Image: Konza Prairie near Manhattan, KS

Finding helpful information about teaching: PhysPort and ComPADRE

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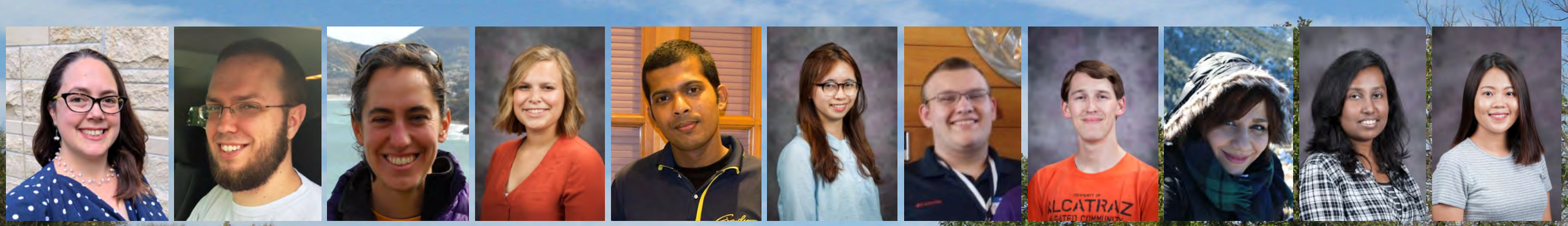
NFW
June 2019

KSUPER



How do students learn physics?

How to help faculty teach better?

How do people learn to research?

NSF

Whoa, that was a lot of info.

When I get home, how do I...?

NFW is overwhelming.

I need ideas about...

I want to try...

Good teaching is important.

How to help students learn more?

How do you know if students are learning?

PhysPort can help.

Find information and advice

Change your teaching

free

friendly

powerful

research-based

PhysPort

Supporting physics teaching with research-based resources

A web resource to support physics professors in using research-based teaching and assessment in their classes

www.physport.org

Applied research into faculty needs
Synthesis research into best practices
Enable research into student learning

www.physport.org

PhysPort
Supporting physics teaching with research-based resources

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AAPT

Home | Expert Recommendations | Teaching Methods | Assessments | Workshops

Welcome to PhysPort (formerly known as the PER User's Guide), the go-to place for physics faculty to find resources based on physics education research (PER) to support your teaching. **Learn more...**

Teaching
I want to...
- find a new teaching method
- get implementation help
- learn more about research-based teaching

Assessment
I want to...
- interpret assessment results
- assess the impact of reforms
- assess advanced physics content or skills

Troubleshooting
I need help with...
- covering enough material
- supporting group work
- arguments for skeptical colleagues

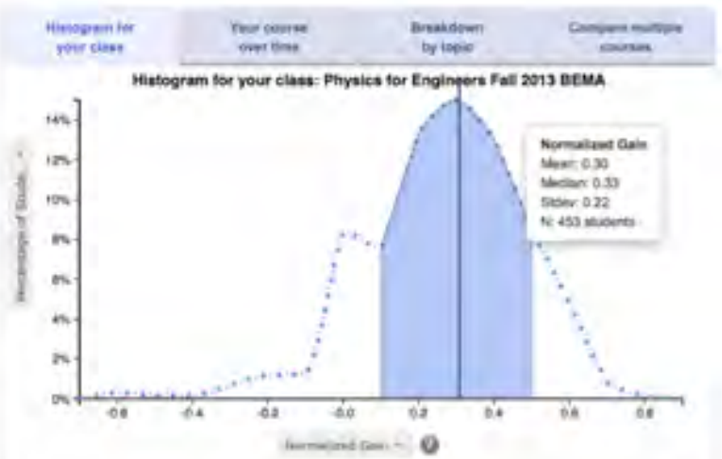
Where can I find good questions to use with clickers or Peer Instruction?

by Sam McKagan, PhysPort director — September 26, 2016

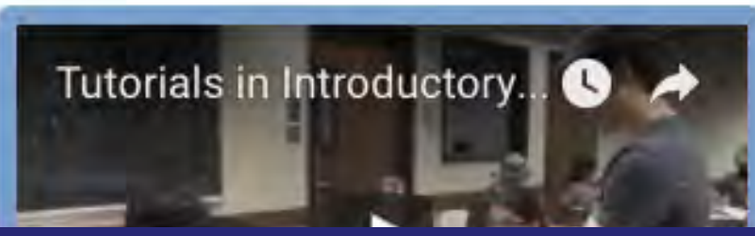
Many research-based teaching methods in physics, including Peer Instruction, CAE Think-Pair-Share, Technology Enhanced Formative Assessment, and teaching with clickers, involve having your students discuss and answer multiple-choice conceptual questions. A challenge of using these methods is finding and writing good questions. This recommendation helps you find and write questions for your class.

Peer Instruction, CAE Think Pair Share, clickers, Technology Enhanced Formative Assessment — Read more »

NEW - PhysPort Data Explorer



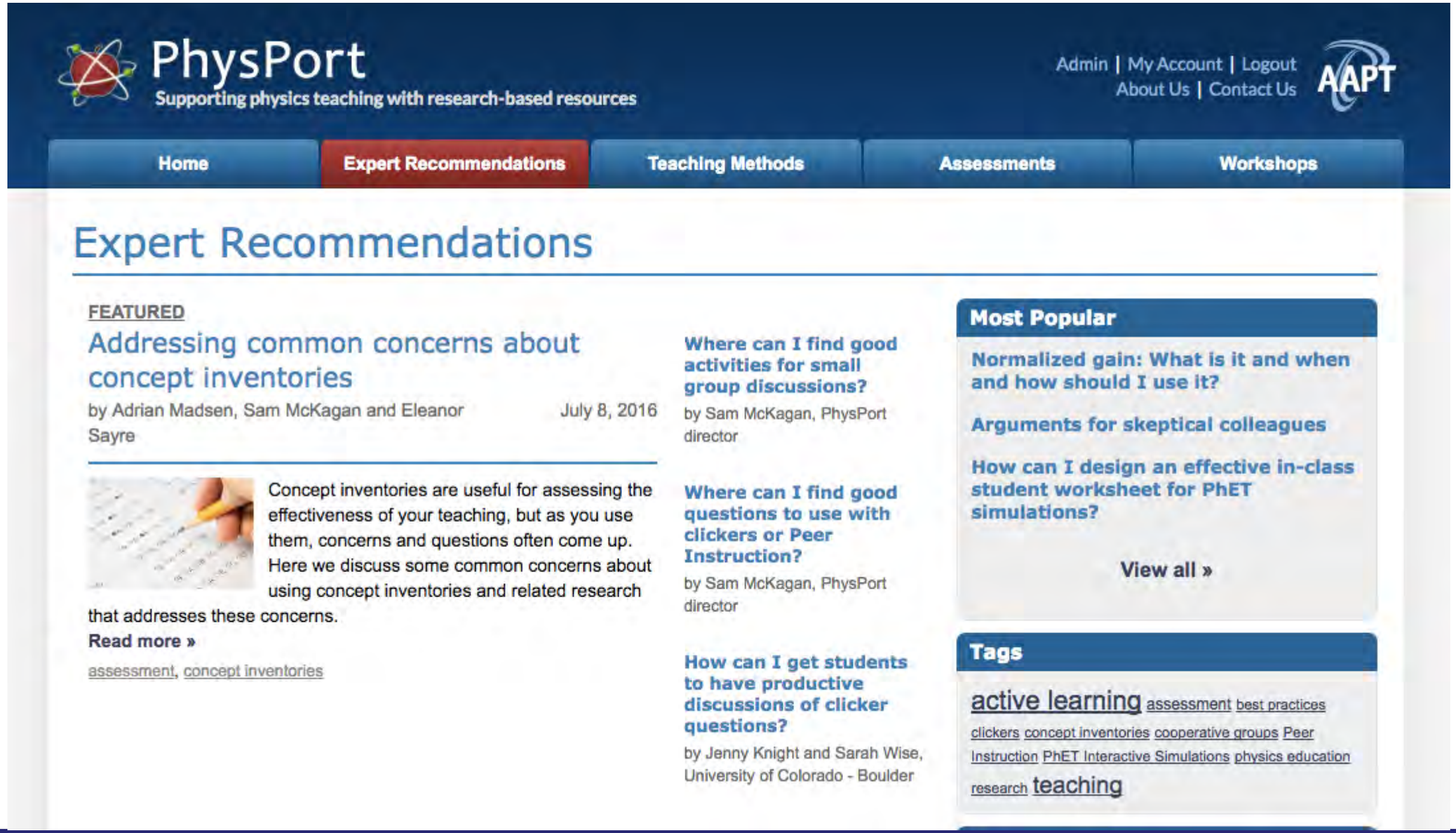
Explore assessment data



Expert Recommendations

physport.org/
recommendations

Friendly articles that interpret and synthesize PER results for physics faculty.



Eleanor Sayre: esayre@gmail.com @sayrelab www.zaposa.com

Expert Recommendations

physport.org/recommendations

Friendly articles that interpret and synthesize PER results for physics faculty.

How can I set up an effective
active learning classrooms?

Have a suggestion?

Want to contribute?

esayre@ksu.edu

smckagan@aapt.org

45 available now!

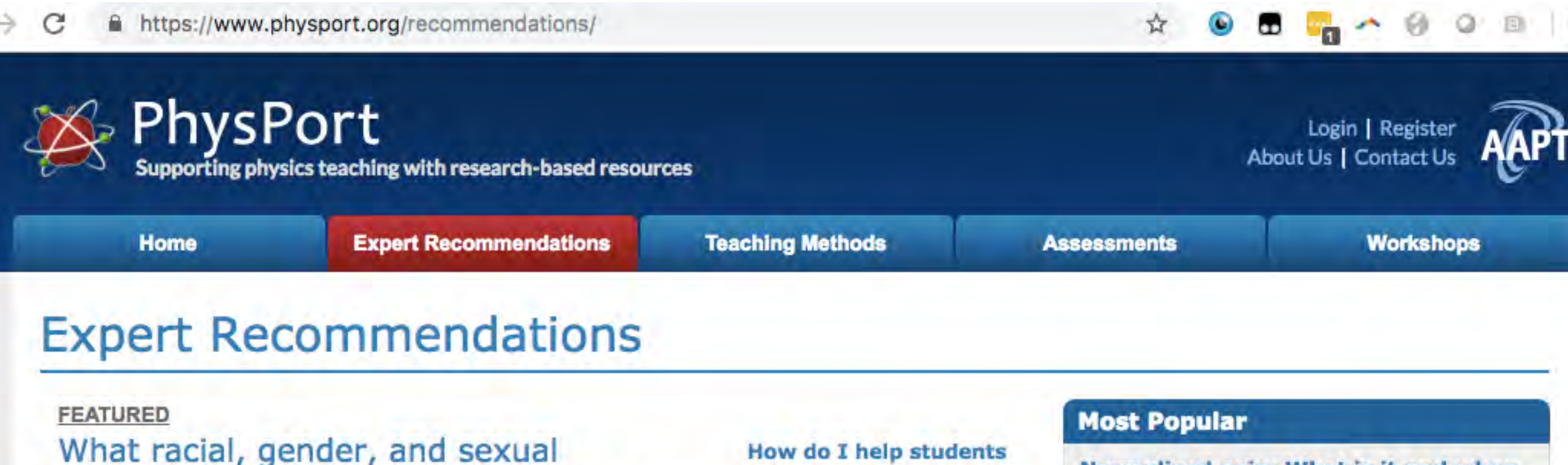
Find expert recommendations

- Thinky-researchy alone time (7 mins)
- Make a group of three (2 mins)
- Take turns to talk about the results of your investigation. (9 mins)

Expert Recommendations

physport.org/
recommendations

- By yourself, on your phone or laptop
- Identify an expert recommendation that speaks to you
  - Helps with an issue in your teaching
  - Helps with a question sparked by NFW
  - Helps with your challenge from the last session
- Use the expert recommendation to better articulate your question (and start to solve it?) (7 mins)



Expert Recommendations

physport.org/
recommendations

- Make a group of three. Longest hair goes first.
- Take turns and play "yes, and"
- Person 1 presents their new question
  - Persons 2&3 think about how they share that question
  - Everyone brainstorms around this topic: what do you want to know? which NFW presentations gave you ideas? how does this connect to your institution?
- Cycle to person 2 then person 3.
- 3 mins focus on each person.

PhysPort can help.

How to help students learn more?

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Change your teaching

Teaching methods

physport.org/methods

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AAPT

Home | Expert Recommendations | Teaching Methods | Assessments | Workshops

Teaching Methods and Materials

Tell us about your course to find methods relevant to **you**.

Any Subject | Any Level | Any Setting | Submit

Student Skills Developed ?
Any

- Conceptual understanding
- Problem-solving skills
- Lab skills
- Making real-world connections
- Using multiple representations
- Designing experiments
- Building models
- Metacognition

Instructor Effort Required ?

57 Research-Based Methods

Sort by: Popularity

Peer Instruction

Small group discussion of conceptual questions interspersed with lectures, increasing engagement and providing formative feedback on student thinking.

Subject +7

Level MS HS IC IM UL GS O

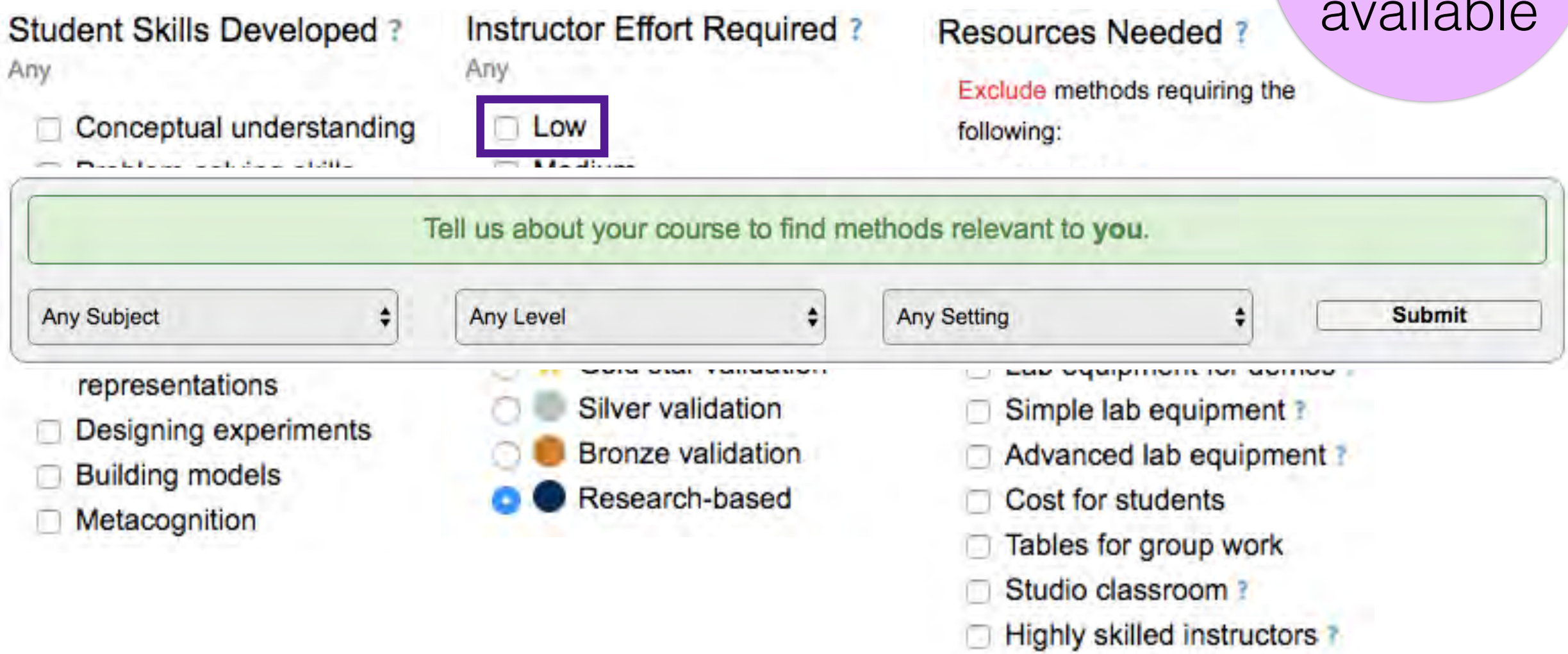
Setting +2

Teaching methods

physport.org/methods

What works for my context?

57 methods available

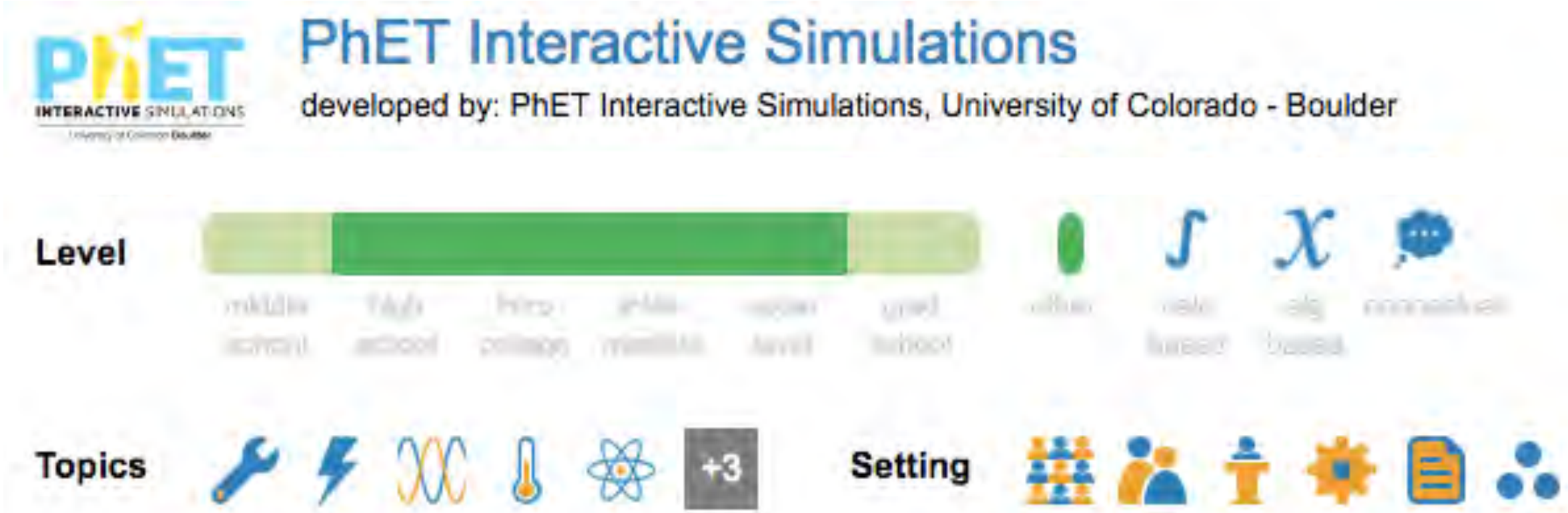


Teaching methods

physport.org/methods

What works for my context?

How does it work? Where can I get it?



Teaching methods

physport.org/methods

What works for my context?

How does it work? Where can I get it?

Overview | Resources | Teaching Materials | Research

What? Open-ended game-like sim… …d minimal text appropriate for a variety of class setting… …isible visible and provide multiple re… …rld connections.

Why? They are fr… …tyle. They are based on rese… …cific science concepts, and … …improved conceptual learn…

Why not? PhET simulations … …r your students to learn to use real lab equipment or to le… …ave access to computers.

Comparative overview

Teaching materials

Classroom video

Resources

Research basis

Example materials

LAB #2: Fun with DC Circuits
Physics 2020, Fall 2004

Classroom video

Teaching methods

physport.org/methods

What works for my context?

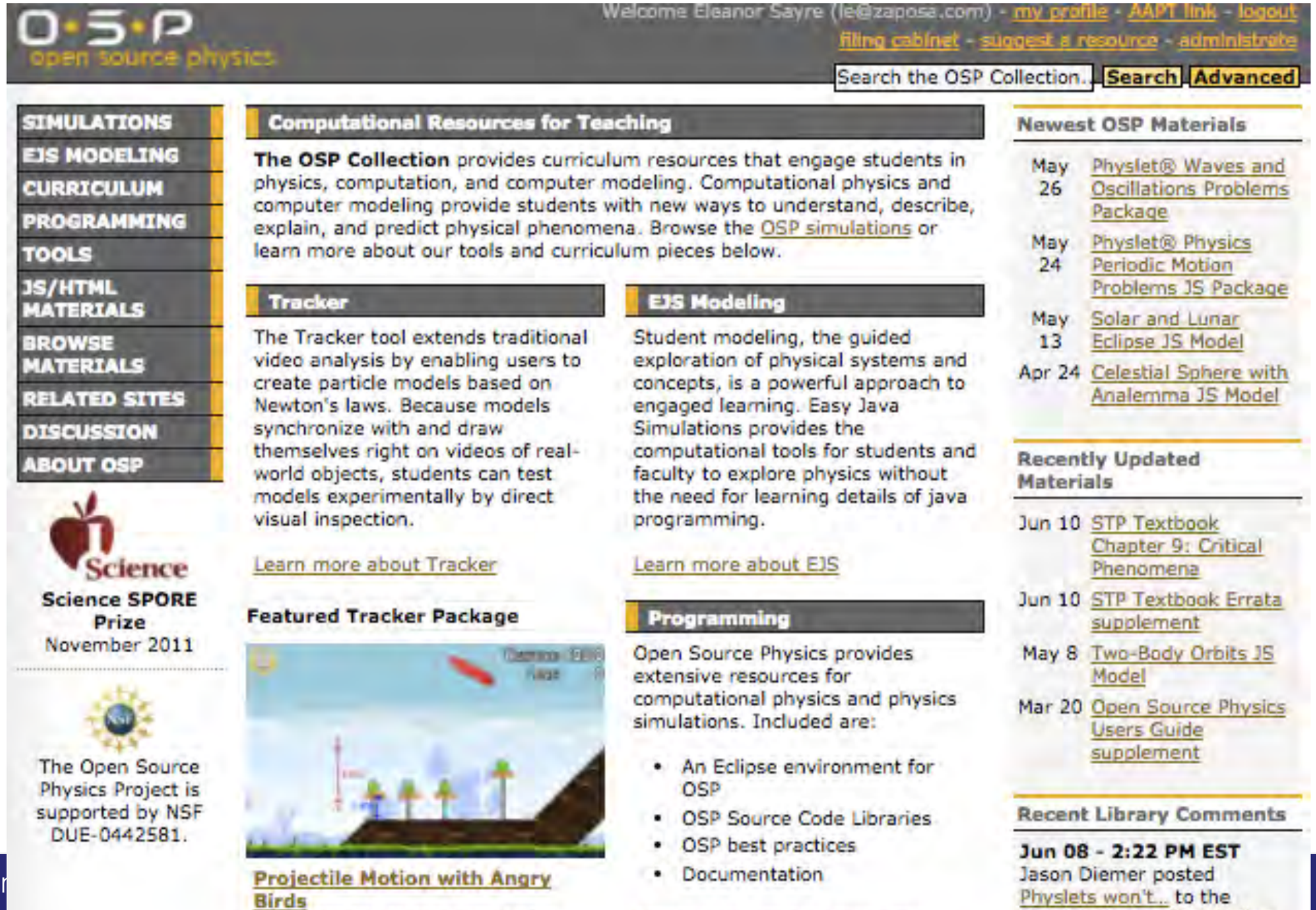
How does it work? Where can I get it?

Get it at compadre.org

- Collections of teaching materials
- Free.
- Intro, upper division, astro, IPLS.... etc
- Simulations, tutorials, clicker questions, ebooks.... etc

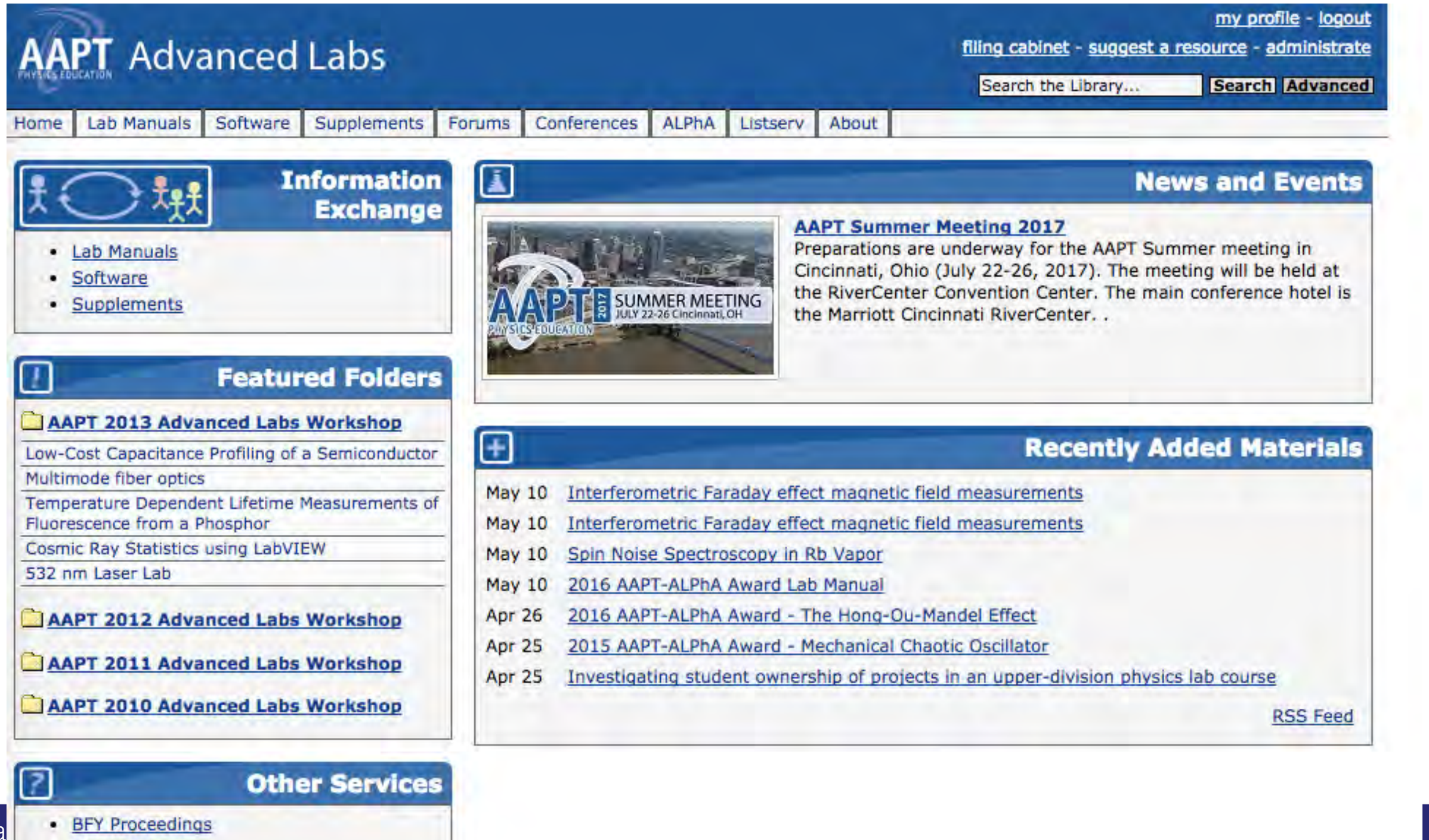
Open Source Physics

www.compadre.org/osp/



Advanced Labs

www.compadre.org/advlabs/



Teaching methods

physport.org/methods

Which method should I choose?

How does it work? Where can I get it?

What else can I do?

57 methods available

Teaching methods

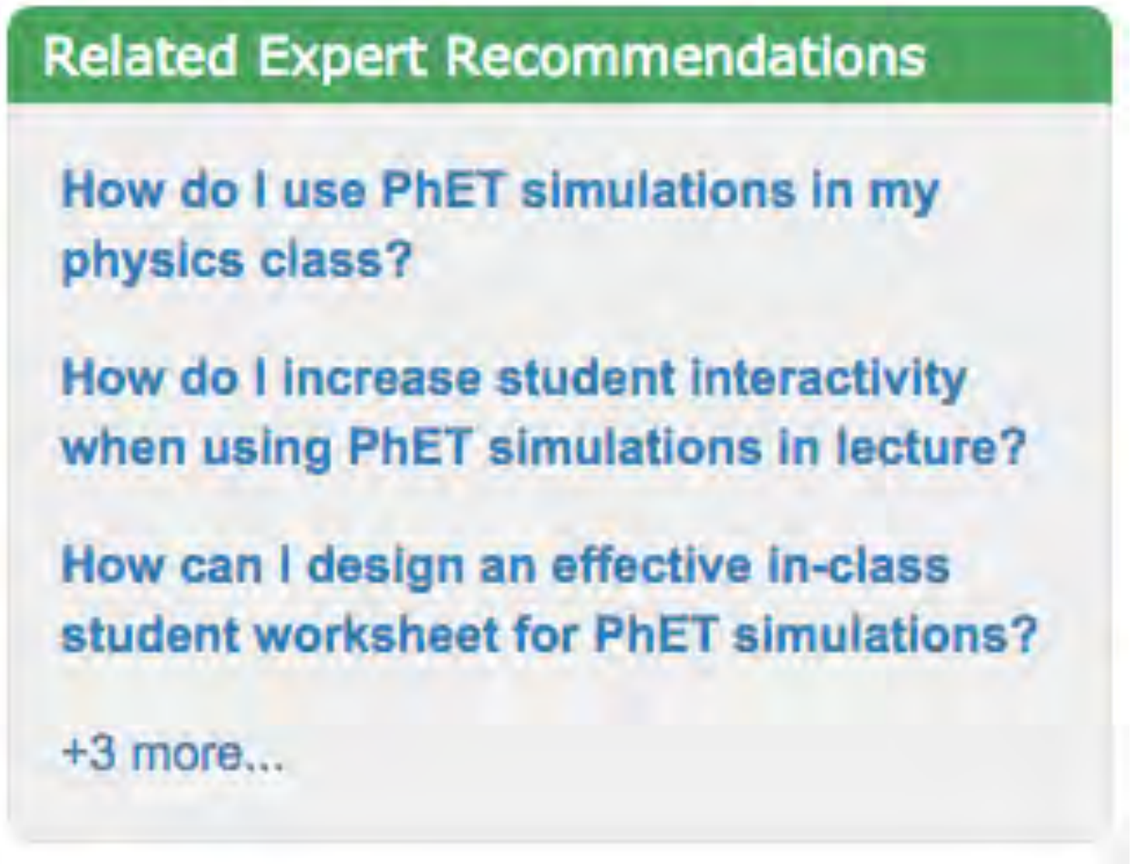
physport.org/methods

Which method should I choose?

How does it work? Where can I get it?

What else can I do?

I need more help



Look it up

- Cruise through the teaching methods pages
- Find something:
  - You already do
  - You learned about here at NFW
  - You're curious about trying next fall
- Imagine:
  - What do I need to know to do this in my class?
  - What resources do I need to implement it?
  - Who else do I need to talk to?
- Bookmark:
  - There SO MUCH information here.
  - Put a pin in it to come back later.

PhysPort can help.

How to help students learn more?

How do you know if students are learning?

free

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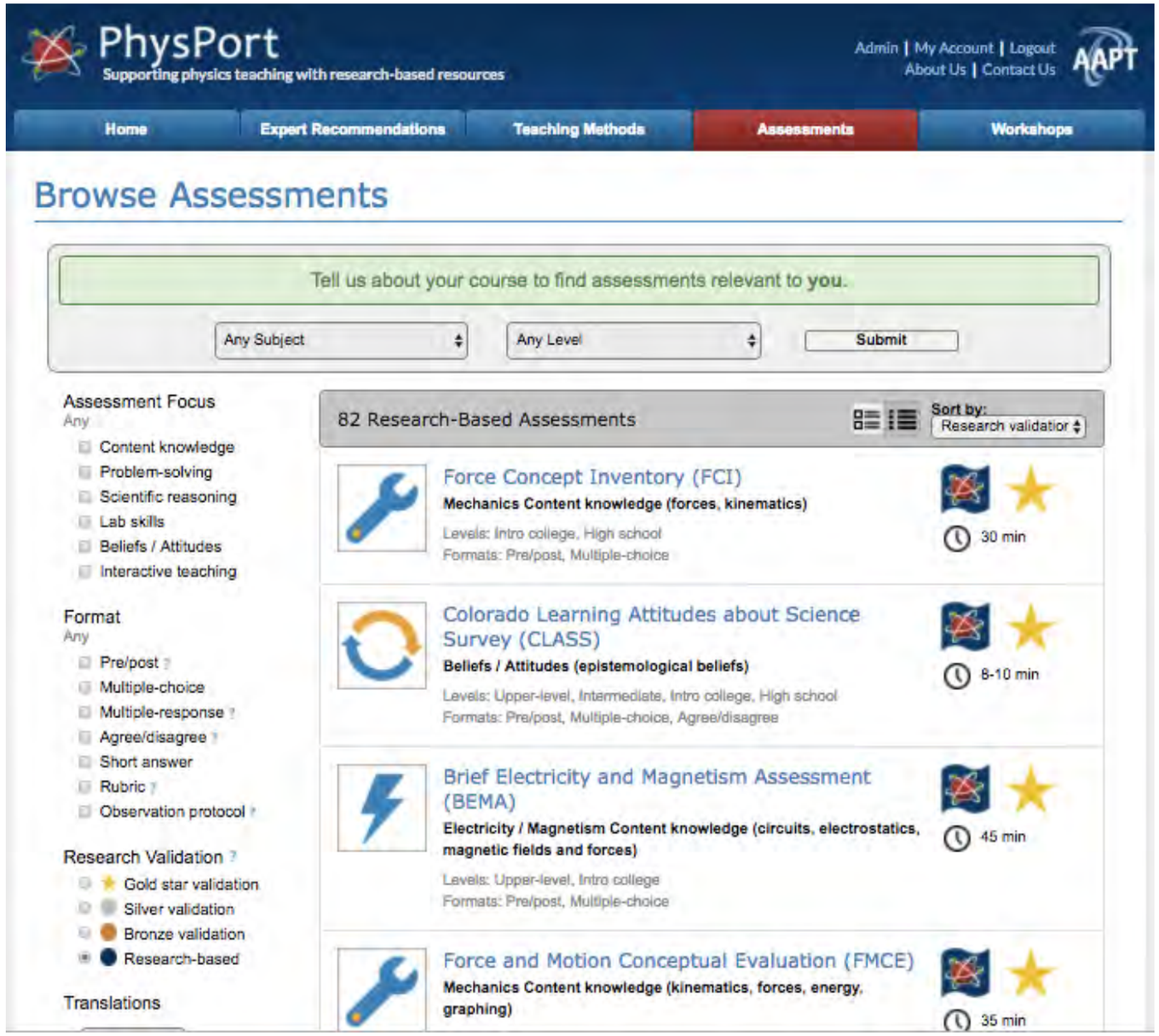
Find information and advice

Change your teaching

Assessment Resources

physport.org/assessments



These are:

- Generally multiple-choice surveys
- Carefully crafted questions
- Conceptual topics across physics curriculum
- Additionally: beliefs, problem-solving skills, affect

project info

Assessment

physport.org/assessments

Which assessment should I choose?

- Conceptual topics across physics curriculum
- Additionally: beliefs, problem-solving skills, affect
- Searchable by
  - kind & level of course
  - format & topic
  - research validation

80+ available

Assessment

physport.org/assessments

Which assessment should I choose?

How should I administer it?

Force Concept Inventory (FCI)

Developed by David Hestenes, Malcolm Wells, Gregg Swackhamer, Ibrahim Halloun, Richard Hake, and Eugene Mosca

Purpose	To assess students' understanding of the most basic concepts in Newtonian physics using everyday language and common-sense distractors.
Format	Pre/post, Multiple-choice
Duration	30 min
Focus	Mechanics Content knowledge (forces, kinematics)
Level	Intro college, High school

Typical results

Sample questions

Research overview

Translations

Assessment

physport.org/assessments

Which assessment should I choose?

How should I administer it?

Where do I get it?

Verified educators!

For faculty and teaching staff

free, easy

Download test

Administration guide

Security instructions

Assessment

physport.org/assessments

Which assessment should I choose?

How should I administer it?

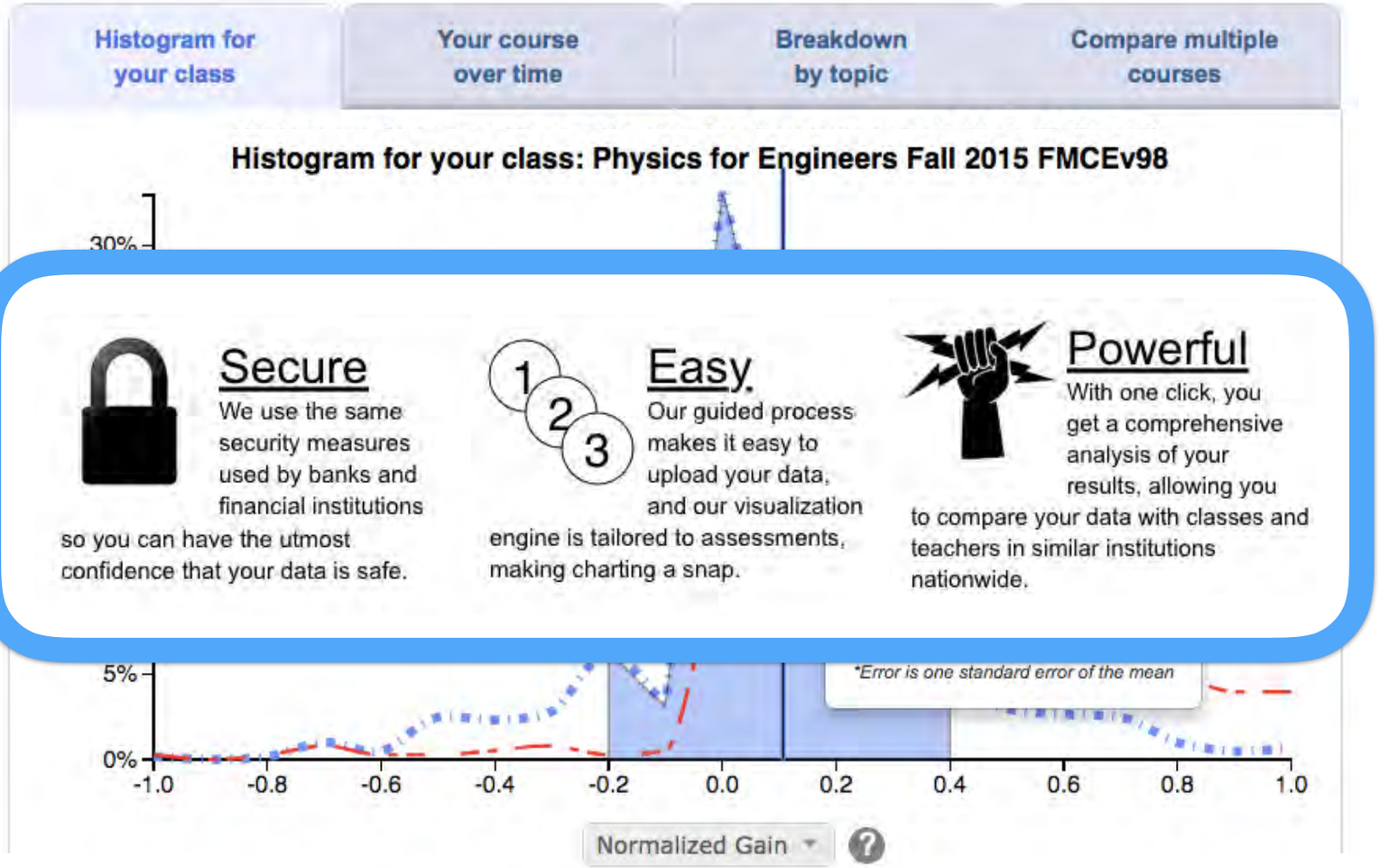
Where do I get it?

How should I interpret my results?

Data Explorer

physport.org/
DataExplorer

Visualize and compare your students' performance on research-based assessment instruments.



Upload your data

Explore your data

Download your results

Eleanor Sayre: esayre@gmail.com @sayrelab www.zaposa.com

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I want personalized help and advice.

FOLCs

www.aapt.org/Conferences/newfaculty/folc.cfm

Consultants

physport.org/consultants

Questions about research

esayre@ksu.edu

PhysPort can help.

Learn about better teaching!
Search for teaching methods
Read recommendations from experts

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Download assessments
Take online workshops

Do Physics Education Research!
Discover how students learn
Build better pedagogy
PEER field schools

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