

Grow a passion for STEM through

Living With STEM

Hands-on learning

Dual-language curriculum



LJCREATE™  
Learning for life

# → Living With STEM

Ages 5 - 11



# → Welcome

We're LJ Create, Education Specialists since 1979

Since 1979 we have been providing award-winning, world-class active learning solutions for technical education.

Today we create complete systems combining digital cloud content and tailor-made hardware kits that deliver innovative, inspiring learning in science, technology and engineering.

At LJ Create our mission is to enable learners throughout the world to achieve their full potential in a wide range of science and engineering areas by providing teaching solutions for schools and further education.

Our practical and innovative topic-specific solutions enable learners to achieve a firm foundation for their future, allowing them to grow and evolve in a way that meets their learning needs.

We help practitioners derive benefits in terms of learning outcomes and school management. We create more opportunities in science, engineering, and technology-based curricula to enable learning for life.

LJ Create employs a diverse range of staff who are dedicated to our company vision. With bases in the UK and USA we are able to impact considerable human and technological resources on our business.



"I love the days that we have Science Lab"

Did you know?

Our **Living With STEM** lesson library contains 1,016 learning units!



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“We know that; we did it in Science Lab!”





# → Living With STEM

Bringing learning to life in elementary school

**Living With STEM** is a hands-on digital program to teach standards-based math, science, engineering and English skills to elementary-aged children.

Over 300 contact hours of directed content ensures that you have the help needed to cover the requirements of STEM learning standards with lessons that are directly linked to grade level expectations.

Continuous interaction with exciting equipment and software creates a learning environment that is engaging for everyone. Students and teachers want to spend time in our STEM labs.

A STEM lab space is ideal; however, our **Living With STEM** content and equipment can be used in every classroom in the school if that's more convenient. Online content means the learning can continue out of school hours and support a flipped classroom.



Did you know?

As well as STEM learning, we include 72 lessons in English language arts in the **Living With STEM** program.



**In South Birdville Elementary School in Haltom City, Texas, 5th Grade Science TAKS scores went from 41% to 69%. Mrs. Ahlfinger who is a specialist teacher at the school says:**

“Normally with special needs students you are limited in the practical work you can do with them in class. A lot of the time it is just not possible to do the hands-on tasks and so they miss out on the experiences.

In this class, it is very different, the combination of computer work and experiments really helps them focus on the task. They are better behaved in the science lab than in their other classes and so they are learning more and are gaining

science skills they would otherwise miss out on.

I can see a difference already in their understanding of the science concepts through the hands-on work.”





# → STEM Classroom

Our classroom is a blended learning environment

You can fit our unique cloud-based program into any space.

Through a combination of high quality cloud-based content and our practical experiment kits, we provide the tools you need to ensure the STEM learning experience in your school is second-to-none.

## Teaching Demonstrations

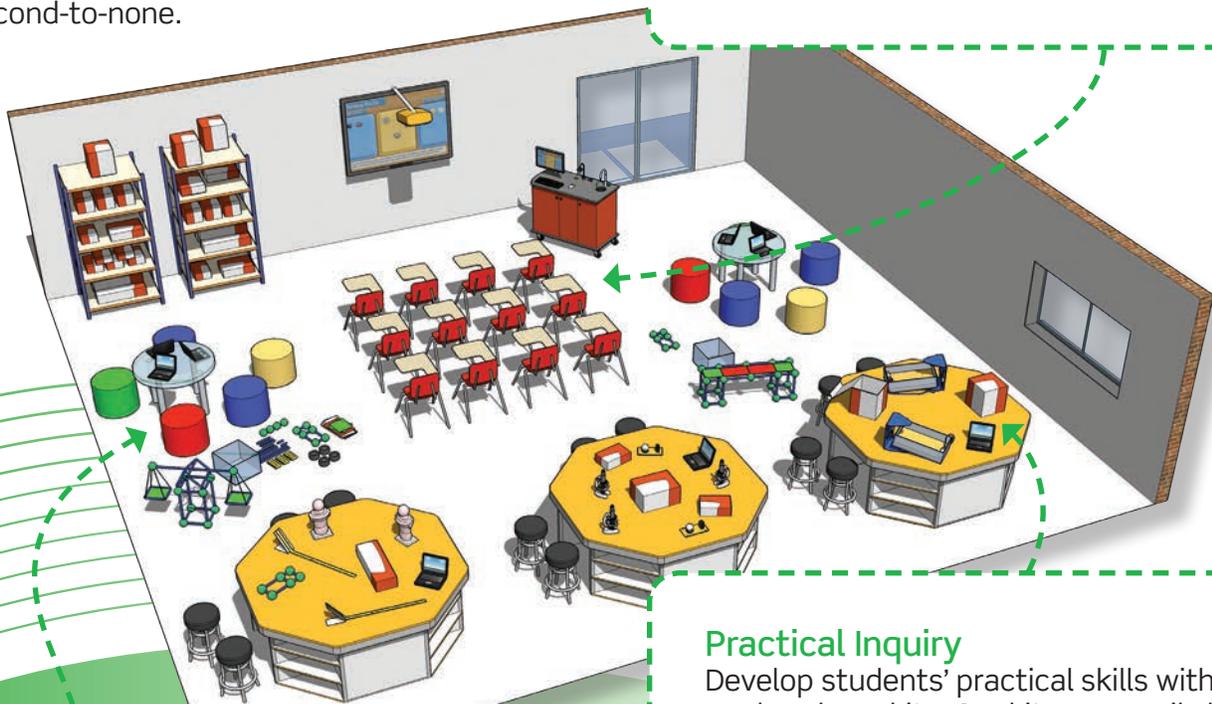
Present theory topics and practical demonstrations with an interactive approach in a classroom setting.

## Practical Inquiry

Develop students' practical skills with our hands-on kits. Our kits can easily be configured for group work.

## Virtual Investigation

Investigate and explore at school and at home with our STEM applications and simulators.





Computer Labs



Practical Workstations



# → Active Learning

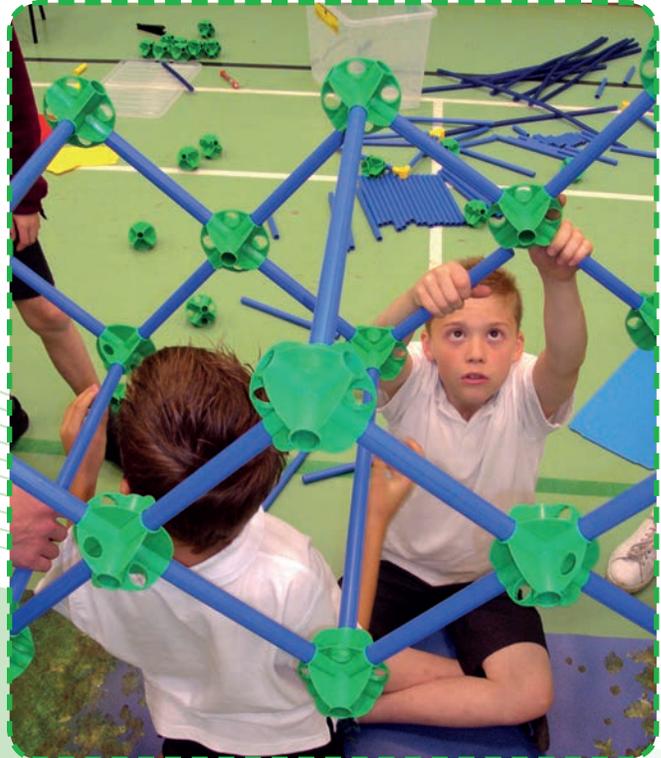
Active learning is exciting learning: for everyone

Create teaching environments where students can actively engage in their own learning.

When lessons are exciting, students find it easier to understand concepts and develop new skills. This is particularly true for children who struggle to concentrate in a traditional classroom setting.

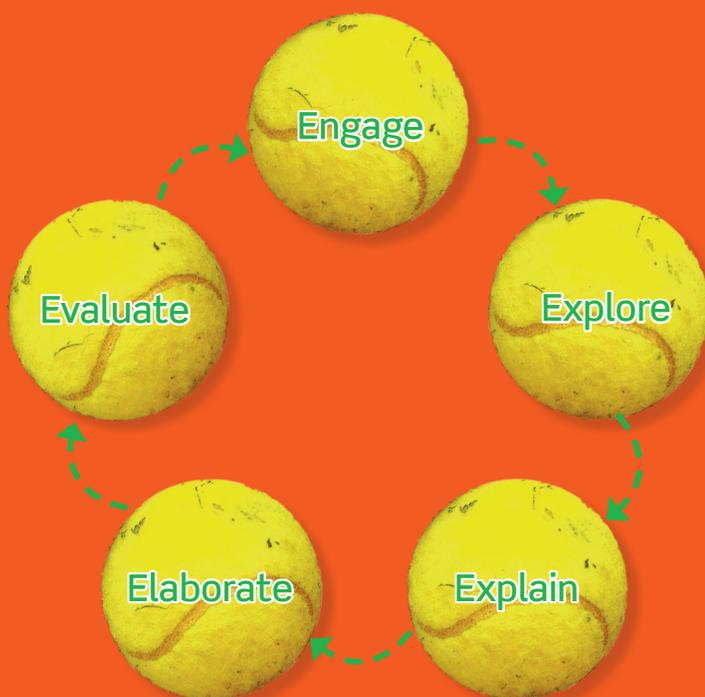
Almost two-thirds of teachers reported that the use of blended learning improved student motivation to participate in class.\*

Our **active learning program** is composed of creative hands-on tasks and interactive virtual software applications that work together flawlessly.



\* Our statistics are taken from the 2013 study "Transforming K-12 Rural Education through Blended Learning" from Northwest Nazarene University, Idaho Digital Learning and iNACOL.

# The 5 Es Model



At LJ Create we've been providing active learning solutions for over 30 years. For us, active learning is about knowing when to guide, and when to let students take the lead. **Living With STEM** is the most popular and successful program we run, and you'll find that our students love our lessons as much as we do.

Our active learning process embraces the **5 Es model** of engagement and exploration in a comprehensive package that is easy to implement and great fun to teach.



# → Cloud Content

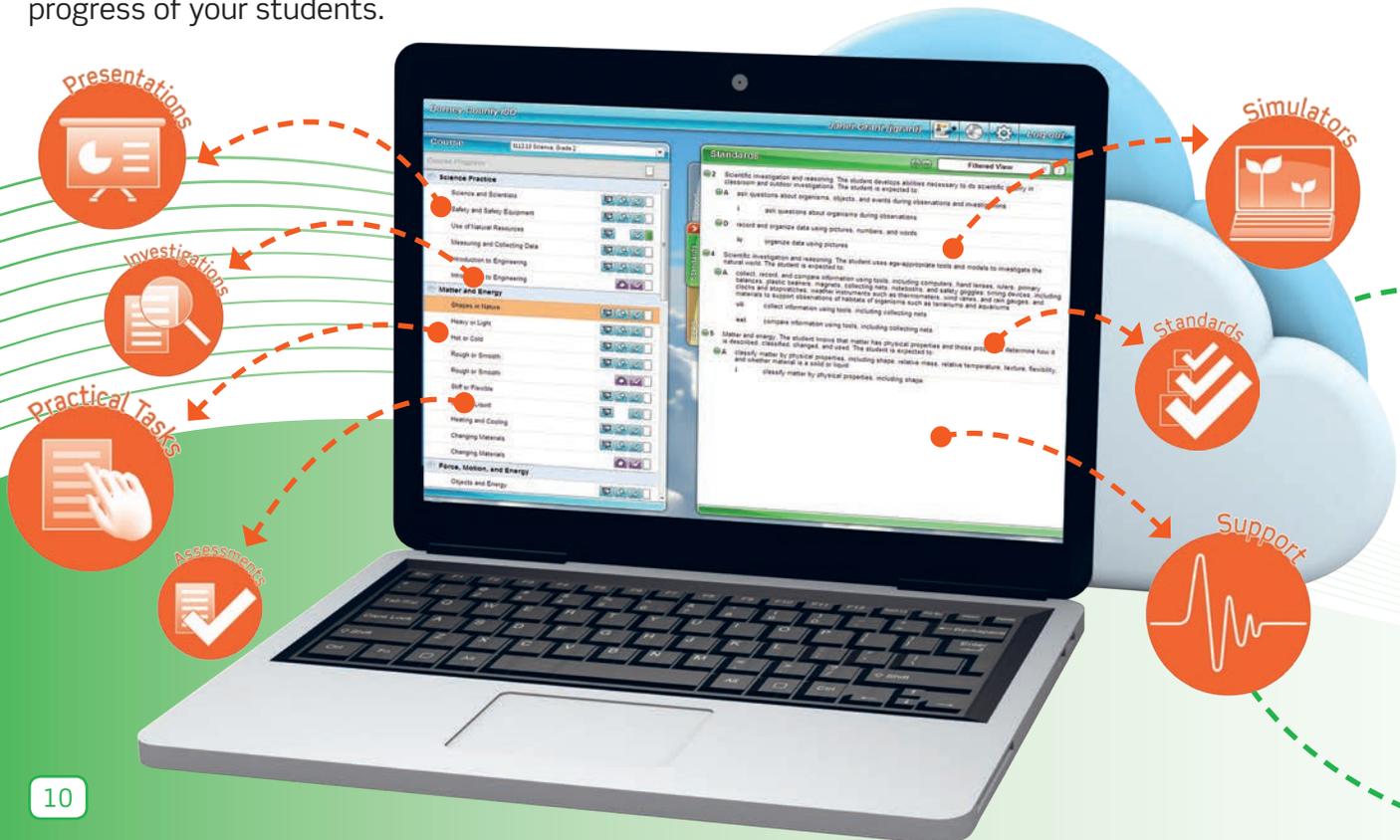
Collaborative curriculum management made simple

Our comprehensive **Living With STEM** lesson library contains over 1,000 STEM lessons which are available any time, anywhere on the cloud. It makes getting started with **Living With STEM** as easy as 1 - 2 - 3.

Start with our digital content. These presentations, investigations, practical tasks and assessments help you plan and conduct lessons for students working independently or in groups. Meanwhile, the Learning Management System automatically tracks and records the progress of your students.

By clicking on the **Standards** tab, you can see exactly where our lessons and resources match up to state and national curriculum standards. Academic and technical subject support is easy to access too, just select the **Support** tab to bring up the support menu for further guidance.

You can access the cloud from anywhere you have an Internet connection and a web browser. Your learning content updates automatically, whenever we make changes to keep it up to date.



1.

### Digital Content

Our lessons are written by our team of experts. Each topic includes presentations, investigations, practical tasks, assessments and learning materials such as applications and simulators. Students can learn about new concepts, refresh their knowledge of previous lessons, and test out their skills with a practical task.



2.

### Learning Management System

Our Learning Management System automatically tracks and records the progress and attainment of your students, and the school's progress overall. You can see how much time students spend on each module, how often they log in, and instantly see records of their grades across the program.



3.

### Academic Standards and Support

It's easy to see from our cloud content menu how our teaching resources link up to state and national standards. We also have plenty of resources offering support in core math, English and science requirements. What's more, all our content is available in English and Spanish language.



We promise that our out-of-the-box cloud set-up is so easy, you'll be up and running in just 2 minutes.



# → Let's Investigate

Simulators and investigations let your students explore

At the heart of the Living With STEM program are 300 exciting inquiry-based digital investigations and simulators.

These lessons are our favorites; they've been designed by our experts to provide an introduction to the real-world application of STEM without having to leave the classroom.

These activities encourage your students to explore scenarios by themselves, and then explain to you what they have learned about STEM. Here are some examples:



Virtual Field Trips

Virtual Labs

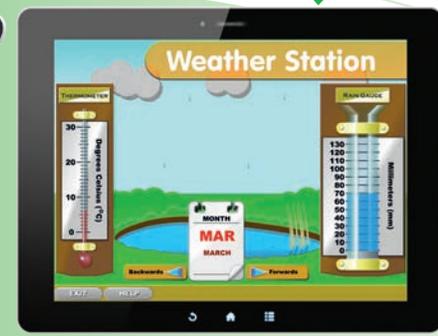
Research Explorers



Virtual Lab Equipment

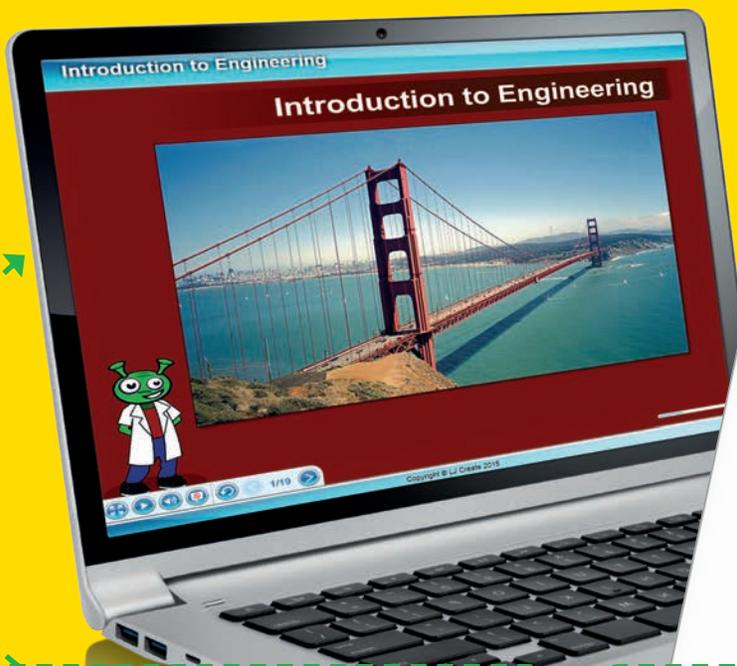
Virtual Field Equipment

Video Labs



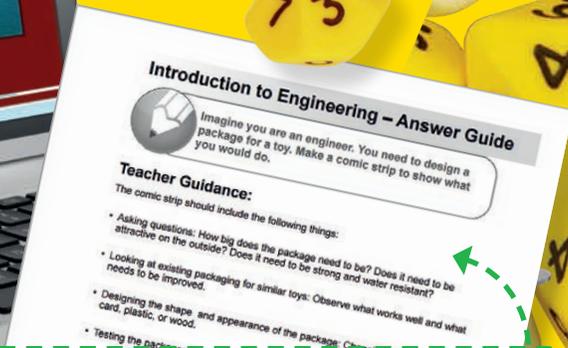
Ms. Janine Crockett, who is a first year teacher at PS69 Brooklyn, New York, says:

“Lots of the students in my classes have limited English proficiency but the multimedia learning material is so visual that it helps them learn, they really like working with the computers and they help each other with the reading.”



**Our digital library for Living With STEM includes 265 media presentations.**

Let Lenia the little green alien talk your students through the topic independently, or switch her off to use the presentations in front of your class. Subtitles are available, along with a PDF handout to print.



We also have written class activities for you to use with many of the presentations.



# → Standards



We focus on fulfilling state and national academic standards

## STEM subject learning standards are both content and skills-based.

When our curriculum teams set out to address a set of standards we apply a magnifying glass to every student expectation to ensure that our linked lessons cover the required content, develop and enhance the required skill(s), and are exactly grade level appropriate.

Thanks to our large in-house team of content authors we can modify and personalize lessons, and respond instantly to teacher feedback. One of the benefits of cloud-based content is that we can change it overnight if we need to. We are exceptionally diligent about our claims to address learning standards.

## Typical examples of standards for which we have created content include:

- **Scientific Investigation and Reasoning:** The student uses scientific inquiry during laboratory and outdoor investigations. The student is expected to analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- **Engineering Design:** The student shall define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time or cost.\*
- **Write** routinely over extended time frames (time for research, reflection and revision) and shorter time frames for a range of discipline-specific tasks, purposes and audiences.
- **Algebraic Reasoning:** The student applies mathematical process standards to analyze and create patterns and relationships. The student is expected to determine the unknown whole number in a multiplication or division equation relating three whole numbers, when the unknown is either a missing factor or product.



# → Support



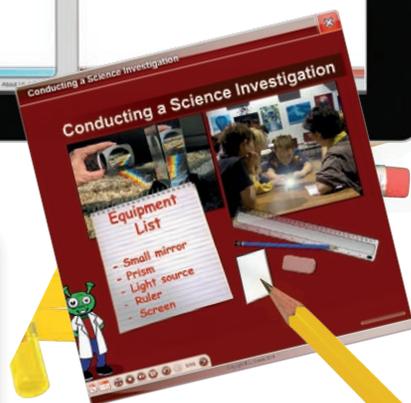
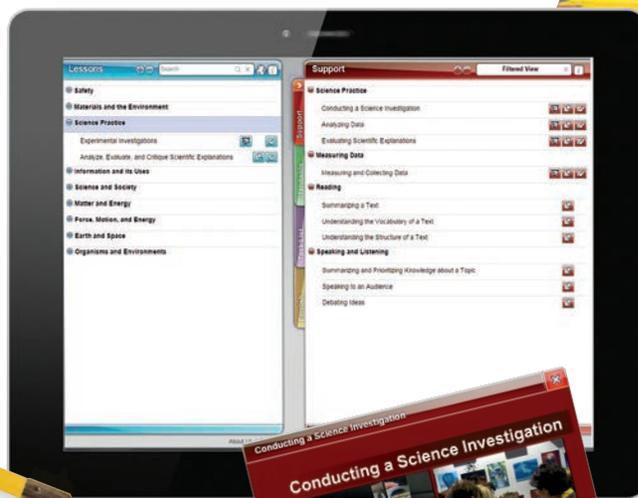
Here to help: for you and your students

We take pride in the quality of support we have provided for over 30 years; that's why we're still around.

We write our programs with teachers in mind. We know that they need to be instructional, and easy to follow. When starting a new program, or on the odd occasion when you do need help, our well-trained staff are always available. Access LJ support via the telephone (and speak to a real person), via email, text, or social media. A series of informative video tutorials help to take you through the process of setting up and reporting student performance.

Our learning program is built on the concept of continuous support to students.

Every lesson includes a support tab that provides access to support study covering required academic and technical knowledge.



If something goes wrong, or you can't find the answer in the cloud, you can call our dedicated support team.



# → Life Science

The processes and cycles of plants and animals

**Young children build their experience of living things by gaining an understanding of needs, diversity, interdependence and growth.**

Students are given the opportunity to ask and answer questions which develop their awareness of biological phenomena. Questions explored include: “What will happen to the woodland creatures if the trees and plants are cut down?”, and “If you want a baby hamster to perform tricks would the parents have to be hamsters that performed tricks?”

The virtual and actual opportunities for life science laboratory explorations include using microscopes, investigating plant structures, and human body systems.

If you want to generate maximum enthusiasm in younger students we recommend our Modeling Pollination activity. This creative lesson brings together several aspects of scientific concepts and practice in an unforgettable hour that’s full of fun.

Did you know?

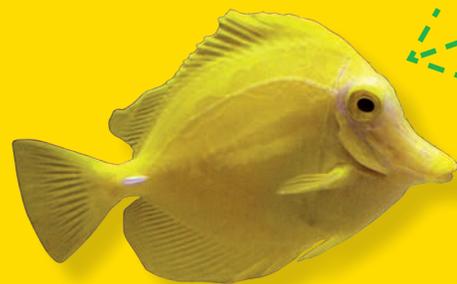
**A group of meerkats living together is called a mob or a gang.**





**The District Curriculum Administrator described to us the impact of the new Living With STEM program on a struggling fourth grader at Caddo Elementary in Shreveport, Louisiana:**

“This new environment, where the students take much more charge of their learning, really “hooked” this particular student and they began to do very well in the science classes. As time progressed the student gained a real thirst for learning and this began to reflect in their other classes. By the end of the school year this particular individual took the progression tests and only missed a jump straight to 6th grade by 1 point.”





# → Earth Science

## Forces that shape our Earth and the Solar System

Children have a natural curiosity in everything around them. They see rain, rivers, hills, the Sun, and stars.

Our collection of lessons allows students to explore Earth's resources, cycles, weather, materials, land formation, and space. Questions explored include: "What type of soil is best for retaining water?", and "What is the difference between weather and climate?"

These Earth and space science lessons include opportunities for students to practice inquiry through virtual and actual laboratory explorations.

These activities include: alternative energy generation, soil analysis, erosion and deposition, rock formation, air, wind, water cycles and the Sun.

Among these creative lessons we recommend the range of tasks based upon our unique Stream Table. This affordable unit is large enough to gather a group around while students see first-hand the effects of water on the land. Crosscutting problem-solving tasks include the design and construction of flood resistant structures.

Did you know?

After the Sun the next closest star to Earth is over 25 trillion miles away.





Mrs. Jessica Vasquez, the Lab Manager of Airport Elementary School in Weslaco, Texas saw her Science TAKS test scores go from 64% to 92%.

“We began using the program in January with our 5th grade classes. They were able to use the lab until they took their science TAKS in April. They loved it so much that after the tests, they kept asking ‘when can we come back into the science lab?’”





# → Physical Science

Forces, energy, and properties of materials

**The principles of physical science drive all of humankind's technological advances and explain the behavior of the world around us.**

Some of these concepts can be quite difficult for young students to understand and this is where our active learning process really shines. Our lessons in this topic are about exploration, explanation and proof; starting with simple questions and building on them until every student has a solid understanding. The many questions we explore include: "Why can you see your breath when you breathe out on a cold morning?", and "What happens when a light ray hits an object that we can see?"

Did you know?

The first recorded telescope was used in the Netherlands in 1608



The **Living with STEM** program provides students with dozens of opportunities to explore physical scientific phenomena through virtual and actual laboratory inquiry. These activities include testing materials and water, measuring energy, predicting and tracking force and motion, and investigating electricity and magnetism.

Our grade appropriate data logger is used in a wide range of physical science lessons; we recommend Speed, Energy and Collisions as a great introduction.





In Midkiff Elementary in Mission, Texas, scores rose from 72% to 95.3% in this year's 5th grade Science TAKS. Lab Manager, Mrs. Norma Esquivel, told us what her students think of the lab:

“They just can't wait to get in here. They just love to do the hands-on work, especially with things like the digital microscope. To them, this is real scientific equipment and they feel like real scientists when they get to use them for themselves.”



# → Math

Numbers, algebra, geometry and personal finance

Using the same active learning process that has provided such great results in science, we have added elementary mathematics to the Living With STEM program.

We cover math concepts through the use of everyday examples that students will recognize; some are generic and some linked to science study. These scenarios then form the basis for our presentations, investigations and virtual and actual laboratory inquiry tasks. Examples include: Pecan farming, money, animal bodies, trees, transportation, springs, sorting rocks, heating, life cycles and pond life.

Some examples won't be so familiar to young students but are important to introduce, like labor and income.

Our math program includes over thirty practical activities to help young children remember the concepts and skills they are learning. Our recommendation for a really motivational session is one where students are asked to design and build a rounding machine using the parts of a marble run. This is great fun, really on-task, and the epitome of active learning!

Did you know?

A rhombus is a parallelogram with two sets of parallel sides and all sides of equal length.

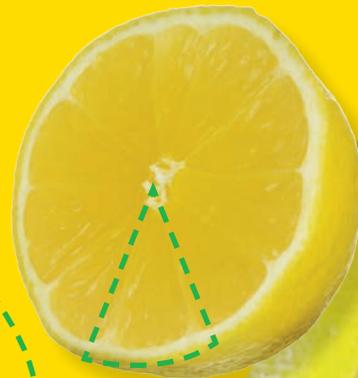
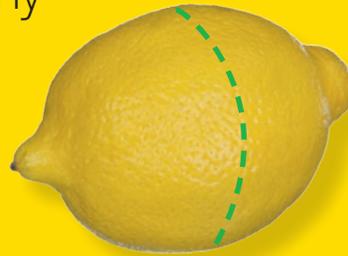


Math



**JB Culbertson is Director of Title 1 programs for the Peoria Public School District 150, Peoria, Illinois. She says:**

“With our English language learners it’s great to watch their faces when they select the Spanish option and the little green alien starts to talk to them in Spanish! This is unique to Living With STEM and what it means for them is that they are accessing the same material at the same level as the other students in the class, instead of being two years behind like with so many other teaching resources.”



# → Science Practice

The skills required to “do” science

This set of lessons is designed to develop student skills in questioning, investigating, modeling, analyzing, and communicating in a safe and secure environment.

We approach each skill independently and then bring them together to ensure that students have the background they need to continue with further education and potential STEM careers.

	Safety	Questioning	Modeling	Investigating	Analyzing	Explaining	Communicating
Life Science	•	•	•	•	•	•	•
Earth Science	•	•	•	•	•	•	•
Physical Science	•	•	•	•	•	•	•
Math	•		•	•	•	•	•
Engineering	•	•	•	•	•	•	•



Did you know?

New data are being discovered every day to challenge our current theories about the natural world.





Ms. Yolanda Vela, the Lab Manager at North Bridge Elementary School, Weslaco, Texas, said her students loved the mini tests in the Living with STEM program:

“Once our fifth graders saw how the program worked, with the special post-tests for each level of a module, they kept asking me, ‘Miss, we need to do these assignments so that we can do the post-test’. They love to get high scores and the system gives them instant feedback when they finish the test. I think this was definitely one of the major factors in our great success this year in the science TAKS.”

(North Bridge Elementary scored 70% in science, an increase of over 36% on the previous year)

# → Engineering

The application of science in the man-made world

**Engineering and technology is the study of the man-made world.**

It has never been truer that each person's life is constantly impacted by the results of the designed environment, for good and bad.

Every young student today will engage directly with some form of engineering or technology in their future career. For this reason the topic has been added to the national science learning standards and we treat this topic as one of the most important elements of the **Living With STEM** program.

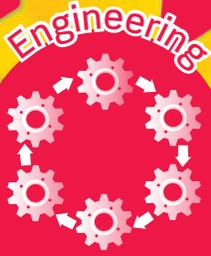
The skills each student will develop during the engineering lessons are similar to those required for science but with a greater emphasis on critical thinking and creativity. Problem-solving and design forms part of the engineering process and must be learned alongside the scientific discipline to model, evaluate, and communicate.

A recommended lesson that brings together the various aspects of engineering is the Mining Truck design challenge.

Did you know?

The Lake Pontchartrain Causeway (Louisiana) is the longest bridge in America at nearly 24 miles long!





**Science Teacher Darby Donohoe-Lopez from Ochoa Elementary in Donna ISD, Texas, says:**

“Once we got everything set up and I started taking the lesson myself, I was so impressed, and I realized the depth I could take this particular science program by using the computers, because the children that understand the lesson can move onto a higher level at their own pace. The children that are taking a little more time to grasp what the concept is about can take the lesson over and over again from the bottom up.”





# → Hardware Kits

Science lab made easy with our kits

Our **Living With STEM** program has been specifically designed so that the practical activities can be completed using equipment that you may already have available.

Each hands-on lesson starts with a list of the items you will need, and **we have minimized the use of consumable items** to ensure that your programs are sustainable.

For convenience and to absolutely ensure predictable results in our **108 practical lessons**, we recommend the use of our **Living With STEM** hardware kits.

Most of the kits are available as a single workstation pack. These are usually used for classroom demonstrations or a modular, rotational environment. The kits used for most of the activities, e.g. the **Apparatus Kit**, are available as a four-pack. These are used for group or whole-class instruction. Then we have some kits to support great, low-cost, exciting activities that we believe you'll want to do with the whole class. We've called these **Class Activity Packs**.

The kits are delivered in our distinctive, easy-to-store orange boxes with storage trays inside and equipment maps inside the lids to make it easy to check that all the equipment has been returned.

Did you know?

Our LJ hardware kits will save you hours of set-up and break-down time.



## Student Math Kit

Order as 505-01

This kit provides the equipment used in many of the math activities in the Living With STEM Cloud Library. We recommend providing one kit per workstation.

Equipment Includes:

- Play money
- Numicon shapes and tray
- 6 and 10 sided dice



## Teacher Math Kit

Order as 505-02

This Math Kit is more comprehensive than the student kit, and designed for demonstration or group work. We recommend providing one kit per classroom.

Equipment Includes:

- All Student Math Kit resources
- 3D shapes and nets



## Apparatus Kit

Order as 500-01

The Apparatus Kit is designed for use across all areas of the Living With STEM program, providing the equipment and consumables for many experiments.

If possible, you should provide an Apparatus Kit for each work station in your class lab. The kit includes PPE equipment, consumables such as paper clips, putty and adhesives, plastic lab equipment, digital timer, stopwatch, measuring tools and magnets.



## Data Logging Kit

Order as 500-02

The Data Logging Kit is used in a range of science practice experiments to enable students to explore how science uses technology to gather data for sound, heart rate, speed and temperature.

Equipment Includes:

- Data Logger (with built-in sensors)
- Additional light, temperature and heart rate sensors





## Problem Solving Kit

Order as 500-03

The Problem Solving Kit lets students explore the techniques and methods used in scientific experimentation and understanding.

Typical Practical Topics Include:

- Ideas from nature in design
- Introduction to engineering
- Experimental Investigation



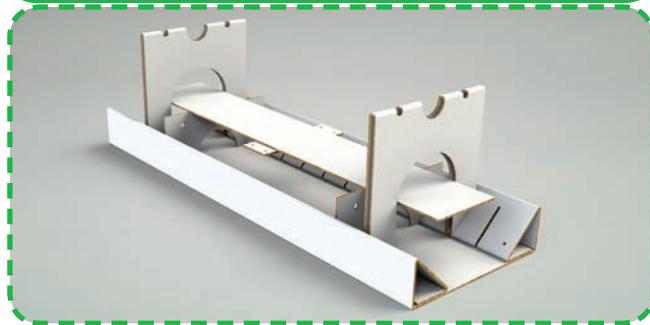
## Bridge Building Kit

Order as 500-04

The Bridge Building Kit is used to investigate fundamental science and engineering topics. By exploring a range of bridge-building techniques, students will learn how a structure's strength is based on its material and design. We recommend providing one kit per workstation.

Equipment Includes:

- Bridge Building model kit and storage box



## TacTic Construction Kit

Order as 500-05

The TacTic Construction Kit is a superb large scale modeling resource, idea for group or team work. This range of rods, clips, joints, wheels, and cogs can be used to design and build models for many of our STEM-based practical activities.

Typical Practical Topics Include:

- Comparing movement
- Engineering and design



## Plant Kit

Order as 500-06

This kit provides a classroom hydroponics set and resources to allow students to explore plant growth, structure and development.

Equipment Includes:

- Hydroponics set
- Lima beans
- Craft knife, black out card, food coloring



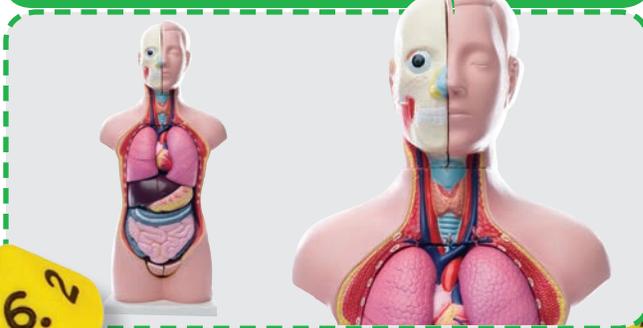
## Human Torso Kit

Order as 500-07

This kit allows a hands-on investigation of human biology. Each of the main organs can be removed and replaced to help develop an understanding of their function and location.

Practical Topics Include:

- The human body



## Hand-held Microscope Kit

Order as 500-08

This kit enables students to explore on screen a variety of samples and material characteristics invisible to the human eye.

Equipment Includes:

- USB microscope
- Sample slide set
- Software



## Mixtures Kit

Order as 500-09

The Mixtures Kit is a comprehensive lab set for exploring how different materials can be mixed and separated using a range of techniques.

Practical Topics Include:

- Properties of mixtures and solutions
- Soil and water
- Volume and state



## Rocks Kit

Order as 500-10

This kit contains a range of rock samples for investigations into the types, formation, and origin of rocks. The kit is designed for group investigation, when students take turns to select a rock to analyze.

**Practical Topics Include:**

- Looking at rocks
- Investigating rocks



## Stream Table Kit

Order as 500-11

The Stream Table is an innovative unit designed to enable classroom demonstrations of subjects such as erosion and deposition. The head unit supplies a simulation of rainfall, while the sand-filled flotation tank is set at an angle to represent the land meeting the sea. Students can use the included wooden blocks to mimic buildings and investigate how natural forces affect our homes and buildings.



## Planetarium Kit

Order as 500-12

The Planetarium Kit is used to explore the interaction and relationships between the Sun and Earth. The equipment enables hands-on investigations into night and day, as well as the seasons.

**Equipment Includes:**

- Planetarium model, cover and power supply
- Storage box



## Energy of the Wind Activity Pack

Order as 500-13

This class activity pack provides a package of items to enable groups of learners to explore the power of the wind, and how science uses this power in modern energy creation.

Equipment Includes:

- Windmill design templates
- Windmill consumables pack



## Sound and Light Kit

Order as 500-14

The Sound and Light Kit contains our unique light rays box, as well as some familiar science equipment used to investigate physical science concepts such as light, sound, and waves.

Equipment Includes:

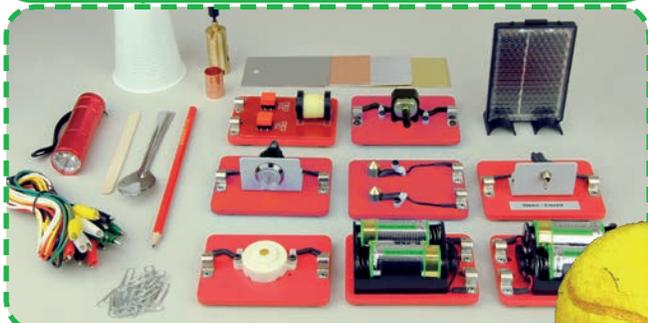
- Light ray box and power supply
- Acrylic lenses set
- Walkie Talkie set



## Electrical Circuits Kit

Order as 500-15

This kit provides all that is needed to investigate simple electrical circuits and components. The large scale mounted components include a lamp, switch, battery, buzzer, and electromagnet. Each component has been designed for elementary level teaching and is connected by simple leads and crocodile clips.



## Properties of Materials Kit

Order as 500-16

The Properties of Materials Kit contains a mixture of everyday objects and materials for learners to investigate. Practical tasks will ask students to consider texture, shape, strength, and weight of objects. The kit also includes weighing equipment.

Equipment Includes:

- Balance and electronic scales
- Heat transfer materials



## Motion Kit

Order as 500-17

The Motion Kit allows learners to experiment with a marble run game to investigate the factors that can change the motion of a marble. Students will build a marble run using a range of pieces to alter the marble's direction and gradient. The kit also includes resources to investigate other ways in which we can make things move using forces such as wind.



## Forces Kit

Order as 500-18

The Forces Kit investigates the physical forces that act upon all objects. The hands-on kit will introduce concepts of pushing and pulling forces, as well as the ways in which they can be measured.

Equipment Includes:

- Boss, clamp, and spring scales
- Weighted bean bags



## Energy and Speed Kit

Order as 500-19

This kit is designed to introduce key concepts of physical science. It uses a bench-top dynamics track, which combines with data logging equipment to create an innovative way for students to explore speed and energy.

Equipment Includes:

- Car track
- Light gate please note this kit requires access to a data logger (p29)



## Pollination Class Activity Pack

Order as 500-20

This engaging whole-class activity enables students to craft models of plants and bees to animate the pollination process. This pack is suitable for groups of up to 30 learners.

Equipment Includes:

- Craft items for bee and flower modeling (consumables)
- Inventory reference sheet



## Fossils Class Activity Pack

Order as 500-21

This class activity pack provides the resources for classes of up to 30 to explore hands-on how fossils are formed. Each student can create their own fossil model to present to the class.

Equipment Includes:

- Craft items for fossil forming (consumables)
- Inventory reference sheet to help with replenishment of consumables



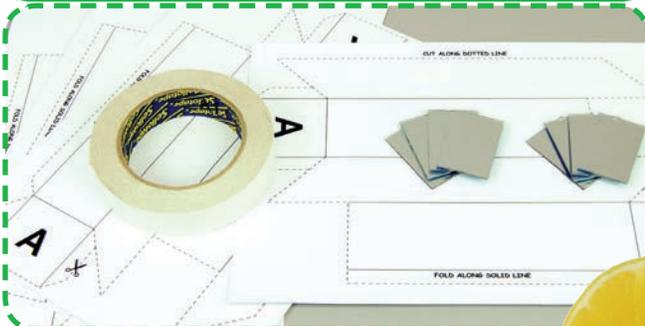
## Optics Class Activity Pack

Order as 500-22

This unique activity pack provides the materials to create a hand-held periscope to investigate optics and explore practical applications of mirrors. This pack is suitable for groups of up to 30 learners.

Equipment Includes:

- Periscope mirrors and templates
- Tape
- Inventory reference sheet



## Sound and Vibration Activity Pack

Order as 500-23

This fun pack provides the materials to demonstrate how sound waves can be transferred in a communication system. This pack is suitable for groups of up to 30 learners.

Equipment Includes:

- Balloons and air pumps
- String telephone consumables pack
- Inventory reference sheet





P.S. Be prepared for real excitement in the classroom!



For more information on our range of STEM resources, please contact:

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