

# **8.02x Online and 8.02 TEAL Residential: How Each Course Can Be Used to Improve the Other**

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# Acknowledging the efforts of:

Walter Lewin, Saif Rayyan, Peter Dourmashkin, George Stephans, Krishna Rajagopal, Ed Bertschinger, Ike Chuang, Sanjay Sarma, Anant Agarwal, Bob Redwine, Bob Brown, Alex d'Arbelloff, Hal Abelson,....and many others

And especially Lori Breslow, Director of the MIT Teaching and Learning Laboratory.....

# Outline of Talk

Brief description of 8.02x: an online edX course offered in spring 2013 with an initial registration of around 30,000 students, based on Prof Walter Lewin's 2002 lectures. 8.01x is currently running and I will not discuss that course here

Brief description of 8.02TEAL: residential interactive engagement format used in introductory MIT physics since 2003.

Question: can features of the 8.02x edx online course be used in 8.02TEAL residential to improve 8.02 residential, and vice versa?

# 8.01x and 8.02x

The Physics Department goals:

- Build full on-line edX courses available to the world around Prof Walter Lewin's 8.01 and 8.02 lectures, complete and in sequence.
- Gain experience with the edX platform
- By participating early, influence the design of the edX platform
- Use this experience to improve residential 8.02 spring 2014 using MITx resources



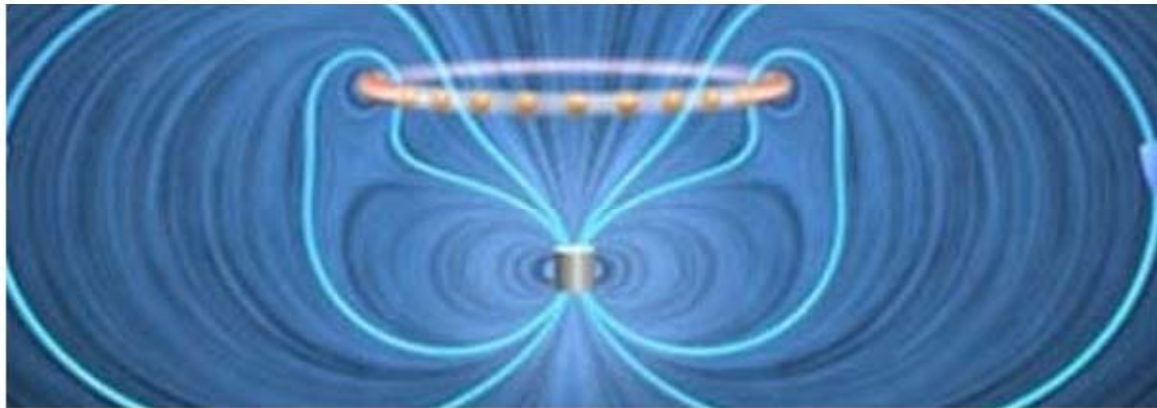
HOW IT WORKS

COURSES

SCHOOLS

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## COURSE DETAIL



## Electricity and Magnetism

8.02x (Electricity and Magnetism) presents the basic concepts of Electromagnetism, and how this touches upon a vast variety of interesting real-world topics.

### ABOUT THIS COURSE

#### ARCHIVED COURSE

This is a past/archived course. Certain features of this course may not be active, but we s

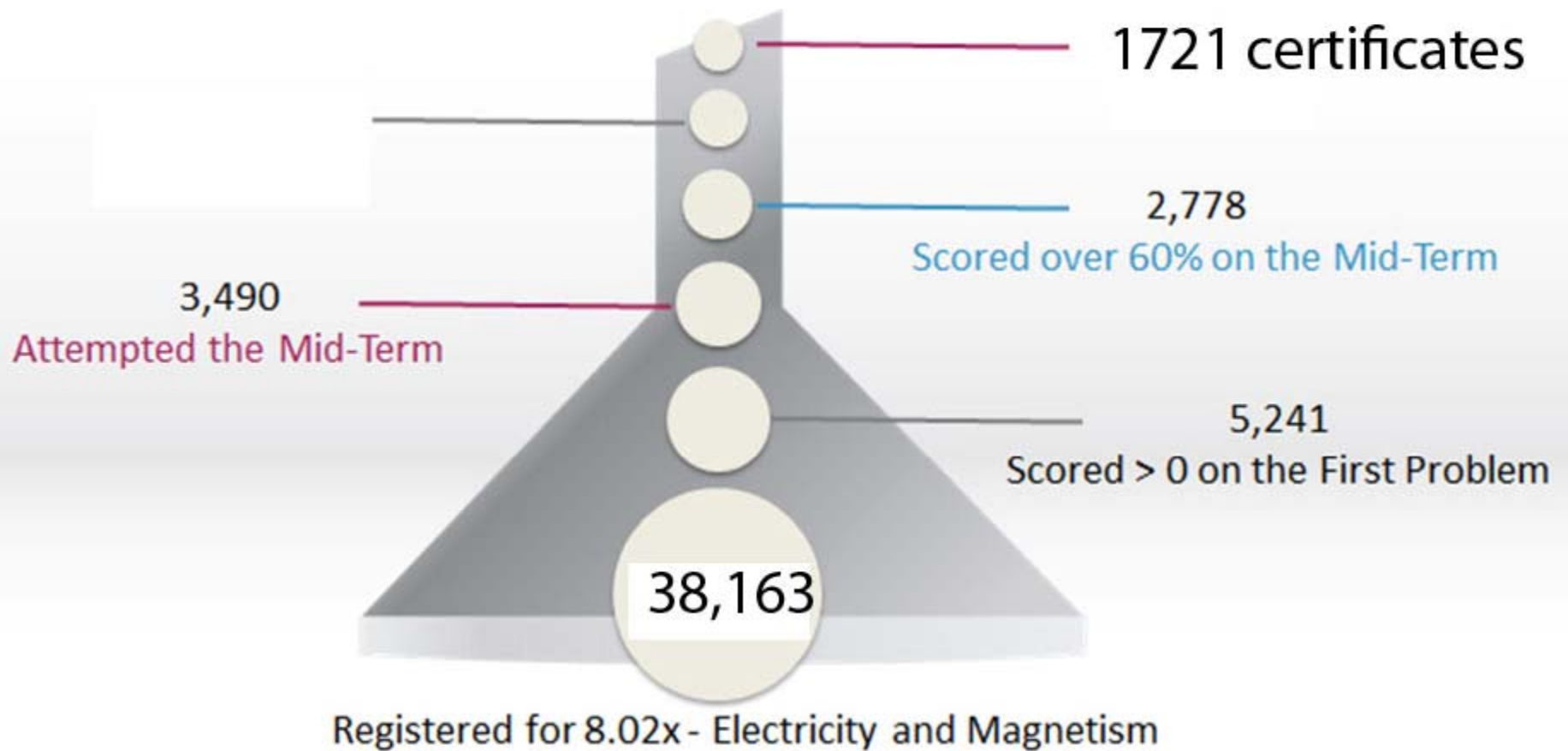
School:	MITx
Course code:	8.02x
Classes start:	18 Feb 2013
Estimated effort:	8-10 hours/week

#### Prerequisites:

While this course is fascinating and even entertaining, it does require an understanding of introductory physics

Di

# 8.02x last spring statistics



# 8.02x last spring countries

United States	7177
India	6836
United Kingdom	1338
Brazil	1219
Spain	1202
Pakistan	977
Russian Federation	914
Colombia	913
Canada	722
Mexico	674
Germany	662
Poland	609
Egypt	592
Greece	527
Ukraine	414

Bangladesh	370
Australia	365
France	355
Italy	338
Peru	330
Turkey	311
Morocco	297
Philippines	275
Indonesia	268
Portugal	263
China	258
Netherlands	252
Japan	241
Chile	237
Nigeria	237

# 8.02x last spring Educational Background

Elementary	69
Junior High	575
High School	5006
Bachelors	4484
Masters	2570
PhD SE	533
PhD Other	99



# 8.02x Was Well Received

Thank you for making this amazing class available for free. I took 2 classes on line before. An electronics class with a Canadian company and one offered by a high school on line. Nothing to do with this one.

Not only [is] Professor Lewin ... amazing , of course, but the structure of the class on line is outstanding. This mixture of videos, quizzes, simulations HW, textbook. The electronics class I took was not only expensive but of very poor quality.

This class takes advantage of the best of internet/java/.. I hope it stays free. I hope for more classes like Physics 8.03 and 8.01 Bravo and thank you again.

Louise

November 7, 2013

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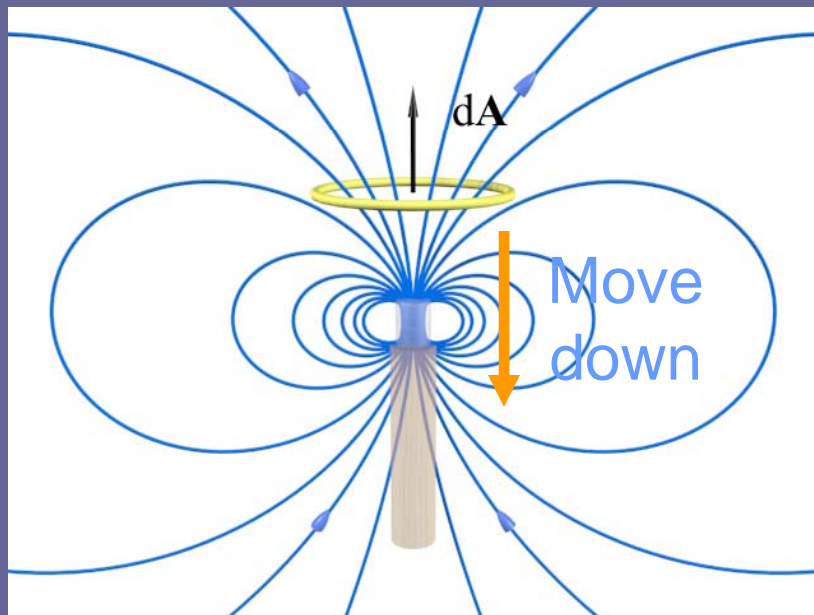


# TEAL Pedagogy (2 hour class)

1. Instruction & concept Q's
2. Pre-Experiment Predictions
3. Experiment
4. In Class Problems
5. Visualization of Experiment



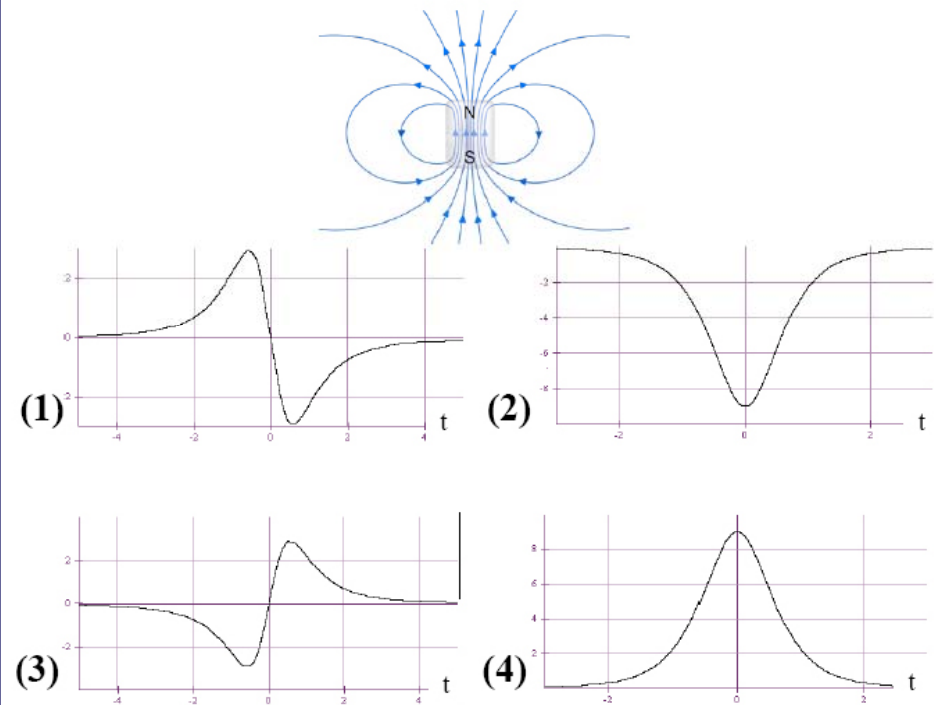
# Pre-Experiment Predictions



Personal Response System  
used for pre-experiment  
questions and responses

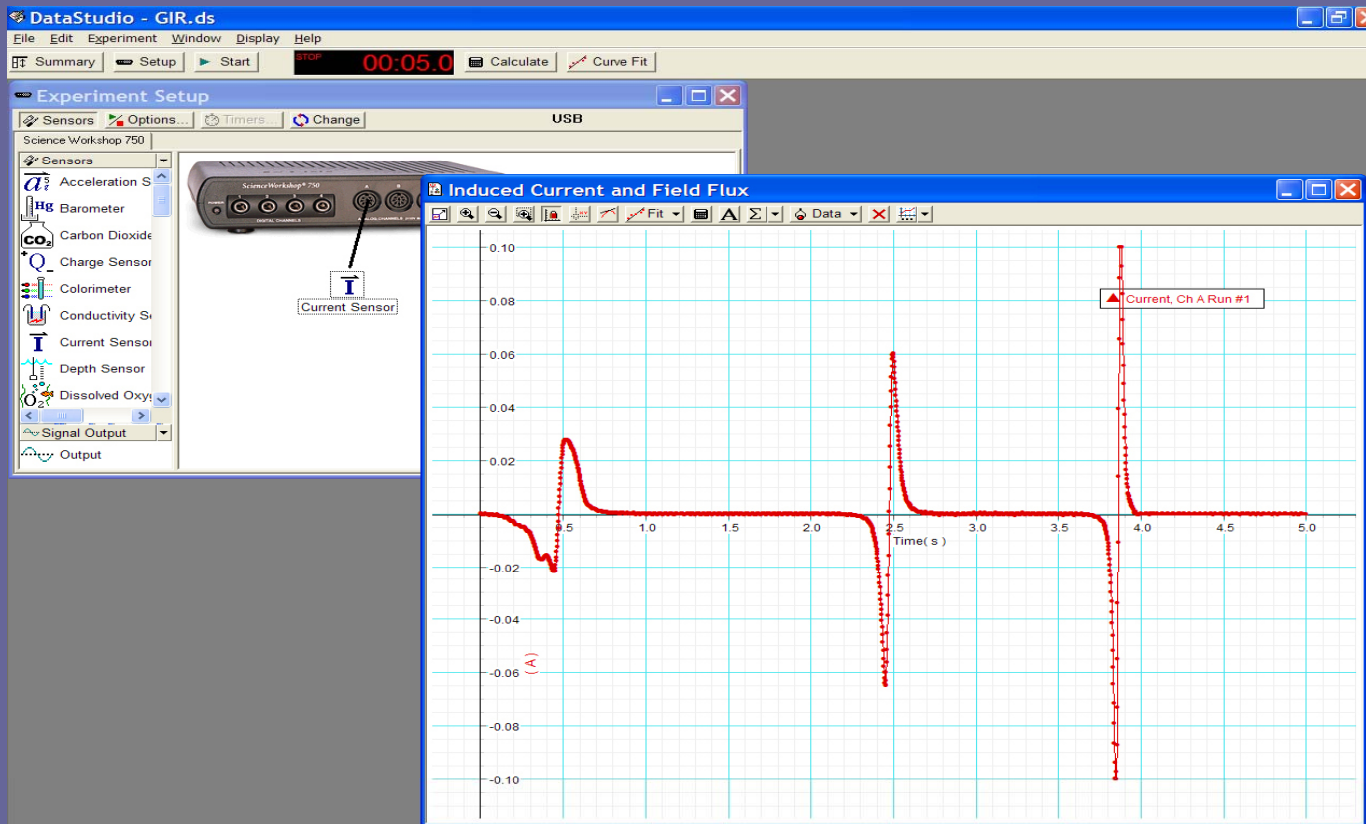
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## Experiment 9 Prediction 1-2



Suppose you move the loop from well *above* the magnet to well *below* the magnet at a constant speed. Predict the shape of a graph of the *current through the loop* as a function of time, taking the positive direction for current in the loop to be counter-clockwise when viewed looking down on the apparatus from above

# 3. Experiment



Experiment includes sliding an aluminum sleeve over the magnet and feeling the slowdown due to eddy currents

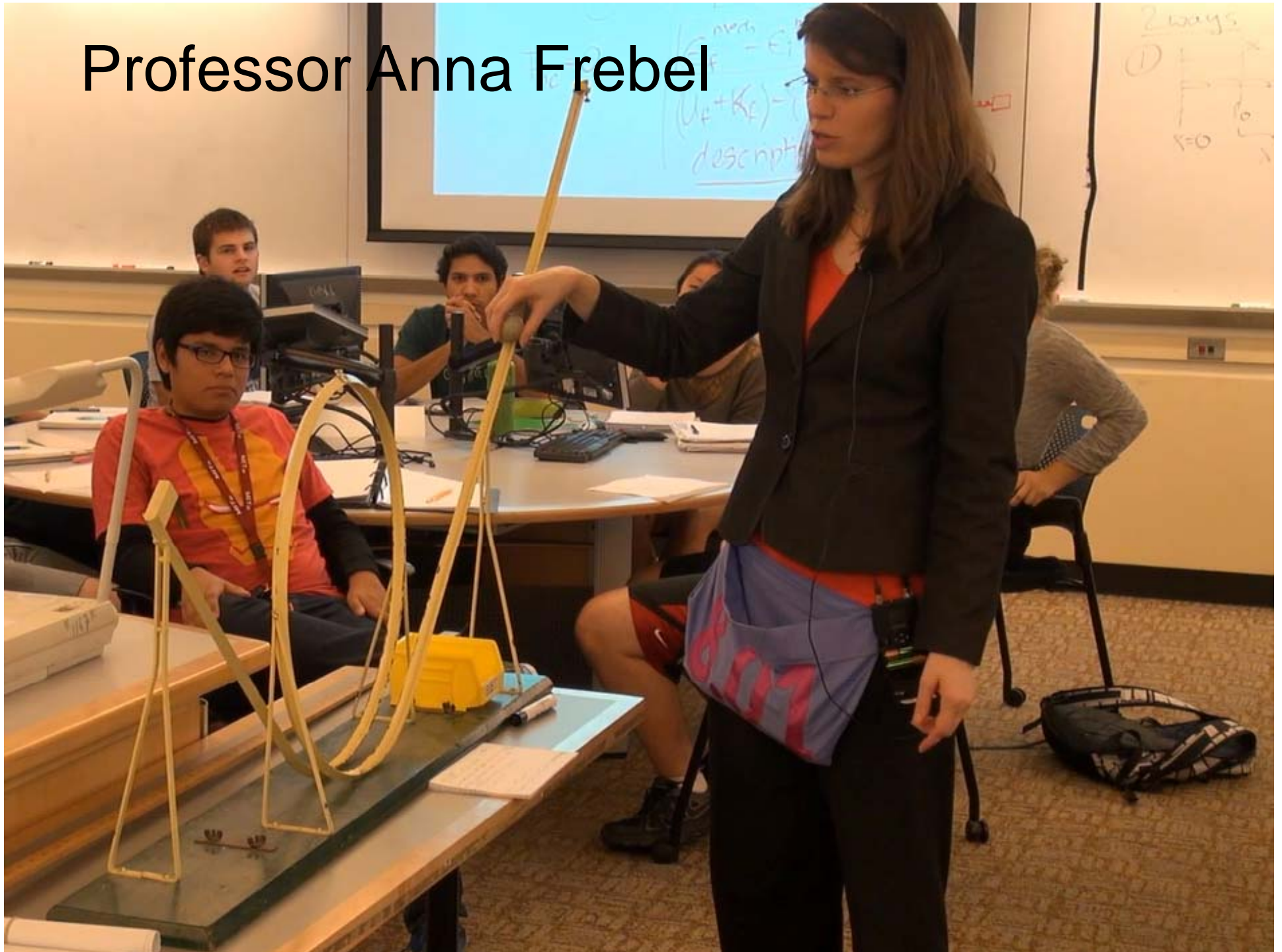
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# Professor Anna Frebel



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# 8.02TEAL+x Spring 2014

We want use the edX platform on campus with the 8.02 TEAL format to increase the effectiveness of class time devoted to both communicating material and to interactive engagement.

We will do this by using the capabilities of the *edX* platform to deliver online content and assessment outside of class.

We plan to work with MIT's Teaching and Learning Laboratory to do formative assessment to help strengthen the connection between edX and MITx and on-campus courses.

In particular, we want to explore the broad question, "What resources help which students to answer which problems most effectively?"