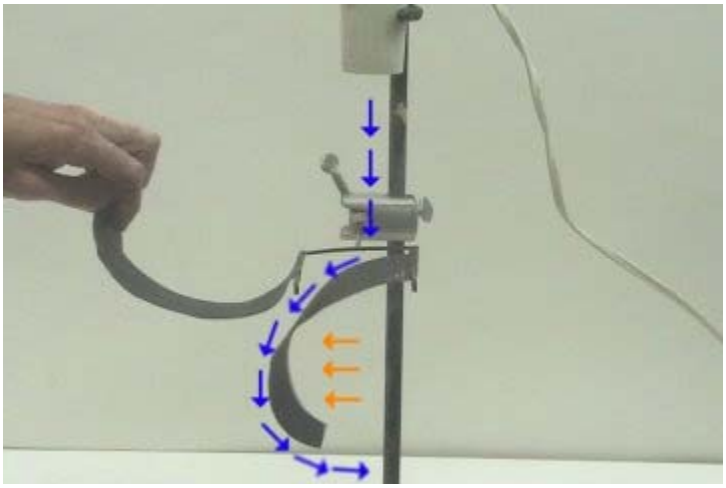
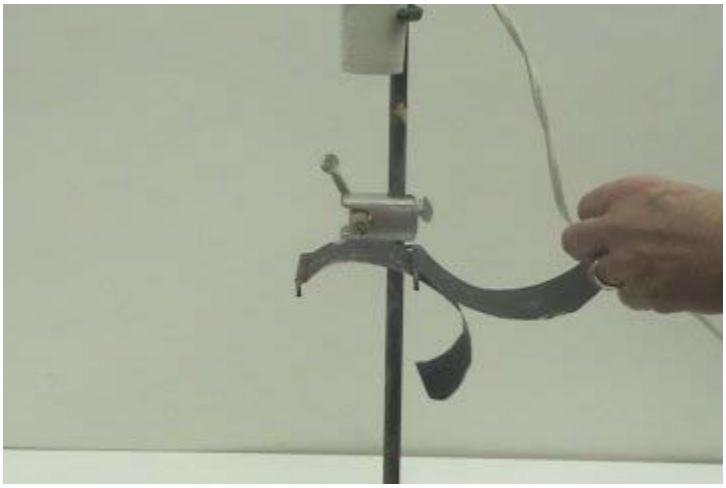
Answer #345

The answer is (b): the sheet will move to the left, as can be seen in an mpeg video by clicking your mouse on the photograph below.



The reason for this result is often mistakenly given as the *Bernoulli effect*. However, the real reason is a lesser known phenomenon known as the *Coanda effect*, named after Henri Marie Coanda (1886 – 1972), a Romanian aeronautical engineer often referred to as the "father of jet aircraft."

When the airstream strikes the convex edge of the metal plate, through a process involving *entrainment* of air and viscosity, the airstream follows the surface and leaves the bottom end of the sheet moving parallel to the sheet. The fact that the air stream follows the curvature of the sheet along which it flows is the Coanda effect. Thus the sheet has *pulled* on the airstream so as to redirect it to the right in the video, with the reaction force on the sheet directed toward the left, as indicated by the orange arrows. So the sheet moves to the left, as seen in the video. Clicking your mouse on the photograph below shows the effect of the airstream on the second sheet.



Question #346 is an extension of this problem.

Question of the Week

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For questions and comments regarding the *Question of the Week* contact Dr. Richard E. Berg by e-mail or using phone number or regular mail address given on the Lecture-Demonstration Home Page.