

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: "Getting 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 (available from Lonnie Grimes)

technology

Extra Credit—improvements (example, release mechanism for Bull's Eye), time-savers, software, research/internet, videos (1. Make a Physics Video 2. Phun Physics —Tell a with digital photos!)

How to Increase the Effectiveness of Labs

role of partners/cooperative learning

balance/timing

use the *Learning Cycle*

PRISMS Roy D. Unruh, Director
PRISMS Project
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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 (*Purpose and Procedure*)
~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 students volunteers do the photographing)
- have students present their results to the rest of the class (I do this when different groups do *different* experiments)