



*theHoustonMuseumofnaturalscience*  
**At Sugar Land**

Exhibit Halls  
Knowledge Hunt



Dinosaurs! (1<sup>st</sup> Floor)

Struthiomimus

“Obviously built to travel at high speeds...” Give two characteristics that support this statement.

1.

2.



Dining with a Dinosaur

Observe the large *t-rex* on display. Scientists know that it is a carnivore because its teeth are sharp so they can be used to slice into the meat they are eating. Why do you think an herbivore’s teeth are dull and blunt?



## Geology

### Rock Types

1. What are the three types of rocks and how does each rock form?
2. Earth is a rocky planet, but which rock is abundant on the surface of the moon?
3. What is the name of the rock that is formed when limestone is exposed to intense heat and pressure?



### Sands across Texas

Sand is made up of rocks broken down by water and wind. Which sand sample has petrified wood in it? Where in Texas is this sample found?



### Elements of a Smartphone

Elements make up the world around us. Name three elements found inside a smart phone:



## Salt

Composed of two elements, what is the chemical composition of salt?

Salt has a cubic crystalline structure. What is the mineral name for salt?

Using the screen with the title “How Does My Body Use Salt”, explore the importance of salt in the human body. What is salt used for in our brains?

What are some commercial uses for salt?

What is a salt dome?

### Local Salt Domes

How deep is the Sugar Land Salt Dome? Do we mine salt from this dome, why or why not?



## Chemistry

### Periodic Table

Use the periodic table to answer the following 4 questions.

1. Elements are sorted on the periodic table by the number of protons they have, this is called their atomic number. What is the atomic number of oxygen?
2. What is the atomic symbol, or abbreviation, for gold on the periodic table?
3. Atomic mass is the weight of an atom's protons and neutrons. What is the atomic mass of lead?
4. Potassium is an important part our diet. It is involved in muscle contractions and nerve impulses. It helps to transmit nerve signals throughout the body and helps muscles to contract and relax properly. What food is known for containing this essential element?

### Sweeter than Sweet

What is the chemical composition of Splenda?

### Chemical Energy

What does a calorie measure?

### Lightning Balls

What happens when you touch your finger to one of the balls?



### Wind/Hydro Energy

1. Which state produces the most wind power in the U.S.?

2. What are the limitations of hydroelectric power?

### Solar Energy

What are the three ways solar energy is collected?

### Nuclear Fusion and Fission Energy

What percentage of power in the U.S. comes from nuclear-power facilities?

### Biofuels

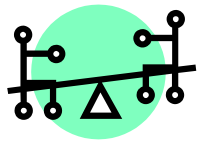
What are some examples of biofuels? Are biofuels renewable resources?

### Coal

What are some of the ways we use coal today?

### Oil and gas

What year was oil discovered in Spindletop, Texas?



### Hand Crank Generator

Chose a set of light bulbs by pressing the “on” button, and then turn the crank to light up the bulbs. Try this for each set of bulbs. Next, read the text panel and explain in your own words why extra bulbs in a set are more difficult to light up.



### First Class Lever (Push down)

Which is easier, when the block is closest or furthest away from the fulcrum? Why?

### Second Class Lever

Which block is harder to lift? In your own words, explain how a second class lever works.



### Levitating Magnets

Why do you think some magnets seem to be “floating”?

### Centripetal Force

Why do the disks move to the middle of the ring when the crank is turned quickly?



### Magnetic Pendulum

Why is the motion of this pendulum called “chaotic”?

### Whisper Dish

What do you think a parabolic shape looks like? Draw it below.



### Spinning Wheels

Spin all three wheels before you read the text panel and answer the following questions.

Which wheel spins the longest?

Why do you think the wheel took so long to stop?

Which wheel is easiest to stop with your hands? Why?

Read the text panel about the spinning wheels. Were your answers above correct? Why or why not?

### Torsional Waves

Define torsional wave.

### Induction Ring

What causes the ring to rise to the top of the iron core?

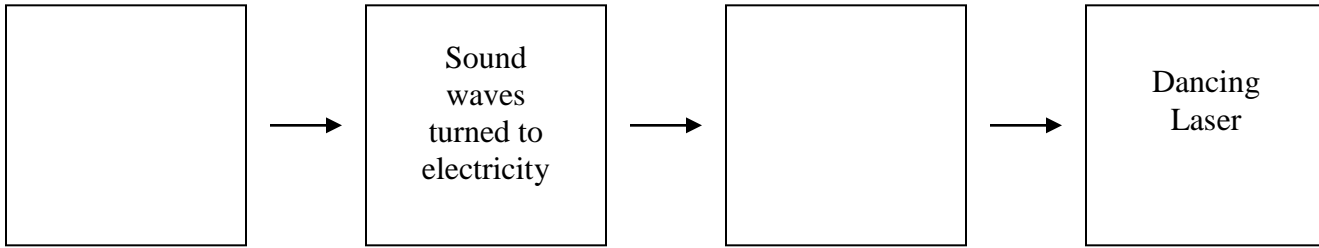


### Disappearing Rods

Why do the rods on the left seem to disappear in the oil?

## Dancing Laser

Fill in the boxes below to label the steps needed to create a dancing laser.



## Hall of Paleontology

### The Hidden Boom

Why do you think soft body fossils are almost impossible to find?

### The “Ocean Tank”

Take a moment to study the text panel next to the “tank” showing the scenes from the ocean floor millions of years ago. The text panel details the various creatures living in the sea at this time. After you have studied the creatures listed move over to the center of the “tank” and view it for two minutes. How many creatures did you see? Pay close attention to creatures appearing from the ocean’s floor.

### Cambrian 542 – 488 MYA (Million Years Ago)

What was the “Cambrian Explosion”?

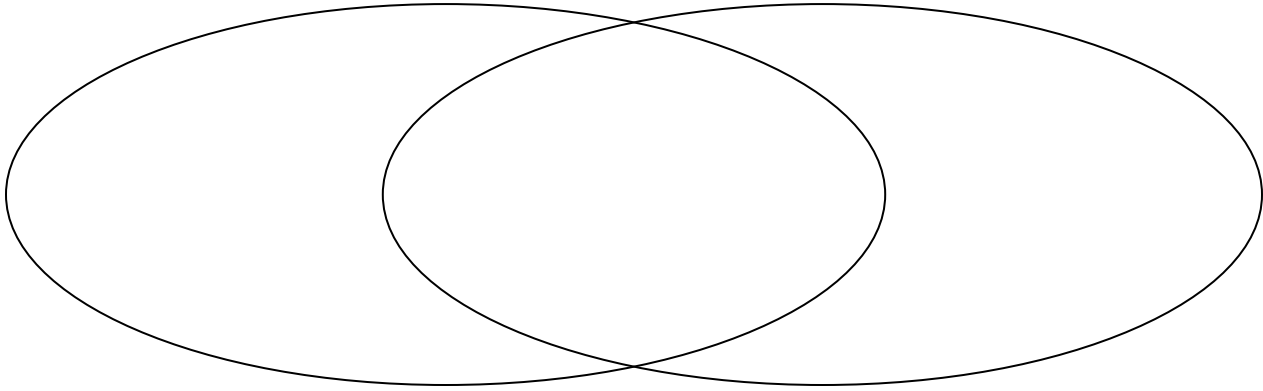
Why were fossils easily preserved during this time period?

### Ordovician 488 – 443 MYA

Look at the various trilobites on display. Make note of where their eyes are located. Why do you think some trilobite eyes adapted over time from looking down to eventually looking out from long stalks?



Using the Venn diagram below, compare and contrast trilobite P1.1689 and trilobite P1.1690.



Choose a trilobite along the back wall to draw below. Be sure to include its eyes.

Silurian 443 – 416 MYA

What type of land fossils appeared in the Silurian period?

Devonian 416 – 359 MYA

What covered the continent during this time period?

What type of fish became more common during the Devonian?

Carboniferous 359 – 299 MYA

Why did insects flourish during the carboniferous period?

How large were cockroaches?

\*Note for older students: If 2.54 cm = 1 inch how big were the cockroaches in inches?

### Permian 299 – 251 MYA

Define: Pangaea –

Look at the Amphibian *Diplocaelus* in the case. Notice his eye socket. What does this tell us about where these animals lived in the ocean?

### Triassic 251 – 200 MYA

In 1947 Edwin Colbert discovered a site containing fossilized bones of thousands of *coelophysis* buried together. What assumption can scientists make about how these animals lived?

Answer the following question based on the text panel quote below:

“Within the large Ghost Ranch sample, in addition to juveniles, two forms have been identified, a large “robust” form and a smaller “gracile” form.”

What do you think this means about how this group of animals lived?

Name two characteristics *coelophysis* shared with modern birds.

### Jurassic 200 – 145 MYA

The *stegosaurus* was not known for its brain size. How did it protect itself?

Why did *stegosaurus* avoid soft squishy landscapes?

### Cretaceous 145 – 65 MYA

Why were duckbilled dinosaurs noisy?

Triceratops

What does *Triceratops* mean?

What were its three horns and massive boney frill used for?

Ankylosaurus

How did *ankylosaurus* solve the problem its need to eat a large amount of plants to survive while protecting itself from meat loving animals such as *T-rex*?

Paleogene 65 – 23 MYA

Eremotherium

List two ways the modern sloth is different from the *eremotherium*.

- 1.
- 2.

Where have scientist found fossils of the giant sloth?

Megalodon

Why do you think we can only find the jaw bone or teeth left by the megalodon?

What type of animal might have been eaten by the megalodon?

Holmesina

Where did the specimen of the *Holmesina* on display come from?

What types of foods did these giant armadillos eat?



## Hall of Space Science

### The Allende Meteorite

How much older is this meteorite than the Earth?

### The First Meteorite Discovered by Ground Penetrating Radar

Look at the meteorite in the case. Estimate how heavy you think it might be. Read the text panel to discover if you guessed correctly. Why do you think it weighs this much?

Who might have observed this meteorite falling to Earth? What evidence leads you to this conclusion?



### Iron Meteorites

What causes this iron meteorites' rounded "thumbprints"?

### Older Than Earth

Where did the meteorite hit the Earth?

What is special about this particular meteorite?

What was the size of the original meteorite?

\*Note: For older students. If the meteorite originally hit the Earth traveling 50,000 kilometers per hour, convert that speed into miles per hour if  $1\text{mi/h} = 1.6\text{ km/h}$ . Please show your work below.



### Touching a Rock from Mars

How did scientists know this rock is from Mars?

On what continent is Zagami, Nigeria?

What fraction of meteorites discovered are from Mars? Express it in its simplest form.



### The Crab Nebula

What emits the blue light at the center of the nebula?



### The Butterfly Nebula

Why can't we see the central star of the Butterfly Nebula?

### The Carina Nebula

What is happening to *Eta Carinae*?

What does each color, listed below, signify in each nebula?

Blue:

Red:

Green:



### The Nearest Stars

1 light year = ~6 trillion miles

How far away are the Alpha Centauri, Sirius, and Vega stars in miles? Use the formula above and show your work.

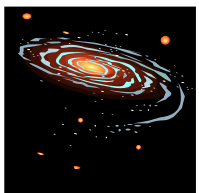
Alpha Centauri:

Sirius:

Vega:

### The Orion Spur

What type of galaxy does the Milky Way belong to?



### The Satellite Galaxies

What is happening to the dwarf galaxies close to the Milky Way?



### The Visible Universe

How do we detect objects at the edge of the visible universe?