

# Work & Energy REVIEW

\*Plus a little extra just for fun!

1. A hill is 100 m long and makes an angle of  $12^\circ$  with the horizontal. As a 50 kg jogger runs up the hill, how much work does the jogger do against gravity? ( $1 \times 10^4$  J)
2. A child riding a bicycle has a total mass of 40.0 kg. The child approaches the top of a hill that is 10.0 m high and 100.0 m long at 5.0 m/s. If the force of friction between the bicycle and the hill is 20.0 N, what is the child's velocity at the bottom of the hill? (11 m/s)
3. A 500. N crate is pushed to the top of a 5.00 m ramp, which is inclined at  $20.0^\circ$  with the horizontal. What is the potential energy of the crate? (855 J)
4. A 16.0 kg child on roller skates, initially at rest, rolls 2.0 m down an incline at an angle of  $20.0^\circ$  with the horizontal. If there is no friction between incline and skates, what is the kinetic energy of the child at the bottom of the incline? (110 J)
5. Old Faithful geyser in Yellowstone National Park shoots water every hour to a height of 40.0 m. With what velocity does the water leave the ground? (28.0 m/s)
- \*6. A strong wind blows against a 20.0 kg hanging sign that is connected by two cables, one on the left and one on the right, to a horizontal pole. As a result of the wind, the left cable is blown askew and now forms an angle of  $37^\circ$  with the horizontal pole and the right cable forms an angle of  $42^\circ$  with the horizontal pole. What is the tension in each of the cables?