

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

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National Science Teachers Association

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

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

Professional Learning Networks to motivate Teacher Learning: Research involving the NSTA Learning Center Convention Center 103A

10:30-11:30 am: **What Does “Blended Professional Development” Look like?** Marian Pasquale, EDC, Center for Children and Technology

12:15-11:15 pm: **How Online Communities Create Value for Educators: Lessons from NSTA.** Darren Cambridge, The American Institutes for Research, and Shaun Kellogg, The Friday Institute for Educational Innovation

2:00-3:00 pm: **Developing Large-Scale Effective Teacher Learning Communities at NSTA.** Al Byers, NSTA

3:45-4:45 pm: **Online Communities of Practice for Professional Development: What’s in It for Us?** Susan Straus, RAND

Goals for this Talk

- Gather audience insights and purpose
- 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.

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Setting the stage and sharing insights:

- Why did you select this session?
- What are examples of professional learning communities (large or small) you are familiar with and why do you think they are successful?
- How might one compare or define a Community of Practice to a Professional Learning Community?

PLC's ...the hype



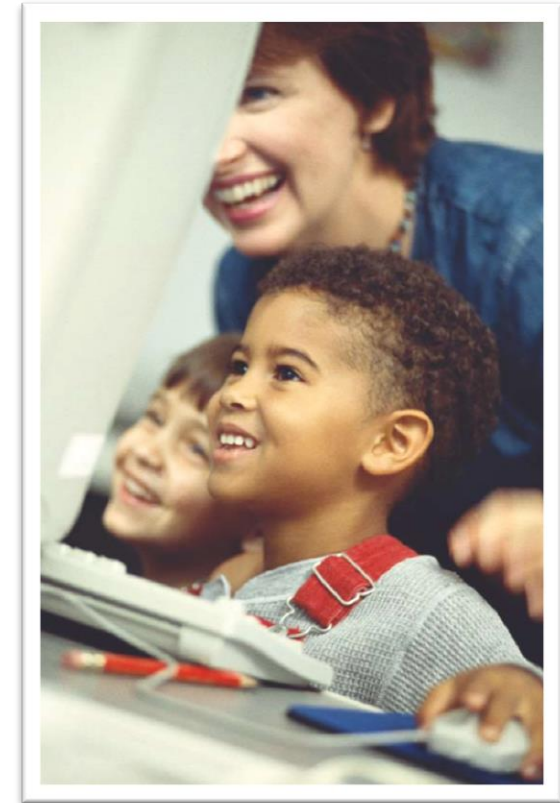
Barclay! The adjacent school district's test scores went up 25% last year apparently due to 'professional learning communities.' Whatever that is...I want two of them!

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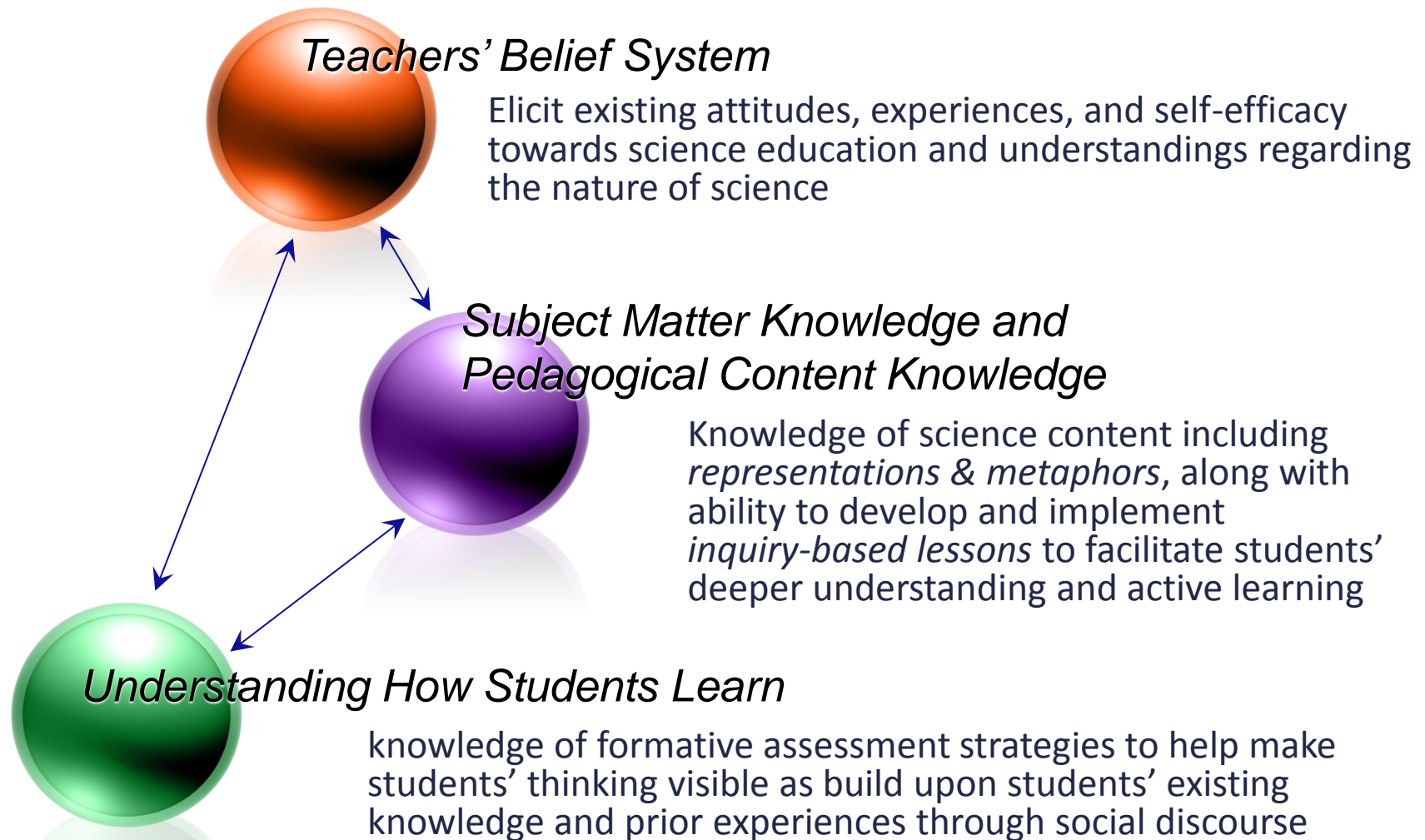
Need: Importance of Teacher Learning

- 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

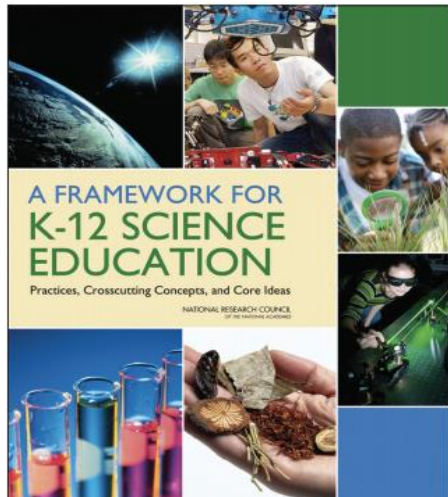


Aaronson, Barrow and Sander, 2003; Bransford, Brown,; Clermont & Borko, 1994; Cochran-Smith and Zeichner, 2005; Cocking, Donovan, & Pellegrino, 2000; Darling-Hammond, 2006; Darling-Hammond and Bransford, 2005; Economic Policy Institute, 2003; Gess-Newsome and Lederman, 1999; Goldhaber, 2002; Goldhaber 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 appears effective when it addresses



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

Back to you! What are promising practices for teacher learning (PD)?

- 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)

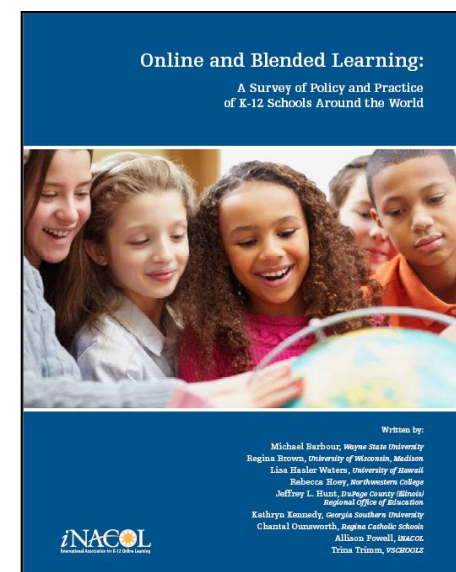
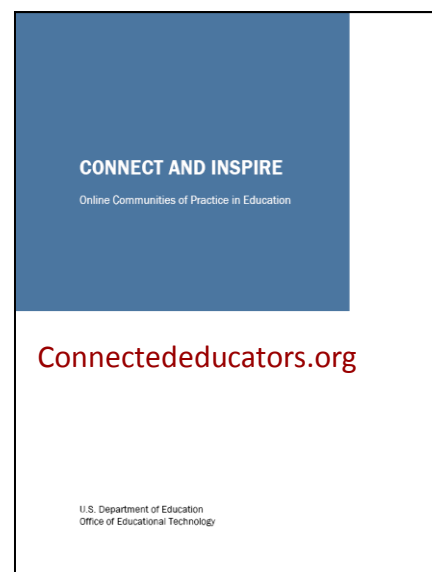
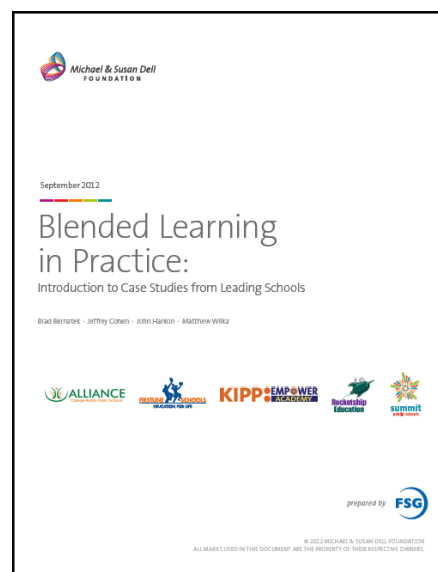
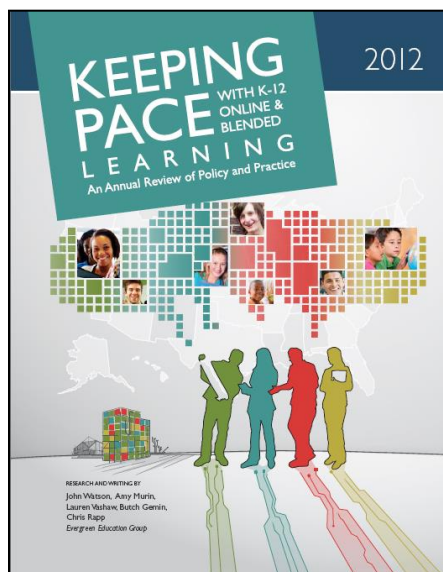
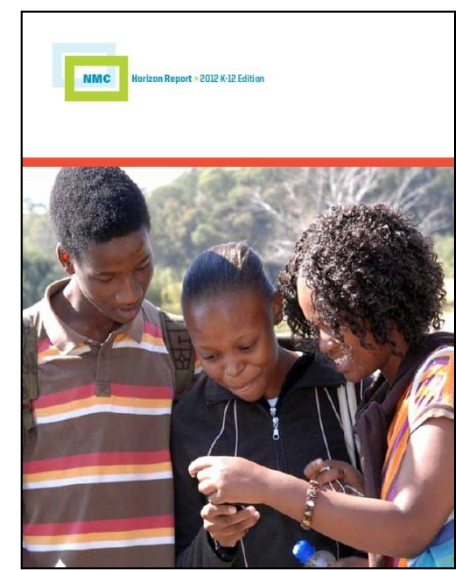
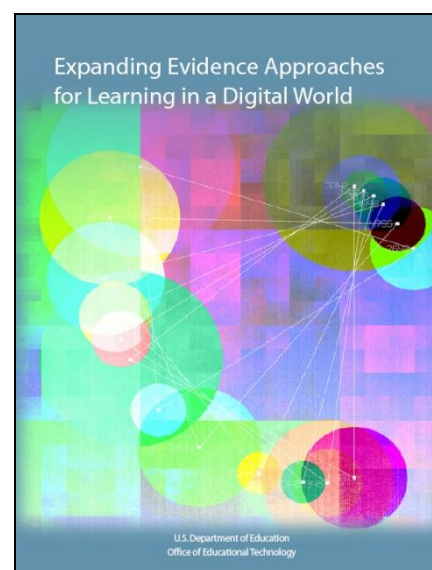
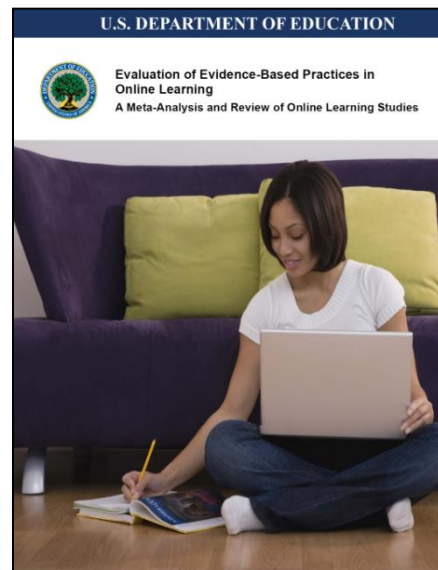
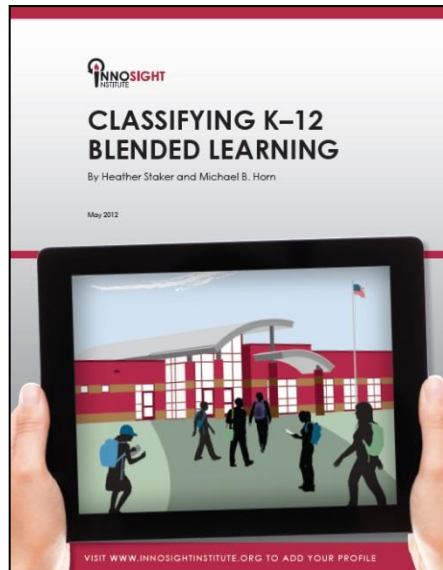
2010 National Education Technology Plan

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.





Primary Technical Working Group

- Robert M Bernard, Concordia University
- Richard E. Clark, University of Southern California
- Barry Fishman, University of Michigan
- Dexter Fletcher, Institute for Defense Analysis
- Karen Johnson, Minnesota Department of Education
- Mary Kadera, PBS
- Susan Patrick, NACOL
- Kurt Squire, University of Wisconsin
- Bill Thomas, Southern Region Education Board
- Bob Tinker, Concord Consortium
- Julie Young, Florida Virtual High School

September 2010

U.S. DEPARTMENT OF EDUCATION



Evaluation of Evidence-Based Practices in Online Learning

A Meta-Analysis and Review of Online Learning Studies



Selected Excerpts of Analysis

- Literature review from 1996 to 2008, more than 1,000 studies, *50 met rigor for meta-analysis*
- On average, *students in online learning performed modestly better* than those receiving f2f instruction (few studies, mostly corporate/IHE's)
- From 50 independent effects identified for meta-analysis comparisons, *11 significantly positive effects favoring online and blended learning*, 3 favoring f2f.
- Instruction *combining online and f2f elements had a larger advantage* relative to purely f2f instruction or purely online instruction
 - Blended vs. Face-to-Face
Mean effect size +0.35, $p < .001$
 - Online vs. Face-to-Face
Mean effect size +0.05, $p = .46$



Blended Professional Development

- 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)

Blended PD: Models for Delivery

- *Anchor Blend*: Begins with f2f and continues online
- *Bookend Blend*: Meet online for pre-work before initial f2f, follow-up online for continued discussion
- *Field Blend*: Most self-directed, where learners control the pace and time for learning, gaining access to resources and support online when and where they need them.



(Kim, Bonk & Oh, 2008)

Blended PD: Models for Student Delivery

- **Rotation**—Within a given course or subject, students rotate on a fixed schedule or at the teacher's discretion between learning modalities, at least one of which is online learning.
- **Flex**—Content and instruction are delivered primarily by the Internet, students move on an individually customized, fluid schedule among learning modalities, and the teacher of record is on site.
- **Self-Blend**—Students choose to take one or more courses entirely online to supplement their traditional courses; the teacher of record is the online teacher.
- **Enriched Virtual**—A whole-school experience in which, within each course, students divide their time between attending a brick-and-mortar campus and learning remotely using online delivery of content and instruction.



(Innosight Institute, 2011)

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.

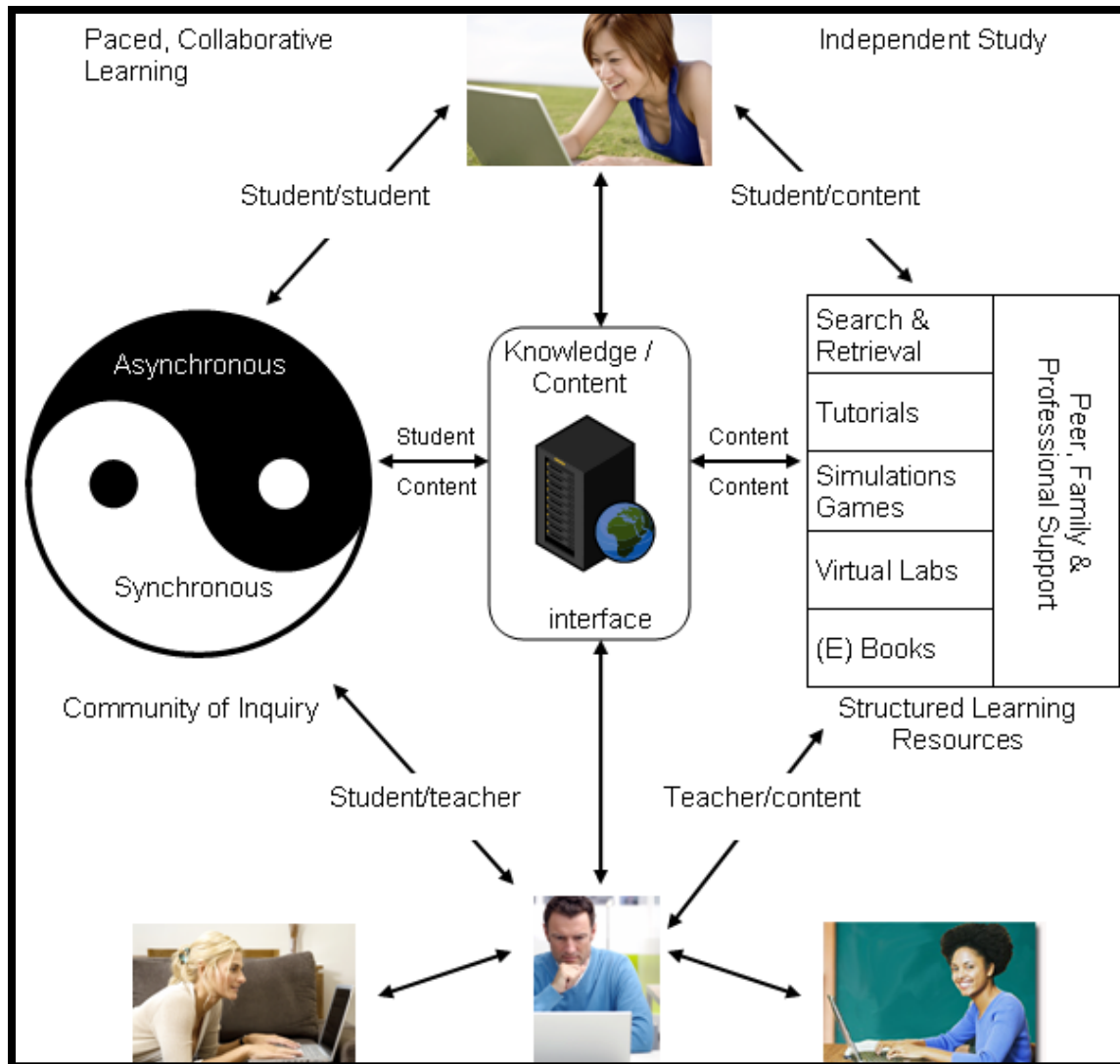
Research in Online and Blended Learning

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

Berger et al. (a deeper look at integration)

The Tool	Main Design Goals	Ways of Enactment
Your Comments	Enable elaboration of and reflection on ideas that had been previously raised in program	Every few days, program facilitator selected interesting statements from transcripts of teachers' discourse in f2f meetings or from online postings, posted it to form and invited teachers to relate to it.
Hot Polls (plus) Hot Reports	To summarize previously raised ideas, to encourage reflection on them and promote participation of newcomers	Every 2 weeks facilitator composed a poll based on a central issue discussed in previous f2f meeting. The 3-5 multiple choice answers were often selected from interesting comments from teachers on issue. In forum teachers encouraged to elaborate on their vote.
Smashing Sentences	To encourage teachers to be attentive to their students' reflections	Teachers were asked to sort out and post some of the most meaningful and interesting ("smashing") sentences from their students reflections on specific new PD-supported activities. Teachers became more aware of student's thinking and shared with colleagues.

Anderson's Equivalency of Interaction Theory



Learner-learner, learner-content, and learner-instructor interaction are preferred for online learning. When diminished support may not permit all three types to be provided when going to scale, if one of the three interaction types is designed well, the other two may be offered in a diminished capacity and still provide an equitable learning experience.

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

Review of selected blended PD research

Here's the top five:

- Personalized and catered to teachers' individual learning needs and preferences
- Collaborating with other like-minded colleagues
- Organizational and Administrator support is critical
- The need and value to closely integrate online and onsite strategies for coherence across the school year
- Teacher engagement and recognition strategies are crucial (a little goes a LONG way)

Learning Center Overview

A Critical Piece of the Teacher Learning Solution

- Self-Directed Access
- 10,700+ 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

<http://learningcenter.nsta.org>

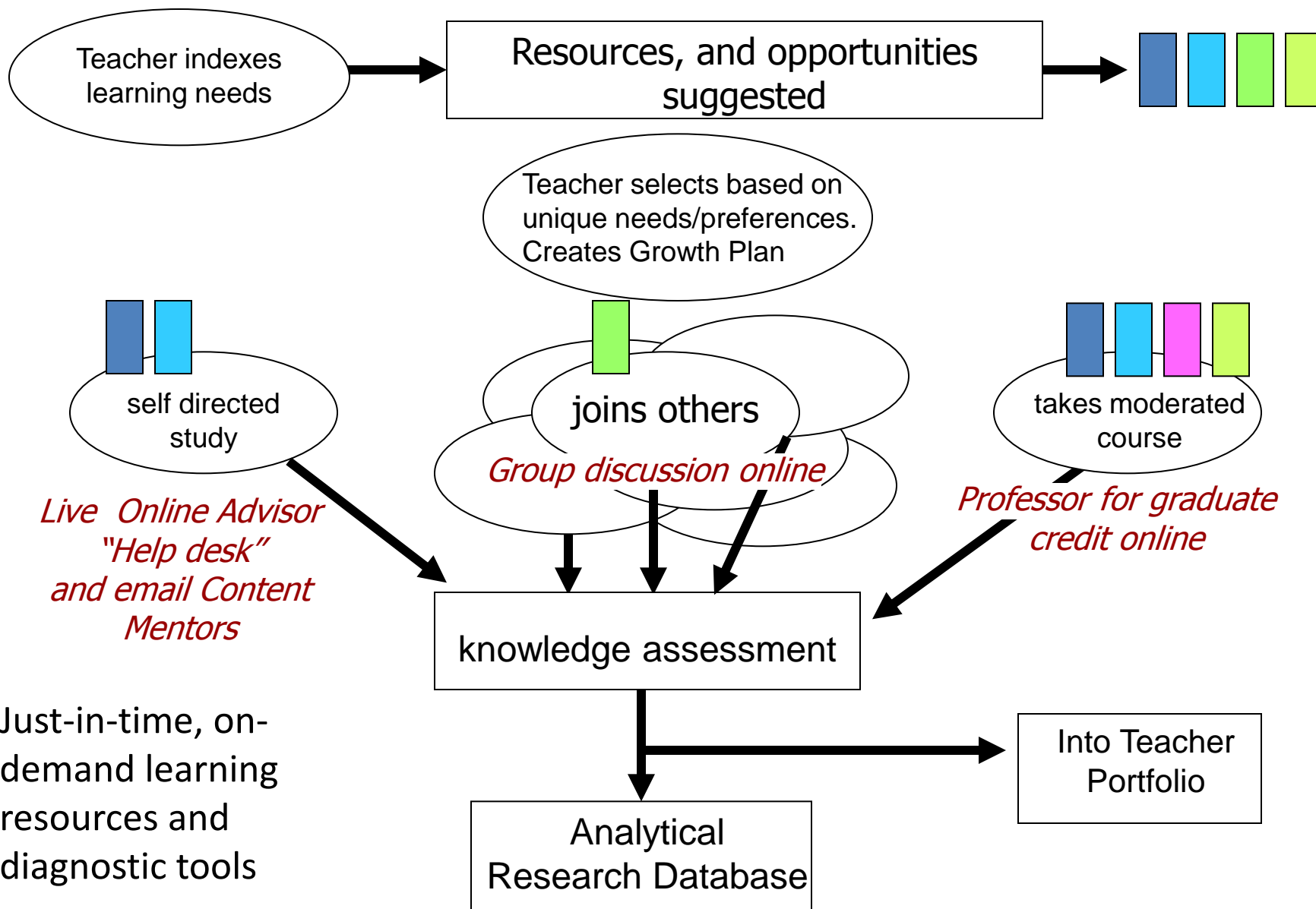


The screenshot displays the NSTA Learning Center website. At the top, the NSTA logo and "National Science Teachers Association" text are visible. Below the header, a navigation bar includes links for Home, My PD Tools, Subjects, Learning Resources & Opportunities, Community Forums, Education Administrator,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

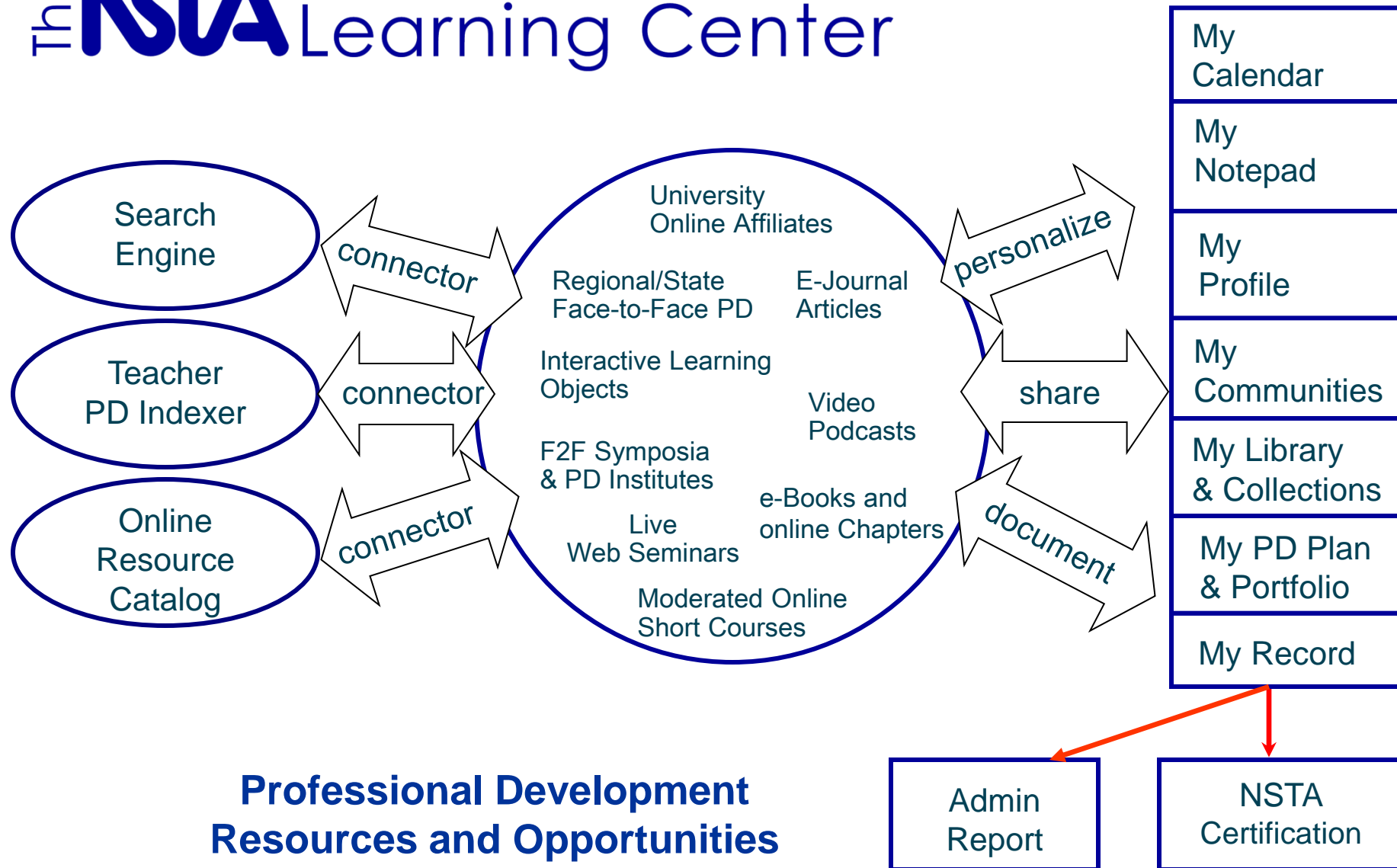
The main content area is titled "My Learning Center" and includes a welcome message for "Albert". It features a progress bar showing "2765 Activity Points" earned and a list of recent achievements, including "Platinum Indexer" and "Diamond Commenter". A section titled "Welcome to Your Personalized Learning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

Below this, there are sections for "Explore Learning Opportunities" and "Live Online Seminars & Classes". The "Explore Learning Opportunities" section includes a table with columns for "By Subject", "By Grade Level", and "By State Standards". The "Live Online Seminars & Classes" section includes a list of resources and a "Do-It-Yourself Learning" section.

On the right side, there is a "Connected Educator" section with a "LIVE SUPPORT ONLINE" button and a "Give us your feedback!" button. Below this, there is a "Most Popular Resources" section with a list of resources.



The NSTA Learning Center



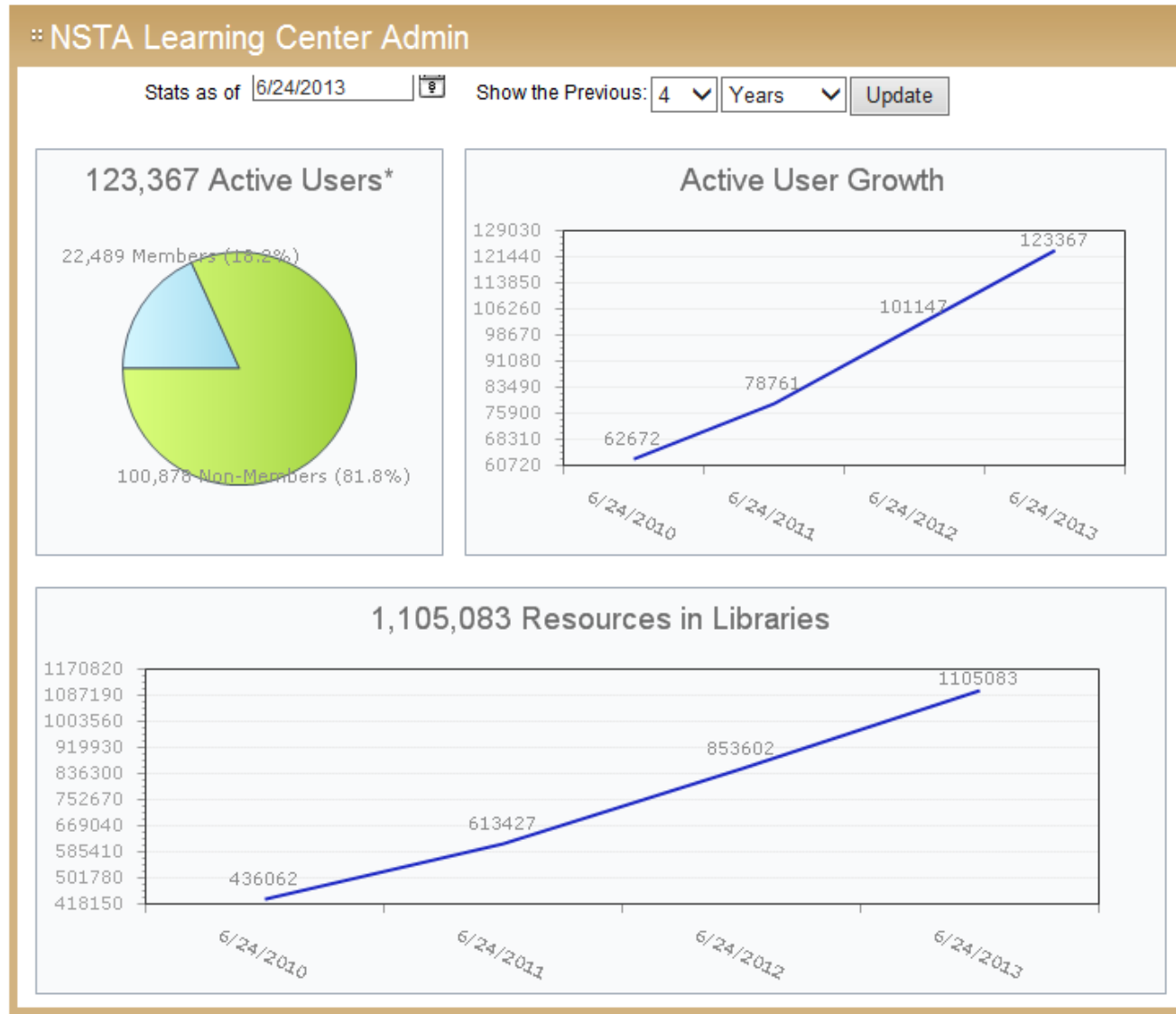
The NSTA Learning Center

Jun 2013: **10,700+** Learning Resources and Opportunities Available

 Do-It-Yourself Learning	 Live Online Seminars & Classes
<p> SciGuides [39] Science Objects [94] SciPacks [24] Archived Seminars/Podcast [1,840+] </p>	<p> Web Seminars [110/year] Short Courses [20+/year] </p>
 Books & Articles	 In Person Experiences
<p> Journal Articles [5,700+] NSTA Press Books [294+] e-Books [200+] e-Chapters [2,093+] </p>	<p> Symposia [6-10/year] PD Institutes [6-10/year] NSTA Conf./Forums [5/year] </p>

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., Schepke, 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
4,000 public
collections
shared

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](#)

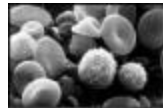


 Sign Up to see what your friends recommend.



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 5-E inquiry 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

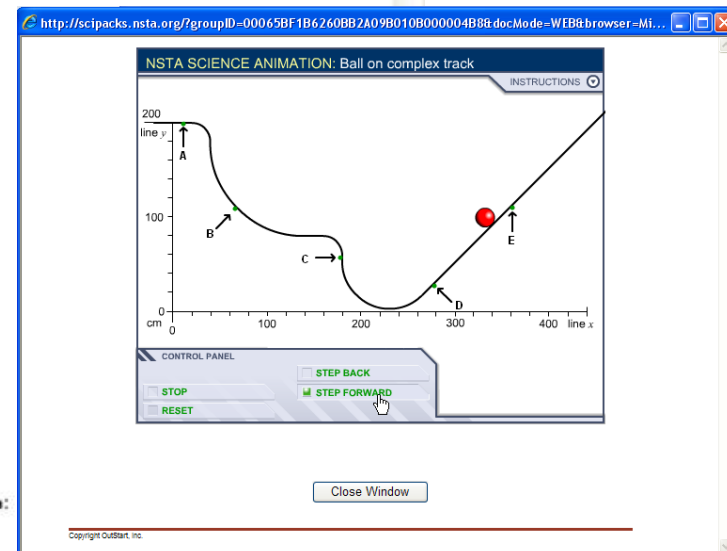
Animation Analysis

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?

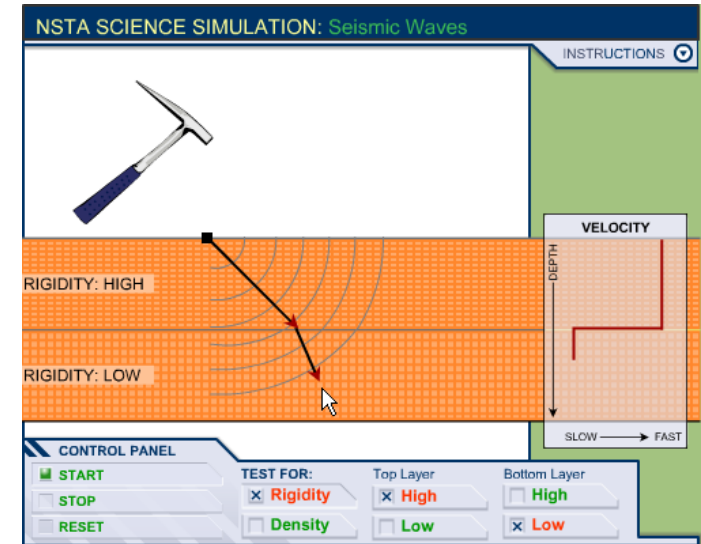
- ☐ E is about 350 centimeters away from A, at an angle of about 80 degrees with respect to Line Y.

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.

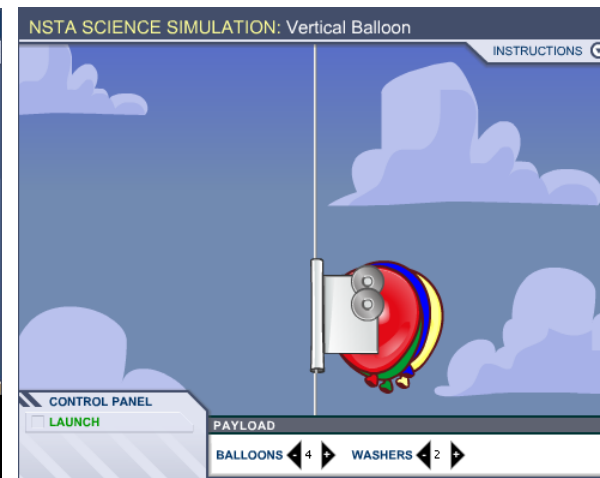
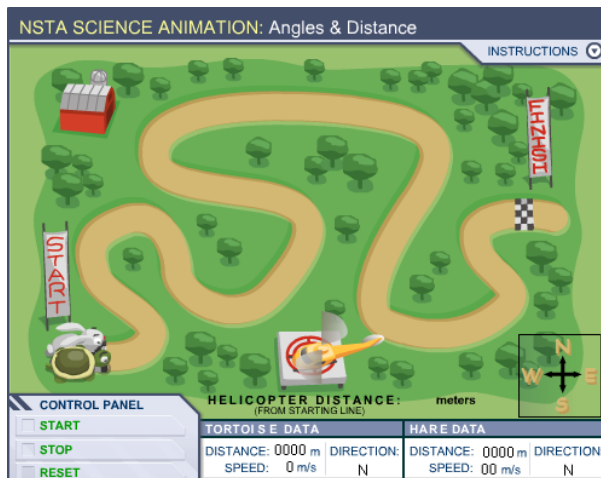
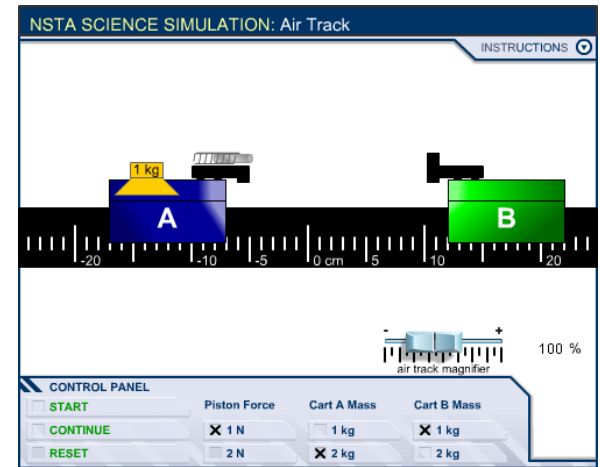
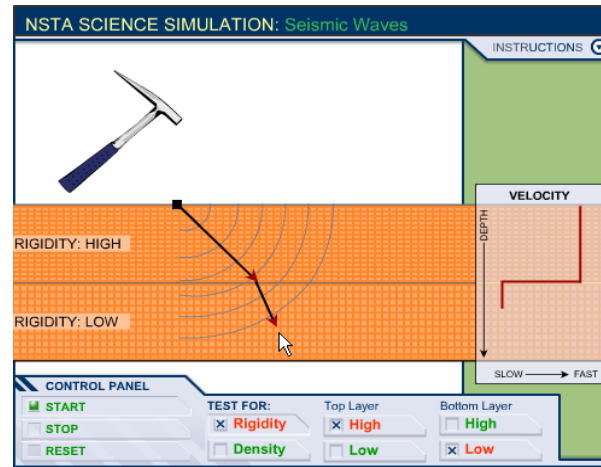
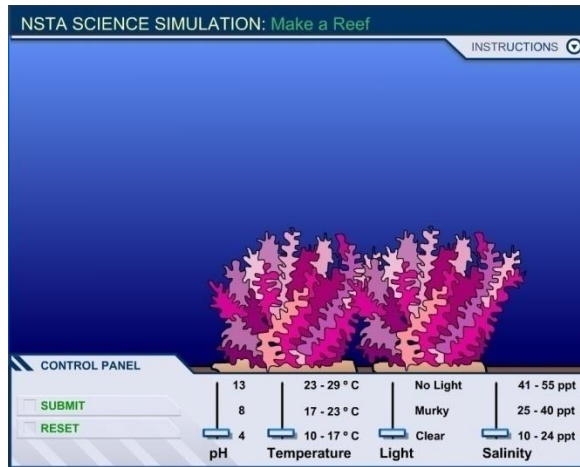
Close

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



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

Over 533
delivered
with 27,000
educators
reached since
2004

Blackboard Collaborate -- TEMPERATURE AND EARTH CLIMATE: MODELING HOT AND COLD PLANETS

File Edit View Tools Window Help

AUDIO & VIDEO

Talk Video

PARTICIPANTS

Brynn Slate Moderator

MAIN ROOM (33)

Brynn Slate Moderator

Jeff Layman Moderator

Rudo Kashiri Moderator

Alyssa Teske

Betty Harper 1

Brandi Savoyers

CHAT - Supervised

Alyssa Teske the atmosphere is CO2 6:39 PM

Esther Van Wageningen carbon dioxide 6:39 PM

Nicholas Malakar greenhouse effect in the atmosphere 6:39 PM

Sandra Deseno its atmosphere 6:40 PM

- Brandi Savoyers joined the Main Room, (6:40 PM) -

- Jennifer Bundy joined the Main Room, (6:40 PM) -

Alyssa Teske is this for c or f 6:41 PM

Rita Crocker to Cindy Vilka 6:42 PM

Cindy, what is your profile picture?

Nicholas Malakar C 6:42 PM

Room Moderators

What are the average temps for...?

Venus Earth Mars

500 500 500

400 400 400

300 300 300

200 200 200

100 100 100

0 0 0

-100 -100 -100

32

NASA Explorer Schools



Selected Participant comments

- This was one of the best. It broke down the practice conceptually and provided specific examples for implementation.
- I learned new information that I can share with my class tomorrow!
- I loved the interactive nature of this presentation. I felt involved every step of the way.
- This was an excellent, worthwhile session. It refreshed my memory about some important concepts.
- Thank you for the resources. This will be a big help to my teaching.

Goals for this Talk

- Gather audience insights and purpose
- 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

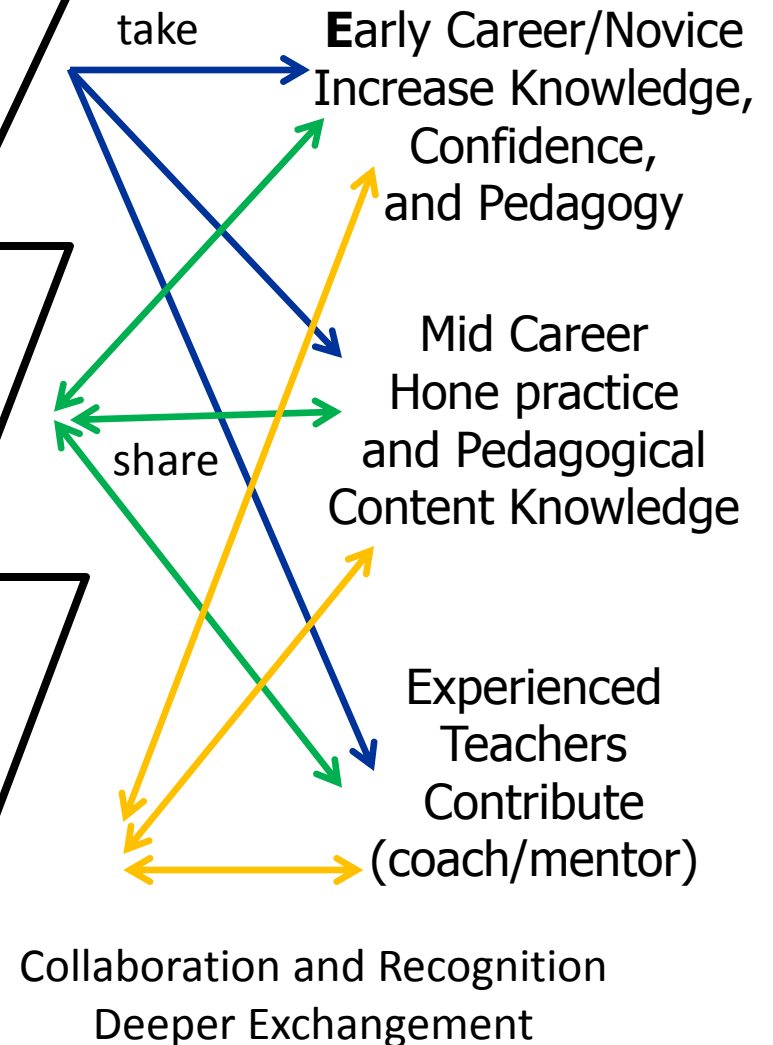
- Just-in-time resources from trusted source and/or colleagues

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.




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



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

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)

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.


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](#)




Kayla Anselmi
20 Posts
3380 Activity Points

[Private Message Kayla](#)



Sandy Gady
834 Posts
29470 Activity Points

[Private Message Kayla](#)



Pamela Auburn
1791 Posts
55600 Activity Points

[Private Message Kayla](#)

:: 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

- Gather audience insights and purpose
- Share an overview of our online professional learning community 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

Testimonials

Awards

Peer-reviewed Publications

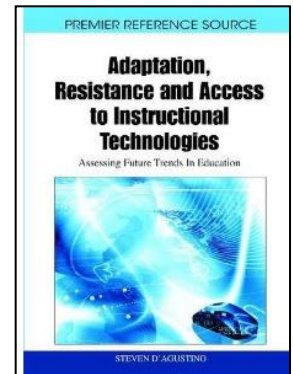
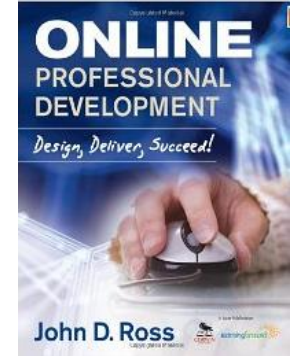
Conference Proceedings

Third-Party Evaluations

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

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.

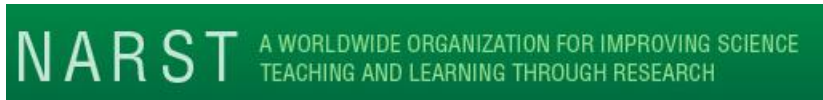
See: <http://learningcenter.nsta.org/research/>

Ongoing 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).

Locate ISTE PDF of PPT at: <http://learningcenter.nsta.org/iste>

Articles, Interviews, Panels, and Case Studies



Forthcoming Article and web seminar discussion on 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



Learning Center **Accountability**

Administrator Web Reports
Document Teacher Activity
Teacher Learning
Application in the classroom

Accountability system for districts; collect data on usage by individual, manage the content on your districts' home page, analyze pre/post test scores and other activity data.

[Overview](#)[Individual Users](#)[SciPack Summary](#)[Manage Content](#)[Calendar](#)[Portfolios](#)[Email List](#)

Overview

Number of Licenses Purchased:

50

Number of Licenses Used:

45

% Used:

90%

Total Products Added by Type

Product Type:**Number Added:**

Journal Article

261

SciPack

127

Science Object

83

Book Chapter

59

SciGuide

41

Podcast

8

Web Seminar Archive

6

585 Total

Individual Users

Individual Users: track digital resource usage, pre/post final assessment results, community activity, and PD Plan Learning Goals

Click on a users name to see all of the resources they've added to their library via the subscription.

- [Export Pre/Post-Test Results \(sorted by SciPack\)](#)
- [View overall activity for this group](#)

User	Date Registered	# of Resources via Subscription	Last Active	Activity Points
Teacher name	02/03/2013 1:42 PM	33	03/25/2013 5:43 PM	1345
Teacher name	09/24/2011 9:58 PM	56	04/02/2013 7:55 PM	1165
Teacher name	02/06/2013 1:50 PM	24	04/01/2013 9:00 PM	1270
	01/31/2013 9:13 PM	0	02/04/2013 1:14 PM	0
	02/11/2013 10:09 PM	24	03/14/2013 7:53 PM	1210
	03/05/2013 9:10 AM	163	04/02/2013 4:08 PM	2610
	02/01/2013 1:04 PM	106	04/01/2013 9:03 PM	2265
	01/31/2013 2:02 PM	237	04/01/2013 11:56 AM	3490
	01/31/2013 7:57 PM	67	04/02/2013 7:36 PM	1780
	02/06/2013 3:53 PM	41	03/27/2013 11:23 AM	1115

Assessments

District /University Pre-Post assessment Results

Graphs

Raw Numbers

5/7/2013



Previous:

4

Quarters

Update

Energy Assessment

1183 Pre-tests taken with a 64% avg score

463 Post-tests taken with a 73% avg score

totals as of 5/7/2013

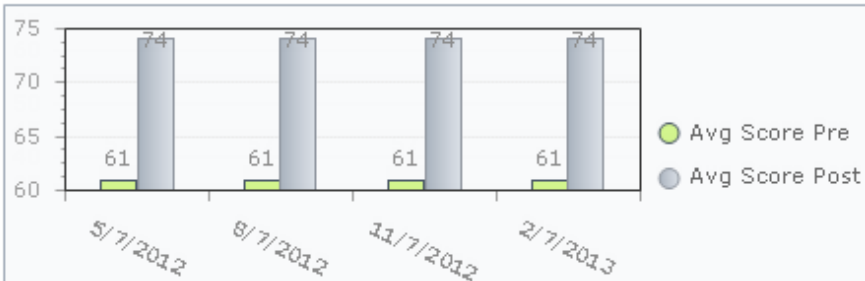


Earth's Changing Surface Assessment

341 Pre-tests taken with a 61% avg score

95 Post-tests taken with a 74% avg score

totals as of 5/7/2013

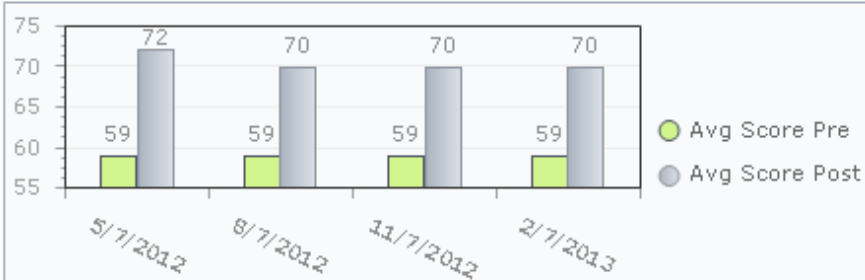


Cell Structure and Function Assessment

415 Pre-tests taken with a 59% avg score

116 Post-tests taken with a 70% avg score

totals as of 5/7/2013



[Overview](#)
[Individual Users](#)
[SciPack Summary](#)
[Manage Content](#)
[Calendar](#)
[Portfolios](#)
[Email List](#)

Individual User Detail for **Teacher name**

[<-- Back to user list](#) [View this user's profile page](#)

Title	Resource Type	Date Added	Reports
"Life" in Movies	Journal Article	01/19/2013 6:50 PM	
A Learning Cycle for All Students	Journal Article	01/19/2013 7:15 PM	
Atomic Structure	SciPack	08/21/2012 11:54 PM	SciPack Progress Report Access History
Atomic Structure and Chemical Bonding	SciGuide	08/21/2012 11:26 PM	
Cell Division and Differentiation	SciPack	09/03/2012 2:04 AM	SciPack Progress Report Access History

SciPack Access History

4/2/2013

Teacher name

Page	Access Date
Solar System Final Assessment	Thu Mar 14, 2013 10:34 AM
Jovian Anomalies	Wed Mar 13, 2013 12:53 PM
Terrestrial Anomalies	Wed Mar 13, 2013 12:53 PM
Differentiation	Wed Mar 13, 2013 12:51 PM
The Gaseous Beginning	Wed Mar 13, 2013 12:51 PM
Quiz	Wed Mar 13, 2013 11:51 AM
Summary	Wed Mar 13, 2013 11:51 AM
Looking Through New Eyes	Wed Mar 13, 2013 11:51 AM
Probing the Solar System	Wed Mar 13, 2013 11:50 AM
Seeing into the Sky	Wed Mar 13, 2013 11:50 AM
Telescopes: The Power of Technology	Wed Mar 13, 2013 11:49 AM
Subsequent Theories	Wed Mar 13, 2013 11:49 AM
Retrograde Motion as Evidence	Wed Mar 13, 2013 11:48 AM
Size and Distance	Wed Mar 13, 2013 11:47 AM
Measuring Positions of Earth, the Moon, and the Sun	Wed Mar 13, 2013 11:47 AM
View from Earth	Wed Mar 13, 2013 11:47 AM
Earth Among the Planets	Wed Mar 13, 2013 11:47 AM
A Closer Look at Asteroids	Wed Mar 13, 2013 10:25 AM
Quiz	Wed Mar 13, 2013 10:21 AM
Summary	Wed Mar 13, 2013 10:21 AM
Looking Through New Eyes	Wed Mar 13, 2013 10:21 AM
Search for New Bodies	Wed Mar 13, 2013 10:21 AM

SciPack Progress Report

4/2/2013

Teacher name

SciPack	Complete
Flow of Matter and Energy in Ecosystems	0%
Does Matter Matter?	0%
Carbon, Carbon Everywhere	0%
Nothing Matters Without Energy	0%
Learning Outcomes	0%
Pedagogical Implications	0%
Flow of Matter and Energy in Ecosystems Final Assessment Attempts: 0	
Solar System	100%
Earth in Space	100%
A Look at the Planets	100%
Asteroids, Comets, and Meteorites	100%
Formation of our	100%
Learning Outcomes	100%
Pedagogical Implications	100%
Solar System Final Assessment Attempts: 3	
Failed Tue Mar 12, 2013 3:12 PM Score: 61.54%	
Failed Wed Mar 13, 2013 10:00 AM Score: 61.54%	
Passed Thu Mar 14, 2013 10:49 AM Score: 88.46%	

Pre/Post Test Results

Test	Date Completed	Results	Score
Solar System Pre-Assessment	2/27/2013 6:01 PM	12/20	60%
Solar System Post-Assessment	3/12/2013 10:42 AM	17/20	85%
Earth and Space Science Indexer	3/3/2013 9:02 AM	26/40	65%
Life Science Indexer	3/3/2013 10:01 AM	33/50	66%
Physical Science Indexer	3/3/2013 10:34 AM	22/30	73%

:: Activity

Activity for Teacher name

11/1/2010

to 4/13/2013

Submit

[Export Activities](#)

3970 Total Points

298 Add NSTA Resource
0 Create Collection
4 Complete Indexer
0 Add Event
0 Add Personal Resource
2 Attend Web Seminar
5 Complete SciPack
2 Write Review
0 Recommend Resource
15 Post comment/question
0 Share Collection
0 Publicize Collection
0 Create Portfolio
0 Create Portfolio Goal
0 Upload Evidence
0 Complete Reflection
0 Generate Report

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.

<http://learningcenter.nsta.org>



S.D. Bechtel, Jr.
Foundation



GE Foundation



Agilent
Technologies
Foundation

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

Thank You

Al Byers

PH: 703-312-9294

Email: abyers@nsta.org

SLIDES

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



The NSTA Learning Center
Visit NSTA.org

Search the Learning Center

Home My PD Tools Subjects Learning Resources & Opportunities Community Forums Education Administrator Help

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

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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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Explore Learning Opportunities
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

Do-It-Yourself Learning Learn at your own pace online with these 1-2 or 6-10 hour interactive activities.
SEE ALL DIY LEARNING RESOURCES

Live Online Seminars & Classes Learn online from certified instructors with your colleagues. 1-2 hour seminars, week and month long courses are available. Earn state and university credit.
SEE ALL ONLINE EVENTS

Books, Articles & Websites

- Books
- Book Chapters
- eBooks
- Journals
- SciLinks

In Person Experiences
Attend an NSTA workshop in person to learn hands-on techniques with other teachers. Earn state and university credit.
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LIVE SUPPORT ONLINE
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Hours of Operation

NEXT GENERATION SCIENCE STANDARDS
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WEB SEMINAR SERIES
Register Today!

RSS SHARE

Most Popular Resources
 Emailed Viewed
 1. Coral Reef Ecosystems
 2. Cell Structure and Function: Cells – The Basis of Life
 3. Plate Tectonics: Layered Earth
 4. Archive: NSTA Learning Center Update and Free PD Resources, ...
 More Popular Resources...