

Developing Large Scale Effective STEM Teacher Learning Communities at the National Science Teachers Association

<http://learningcenter.nsta.org/impact>

Al Byers, Ph.D.

abyers@nsta.org

M: 571-643-3360

Associate Executive Director, Services
National Science Teachers Association

Goals for this Talk

- Share an overview of our STEM e-learning portal and the need it addresses
- Share strategies behind the design and affordances provided via our online professional learning community
- Share and discuss research findings and studies that are supporting our on-going design efforts.

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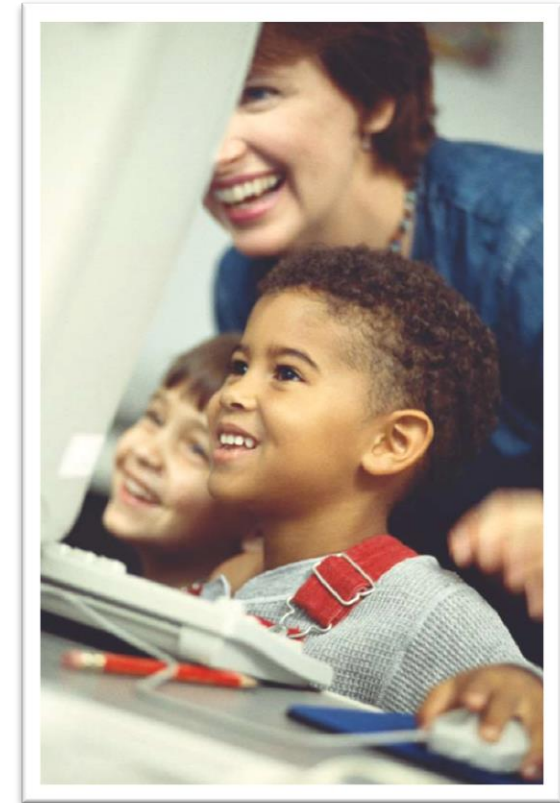
PLC's ...the hype



Barclay! The adjacent school district's test scores went up 25% last year apparently due to STEM 'professional learning communities.' Whatever that is...I want two of them!

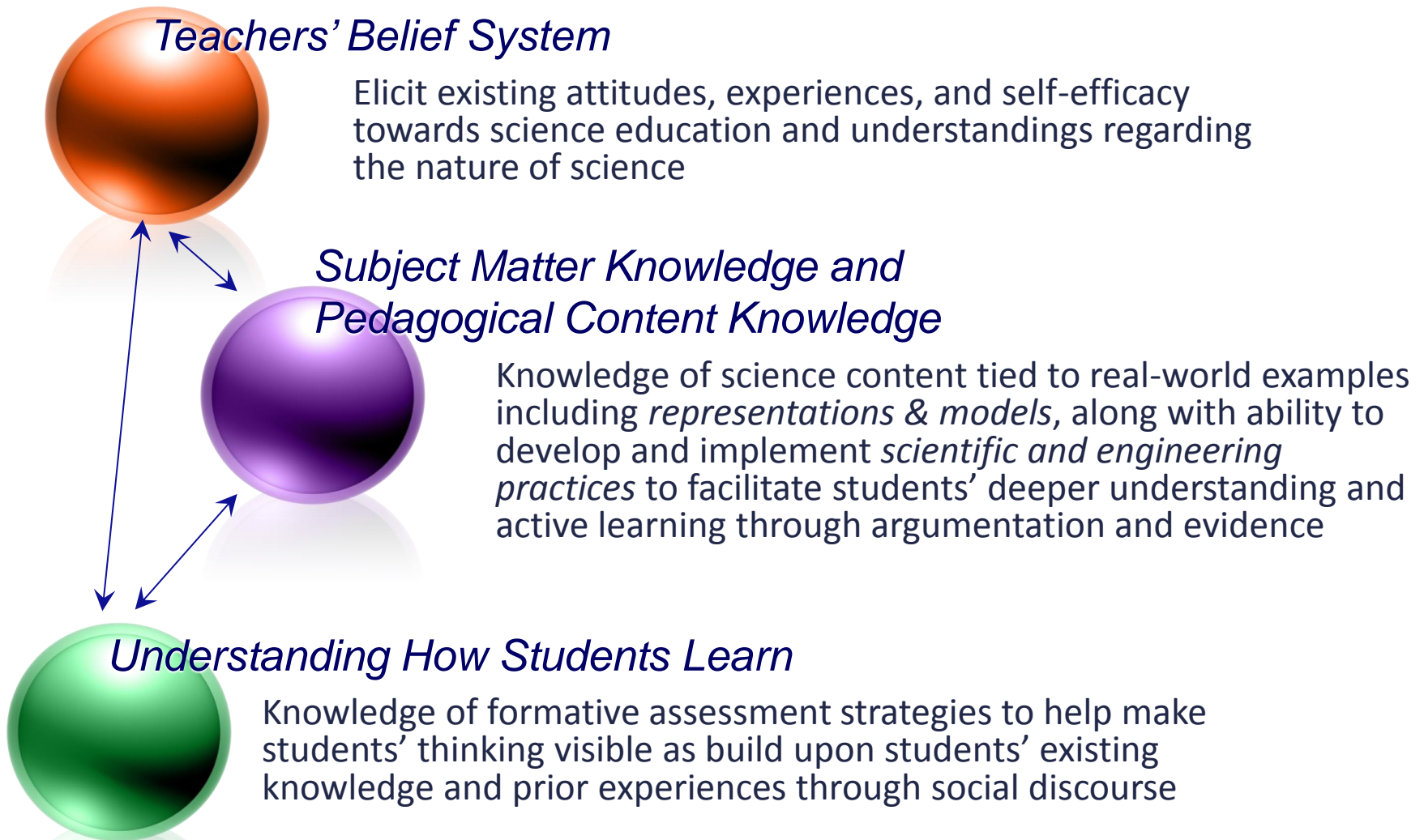
Need: Importance of Teacher Learning

- A significant, *positive* correlation exists between *student achievement* and *teachers' content knowledge* (subject matter & pedagogical content knowledge)
- Detrimental effects occur when teachers do not feel confident in science

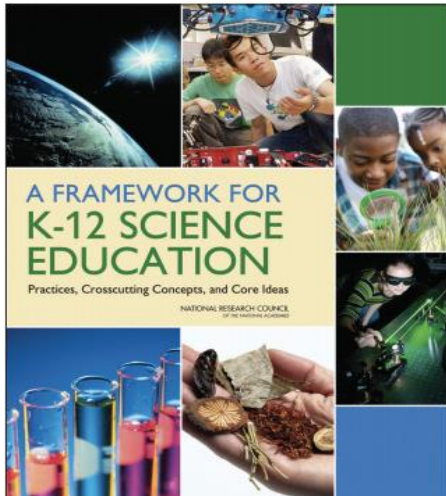


Aaronson, Barrow and Sander, 2003; Bransford, Brown,; Clermont & Borko, 1994; Cochran-Smith and Zeichner, 2005; Cocking, Donovan, & Pellegrino, 2000; Darling-Hammond, 2006; Darling-Hammond and Bransford, 2005; Economic Policy Institute, 2003; Gess-Newsome and Lederman, 1999; Goldhaber, 2002; Goldhaber and Brewer, 1998; Goldhaber and Brewer, 2000; Jepsen, 2004; Kane, Rockoff and Staiger, 2006; Ma, 1999; Monk, 1994; Rivkin, Hanushek, and Kain, 2005; Rockoff 2004; Sanders and Rivers, 1996; Shulman, 1986, 1987; Wenglinsky, 2002; Wilson, Floden and Ferrini-Mundy, 2001. Council of Chief State School Officers: Blank, R.K., Alas, N., & Smith, C. 2008.; Mestre & Cocking, 2002; Weinburgh, Smith, & Clark, 2008; Whitehurst, 2002; Wilson, Floden, & Ferrini-Mundy, 2002.

Teacher Learning and Professional Development: Appears effective when it addresses the following



The Framework and Next Generation Science Standards have a New Vision of Science Learning that Leads to a New Vision of Teaching



Intertwine three dimensions



- Scientific and Engineering Practices
- Disciplinary Core Ideas
- Cross-cutting Concepts

What are promising practices for
teacher learning?

What are promising practices for teacher learning?

- Job-embedded, aligned to local curriculum
- Informed by student learning data and work
- Part of local PLC or CoP
(building capacity from within, collaborative)
- On-going, year long, of sufficient duration, intensity, and coherence. (50-80 hours/year)
- Addresses teachers' personal learning needs/preferences within district strategic initiatives (bounded autonomy)

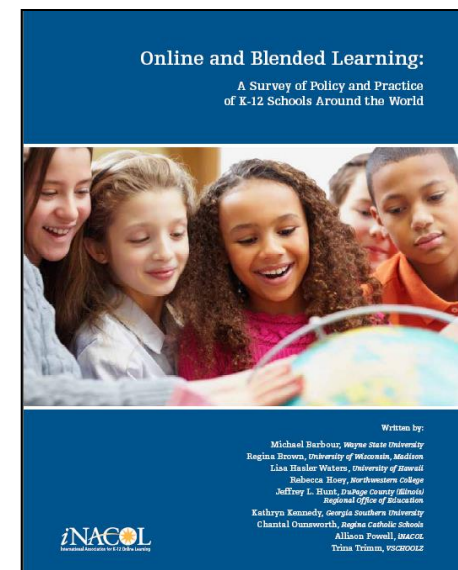
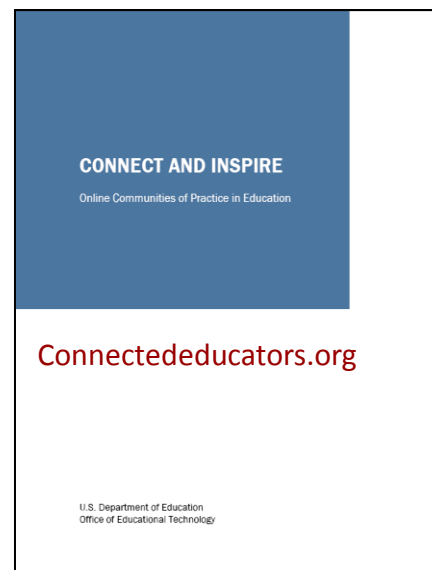
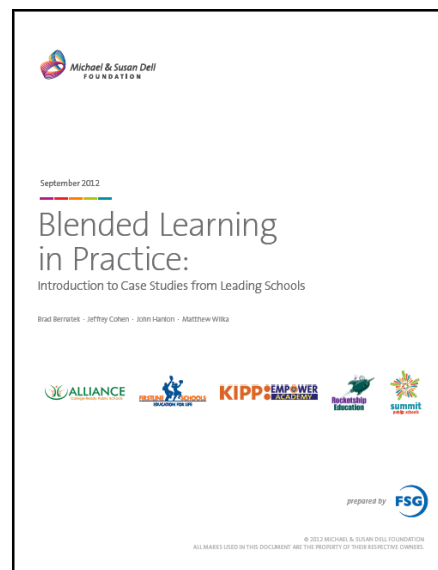
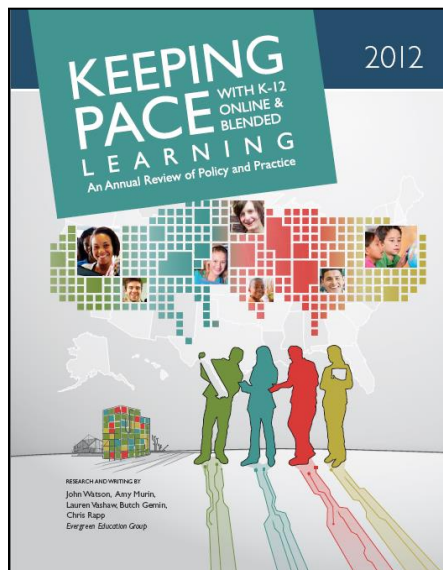
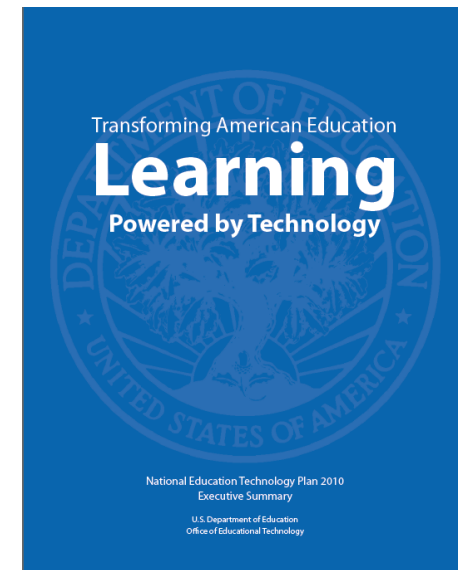
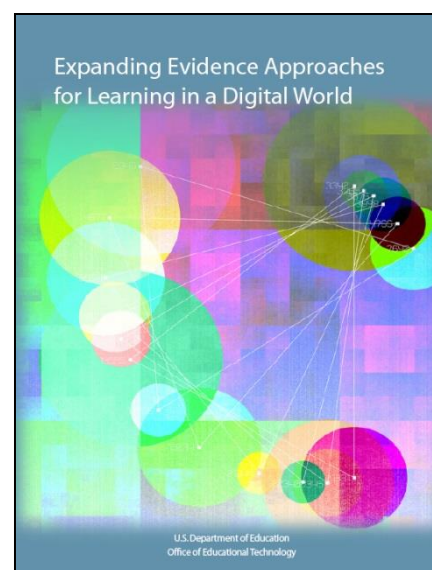
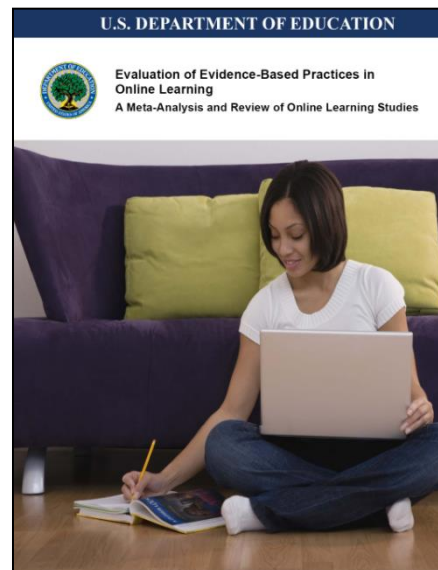
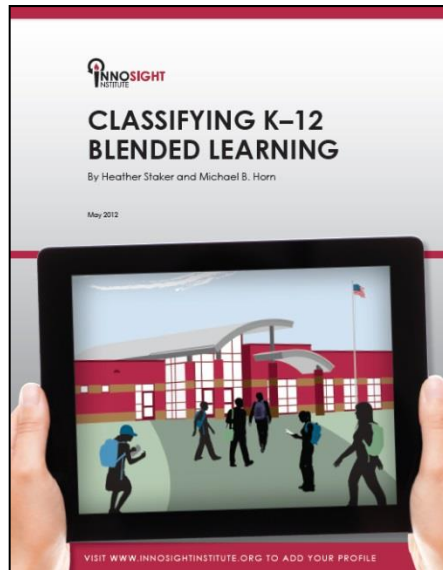
2010 National Education Technology Plan

Through online learning systems, teachers may enhance their learning through **blending the best of onsite PD with online PD** that provides **immediacy, convenience, self-direction, and collaboration** with other colleagues and experts via professional learning communities.

For teachers to effectively facilitate using interactive resources, learning systems, and connectedness to online communities, **teachers need to experience it firsthand—as part of their own learning and professional development.**

US Department of Education (2010). *Transforming American education: Powered by Technology*. Washington, DC: Office of Educational Technology.





Blended Teacher Learning

- Integration between Onsite and Online Learning



- Involves the mix of *pedagogical strategies* in combination with various *modes and mediums* leveraging *technology-mediated solutions* to maximize desired learning outcomes

(Kim, Bonk & Oh, 2008; Lockee, BB., Moore, M., Burton, J., 2001; Smith & Kurthen, 2007; Tang & Bryne, 2007; Vaughan, 2007; Verkroost, Meijerink, Lintsen, & Veen, 2008; Yoon & Lim, 2007)

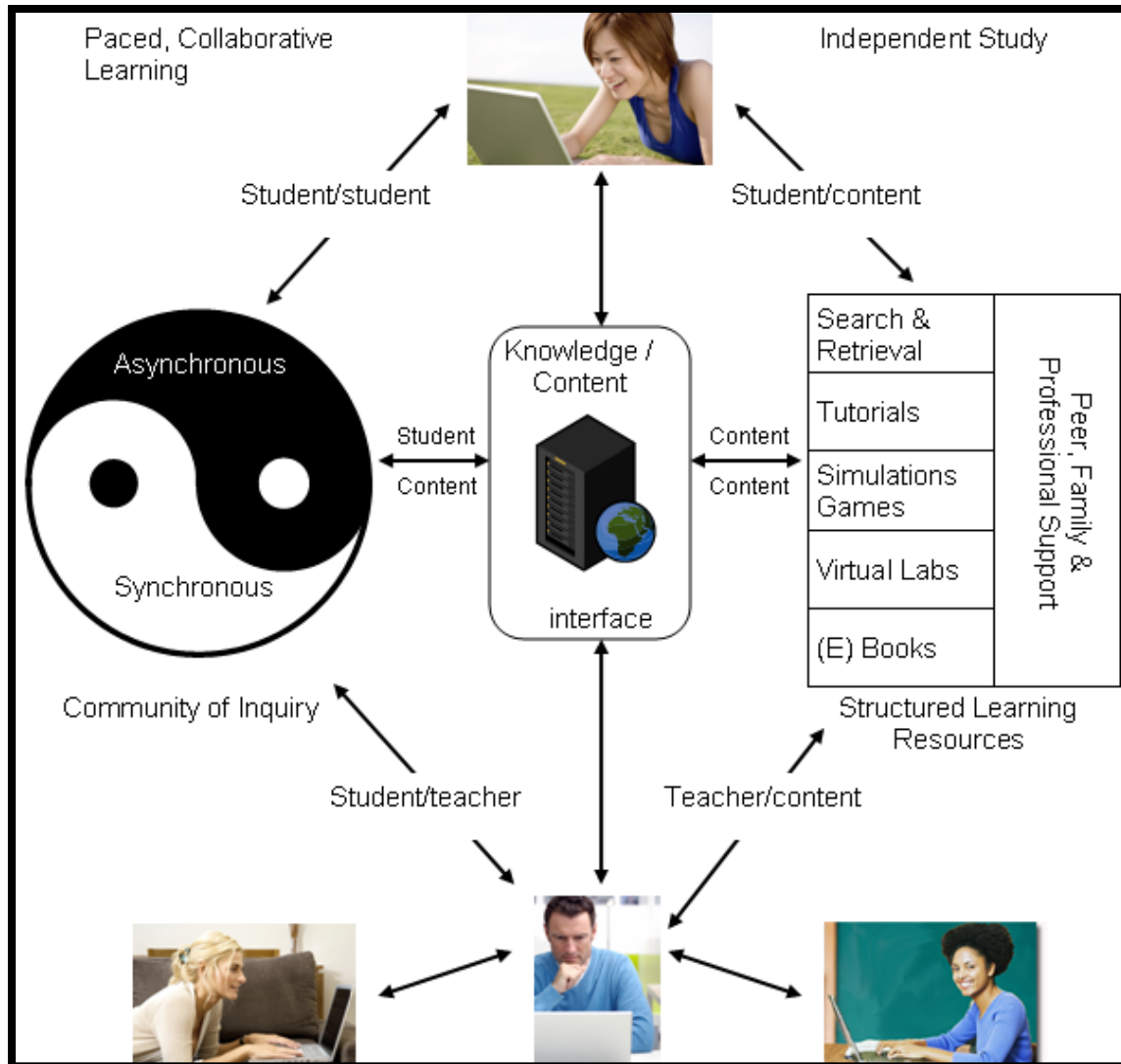
Research in Online and Blended Learning

Study	PD Program Model	Target Audience/ Content Area	Research Findings
Berger et al. (2008)	Blended online and face-to-face	High School Physics (n=16)	Strong online participation linked to student work, Your Comments, Hot Polls, Hot Reports, Smashing Sentences
Krall et al. (2009)	Self-paced, on-demand, hands-on kits, mentor	Elementary and Middle Science and Inquiry (n = 43)	Significant gains in subject knowledge. Hands-on most valued. Low mentor rating via email -- too critical
Owston et al. (2008)	Blended online and face-to-face	Middle School Science & Math (n = 33)	Significant gains in teacher perception of inquiry. Weak online participation. Challenges in online component even when provide release time. Reading articles and commenting.

Research in Online and Blended Learning

Study	PD Program Model	Audience & Content	Research Findings
del Valle et al. (2009)	Self-paced, 12 week module, instructor help	K-12 in-service teachers (n=59)	Mastery-sig. time over longer period, Task-focused-less time in shorter period, not prefer cohort learning. Procrastinator-little time, longer period to complete, prefers cohort learning.
Lowes et al. (2007)	4-week course, async discourse, readings, group project at end. 6 schools, 3 states	Middle & High (grades 6-10), school-wide reform	Online discourse analysis. Cheerleader-affirming + new information increases online participation. Vary over course to more questioning/challenging at end.
Whitaker (2007)	On-demand: 3 levels of support. A) web access B) reflection tools, resources, C) 1-on-1 video chat and teaching clip.	pre-K teachers (n=235)	Level of service significantly affects teacher participation. Group C log on more, Group A log on for longer periods of time, but significantly less frequently. Personalized feedback strongly valued. Better to respond quickly with brief message that delayed with longer posts

Anderson's Equivalency of Interaction



While learner-learner, learner-content, and learner-instructor interaction is preferred for online interaction to enhance learning, if one of the three interactions is designed well, the other two may be offered in a diminished capacity and still provide an equitable learning experience. This address scalability issues where diminished support may be available.

Anderson, T. (2003) Getting the mix right again: An updated and theoretical rationale for interaction. International Review of Research in Open and Distance Learning, 4

Learning Center Overview

A Critical Piece of the Teacher Learning Solution

- Self-Directed Access
- 11,000+ resources
- Free tools to help teachers **diagnose, organize, personalize, and document** their learning
- Immediate free access to online **advisors** and colleagues through chat and discussion
- Recognition system with badges tied to personal profiles

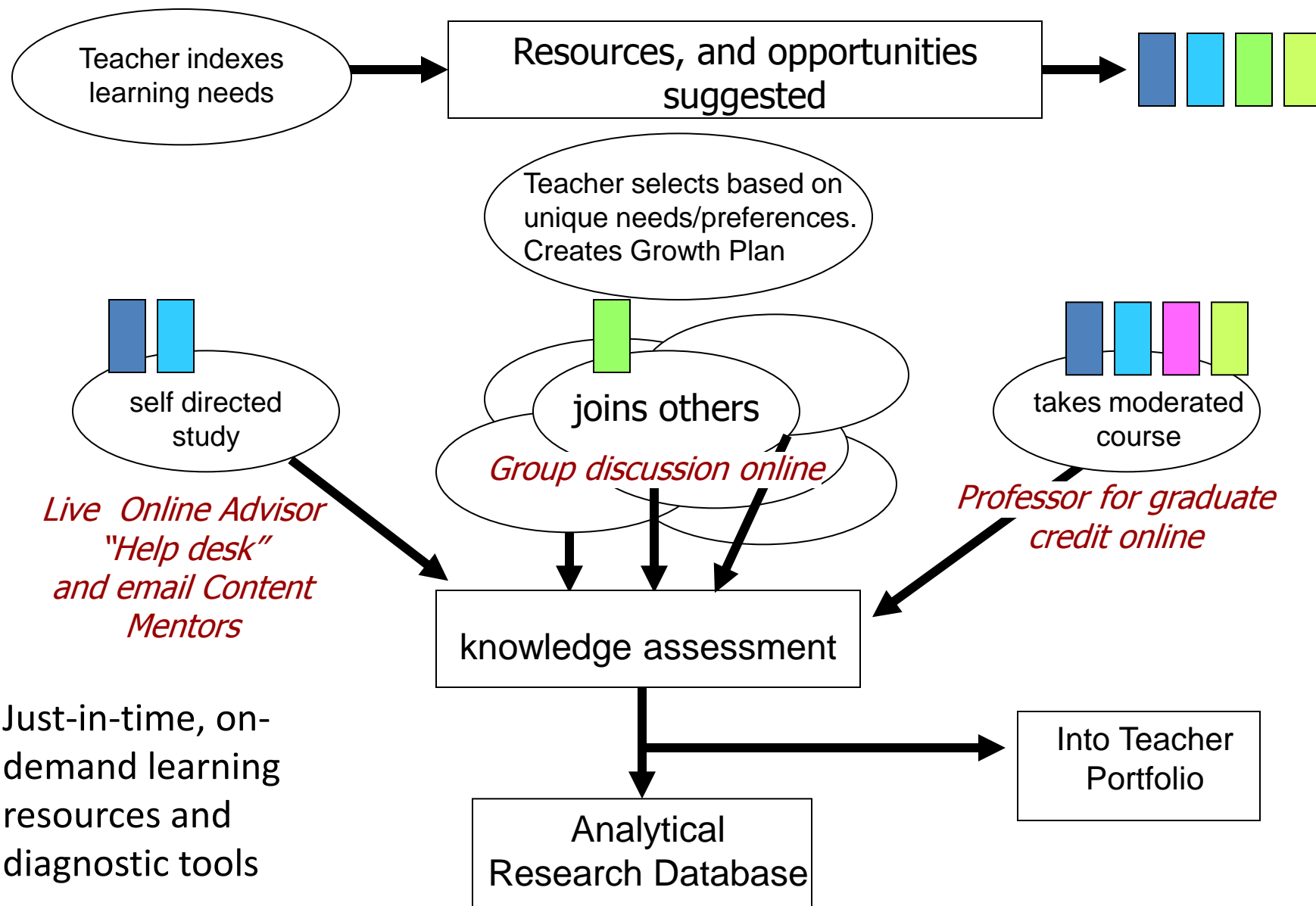
<http://learningcenter.nsta.org>

The screenshot displays the NSTA Learning Center website. At the top, the NSTA logo and "National Science Teachers Association" text are visible. Below the header, a navigation bar includes links for Home, My PD Tools, Subjects, Learning Resources & Opportunities, Community Forums, Education Administrator, and Help. A search bar is also present.

The main content area is titled "My Learning Center" and includes a welcome message for "Albert". It features a progress bar showing "2765 Activity Points" earned and a list of recent achievements, including "Platinum Indexer" and "Diamond Commenter". A section titled "Welcome to Your Personalized Learning Web Space!" provides a search bar and a list of resources, including "This Week's Most Shared Collection" and "Life Science HDQE".

Below this, the "Explore Learning Opportunities" section is divided into three columns: "By Subject" (Earth & Space Science, Life Science, Physical Science), "By Grade Level" (Elementary, Middle School, High School, College), and "By State Standards" (Select your state to begin: Choose a state). It also includes sections for "Do-It-Yourself Learning", "Live Online Seminars & Classes", "Books, Articles & Websites", and "In Person Experiences".

On the right side, there is a "LIVE SUPPORT ONLINE" section with a "Click here" button and a "Hours of Operation" link. Below this is the "Connected Educator" logo and a "Give us your feedback!" button. At the bottom, there is a "Most Popular Resources" section with a list of resources, including "Coral Reef Ecosystems", "Cell Structure and Function: Cells -- The Basis of Life", "Plate Tectonics: Layered Earth", and "Archive: NSTA Learning Center Update and Free PD Resources, ...".



The NSTA Learning Center

Sept 2013: **11,000+** Learning Resources and Opportunities Available



Do-It-Yourself Learning



Live Online Seminars & Classes

SciGuides [39]

Science Objects [94]

SciPacks [24]

Archived Seminars/Podcast [1,840+]

Web Seminars [110/year]

Short Courses [20+/year]



Books & Articles



In Person Experiences

Journal Articles [5,800+]

NSTA Press Books [310+]

e-Chapters [2,140+]

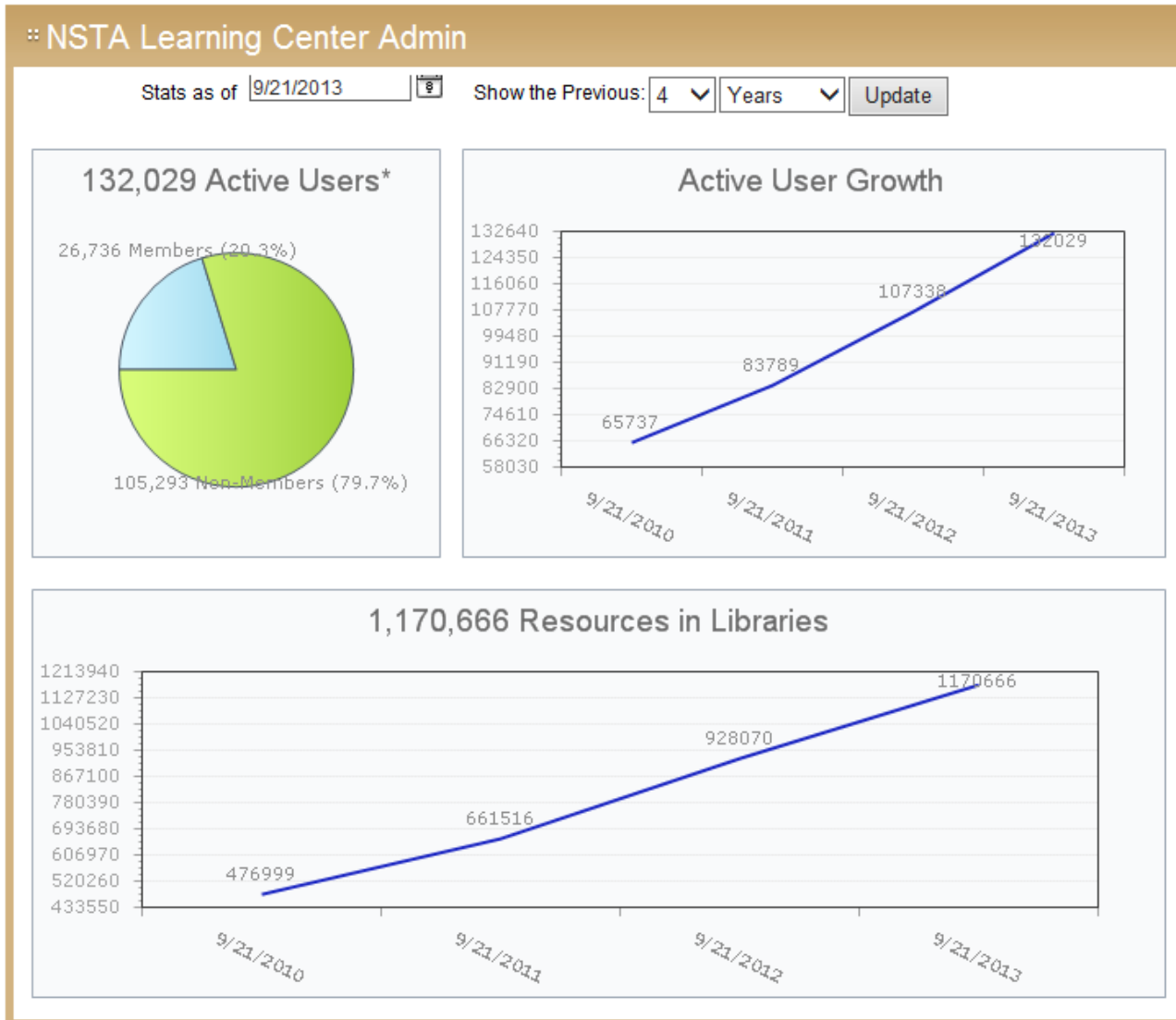
Symposia [3-6/year]

PD Institutes [6-10/year]

NSTA Conf./Forums [5/year]

Resources tagged to filter or sort by learning preference

The Learning Center has grown substantially since 2010





Learning Center


Selected Tools to Facilitate Personalization and Sharing

PD Indexer and The PD Plan and Portfolio

- Identify Personal Learning Needs in Core Ideas of Science
- View Resources and Opportunities for Consideration
- Add to Your Individual Growth Plan

PROFESSIONAL DEVELOPMENT INDEXER

The Professional Development Indexer helps you diagnose your needs in specific science content areas and provide suggestions of NSTA e-PD resources and opportunities you may want to consider as you plan your professional development (PD). The Indexer does not assign a grade or present a score to the questions you answer, but saves a list of recommended resources for later review.



You have two options for indexing your PD needs. First, you may review all of the content areas across any of the three science disciplines provided: physical, life, or earth and space science by clicking the "Diagnose All Subjects" button with a specific discipline. This will present you with five questions randomly selected from each content area for that discipline. Or, you may select one or more content areas within a discipline by checking the appropriate boxes and then selecting the "Diagnose Selected Subjects" button. This will present 10 questions from each science content area selected.

Earth and Space Science Indexer

Content Areas Covered:

- ☐ Rock Cycle
- ☐ Earth, Sun, and Moon
- ☐ Gravity and Orbits
- ☐ Solar System
- ☐ Plate Tectonics
- ☐ Universe
- ☒ Oceans Effect on Weather and Climate
- ☐ Earth's Changing Surface

Diagnose Selected Subjects

Diagnose All Subjects

Completed Indexes Indexes in Progress

Completed Indexer Results

Rock Cycle, Earth...	Results 3/23/2007	Delete
Solar System, Pla...	Results 11/5/2008	Delete
Gravity and Orbit...	Results 11/17/2009	Delete
Solar System	Results 10/5/2009	Delete
Oceans Effect on ...	Results 11/21/2009	Delete

Hide Results

Life Science Indexer

Content Areas Covered:

- ☐ Cell Structure and Function
- ☐ Coral Reef Ecosystems
- ☐ Science of Food Safety

Completed Indexes Indexes in Progress

Completed Indexer Results

Cell Structure an...	Results 9/11/2009	Delete
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PROFESSIONAL DEVELOPMENT INDEXER

Category: Life Science Indexer

Date: 4/1/2011

↓ **About Your Feedback**

↓ **Collapse All Recommended Resources**

Cell Division and Differentiation

Your score: **5** out of **10** correct

Close Resources

All Resources for this Subject

Cell Division and Differentiation



Cell Division and Differentiation: Continuity of Life

Science Object



Continuity of
Life

Add to PD Plan

Science Objects are two hour on-line interactive inquiry-based content modules that help teachers better understand the science content they teach. This Science Object is the first of three Science Objects in the Cell Division and Differentiation SciPack.

Member Price: **Nonmember Price:** Free

Free

Grade Level: Elementary School, Middle School, High School



Cell Division and Differentiation: Variation and Specialization of Cells

Science Object



Variation and
Specialization of
Cells

Add to PD Plan

Cronbach Alpha Internal Consistency

Pre and Postassessment	No. of Items	No. of Cases	Internal Consistency*
Earth History	20	111	.704
Magnetic and Electric Forces	22	114	.821
Nature of Light	20	105	.737
Atomic Structure	16	102	.882
Cell Structure and Function	23	261	.636
Chemical Reactions	23	101	.877
Elements, Atoms, & Molecules	28	103	.812
Cell Division & Differentiation	22	97	.752
Cells & Chemical Reactions	24	94	.821
Force and Motion	25	220	.816
Energy	20	227	.759
Solar System	20	238	.695
Plate Tectonics	20	216	.790

Byers, A., Koba, S., Sherman, G., Scheppke, J., & Bolus, R. (2011). Developing a web-based mechanism for assessing teacher science content knowledge.

Journal of Science Teacher Education.

[Welcome](#)
[Select Goal Categories](#)
[Define/Measure Goals](#)
[View Status](#)
[Generate Report](#)

Identify Evidences

Portfolio Manager

- My Content Knowledge
 - (goal) - Review/Improve Physical Science Understanding
 - (goal) - Cell Differentiation: Depth of Understanding
 - Reflection
- My Content Pedagogy
- My Assessment/Evaluation Skills
- My Technology Skills
- My Leadership Skills
- My Management Skills
- Impact on Student Learning
- Other

Category: My Content Knowledge

Goal: Cell Differentiation: Depth of Understanding

My Tasks:

[Define Evidence](#)

[Edit Goal](#)

[Delete Goal](#)

Instructions and How-To Animations

Identified Professional Development Resources

PD Resource to Address Goal	Note	
Cell Division and Differentiation: Continuity of Life	I am a middle level teacher, now responsible for 3 preps, and am teaching in an area with little experience	Delete

Expected Date of Goal Completion

6/1/2011

Goal Statement

- Empty - [Add information](#)

Why I chose this goal, and where I am now

- Empty - [Add information](#)

Standards

You are currently using **1%** of your **1 GB**

My Library

Upload and
share your
own resources

Over
4,100 public
collections
shared

Over 50,000
personal
resources
uploaded

Two GB *free*
space for your
personal files

My Library

Welcome, Albert  Admin | Log Out

Welcome to your collection of professional development resources. Select from the links and tabs below to access your NSTA resources, your uploaded items, organize them into collections, and then share your collections with others.



My Resources

My Resource Collections

Assessment

One of the biggest challenges to the more widespread use of inquiry is the difficulty teachers have in identifying appropriate activities.

Intended for: Elementary, Middle school

-  [Share this Collection](#)
-  [Make this Collection Public](#)

-  [Back to All Collections](#)
-  [Edit Collection Name/Description](#)
-  [Delete Collection](#)

Sharing
Resources

Currently displaying items: 1 - 2 of 2

Sort By: Title








A Rubric for Selecting Inquiry-Based Activities

Type: Journal Article

Days Remaining: Unlimited

Grade: Middle School

Summary: One of the biggest challenges to the more widespread use of inquiry is the difficulty teachers have in identifying appropriate activities. Teachers can structure the use of inquiry in the classroom with this rubric based on the *National Science Education...*

-  Recommend to a Friend
-  Modify Collections
-  View/Edit Notes
-  Write Review
-  Remove From Collection








Assessing Student Presentations From Three Perspectives

Type: Journal Article


Days Remaining: Unlimited

Grade: Middle School

Summary: Analyzing student presentations from three perspectives—expert, peer, and self—provides extended feedback and opportunities to learn. All three of these are helpful and serve different purposes. The expert (teacher) feedback shows how the teacher views...

-  Recommend to a Friend
-  Modify Collections
-  Create Note
-  Write Review
-  Remove From Collection

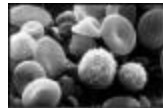
 Recommend

 Sign Up to see what your friends recommend.



Learning Center

Selected Resources and Opportunities





- Two-hour **free** online learning experience in a particular topic
- Interactive **simulations** of phenomena in an engaging way
- Questions to promote **learning** via inquiry-based strategy
- Based on **Disciplinary Core Ideas in the NGSS**
- Over eighty **(94) free** Science Objects currently available



Position and Motion

-  Introduction
-  Position
-  Motion
-  Changes in Motion
-  Tying it All Together
 -  Tying it All Together
 -  Animation Analysis
 -  Summary
-  Evaluation
-  Glossary
-  Credits

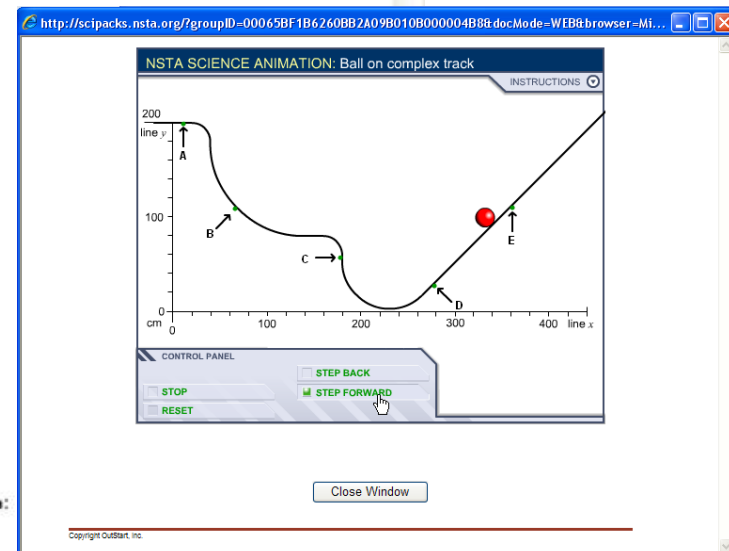
Animation Analysis

The following animation shows a ball rolling along a track. Replay the motion a number of times and then answer the multiple-choice questions that follow. In answering those questions, feel free to replay the animation if necessary. Select the icon to launch the animation in a new window.



Figure 5.2. Ball on Complex Track Animation

For those unable to engage with the interactive component, select this link for a long text description:
[Text Description](#)



Practice

Okay, now that those mental wheels are turning, see if you can answer these questions. If you miss an answer or two or three, it might be worth your while to review the appropriate sections of this Science Object.



What is the approximate position of Point E in relationship to Point A?

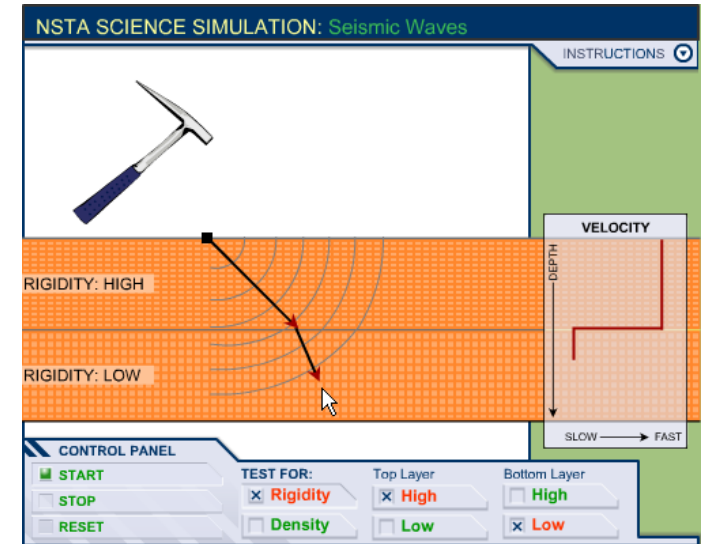
- ☐ E is about 350 centimeters away from A, at an angle of about 80 degrees with respect to Line Y.

Interactive Learning beyond Narrative and Images



2 of 3

The petri dish after overnight incubation shows colonies of bacterial growth.



Which of the following best describes the concept of inertia?

- ☐ Inertia is just a name that describes the fact that an object obeys Newton's first law.
- ☐ Inertia is sort of an "internal force" that actively resists changes in motion. For example, when you try to push something, its inertia pushes back on you.
- ☒ Inertia is something that pushes an object along once you have thrown and released it.
- ☐ Inertia is something an object has moving, an object loses its inertia.

Check

Answer Feedback

Please try again.

Inertia is the reason the object keeps moving even after you release it, but it is not something that pushes the object along. Once you release the object, there might be forces of air friction and gravity acting on it, but the object itself doesn't do any pushing.

Close

If a force is exerted on an object, you can be sure the object will accelerate.

Check Your Thinking

False. In order to figure out whether or not an object will accelerate, you must determine the *net* force acting on it. It's possible that the force in question is balanced out by another force, leading to zero net force and zero acceleration.

Over 260 free Simulations and Animations

NSTA SCIENCE SIMULATION: Make a Reef

INSTRUCTIONS ⓘ

CONTROL PANEL

pH: 4 | Temperature: 23 - 29 °C | Light: No Light | Salinity: 41 - 55 ppt

8 | 17 - 23 °C | Murky | 25 - 40 ppt

13 | 10 - 17 °C | Clear | 10 - 24 ppt

NSTA SCIENCE SIMULATION: Seismic Waves

INSTRUCTIONS ⓘ

CONTROL PANEL

☒ START ☐ STOP

TEST FOR: ☒ Rigidity ☐ Density

Top Layer: ☒ High ☐ Low

Bottom Layer: ☐ High ☒ Low

NSTA SCIENCE SIMULATION: Air Track

INSTRUCTIONS ⓘ

CONTROL PANEL

Piston Force: ☒ 1 N ☐ 2 N

Cart A Mass: ☐ 1 kg ☒ 2 kg

Cart B Mass: ☐ 1 kg ☐ 2 kg

NSTA SCIENCE ANIMATION: Angles & Distance

INSTRUCTIONS ⓘ

CONTROL PANEL

HELICOPTER DISTANCE: (FROM STARTING LINE) meters

TORTOISE DATA		HARE DATA	
DISTANCE: 0000 m	DIRECTION: N	DISTANCE: 0000 m	DIRECTION: N
SPEED: 0 m/s		SPEED: 00 m/s	

NSTA SCIENCE ANIMATION: Velocity & Speed

INSTRUCTIONS ⓘ

CONTROL PANEL

Well, Derek, Tank the Tortoise had a considerable challenge with speed and the hare, Mel, had to overcome his challenge with overall average speed.

NSTA SCIENCE SIMULATION: Vertical Balloon

INSTRUCTIONS ⓘ

CONTROL PANEL

PAYLOAD: 4 2

NSTA WEB SEMINARS

LIVE INTERACTIVE LEARNING @ YOUR DESKTOP

NSTA offers
110 free live
web seminars
during the
school year.

Over 550
delivered
with 30,000
educators
reached since
2004

Goals for this Talk

- Share an overview of our e-learning portal and the need it addresses
- **Share strategies behind the design and affordances provided via our online professional learning community**
- Share and discuss research findings and studies that are supporting our on-going design efforts.

Learning Center **Community**



Building a Vibrant Learning Community

- ***Psycho-emotional Roles for Growth and Recognition***
- ***Compelling Content***
- ***Moderated Social Learning Discourse***



Interaction Opportunities

Consume/Engage/Excite

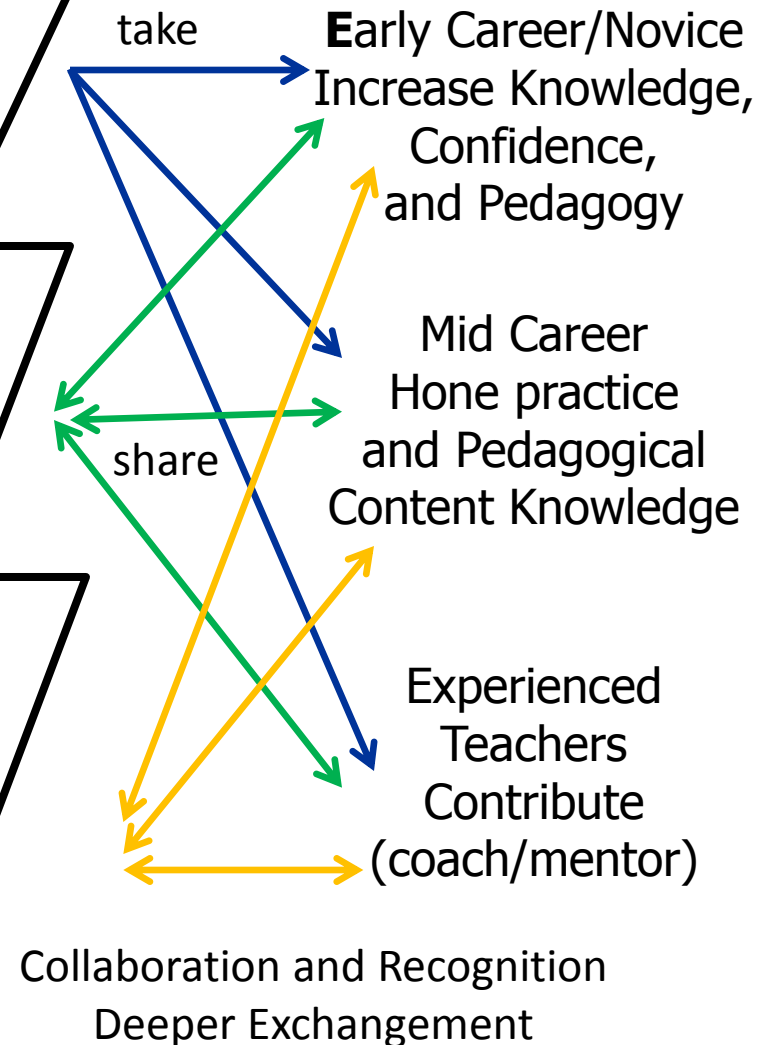
- Just-in-time resources from trusted source and/or colleagues

Consume/Contribute/Extend

- Resources/Strategies support local student-driven data
- Professional Learning Community

Consume/Mentor/Enlighten

- Elevate stature in community
- Serve in leadership capacity
- Contribute to improvement and generation of resources
- Refine strategies, support others



Wendy Ruchti

Wendy Ruchti has been part of the Educational Foundations Department at Idaho State University's College of Education since 2008. She received a PhD in Education from the University of Idaho in 2005 with an emphasis in curriculum and instruction in STEM education. At ISU, she has taught several educational foundations courses. Her research interests include elementary science education and creating collaborative online learning environments. Before coming to ISU, she taught middle school science and math.



Lara Smetana

Lara Smetana is an assistant professor of science education at Southern Connecticut State University. She brings classroom experience as an 8th grade physical science teacher and has worked with a variety of informal education programs across the country. Lara teaches courses in elementary science methods and educational technology and mentors student teachers. Her research interests include pre- and in-service teacher education and the use of educational technology in science teaching and learning.



Kathy Sparrow

Dr. Kathy Sparrow is currently an adjunct professor at Florida International University (FIU), teaching Elementary Science Methods. She previously worked as a middle and high school science teacher as well as the Science Supervisor for Akron Public Schools. She was a Regional Director for SECO, served on the NSTA Board of Directors and was president of the National Science Education Leadership Association (NSELA). Kathy was also awarded the Outstanding National Science Supervisor Award in 1999.



Search the Learning Center

Discussion Forums Education Administrator

Welcome, Flavio :: [Admin](#) | [Log Out](#)

New: Discussion Forums Help Desk

NEW LIVE SUPPORT

Online Advisors now available!

Featured PD Resource

Science Objects **FREE**

Force and Motion: Position and Motion

LIVE SUPPORT ONLINE

Click here →

Growth across all community forums

- 12 Discussion Forums
- 2,200+ User Generated Topics
- 22,000+ Posts by Users
- Physical Science
- Life Science
- Earth/Space Science
- Pedagogy
- Evaluation/ Assessment
- Research in Science Ed
- STEM
- NGSS

Community Forums

Home > General Science and Teaching > The Flipped Classroom

Find Topics and Users

SEARCH COMMUNITY/PEOPLE

LIVE SUPPORT ONLINE

Click here →

Hours of Operation

Sun Dec 04, 2011 3:34 PM

80 Replies by Pamela Auburn

1517 Views Fri Mar 15, 2013 1:39 PM

18 people currently online

POST REPLY

WATCH THIS TOPIC

MOVE THIS TOPIC

by Kayla Anselmi, Thu Dec 08, 2011 1:15 PM


Sandy,


These are two great resources, thank you. The way I plan to deal with students who do not have access to the internet is either by allowing them to download the video files to a flash drive to play on their computer (without internet) or by giving them a DVD with the videos burned to it so they can play them on their TV.

Here are two documents that I prepared to provide to parents and students as I begin this flipped model.

Attachments

 [Flipped Classroom Parent Letter.pdf](#) (0.06 MB)

 [Flipped Mastery Rubric Unit 7.doc](#) (0.05 MB)

 **Kayla Anselmi**
20 Posts
3380 Activity Points


NSTA New Science Teacher Academy Explorations Accelerator

Private Message Kayla

EDIT

REPORT

REMOVE

by Sandy Gady, Thu Dec 15, 2011 10:40 PM

I too like your letter home to parents/guardians. You provide in a very clear and positive way the expectations you have that students will watch the videos at home.

A couple of curiosities. One, how long are the videos the students watch? Did you create them yourself, or are they already on YouTube or some other source? From your rubric, it appears you have a list of expectations for the amount of work your students need to complete. I'm not sure how long the unit you have listed is to last, it appears to be about three weeks. I noticed the note on the bottom that at the end of six weeks work not completed would be a zero. I would love to know more how this works in a real classroom over a period of time and the changes and modifications you would make.

 **Sandy Gady**
834 Posts
29470 Activity Points


Platinum Advocate

Private Message Kayla

EDIT

REPORT

REMOVE

by Pamela Auburn, Sat Nov 03, 2012 1:00 PM

I began flipping some of the lessons in my chemistry class when I re-wrote the learning outcomes to emphasize what students should be able to "do" rather than what they should know. This rewrite called to my attention that if the LOs were performance based I would need to structure my lessons around those performance objectives. Yes I know students are supposed to practice with homework at home. Well just as some students do not watch the videos even fewer do homework. So here I chose to fight the battle in what I thought the most effective manner. Practice is critical and guided practice is better than unguided (individual at home practice - more on this later) practice.


Here is a collection of resources on flipped classrooms

Flipping Your Classroom Collection

(10 items)

Open in New Window

 **Pamela Auburn**
1791 Posts
55600 Activity Points


SciPack Accelerator

Private Message Kayla

EDIT

REPORT

REMOVE

5

:: Learning Center Profile



**Kathy
Renfrew**

21175 Activity Points

[Private Message Kathy](#)



Web Seminar
Optimizer

[Recent Posts](#)

[Recent Public Collections](#)

[Recent Reviews](#)

About Me: As a teacher, I bring experience to my work at the Vermont Agency of Education. I am co-lead in Vermont's role in NGSS development. As the Elementary Science & Mathematics Specialist I assist with the implementation of the CCSS in both Mathematics and English Language Arts. Recently our team developed a Short Focused Research Project based on science content for K-2 students that is being shared regionally throughout the state. I am a member of a collaborative team of specialists from New Hampshire, Rhode Island and Measured Progress who develop, and construct the NECAP science assessment. In 2000, I was honored as Vermont's elementary Presidential Awardee for Excellence in Science Teaching. I am an active NSTA member who is currently on the committee that chooses the Outstanding Science Trade Books.

[View Your
Activity Log](#)

Affiliation: VT Agency of Education

Location: West Barnet, VT

Badges Earned:



Integrating high quality content with moderated discourse to improve personal practice:

I use the Learning Center to ***share ideas*** that I have and ***learn more about the ideas of others***. What I've found in our practice is that, ***if you isolate yourself, it basically stunts your growth...*** there's no follow-up or conversation with other educators... ***So the opportunity to talk "education" in these forums is very valuable,*** you get insights from other people regarding these resources. In that way ***it has been very crucial to my growth*** as an educator...



See: <http://learningcenter.nsta.org/impact/testimonials.aspx>

Teacher
Recognition

Administrator
Affirmation

My Learning Center


Welcome, Albert :: Admin | Log Out

Welcome My Profile My Library My PD Indexer My PD Plan and Portfolio My PD Record and Certificates My Calendar My Notepad My Community Forums My Help Desk

Welcome to Your Personalized Learning Web Space!

SEARCH COMMUNITY

Albert, you've already earned [2765 Activity Points!](#)

You've recently earned:  **Platinum Indexer** [Complete Indexers](#)



You're close to earning: **Diamond Commenter** [Post 25 more comment/questions](#)

UPDATE YOUR PROFILE

CHECK THE LEADER BOARDS

Activity Progress Bar

Your Activity Matters!

It donates Books and Pencils!



With these resources you can build your professional development plan, track your activities and assess your progress. You can start at "Explore Learning Opportunities" below or by creating your game plan with the PD Plan and Portfolio tool. You may also review an [archived Web Seminar](#) or a [multimedia overview](#) of the Learning Center.



Jennifer M Tanko
Last Week's [Top Advocate](#)



This Week's
Highest Rated Collections



[Interdependence of Life](#)
Shared by:
[Alison Rivera](#)

:: Explore Learning Opportunities
• [Advanced Search](#)

• [See all FREE Lesson Plans](#)
• [See all FREE Resources](#)



LIVE SUPPORT
ONLINE

Click here

NSTA Learning Center Leader Boards

Follow your top colleagues' online activity and contributions



Top Commenters

Building a worthwhile learning community provides opportunities for you to recognize those leaders that share their ideas, lessons and resources. The top commenters are those that contribute their voice in the Community Forums. [Join the dialog!](#)

Learning Headlines and Opportunities

























Upcoming live web seminars:

NGSS@NSTA
STEM STARTS HERE

May 14, 2013 - [NGSS Crosscutting Concepts](#)



May 16, 2013 - [Engineering Design Challenge: Thermal Protection System](#)

Overall	Commenters	Aggregators	Disseminators	Advocators	SciPack Power Users
Pos	Name	Commenter Points Earned	Recent Donations/Badges		
1	 Dorian Janney	3,440	   		
2	 Therese Houghton	3,230	   		
3	 Angelika Fairweather	2,670	   		
4	 LeRoy Attles	2,430	   		
5	 Lorrie Armfield	2,050	   		

Teacher perceptions of administrator recognition matters. Affirmation has impact.

Pre-Service Methods Professor: I have to admit that I was skeptical about the points/badges system working with my students, but I was SO-O-O-O wrong! I simply put an announcement on Blackboard praising the top folks to date over the weekend. I didn't even think about the fact that the only man in one class had the overall top points. Several young women announced, "We can't let Terry get away with that!" And so it began.... Sally mocked them for not checking their profile page for updates on their points...I haven't met with my other class yet, but they too have upped the ante. I don't know what their reason is. I just know that a small group has infected the larger group.

<http://learningcenter.nsta.org/impact/testimonials.aspx>

Recognizing Teacher Learning and Leadership

- *Provide opportunities to build reputation and contribute to the community and as part of your own personal growth*
- *Over 48,000 badges earned in 2011-2012*



Administrator: *One of our teachers sent the following information after receiving a note from NSTA that stated:*

Congratulations! You have been selected as the NSTA Learning Center Top Advocator for the week of May 28 – June 3, 2012.

She was delighted and wrote, "Look at what I got in my email! ...NSTA picked me!! It's all because of you that I started this science journey in the first place! Thank you!!"

Badges to encourage community activity and sharing

Disseminator: Share an LC collection

10 Activity Points (AP)

[Select a collection to share](#)



Onyx Disseminator - Share a collection with 1 person



Pearl Disseminator - Share a collection with 5 people



Ruby Disseminator - Share a collection with 10 people



Emerald Disseminator - Share a collection with 25 people



Sapphire Disseminator - Share a collection with 50 people



Diamond Disseminator - Share a collection with 100 people



Platinum Disseminator - Share a collection with 150 people

Badges to encourage and document significant learning

Complete and pass a SciPack final assessment

100 Activity Points (AP)

[View the SciPacks](#)



SciPack Activator - Complete 1 SciPack and pass the Final Assessment



SciPack Optimizer - Complete 3 SciPacks and pass the Final Assessment



SciPack Accelerator - Complete 6 SciPacks and pass the Final Assessment

To earn your Activity Points after completing the SciPack final assessment, visit the [My PD Record and Certificates page](#). While there you may view, save, and print your SciPack certificate.

Complete all SciPacks within Physical Science

1000 Activity Points (AP)

[View the SciPacks](#)



PS SciPack Ultimotor - Complete all SciPacks within Physical Science

Notice
relative
weighting of
activities.
Those that
take more
effort earn
more points

Goals for this Talk

- Share an overview of our e-learning portal and the need it addresses
- Share strategies behind the design and affordances provided via our online professional learning community
- **Share and discuss research findings and studies that are supporting our on-going design efforts.**



Learning Center **Impact**

Pre/Post Assessment Results
Peer-reviewed Publications
Conference Proceedings
Third-Party Evaluations

<http://learningcenter.nsta.org/impact>

Indexers and Assessments

District Pre/Post Results

Graphs

Raw Numbers

6/7/2012



Previous: 4

Quarters

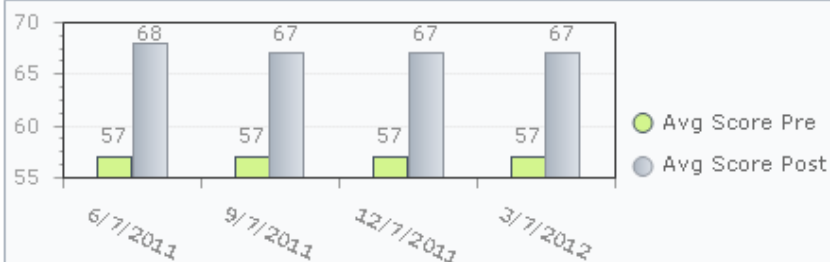
Update

Force and Motion Assessment

1626 Pre-tests taken with a 56% avg score

549 Post-tests taken with a 67% avg score

totals as of 6/7/2012

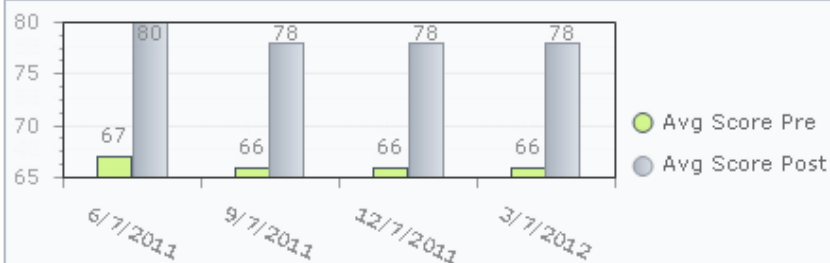


Energy Assessment

1108 Pre-tests taken with a 66% avg score

373 Post-tests taken with a 78% avg score

totals as of 6/7/2012

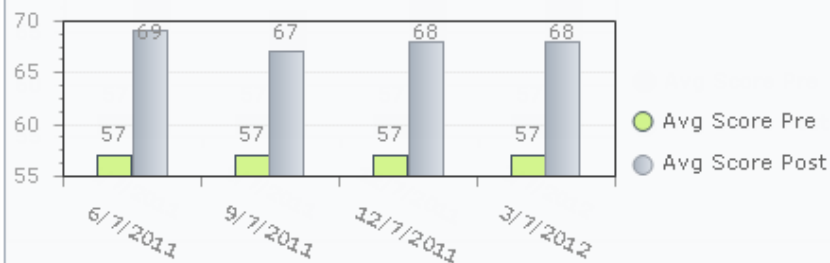


Oceans Effect on Weather and Climate Assessment

653 Pre-tests taken with a 57% avg score

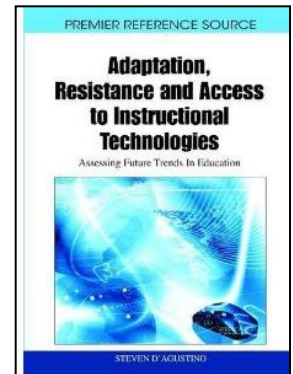
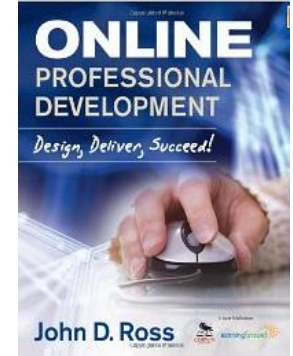
228 Post-tests taken with a 69% avg score

totals as of 6/7/2012



Peer-Reviewed Journals, Proceedings, and Books

- First steps towards a social learning analytics for online communities of practice for educators. International Learning Analytics and Knowledge Conference (2012).
- Simple and Computational Heuristics for Forum Management in the NSTA Learning Center: A Role for Learning Analytics in Online Communities of Practice Supporting Teacher Learning. International Conference on System Sciences (2012).
- Digital Resources to Support Science Instruction, Expert Panel, National Association for Research in Science Teaching, National Conference Symposium (2012).
- Social Network Analysis of Affiliation Networks to Promote Online Communities of Practice for Science Education, International Network for Social Network Analysis, Social Networks Conference (2012).
- Developing a web-based mechanism for assessing teacher science content knowledge. Journal of Science Teacher Education 22(3): 273-289, (2011).
- Improving Educator Effectiveness—Teachers as Co-learners. State Educational Technology Directors Association Leadership Summit: Leverage Technology for Learning (2011).
- Evaluation of online, on-demand science professional development material involving two different implementation models. Journal of Science Education and Technology 17(1): 19-31, (2008).



Third-party Evaluation Studies

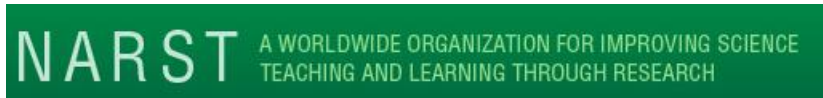
- **Quasi-experimental Design Study:** Across 3 districts finding *significant gains in teacher content knowledge using single SciPack*. (2008). n=45, teachers in grades 5-8
- **Experimental Design Study:** Pretest-posttest delayed-treatment/control group design with random assignment finds *significant gains in teacher content knowledge, teacher self-efficacy, and students' gain scores for grades 5-8 in treatment group across two SciPacks*. (2009-2010), n = 56
- **Descriptive Study:** Dissertation research finds *significant gains in teacher learning* for pre-posttest and pretest-final assessment. (2010). n = 85, teachers grades 3-6 from 11 different states.
- **NASA Blended PD Evaluation Study.** Incorporated SciPacks, Online Communities, Badges, Leader Boards, and Online Courses across 13 districts. *Significant gains in teacher learning and self-efficacy* (2010-2012) n = 300.

See: <http://learningcenter.nsta.org/research/>

Latest Research Studies

- **NSF VOSS study:** as Co-PI with RAND Corporation looking at which affordances are of greatest import and impact within our online community and for blended learning (Susan Strauss).
- **NSF DRK12 study:** Smaller study, looking at our blended PD district-based efforts with EDC (Lauren Goldenberg and Marian Pasquale).
- **US Department of Education, Office of Educational Technology ongoing research:** Connected Educator's Project looking at community management and value creation with the American Institutes for Research and the Friday Institute for Educational Innovation (Darren Cambridge, Sherry Booth, Shaun Kellogg).

Articles, Interviews, Panels, and Case Studies



Learning Center recognized as “Notable” web seminar July 24 1:00-2:00 PM EST



With insight from AIR...

CS 10K Community Work Plan January 2013, NSF CS PI Conference



“The [CS10K Community] site will issue digital badges, modeled off of the National Science Teachers Associations’ Learning Center badging System, to recognize teachers with specific qualifications, expertise, experiences, or contributions to the community.”

Effort sponsored by the US Department of Education,
Office of Education Technologies, and the National Science Foundation

I think the best blended learning model is:

1. Providing access to an online repository of digital content to enhance onsite PD experiences

2. Extending face-to-face summer experiences online via discussion with other colleagues on promising practices and strategies for pedagogy

3. Interacting in real time online throughout the year with leading scientists, engineers, and education experts from institutions such as US Department of Education, NASA, NOAA, and NSF discussing research with examples of applications for the classroom

4. Helping teachers diagnose and create long term growth plans that cater to their unique learning needs and connects them with resources and access to others with similar learning goals online whereby they might receive recognition and attribution as they collaborate

The NSTA Learning Center

Purpose: To enhance the personal learning of teachers by providing a suite of tools, resources, and opportunities to support their individual long-term professional growth based on their unique learning needs and preferences and within a professional learning community.



S.D. Bechtel, Jr.
Foundation



GE Foundation



Agilent
Technologies
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Developing Large Scale Effective STEM Teacher Learning Communities at the National Science Teachers Association

Thank You

Al Byers
Associate Executive Director
NSTA Services
PH: 703-312-9294
Email: abyers@nsta.org



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UPDATE YOUR PROFILE CHECK THE LEADER BOARDS

Activity Progress Bar Your Activity Matters! It donates Books and Pencils!

Jennifer M Tanko Last Week's Top Advocate

This Week's Highest Rated Collections Interdependence of Life Shared by: Alison Rivera

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See all FREE Lesson Plans
Advanced Search See all FREE Resources

By Subject	By Grade Level	By State Standards
<ul style="list-style-type: none"> Earth & Space Science Life Science Physical Science 	<ul style="list-style-type: none"> Elementary Middle School High School College 	Select your state to begin: Choose a state

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4. Archive: NSTA Learning Center Update and Free PD Resources, ...

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