



## **GOT SCIENCE? GUIDE | ANSWER KEY**

### **Grades K-2**

**Enjoy the adventure! Science City is about finding science wherever we are.**

**TEACHERS/CHAPERONES:** Help the children relate to the familiar sights and sounds in their community such as traffic signs, fire hydrants, street marker signs, parks and friendly people. Remind the children to be good citizens wherever they are by thinking of their safety and being considerate of others.

**NOTE:** The activities and questions in this guide feature concepts and ideas that typically will be within the grasp of kindergarten through second grade children. Encourage children to discover the answers on their own. Please do not leave children unaccompanied at any time. There is no sequence to these activities. Start at any point of special interest. Thank you for helping the children to have an educational and fun time in Science City.

**Please note:** Exhibits are sometimes removed temporarily for repair or refurbishment, or may be in use by other groups, so be prepared to be flexible.

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**Teachers:** *Standards for KS and Strands for MO listed on these pages next to the exhibits are intended for guides to understanding or reinforcing concepts addressed by these suggested standards. Follow-up in your classroom about the students' experiences will further enhance the hands-on learning experienced at Science City.*

**\*The following exhibits are listed in alphabetical order. This is not a recommended flow for exploring the science center. Reference a science center map for assistance.**



## ECHO CAVE

NGSS: LS1

MO Science Strands: 1, 5, 7

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Activity: Walk slowly through Echo Cave making observations of what you see.**

- What do you see or not see that indicates whether or not someone has “lived” in this space?  
A. Indications that someone has used this space as a shelter are: cave paintings, large wooden crate, two smaller wooden boxes, floor worn from use; (answers are found through observation and investigation).
- Name some animals that might live in caves. Bats, insects, mammals such as bears, mountain lions. But these are not true troglaphiles. Troglaphiles are true cave dwellers which have adapted to living their lives in the dark. They can have no eyes or pigmentation (color) to their skin. Some examples are snails that have white shells and very tiny eyes, blind cave fish, Kauai Cave Wolf Spider which is also blind.
- What makes a cave a good home for some animals? In the case of bats, because they hunt at night and sleep during the day, the cave is a peaceful place to rest without interruption. They are safe from predators because they hang up high in the cave out of reach.

**Draw a picture of an animal you think would live in a cave.**



## GIANT LEVER

NGSS: K-PS2-1, K-2-ETS1

MO Science Strands: 2, 7

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Activity: Observe how high the rope is attached to the lever for each team?**

- Do you think this will make a difference for the teams in a Tug-of-War?

**Activity: Group the students into two teams; have a tug of war to see which team can ring the bell.**

- Which team won? Can you explain why?
- Have the teams to switch sides for another tug-of-war. What did you learn?

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### FACT

**The lever is one type of simple machine.**

Can you name two more simple machines? There are a total of 6 altogether. **Pulley, incline plane, wheel and axle, wedge, screw.**



## HELICOPTER

NGSS: K-2-ETS1

MO Science Strands: 2, 7, 8

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Activity: Take turns climbing into the helicopter pretending to be the passenger and the pilot.**

- Name two things, or draw two things, that are different about a helicopter and an airplane. (Notice the Butler Blackhawk bi-plane near the Science City entrance.)
- With a partner: Observe/describe what happens to the propellers on top of the helicopter and its tail when someone pushes the pedals inside the helicopter.
- How are helicopters useful to community workers? **Police can search above the trees and buildings, they allow the traffic reporter for early morning commuters to see traffic jams from above, emergency airlift for a hospital to go around traffic and get to the hospital quickly.**

**Sketch the helicopter. How does the design of the helicopter help it work?**

- How can using helicopters help to solve problems?

## LIGHT ALLEY

NGSS: 2-PS1, 1-PS4

MO Science Strands: 1, 2, 7

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Activity: Play around with creating designs on the Color Wall and shadows on the Shadow Wall.**

- What three colors are the lights aimed at this wall? **Red, Green and Blue**
- Do the shadows make the same colors as the lights?
- What other colors can you make? **White, pink, yellow...**



## MISTER E. HOTEL

NGSS: LS1.D

MO Science Strands: 7

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Activity: Search the Stone blocks on the outside walls of our hotel.**

- What hidden pictures did you find in the blocks of the hotel?

**Activity: Visit the hotel diner and observe someone standing behind the table.**

- What do you notice missing on that person?
- Does this remind you of a magic trick?
- Can you explain why the person appears to have “lost their legs”?

**Activity: Visit the spinning Vases/Faces in the hotel entryway.**

- Have someone start counting when you look at the spinning shapes. Say “Faces!” when you see the shapes look like faces.
- How long did it take you to see the faces?



## MUSIC PARK

NGSS: K-2-ETS1

MO Science Strands: 1, 7, 8

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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#### **Activity: Explore the unusual musical instruments in Music Park.**

- Name three of the different ways to make music in Music Park: **Use the mallet on the xylophone, bounce up and down on the floor keyboard, wave your hand over the sensors on the raised area by the tree, turn on the fan above the trees to blow the wind chimes, speak into the whisper dishes.**
- What instrument does the keyboard on the floor remind you of? **Piano, keyboard, organ.**
- What is the same and different about the sounds you make in Music Park. **Same: all sounds made from vibrations, need to do something to make sounds, different: loud & soft, high & low pitch, different materials used for making sound, direct action (using mallet), indirect action, push button to make air move wind chimes (answers are found through observation and investigation).**

#### **Activity: Place your hand on top of one of the bars on the xylophone while someone pounds on the bottom of that bar.**

- What do you feel? **Vibration**



## NATURE CENTER

NGSS: K-LS1, 1-LS3, 2-LS4

MO Science Strands: 3,7

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

**ADULTS:** *Before entering, remind the children that animals sense danger with sudden noises and unusual activity. Enjoy the animals but do not tap on the glass, nor poke fingers into cages. Use quiet voices to avoid frightening our animals.*

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**Activity:** Select an animal and describe these five things you observe that would help someone recognize this animal, even if they could not see it:

- Does this animal have scales, feather, fur or skin?
- Does it have any legs? If so, how many?
- Does it live on land, in water, or both?
- Where do you think these animals would live in nature?
- What one thing do all the animals need to live? **Water**
- Draw a picture of the animal you chose:

**Grade 2 Activity:** Choose two animals that live in different habitats to observe using the above questions. Create a Venn diagram comparing and contrasting the two animals.



## PREHISTORIC DIG

NGSS: LS1, LS4

MO Science Strands: 1, 4, 5, 7, 8

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

**ADULTS:** Before entering the dig site, please help children put on protective eye goggles and select a small shovel and brush to imitate some tools of paleontologists.

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**Activity: Carefully use your tools to uncover some prehistoric “fossils.”**

- Are fossils living or non-living? **Fossils are non-living.**
- What can you learn from looking at fossils? **You can learn what type of animal lived millions of years ago.**
- What was the environment like in that area? **You can get an idea of what the animal looked like.**
- Draw two different fossils you found:
- Draw a picture of how you think one of the animals might have looked when it was alive.

**Activity: Observe the video playing above the Prehistoric Dig area.**

- Describe one activity you see.
- Draw a picture of one tool you see the scientists using in the video.

**Activity: Look inside the Dino Lab to observe where and how a real paleontologist would work.**

- Name some tools a paleontologist needs to do his/her job in the lab: **Examples of tools: shovel, goggles, brush, high power light, gloves, magnifying glass.**





## SCIENCE ON A SPHERE

Various Science standards depending on content  
CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Visit the kiosk inside the Science on a Sphere exhibit area.** There are a variety of choices that address various Kansas and Missouri education standards. Select a dataset that best fits the grade level curriculum for your group. Take a seat and observe the many facets demonstrated with this technology.

- What dataset did you watch?
- Record one interesting thing that you learned.
- What other topic would you like to learn about at Science on a Sphere at another visit?

## TRAIN OVERLOOK

NGSS: K-2-ETS1  
MO Science Strands: 7, 8  
CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Activity: Notice the parked and moving trains on the tracks.**

- Name some things that a train might be carrying: **Cars, food, coal, manufacturing parts, cattle, people! Anything at all!**
- How many different kinds of train cars can you name that you see on the tracks below?
- What other ways can people, products and animals travel? **Airplane, car, truck, ship.**
- How can trains help us solve problems?



## WATER TABLE MAZE

NGSS: ESS2-3

MO Science Strands: 1, 2, 5, 7, 8

CCS ELA Connections: CCSS.ELA-LITERACY.W.K.8, 1.8, 2.8

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**Activity: Play cooperatively with the blue sliding pieces to cause the water flow to change.**

- Can you cause the flow to go uphill or back toward the beginning point? **Yes, it can be done.** How? **Experiment to discover how!**
- Does a river or stream in nature ever loop around changing directions? **Yes they do. They meander throughout their lifetime, which causes them to change their patterns. They may also have to change directions to move around a natural damn.**
- Do you think rivers could flow in a circle shape? **Rivers need an opening or a place where the water is fed into them. If they flowed in a circle, they wouldn't have an opening and no way for the water to be replenished.**
- Where can we find water on our earth?

**Activity: Try creating one large diagonal channel, then re-arrange to a channel with many zig-zags.**

- Which channel did the water flow through more slowly?

**Activity: Divide the group into two teams. Each team builds a channel on different sides of the Water Maze. Then race similar objects using the teams' channels.**

- Which design allows the object to move more quickly through the channel?
- Which design allows the object to move more smoothly?