Experience Guide

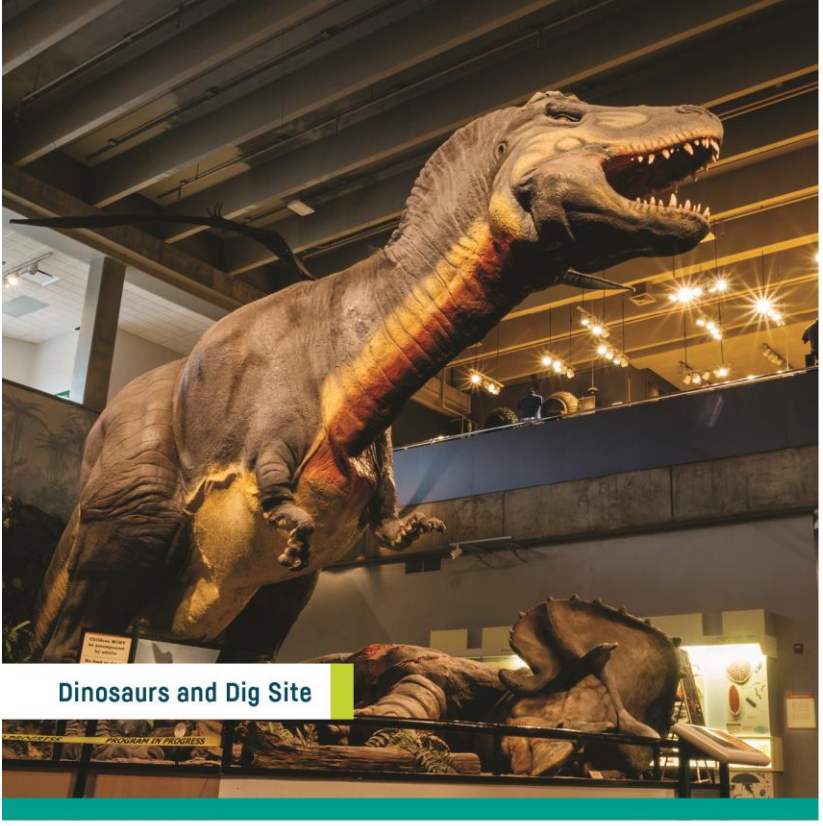
Grade: 4

To support meaningful engagement with museum content, we have developed grade-specific experience guides aligned with NGSS standards. These guides are designed to help students and chaperones explore exhibitions more deeply and purposefully.

Each guide is organized by gallery content and can be tailored to your needs. Before your visit, you may print the guides at your school, selecting specific sections based on your learning objectives. This flexibility allows you to focus on topics or exhibits that best align with your curriculum goals.

Use these guides to lead your students through exhibitions with engaging conversation starters and hands-on activities, creating a focused and enriching museum experience.

SAINT LOUIS
SCIENCE CENTER



Dinosaurs and Dig Site

Earth Sciences

Experience Energy

LOWER LEVEL

- Dinosaurs and Dig Site
- Earth Sciences
- Paleo Lab
- Experience Energy
- Energy Stage
- T.rex Room
- Dino Den (Esports)
- May Hall

Earth Sciences

T-Rex Exhibit

Activity 1: Dinosaur Differences

Objective:
Use observation skills to compare T-Rex to other dinosaurs.

Instructions:
Have students look closely at the T-Rex and other dinosaur models. In small groups, ask them to share details they notice such as size, shape, and any unique features.

Discussion:
What do they notice about the T-Rex compared to other dinosaurs? How do they think it moved and behaved?

Standard:
LS1.A – Structure and Function.

Pennsylvanian Diorama

Activity 2: Paleo Plant and Animal Hunt

Objective:
Identify different plants and animals in the diorama, discuss their characteristics and how they adapted to their environment.

Instructions:
In groups, try to find all the plants and animals listed on the placards. Notice characteristics about the animals, such as their size and where they live (in the water, on land, in trees, etc.)

Discussion:
Based on what you see in the diorama what do you think the climate was like in Missouri during the Pennsylvanian? How do these plants and animals in the display compare to those we have today? Do you think any types of modern animals from the Missouri area would have survived in the Pennsylvanian? Do you think any animals from the Pennsylvanian would survive in modern-day Missouri?

Standard:
ESS1.C – The History of Planet Earth; LS1.A – Structure and Function.

Earthquake Simulator

Activity 3: Earthquake Exploration

Objective:
Understand the causes and effects of earthquakes.

Instructions:
Read the placards and learn about nearby earthquakes. Stand on the simulator and experience different sized earthquakes.

Discussion:
What did they feel during the simulation? How do they think earthquakes can change the landscape?

Standard:
ESS2.B – Plate Tectonics and Large-Scale System Interactions.

EXPERIENCE ENERGY

Rollercoaster Exploration

Activity 1: Exploring Gravity

Objective:
Review gravitational force exerted on objects, understand the relationship between speed and energy.

Instructions:
Explore and interact with the rollercoaster exhibit. Partner up with another person and take turns with the rollercoaster on the wall. Experiment with the track, make hills and try to get the cars to make it to the end of the track.

Discussion:
What can you do to affect the speed of the cars? How did you change your track for the cars to make it over hills?

Standard:
PS2.A Forces and Motion; PS2.B – Types of Interactions.

Car Engine Exhibit

Activity 2: Build a Car

Objective:
Observe the difference in electric and combustible engines.

Instructions:
Have students assemble the different cars on the wall.

Discussion:
Tal about the similarities and differences of the two engines. Discuss any of the experiences that the students have had with electric vehicles (busses, scooters, cars).

Standard:
ETS1.A – Defining and Delimiting an Engineering Problem.

Energy Conservation Exhibit

Activity 3: Energy Savers

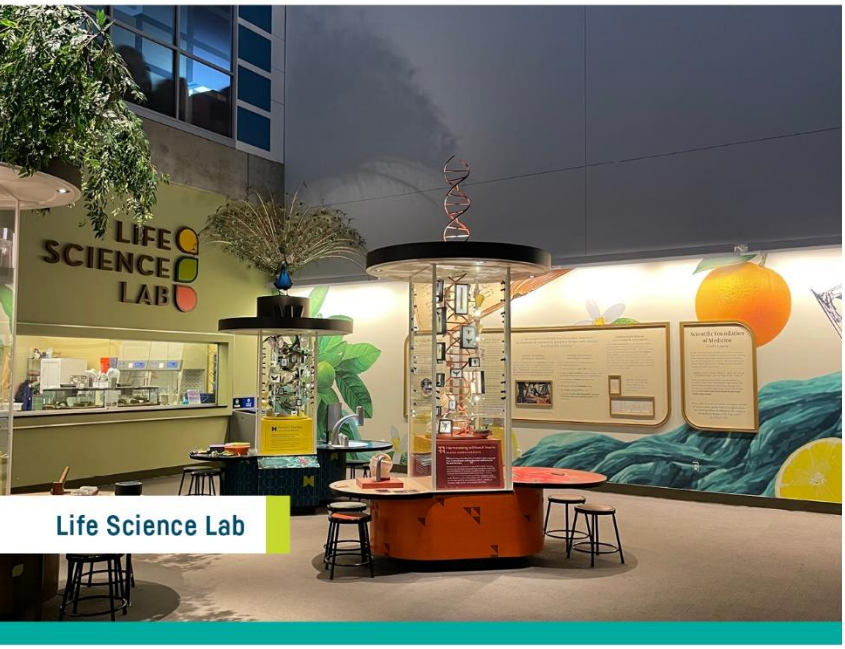
Objective:
Learn ways to conserve energy.

Instructions:
Explore the exhibit on energy conservation and find different ways we can save energy at home and school. Have students list three ways they can conserve energy in their daily lives.

Discussion:
Why is it important to conserve energy? How can saving energy help the environment?

Standard:
PS3.B – Conservation of Energy and Energy Transfer.

GROW



Life Science Lab

GameXPloration

FIRST FLOOR

+ Lobby / Tickets
+ Life Science Lab
+ GameXPloration
+ GROW
+ Boeing Hall

GAMEXPLORATION

Foosball Energy

Activity 1: Foosball and Energy Transfer

Objective:
Describe how energy is transferred between objects when playing foosball.

Instructions:
Find the eight-player Foosball table. Play a game of foosball.

Discussion:
What forces did you observe when playing foosball? How is energy transferred between objects in a foosball game?

Standard:
PS2.B – Types of Interactions.

Interactive Gaming Stations

Activity 2: Play and Learn

Objective:
Experience hands-on learning through interactive digital games.

Instructions:
Spend time at the interactive console stations. Choose a game to play and note how it uses technology to create an interactive experience.

Discussion:
Did you enjoy this game? How does this game use light, sounds, and movement to make it fun to play?

Standard:
PS4.C – Information Technologies and Instrumentation.

The Future of Gaming

Activity 3: Future Game Design

Objective:
Predict future developments in gaming technology.

Instructions:
Think about what games might look like in the future.

Discussion:
What features would you add to a game to make it more fun or educational? How do you think games will change in the next 10 years? What new technology do you think will be used in future games?

Standard:
ETS1.C – Developing Possible Solutions; ETS1.C – Optimizing the Design Solution; PS4.C – Information Technologies and Instrumentation.

LIFE SCIENCE LAB

Historical Medicine and Nature

Activity 1: Discovering Old and New

Objective:

Learn about historical medical practices and compare them with modern techniques inspired by nature.

Instructions:

Explore the display with historical medicines, discuss how these medicines or medical practices are still relevant today.

Discussion:

Can you find an example of a tool that was inspired by an animal? How did people use plants to treat illnesses in the past? Why do you think some of these methods are still used today?

Standard:

LS1.A – Structure and Function.

Nature's Toolbox

Activity 2: How Animals Use Energy

Objective:

Discover how animals use energy from their environment.

Instructions:

Observe the reef aquarium in the Life Science Classroom.

Discussion:

How do the fish interact with their surroundings? How are they getting energy from their environment? Think about how this is similar to how people get energy from their environment.

Standard:

LS1.C – Organization for Matter and Energy Flow in Organisms; PS3.D – Energy in Chemical Processes and Everyday Life

Observing Aquatic Animals

Activity 3: Animal Behaviors and Adaptations

Objective:

Observe and understand the behaviors and adaptations of aquatic animals.

Instructions:

Spend a few minutes observing the axolotls, Western Lesser Siren, and African Clawed Frogs in the display window. Note any interesting behaviors and read about their adaptations.

Discussion:

What behaviors do you notice in these animals? What adaptations do these animals have for their natural environments? How do these adaptations help them survive?

Standard:

LS1.A – Structure and Function.

Outside – GROW Garden Grounds (Seasonal)

Activity 1: Interactions in the Ecosystem

Objective:
Understand the role of pollinators in the ecosystem.

Instructions:
Observe the plants and insects in the area.

Discussion:
Why are pollinators important for plants? How do plants and pollinators help each other?

Standard:
LS2.B – Cycles of Matter and Energy Transfer in Ecosystems.

Outside – Bioswales and Rain Gardens

Activity 2: Water Cycling

Objective:
Find water runoff and conservation solutions for their neighborhoods and schools.

Instructions:
Locate the bioswales and rain gardens that are around the north side of the Pavilion.

Discussion:
How do you think a rain garden helps both plants and our sewer systems? What is one thing you could do at your home or school to increase biodiversity?

Standard:
LS2.C – Ecosystem Dynamics, Functioning, and Resilience; ETS1.B – Developing Possible Solutions.

Pavilion – Hydroponics Display

Activity 3: Understanding the Needs of Living Things

Objective:
Learn how plants can grow without soil.

Instructions:
Observe the hydroponics display and identify resources provided to the plants.

Discussion:
What are the essential needs of plants to survive? How do these needs compare to the needs of humans?

Standard:
LS1.C – Organization for Matter and Energy Flow in Organisms.

Pavilion – Interactive Displays

Activity 4: Interactive Learning

Objective:

Learn about the science behind food production.

Instructions:

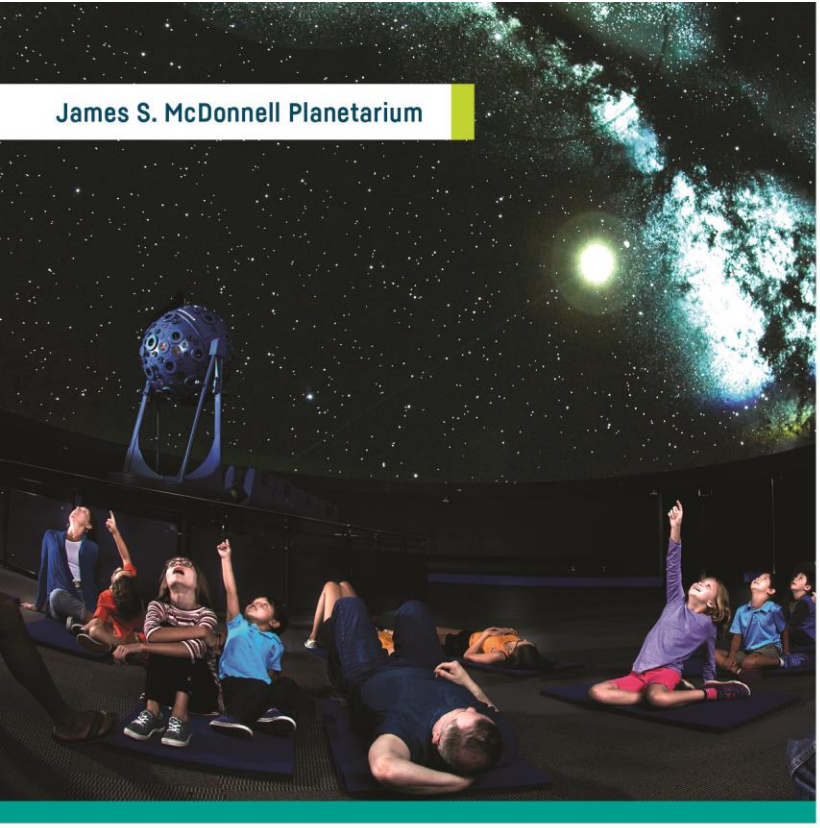
Engage with digital activities that show the journey of food from farm to table.

Discussion:

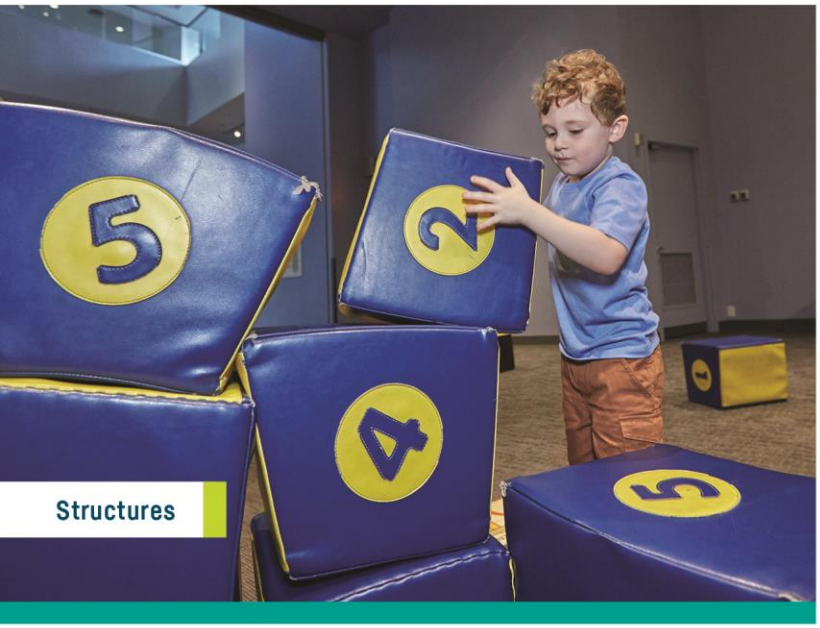
What steps are involved in growing and preparing food? How can technology help improve agriculture?

Standard:

ETS1.A – Defining and Delimiting Engineering Problems.



James S. McDonnell Planetarium



Structures

Makerspace

SECOND FLOOR

+ OMNIMAX® Theater
+ McDonnell Planetarium
+ Structures
+ Experience Flight
+ Current Curiosities
+ Makerspace
+ Discovery Room

MAKERSPACE

Parachute Experiment

Activity 1: Experiment with Parachutes

Objective:

Understand how different weights and parachute designs affect flight.

Instructions:

Provide students with materials to create their own parachutes. Encourage them to experiment with different weights and designs to see which one stays in the air the longest.

Discussion:

Which parachute design worked best and why? How did the weight affect the flight? What changes would they make to improve their design?

Standard:

PS2.A – Forces and Motion.

Riga-Ma-Jig Exhibit™

Activity 2: Build a Structure

Objective:

Develop problem-solving and engineering skills by constructing a stable structure.

Instructions:

Give students a challenge to build a structure that can support a certain weight using the Riga-Ma-Jig materials. Provide a variety of connectors and beams for them to use.

Discussion:

What strategies did they use to make their structure stable? What challenges did they face, and how did they overcome them? How can they improve their design?

Standard:

ETS1.A – Defining and Delimiting Engineering Problems.

Air Ball Exhibit

Activity 3: Bernoulli's Principle in Action

Objective:

Explore the principles of air pressure and flight.

Instructions:

Let students experiment with the blower tubes to keep the balls suspended in the air. Challenge them to move the balls through the hoops without touching them.

Discussion:

How does the air pressure keep the balls in the air? What happens when they change the position of the blower tubes? How can they improve their aim to get the balls through the hoops?

Standard:

PS3.B – Conservation of Energy and Energy Transfer.

Keva Gallery

Activity 1: Dream It, Build It

Objective:

Develop problem-solving and engineering skills by constructing a stable structure.

Instructions:

Divide into small groups around the tables in the gallery. See which group can build the biggest pyramid in two minutes.

Discussion:

What was challenging about this activity? How did you make your structure stable? Do you think you could make a taller tower if you had more time?

Standard:

ETS1.A – Defining and Delimiting Engineering Problems; ETS1.B – Developing Possible Solutions; ETS1.C – Optimizing the Design Solution.

STRUCTURES

Arch Building Exhibit

Activity 1: Build Your Own Arch

Objective:

Understand the stability and strength of arches through hands on construction.

Instructions:

Students will use provided blocks to construct an arch, carefully aligning them to form a self-supporting structure. After building, discuss why the arch holds up even without additional support.

Discussion:

What makes the arch stable? Why do you think this shape is used in architecture? How would the structure change if we removed one of the blocks?

Standard:

PS2.A – Forces and Motion.

Bridges Exhibit

Activity 2: Bridge Challenge

Objective:

Explore different types of bridges and their design principles.

Instructions:

Students will examine different models of bridges (suspension, beam, truss) and attempt to build their own bridges. Students can test the strength of their designs by placing weights on the bridges.

Discussion:

Which type of bridge holds the most weight? How do the different designs affect the strength of the bridge? What forces are acting on the bridges?

Standard:

ETS1.C – Optimizing the Design Solution; PS2.A – Forces and Motion.

Skyscrapers Exhibit

Activity 3: Tall Towers

Objective:

Learn about the forces that affect tall structures and how engineers design skyscrapers to resist these forces.

Instructions:

Students will attempt to build the tallest tower they can using building blocks, while ensuring it remains stable. Encourage them to think about how wind or earthquakes might affect their structure.

Discussion:

What makes a tall structure stable? How would you redesign your tower to make it more stable? What forces could cause a tall structure to fall over?

Standard:

PS2.A – Forces and Motion; PS2.B – Types of Interactions.

"Go with the Flow" and" Drops of Knowledge"

Activity 3: Water systems

Objective:

Discover the complex system used to capture, clean and move water for human use.

Instructions:

Follow the water through a whole cycle.

Discussion:

Water is an important resource that is scarce in some areas of our country. How can we play a role in keeping our water clean and sewers functional? Should you flush these: cotton swabs, tissues, paper towels, dental floss? (No) Only flush: toilet paper, your waste and water. What is one way you can commit to reducing your water use at home or at school?

Standard:

ESS2.A – Earth's Materials and Systems; ESS2.C – The Role of Water in Earth's Surface Processes; ESS3.A – Natural Resources.

JAMES S. MCDONNELL PLANETARIUM

Mission: Mars Base

Activity 1: Exploring the Mars Base

Objective:

Understand the challenges of living and working on Mars and how scientists and engineers design habitats to overcome these challenges.

Instructions:

As a group, explore the Mars Base exhibit. Pay attention to how the habitat is designed to protect astronauts from the harsh environment on Mars. Look at the different stations in the base. What do astronauts need to survive? How do they get food, water, and air?

Discussion:

Why is it difficult to live on Mars compared to Earth? What do you notice about the design of the habitat? How does it help astronauts stay safe and healthy?

Standard:

ESS3.A – Natural Resources and Human Impact.

Rotating Globe

Activity 2: As the World Turns

Objective:

Postulate how scientists use data collected from satellites.

Instructions:

Have students explore the “Earth’s Vital Signs” and “Latest Events” on the Eyes on the Earth interactive monitor.

Discussion:

Did the students see any events they recognized? How do they think we can use the information gathered to make decisions about the health of our planet? How about predicting weather?

Standard:

ESS3.B – Natural Hazards, ESS3.D-Global Climate Change.