

# F4 FOCUSED FIELD TRIPS

**PLEASE NOTE:** Parts of Level 1 are currently under renovation while we prepare your next scientific adventure! For up-to-date construction information, please visit [azscience.org/construction\\_updates](http://azscience.org/construction_updates).

## Fourth Grade Student Investigation

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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 - opens Sept. 26 to members and Sept. 27 to the public! The W.O.N.D.E.R. Center – Coming Soon!**

Find out just what makes you, YOU!

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**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! (Level 2)

#### 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? \_\_\_\_\_

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## 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 (level 2)

### What to do:

Make a prediction on whether the following materials are electrical conductors:

Steel nails: \_\_\_\_\_

Rubberband: \_\_\_\_\_

Magnet: \_\_\_\_\_

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?*

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## 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:

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

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## 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?

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## 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?

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How is geothermal energy produced?

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What produces most of the world's energy?

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