Fourth Grade Student Investigation

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ARIZONA SCIENCE CENTER

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Fourth Grade Investigation

The Investigation contains activities on a variety of topics found throughout the Center. Each activity directly supports the Arizona state science standard (listed in the Teacher Guide). Exhibits are also sometimes removed temporarily for repair or refurbishment, or may be in use by other groups, so be prepared to be flexible.

Investigation Activities

Level 1: All About Me in the Steele Foundation Gallery

Beat It!

Our heart is an involuntary muscle that pumps blood so our body can do everything it needs to do. Our heart automatically responds to higher activity levels by beating harder and faster.

Where to go
Heart Beat Drum

What to do
Place hands on hand pads and follow the directions.

What changes do you observe in the drumbeat after doing jumping jacks?

How Much Can This Bone Bear?

Bones grow and change over time. Load that is put on your bones is called stress. Some parts of your bone feel more stress than others.

Where to go
Load-Bearing Bones

What to do
Observe the replica of a human bone and the cut out of a tree trunk. Focusing on the stress patterns in both specimens, what patterns do you recognize in the plant and animal structures?

_____

_____

Level 2: Get Charged Up! In the Kemper and Ethel Marley Foundation Gallery

Electric Circuits

Electric current is created with electrons move along an electrical path. When the path is connected in a loop it is called a closed circuit. Current is the measure of moving electrons flowing through a circuit. A circuit must be closed in order for the moving electrons to energize or power electrical devices.

Where to go:
Get Charged Up!

What to do:
Choose a circuit board from the rack at the Electric Circuits exhibit. Follow the directions to complete a circuit.

What happens when the circuit is open? _____

Try this: Use a resistor and light bulb to make a circuit. Measure the current using the voltmeter with the red and black probes. Now, add another resistor to the circuit. Measure the current again. Are there any differences? Why or why not? _____
_____

Does It Conduct?

An electrical conductor is a material that allows electrons to flow through it, therefore letting electricity flow easily. Copper is widely used in electrical wiring because of its ability to conduct current easily.

Where to go:
Get Charged Up! Gallery

What to do:
Make a prediction on whether the following materials are electrical conductors:
Steel nails:_____
Rubber bands:_____
Aluminum cans:_____
Smashed Pennies:_____

Now test these materials and compare your results with your predictions.

Level 3: Forces of Nature in the Sybil B. Harrington Galleries

Here Come the Winds of Change – And Other Forces Too

Natural forces such as wind and earthquakes can shape the land we live on.

Where to go
Sculpt With Wind, Shake It Up, and Rift Zone

What to do
Activate the various forces of change in each exhibit.

What changes do you observe?
Which of the forces do we have in Arizona?
Do some forces appear to be more powerful than others? Why or why not?

_____

_____

_____

Desert Water

We may live in a desert, but when the monsoons arrive Arizona can get sudden and very heavy rains! This heavy rain can create different types of river formations in the sand. Can you create and identify some river formations you might have seen in Arizona?

Where to go
Stream Table

What to do
Experiment with the sand and water and see how landforms can affect the flow of water. Now, using the paddles, try to create the following river formations in the sand:

Meander – rounded, S-shaped bend or loop in a river
River fork – a point along a river where a second river branches off from the first
Sandbar – shallow deposit of sand found on the inside of a river bend where the currents are slower.

What to do
Go downstairs to the Many Hands Make a Home Gallery, and look at the aerial photo of the Phoenix Valley. Find the Salt River as it cuts across Phoenix from northeast to southwest (N is up, W is left).

Can you find examples of the 3 river formations in this real river system?

Level 4: Solarville in the APS Solar Gallery

Poop to Power

When organic matter such as poop is broken down, it can be produce methane. Methane is burned in an engine that runs a generator to produce electricity.

Where to go
Poop to Power

What to do
List two sources of biogas:

_____

How many cows would be needed to light **FOUR** 100-watt light bulbs for **24** hours?

_____

House Hunters

Have you ever thought about what materials your house is made from? Here in the desert, there are many different material choices for homes. Can you name a few?

Where to go
Desert Dwellings

What to do
Read the descriptions of the different housing materials.

What material would you prefer to have your house built from? Why?

_____

_____

Renewable Energy

Every day we rely on various sources of energy to heat and cool our homes, run our cars, wash our clothes, cook our food, turn on lights and make the products we use. Without energy we wouldn't be able to watch TV or talk on the phone. Over the years our scientists have discovered many ways to generate the energy we need to live comfortably. Some of this energy is from non-renewable sources; once it is used up, we can't get any more. Other energy comes from renewable sources such as the sun.

Where to go

Renewable Energy

What to do

Read the panel on renewable energy.

Which two renewable energy sources does the United States lead?

_____

How is geothermal energy produced?

_____

What produces most of the world's energy?

_____