

ENERGY & WORK

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For Babies in India, a 30-Foot Plunge for Good Luck



INTRODUCTION: First goal is to use energy concepts to find speed of baby after falling 30 ft., Then use work-energy concepts to find force on baby as it stops in catching blanket. Take the under 3 month old baby as 12 pounds of weight.

QUESTIONS: (a) Find speed of baby using energy concepts as it just hits blanket after falling 30 ft.? (b) Using energy-work concepts find force on baby as it stops in 3 ft. in catching blanket? **HINT:** Besides losing kinetic energy as the baby hits the net the baby loses a little bit of potential falling the last 3 ft. in the blanket. (c) **EXTRA EXTRA CREDIT:** Solve for the stopping force using Newton's second law. You will have to find the baby's deceleration first.....it's the a while the baby stops in three feet. $F_{NET} = m a$, here $F_{NET} = F - m g$

How far would you go to show your religious faith? Some families in rural [India](#) — both Hindus and Muslims — are willing to let their babies be tossed off the roof of a shrine, **(((to be caught in a stretched bedsheet about 30 feet below.)))** The ritual, long popular in Maharashtra and Karnataka States, dates back almost 700 years, to a time when [infant mortality](#) was high, medical knowledge was scant and families had few places to turn for help. Legend has it that **a saint advised people whose babies were dying to build a shrine and drop the ailing infants from the roof to show their trust in the almighty**. When they did so, the story goes, the babies were miraculously cradled to safety in a hammock-like sheet that appeared in midair. From then on, prayers for the birth of a healthy baby in the region have included a promise to toss the baby as an offering to the god who granted the prayers. **Villagers believe that the ritual brings the child long life and good luck, and maintain that it does no harm.** Officials say the practice is illegal under India's children's rights law, and the local police authorities in Solapur say they have not received any reports of baby-tossing since 2010. Even so, witnesses say it continues on a small scale in some villages, including in Mangasuli, where the Lord Khandoba, an avatar of Shiva, is worshiped by Hindus as the deity of the family. "The practice continues throughout the year, and babies are tossed within two months of being born, come rain or shine — it's tradition," said Javed Fardin Akhtar, a resident of the nearby city of Sangli who said he witnessed the ritual in Mangasuli in April. Mr. Akhtar said that the actual tossing was done not by the parents, but by experienced devotees of the shrine. After one bounce on the bedsheet, the babies are swiftly returned to the arms of parents waiting anxiously in the cheering crowd below.

HINTS: $K = \frac{1}{2} m v^2$, $U(\text{gravitational potential energy}) = m g h$, $\text{Work} = \Delta K + \Delta U$, $\text{Work} = W = F x$, $g = 32 \text{ ft./s.}^2$

$V^2 = V_0^2 + 2 a X$, $\text{weight} = m g$,

ANSWERS: (a) – 43.82 ft./s. , (b) $F = 132 \text{ lb.}$, (c) $a(\text{while stopping in net in 3 ft.}) = 320 \text{ ft./s.}^2$, $F = 132 \text{ lb.}$ by Newton's 2nd Law