

Blending Online and Onsite Professional Development: Applying What the Research Says for Effective and Sustainable Learning Communities

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Goals for this Talk

- Provide an awareness of selected blended PD research findings in science education
- Discuss promising practices and potential pitfalls with blended PD models and how to help sustain and increase the effectiveness of local professional learning communities.
- Showcase NSTA's solution to assist with your needs: The NSTA Learning Center
- Share impact and efficacy studies of our efforts

Online Learning ...the hype



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

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EVALUATING WHAT WORKS IN BLENDED LEARNING

[Complete Coverage ▶](#)

Blended Learning Models Generating Lessons Learned

A variety of models for mixing face-to-face education and online instruction are generating lessons learned

By [Katie Ash](#)

Since blended learning exploded onto the K-12 scene with promises of personalized and student-centered learning, it has proliferated into dozens of different models, with educators continually tweaking and changing those methods to find the perfect balance of face-to-face and online instruction to meet the needs of their students.

Interest in blended education remains high, spurred partly by research offering support for advocates' claims that blended learning is more effective than either online or face-to-face instruction on its own.

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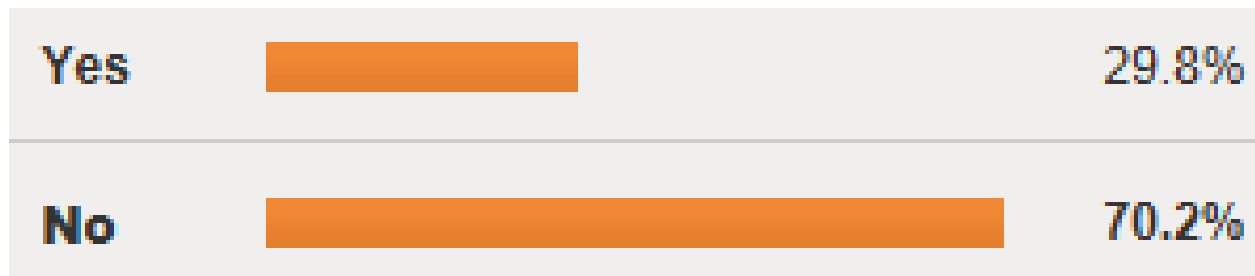
 [Tweet](#) 63

EDUCATION WEEK
 **Multi-User**
LICENSING

Review of Your Perceptions Regarding Blended PD Research Online Survey Results

Pre-Survey



I have implemented a blended learning effort (onsite and online) for teachers in my district.



I have implemented a blended learning effort (onsite and online)

- We offer *blended courses* of biology, earth science, oceanography, ecology and chemistry at our high school alternative Ed site
- We encourage our teachers to use online resources especially ones that *provide a more realistic view of science concepts* as well as onsite textbooks and resources
- We use a blended learning process to train teachers in GIS. We also *use PD 360* in our district to provide staff development for teachers
- I have tried to have blended professional development for teachers (very small steps). They *meet first face to face* and then learn, *share and discuss in subsequent sessions on line*.
- Our PD courses (for teachers across school divisions) use *Moodle* course management system to facilitate learning beyond the physical classroom with online *discussion boards, file sharing, and overall communication*. My pre-service teachers have used NSTA learning packs to teach themselves content which we then discuss onsite.
- *Not sure what the definition of "blended learning effort" is?*

I think there is some value to a blended learning approach for teacher professional development?

Strongly Agree		42.6%
Agree		57.4%
Disagree		0.0%
Strongly Disagree		0.0%

n = 48

I think there is some value to blended learning for teacher PD

- We are just beginning to explore this option in my work now because some of our *participants are from rural parts* of the state. [PLACE]
- *Time constraints* make online sometimes better than onsite. [PACE]
- We readily see students learn in different modalities, but we think adults don't?
- I think it should be a blended approach, *never all through technology*.
- Blended learning is a way to *extend the P.D. experience* and *promote collaboration* among P.D. cohorts. [allows for *sustained PD support*]
- Not everything has to be done in person. By *being purposeful about what has to happen "in person", we maximize time together*.
- I believe teachers need to collaborate *outside of their own school* and even *outsider their own school division*. Face to face establishes connections while online *keeps the connections growing*.
- Makes sense.

I think blended PD might best described as:

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



25.5%

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



25.5%

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









17.0%

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



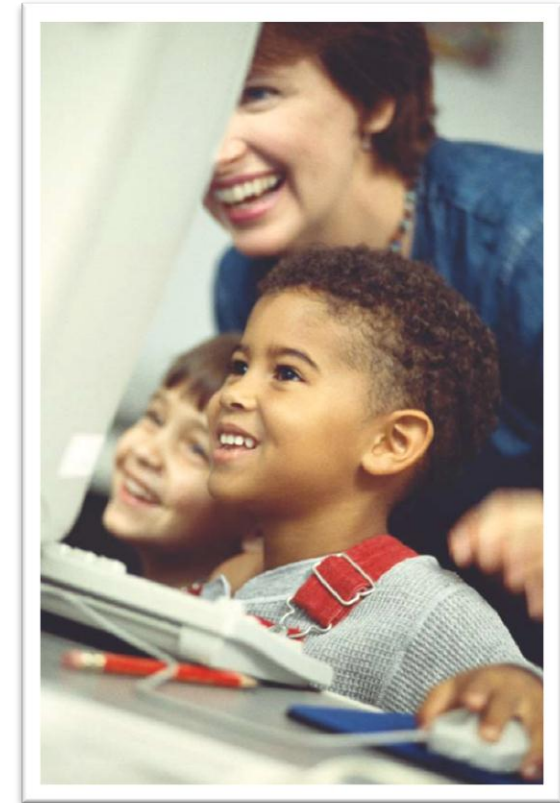
31.9%

I would like to know the following about blended learning for teachers:

What does the research say about the value of blended learning?		61.7%
What challenges might I encounter in deploying a blended learning effort for teachers?		63.8%
What are strategies that might enhance blended learning efforts?		76.6%
What are various blended learning models used by others?		63.8%
What effort and time commitment will I as an administrator need to dedicate to support a blended learning teacher model?		44.7%
Are recognition systems with points, attribution, and badges linked to online personal profiles, digital portfolios, a passing trend, or is there something there?		21.3%

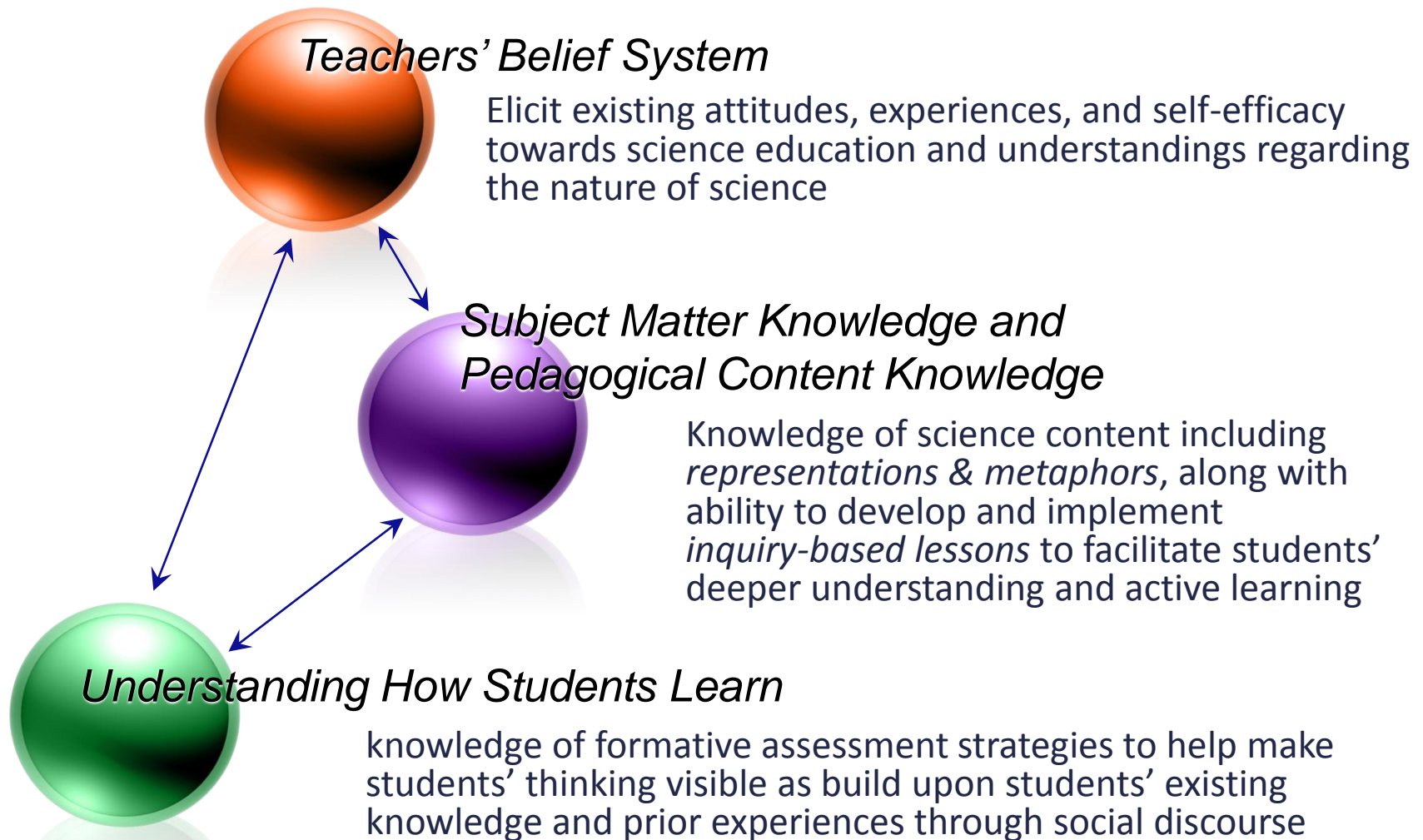
Why Provide Teacher PD at All?

- 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.

Professional Development: Appears effective when it addresses the following



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 PD

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 PD

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.

Learning Center Overview

A Critical Piece of the Teacher Learning Solution

- Self-Directed Access
- 10,100+ 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>

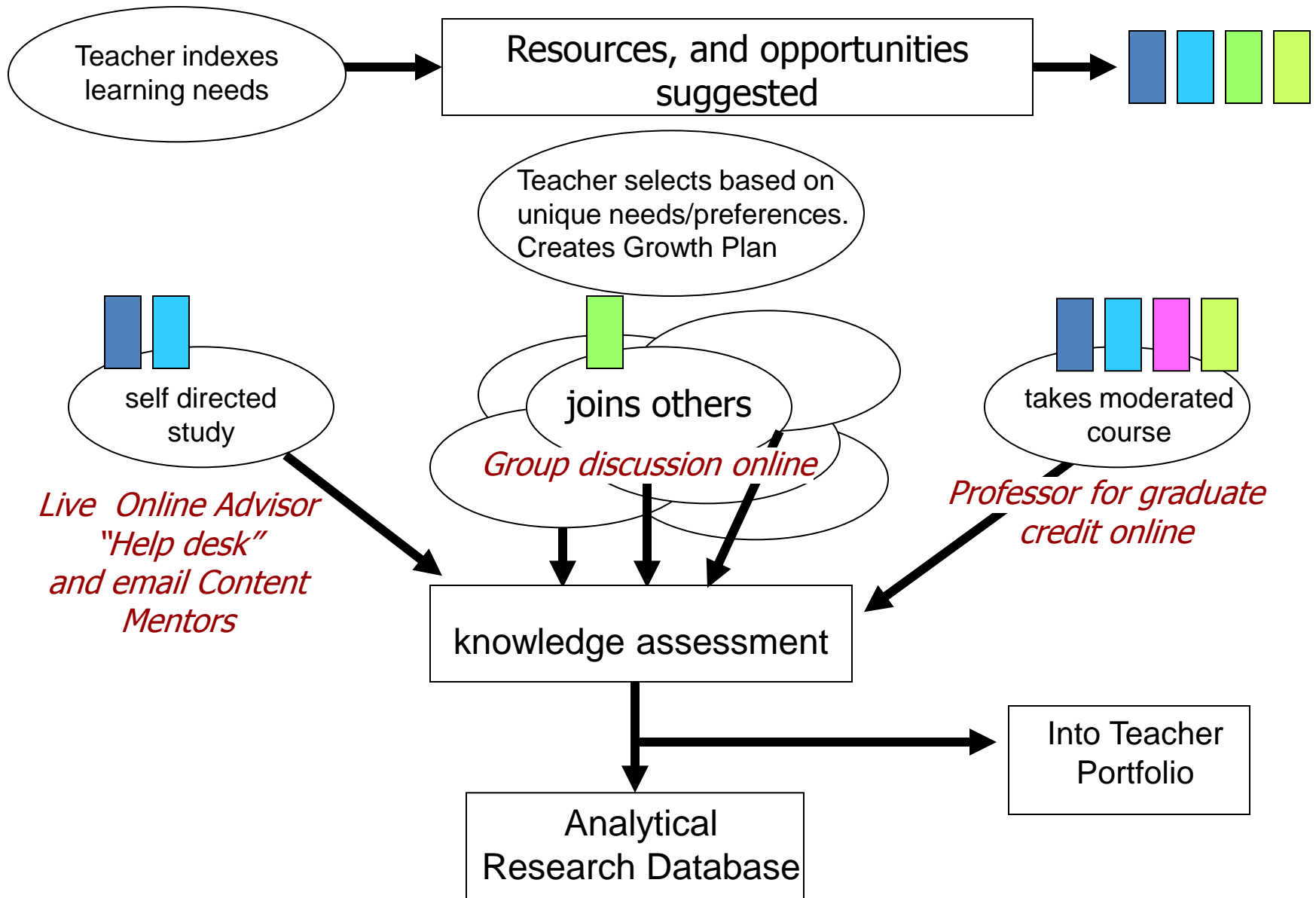


The screenshot displays the NSTA Learning Center website. At the top, the NSTA logo and "National Science Teachers Association" text are visible. Below the header, a navigation bar includes links for Home, My PD Tools, Subjects, Learning Resources & Opportunities, Community Forums, Education Administrator, 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 "Welcome to Your Personalized Learning Web Space!" section with a search bar and a "SEARCH COMMUNITY" button. Below this, there's a section for "Albert, you've already earned 2765 Activity Points!" and a "Your Activity Matters!" box. A "Vanessa Lorenzo Barcena" profile is highlighted as the "Last Week's Top Disseminator".

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). Below these are sections for "Do-It-Yourself Learning", "Live Online Seminars & Classes", "Books, Articles & Websites", and "In Person Experiences".

On the right side, there's a "LIVE SUPPORT ONLINE" section with a "Click here" button and "Hours of Operation". Below that is the "Connected Educator" logo and a "Give us your feedback!" button. At the bottom right, there's a "Most Popular Resources" section with a list of resources: 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, ...

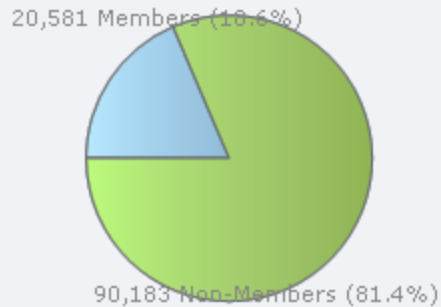


Nov 2012 Collection: **10,100+** PD Resources and Opportunities Available

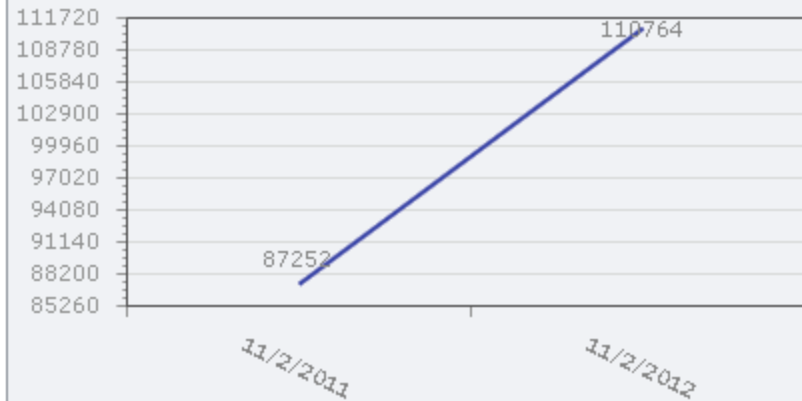
 Do-It-Yourself Learning	 Live Online Seminars & Classes
<p> SciGuides [42] Science Objects [94] SciPacks [25] Archived Seminars/Podcast [1,670+] </p>	<p> Web Seminars [120+/yr] Short Courses [20+/year] </p>
 Books & Articles	 In Person Experiences
<p> Journal Articles [5,500+] NSTA Press Books [300+] e-Books [190+] e-Chapters [1,800+] </p>	<p> Symposia [6-10/year] PD Institutes [6-10/year] NSTA Conferences [5/year] </p>

Resources tagged to filter or sort by learning preference

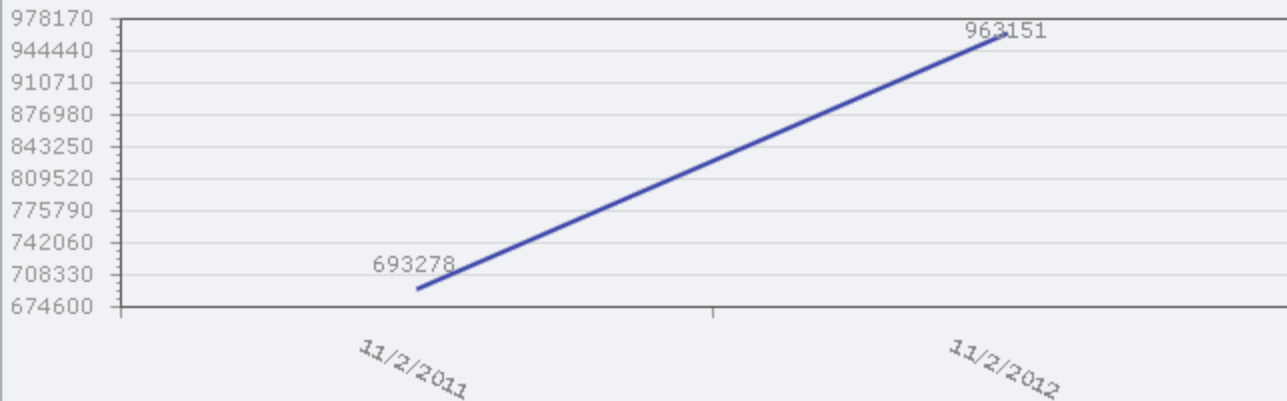
110,764 Active Users*



Active User Growth



963,151 Resources in Libraries



Teachers are adding over 963,000 resources across their personal libraries from the 10,000 assets available with a strong growth trajectory!



Learning Center

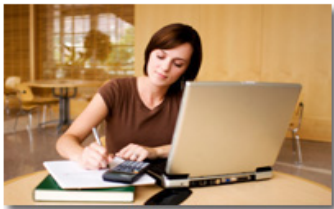
Selected Tools to Facilitate Personalization

PD Indexer and The PD Plan and Portfolio

- Diagnose gaps in Content Knowledge Understanding
- View Resources and Opportunities for Consideration
- Add to your 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



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



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

Over
7,400
collections
available

Rate and
share public
collections

Upload and
share your
own resources

2 GB free
space!

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 **Community**



Building a Vibrant Learning Community

- ***Psycho-emotional Roles for Growth and Recognition***
- ***Compelling Content***
- ***Social Engagement Opportunities***



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 discussions

- 13 Forums
- 1,322 Topics
- 15,553 Posts
- Physical, Life, Earth/Space
- Pedagogy
- Evaluation/Assessment
- Research in Science Ed
- Technology Integration
- NGSS

Community Forums

[Home](#) > [General Science and Teaching](#) > **The Flipped Classroom**

Find Topics and Users

SEARCH COMMUNITY/PEOPLE



[Hours of Operation](#)

6 people currently online

POST REPLY

WATCH THIS TOPIC

MOVE THIS TOPIC

by [Kayla Anselmi](#), Sun Dec 04, 2011 3:34 PM

I recently attended the Conference for the Advancement of Science Teaching in Dallas, Texas. while I was there I had the opportunity to hear Jon Bergman speak about a model of teaching that his department has pioneered called the flipped classroom. In this model, students watch high quality, teacher made instructional videos as homework and spend class time practicing content through activities, practice problems, and labs. Lecture becomes homework and practice becomes class work, hence the term "flipped". I was instantly amazed at the way this model provided for differentiation among students, time for remediation, and student driven learning. It seemed to address all of the issues I had been facing in my own classroom. I have resolved to try it out in my classroom in the coming semester. I would love to hear any opinions, concerns, or questions that you might have about the Flipped Classroom.



[Kayla Anselmi](#)

20 Posts

[Learning Center Activity Points](#)

Private Message Kayla

EDIT REPORT REMOVE

by [Lorrie Armfield](#), Sun Dec 04, 2011 10:54 PM

I am a big proponent of the flipped classroom. Although not widely embraced in my county as of yet, I discovered that using this model in my classroom increased scholar interactions with one another. I was able to work with small groups, serving as a 'guide on the side' instead of the 'sage on the stage'. As a learning coach, I could walk around the room and ask questions, while encouraging the scholars to be more responsible for their own thinking and learning. My scholars were eager to help one another instead of relying on me. On our county's benchmark assessment for first quarter, my classes scored higher overall than any other classes in our area of the district (about ten schools).

My scholars all have iPads, so this past quarter, I posted information to our class



[Lorrie Armfield](#)

167 Posts

[Learning Center Activity Points](#)

Private Message Lorrie

Learning Center **Recognition and Rewards**

The NSTA Learning Center

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My Learning Center

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[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!

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!



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

This Week's
 Highest Rated Collections



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

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.

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

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 • [See all FREE Resources](#)



**LIVE SUPPORT
ONLINE**

[Click here](#)

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:



October 30, 2012 - [Engineering Design Challenge: Water Filtration](#)



November 15, 2012 - [ExploraVision Tips and Online Resources](#)

Overall	Commenters	Aggregators	Disseminators	Advocators	SciPack Power Users	
Pos	Name	Commenter Points Earned	Recent Donations/Badges			
1	 Dorian Janney	3,330				
2	 Therese Houghton	3,230				
3	 Angelika Fairweather	2,670				
4	 LeRoy Attles	2,430				
5	 Lorrie Armfield	2,050				
6	 Bambi Bailey	2,020				
7	 Allison Cooke	1,980				

Testimonials from teachers, administrators and professors

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 36,000 badges earned in 2011-2012*

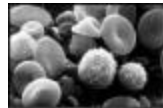


Administrator: *One of our teachers sent the following information after receiving a note from NSTA that stated: Congratulations! You have been selected as the NSTA Learning Center Top Advocator for the week of May 28 – June 3, 2012. She was delighted and wrote, "Look at what I got in my email! ...NSTA picked me!! It's all because of you ladies that I started this science journey in the first place! Thank you!!"*



Learning Center

Selected Content Resources



Position and Motion

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

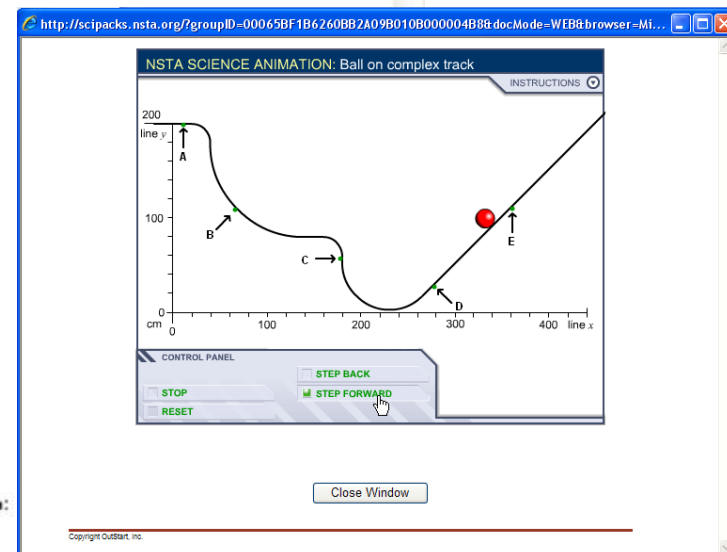
Animation Analysis

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?

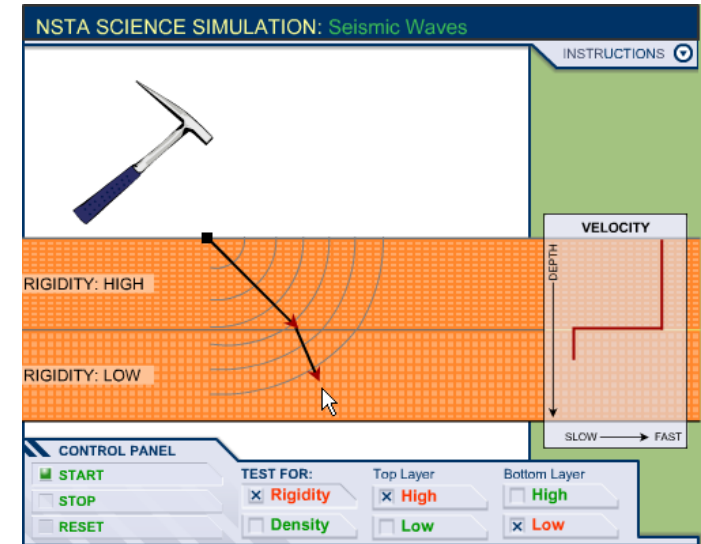
- ☐ E is about 350 centimeters away from A, at an angle of about 80 degrees with respect to Line Y.

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.

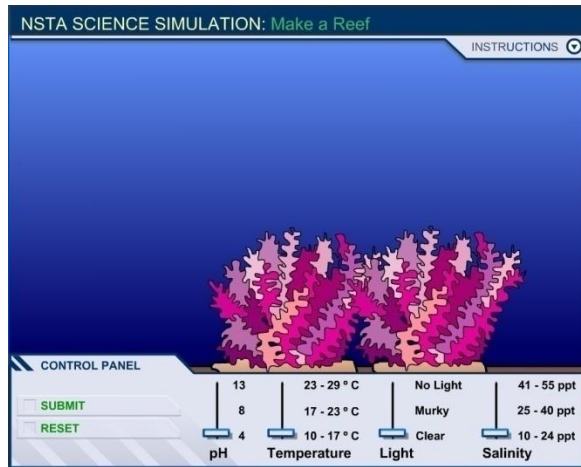
Check Your Thinking

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 ⓘ



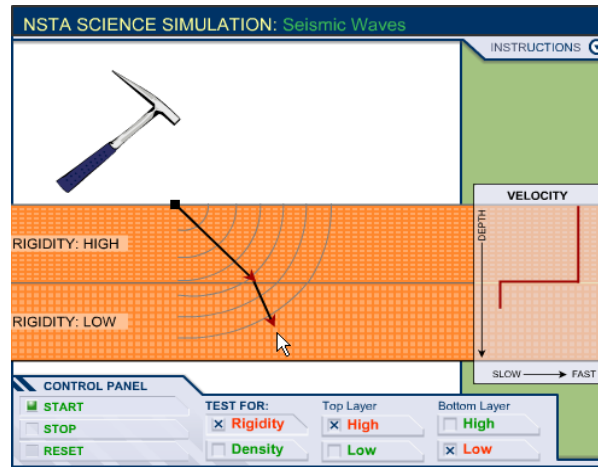
CONTROL PANEL

SUBMIT
RESET

pH: 4 | 8 | 13
Temperature: 23 - 29 °C | 17 - 23 °C | 10 - 17 °C
Light: No Light | Murky | Clear
Salinity: 41 - 55 ppt | 25 - 40 ppt | 10 - 24 ppt

NSTA SCIENCE SIMULATION: Seismic Waves

INSTRUCTIONS ⓘ



RIGIDITY: HIGH
RIGIDITY: LOW

CONTROL PANEL

START
STOP
RESET

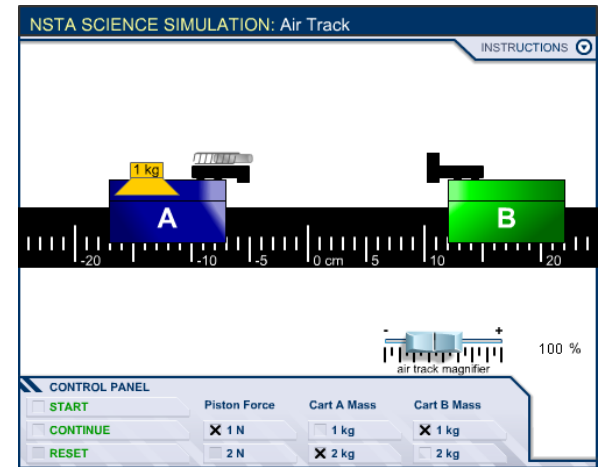
TEST FOR:
☒ Rigidity
☐ Density

Top Layer: ☒ High ☐ Low
 Bottom Layer: ☐ High ☒ Low

VELOCITY
DEPTH
SLOW → FAST

NSTA SCIENCE SIMULATION: Air Track

INSTRUCTIONS ⓘ



CONTROL PANEL

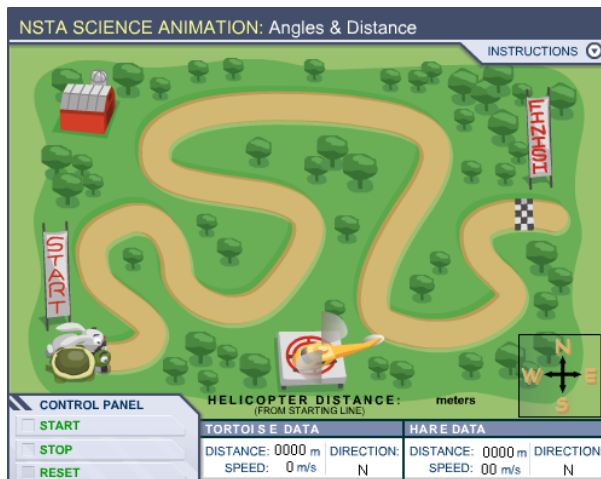
START
CONTINUE
RESET

Piston Force: ☒ 1 N ☐ 2 N
 Cart A Mass: ☐ 1 kg ☒ 2 kg
 Cart B Mass: ☒ 1 kg ☐ 2 kg

air track magnifier 100 %

NSTA SCIENCE ANIMATION: Angles & Distance

INSTRUCTIONS ⓘ



CONTROL PANEL

START
STOP
RESET

HELICOPTER DISTANCE: (FROM STARTING LINE) meters

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

NSTA SCIENCE ANIMATION: Velocity & Speed

INSTRUCTIONS ⓘ



AVERAGE SPEED
VELOCITY

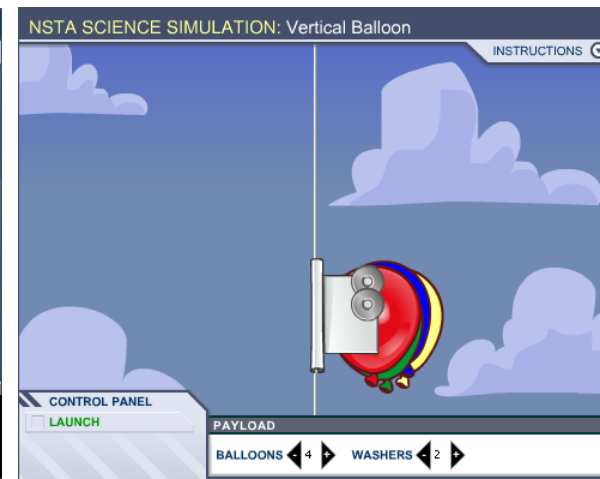
CONTROL PANEL

START
STOP
RESET

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

LAUNCH

PAYLOAD
 BALLOONS ◀ 4 ▶ WASHERS ◀ 2 ▶

NSTA SciPacks



3-5 Science Objects



Content Mentor
Email Support

10-Hour,
self-directed,
inquiry-based
learning experience



Assessment
and Certification



Pedagogical
Implications

NSTA **WEB SEMINARS**

LIVE INTERACTIVE LEARNING @ YOUR DESKTOP

Social engagement

Participants

- Flavio Mendez (Moderator)
- Jeff Layman (Moderator)
- Johnson, Steven E. (Moderator)
- Alli Widmar 1
- Alison Moran
- Andrew Kirk
- Angel Sanabria
- Argy Leyton
- Calvin Hoyt
- Can Guner
- Carla Melendy
- Christopher Power
- Cynthia (Cindy) Henry
- Gerri Fitzloff
- Jackie Matthews
- James Szymanski (Away)
- Jeanann Klopchin
- Joann Hudak

32 Participants

Direct Messaging

Show: All

Christopher Power: no
Moderator (Jeff Layman): Pop-up blocker may be
 Kathy Turner: yes
Moderator (Jeff Layman):
<http://spaceflight.nasa.gov/realdata/tracking/index.html>
 Judy Treadway: no blocker, maybe mac?
 Lorraine Harper: its my dial up
 Alison Moran: dial up is tough
Moderator (Flavio Mendez): spaceflight.nasa.gov
 Lorraine Harper: pain in the booty
 marv hamelin: my connection is through cable

Send to: Moderators

Audio

Microphone Speaker

17:54 In session for 26 hours

Whiteboard - Main Room (Scaled 103%)

Spacecraft Power System Options

Mir

Hubble

Nuclear	Solar	Energy Storage



We offer
120 free
live web
seminars
during the
school
year.



Learning Center

Web-accessible Reports to Document Community Activity and Teacher Learning

Indexers and Assessments

District Pre/Postassessment Results

11958 total SciPack final assessments finished to date. 7449 passed.

Graphs Raw Numbers

6/7/2012



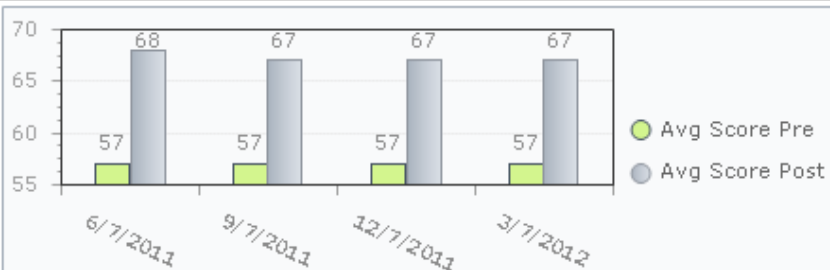
Previous: 4 Quarters Update

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

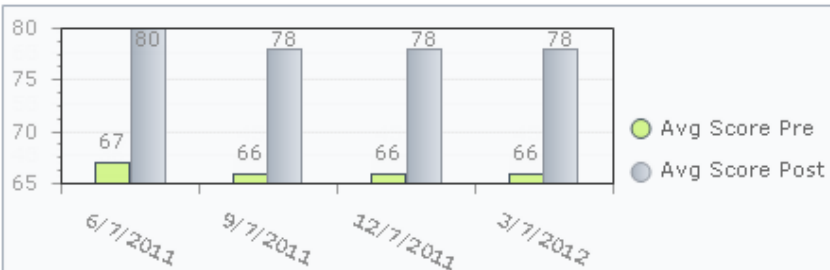


Energy Assessment

1108 Pre-tests taken with a 66% avg score

373 Post-tests taken with a 78% avg score

totals as of 6/7/2012

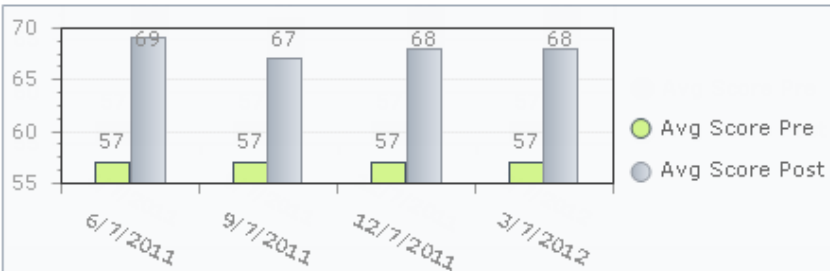


Oceans Effect on Weather and Climate Assessment

653 Pre-tests taken with a 57% avg score

228 Post-tests taken with a 69% avg score

totals as of 6/7/2012



State and District Collaborations

- Over 140 unique private/public learning communities across State and District Partnerships using the Learning Center in various blended teacher learning models as of July 2012
- See dozens of administrator, university, and teacher testimonials

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

University Pre-Service Models

- Florida International University
- Georgia Southern University
- Idaho State University
- Indiana University-Purdue University Columbus
- Mercer University
- Montana State University
- Plymouth State University
- Radford University
- Shippensburg University
- Southern Illinois University/Carbondale
- University of Maryland, Baltimore County
- University of Texas at Tyler

Preservice Science Method Professor Testimonials

I am writing to praise NSTA for your creative efforts in providing online professional development resources for teachers and to let you know that at **The University of Maryland, Baltimore Campus** we are using the resources with our pre-service elementary science teachers to boost their content understandings and help them gain insights into high quality professional development. As the professor of the UMBC elementary science methods course and as a professional development researcher, my belief is that the day you decide to become a science teacher you start on your professional development journey. So, one of the main goals in my course is to help my pre-service teachers become aware of the resources that will serve them across their careers as life-long learners. **The online professional development resources on the NSTA website are a perfect fit for helping us reach this goal. I encourage other university science educators to get their students involved in Learning Center activities. Our pre-service teachers deserve the opportunity to experience NSTA's innovative, high quality, online professional development learning experiences as these are the types of activities they will be doing as practicing science teacher**

UMBC

Susan M. Blunck, Ph.D.
Associate Clinical Professor
Science Education
Director UMBC Center for
Excellence in STEM Education

Preservice Science Method Professor Testimonials

I utilize the NSTA Learning Center for my Pre-service Teachers enrolled in my science methods courses at The University of Texas-Tyler. I utilize the Learning Center because it is much more comprehensive than a methods text. The NSTA Learning Center allows me to develop (preload) a library of materials I can share with my students to serve as their text. It allows the students to build upon the library by adding their own resources as they learn about science teaching and learning. In the EC-6 and 4-8 grade level certification programs too many students do not have the content backgrounds they need in science. The Learning Center allows me to evaluate my students' science content knowledge using the free PD Indexer tool and develop a remediation plan using SciPacks to address their gaps in knowledge. The best part is that students complete the modules outside of class rather than taking limited class time. Students also seem to like the SciGuides that are coupled with the SciPacks and Science Objects, as they provide vetted web-based resources, lesson plans, and access to the simulations found in the SciPacks for use in the classroom.



Michael Odell, Ph.D.
Roosth Chair in Education
Executive Director, The
Ingenuity Center
University of Texas at Tyler

See dozens more: <http://learningcenter.nsta.org/impact/>



Learning Center **Impact Studies and Research**

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

Research and Dissemination

- **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/>

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)

It's about varying the mix...

- Administrator acknowledgement, and recognition systems help to integrate online and onsite as single effort for your PLC's.
- Mix various instructional strategies:
 - Case Study/Debates
 - Sharing Students Work/Products
 - Role Playing Scenarios
 - Collaborative Projects/Inquiries
 - Panel Discussions/Hot Polls
 - Smashing Sentences
 - Data Analysis/Visualizations

Blending Online and Onsite Professional Development: Applying What the Research Says for Effective and Sustainable Learning Communities

Questions?

Al Byers
PH: 703-312-9294
Email: abyers@nsta.org

<http://learningcenter.nsta.org>

The screenshot displays the NSTA Learning Center website. At the top, the NSTA logo and "National Science Teachers Association" 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". There are buttons for "UPDATE YOUR PROFILE" and "CHECK THE LEADER BOARDS". A section titled "Explore Learning Opportunities" offers filters by Subject (Earth & Space Science, Life Science, Physical Science), Grade Level (Elementary, Middle School, High School, College), and State Standards. It also promotes "Do-It-Yourself Learning" and "Live Online Seminars & Classes". At the bottom, there are sections for "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 "NEXT GENERATION SCIENCE STANDARDS" section with a "Register Today!" button. A "Most Popular Resources" section lists items like "Coral Reef Ecosystems" and "Cell Structure and Function: Cells - The Basis of Life".

On the Horizon: Teacher Learning Journeys!

