Proposed Problem

10. You are part of a citizen's group evaluating the safety of a high school athletic program. To help judge the diving program you would like to know how fast a diver hits the water in the most complicated dive. The coach has his best diver perform for your group. The diver, after jumping from the high board, moves through the air with a constant acceleration of 9.8 m/s^2. Later in the dive, she passes near a lower diving board which is 3.0 m above the water. With your trusty stop watch, you determine that it took 0.20 seconds to enter the water from the time the diver passed the lower board. How fast was she going when she hit the water?

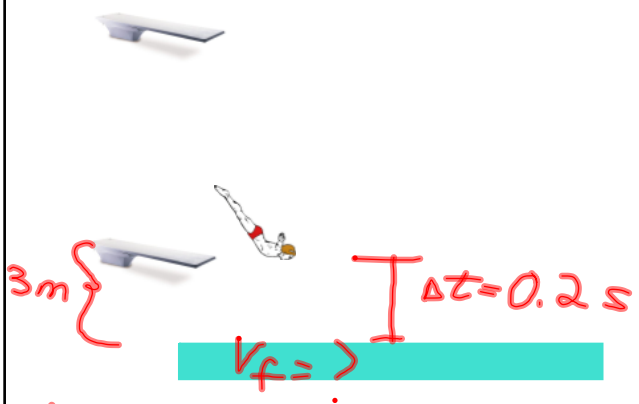
- Create Useful description - sketch, graphs, define quantities, define problem
- Physics Approach - list physics concepts that would apply to this problem
- Specific Application of Physics - use the concepts to model mathematically model the problem
- Mathematical Procedures - use the equations to solve the problem

Aug 5-9:52 AM

Physics Problem Solving Sheet

Useful Description

Picture & Given Information:



$\Delta y = -3$ m $a = -9.8 \frac{m}{s^2}$ V_f = ?

$\Delta t = 0.2$s V_i =

Question: How fast does she hit the water?

Target Quantiy: V_f = ?

Physics Problem Solving Sheet (cont.)

Physics Approach

Physics Concepts and/or Principles:

const acc / free fall

Specific Application of Physics

Assumptions/ Constraints:

no air res.

Specific Equations:

$\Delta y = v_f \Delta t - \frac{1}{2} a t^2$

Mathematical Procedures

Employ specific equations to solve for target quantity.

$\Delta y = v_f t - \frac{1}{2} a t^2$

$-3\,m = v_f(0.2\,s) - \frac{1}{2}\left(-9.8\,\frac{m}{s^2}\right)(0.2\,s)^2$

$-3\,m = 0.2\,s\,(v_f) + 0.98\,m$

$-3.98\,m = 0.2\,s\,(v_f)$

$19.9\,\frac{m}{s} = v_f$

Jul 26-9:49 PM