

Sec _____ Group _____

Print Names _____

Visual Physics RQ 8, Spring 2004



Lord of the Rings: Return of the King

The trolls could fire each of two bolts with masses (m_1 or m_2 ; $m_2 = 2 m_1$) from one of two identical giant crossbows with masses (M_1 and M_2), on a hill half the height of the gate at height (h). One crossbow aims at the top of the castle gate and the other at the bottom. The crossbows each have identical spring constants of (k). The amount of damage done to the door is proportional to the amount of energy transferred at time of impact. If

- Decide which mass will do more damage to the gate?
- Describe all energy transfers.
- What difference would it make if you used crossbow one or two? And/or bolt one or two.
- **Be sure to write down ALL of your assumptions, Free Body Diagrams and formula derivations. Box Answers.**