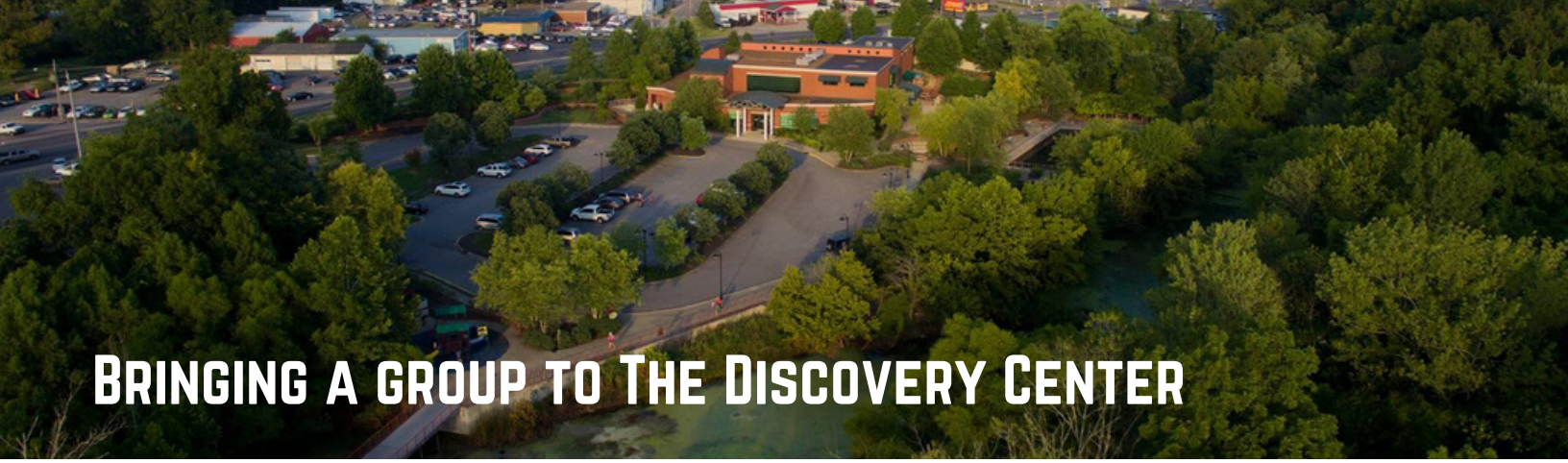
2023-2024 Discovery Center
Educator's Guide

www.**explorethedc**.org | (615) 890-2300



Bringing a group to The Discovery Center

Discovery Center provides fun and effective, informal learning experiences that reinforce classroom learning. Located adjacent to 20 acres of spectacular wetlands, Discovery Center is full of exciting exhibits and wildlife to explore – both inside and out.

Most programs include a 60-minute field study plus Discovery Center exploration. The specific field study content is based on the grade level attending.

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

Start your reservation at
www.explorethedc.org/fieldtrips
or call us at (615) 890-2300 ext 246.

A Discovery Center staff member will call or email you to complete your reservation.

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

Rules of Play

Please review with students before arrival

- Always use your walking feet.
- Return exhibit items to their home.
- School groups are not allowed in Tiny Town. This area is for children under the age of 5.
- 1 person at a time going down the slide, always go feet first, on your back pockets.
- Say “All Clear” at the bottom of the slide.
- Be courteous to other visitors around you.
- You may not go out a door leading to the outside without an adult with you.
- There are bathrooms and a water fountain on both floors.

Field Study Descriptions and Grade Levels

**indicates the field study can be a mobile field trip*

Animals All Around (PK-5)*

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

Wetland Wonders (PK-5)

Offered April - October

- Explore the urban wetlands that unique plants and animals call home. Weather permitting, students put on boots to wade in Murfree Spring, use a net to catch and release tadpoles, and have an up-close encounter with our wetlands animals.

Dissection Labs (2-5)

- Explore the parts of the body and functions of organs through hands-on investigations and dissections of real frogs or owl pellets.

Eco Engineers (3-5)*

- 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.

Science Sampler (K-5)* ***New in 2023!***

- Be prepared to be wowed by our science a la carte offerings. You get to choose two physical science experiences tailored to your grade level. Experiences include states of matter, magnets, circuits, forces, and sound and light waves.

Star Lab (K-5)* ***New Planetarium Technology in 2023!***

- Our STARLAB portable planetarium takes students on an exploration of the night sky during the day! Program topics inside the planetarium include the solar system, star fields, constellations, night and day cycles, and moon phases. Outside the planetarium, students experiment with forces by launching rockets.




Animals All Around (60-minutes)

Outcomes:

- Students analyze internal and external structures that function to support survival along with how the animals adapt to their environment.
- Students develop an understanding of how plants, animals, and nonliving things in an ecosystem interact with each other.
- Students interact with animals and learn about mammals, birds, reptiles, and amphibians.
- Students learn life cycles and classifications of animals and adaptations for survival.

Mammals and Birds

- Introduce terminology.
- Discuss birds and bird characteristics.
- Introduction to Pemberton (great horned owl) and show feathers.
- Discuss mammal characteristics, diets, and adaptations.
- Introduction to mammal animals.

Reptiles and Amphibians

- Introduce terminology.
- Discuss amphibians and amphibian characteristics and adaptations.
- Introduction to the frog.
- Discuss the metamorphic life cycle.
- Discuss reptiles and reptile characteristics and adaptations.
- Introduction to the turtles.
- Discuss turtle characteristics and adaptations.
- Introduction to the snakes
- Discuss snake characteristics and adaptations.

Vocabulary

Depend, habitat, infer, observation, offspring, similarities, differences, adaptation, mammal, reptile, amphibian, producer, herbivore, carnivore, food chain, food web, biome, lifecycle, ecosystem

Standards

K.KS:1 From molecules to organisms: structures and processes
K.LS3.1: Heredity: inheritance and variation of traits
K.ESS3: Earth and human activity
K.ETS2: Links among engineering, technology, science, and society.

1.LS1: From molecules to organisms: structures and processes
1.LS2: Ecosystems: interactions, energy, & dynamics
1.ETS1: Links among engineering, technology, science, and society.

2.LS1: From Molecules to Organisms: Structures and Processes 28
2.LS2: Ecosystems: Interactions, Energy, and Dynamics
2.LS3: Heredity: Inheritance and Variation of Traits

3.LS4: Biological Change: Unity and Diversity
4.LS2: Ecosystems: Interactions, Energy, and Dynamics

5LS1: From molecules to organisms: structures and processes
5LS3: Heredity: inheritance and variation of traits
5LS4: Biological change: unity and diversity

Wetland Wonders (60-minutes)

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 to support survival along with how they adapt to their environment

Wetland Animals

- Discuss the types of animals that live in wetland habitats.
- Intro to frogs and their characteristics.
- Intro to slider turtles and their characteristics.
- Intro to box turtles and their characteristics. (compare and contrast to slider turtle)
- Intro to snakes and their characteristics.

Catch and Release

- Discuss how the spring is related to the wetlands.
- Set expectations for students on what they can catch.
- Set expectations for how students will use the tools and how to handle their catch.
- Review the specimens caught by the class and release them back into the spring.

Boots and Wading

- Explain facts about Murfree Spring Wetlands.
- Have students and chaperones swap their shoes for rubber boots (provided).
- Set expectations for going in the spring and how to explore the rocks, sticks, etc.
- Return to shoes and have students share/reflect on what they found in the spring.

Vocabulary

Mammal, amphibian, reptile, internal, external, adaptation, inheritance, traits, ecosystems, species, biomes, invasive, native, producers, herbivores, carnivores, omnivores, decomposers, food chain, food web, ecosystem, native, invasive, hydra/hydri/hydro

Standards

K.KS1 From molecules to organisms: structures and processes
K.LS3.1 Heredity: inheritance and variation of traits
K.ESS3 Earth and human activity
K.ETS2 Links among engineering, technology, science, and society.

1.LS1: From molecules to organisms: structures and processes
1.LS2: Ecosystems: interactions, energy, & dynamics
1ETS1: Links among engineering, technology, science, and society.

2.LS1.1 Use evidence and observations to explain how 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.LS1.2 Obtain and communicate information to classify animals (vertebrates-mammals, birds, amphibians, reptiles, fish, invertebrates-insects) based on their physical characteristics.
2.LS2.2 Predict what happens to animals when the environment changes (temperature, cutting down trees, pollution, salinity, drought, land preservation).

3.LS4: Biological Change: Unity and Diversity

4.LS2: Ecosystems: Interactions, Energy, and Dynamics.

5LS1: From molecules to organisms: structures and processes 5LS3: Heredity: inheritance and variation of traits
5LS4: Biological change: unity and diversity

Dissection Labs (60-minutes)

Outcome:

- Students will analyze internal and external structures that function to support survival along with how they adapt to their 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 food chain.
- Students will explore anatomy, paying close attention to the internal and external structures that support survival, growth, behavior, and reproduction.

Introduction

- What is a dissection? Why/how do scientists use dissections to learn about living things?
- Go over PPE (personal protective equipment) and disperse.

Frog

- Discuss internal versus external anatomy.
- Students use a probe and tweezers to make observations on external structures using the dissection map as a guide. Discuss observations.
- Guide students on making the cuts with dissection scissors for the mouth. Discuss observations.
- Guide students on making the cuts with dissection scissors on the stomach to access internal structures.
- Students use a probe and tweezers to make observations on the internal structures using the dissection map as a guide. Discuss observations.
- Encourage students to pick an organ or two and come to the Microscopes to see more. Discuss how to use microscopes and what they observe.

Owl Pellets

- Discuss what an owl pellet is and why owls produce them.
- Discuss how biologists use them in habitat evaluation.
- Have students make predictions about what they may find in the pellets.
- Students explore the pellets matching the bones they find with the dissection map to identify what the owl ate.
- Reflect on what everyone's owl ate and discuss.

Vocabulary

Predator, prey, cross-section, thriving, endangered, internal, external, survival, reproduction, carnivore, herbivore, ecosystem, physical adaptations, specimen-specific vocabulary

Standards

2.LS1: From Molecules to Organisms: Structures and Processes
2.LS2: Ecosystems: Interactions, Energy, and Dynamics
2.LS3: Heredity: Inheritance and Variation of Traits

3.LS1: From Molecules to Organisms: Structures and Processes

4.LS2: Ecosystems: Interactions, Energy, and Dynamics

5LS1: From molecules to organisms: structures and processes
5LS3: Heredity: inheritance and variation of traits
5LS4: Biological change: unity and diversity

Eco Engineers (60-minutes)

Outcomes:

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

Introduction

- Introducing animal traps: Show videos and different types of traps and ask questions to get them to think about the design of the trap. How do trap designs differ? How are they similar? What do you need to know about the animal? Does the shape, behavior, & movement of the animal play a role in the design of the trap?

Engineering design process

- Engage students in thinking about engineering by providing a problem to be solved and progress through the engineer design process.
- Review Design Engineering Process with worksheet

Critter Capture Challenge

(working in groups of 4-6)

- Introduce challenge and constraints: Beaver figurine for size, stay connected to an anchor, does not harm the animal, keeps animal inside a container
- Draw a prototype
- Build prototype
- Test
- Share
- Ensure time to Revise

Vocabulary

Engineer design process, prototype, mechanism, habitat, relocation, traps, beaver

Standards

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

4.ETS1: Engineering Design
4.ETS2: Links Among Engineering, Technology, Science, and Society

5.ETS1: Engineering Design

Science Sampler (60-minutes)

Outcome:

- Students will understand matter can exist in different states and have 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 understand cause and effect between vibrating materials and sound.
- 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.

States of Matter

- Understand and build prior knowledge of solids, liquids, and gasses.
- The whole group guided discussion focusing on the properties of matter.
- Demonstrate heating and cooling with energy transfer using Liquid Nitrogen Demonstration.

Lights

- Understand and build prior knowledge around light.
- Discuss the properties of light (colors, how it moves, refraction, reflection, opaque, transparent, translucent)
- Hands-on demonstration properties with the help of the students.

Circuits:

- Understand and build prior knowledge of energy and its forms.
- Through guided discussion develop an understanding of how energy moves through. This includes conduction, circuits, and their components.
- Demonstrate circuits with Energy sticks.
- Experiment with creating circuits and conductivity with hands-on exploration.

Magnets

- Understand and build prior knowledge about magnets.
- Guided discussion on the properties of magnets focusing on their ability to attract and repel with polar ends.
- Students explore with magnets and magnetic forces through hands-on experimentation.

Forces

- Understand and build prior knowledge on forces, trajectory, potential, kinetic, and collision.
- In groups of 4-5, students use available materials to build the strongest tower possible to keep their figures safe.
- Instructor tests designs by launching projectiles toward the towers and discussing potential/kinetic energy transfer, trajectory, & collision concepts.
- Students make observations and share their findings.
- Rebuild followed by a retest.

Science Sampler (continued)

Vocabulary
Force, motion, matter, atoms, solid, liquid gas, trajectory, chemical, physical, opaque, transparent, translucent,reflective, gravity, friction, collision, circuit, light wave, sound wave, potential, kinetic, polar, pull, push

Standards
K.PS1: Matter and its interactions

1.PS4: Waves and their application in technology for information transfer

2PS2: Motion and stability: Forces and interactions.2.PS3: Energy

3.PS1: Matter and its interactions
3.PS2: Motion and stability: Forces and interactions
3.PS3: Energy

4.PS3: Energy
4.PS4: Waves and their applications in technologies for information transfer

5.PS1 Matter and its interactions
5.PS2: Motion and stability: Forces and interactions

STAR LAB (60-MINUTES)

Outcomes:

- Students 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 explore potential energy, kinetic energy, and trajectory.

Planetarium

- Set expectations for how the students will enter the planetarium and sit while inside the dome.
- Planetarium programming for "Night and Day" or "Solar System" is pending for the student grade group.
- Guiding questions create an interactive and personalized programming experience that leads students through sky patterns and planets.
- Set expectations for leaving the planetarium.

Rockets

- Divide classes into groups of 3-5.
- The whole group discusses understanding and building prior knowledge of rockets, propulsion, and energy.
- Explore the engineering design process and rules for rocket build.
- During the launching, discuss potential versus kinetic energy.
- After launch, discuss observations and improvements to the rocket.
- Redesign and test. Make comparisons between launches.

Vocabulary

Atmosphere, solar system, orbit, rotation, force, crystalize, conductor, mixture, physical change, direction, motion, pull, push, force, gravity, speed, weight, collision, friction, eclipse, lunar, lunar cycle, radiant energy, reflection, refraction, mass, potential, kinetic

Standards

K.ESS2 Earth's Systems

1PS3: Energy
1ESS1: Earth's place in the universe

2.PS2: Motion and Stability: Forces and Interactions
2.PS3: Energy

3.ESS1: Earth's Place in the Universe
3.PS1: Matter and Its Interactions

4.PS3: Energy
4.ESS1: Earth's Place in the Universe

5.PS2: Motion and stability: Forces and interactions
5ESS1: Earth's place in the universe

Educator Specials

Gift Shop Discount!

Please visit our Gift Shop. You will receive 10% off all non-food items on the day of your tour!

Teacher Membership Discount!

Bring proof that you are a currently employed K-12 classroom teacher to get 15% off membership for your family for a year.

"Thank you from the most sincerest of places. From the moment we expressed interest to the moment our buses left the center [our experience] was top-notch! I can not tell you how many times my students shared, "This is the best day ever!" or "I love this place!" Teaching is not something we can do on our own. We sincerely appreciate each of you. You have supporters for life!"

College Grove Elementary School

"My students absolutely LOVED this field trip! They were so excited and learned so much from our time today. Their favorite parts were seeing/touching the animals and learning about liquid nitrogen. Our two guides were very knowledgeable and engaging! We will definitely come back again next year!"

Saint Rose Catholic School

“I had so much fun! I pet a corn snake, and learned that snakes smell with their tongue.”
-2nd grader, Haywood Elementary

"Thank ya'll for welcoming our 2nd grade for everything. We are so happy we saw the animals and all of the cool stuff. This is a really big thank you!"
-2nd grader, Springdale Elementary

discovery center

We love to hear from you!

Please submit questions, student writings, or evaluations to:

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