



2025-2026

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Request a Field Study Today!

GENERAL INFORMATION



Discovery Center provides fun and effective, informal educational experiences that reinforce classroom learning. Located adjacent to 22 acres of spectacular wetlands, Discovery Center is full of exciting exhibits and wildlife to explore - both inside and out.

Our goal is to make the Discovery Center an extension of your classroom with premier hands-on and inquiry-based learning. All Field Study objectives and programming are carefully vetted to correlate with up-to-date TN state educational standards. We can adjust our curriculum to meet the needs of your group.

We have carefully curated guided lessons that help to engage students through inquiry-based and hands-on learning in key areas for each grade level. We want to be an extension of your classroom to support our future generation of STEAM enthusiasts!

Our Mission

Engaging Curious Minds to Fuel the Future

Our Vision

To build a community with the courage to ask thoughtful questions, the drive to find creative solutions, and the confidence to implement positive change

Our Values

Fun & Play, Diversity & Inclusion, Creativity, Transformative Learning, Curiosity

Self-Guided Field Study

Explore the Discovery Center at your own pace. We have exhibit guides to help you make the most of your time.

Guided Field Study

Guided Field Studies include an instructor-led field study plus Discovery Center exploration. Our goal is to make the Discovery Center an extension of your classroom with premier hands-on and inquiry-based learning.

Mobile Field Study

Hands-on lessons presented in your classroom! Mobile Labs: Learning on the Go! is a great way to bring the Discovery Center resources to your classroom or site.

Science Assembly

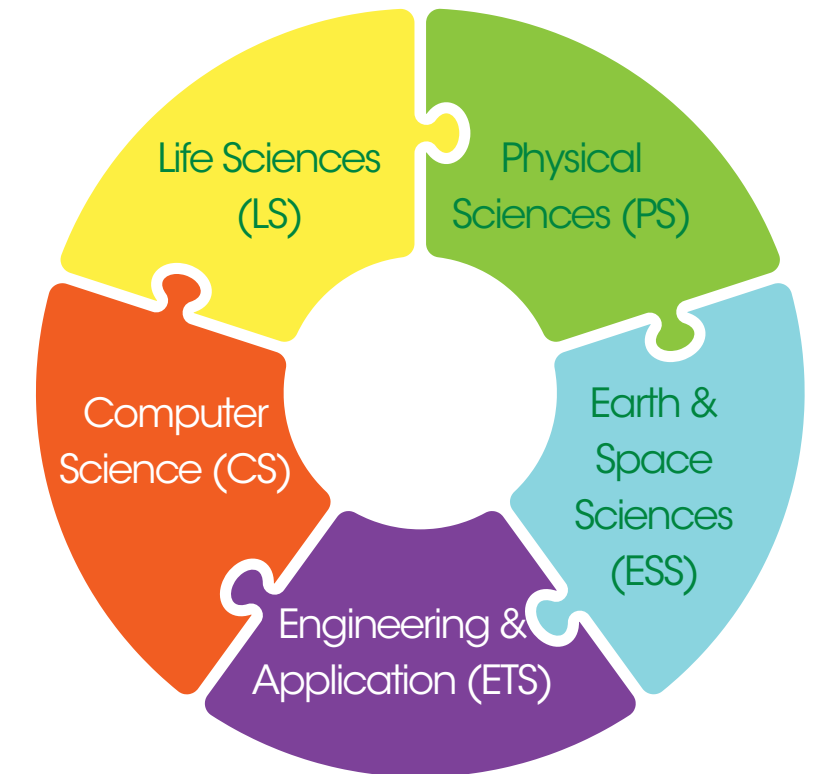
We know how to wow a crowd! Allow us to amaze your students in a large group with our a la cart Science Assembly (Physical Science only).

STEM/Science Nights

Discovery Center can help you take your family night to the next level. We'll bring information about our museum and upcoming programs along with a hands-on activity for your visitors to enjoy.

Maximize field trip benefits by booking strategically!

| | |
|---|---|
| Before a unit to activate engagement and connect prior learning. | At the end of a unit to apply concepts and bring it all together. |
| Wetland Wonders Water Cycle Unit | Water Cycle Unit Wetland Wonders |
| In the middle of a unit to reinforce concepts and apply learning. | After some time to spiral back to learning and keep it fresh. |
| Water Cycle Wetland Wonders Unit | Water Cycle Other Unit Wetland Wonders |



PRICING:
For the most up to date pricing: Checkout our website.
<https://explorethcdc.org/plan-your-visit/field-trips/>

BOOKING PROCESS

[Request a Field Study Today!](#)

Why a Waitlist?

We moved from a *Field Trip Inquiry Form* to **Request a Field Study** for a few reasons. The biggest is that by 'Requesting a Field Study', we capture your preferred field trip dates and will assign those when possible on a first-come/first-serve basis. We see on average 9 school groups join the list each week and this allows us to more quickly respond to requests as well. We have also clarified our follow up process and included a process to remove schools from the list if they are not ready to finish the booking process yet. Schools can always rejoin the list if they need more time to plan. Please remember, until you receive an invoice from us, **your booking is not finished.**

Booking Process



After 5 days of no contact during the booking process, schools will be removed from the list and can rejoin when they are ready to book.

Check your SPAM and TRASH Folders - we are finding that a lot of district firewalls are sending our emails there.

Emails from scheduling@exploredc.org



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All Access Friendly Field Studies

Many of our favorite field studies can be adapted based on group needs. For example, we have found that our States of Matter demonstration is a hit, especially when we tone down the liquid nitrogen 'explosion'. Just let us know how we can help your students enjoy their visit.

ACCESSIBILITY

Support for ALL Access

Discovery Center is committed to providing opportunities for ALL children to play, explore, and grow no matter their physical, behavioral/sensory, financial, or other needs. We have highlighted a few of our accommodations below. Check out the full story at <https://exploredc.org/plan-your-visit/accessibility/>

Assistive Technology Check-Out: Several types of assistive technologies are available for check-out during your visit.

- Noise-Reducing Headphones
- Transition Timers
- Weighted Vests
- Easi-Grip Loop Scissors and Triangular Crayons

The Chill Zone: Discovery Center's sensory calm-down space.

Wheelchair Access: The Discovery Center building is fully ADA-accessible, and we have worked to make as many exhibits fully accessible as possible. Many areas in our outdoor exhibits - including the wetlands walkways - are also accessible.



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TEACHER & CHAPERONE GUIDE

Teacher & Chaperone Communication

Discovery Center is committed to streamlining your visit. We have highlighted some key information below. Check out the full guide including our weather policies and printable guides for chaperones at <https://explorethcdc.org/plan-your-visit/field-trips/>

Check-in

Scheduled Events

Exploration

Check-Out

Check-in

- During your exploration time, you have several options for organizing your play. We recommend the following:
 - Split large groups so that some are exploring the 1st floor while others are exploring the 2nd floor.
 - For maximum fun, ensure a 1:6 chaperone to student ratio. Encourage chaperones to engage with students.
 - Take advantage of the Wetlands - go on a wetland walk, explore Murfree Springs, or detour to Nature Play past the lunch area for some outside fun.
 - Ask the front desk for an exhibit guide for a deeper dive into the learning goals of each exhibit.

Exploration

- When you arrive students should **REMAIN ON THE BUS**.
- Send the **lead teacher** in to check in at the front desk. At the Front Desk, lead teacher will provide payment and get the wristbands for your school personnel. The lead teacher should be ready with...
 - Number of students
 - Number of school personnel
 - Number of prepaid chaperones
 - Groups by Teacher Name
- Our field trip coordinator will then give directions for student unloading and lunches. We will have a bin for lunches and jackets as needed. Because of limited storage space, please do NOT bring student backpacks.

Scheduled Events

- Groups - depending on your trip size, we will organize you into groups. Groups will travel together throughout the day.
- Based on your itinerary for the day, you will be guided to scheduled events by group.
- Stations - We can hold 1-2 classes per station and will run 2 stations simultaneously.
- Lunch - We have set aside **30 minutes for your lunch**. Please be sure that you are ready for lunch when it is your time as we often have schools scheduled back-to-back.

Check-Out

- When you are ready to head out, let our front desk know. They can make an all call announcement for your group. Buses can pull up to the front door for short time periods for loading.



From lessons in the wetlands on biodiversity to time with our live animal ambassadors, our team specializes in life sciences. We engage students of all ages through multiple learning experiences.

| Theme | Field Trip Topic | Pre-K | K | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------|--------------------|-----------------|-----------------|---|---|---|---|---|---|
| Life Sciences | Animals All Around | Guided & Mobile | | | | | | | |
| | Wetland Wonders | Guided Only | | | | | | | |
| | Seed to Plant | Guided & Mobile | | | | | | | |
| | Dissection Lab | | Guided & Mobile | | | | | | |

Animals All Around (PreK - 5) (Guided or Mobile)

Reptiles, amphibians, mammals, and birds are part of our menagerie! Students learn through guided live animals encounters.

Outcomes:

- Students analyze internal and external structures that support survival and adaptation to the environment.
- Students get to meet animals and learn about mammals, birds, reptiles, and amphibians.
- Students learn life cycles and classifications of animals and adaptations for survival.

Wetland Wonders (PreK - 5) (Guided only)

(offered April - October)

Explore the urban wetlands that unique plants and animals call home. You can choose how the students discover with options for boots and wading in the creek or catch and release in the Lily pad Pond. Then decide how your group will see different species by choosing between an animal encounter, guided wetland walk, or focusing on life cycles.

Outcomes:

- Students develop an understanding of how plants, animals, and nonliving things in an ecosystem interact with each other.
- Students analyze internal and external structures that function supporting survival along with how they adapt to their environment.

Dissection Labs (K- 5) (Guided or Mobile)

Explore the parts of the body and functions of organs through hands-on investigations and dissections of real frogs (recommended for 3rd grade and up) or owl pellets. *Dissection Labs are an upcharge from our typical field trip fee.

Outcomes:

- Students will analyze internal and external structures that support survival and adaptation to the environment.
- Students will develop an understanding of how plants, animals, and nonliving things in an ecosystem interact with each other.
- Students will explore anatomy, paying close attention to the internal and external structures that support survival, growth, behavior, and reproduction.

Seeds to Plants (K- 1) (Guided or Mobile)

Watch your students' knowledge grow like a weed! Students make observations about plants through hands-on activities and exploration.

Outcomes:

- Students will explore and observe plants and seeds, shapes, sizes, textures, and colors.
- Students will use various tools to support scientific inquiry, such as recording data and observations with multiple materials, making classifications, and predictions.
- Students will investigate plants, parts of the plant, life cycle of plants and identify measurable attributes of a plant.
- Students will explain the function of the roots, stem, leaves, flower, and fruit of a plant.

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PHYSICAL SCIENCES

Our Physical Science catalog is expansive with lessons from magnets and circuits to forces and states of matter. Kids get hands-on exploring physical science properties.

| Theme | Field Trip Topic | Pre-K | K | 1 | 2 | 3 | 4 | 5 | 6 |
|-------------------|------------------|-----------------|---|---|---|---|---|---|---|
| Physical Sciences | Science Sampler | Guided & Mobile | | | | | | | |
| | Science Assembly | Mobile Only | | | | | | | |

Science & STEAM Nights

Discovery Center can help you take your family night to the next level. We'll bring information about our museum and upcoming programs along with a hands-on activity for your visitors to enjoy.

We can tailor the activity to anyone of our Science and STEAM topics including Life Sciences, Physical Sciences, Earth & Space Sciences, Engineering & Technology and Computer Science.

Science Sampler (K-5) (Guided or Mobile)

Students get hands-on as they explore physical science concepts. You get to choose two physical science experiences tailored to your grade level. Experiences include states of matter, magnets, circuits, forces, and light waves.

Outcomes:

- Students will understand matter can exist in different states and has properties that can be observed- Chemical and physical change.
- Students will explore the effects of light with transparent, translucent, opaque, and reflective and gain a deeper understanding of light waves and bending of light.
- Students will explore push, pull, collision, and trajectory.
- Students will explore potential and kinetic and Newton's law of motion.
- Students will gain an understanding of electricity and the completion of circuits.

Teachers will pick TWO stations for Guided or ONE station for mobile

- Light
- Magnets
- Forces
- Circuits
- States of Matter

Science Assembly (K-5) (Mobile Only)

Prepare to be wowed with our science a la carte offerings. You get to choose two or more physical science experiences tailored to your grade level. Experiences include States of Matter, Light, Electricity, Bernoulli's Principle, and Gyroscopic Forces.

Outcomes:

- Students will understand matter can exist in different states and has properties that can be observed- Chemical and physical change.
- Students will explore the effects of light with transparent, translucent, opaque, and reflective. Deeper understanding of light waves and bending of light.
- Students will explore push, pull, collision, and trajectory.
- Students will explore potential and kinetic and Newton's law of motion.
- Students will gain an understanding of electricity and the completion of circuits.

Each hour long show contains 2x30 minute segments. Choose from the following.

- States of Matter
- Light
- Electricity
- Bernoulli's Principle
- Gyroscopic Forces

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EARTH & SPACE SCIENCES

Our STAR Lab inflatable planetarium allows us to travel through space and time to unlock the wonders of the universe.

| Theme | Field Trip Topic | Pre-K | K | 1 | 2 | 3 | 4 | 5 | 6 |
|------------------------|------------------|-----------------|---|-----------------|---|---|---|---|---|
| Earth & Space Sciences | Star Tour | | | Guided & Mobile | | | | | |
| | Weather Whizzes | Guided & Mobile | | | | | | | |

STAR Tour (1-5) (Guided or Mobile)

Our STAR lab portable planetarium takes students on an exploration of the night sky during the day! Program topics inside the planetarium include the solar system, constellations, day and night cycles, and moon phases. For our planetarium to visit your location, we need an indoor space that is 15ft x 15 ft x 15ft.

- Outcomes:
- Student will observe planets and stars in the solar system using observational data to categorize the planets.
 - Students will observe planets and stars in the solar system.
 - Students will observe day and night patterns and shadows.
 - Students will observe how stars and constellations appear to move from the Earth's perspective throughout the seasons.

The planetary show is curated to meet grade level standards and are about 30 minutes long. For mobile, we do one show per class and for guided, a 30 minute show is paired with a 30 minute hands-on activity. We have a variety of options to choose from including planets, day & night, distance in space, constellations (with a variety of foci based on historical perspectives of indigenous populations or European)

Weather Whizzes (K, 3) (Guided or Mobile)

Explore the wonders of weather through hands-on demonstrations about warm and cold fronts, thunderstorms, lightning, and tornadoes.

- Outcomes:
- Students will explore weather measuring tools.
 - Students will discuss storms and their causes.
 - Students will observe models of lightning and tornadoes.

- Standards:
- Kindergarten: K.ESS.2.1, K.ESS.3.2
 - 3rd Grade: 3.ESS.2.2, 3.ESS.2.1

Science & STEAM Night: Star Lab

Discovery Center can help you take your family night to the next level. We'll bring information about our museum and upcoming programs along with a hands-on activity for your visitors to enjoy.

A few of the Star Lab shows can be tailored to a hop-in/hop-out format. Contact scheduling@exploredc.org for more information.

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ENGINEERING & APPLICATION

Beyond sharing the wonders of STEAM, we love to see kids take the steering wheel to tackle real world challenges. We believe that students are never too young to be problem solvers and offer engineering lessons starting in Pre-K. Each lesson engages students in the Engineering Design Process.

| Theme | Field Trip Topic | Pre-K | K | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------|------------------------------------|-----------------|---|---|-----------------|---|-----------------|---|---|
| Engineering & Application | Biodiversity | | | | | | Guided & Mobile | | |
| | Invasive Iradicators | | | | | | Guided & Mobile | | |
| | Solar Scientist | | | | | | Guided & Mobile | | |
| | Eco Engineers | | | | Guided & Mobile | | | | |
| | Engineering with the 3 Little Pigs | Guided & Mobile | | | | | | | |

Upper Grades Engineering (4-6)

Each of the upper grades lessons is built around hands-on problem solving. Students practice using the Engineering Design process to solve problems in groups.

BioDiversity (4 - 6) (Guided or Mobile)

Take a look at how macroinvertebrate biodiversity in streams can determine water quality with a small group experiment. Students also discuss and learn about water quality testing through hands-on activities..

Invasive Plant Eradicators (4 - 6) (Guided or Mobile)

Work as a team of environmental engineers to develop a machine to rid a wetland habitat of invasive plants. Students learn about a common invasive plant in the Murfree Spring Wetlands and discuss the impacts invasive plants can have on an environment.

Solar Scientists (4 - 6) (Guided or Mobile)

Perform an experiment to see how the amount or color of light affects how much energy is produced by a solar cell.

Outcomes:

- Students will discuss renewable and non-renewable energy sources.
- Students will design and test different solutions that impact energy transfer.

Engineering with the 3 Little Pigs (Ages 3 - 1st Grade) (Guided or Mobile)

We meld literacy and engineering by studying some iconic characters. Students engage in the engineering design process and practice failing and retrying by building a house with commonly found materials and attempting to blow it down.

Outcomes:

- Students will engage in scientific inquiry through the process of asking questions, investigating, and constructing explanations.
- Students will solve a problem using the three-step design process.

Eco Engineers (Grades 2 - 5) (Guided or Mobile)

Energize your students with this exploration of engineering. Using a variety of materials and their knowledge, students will build their own relocation containers to help rescue a beaver in the wetlands. As students iterate through this design challenge, they gain first-hand experience in the design process.

Outcomes:

- Students will be able to design and build a device that uses different types of mechanisms to capture an animal.
- Students will be able to explain design considerations.
- Students will be able to utilize the three step design process to meet a real-world problem that includes specified criteria and constraints.

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COMPUTER SCIENCE

Students engage with our growing library of programmable bots as they practice computational thinking!

| Theme | Field Trip Topic | Pre-K | K | 1 | 2 | 3 | 4 | 5 | 6 | |
|------------------|-------------------------------------|--------------------------------------|---|---|---|---|---|---|---|--|
| Computer Science | Computational Thinking with Beebots | Guided & Mobile | | | | | | | | |
| | TBD: In progress surprise! | Coming in Fall 2026! Guided & Mobile | | | | | | | | |
| | Small Group - Robotics | Guided & Mobile | | | | | | | | |

Computational Thinking with Beebots

Students learn the basics of computational thinking through an unplugged computer science activity and progress to programming BeeBots to collect pollen.

Outcomes:

- Students will be able to break down a bigger coding challenge into small parts.
- Students will be able to work collaboratively to create an algorithm for their part.

Beebots are simple robots that can be programmed without a computer. We can level up this activity for most grade levels, however starting in 4th grade, computer science standard emphasize block or text coding. This is a great starter lesson to kickoff computational thinking in any grade level.

Small Group - Robotics

Exclusively for small groups (60 students or less) - Students will work in groups to program VEX Go or VEX IQ robots to solve a variety of challenges. Students can use devices to program using block coding and use computational thinking to break down larger challenges into small, manageable chunks.

Coming in Fall 2026!

We are excited to reveal a new field trip option in 2026 for Computational Thinking and Computer Science. Be on the lookout for an announcement coming early 2026!

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MIDDLE SCHOOLS

We have identified some great middle school cross-overs. We would also love to work with you to create valuable experiences for your students, please let us know in your inquiry form what you are looking for. We are constantly growing our portfolio and have identified where our tools and resources can meet your standards below. Each Middle School Field Trip will also include a take-home for students and parents with career and high school pathway connections. Check in with our scheduling expert (scheduling@exploredc.org) to find the right fit for your group and look for Middle School Monday seasons where middle school groups of 200 students or less can get exclusive museum access.

| Theme | Field Trip Topic | 6 | 7 | 8 |
|---------------------------|--|--|---------------------|----------------------------|
| Life Sciences | Wetland Wonders | LS2.1,LS2.2, LS2.3, LS2.4, LS2.5, LS4.1, ESS2.5 | LS1.4, LS2.1, LS3 | LS4.2, LS4.3, LS4.4 |
| | Dissection Lab | | LS1.1, LS1.2, LS1.3 | |
| Physical Sciences | Science Sampler | PS3.1 | PS1.3 | PS2.1, PS2.2, PS2.5, PS2.6 |
| Earth & Space Sciences | Star Tour | | | PS1.2, PS2.3, ESS1.1 |
| Engineering & Application | Biodiversity | LS2.4, LS2.5, ESS2.5, ESS3.3 | | |
| | Invasive Iradicators | LS2.4, LS2.5 | | |
| | Solar Scientist | ESS3.1, ESS3.2 | | |
| | Eco Engineers | ETS1.1 | | |
| Computer Science | Computational Thinking with VEX Robots | MS.FC.3, MS.FC.4, MS.AT.2, MS.AT.3, MS.PC.1, MS.PC.2, MS.PC.3, MS.PC.5 | | |

[Request a Field Study Today!](#)



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TEACHER PROFESSIONAL DEVELOPMENT

Our team would love to host your instructional team for a Teacher Field Trip or we can create great custom professional development options for your group. We specialize in hands-on, experiential learning and STEAM experiences.

Past Examples:

- Hosted a group of pre-service teachers for a field trip, they observed a local school in their education stations and then received 1 hour of PD on informal learning.
- Hosted a group of district instructional leads during a field trip from their district. Held a 1 hour brainstorming meeting.
- Hosted a team building for a group of educators and led them through an exploration of the wetlands in boots.

Topics

- Experiential Learning
- Informal Learning
- Computer Science
- Environmental Education
- Integrating Literacy and STEAM
- Any of our Field Trips
- Team Building

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Grade Level Recommendations

PRE-K & KINDERGARTEN



[Request a Field Study Today!](#)

We base our Pre-K lessons on Kindergarten standards and may adapt or adjust the timing to better suit our smaller learners. We recommend at least 3 years old for our guided lessons as students will be asked to follow instructions, listen to lessons, and engage in curious science play.



Life Science

The best fit for this grade level is our Wetland Wonders Field Trip with Catch & Release and Wetland Animal Stations. This trip is available April through October. Second best, we recommend Animals All Around.



Physical Science

The best fit for this grade level is our Science Sampler with any station choice; Light, Forces, Magnets, States of Matter, or Circuits

WETLAND WONDERS

ANIMALS ALL AROUND

SCIENCE SAMPLER



Earth & Space Science

Our Weather Whizzes Field study has students understanding weather patterns and measurement tools or you can get a jump start on 1st grade content with constellations or day & night in our inflatable planetarium. Just book a STAR Tour.



Engineering

The best fit for this grade level is our Engineering with the 3 Little Pigs. Kids love to build and rebuild to fend off the big bad wolf.



Computer Science

The best fit for this grade level is our Computational Thinking with Beebots. Even our newest coders can program the beebots to find the pollen.

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WEATHER WHIZZES

STAR TOUR

ENGINEERING WITH THE 3 LITTLE PIGS

COMPUTATIONAL THINKING





Grade Level Recommendations

1ST GRADE



[Request a Field Study Today!](#)

In first grade, our premier experiences revolve around life science or Earth & Space Science. In our Seeds to Plant field study - students get hands-on as they explore and then apply plant functions. In our STAR Tour - students will make observations of the sky and draw conclusion about the patterns they find.



Life Science

The best fit for this grade level is our Seed to Plant. We purpose built this field study for 1st grade and it includes activities on plant parts and their functions and a hands-on build activity.

[SEEDS TO PLANT](#)



Physical Science

The best fit for this grade level is our Science Sampler with the Light station and then either the Forces or Magnets station to get a head start on 2nd grade standards.

[SCIENCE SAMPLER](#)



Earth & Space Science

Our inflatable STAR LAB planetarium is available for the Day & Night lesson for 1st grade where we deep dive into the rotation of the earth and how that impacts Day & Night patterns.

[STAR TOUR](#)



Engineering

The best fit for this grade level is our Engineering with the 3 Little Pigs. Kids love to build and rebuild to fend off the big bad wolf.

[ENGINEERING WITH THE 3 LITTLE PIGS](#)



Computer Science

The best fit for this grade level is our Computational Thinking with Beebots. Even our newest coders can program the beebots to find the pollen.

[COMPUTATIONAL THINKING](#)

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Grade Level Recommendations

2ND GRADE



In 2nd Grade, we have some great choices in Life Science and the Physical Sciences. We can adapt most other field trips to either review or front load from other grades.

[Request a Field Study Today!](#)



Life Science

The best fit for this grade level is our Animals All Around field study. Students will meet Animal Ambassadors and learn how to classify animals based on physical characteristics and then extend their learning with a hands-on activity.

[ANIMALS ALL AROUND](#)



Physical Science

The best fit for this grade level is our Science Sampler with the Forces or Magnets stations where students will engage with hands-on activities to explore and practice physical science properties.

[SCIENCE SAMPLER](#)



Earth & Space Science

While we don't have any 2nd grade specific Earth & Space options, you can review 1st grade or get a jump start on 3rd grade standards. Wetland wonders also has potential for a unique focus on bodies of water.

[WETLAND WONDERS](#)



Engineering

Our 2nd grade classrooms are ready for our big kid Engineering projects like Eco Engineers. Students will engage in a 55 minute engineering challenge to save the Wetland Beavers.

[ECO ENGINEERS](#)



Computer Science

The best fit for this grade level is our Computational Thinking with Beebots. Even our newest coders can program the beebots to find the pollen.

[COMPUTATIONAL THINKING](#)

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Grade Level Recommendations

3RD GRADE



In 3rd Grade, we start to build more science and engineering skills as students now have access to dissection labs and engineering field studies with group work and material lists.

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Life Science

The best fit for this grade level is our Dissection Lab field study with a frog dissection. Students will observe the internal and external structures of a frog as well as gain skills in digital microscopes and science tools. Wetland Wonders with catch & Release and Life Cycle stations is also a strong option.



Physical Science

The best fit for this grade level is our Science Sampler with the Circuits and Magnets stations where students will engage with hands-on activities to explore and practice physical science properties.

[DISSECTION LAB](#)

[WETLAND WONDERS](#)

[SCIENCE SAMPLER](#)



Earth & Space Science

The best fit for this grade is our STAR Tour with a deep dive on the planets or Weather Whizzes which has students understanding weather patterns and measurement tools



Engineering

The best fit for this grade level is our Eco Engineer field study where students will work in teams to solve a real-world problem and help the wetland beavers.



Computer Science

The best fit for this grade level is our Computational Thinking with Beebots. Even our newest coders can program the beebots to find the pollen.

[WEATHER WHIZZES](#)

[STAR TOUR](#)

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Grade Level Recommendations

4TH GRADE



[Request a Field Study Today!](#)

In 4th Grade, we have strong field studies related to life science with our Wetland Wonders Food Web station which can be adapted to a 30 min station along with catch & release, or run on it's own with an in-depth look at the impact of keystone species and invasive species on energy in a system.



Life Science

The best fit for this grade level is our Wetland Wonders field study with Catch & Release and Food Web stations. Students will conduct a species inventory in the wetlands and then compete an activity to understand how species interconnect. (Also available offseason as an in-depth Food Web Experience.)

WETLAND WONDERS



Physical Science

The best fit for this grade level is our Science Sampler with the Light and Forces stations where students will engage with hands-on activities to explore and practice physical science properties.

SCIENCE SAMPLER



Earth & Space Science

While we don't have any 4th grade specific Earth & Space options, you can review 3rd grade or get a jump start on 5th grade standards in a STAR Tour. Wetland wonders also has potential for a unique focus on geology.

WEATHER WHIZZES

STAR TOUR



Engineering

The best fit for this grade level is either our Biodiversity or Solar Scientist Engineering Field Studies. Eco Engineer field study is also a good choice that aligns with some ESS standards.

UPPER GRADES ENGINEERING

ECO ENGINEERS



Computer Science

4th Grade students can still learn the basics of computational thinking with our Computational Thinking Field Study before tackling more advanced coding in the classroom.

COMPUTATIONAL THINKING

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Grade Level Recommendations

5TH GRADE



In 5th Grade, we have strong field study with our STAR LAB Star Tour where students can explore distance and relative locations within the universe.

[Request a Field Study Today!](#)



Life Science

The best fit for this grade level is our Dissection Lab field study with a frog dissection. Students will observe the internal and external structures of a frog as well as gain skills in digital microscopes and science tools. Wetland Wonders with catch & Release and Wetland Animal stations is also a viable option.

[DISSECTION LAB](#)

[WETLAND WONDERS](#)



Physical Science

The best fit for this grade level is our Science Sampler with the States of Matter and Forces stations where students will engage with hands-on activities to explore and practice physical science properties.

[SCIENCE SAMPLER](#)



Earth & Space Science

We have a brand new field study for 5th grade Earth & Space. Students will explore relative and actual distance in space as well as explore the galaxies surrounding the Milky Way in our inflatable STAR LAB planetarium.

[STAR TOUR](#)



Engineering

The best fit for this grade level is one of our upper elementary engineering field studies where students work in teams to solve real world problems.

[UPPER GRADES ENGINEERING](#)



Computer Science

5th Grade students can still learn the basics of computational thinking with our Computational Thinking Field Study before tackling more advanced coding in the classroom.

[COMPUTATIONAL THINKING](#)

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Life Sciences

ANIMALS ALL AROUND

Reptiles, amphibians, mammals, and birds are part of our menagerie! Students learn through guided live animal encounters. Outcomes:

- Students analyze internal and external structures that support survival and adaptation to the environment.
- Students get to meet animals and learn about mammals, birds, reptiles, and amphibians.
- Students learn life cycles and classifications of animals and adaptations for survival.

| Grade | Stations | Standard Alignment |
|--------------------|-------------------|--------------------|
| Pre K/Kindergarten | 30 minute station | Moderate/Strong |
| 1st | 55-minute station | Minimal |
| 2nd | 55-minute station | Strong |
| 3rd | 55-minute station | Minimal |
| 4th | 55-minute station | Minimal |
| 5th | 55-minute station | Minimal |

• Pre-K/K - FOCUS ON Animal Senses

- K.ETS1: Engineering Design:
 - 3) Ask and answer questions about the scientific world and gather information using the senses.
- K.LS1: From Molecules to Organisms - Structures and Processes:
 - 3) Explain how animals, including humans, use their five senses to interact with the environment.

• 1st Grade FOCUS ON Animal & Environment

- 1.LS2: Ecosystems, Interactions, Energy, and Dynamics:
 - 3) Develop and use models to show how plants and animals depend on their surroundings and other living things to meet their needs in the places they live.

• 2nd Grade FOCUS ON Animal & Adaptations

- 2.LS1: From Molecules to Organisms - Structures and Processes:
 - 1) Use evidence and observations to explain that many animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air.
 - 2) Obtain and communicate information to classify animals (i.e., vertebrates: mammals, birds, amphibians, reptiles, fish; and invertebrates: insects) based on their physical characteristics.
- 2.LS2: Ecosystems: Interactions, Energy, and Dynamics:
 - 2) Predict what happens to animals when the environment changes (temperature, cutting down trees, wildfires, pollution, salinity, drought, land preservation).

• 3rd Grade FOCUS ON Animal Behavior

- 3.LS.2.1: Ecosystems: Interactions, Energy, and Dynamics:
 - 1) Obtain information to compare various ways that groups organize (e.g., specialized roles for members vs same roles for members) to explain the benefits of animal group behavior.

• 4th Grade FOCUS ON Food Web

- 4.LS.2.2: Ecosystems: Interactions, Energy, and Dynamics:
 - 2) Using information about the roles of organisms (producers, consumer, decomposers) in an ecosystem, evaluate how those roles are interconnected in a food web, and communicate how the organisms are continuously able to meet their needs in a stable food web.

• 5th Grade FOCUS ON Animal Heredity

- 5.LS.4: Biological Change: Unity and Diversity:
 - 1) Use evidence to construct an explanation for how variations in characteristics among individuals within the same species may provide advantages to these individuals in their survival and reproduction.
- 5.LS.3: Heredity: Inheritance and Variation of Traits:
 - 1) Distinguish between inherited characteristics and those characteristics that result from an interaction with the environment. Apply this concept by giving examples of characteristics of living organisms that are influenced by both inheritance and the environment.



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Life Sciences

WETLAND WONDERS

(offered April - October)

Explore the urban wetlands that unique plants and animals call home. You can choose how the students discover with options for boots and wading in the creek or catch and release in the Lily pad Pond. Then decide how your group will see different species by choosing between an animal encounter, guided wetland walk, or focusing on life cycles.

Outcomes:

- Students develop an understanding of how plants, animals, and nonliving things in an ecosystem interact with each other.
- Students analyze internal and external structures that function supporting survival along with how they adapt to their environment.

Special Food Web deep dive offered offseason for 4th & 5th Grade

| Grade | Stations | Standard Alignment |
|--------------------|-----------------------------------|--------------------|
| Pre K/Kindergarten | Catch & Release + Wetland Animals | Moderate/Strong |
| 1st | Catch & Release + Wetland Animals | Minimal |
| 2nd | Catch & Release + Wetland Animals | Moderate |
| 3rd | Catch & Release + Life Cycles | Minimal |
| 4th | Catch & Release + Food Web | Strong |
| 5th | Catch & Release + Wetland Animals | Minimal |

• Pre-K/K - FOCUS ON Animal Senses

- K.LS1: From Molecules to Organisms: Structures and Processes
 - 2) Recognize differences between living organisms and non-living materials and sort them into groups by observable physical attributes.
- K.LS3: Heredity: Inheritance and Variation of Traits
 - 1) Collect and analyze observational data to show that young living things are like, but not exactlylike, their parents.

• 1st Grade FOCUS ON Animal & Environment

- 1.LS2: Ecosystems, Interactions, Energy, and Dynamics:
 - 3) Develop and use models to show how plants and animals depend on their surroundings and other living things to meet their needs in the places they live.

• 2nd Grade FOCUS ON Animal & Adaptations

- 2.LS2: Ecosystems: Interactions, Energy, and Dynamics:
 - 1) Develop and use models to compare how animals depend on their surroundings and other living things to meet their needs in the places they live.
 - 2) Predict what happens to animals when the environment changes (temperature, cutting down trees, wildfires, pollution, salinity, drought, land preservation).

• 3rd Grade FOCUS ON Animal Behavior

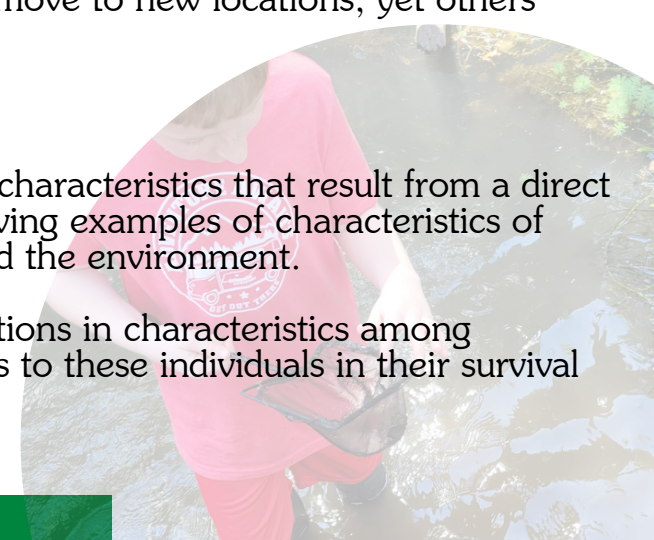
- 3.LS.1: From Molecules to Organisms: Structures and Processes
 - 1) Use graphical representations to compare how species including humans and other organisms have unique and diverse life cycles.
- 3.LS4: Biological Change: Unity and Diversity
 - 1) Use evidence to explain the cause and effect relationship between a naturally changing habitat and how well an organism survives.
 - 2) Use evidence to determine the changes between an environment's biodiversity and human resources.

• 4th Grade FOCUS ON Food Web

- 4.LS.2.2: Ecosystems: Interactions, Energy, and Dynamics:
 - 1) Develop and use models to illustrate the flow of matter through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers.
 - 2) Using information about the roles of organisms (producers, consumers, decomposers) in an ecosystem, evaluate how those roles are interconnected in a food web, and communicate how the organisms are continuously able to meet their needs in a stable food web.
 - 3) Develop and use models to determine the effects of introducing a species to, or removing a species from, an ecosystem and how either one can damage the balance of an ecosystem.
 - 4) Analyze and interpret data about changes in the environment to explain how some organisms may survive and reproduce, some may not survive, others move to new locations, yet others move into the transformed environment.

• 5th Grade FOCUS ON Animal Heredity

- 5.LS.3: Heredity: Inheritance and Variation of Traits:
 - 1) Distinguish between inherited characteristics and those characteristics that result from a direct interaction with the environment. Apply this concept by giving examples of characteristics of living organisms that are influenced by both inheritance and the environment.
- 5.LS4: Biological Change: Unity and Diversity
 - 1) Use evidence to construct an explanation for how variations in characteristics among individuals within the same species may provide advantages to these individuals in their survival and reproduction.



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Life Sciences

SEEDS TO PLANTS

Watch your students' knowledge grow like a weed! Students make observations about plants through hands-on activities and exploration.

Outcomes:

- Students will explore and observe plants and seeds, shapes, sizes, textures, and colors.
- Students will use various tools to support scientific inquiry, such as recording data and observations with multiple materials, making classifications, and predictions.
- Students will investigate plants, parts of the plant, life cycle of plants and identify measurable attributes of a plant.
- Students will explain the function of the roots, stem, leaves, flower, and fruit of a plant.
- Students will develop a contraption to ensure a plant's survival in a climate/habitat that lacks a certain element

| | Stations | Fit |
|--------------------|-------------------|---------------------|
| Pre K/Kindergarten | 30 minute station | Moderate/Strong Fit |
| 1st | 55-minute station | Strong Standard Fit |

• Pre-K/K - FOCUS ON Plant Life Cycle

- K.ETS1: Engineering Design:
 - 3) Ask and answer questions about the scientific world and gather information using the senses.
- K.LS1: From Molecules to Organisms - Structures and Processes:
 - 1) Use information from observations to identify the differences between plants and animals and how they live and grow.
- K.LS3: Heredity: Inheritance and Variation of Traits
 - 1) Collect and analyze observational data to show that young living things are like, but not exactly like, their parents.

• 1st Grade FOCUS ON Plant Structure & Function

- 1.LS1: From Molecules to Organisms: Structures and Processes
 - 1) Develop and use a model to explain the structure of plants and describe the function of their parts
 - 2) Observe and analyze how living organisms grow and change over time
 - 3) Analyze and interpret data from observations to describe how plants respond to changes in the environment
- 1.LS2) Ecosystems: Interactions, Energy, and Dynamics
 - 1) Conduct an experiment to show how plants depend on air, water, minerals from soil, and light to grow and thrive
 - 3) Develop and use models to show how plants and animals depend on their surroundings
- 1.ETS1) Engineering Design
 - 1) Apply an engineering design approach to identify and solve practical problems
 - 2) Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved
 - 3) Develop a simple sketch, drawing, or physical model that communicates solutions to others



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Life Sciences

DISSECTION LABS

Explore the parts of the body and functions of organs through hands-on investigations and dissections of real frogs (recommended for 3rd grade and up) or owl pellets. *Dissection Labs are an upcharge from our typical field trip fee.

Outcomes:

- Students will analyze internal and external structures that support survival and adaptation to the environment.
- Students will develop an understanding of how plants, animals, and nonliving things in an ecosystem interact with each other.
- Students will explore anatomy, paying close attention to the internal and external structures that support survival, growth, behavior, and reproduction.

| Grade | Stations | Standard Alignment |
|--------------------|-------------------------------------|--------------------|
| Pre K/Kindergarten | Owl Pellets (Only for Kindergarten) | Moderate |
| 1st | Owl Pellets | Minimal |
| 2nd | Owl Pellets | Moderate |
| 3rd | Frogs or Owl Pellets | Strong |
| 4th | Frogs or Owl Pellets | Minimal |
| 5th | Frogs or Owl Pellets | Strong |

• Pre-K/K - FOCUS ON Animal Senses

- K.LS1: From Molecules to Organisms: Structures and Processes
 - 2) Recognize differences between living organisms and non-living materials and sort them into groups by observable physical attributes.
- K.LS3: Heredity: Inheritance and Variation of Traits
 - 1) Collect and analyze observational data to show that young living things are like, but not exactly like, their parents.

• 1st Grade FOCUS ON Animal & Environment

- 1.LS1: From Molecules to Organisms: Structures and Processes
 - 2) Observe and analyze how living organisms grow and change over time.
 - 3) Analyze and interpret data from observations to describe how plants respond to changes in the environment (e.g., turn leaves toward the sun).

• 2nd Grade FOCUS ON Animal & Adaptations

- 2.LS1: From Molecules to Organisms: Structures and Processes
 - 1) Use evidence and observations to explain that many animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air.
 - 2) Obtain and communicate information to classify animals (i.e., vertebrates: mammals, birds, amphibians, reptiles, fish; and invertebrates: insects) based on their physical characteristics.

• 3rd Grade FOCUS ON Animal Behavior

- 3.LS.1: From Molecules to Organisms: Structures and Processes
 - 2) Analyze the internal and external structures that aquatic and land organisms have to support survival, growth, behavior, and reproduction.

• 4th Grade FOCUS ON Food Web

- 4.LS.2.2: Ecosystems: Interactions, Energy, and Dynamics:
 - 2) Using information about the roles of organisms (producers, consumers, decomposers) in an ecosystem, evaluate how those roles are interconnected in a food web, and communicate how the organisms are continuously able to meet their needs in a stable food web.

• 5th Grade FOCUS ON Animal Heredity

- 5.LS4: Biological Change: Unity and Diversity
 - 1) Use evidence to construct an explanation for how variations in characteristics among individuals within the same species may provide advantages to these individuals in their survival and reproduction.



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Physical Science

SCIENCE SAMPLER

Students get hands-on as they explore physical science concepts. You get to choose two physical science experiences tailored to your grade level. Experiences include states of matter, magnets, circuits, forces, and light waves. (Best fit by grade level)

Outcomes:

- Students will understand matter can exist in different states and has properties that can be observed- Chemical and physical change.
- Students will explore the effects of light with transparent, translucent, opaque, and reflective and gain a deeper understanding of light waves and bending of light.
- Students will explore push, pull, collision, and trajectory.
- Students will explore potential and kinetic and Newton's law of motion.
- Students will gain an understanding of electricity and the completion of circuits.

| Grade | Stations (25 Minutes Each) (Pick TWO) | Standard Alignment |
|--------------|--|----------------------|
| Kindergarten | States of Matter , Magnets , Circuits, Light | Moderate Fit |
| 1st Grade | Light | Strong Fit |
| 2nd Grade | States of Matter , Forces, Light | Strong/ Moderate Fit |
| 3rd Grade | States of Matter , Magnets , Circuits, Light | Strong/ Moderate Fit |
| 4th Grade | Light, Forces | Moderate Fit |
| 5th Grade | States of Matter , Forces | Moderate Fit |

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• Pre-K/K

- K.PS1:
 - 1) Plan and conduct an investigation using patterns to classify different kinds of materials by their observable properties (i.e. absorbency, color, texture, hardness, and flexibility), by their uses, and by whether they occur naturally or are manufactured.
 - 2) Conduct investigations to understand that matter can exist in different states (i.e. solid and liquid) and has properties that can be observed and tested.
 - 3) Construct an evidence-based account of how an object made of a small set of pieces (e.g. blocks, snap cubes) can be disassembled and made into a new object.
- K.PS4: Waves and Their Application in Technologies for Information Transfer
 - 1) Record data from an investigation using senses to detect light, sound, and vibrations and communicate observations.

• 1st Grade

- 1.PS4: Waves and Their Application in Technologies for Information Transfer
 - 1) Make observations to construct an evidence-based account that objects are visible when light shines on them or if they produce their own light (e.g., very hot objects), and that different amounts of light influence what we can see.
 - 2) Conduct an investigation to describe how the path of a beam of light can be changed by interactions with different materials (i.e. light passes through, some light passes through, light changes directions, or light is blocked which can cause shadows).

• 2nd Grade

- 2.PS2: Motion and Stability: Forces and Interactions
 - 1) Analyze the push or the pull that occurs when objects collide or are connected.
 - 2) Plan and carry out an investigation to demonstrate how pushing and/or pulling an object affects the motion of the object within a system.
- 2.PS3: Energy
 - 1) Demonstrate how a stronger push or pull makes things go faster and how faster speeds during a collision can cause a bigger change in the shape of the colliding objects.

• 3rd Grade

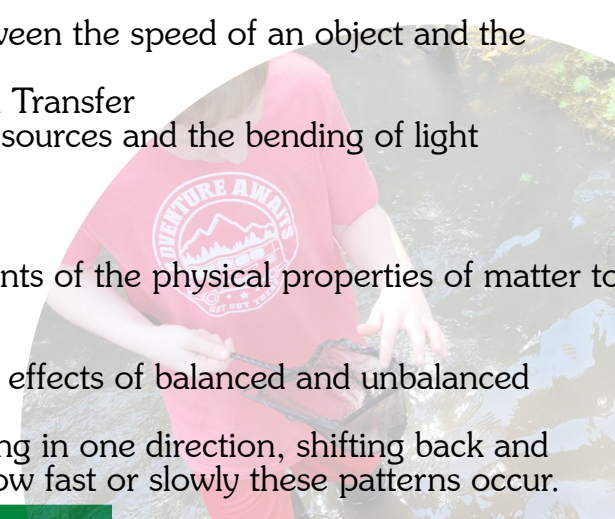
- 3.PS1: Matter and Its Interactions
 - 1) Develop a model of solids, liquids, and gasses to describe that each state of matter is made of particles too small to be seen.
- 3.PS2: Motion and Stability: Forces and Interactions
 - 1) Explain cause and effect relationships of forces that cannot be seen including interactions between two objects not in contact with each other (i.e., static electricity, magnetism and gravity).
- 3.PS3: Energy
 - 2) Develop a model to show that energy can be transferred from place to place by electric currents in a system (e.g., open, closed, simple, parallel, series circuits).
 - 3) Evaluate how magnets cause changes in the motion and position of objects, even when the objects are not touching the magnet.

• 4th Grade

- 4.PS3: Energy
 - 1) Use evidence to explain the cause and effect relationship between the speed of an object and the energy of an object.
- 4.PS4: Waves and their Application in Technologies for Information Transfer
 - 2) Construct an explanation for how the colors of available light sources and the bending of light waves determine what we see.

• 5th Grade

- 5.PS1: Matter and Its Interactions
 - 1) Analyze and interpret data from observations and measurements of the physical properties of matter to explain phase changes between a solid, liquid, or gas.
- 5.PS2: Motion and Stability: Forces and Interactions
 - 1) Plan and carry out an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of the object.
 - 4) Explain how forces can create patterns within a system (moving in one direction, shifting back and forth, or moving in cycles), and describe conditions that affect how fast or slowly these patterns occur.



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Physical Science

SCIENCE ASSEMBLY

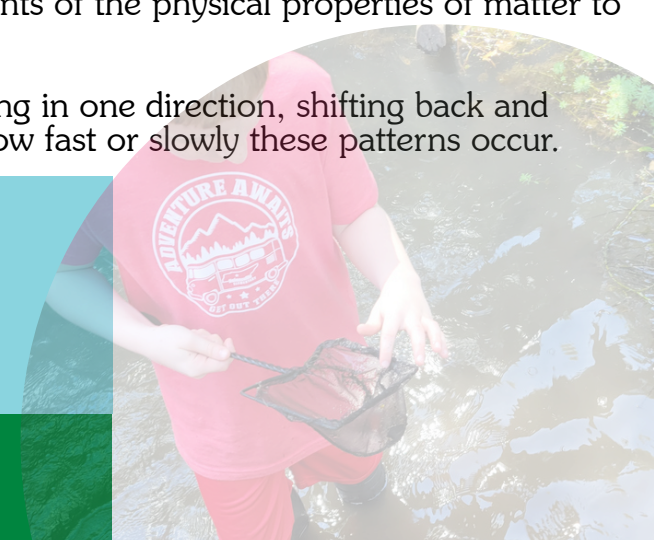
Prepare to be wowed with our science a la carte offerings. You get to choose two or more physical science experiences tailored to your grade level. Experiences include States of Matter, Light, Electricity, Bernoulli's Principle, and Gyroscopic Forces.

Outcomes:

- Students will understand matter can exist in different states and has properties that can be observed- Chemical and physical change.
- Students will explore the effects of light with transparent, translucent, opaque, and reflective. Deeper understanding of light waves and bending of light.
- Students will explore push, pull, collision, and trajectory.
- Students will explore potential and kinetic and Newton's law of motion.
- Students will gain an understanding of electricity and the completion of circuits.

| Grade | Pick Two 30 minute Show Segments. | Standard Alignment |
|--------------|--|----------------------|
| Kindergarten | States of Matter, Light | Moderate Fit |
| 1st Grade | Light | Strong Fit |
| 2nd Grade | Gyroscopic Forces, Light | Strong/ Moderate Fit |
| 3rd Grade | Gyroscopic Forces, Circuits, Light, States of Matter | Strong/ Moderate Fit |
| 4th Grade | Gyroscopic Forces, Circuits | Moderate Fit |
| 5th Grade | Gyroscopic Forces, States of Matter | Moderate Fit |

- **Pre-K/K**
 - K.PS1:
 - 2) Conduct investigations to understand that matter can exist in different states (i.e. solid and liquid) and has properties that can be observed and tested.
 - K.PS4: Waves and Their Application in Technologies for Information Transfer
 - 1) Record data from an investigation using senses to detect light, sound, and vibrations and communicate observations.
- **1st Grade**
 - 1.PS4: Waves and Their Application in Technologies for Information Transfer
 - 1) Make observations to construct an evidence-based account that objects are visible when light shines on them or if they produce their own light (e.g., very hot objects), and that different amounts of light influence what we can see.
 - 2) Conduct an investigation to describe how the path of a beam of light can be changed by interactions with different materials (i.e. light passes through, some light passes through, light changes directions, or light is blocked which can cause shadows).
- **2nd Grade**
 - 2.PS2: Motion and Stability: Forces and Interactions
 - 1) Analyze the push or the pull that occurs when objects collide or are connected.
 - 2) Plan and carry out an investigation to demonstrate how pushing and/or pulling an object affects the motion of the object within a system.
 - 2.PS3: Energy
 - 1) Demonstrate how a stronger push or pull makes things go faster and how faster speeds during a collision can cause a bigger change in the shape of the colliding objects.
- **3rd Grade**
 - 3.PS1: Matter and Its Interactions
 - 1) Develop a model of solids, liquids, and gasses to describe that each state of matter is made of particles too small to be seen.
 - 3.PS2: Motion and Stability: Forces and Interactions
 - 1) Explain cause and effect relationships of forces that cannot be seen including interactions between two objects not in contact with each other (i.e., static electricity, magnetism and gravity).
 - 3.PS3: Energy
 - 2) Develop a model to show that energy can be transferred from place to place by electric currents in a system (e.g., open, closed, simple, parallel, series circuits).
- **4th Grade**
 - 4.PS3: Energy
 - 1) Use evidence to explain the cause and effect relationship between the speed of an object and the energy of an object.
 - 3) Describe how stored energy can be converted into another form for practical use in a system.
- **5th Grade**
 - 5.PS1: Matter and Its Interactions
 - 1) Analyze and interpret data from observations and measurements of the physical properties of matter to explain phase changes between a solid, liquid, or gas.
 - 5.PS2: Motion and Stability: Forces and Interactions
 - 4) Explain how forces can create patterns within a system (moving in one direction, shifting back and forth, or moving in cycles), and describe conditions that affect how fast or slowly these patterns occur.



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Earth & Space Sciences

STAR TOUR

Our STAR lab portable planetarium takes students on an exploration of the night sky during the day! Program topics inside the planetarium include the solar system, constellations, day and night cycles, and moon phases. For our planetarium to visit your location, we need an indoor space that is 15ft x 15 ft x 15ft.

Outcomes:

- Student will observe planets and stars in the solar system using observational data to categorize the planets.
- Students will observe planets and stars in the solar system.
- Students will observe day and night patterns and shadows.
- Students will observe how stars and constellations appear to move from the Earth's perspective throughout the seasons.

| Grade | Pick One 30 minute Show Segment (Guided trips are paired with 30 min hands-on activity) | Standard Alignment |
|--------------|--|--|
| Kindergarten | | No fit |
| 1st Grade | <ul style="list-style-type: none"> • Constellations - 30 Min • Day & Night - 30 min | Moderate Fit |
| 2nd Grade | <ul style="list-style-type: none"> • Constellations - 30 Min | Minimal fit |
| 3rd Grade | <ul style="list-style-type: none"> • Planets - 30 min | Strong fit |
| 4th Grade | | No fit |
| 5th Grade | <ul style="list-style-type: none"> • Space and Distance Exploration - 30 Min • Constellations - 30 Min • Day & Night - 30 min • Eclipse - 30 min | Strong Fit Moderate Fit Moderate Fit Moderate Fit |

• Pre-K/K

- N/A

• 1st Grade

- 1.ESS1: Earth's Place in the Universe
 - 1) Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.
 - 2) Observe natural objects in the sky that can be seen from Earth with the naked eye and recognize that a telescope, used as a tool, can provide greater detail of objects in the sky.
 - 3) Make observations to predict patterns between sunrise and sunset, and the change of seasons.

• 2nd Grade

- 2.ESS1: Earth's Place in the Universe
 - 1) Recognize that some of Earth's natural processes are cyclical, while others have a beginning and an end. Some events happen quickly, while others occur slowly over time.

• 3rd Grade

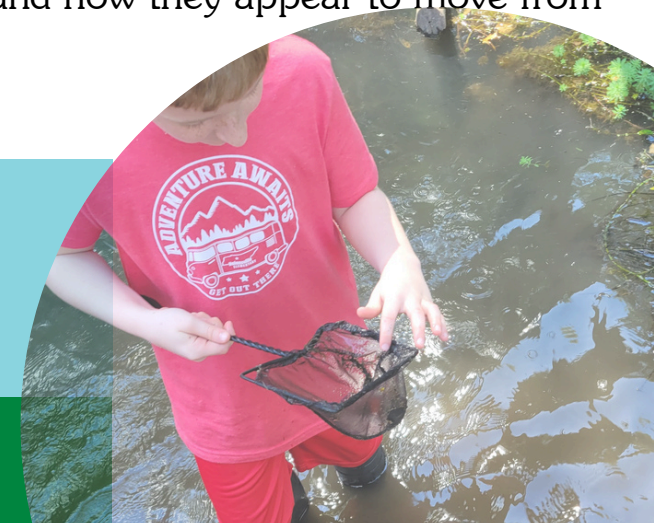
- 3.ESS1: Earth's Place in the Universe
 - 1) Use data to categorize different bodies in our solar system including inner and outer planets, moons, asteroids, comets, and meteoroids according to their physical properties and motion.

• 4th Grade

- N/A

• 5th Grade

- 5.ESS1: Earth's Place in the Universe
 - 1) Explain that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.
 - 2) Research and explain the position of the Earth and the solar system within the Milky Way galaxy, and compare the size and shape of the Milky Way to other galaxies in the universe.
 - 3) Use a model to explain how the orbit of the Earth and sun cause observable patterns: a. day and night; b. changes in length and direction of shadows over a day.
 - 4) Explain the cause and effect relationship between the positions of the sun, earth, and moon and resulting eclipses, tides, and appearance of the moon.
 - 5) Relate the tilt of the Earth's axis, as it revolves around the sun, to the varying intensities of sunlight at different latitudes. Evaluate how this causes changes in day-lengths and seasons.
 - 6) Use tools to describe the position of constellations and how they appear to move from the Earth's perspective throughout the seasons.



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Earth & Space Sciences

WEATHER WHIZZES

Explore the wonders of weather through hands-on demonstrations about warm and cold fronts, thunderstorms, lightning, and tornadoes.

Outcomes:

- Students will explore weather measuring tools.
- Students will discuss storms and their causes.
- Students will observe models of lightning and tornadoes.

• Pre-K/K

- K.ESS2: Earth's Systems
 - 1) Make observations to gather weather data (i.e. precipitation, wind, temperature, cloud cover) using tools (e.g. thermometer, rain gauge).
- K.ESS3: Earth and Human Activity
 - 2) Explain the purpose of weather forecasting to prepare for, and respond to, severe weather in Tennessee.

• 3rd Grade

- 3.ESS2: Earth's Systems
 - 1) Develop a model to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
 - 2) Develop a model to describe the cycling of water through Earth's spheres driven by energy from the sun.

| | Two 30 Minute Stations | Standard Alignment |
|--------------------|---|--------------------|
| Pre K/Kindergarten | Measuring Weather Station Storms Station | Strong Fit |
| 3rd grade | Measuring Weather Station Storms Station | Strong Fit |

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Engineering.

UPPER GRADES ENGINEERING

Each of the upper grades lessons is built around hands-on problem solving. Students practice using the Engineering Design process to solve problems in groups.

BioDiversity (4 - 6) (Guided or Mobile)

Take a look at how macroinvertebrate biodiversity in streams can determine water quality with a small group experiment. Students also discuss and learn about water quality testing through hands-on activities..

Invasive Plant Eradicators (4 - 6) (Guided or Mobile)

Work as a team of environmental engineers to develop a machine to rid a wetland habitat of invasive plants. Students learn about a common invasive plant in the Murfree Spring Wetlands and discuss the impacts invasive plants can have on an environment.

Solar Scientists (4 - 6) (Guided or Mobile)

Perform an experiment to see how the amount or color of light affects how much energy is produced by a solar cell.

Outcomes:

- Students will discuss renewable and non-renewable energy sources.
- Students will design and test different solutions that impact energy transfer.

• 4th Grade

- 4.ESS2: Earth's Systems
- 4.LS2: Ecosystems: Interactions, Energy, and Dynamics
- 4.ETS1: Engineering Design
 - 1) Categorize the effectiveness of design solutions by testing and comparing them to specified criteria and constraints.

• 5th Grade

- 5.LS3: Heredity: Inheritance and Variation of Traits
- 5.ETS1: Engineering Design
 - 1) Plan and carry out tests on one or more elements of a prototype in which variables are controlled and failure points are considered to identify which elements need to be improved. Apply the results of tests to redesign the prototype.
- 5.ETS2: Links Among Engineering, Technology, Science, and Society
 - 1) Use appropriate tools to make measurements and answer testable questions.

• 6th Grade

- 6.LS2: Ecosystems: Interactions, Energy, and Dynamics
- 6.LS4: Biological Change: Unity and Diversity
- 6.ESS3: Earth and Human Activity
- 6.ETS1: Engineering Design
 - 1) Design, evaluate, and improve a possible solution for maintaining biodiversity of ecosystems.
 - 2) Design, construct, and test a device that either minimizes or maximizes thermal energy transfer by combining solutions or parts of solutions to solve a problem that can be communicated and explained to others.

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Engineering.

ECO ENGINEERS

Energize your students with this exploration of engineering. Using a variety of materials and their knowledge, students will build their own relocation containers to help rescue a beaver in the wetlands. As students iterate through this design challenge, they gain first-hand experience in the design process.

Outcomes:

- Students will be able to design and build a device that uses different types of mechanisms to capture an animal.
- Students will be able to explain design considerations.
- Students will be able to utilize the three step design process to meet a real-world problem that includes specified criteria and constraints.

| Grade | Station | Standard Alignment |
|-----------|-------------------------------|--------------------|
| 2nd Grade | • 55 minute Engineering Build | Moderate fit |
| 3rd Grade | • 55 minute Engineering Build | Strong fit |
| 4th Grade | • 55 minute Engineering Build | Strong fit |
| 5th Grade | • 55 minute Engineering Build | Moderate Fit |
| 6th Grade | • 55 minute Engineering Build | Moderate Fit |

• 2nd Grade

- 2.ETS1: Engineering Design
 - 1) Apply an engineering design approach to identify and solve practical problems.
 - 3) Compare and contrast solutions to a design problem by using evidence to point out strengths and weaknesses of the design.

• 3rd Grade

- 3.ETS1: Engineering Design
 - 1) Design a solution to a real-world problem that includes specified criteria and constraints.
 - 2) Apply evidence or research to support a design solution.

• 4th Grade

- 4.ETS1: Engineering Design
 - 1) Categorize the effectiveness of design solutions by testing and comparing them to specified criteria and constraints.

• 5th Grade

- 5.ETS1: Engineering Design
 - 1) Plan and carry out tests on one or more elements of a prototype in which variables are controlled and failure points are considered to identify which elements need to be improved. Apply the results of tests to redesign the prototype.

• 6th Grade

- 6.ETS1: Engineering Design
 - 1) Design, evaluate, and improve a possible solution for maintaining biodiversity of ecosystems.

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Engineering.

ENGINEERING WITH THE 3 LITTLE PIGS

We meld literacy and engineering by studying some iconic characters. Students engage in the engineering design process and practice failing and retrying by building a house with commonly found materials and attempting to blow it down.

Outcomes:

- Students will engage in scientific inquiry through the process of asking questions, investigating, and constructing explanations.
- Students will solve a problem using the three-step design process.

| Grade | Station | Standard Alignment |
|-----------------------|---|--------------------|
| PreK (3 years and Up) | <ul style="list-style-type: none"> • 30 minute Engineering Build | Strong Fit |
| Kindergarten | <ul style="list-style-type: none"> • 55 minute Engineering Build | Strong fit |
| 1st Grade | <ul style="list-style-type: none"> • 55 minute Engineering Build | Moderate fit |

• PreK (3 Years and Up)

- K.PS1: Matter and Its Interactions
 - PK.PS1.01a. Describe and categorize objects based on their observable properties.
 - PK.PS1.01d. Observe, predict, and describe how objects can be combined, stacked, or arranged to create a new object.
- K.PS1.ETS1: Engineering Design
 - PK.PETS1.01c. Make predictions based on observations and prior explorations.

• Kindergarten

- K.PS1: Matter and Its Interactions
 - 1) Plan and conduct an investigation using patterns to classify different kinds of materials by their observable properties (i.e. absorbency, color, texture, hardness, and flexibility), by their uses, and by whether they occur naturally or are manufactured.
- K.ETS1: Engineering Design
 - 1) Apply an engineering design approach to identify and solve practical problems.

• 1st Grade

- 1.ETS1: Engineering Design
 - 1) Apply an engineering design approach to identify and solve practical problems.
 - 2) Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved.
 - 3) Develop a simple sketch, drawing, or physical model that communicates solutions to others.

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Computer Science

COMPUTATIONAL THINKING

Students learn the basics of computational thinking through an unplugged computer science activity and progress to programming BeeBots to collect pollen.

Outcomes:

- Students will be able to break down a bigger coding challenge into small parts.
- Students will be able to work collaboratively to create an algorithm for their part.

| Grade | Station | Standard Alignment |
|---------------------|---|--------------------|
| PreK & Kindergarten | <ul style="list-style-type: none"> • 30 minute | Minimal Fit |
| 1st Grade | <ul style="list-style-type: none"> • 55 minute | Moderate fit |
| 2nd Grade | <ul style="list-style-type: none"> • 55 minute | Moderate fit |
| 3rd Grade | <ul style="list-style-type: none"> • 55 minute | Strong Fit |
| 4th Grade | <ul style="list-style-type: none"> • 55 minute | Minimal Fit |
| 5th Grade | <ul style="list-style-type: none"> • 55 minute | Minimal Fit |

• Kindergarten

- CS.K.AT.1 - Construct sequential events step-by-step in a logical order.
- CS.K.FC.2 - Ask questions to conduct investigations, solve problems and test solutions

• 1st Grade

- CS.1.AT.1 - Identify and revise problem-solving strategies to solve a simple problem
- CS.1.AT.2 - Classify & Sort information into logical order with or without a computer

• 2nd Grade

- CS.2.AT.1 - Plan and create a design document to illustrate thoughts, ideas, and stories in a sequential (step-by-step) manner (e.g., story map, storyboard, sequential graphic organizer)
- CS.2.AT.2 - Compare and evaluate multiple ways to get a solution

• 3rd Grade

- CS.3.AT.2 - Create an algorithm to solve a problem as a collaborative team.
- CS.3.PC.1 - Analyze a given list of sub-problems while addressing a larger problem.
- CS.3.PC.2 - Define a problem or task, decompose it into smaller sub-problems.
- 3.NBT.A.2 - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

• 4th & 5th Grade

- Students in these grades can still practice computational thinking. The grade level standards focus on block or text coding which teachers can tackle after this introduction.



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