

Conceptual Questions
Newton’s Laws of Motion

1. *Schloss Einstein* is a German television series and soap opera that portrays the lives of teenagers at Schloss Einstein (Castle Einstein), a fictional boarding school. Think of it as a German version of DeGrassi.

Watch the opening credits [Schloss Einstein](#).

There are four examples of Newton’s Laws in the opening credits. Each group has been assigned an example.

Kathi and Jannis pulling on the rope	Group 1
Lennard on the skateboard	Group 2
Simon squirting the ketchup	Group 3
Pawel and Henri pulling on the pillow.	Group 4

Use any of Newton’s Laws to explain the scenario and resulting action. Your response may use only one law or multiple laws. Remember

- A. action forces require reaction forces and that these forces must be equal.
- B. you can’t build up friction or tension to overcome static friction.
- C. Specifically state which Law you are referencing and how that Law supports your explanation.

Question 2: Groups 1 and 2

2. *Die Pfefferkörner* is a German television series in which five friends (the Peppercorns) meet in a spice warehouse to solve crimes and catch criminals.

In the recent TV film, *Die Pfefferkörner und der Fluch des Schwarzen Königs* (aka The Peppercorns and the Curse of the Black Kings), main character Mia and her best friend and classmate Benny encounter some criminals (the famous “Ganoven und Gangster/Gauner und Verbrecher”) on a class trip.

Watch the [clip](#) from the movie in which Mia and Benny prevent the criminals from capturing them

by throwing soapy water on the bridge.

A. Using any of Newton's Laws of Motion as the basis for your answer, explain why the criminals are not able to run when there is soapy water on the bridge.

B. Using any of Newton's Laws of Motion and the concept of friction as the basis for your answer, explain why the criminals are eventually able to run after Mia and Benny. Note: Do not write "they stepped on the non-soapy part."

Question 3: Groups 3 and 4

3. On Episode 3 of Season 6 of the Amazing Race, racers were "had to slide a shot glass along the bar and hit the target."

Watch the Amazing Race clip from the episode "[Counting Bears is not Rocket Science](#)."

A. Using any of Newton's Laws of Motion as the basis for your answer, what advice would you give to the racers to hit the target. You may not answer "You have to slide it just right."

B. Assume one of the shot glasses goes over the edge. Explain, in words, how you would calculate the horizontal distance the glass lands from the base of the bar. There is a coefficient of kinetic friction between the glass and the ice bar.

Note: You are to complete the assignment individually. Create a Google Doc, name it 20HPhysLastNameNewtonConceptsand share it with me.