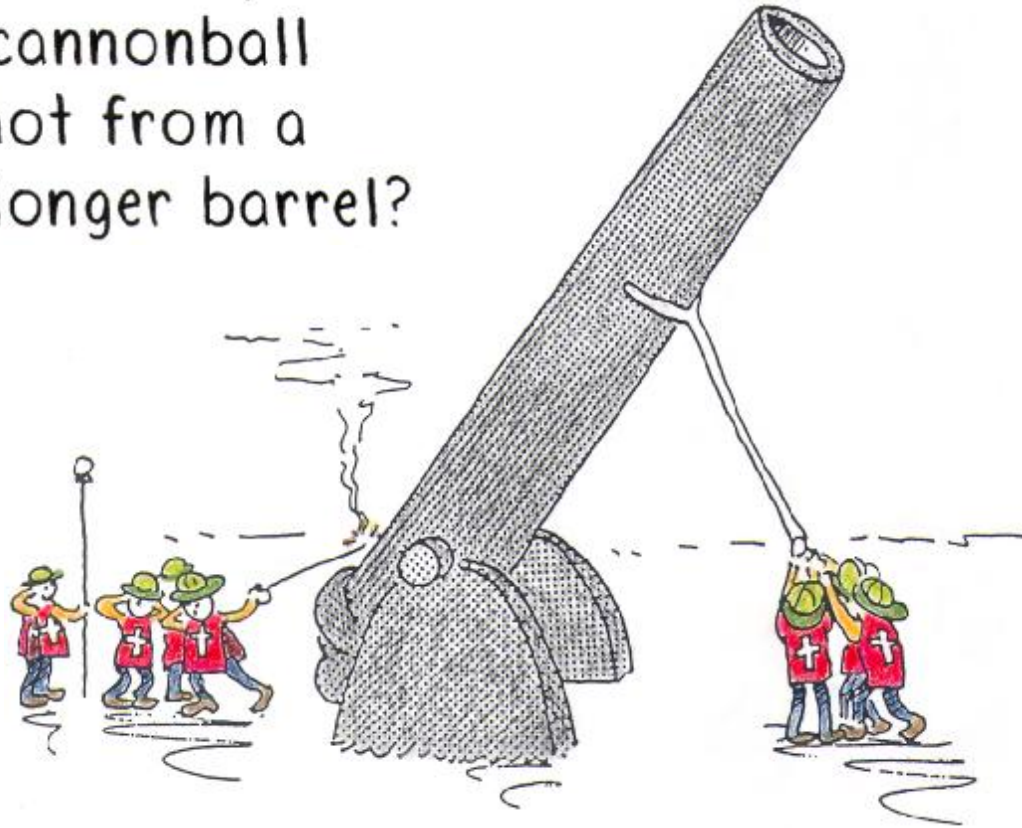


NEXT-TIME QUESTION

CONCEPTUAL Physics

For the same force, why is the speed of a cannonball greater when shot from a cannon with a longer barrel?

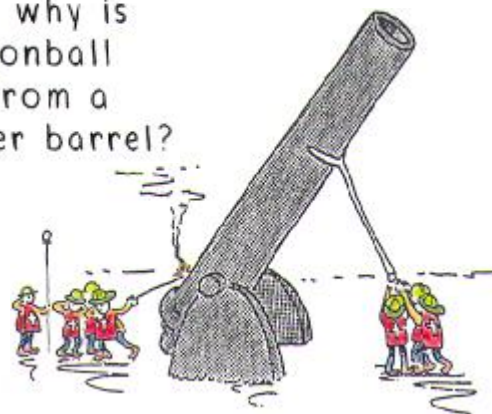


ARBOR SCIENTIFIC
TOOLS THAT TEACH.

Hewitt
Drawit!

NEXT-TIME QUESTION

For the same force, why is the speed of a cannonball greater when shot from a cannon with a longer barrel?



Answer:

There are two main reasons for the greater speed. A cannonball with greater speed has greater momentum and greater kinetic energy. How does it get greater momentum for the same applied force? By a greater impulse, which is "force \times time." The time during which the force acts is longer in the long barrel! Or how does the cannonball get more kinetic energy? By greater work, which is "force \times distance." The greater distance the force acts in the barrel produces more work = more kinetic energy!

