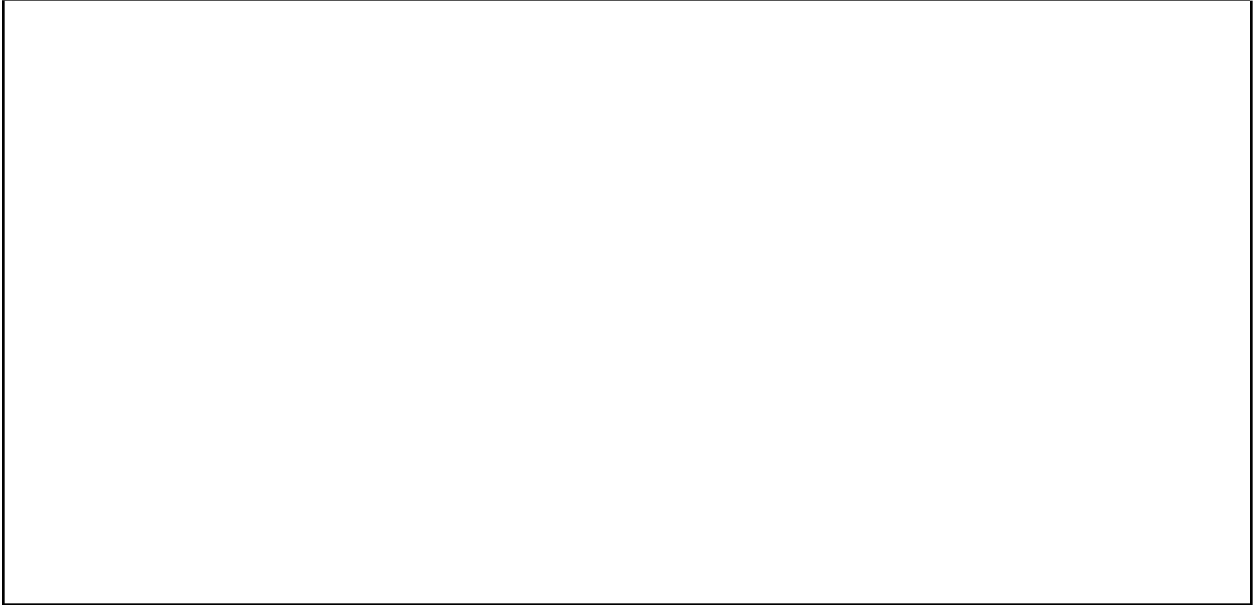
*“Younger children appear to be at greater risk than adults, yet helmet use is low despite this risk and legislation and ordinances requiring helmet use among younger riders.”
(Strotmeyer, 2020)*

1. First, let's describe what happens during an impact collision.
 - a. Draw a model of an impact collision between the head (without a helmet) of a biker/skateboarder/scooter rider and another object.
 - Use arrows to show the direction and magnitude of forces that appear in the collision.

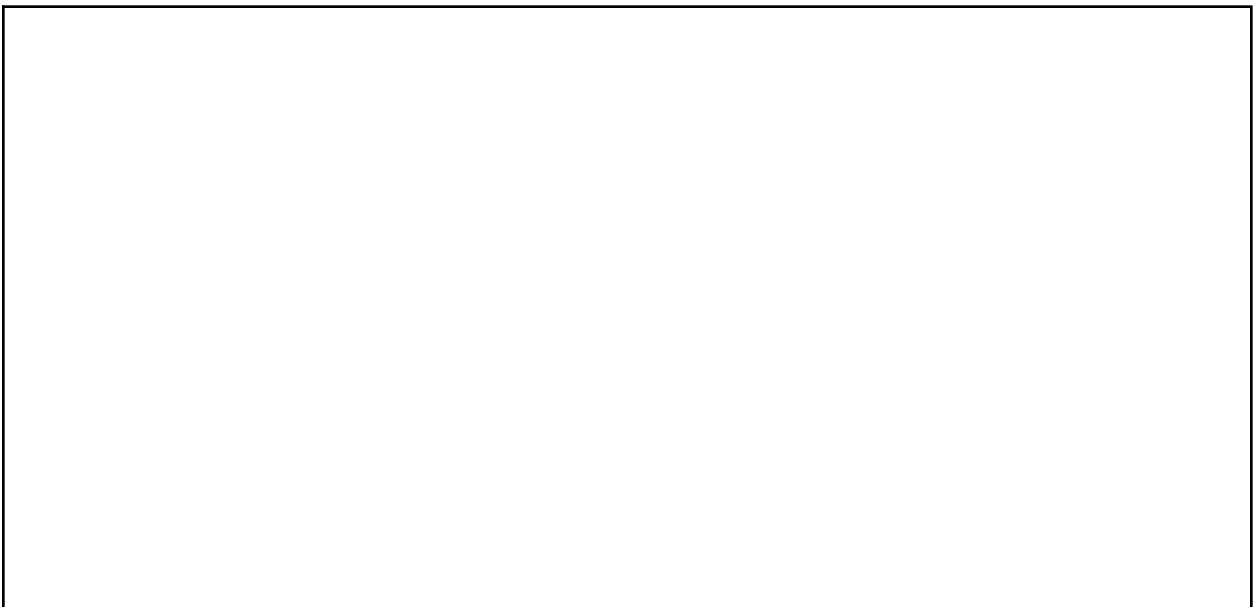
- b. Use Newton's Third Law to explain how the biker/skateboarder/scooter rider's head would be impacted in the collision in question 1A.



2. Design and draw a helmet model that will absorb most of the force in an impact collision between the head (without a helmet) of a biker/ scooter rider/ skateboarder and another object.
- Provide labels for each part of your design within the model.



3. The person from Question 1 is now wearing the helmet you designed.
- a. Refer to your model from Question 1 to draw a **new model** of an impact collision between the head (**with a helmet**) of a biker/ skateboarder/ scooter rider and another object.
- Use arrows to show the direction and magnitude of forces that appear in the collision.
 - Include the differences in forces on the helmet vs. the head.



- b. Use Newton's Third Law to explain how your new helmet design would better protect the entire head during a collision.