

# WORK-ENERGY

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**Question: The writer, Harry Hurt, is shown pulling a 25 pound(maximum pull) bow. The 1 oz. arrow is said to attain a speed of 140 feet/sec after release of bow string. If Harry pulled the arrow back 18 inches prior to release, confirm the arrow does leave the bow at 140 ft/s? Hint: The elastic potential energy  $\frac{1}{2}KX^2$  is converted into kinetic energy  $\frac{1}{2}mV^2$ . Convert all values into the English system e.g. convert oz. to pounds and then to slugs. 16 oz. = 1 pound, 12 inch = 1 foot. Consider the spring constant  $K = F/x$  and in this case 25 pounds/1.5 feet. Note: 18 inches = 1.5 feet. Good luck and happy confirmation of the speed.**

## With a Full Quiver, Eager to Join the Band of Merry Men



Uli Seit for The New York Times

Joe McGlynn, a world champion marksman, showing the writer how to use a compound bow at Pro Line Archery Lanes in Ozone Park, N.Y.

“The two basic things are: don’t get shot and don’t shoot anyone else,” he advised. As instructed, I pulled and pulled until the bowstring was vibrating against the tip of my nose, and my right index finger was jammed up against the back corner of my mouth. My recurve bow had a mass weight of only 1.5 pounds, but its so-called **“draw weight,” a measure of the resistance of the bowstring, was 25 pounds.** My left hand and arm were quivering so hard I couldn’t even begin to steady the circular iron sight attached to the bow handle. The **recurve launches arrows at a rate of 140 feet per second.** As Joe predicted, I managed to hit the yellow center circle of my 10-yard target using the bow. The compound bow’s relatively high-tech features include perforated fiberglass limbs equipped with pulleys. The pulleys reduce the bow’s 50-pound draw weight to the equivalent of 17.5 pounds once the string passes the “let off” point. As a result, it is much easier to hold a full draw with the compound. Even better in my view, the compound has a telescopic sight, which enables the myopic among us to actually see what we’re aiming at.

