Career Blade
Career Awareness and Preparation System

LearningBlade®
STEM / CS/ CTE Career Awareness Resources

# STEM/Computer Science/CTE

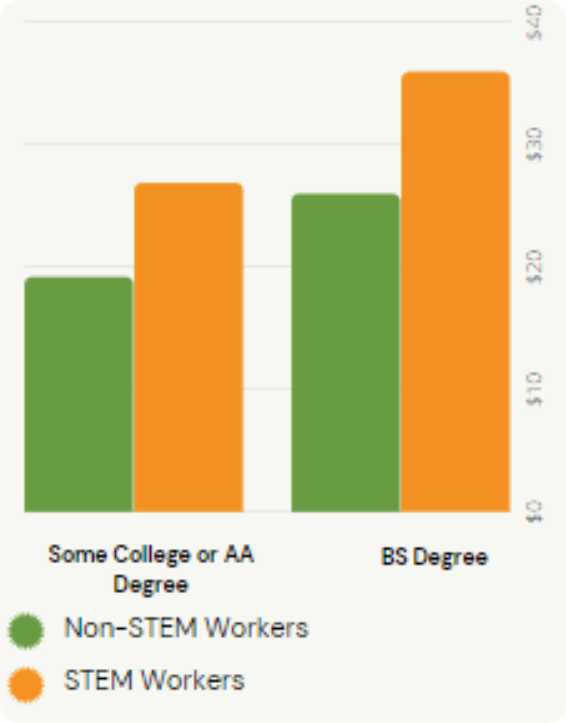
Joshua Sneideman – Vice President

STEM ACTION CENTER

**Sign up for your free account at:**
**www.LearningBlade.com/ID**
**www.CareerBladeIdaho.com**

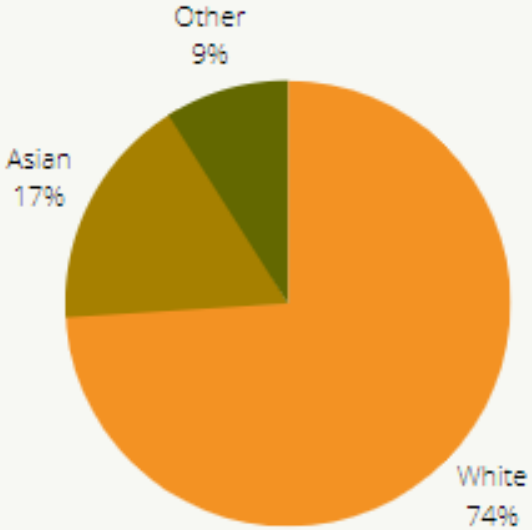
**For more information, email us at:**
**info@LearningBlade.com**

# Demand for STEM, computer science, career tech workers is growing, but participation by students is lacking.

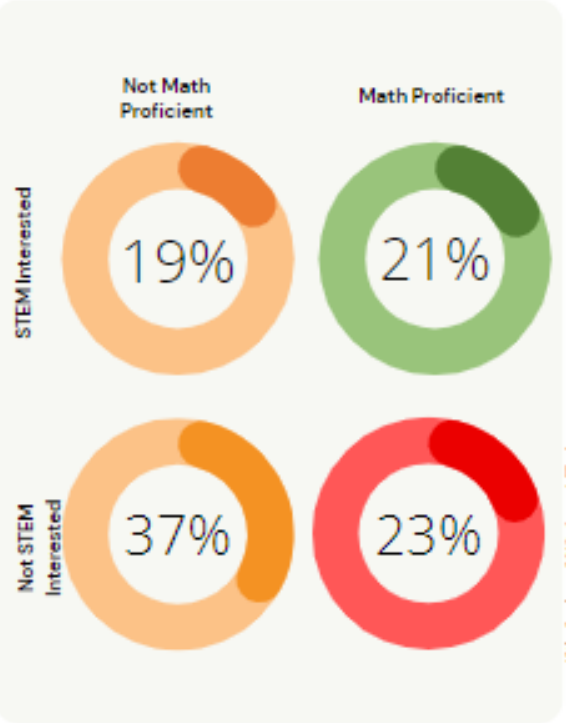



**STEM Jobs pay more at all levels**

**Women are underrepresented in STEM**




**Minorities are underrepresented in STEM**




**23% of Students are prepared for STEM, but are not interested**

# Students need exposure to High-Demand careers as early as middle school.

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

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


"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

# We introduce students to CS and STEM Careers through “Missions”.


Contextualized Learning for Students, Tailored to their Interests

Reinforcing Academic Standards while Providing Resources that ANY Teacher can use

# “Missions” involve a societal challenge that interests students

**12**

**“Missions” that engage all students**

| Mission | Challenge | Career Clusters |
|---|---|---|
| **Car Manufacturing** | Use modern manufacturing techniques to design and build a new concept car | Advanced Manufacturing |
| **Dolphin Rescue** | Help rescue rehabilitate an injured dolphin, including creating an artificial prosthetic tail | Biomedicine, Marine Science |
| **Energy Sources** | Evaluate alternative or upgraded energy sources for a city that currently has an old coal-fired power plant | Energy Production, Environment |
| **Entrepreneurship** | Set up a new business with a focus on entrepreneurship | Finance, Business |
| **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 |
| **Fresh Food** | Consider methods to increase production of local foods in a community | Agriculture |
| **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 |
| **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 |
| **Lightweight Aircraft** | Design a lightweight and easily maintained aircraft for distant missions | Lightweight Metals Manufacturing |
| **Rescue Robots** | Explore technology used for robotics design, such as sensors, electrical circuits, industrial design and computers | Electronics, Computer Science |
| **Transportation Congestion** | Evaluate new transportation methods for a city that has a traffic congestion problem | Transportation |

# Each Mission includes an interactive toolbox of lessons and activities.

Interactive online lessons, ready-to-use lesson plans and activities for middle and high school students.
Can be used by any teacher, anywhere. Validated and proven to increase STEM/CS/CTE career interest.

### Interactive Lessons

Over 400 online lessons tied to academic standards

### Hands-On Projects

Mission challenges are project-based lessons using common materials

### Design Thinking

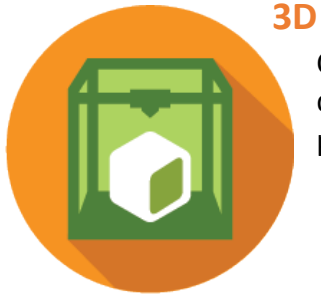
Solve complex problems with the 5-step creative thinking process

### Parent Discussions

Handouts and easy experiments for at-home discussions

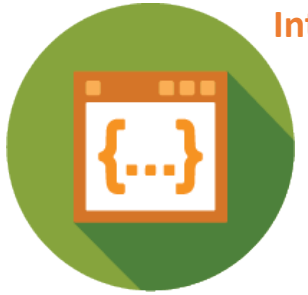
### Career Videos

Introduce over 50 careers with real-life people



### 3D Printing Activities

Create objects that demonstrate science principles



### Intro to Coding

20-hour middle school course providing robust coding experiences

### Papercraft Figures

Students make origami-type figures of 100 careers and technologies

# SAI Int. brings strong experience in similar education solutions.

**Creators of the ACT WorkKeys® curriculum: KeyTrain® and Career Ready 101® (acquired by ACT)**

- Helped to create the **National Career Readiness Certificate**
- Used in approx. **15% of US high schools** and in other agencies
- Managed **28 statewide contracts** with over 4 million registered users
- Delivered **7.2 million lessons and 2.4 million hours** used per year
- Statistically proven effective at raising basic skills test scores

**Tennessee-based WBE, MBE and Small Business of the Year for Chattanooga**

# Middle School and Perkins V for Career and Technical Education(CTE)

The Perkins V Act specifically requires career exploration in middle school:

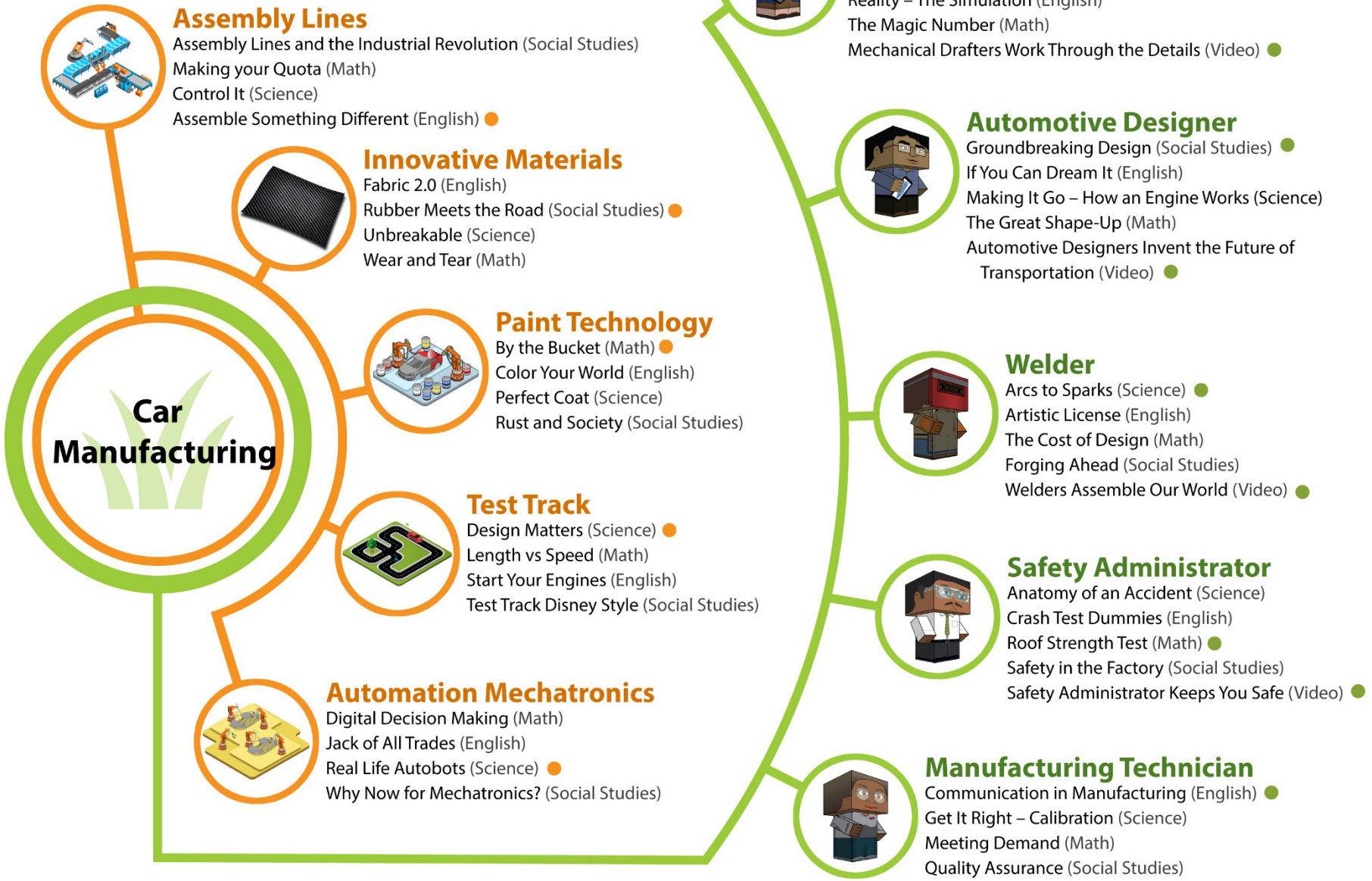
- Section 135 (b) (1) says to “provide career exploration and career development activities through an organized, systematic framework designed to aid students, including in the middle grades, before enrolling and while participating in a career and technical education program, in making informed plans and decisions about future education and career opportunities and programs of study.”

- Learning Blade meets this need.

CTE® Career & Technical Education

# Car Manufacturing

Use modern manufacturing techniques to design and build a new concept car.




## Assembly Lines

Assembly Lines and the Industrial Revolution (Social Studies)
Making your Quota (Math)
Control It (Science)
Assemble Something Different (English) ●

## Innovative Materials

Fabric 2.0 (English)
Rubber Meets the Road (Social Studies) ●
Unbreakable (Science)
Wear and Tear (Math)

## Paint Technology

By the Bucket (Math) ●
Color Your World (English)
Perfect Coat (Science)
Rust and Society (Social Studies)

## Test Track

Design Matters (Science) ●
Length vs Speed (Math)
Start Your Engines (English)
Test Track Disney Style (Social Studies)

## Automation Mechatronics

Digital Decision Making (Math)
Jack of All Trades (English)
Real Life Autobots (Science) ●
Why Now for Mechatronics? (Social Studies)

## Mechanical Drafter

Aerodynamics in Action (Science) ●
From the Page to the Track (Social Studies)
Reality – The Simulation (English)
The Magic Number (Math)
Mechanical Drafters Work Through the Details (Video) ●

## Automotive Designer

Groundbreaking Design (Social Studies) ●
If You Can Dream It (English)
Making It Go – How an Engine Works (Science)
The Great Shape-Up (Math)
Automotive Designers Invent the Future of Transportation (Video) ●

## Welder

Arcs to Sparks (Science) ●
Artistic License (English)
The Cost of Design (Math)
Forging Ahead (Social Studies)
Welders Assemble Our World (Video) ●

## Safety Administrator

Anatomy of an Accident (Science)
Crash Test Dummies (English)
Roof Strength Test (Math) ●
Safety in the Factory (Social Studies)
Safety Administrator Keeps You Safe (Video) ●

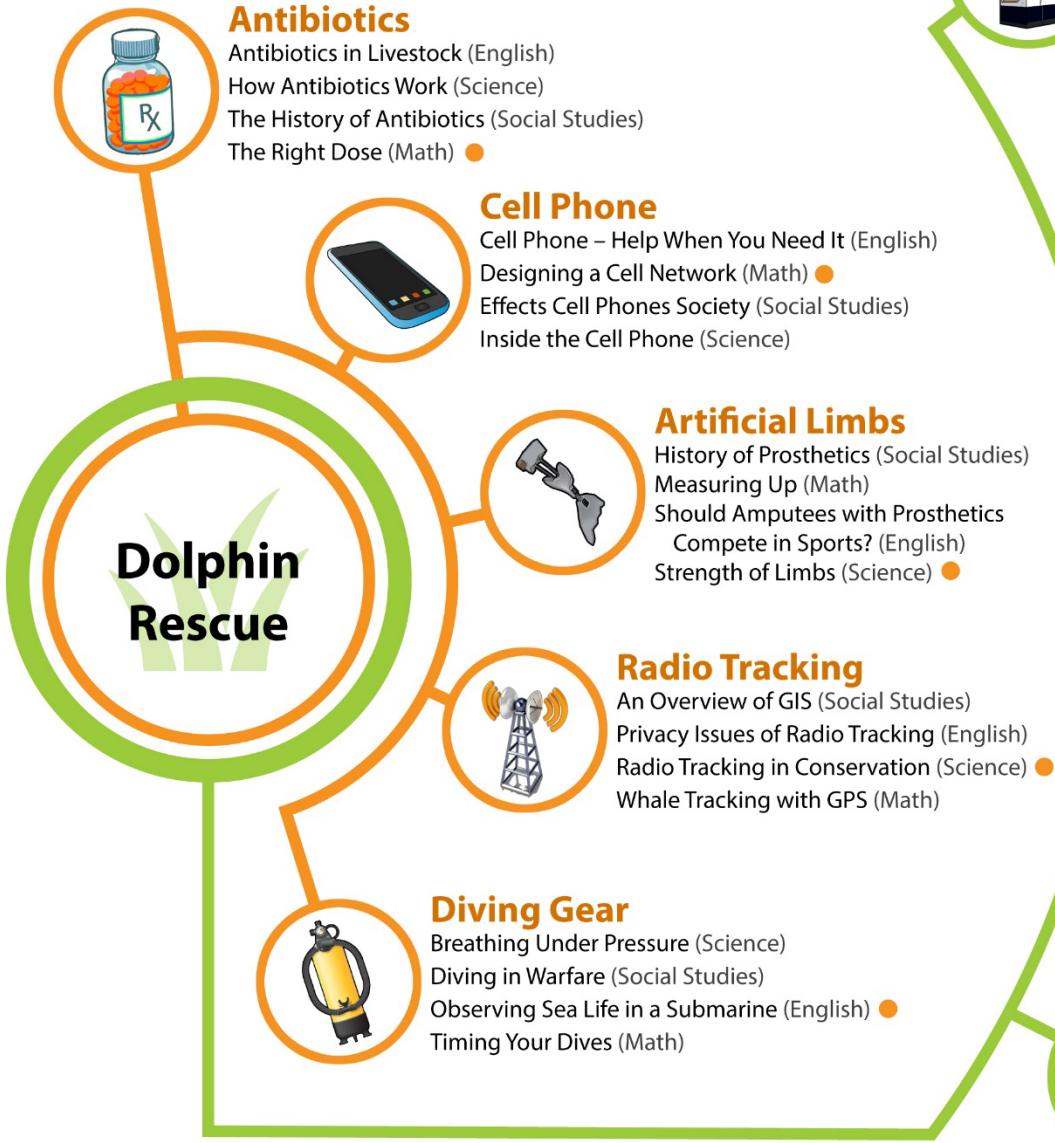
## Manufacturing Technician

Communication in Manufacturing (English) ●
Get It Right – Calibration (Science)
Meeting Demand (Math)
Quality Assurance (Social Studies)
Learn About a Manufacturing Technician (Video) ●

● ● Express missions only include these lessons.

# Dolphin Rescue

Help rescue and rehabilitate an injured dolphin, including creating an artificial prosthetic tail.




## Antibiotics

Antibiotics in Livestock (English)
How Antibiotics Work (Science)
The History of Antibiotics (Social Studies)
The Right Dose (Math) ●

## Cell Phone

Cell Phone – Help When You Need It (English)
Designing a Cell Network (Math) ●
Effects Cell Phones Society (Social Studies)
Inside the Cell Phone (Science)

## Artificial Limbs

History of Prosthetics (Social Studies)
Measuring Up (Math)
Should Amputees with Prosthetics Compete in Sports? (English)
Strength of Limbs (Science) ●

## Radio Tracking

An Overview of GIS (Social Studies)
Privacy Issues of Radio Tracking (English)
Radio Tracking in Conservation (Science) ●
Whale Tracking with GPS (Math)

## Diving Gear

Breathing Under Pressure (Science)
Diving in Warfare (Social Studies)
Observing Sea Life in a Submarine (English) ●
Timing Your Dives (Math)

## Biomedical Engineer

Physics of Swimming (Math)
Students Driving Change (English)
The Bionic Man (Science)
What is a Biomedical Engineer (Social Studies) ●
Biomedical Engineers Use Technology to Improve Our Health (Video) ●

## Machinist

3D Printing Technology (Math)
A Day in the Life of a Machinist (Social Studies) ●
Getting Into Shape (Science)
Modern Machining Technology (English)
Machinists Craft Our Modern World (Video) ●

## Marine Biologist

A Day in the Life of a Marine Biologist (English) ●
Jacques Cousteau (Social Studies)
Lessons from the Gulf Oil Spill (Math)
Whale Hunting (English)
Marine Biologists Preserve Our Aquatic Environments (Video) ●

## SCUBA Diver

Aquarius Underwater Laboratory (Science) ●
A Day in the Life of an Aquarium Diver (Math)
The History of Underwater Diving (Social Studies)
Coral Reefs - Our Underwater Rainforests (English)
Commercial Divers go to Great Depths (Video) ●

## Veterinarian

Advanced Surgical Care in Pets (Social Studies)
Calculating a Diet for a Captive Dolphin (Math) ●
Modern Advances in Veterinary Care (Science)
The Perfect Habitat (English)
Veterinarians Care for Our Animal Friends (Video) ●

● ● Express missions only include these lessons.

# Energy Sources

Evaluate alternative or upgraded energy sources for a city that currently has an old coal-fired power plant.

**Energy Sources**

## Environmental Protection Agency

Climate Change (Science) ●
What is the Energy Star Program? (English)
How Clean is the Energy You Use? (Math)
What is the EPA? (Social Studies)

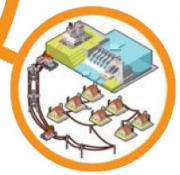
## Energy Conservation

Calculating Your Carbon Footprint (Math)
Great Inventors (Social Studies)
Saving Energy at Home (Science) ●
What is Clean Energy? (English)

## Emission Controls

Emission Releases (Math)
Hazardous Air Pollutants (Social Studies)
The Science Behind Emissions (Science)
What are Emissions? (English)

## The Power Grid



Blackout (Social Studies)
How Much Power Do You Need? (Math)
The Power Grid (Science) ●
The Smart Grid (English)

## Renewable Energy

Geothermal Heating and Cooling (Science)
Hydroelectric Power (Social Studies)
Calculations for Solar Energy Systems (Math) ●
Wind Energy (English)

## Environmental Protection Specialist

Fuels – Coal, Oil, and Natural Gas (Science)
How to Become an Environmental Protection Specialist (English) ●
Keeping It Clean (Math)
Renewable Energy vs. Fossil Fuels (Social Studies)
Environmental Protection Specialists Give Good Stewardship (Video) ●

## Environmental Engineer

A Day in the Life of an Environmental Engineer (English) ●
Can the Color of Your House Reduce Your Energy Bill? (Science)
Electrical Energy Cost Calculator (Math)
History of Coal Fired Power Plants (Social Studies)
Environmental Engineers Keep Our World Clean and Healthy (Video) ●

## Economist

A Day in the Life of an Economist (English)
Economic Impacts of Global Warming (Science)
The Great Energy Debate (Social Studies) ●
To Build or Not to Build (Math)
Economists Affect the Bottom Line (Video) ●

## Nuclear Engineer

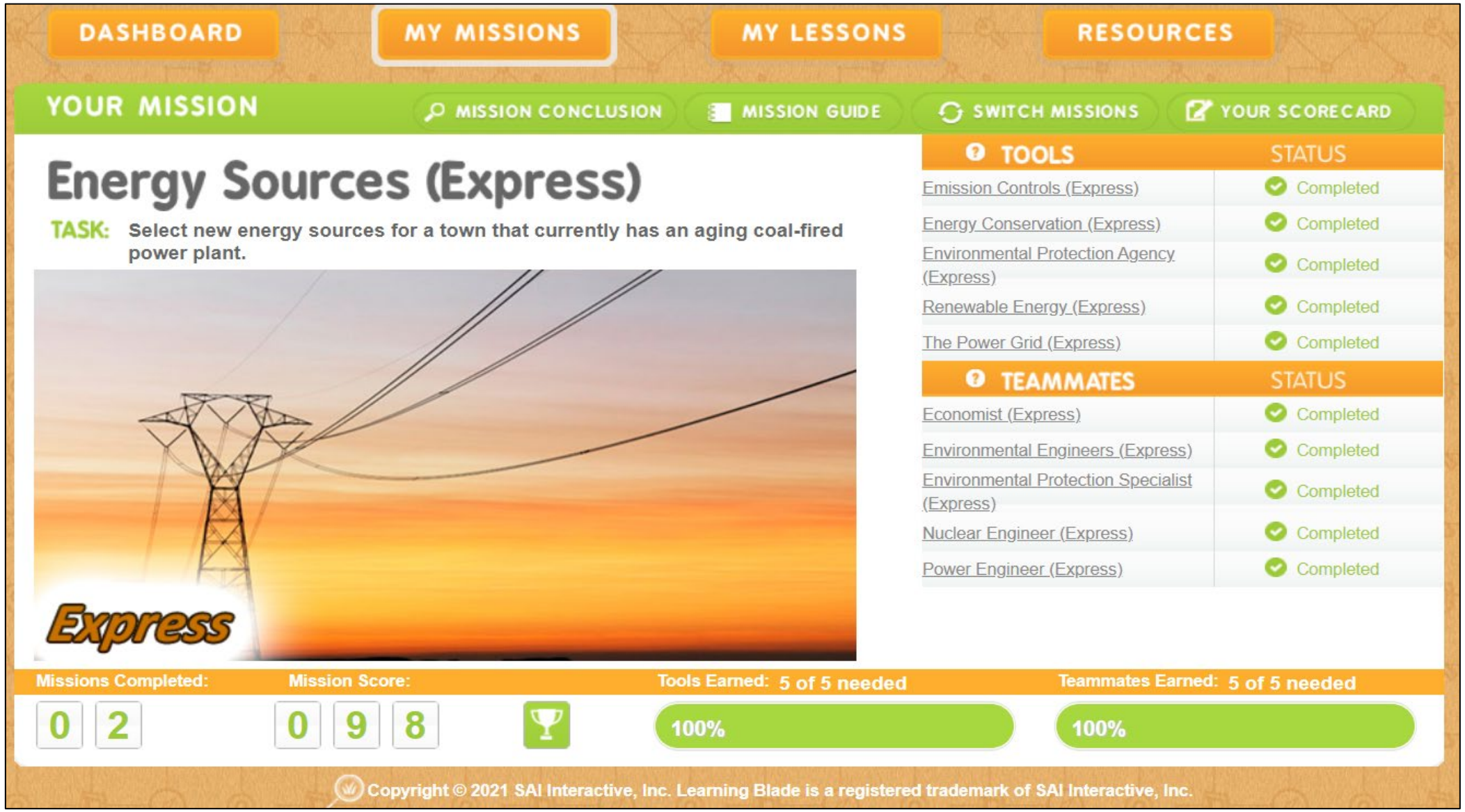
Benefits and Uses of Nuclear Power (English)
How a Nuclear Power Plant Works (Science) ●
The Cost of Nuclear Power (Math)
Top Nuclear Power Disasters (Social Studies)
Nuclear Engineers Provide the Power (Video) ●

## Power Engineer

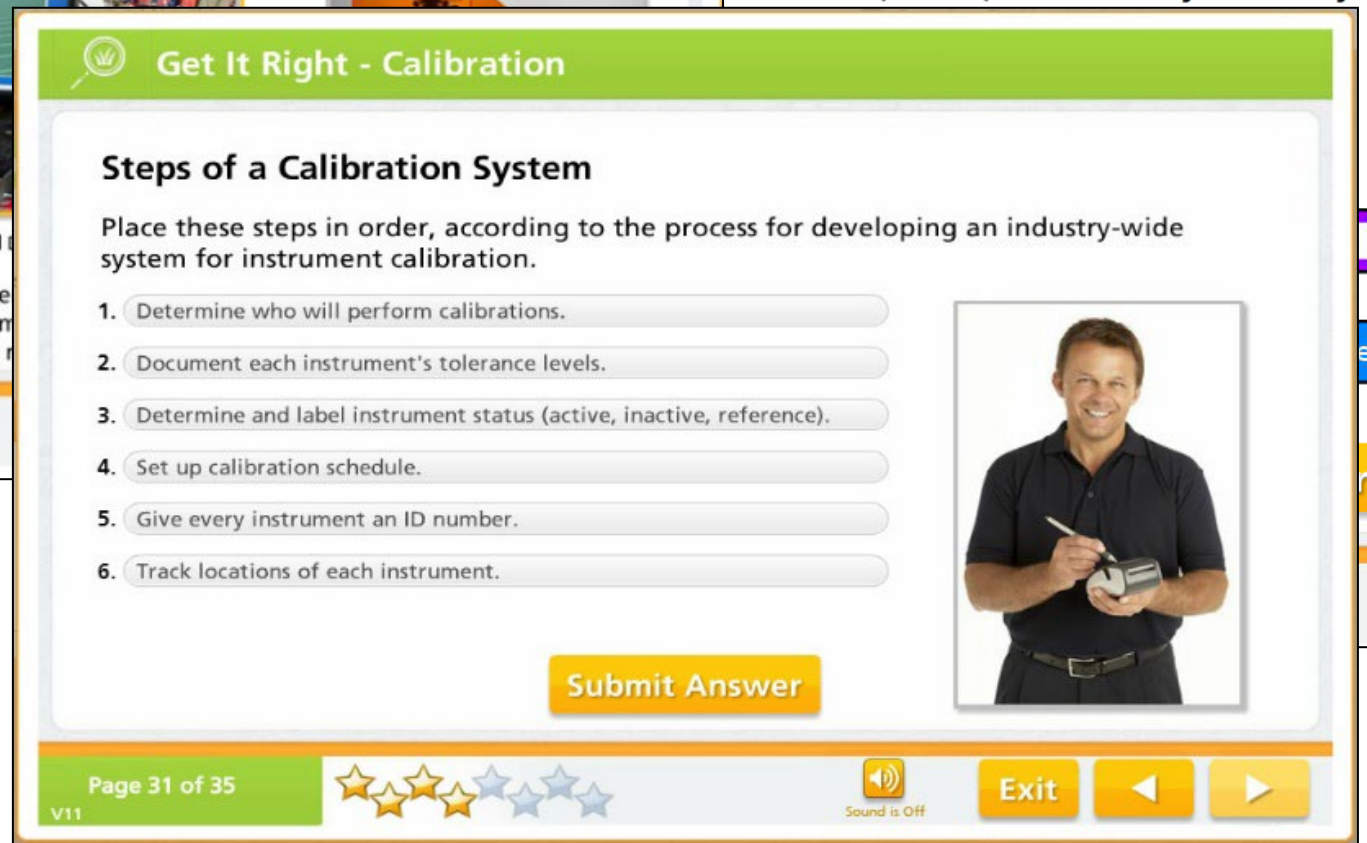
History of Oil Exploration (Social Studies)
Is Renewable Energy the Answer? (English) ●
Oil and Gas Exploration (Math)
What is Power and Energy? (Science) ●
Power Engineers Get Energy (Video)

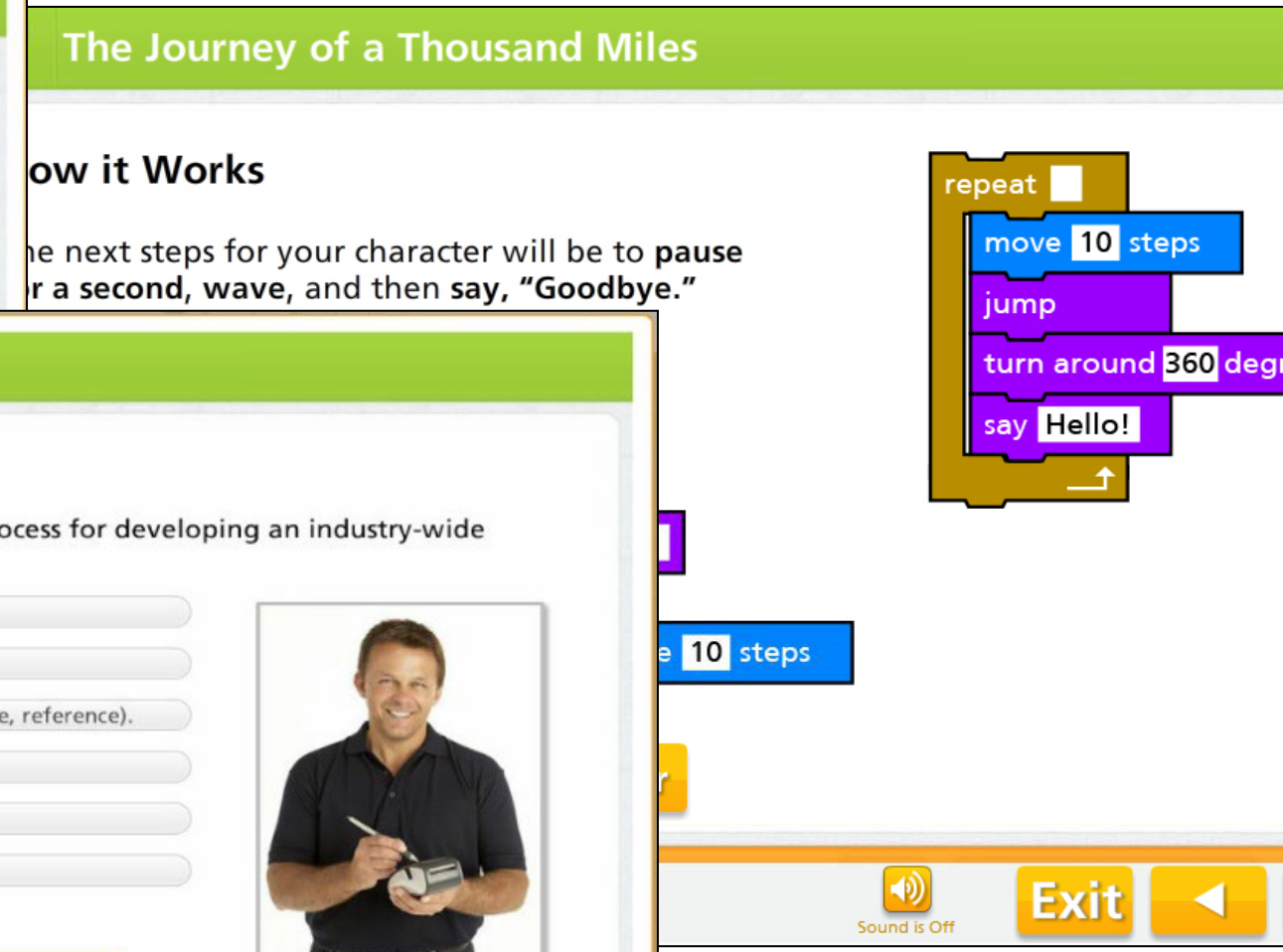
● ● Express missions only include these lessons.

# Students operate missions from a mission dashboard.



# LB interactive lessons introduce careers while reviewing academics.

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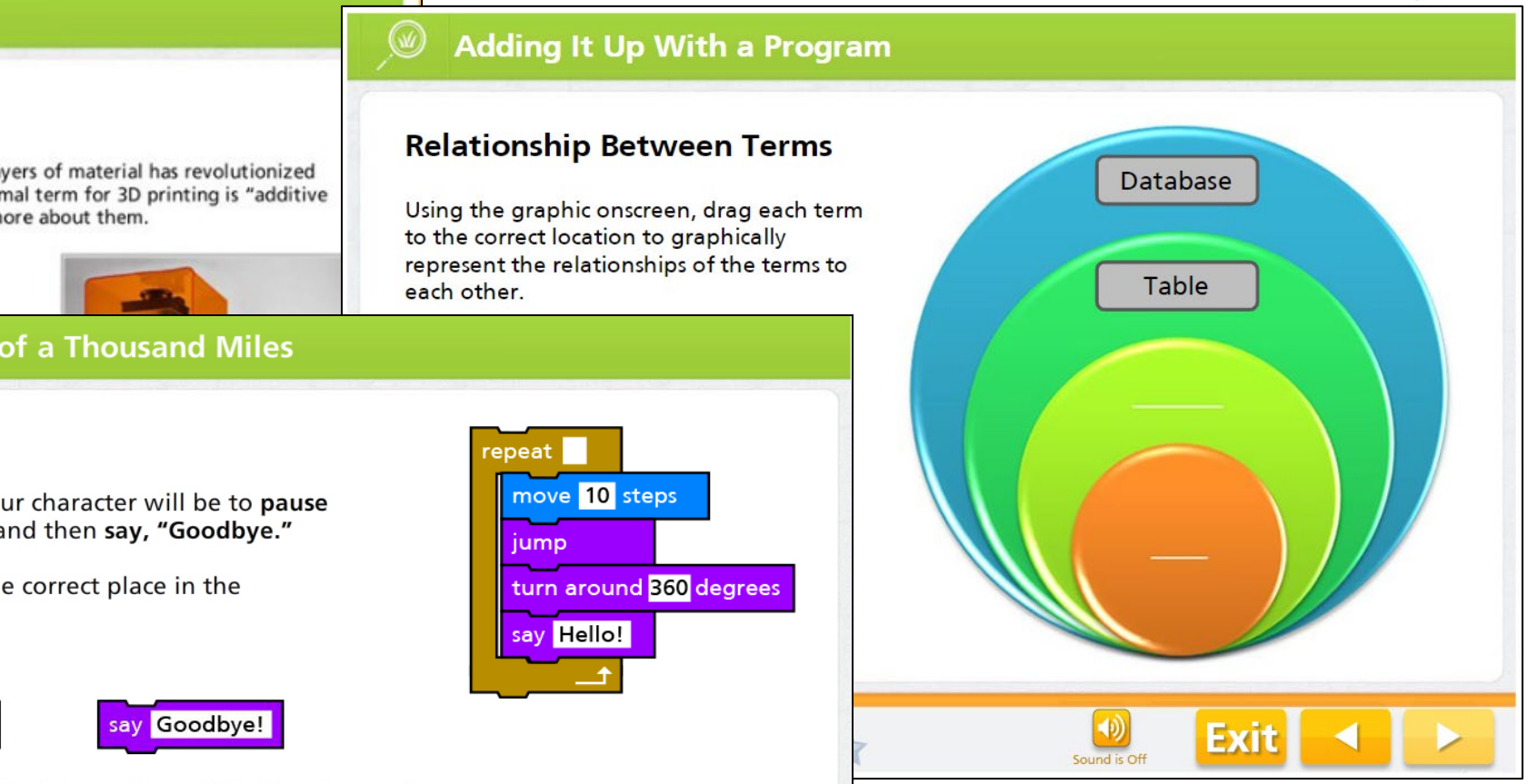
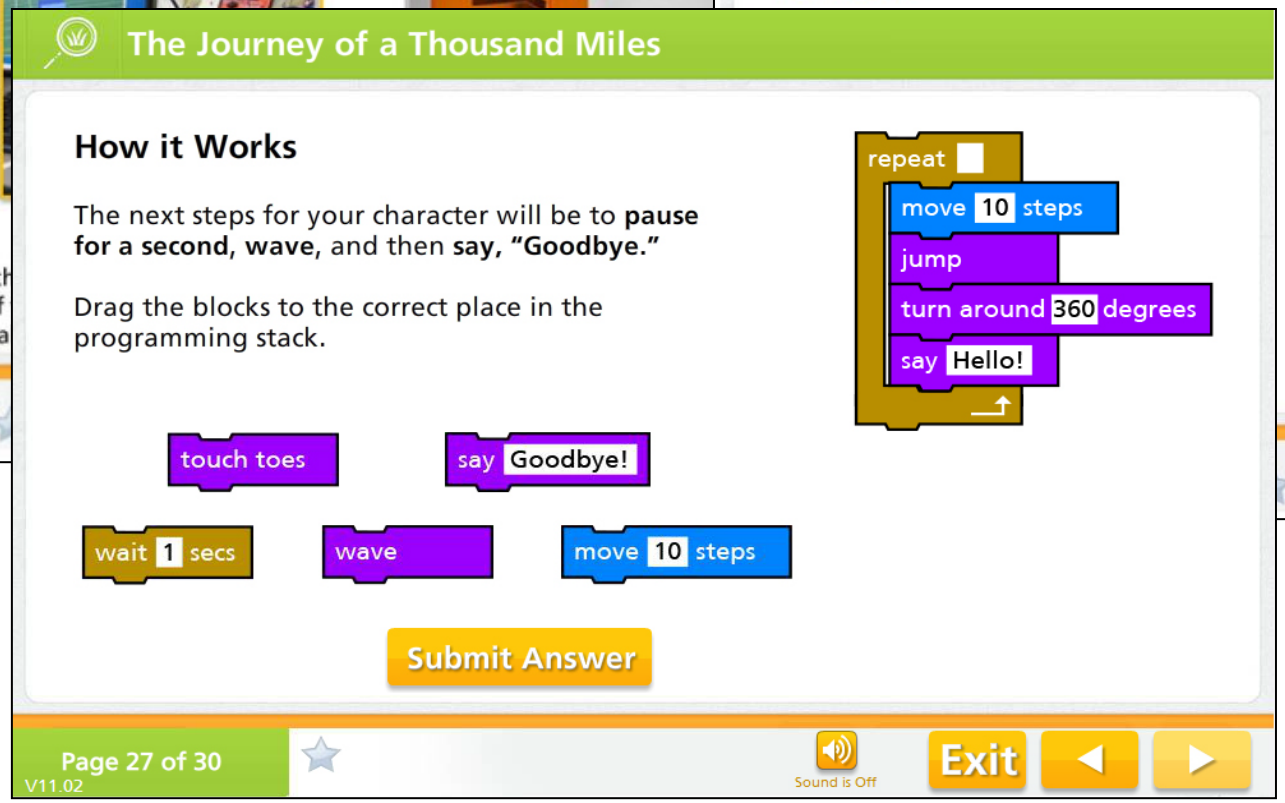
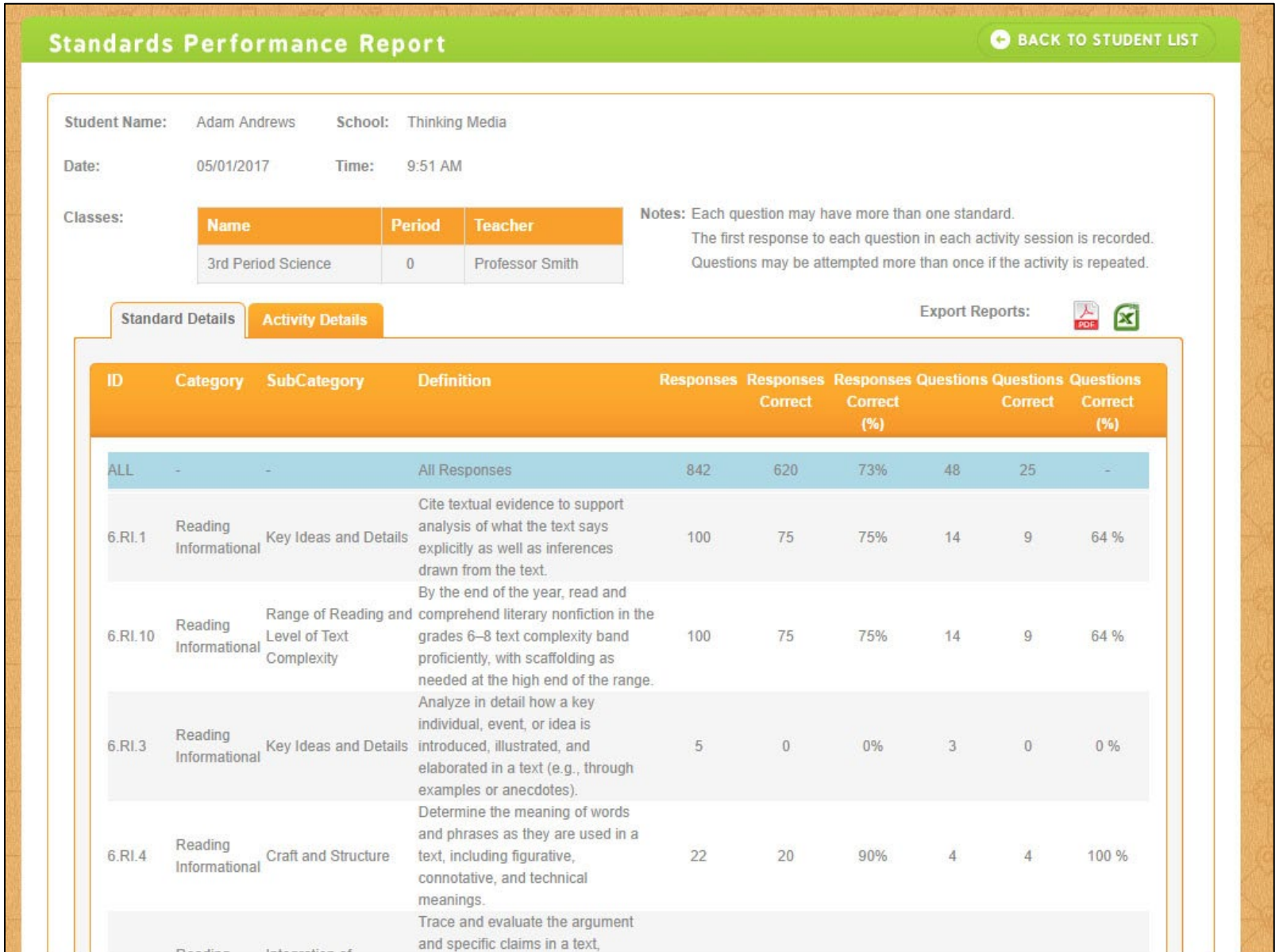


# The system provides academic skills reports by class or student.



## Standards Performance Report

BACK TO STUDENT LIST

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

**Date:** 05/01/2017 **Time:** 9:51 AM

**Classes:**

| Name | Period | Teacher |
|---|---|---|
| 3rd Period Science | 0 | Professor Smith |

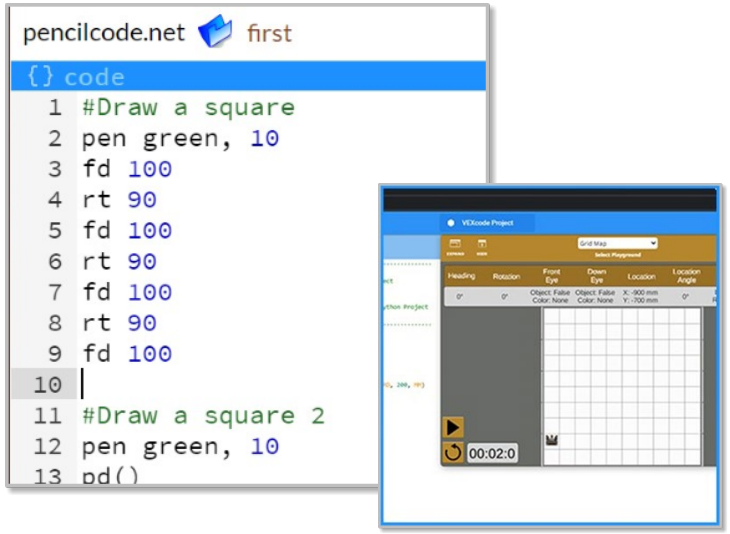
**Notes:** Each question may have more than one standard.
The first response to each question in each activity session is recorded.
Questions may be attempted more than once if the activity is repeated.

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.10 | Reading Informational | Range of Reading and Level of Text Complexity | By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range. | 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 % |
| | | | Trace and evaluate the argument and specific claims in a text, | | | | | | |

# NEW for 2022! – ***Introduction to Coding*** Course

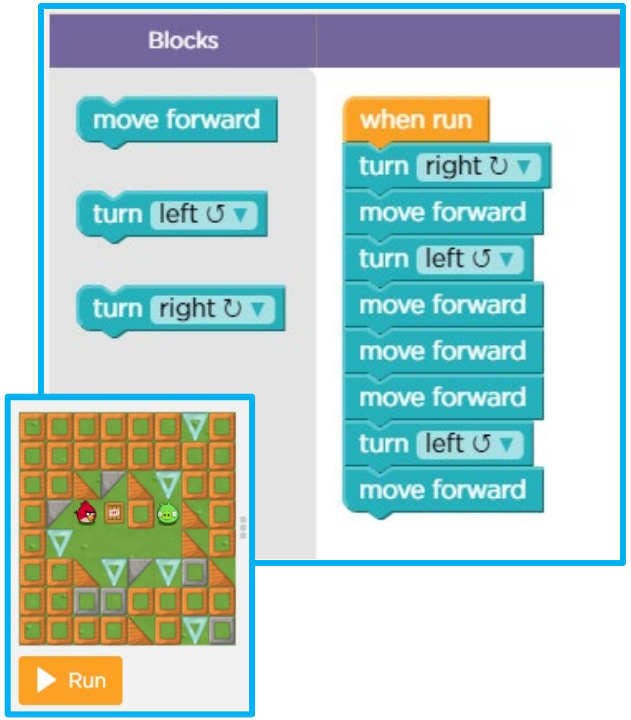

**This 20-hour course provides everything you need to introduce students to computer science and real, text-based computer programming for MIDDLE SCHOOL!**

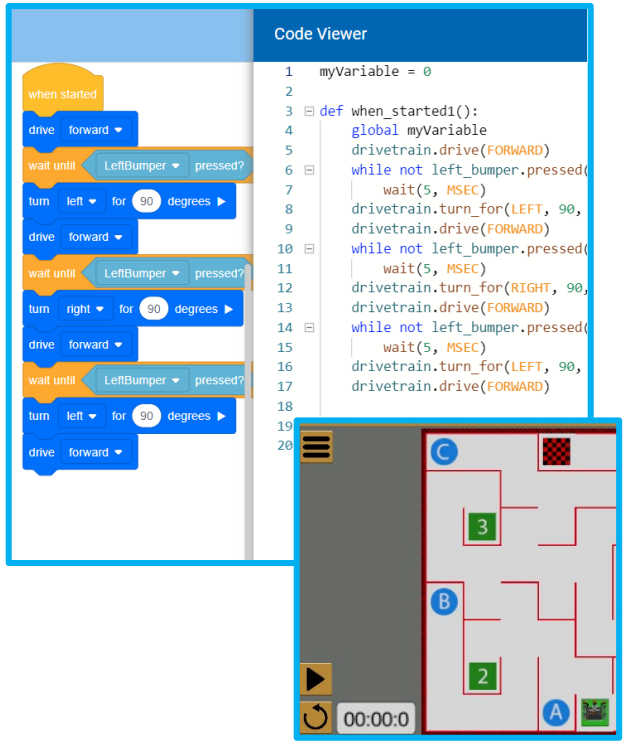
Includes online lessons, group classroom activities, and complete lesson plans for guiding students through authentic coding experiences. Topics include:

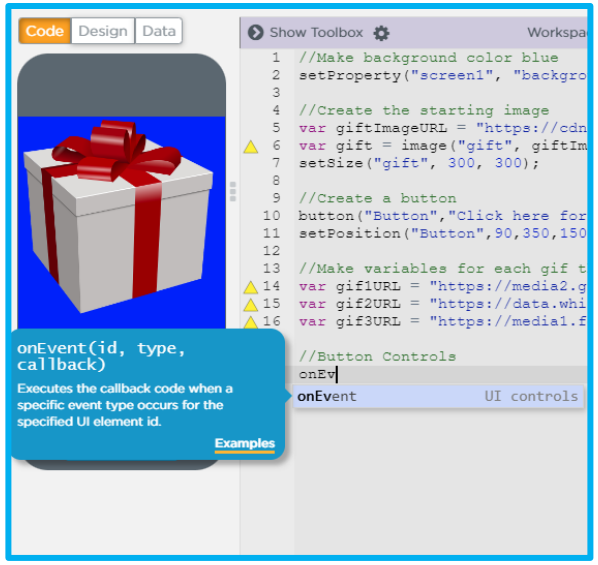
- Computer hardware and software
- Simple algorithms and common statements
- Offline algorithm games
- Beginning programming
- Creating a simulated mobile app
- Concepts of cybersecurity and personal security
- Exploring common IT careers

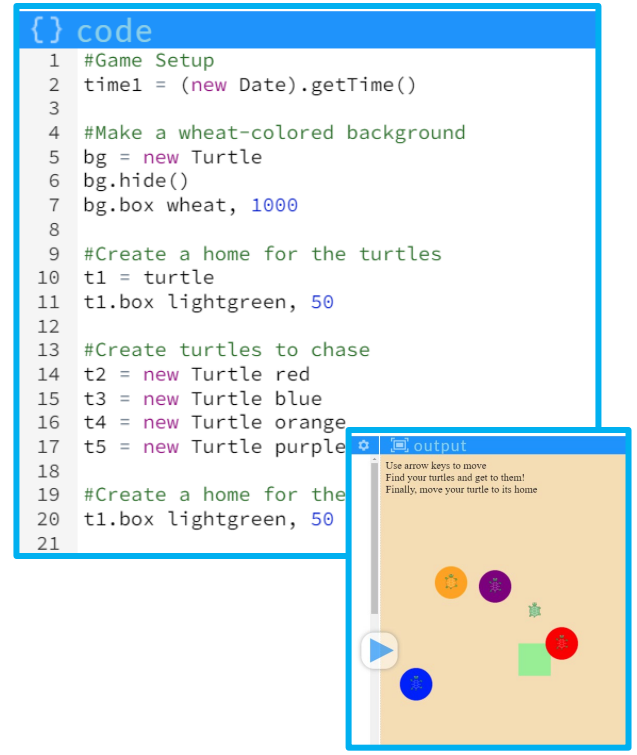
# Coding Progression

**Block-based coding** → **Block-based coding with text-based code viewer** → **Text-based coding with suggestions and assistance** → **Text-based coding**





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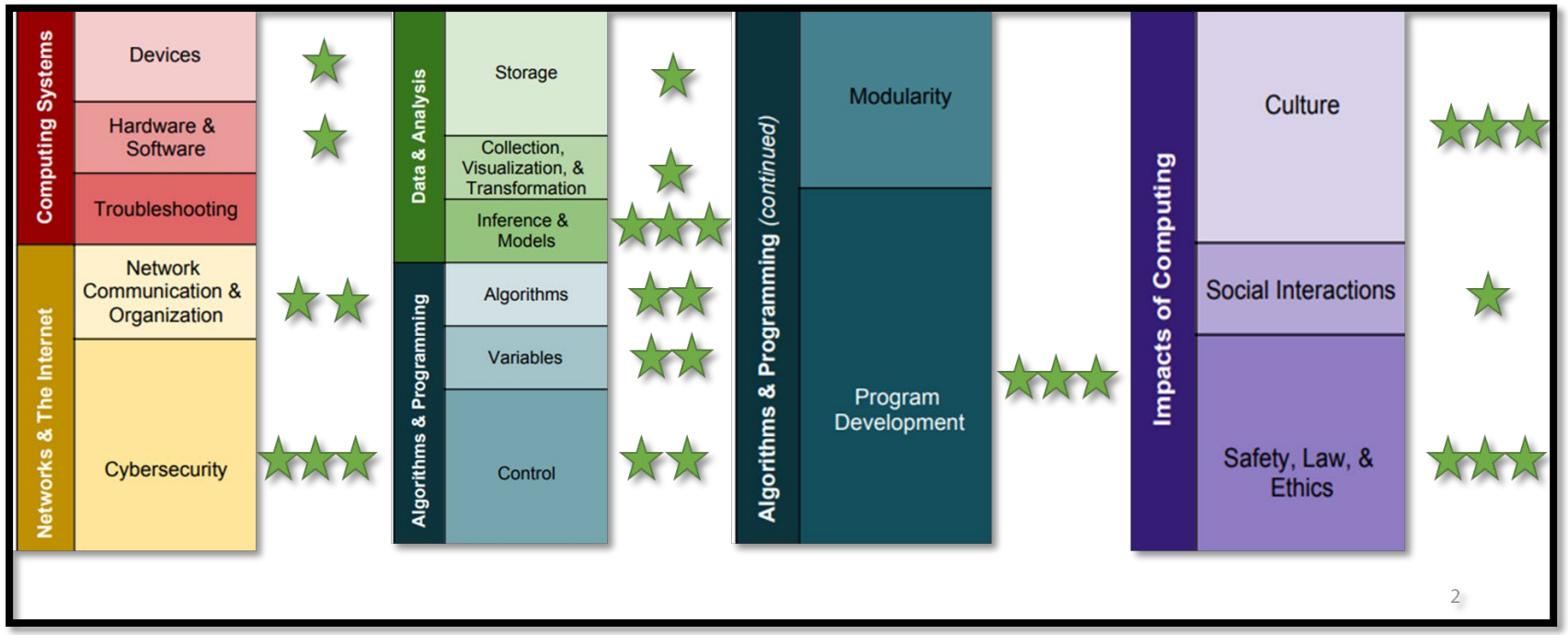
# Approved CSTA Quality PD

## Learning Blade - *Intro to Coding* PD is accredited by CSTA for quality PD .




**Learning Blade Aligns with CSTA Level 2 Standards for Middle Grades**

An independent committee of experts evaluates the indicators of quality computer science PD and elements of effective teacher PD including the following:

- **Content Focus**
- **Inclusivity**
- **Active Learning**
- **Collaboration**
- **Differentiation**
- **Models & Modeling**
- **Accessibility**
- **Feedback & Reflection**
- **Efficacy**
- **Ongoing Support**

# Win a 3D Printer Contest

Learning Blade will be **awarding "Adventurer 3 Lite3" 3D printers** to our most active schools.

Schools that complete **5,000 online lessons** during the 2022-2023 academic year will win this great printer.


Schools have already won a 3D Printer will receive a Tello Drone!

# Multiple Statewide and District Implementations

## Arkansas

Arkansas Department of Education, & The Arkansas Public School Resource Center

## Missouri

Missouri Department of Elementary & Secondary Education (DESI)

## South Carolina

South Carolina Department of Education, Office of Career & Technical Education

## Louisiana

Louisiana Department of Education

## Alabama

Department of Education Office of Career & Technical Education & Alabama Works

## Tennessee

Tennessee Chamber of Commerce

## Idaho

Idaho STEM Action Center

## Mississippi

University of Southern Mississippi, Mississippi Department of Education

## Arizona

Office of the Governor Doug Duvey, AZonTrack, & Generation Schools Network

## New Hampshire

New Hampshire Department of Education

**Also, Multiple Districts/Schools in:**
**Florida, Georgia, Kentucky, Maryland, North Carolina, Ohio**

# Our accomplishments are nationally recognized.

**Validation from Battelle**

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

***Selected as an "Accomplished" solution in the STEMworks database by WestEd***
by *meeting rigorous design principles, and evaluation by independent reviewers.*

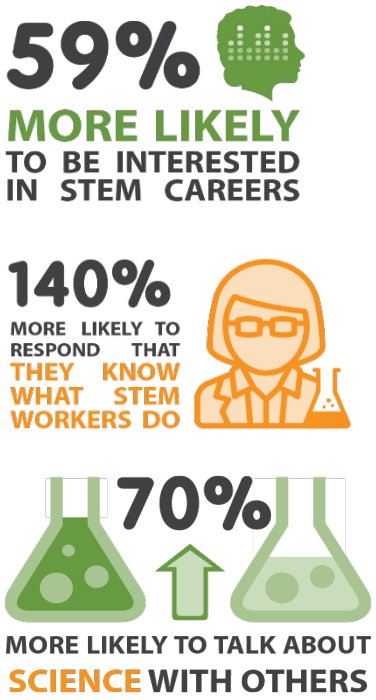
***Recognized by NREA as an effective means for bringing STEM career awareness and interest to rural schools.***

# Our results have been independently validated.

BATTELLE

## Student Survey Results Validated by Battelle:

- **55% Increase in students who strongly agree that they are interested in a career in Computer Sci.**
- **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.




Results from Student Surveys

**Independent Ed.D. Research Results:** Katherine Kendall, 2017. All items p<.001, N=276

**Learning Blade users were more likely to intend to pursue STEM careers:**

- **59% more likely** to be interested in a STEM career
- **84% more likely** to want a job that designs or builds things
- **140% more likely** to respond that they knew what STEM workers do
- **70% more likely** to be willing to like to talk about science with others

**Selected as "Accomplished" in STEMworks database by WestEd by meeting rigorous design principles and evaluation by independent reviewers**

STEMWORKS

**Learn more at http://link.learningblade.com/results**

# The Issue?

**Shortage of Qualified Workers**

**Students Unaware of Career Pathways**

# The Cause?

**Students “Can’t Be What They Can’t See”**

**Teachers Lack Time and Resources to Keep up with and Incorporate Local Careers and Industries**

# Lessons Link Academics to Local Careers

**Lesson plans are individually tailored to the grade level and local regions of the state.**

## Lessons include:

- Career Name and Description
- Student Self-Paced Academic Lesson
- Lesson Plan for Hands-On or Creative Thinking Problem Solving
- Career Connection – how the lesson connects to the career
- Local Connections – regional employers that hire this type of career
- Salary and Outlook
- Academic Standards Alignment

# Career Blade – Informs Students of Local Careers

## By Age Range:

- K-2
- 3-5
- 6-8
- 9-12

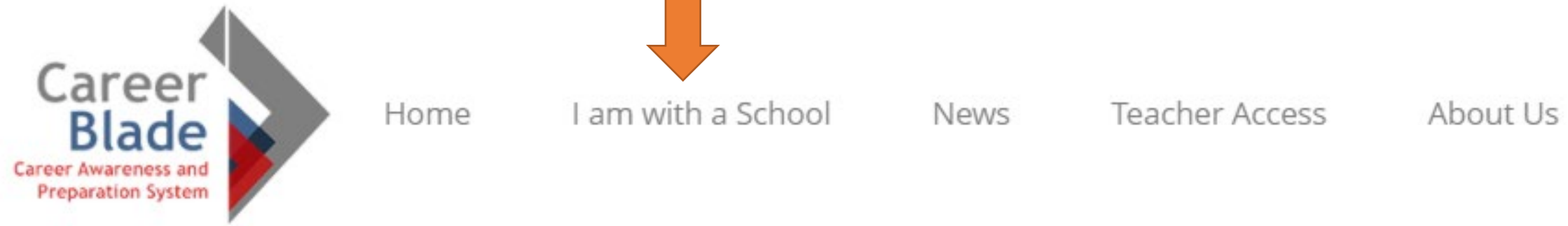
## By Industries

## By Local Businesses

## By Careers:

- CNC Operator/Machinist
- Computer Programmer
- Database Administrator
- Data Scientist
- Electrician
- Farmer / Rancher
- Financial Analyst
- Industrial Maintenance
- Info Security Analyst
- Marketing Manager
- Nursing
- Production Manager
- Supply Chain Analyst
- Truck Driver
- Welder

# How to Get Started




Each lesson includes:

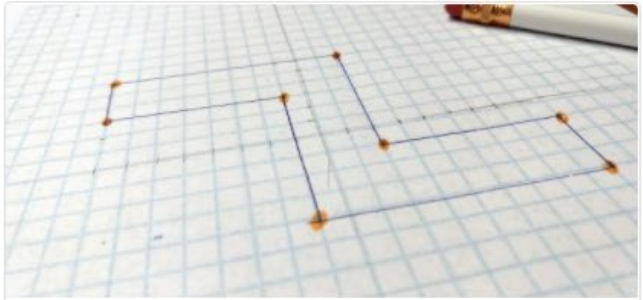
- Career name and description
- Lesson Plan for hands-on or creative thinking problem solving
- Career Connection illustrating how the lesson connects to the career
- Local Connections featuring regional employers that hire this type of career
- Salary and Outlook
- Academic Standards Alignment with answer key and/or teacher rubric

You can access the lesson plans here.

# View Lessons By Grade

## All Lessons in My Grade

Home > Lessons > My Grade



### CNC Operators and Machinist: Using Precision Machinery

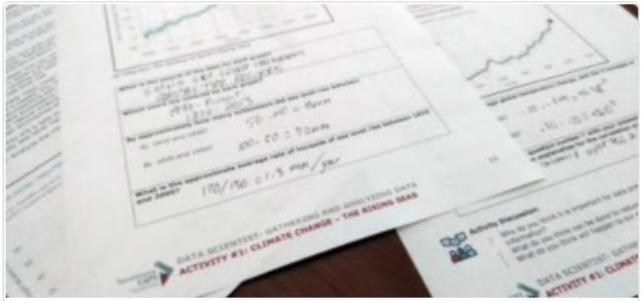
**Grade Level: 6-8**

Students will explore the roles of a CNC Operator that enable them to fabricate part and tools.


### Computer Programmer: Hour of Code - Intermediate

**Grade Level: 6-8**

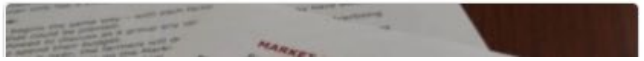
Computer Programmers create, modify, and test the code, forms, and script that allow computer applications to run. Work from specifications drawn up by software developers or other individuals.



### Data Scientist: Gathering and Analyzing Data

**Grade Level: 6-8**

Students will be introduced to the career of a data scientist and how they analyze and interpret data.



# Searches Lead Teachers/Staff to Lessons Plans

## NURSING: NURSES HELP MAINTAIN HEALTHY LIFESTYLE

Tennessee CAPS

### LESSON PLAN OVERVIEW

**Purpose:** This lesson plan highlights some of the skills a Nurse for patients. Licensed Practical Nurses (LPN), Licensed Vocation Registered Nurses (RN) provide and coordinate patient care, e about various health conditions, and provide advice and emoti their family members.

**Grade Level:** 3-5

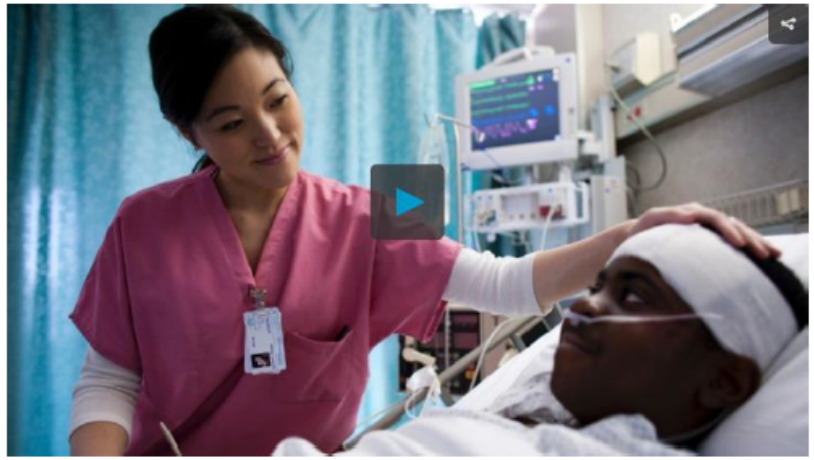
**Learning Objectives:**

- Students will explore the roles of nurses in common healthcare situations.
- Students will learn how to measure and record resting and active pulse rates.
- Students will complete a design thinking exercise of developing a heart health menu plan.
- Students will gain an insight into the nursing profession, including common job tasks, salary,

**Class Message:** Today we are going to explore nursing careers within the healthcare system. We will discuss common nursing tasks, like checking vital signs, and practice doing some of the tasks that nurses do in their work. We will also discuss healthy living and create a plan for a healthy heart.

A Nurse provides and coordinates patient care to include assessing patients' condition, recording medical history and symptoms, administering patient medicine and treatment, consulting and collaborating with doctors and other healthcare providers, performing diagnostic tests and analyzing results, and teaching patients and their families how to manage illness or injury at home.

Let's watch this brief video to better understand the role of a Nurse and how they affect our everyday lives.



Nurses: Experts in Patient Care (http://tn-caps.com/r/35VNR)

# Lessons Plans Lead to Activities



**DRAFT for REVIEW ONLY – DO NOT DISTRIBUTE.**

**Activity Procedure:**

- Using the first and second fingertips, press firmly but gently on the arteries until you feel a pulse.
- Begin counting the pulse when the clock's second hand is on the 12.
- Count your pulse for 60 seconds (or for 15 seconds and then multiply by four to calculate beats per minute).
- When counting, do not watch the clock continuously, but concentrate on the beats of the pulse.
- If unsure about your results, ask another person to count for you.

**Activity Results:** Record your pulse rate results in the spaces below, then compare your results to the Pulse Rate Chart shown.

| Charting Your Results | Results |
|---|---|
| Resting Pulse Rate | |
| Active Pulse Rate | |
| Difference between Active & Resting | |

Pulse Rate Chart

| Age | Pulse Range | Are You Within This Range? |
|---|---|---|
| 3 to 4 years old | 80 to 120 beats per minute | |
| 5 to 6 years old | 75 to 115 beats per minute | |
| 7 to 9 years old | 70 to 110 beats per minute | |
| 10 years and older | 60 to 100 beats per minute | |

**Activity Discussion:**

- How easy was it to measure pulse rate in the different ways shown above?
- Why is it important to measure a person's pulse rate in different situations?
- How did your pulse rate compare to the Pulse Rate Chart?
- How can doctors and nurses use pulse rate information to help patients?
- Why is measuring a patient's pulse rate every time they visit a doctor helpful?

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**ACTIVITY #1: LOOKING AFTER HEALTHY HEARTS**

**Introduction:** Nurses gather important information about patients so doctors can provide better medical care. Part of this information is taking a patient's vital signs to include Pulse Rate. A nurse checks your pulse to check your heart's rate, rhythm, and regularity. Each pulse matches up with a heartbeat that pumps blood into your arteries. The force of the pulse helps evaluate the amount (strength) of blood flow to different areas of your body. If a patient's pulse rate is too low or too high, it is a possible indicator that the patient is not following a healthy diet and lifestyle. The four main vital signs most often monitored by health care providers are:

- **Body temperature** – the average temperature inside your body
- **Pulse rate** - the rate at which your heart beats
- **Respiration rate** - the rate at which you take breaths
- **Blood pressure** – the amount of effort it takes to pump blood through your body

**Activity Description:** Today, we are going to practice measuring pulse rate. In this activity you'll be counting the number of times the heart beats per minute. As the heart beats, it pushes blood through the arteries, causing the arteries to expand and contract with the flow of blood. You can feel the beats by firmly pressing on the arteries, which are located close to the surface of the skin at certain points of the body.

Your pulse can be found:

- on the side of the neck
- on the inside of the elbow
- at the wrist

**NOTE**: If you use the lower neck, be sure not to press too hard, and never press on the pulses on both sides of the lower neck at the same time to prevent blocking blood flow to the brain.

Tennessee CAPS

# Activities Lead to Employer Engagement

**Lesson plans include specific contact information and interaction opportunities:**

- Guest speakers or Panelists One-day Field Trips
- Mentoring students
- Video or picture uploads
- Resume reviews, project feedback or interview preparation
- Volunteer opportunities
- Learning opportunities Employment
- Career Fairs
- Curriculum support or experiential learning programs
- Sponsorships and/or equipment donations
- Product Donation