How to Increase Your Impact Teaching Physics

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General Remarks
Do's and ***Don'ts***
Do less!
Do labs
Do encourage creativity
Do encourage problem solving
Do encourage a positive attitude/spirit of cooperation
Do encourage them to see the connection between math and physics
Do encourage them to use computers as tools
Do utilize props in your presentations
Do keep a physics "diary"
Do have students keep a note "log"
Do make learning physics FUN!

. . . on the other hand . . .

Don't make physics a killer course
Don't spend the first semester on kinematics
Don't use the same pedagogy all the time
Don't ruin a 20 minute activity with a 40 minute write-up!

What Matters to Kids

Grades

Grading—weighting and scale

reputation of physics/enrollments

math not the chief challenge

role of critical thinking

shaping attitude of students/humility

increasing comprehension/lessening apprehension

Textbook

introductory activity: "Get to Know Your Textbook"

increase reading effectiveness--reading notes/outlining/modeling

Reading Quizzes/Homework

Pre-Lab Quizzes/P&P and Unit Tests--encouraging students to "cheat"

Videos—video study guides (Lonnie Grimes)

technology

Extra Credit—improvements (release mechanism), time-savers, software, research/internet, videos (1. physics video 2. Phun physics!)

How to Increase the Effectiveness of Labs

role of partners/cooperative learning

balance/timing

use the ***Learning Cycle***

PRISMS Roy D. Unruh, Director
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• do pre-lab demos that are central and then keep referring to them (such as dropping balls--Newton's 2nd Law apparatus)

• give pre-lab quizzes
~ P & P (***P***urpose and ***P***rocedure)
~how they would explain it to a physics student in NY on the telephone ("Trial and Error")

• assign different partners than their friends (I always do this for "important" labs--such as "Bull's Eye")

• do computer simulations that require data checking/computations by the student ("Extra Small", "Bull's Eye")

• include lab material/procedures on tests (sample test)

• set (reasonable) time limits

• try photographing your students in lab (I dedicate an old camera for this purpose and have student volunteers do the photographing)

- have students present their results to the rest of the class (I do this when different groups do ***different*** experiments)