LearningBlade®

Growing interest and sharpening skills for STEM.

Impacting the Next Generation in STEM

Sheila Boyington, President

Dr. Dane Boyington, CTO

Congressman Zach Wamp

APSRC

Arkansas Public School Resource Center

Demand for STEM Workers is Growing

12%

STEM Jobs

8%

Non-STEM Jobs

Growth in Arkansas Jobs 2014-2024

http://vitalsigns.changetheequation.org/state/arkansas/demand

LearningBlade®
Growing interest and sharpening skills for STEM.

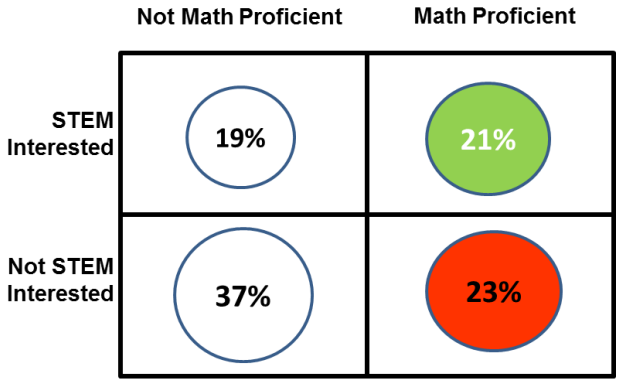
Why STEM Career Awareness Matters

LearningBlade®
Growing interest and sharpening skills for STEM.

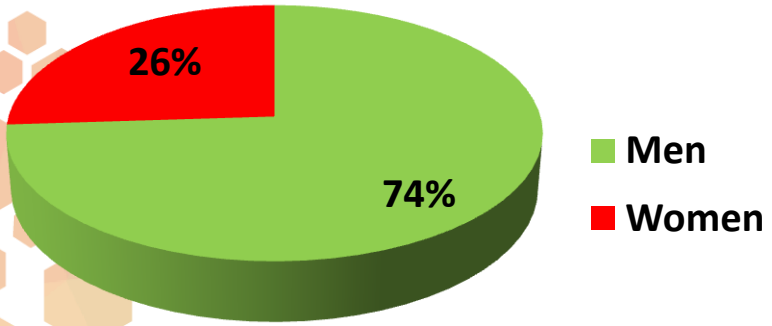
Need More Interest and Diversity in STEM Students

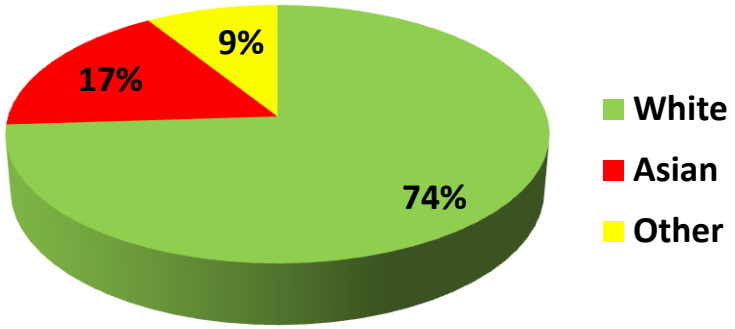
21% Interested and Prepared

23% Prepared but not Interested



12th Graders, 2013, from ACT, Inc.





Only 26% of STEM Workers are Minority or Female

LearningBlade®
Growing interest and sharpening skills for STEM.

Students Need Exposure to STEM Careers in Middle School to Meet Job Needs in AR!

130,516 **STEM jobs by 2024 in Arkansas**

No. 1 Reason Students do not Major in STEM is **Lack of Awareness of Careers**

94% Middle School Students Making **Career-Related Decisions**

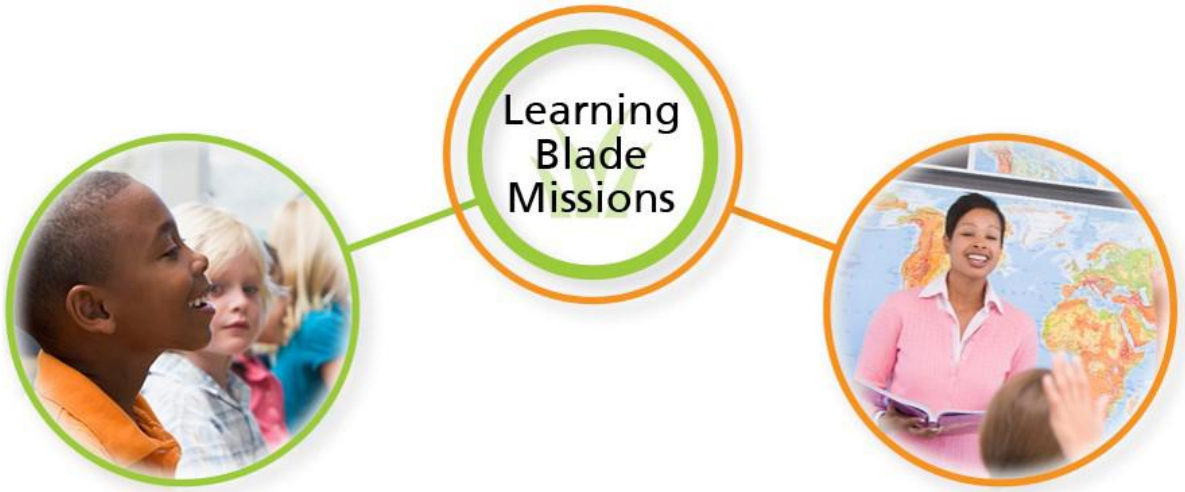
Increase of 8988 STEM jobs in Arkansas from 2016 to 2025, https://www.usinnovation.org/state/pdf_cvd/ASTRA-STEM-on-Hill-Arkansas2016.pdf

"Increasing Student Interest in Science, Technology, Engineering, and Math (STEM)" UMass Donahue Institute Research and Evaluation Group, 2011, as retrieved from http:www.mass.edu/forinstitutions/prek16/documents/Student%20Interest%20Summary%20Report.pdf

LearningBlade®
Growing interest and sharpening skills for STEM.

Learning Blade Creates STEM Awareness

Game-Based, Contextualized Learning Tailored to the Interests of each Student



Reinforcement of Basic Academics Indexed by Standards

- A **supplemental, online** game-based platform
- **Engages students** with a wide range of STEM technologies and careers
- Requires **minimal preparation** - Little training and no specialized equipment necessary
- Motivates **minorities and girls** to explore STEM fields
- Useful in **many academic classrooms**; analyzes student skills according to middle school **Academic Standards**

LearningBlade®
Growing interest and sharpening skills for STEM.

Missions Focus on Variety of Career Clusters

12

Contexts for STEM Clusters

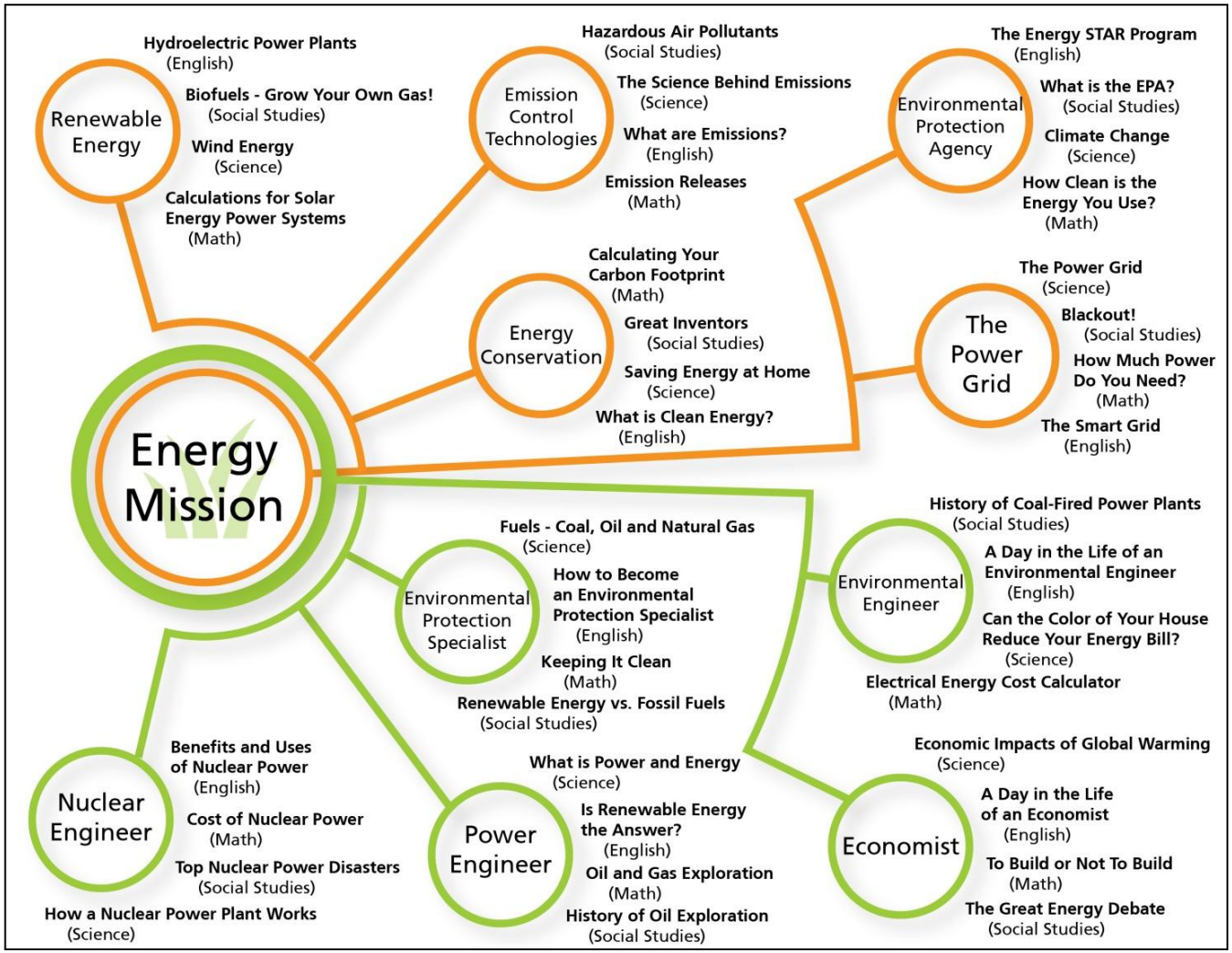
Dolphin Rescue	Help rescue rehabilitate an injured dolphin, including creating an artificial prosthetic tail	Biomedicine, Marine Science
Haiti Orphanage	Design and build an environmentally-sound orphanage for children left homeless by an earthquake in Haiti	Construction, Sustainability
Heart Surgery	Conduct heart surgery and therapy for a child with a heart defect; evaluate the use of artificial hearts or heart components	Medicine
Energy Production	Evaluate alternative or upgraded energy sources for a city that currently has an old coal-fired power plant	Energy Production, Environment
Local Food	Consider methods to increase production of local foods in a community	Agriculture
Robotics Design	Explore technology used for robotics design, such as sensors, electrical circuits, industrial design and computers	Electronics, Computer Science
Flu Outbreak	How health and IT professionals can use data warehousing and analysis to predict flu outbreaks using GIS and social media data	Information Technology
Transportation Jam	Evaluate new transportation methods for a city that has a traffic congestion problem	Transportation
Manufacturing Concept	Use modern manufacturing techniques to design and build a new concept car	Advanced Manufacturing
Entrepreneur-ship	Set up a new business with a focus on entrepreneurship	Finance, Business
Lightweight Aircraft	Design a lightweight and easily maintained aircraft for distant missions	Lightweight Metals Manufacturing
Hack Attack	Learn about methods to create and protect website, apps and social media after a school's website and media are hacked	Computer Science

100 Careers and Technologies

400 Interactive Academic Lessons

Tools

Teammates



Computer Science Mission

New *"Hack Attack"* Computer Science Mission*:*
After noticing changes to your school's website and social media, you and your friends decide to create a way to detect and track attempts to hack the school accounts.

TEAMMATES	TOOLS
Software Engineer	Cybersecurity
Web Developer	Data Analytics
Data Scientist	Cloud Computing
Information Security Analyst	Social Media
UI/UX Designer	Mobile Applications

Launching at APSRC Conference October 18th

LearningBlade®
Growing interest and sharpening skills for STEM.

Battelle Education: *Learning Blade Increases STEM Career Interest AND Reviews Academic Standards*

DOUBLING the # of students interested in becoming an engineer and/or scientist

79% Increase In students recognizing "*Math is helpful when solving interesting problems.*"

69% Increase In students recognizing "*What I learn in school will be useful later in life.*"

56% Increase In students interested in **taking advanced math classes** in high school.

LearningBlade®
Growing interest and sharpening skills for STEM.

Learning Blade Arkansas Status

The Governor supported statewide deployment through the **Arkansas Public School Resource Center**.

Pilot program in 2015-16 school year:

- **74 schools** and **5,367 students** registered
- Students completed **2,298 hours** in over **13,256 lessons**

Statewide deployment beginning for 2016-17 school year:

- **415 schools** and **11,340 students** already registered
- **31,342 lessons** completed
- **Trained 325** staff
- Estimated **314% ROI**

"Learning Blade's focus on STEM education will offer Arkansas's students new and exciting opportunities to learn real-world computer science concepts. This program will help our young learners master the fundamentals required for an array of specialized and highly-competitive STEM careers. This effort, along with my computer science initiative, is putting Arkansas's students in an even better position to land tech-driven jobs. As the computer coding movement in Arkansas continues to gain momentum, I look forward to even greater numbers of students taking on the skills needed for these challenging and rewarding fields."

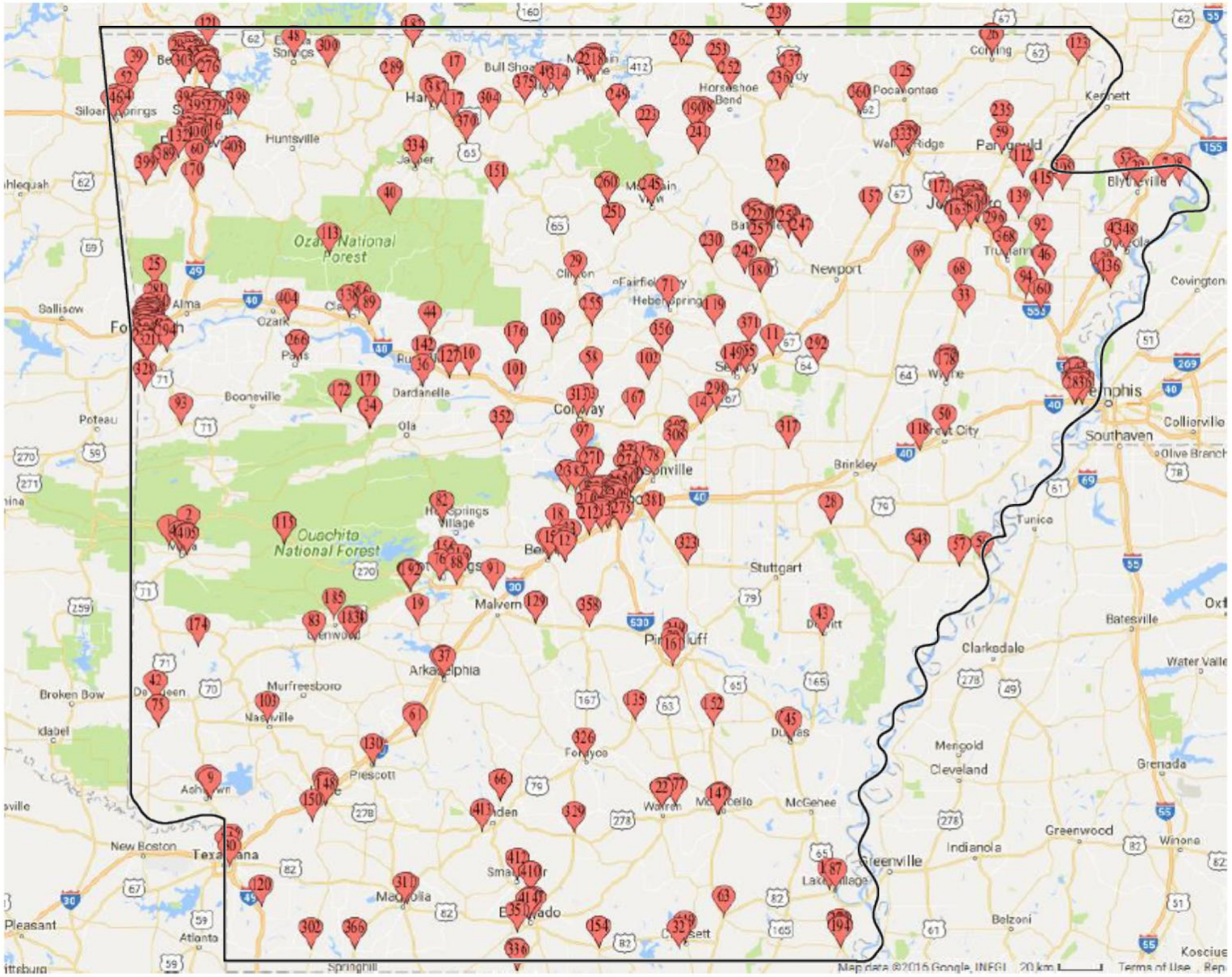
- Governor Asa Hutchinson, Arkansas

ARKANSAS DEPARTMENT OF EDUCATION

Arkansas Department ACE of Career Education

gBlade®
ng skills for STEM.

Currently Registered Schools



Learning Blade Tennessee Status

Supported by the legislature through appropriation to the Tennessee STEM Innovation Network (TSIN). Now in 2nd year through recurring funds.

Current deployment status:

- **498 schools activated Learning Blade accounts in over 82 counties**
- **61,523 students are currently registered**
- **Completed 141,517 STEM Lessons**
- **Over 21,384 hours of STEM engagement**
- **Estimated 500% ROI**

tsin Tennessee STEM Innovation Network

"Students deserve high quality engagement around STEM careers. The Tennessee STEM Innovation Network's providing Learning Blade's unique online personalized STEM career awareness to all TN middle schools allows our schools this engagement while increasing academics successfully."

- Dr. Kathleen Airhart, TN Department of Education, Deputy Commissioner / COO

LearningBlade®
Growing interest and sharpening skills for STEM.

LearningBlade®

Growing interest and sharpening skills for STEM.

BATTELLE Education

Learning Blade has been validated as a supplemental tool for increasing STEM career awareness and interest by Battelle Education.

The ACT®

Suggested resource by STEM experts in ACT's "The Condition of STEM 2014, 2015, 2016"

manufacturing FORESIGHT

Selected as a "Game changing practice for engaging students in STEM and manufacturing"

In partnership with

APSRC Arkansas Public School Resource Center

tsin Tennessee STEM Innovation Network

MINORITIES IN ENERGY INITIATIVE U.S. DEPARTMENT OF ENERGY

STEMconnector®

TENNESSEE CHAMBER of Commerce & Industry

TENNESSEE MANUFACTURERS ASSOCIATION

lift

TATA CONSULTANCY SERVICES

TENNESSEE ASSOCIATION OF MANUFACTURERS

MWM Million Women Mentors® Advancing Women and Girls in STEM Careers Through Mentoring

hope street group

Computer Science Mission Featured by White House

- Worked with Tata Consultancy Services (TCS) and the State of Arkansas to release a new Learning Blade mission dedicated to computer science technologies and careers
- Included in White House's "Computer Science for ALL" summit

Thinking Media is committing to exposing up to 30,000 middle school students in 320 schools in Arkansas to computer science careers through the **Governor of Arkansas's** initiative to deliver **Learning Blade**, a tool for increasing STEM career awareness, by December 2017. In addition, at a national level, **TATA Consultancy Services (TCS)** will collaborate with Thinking Media and Learning Blade to introduce ten different CS careers and technologies in a way that emphasizes social interaction and impact.

Tennessee STEM Innovation Network will create a virtual STEM education hub equipped with CS courses, CS and STEM career awareness through **Learning Blade** to reach rural and under-served students at over 150 schools by June 2017.

#CSforALL

TATA CONSULTANCY SERVICES

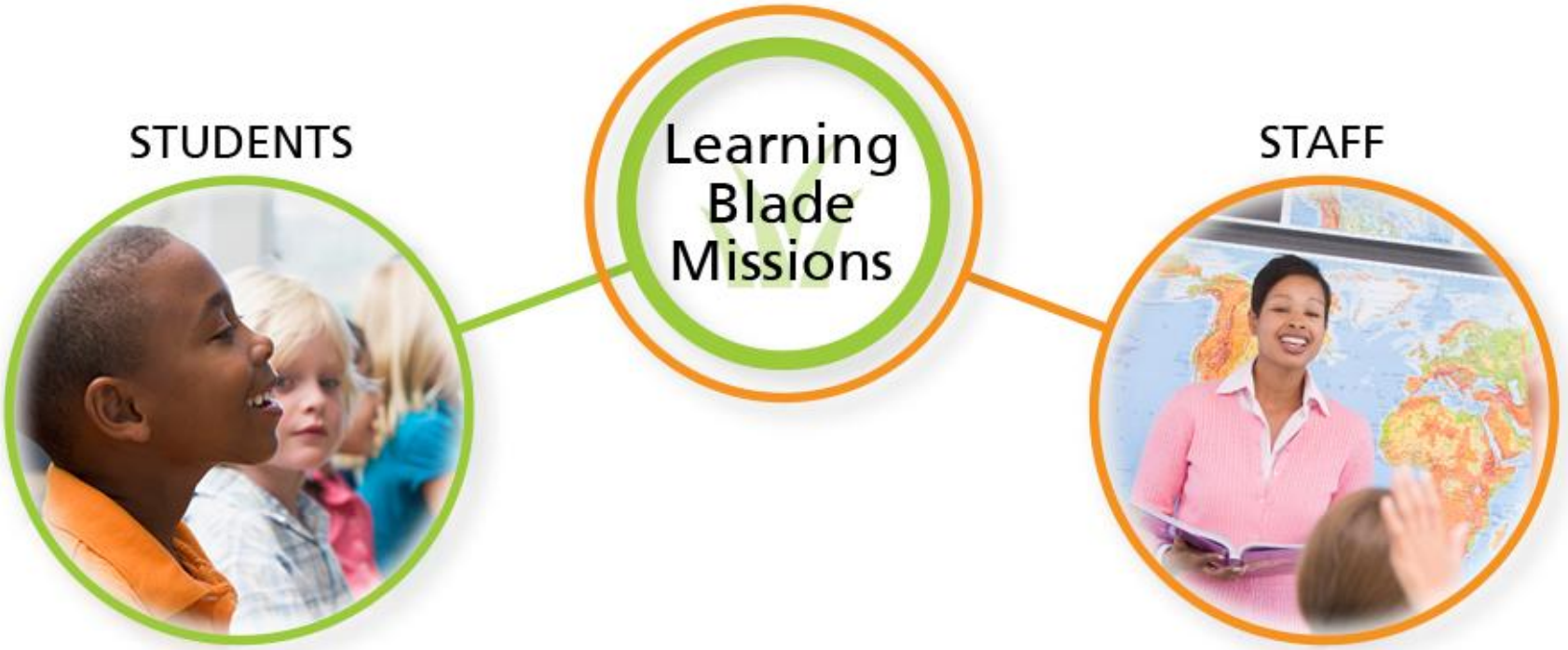
LearningBlade®
Growing interest and sharpening skills for STEM.

Thank You!

For more information, contact Sheila@thinkingmedia.com

LearningBlade®
Growing interest and sharpening skills for STEM.

THANK YOU!



Game-Based, Contextualized Learning
Tailored to the Interests of each Student

Reinforcement of Basic Academics
Indexed by Standards

LearningBlade®
Growing interest and sharpening skills for STEM.

STEM² Hub Accomplishments

- STEM² Hub is serving as a role model for statewide STEM workforce preparation; is supported by wide range of industries
- Florida's representative to national STEMx organization
- Accomplishments in one year include:
  - Grew after-school competitive robotics teams by 62%
  - Grew after-school competitive math teams by 33%
  - Introduced computer science curriculum at elementary level
  - Convened iBuy Regional Event to showcase local startup tech
  - Published State of STEM report for Northeast Florida
  - Forged partnerships with best practice STEM curriculum developers

LearningBlade®
Growing interest and sharpening skills for STEM.

LEARNING BLADE – Return on Investment

With an investment of $400,000 per year, the increase in state and local tax revenues as a result of better employment in STEM careers will yield an high return on investment:

Basis:

- Increase [illegible]orker: $ 31,636
- Increase [illegible]venue per worker: $ 3,100
- Percentage of school participating: 25%
- Fraction of students who change careers 1 in 200

FIX

Results:

- **314% Return on Investment**
- **162 New Jobs Filled per Year**

LearningBlade®
Growing interest and sharpening skills for STEM.

2 Distinctions

BATTELLE Education

Validation from BattelleEd / STEMx

Learning Blade has been validated as a supplemental tool for increasing STEM career awareness and interest by Battelle Education

The ACT®

Suggested resource by STEM experts in ACT's "The Condition of STEM" in the 2014 and 2015 Reports

LearningBlade®
Growing interest and sharpening skills for STEM.

Learning Blade – Return on Investment

With an investment of $1.5M per year, the increase in state and local tax revenues as a result of better employment in STEM careers will yield an high return on investment:

Basis:

- Increase [illegible]orker: $ 35,193
- Increase [illegible]venue per worker: $ 2,710
- Percentage of school participating: 25%
- Fraction of students who change careers 1 in 200

FIX

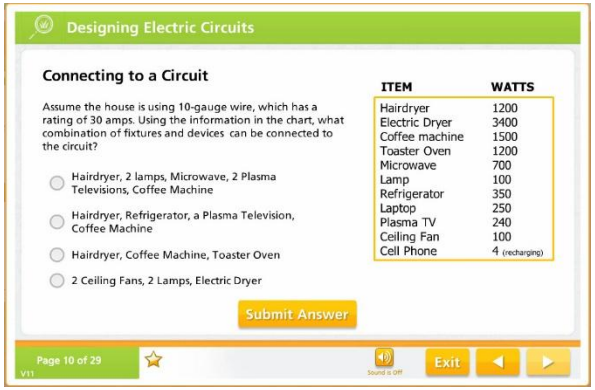
Results:

- **509% Return on Investment**
- **1020 New Jobs Filled per Year**

Learning Blade is a Supplemental STEM Career Awareness System that Supports Academics

- Introduces students to a wide range of STEM technologies and careers and **engages students** through a game-based platform
- Requires **minimal preparation -** Little teacher training and no specialized equipment necessary
- Motivates **minorities and girls** to explore STEM fields
- Useful in many academic classrooms, not just science
- Analyzes student skills according to **Standards** nomenclature
- Based on **Middle School Standards –** around 100 hours of curriculum that can be used in Middle and High schools
- Bringing STEM to **Rural Communities**

Learning Blade Increases STEM Career Interest AND Reviews Academic Standards



- Self-paced, online system allows use in any location, including rural
- Tied to academic skills and useful in any classroom, not just science
- Reaches Rural Communities

Results:

71% Increased Awareness of STEM Careers and Technology

37% More Likely to Follow STEM

Source: Learning Blade pilot studies in 5 states validated by Battelle Education

LearningBlade®
Growing interest and sharpening skills for STEM.

Learning Blade Increases STEM Career Interest AND Reviews Academic Standards

DOUBLING the # of students interested in becoming an engineer and/or scientist

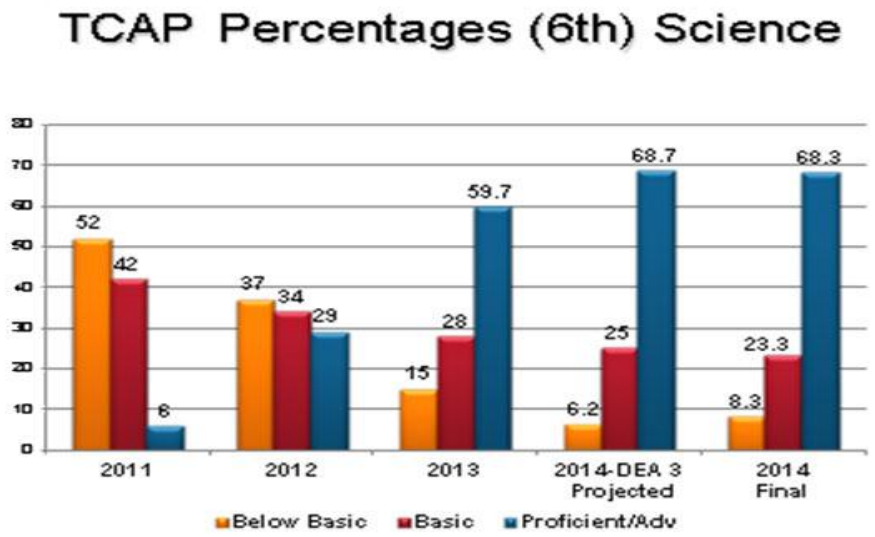
79% Increase In students recognizing "*Math is helpful when solving interesting problems.*"

69% Increase In students recognizing "*What I learn in school will be useful later in life.*"

56% Increase In students interested in **taking advanced math classes** in high school.

LearningBlade®
Growing interest and sharpening skills for STEM.

Learning Blade Results



TN State science assessment scores at CGLA - adopted Learning Blade in 2013.

LearningBlade®
Growing interest and sharpening skills for STEM.

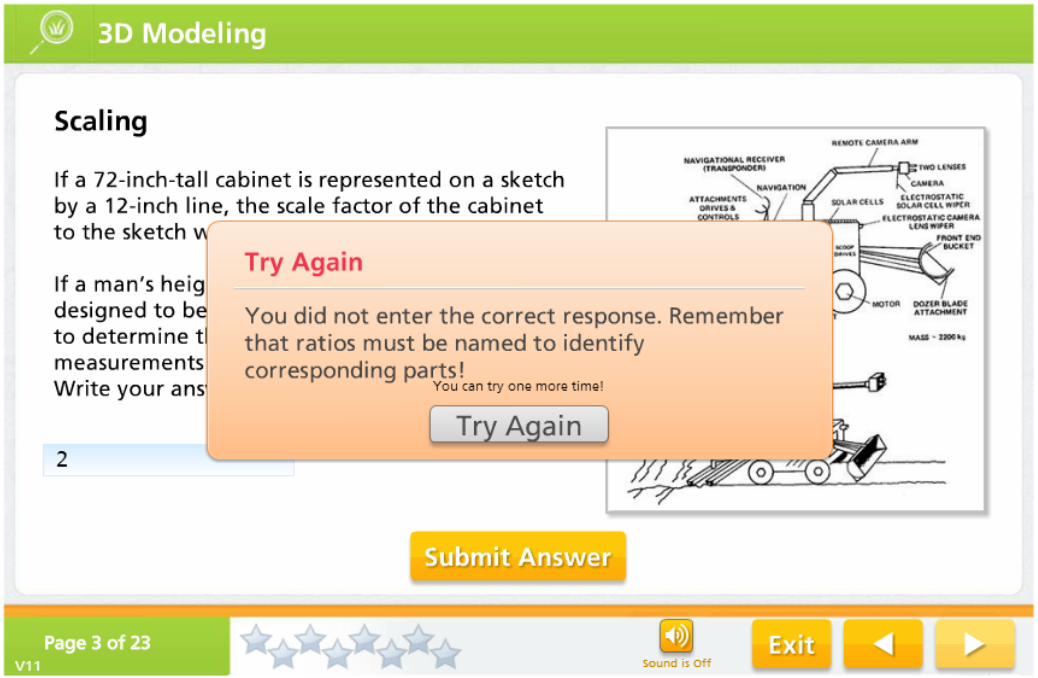
Learning Blade is Interdisciplinary

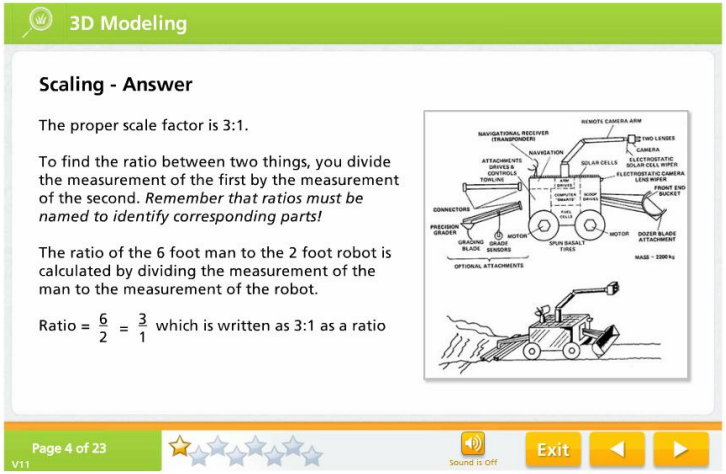
Individual lessons include topics in the context of science, math, English and social studies

LearningBlade®
Growing interest and sharpening skills for STEM.

Formative Feedback

Every question a student answers in Learning Blade is followed by instantaneous feedback, allowing for individualized student growth.



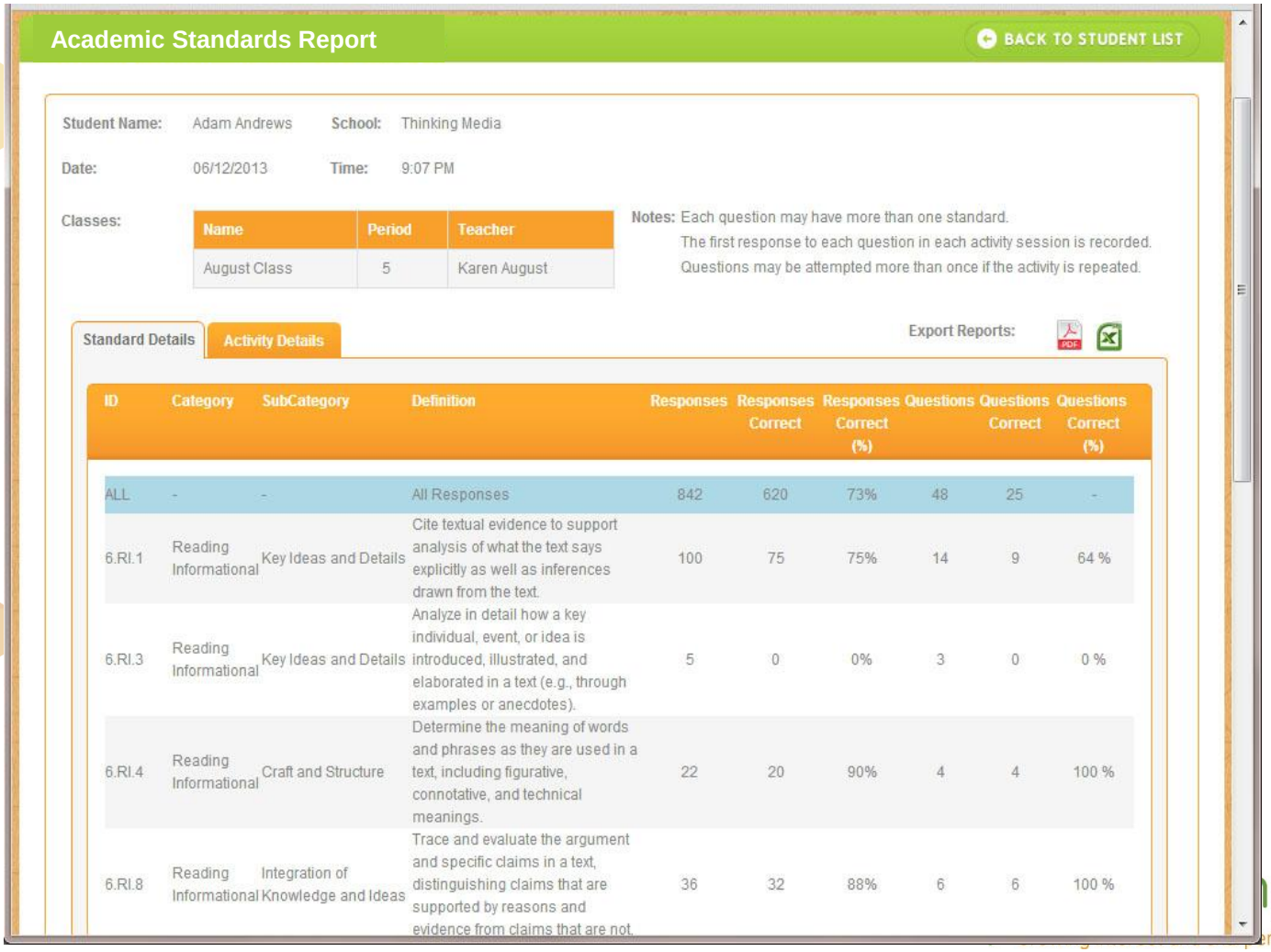


Audio Assistance

An integrated narrative soundtrack is included for those students who need reading assistance - shown to increase Lexile scores.

Individualized Reporting

Integrated Learning Management System tracks progress, reports on performance against specific academic standards



Academic Standards Report

BACK TO STUDENT LIST

Student Name: Adam Andrews **School:** Thinking Media

Date: 06/12/2013 **Time:** 9:07 PM

Classes:

Name	Period	Teacher
August Class	5	Karen August

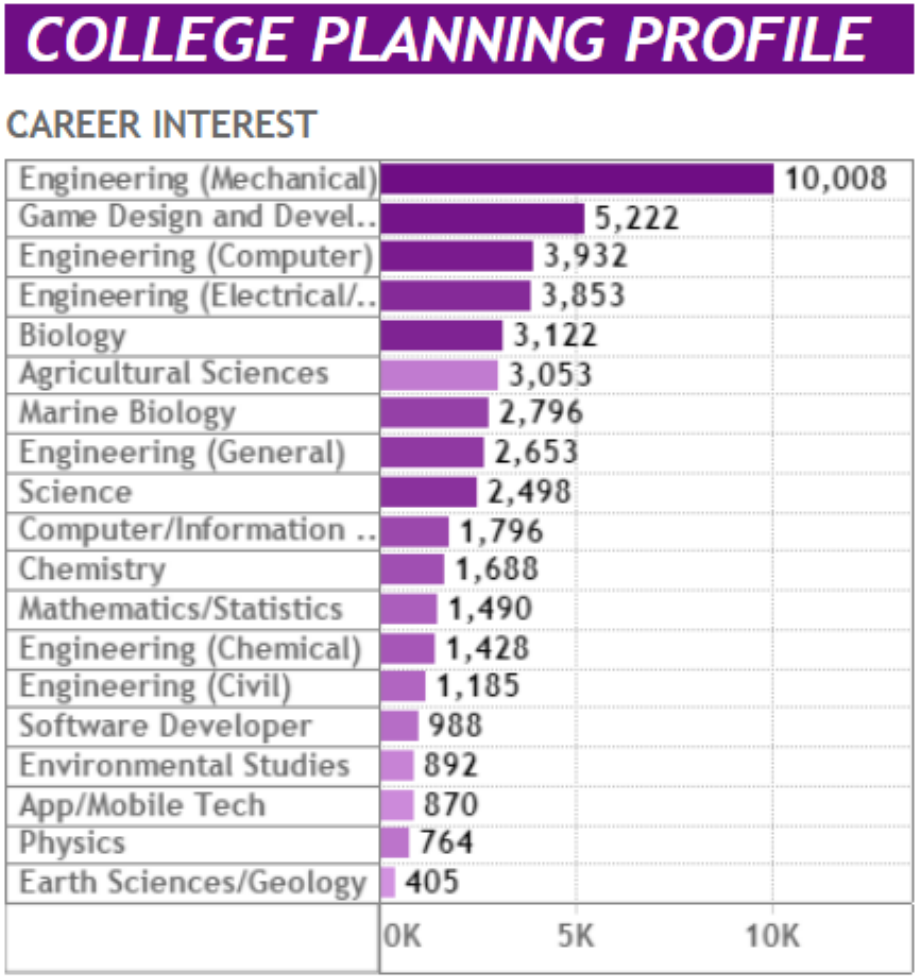
Notes: Each question may have more than one standard.
The first response to each question in each activity session is recorded.
Questions may be attempted more than once if the activity is repeated.

Standard Details | Activity Details

Export Reports:

ID	Category	SubCategory	Definition	Responses	Responses Correct	Responses Correct (%)	Questions	Questions Correct	Questions Correct (%)
ALL	-	-	All Responses	842	620	73%	48	25	-
6.RI.1	Reading Informational	Key Ideas and Details	Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	100	75	75%	14	9	64 %
6.RI.3	Reading Informational	Key Ideas and Details	Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).	5	0	0%	3	0	0 %
6.RI.4	Reading Informational	Craft and Structure	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.	22	20	90%	4	4	100 %
6.RI.8	Reading Informational	Integration of Knowledge and Ideas	Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.	36	32	88%	6	6	100 %

TN Students STEM College Bound Profile



http://www.shapingourfuture.org/

List of Careers in Learning Blade

Accountant
Agricultural Engineer
Agronomist
Anthropologist
Architect
Automotive Designer
Automotive Engineer
Biomedical Engineers
Business Consultant
Civil Engineer
Computer Programmer
Database Administrator
Doctors
Economist
Electrical Technician
Electrician
Environmental Engineers
Environmental Protection
Epidemiologist
Food Assurance Technician
Industrial Designer
Industrial Engineer
Investor
Logistics Engineer
Machinist
Manufacturing Technician
Marine Biologist
Mechanic
Mechanical Drafter
Mechanical Engineer
Microbiologists
Nuclear Engineer
Nurses
Paramedic
Power Engineer
Safety Administrator
Scuba Diver
Statistician
Therapists
Transportation Engineer
Transportation Planner
Veterinarians
Welder

Current Status in Tennessee

The Tennessee STEM Innovation Network (TSIN) has made Learning Blade available to all middle schools and other organizations statewide

Currently activated in schools in these counties – Feb. 2016

Tennessee Results – March 2016

- **360 schools** activated Learning Blade accounts in over **65 counties** with access to 100 hours of STEM materials tied to the **TN Ready standards**
- Over **53,000 students are currently registered**
- Tennessee students have **completed over 94,000 lessons**
- Over **25 in-person training events** across the state
- Over **95 webinar trainings** offered
- **PhD Candidate** in Tennessee focusing research on Learning Blade
- **Other Engaged Partners** include the Tennessee State Chamber , Tennessee Association of Manufacturers, Launch TN, Hope Street Group, and STEMConnector® /Million Women Mentors
- Supports the Governor's **Drive to 55** for middle school students
- **Dr. Kathleen Airhart**, Dept. State Superintendent and Chief Operating Officer visited schools using the TSIN-supported Learning Blade to review progress of implementation

Tennessee Results – March 2016

Preliminary Student Survey Results from Tennessee Indicate Strong Response in Our Primary Goal of Increasing STEM Interest and Academic Relevancy

	Before LB	After LB
I would like to be an engineer or scientist in the future (strongly agree)	10%	21%
I would like a job where I design or build things (strongly agree)	14%	25%
What I learn in school will be useful later in my life (strongly agree)	33%	56%
Math is helpful when solving interesting problems (strongly agree)	26%	47%
In high school, I plan to take advanced math classes or more science classes than are required	29%	38%

Significant at 95% confidence, n=87 pre-users, 220 post-users

Why is STEM Education Needed in Tennessee?

Tennessee's Drive to 55 Target Workforce is Today's Students

A four-year degreed worker in 2025 is **today's 6th grade student**.

2015

For Drive to 55 to succeed,
We need to engage today's student.

2025

Preparing Students for TN Ready

(New) TNReady Example Question

Place the details in the correct order that they happened in the passage. Order from 1-6.

The entire passage is located in the last section of this guidebook called "Resources."

A well-dressed man asked to see Mr. Jefferson.	4
Mr. Jefferson refused to go back to the hotel.	6
The landlord said he had no rooms.	3
Men sat by the door of a hotel in Baltimore.	1
A man covered in mud asked for a room at the hotel.	2
The landlord apologized to Mr. Jefferson.	5

Students will drag and drop the choices into the correct order from 1-6 on the computer.

(New) TNReady Example Question

Lucas has 45 pencils.

- He places the pencils into 5 groups, using all the pencils.
- Each group has the same number of pencils.

Part A

Enter an equation that can be used to find the number of pencils, p, in each group.

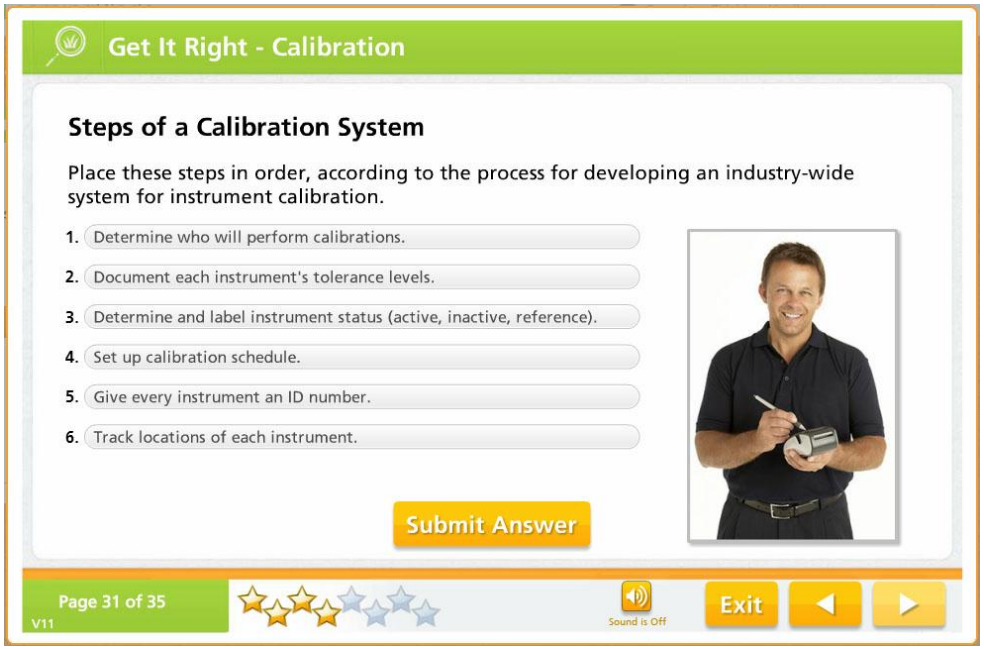
45 ÷ 5 = p

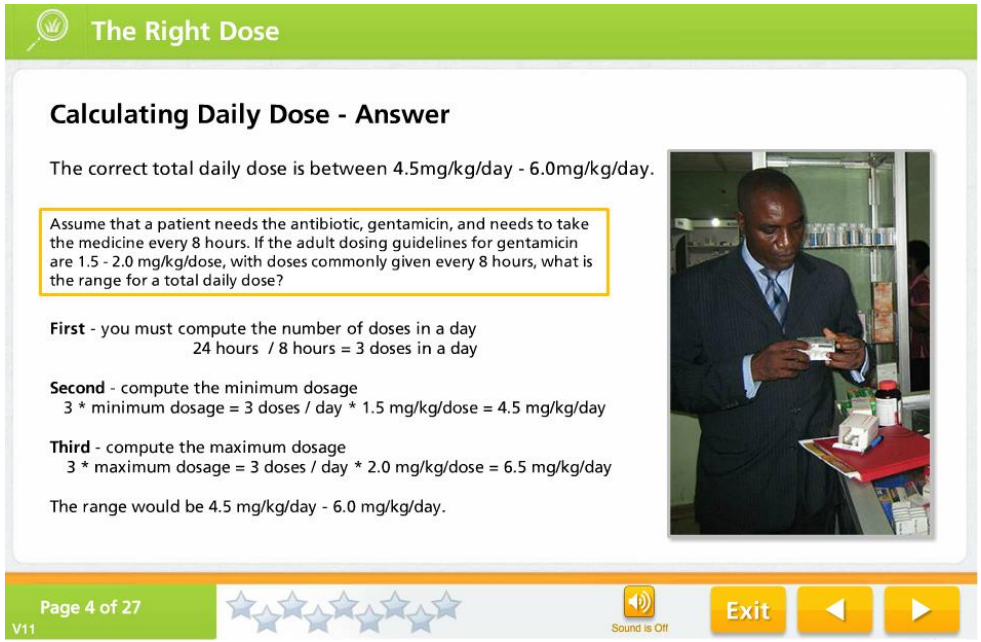
Part B

Enter the number of pencils in each group.

P = 9

7





LearningBlade®

Growing interest and sharpening skills for STEM.

Battelle
The Business of Innovation

Learning Blade has been validated as a supplemental tool for increasing STEM career awareness and interest by BattelleEd.

The ACT®

Suggested resource by STEM experts in ACT's "The Condition of STEM 2014, 2015"

In partnership with

APSRC
Arkansas Public School Resource Center

tsin Tennessee STEM Innovation Network

MINORITIES IN ENERGY INITIATIVE
U.S. DEPARTMENT OF ENERGY

STEMconnector®

Launch Tennessee

TENNESSEE CHAMBER of Commerce & Industry
TENNESSEE MANUFACTURERS ASSOCIATION

lift

MWM Million Women Mentors®
Advancing Women and Girls in STEM Careers Through Mentoring

DATASEAM

TENNESSEE ASSOCIATION OF MANUFACTURERS

hope street group

Thinking Media Brings Strong Experience in Similar Education Solutions

- Tennessee-based WBE, MBE and Small Business of the Year for Chattanooga
- Creators of KeyTrain® for ACT WorkKeys®, acquired by ACT
  - Online basic skills enhancement curriculum
  - Used in approx. 15% of US high schools and in other agencies
  - Managed 28 statewide contracts with over 4 million registered users
  - 7.2 million lessons and 2.4 million hours used per year
  - Statistically proven effective at raising basic skills test scores