

Name: _____

Date: _____

Lesson 13 Student Assessment

You are riding down the sidewalk on a skateboard (or roller skates, or an electric scooter). You hear your phone ring, so you take it out of your pocket to see what your friends have to say. Without warning, you hit a bump in the road and lose your balance. Lucky for you, you catch yourself against the wall of a building. Unluckily for your phone, it was in your hands when you caught yourself.

1. Draw a force diagram showing the collision forces between your phone and the wall. Only include the phone and the wall and any forces from the interaction of the phone and wall in your diagram.
2. Sketch what the surface of the wall might look like **before the collision**, and next to it, sketch what the surface of the wall would look like **during the collision**.
3. Compare the strength of the force of the phone on the wall to the force of the wall on your phone.
4. When the phone collided with the wall, the wall didn't change its motion. Why not?
5. Sadly, your phone did not survive the collision. Explain why the phone broke.
6. Fortunately, the wall survived the collision just fine. Explain why the wall didn't break.
7. Describe a phone protector you might use to protect your phone.
8. Explain why the phone protector might have protected your phone.

9. Let's say that instead of protecting your phone, there was protective material on the wall. Would it be possible to protect your phone by putting some protective material on the wall? Why or why not?

10. Let's say that the protective material on your phone added a lot of mass to your phone. Would the extra mass protect your phone or could it harm your phone? Why?