

Design your own question from your favorite exhibit not mentioned in the packet. Other students will try to answer your question once this packet is graded.

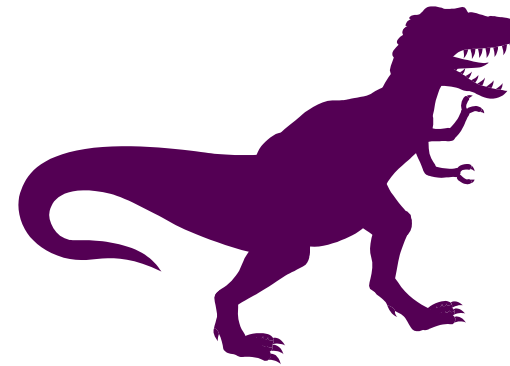
Question:

Answer:

Group Leader _____ Name _____

T-Rex encounter time _____ Teacher _____ Period _____

GEOLOGICAL TIME, MINERALS, SPACE, & T-REX ENCOUNTER



Instructions:

- Work with your group to complete this booklet. Remember, the booklet will be graded.
- Pace yourself so that you can finish the booklet in the amount of time you have.
- Each group goes to the Prehistoric Journey, the Gem and Mineral Show, the T-Rex Encounter, and Space Odyssey in a different order—and the T-Rex Encounter at certain times! Stay with your group ! This will be strictly enforced!
- The Gem and Mineral Show and Space Odyssey are both on the bottom floors, and the T-Rex Encounter and Prehistoric Journey are on the top floors.

TAKE GOOD CARE OF THIS BOOKLET: IT WILL BE COLLECTED AT THE END OF THE TRIP!

Prehistoric Journey) Entrance

Watch The Movie

When and how was the moon formed?

What probably made the scientists realize that the Stromatolite formation was a life form? **Asteroid impact 4.5 billion yrs. Ago!**

First Diorama) Title: *Explosion of Life*

1. How were Anomalocaris mouths shaped?

Round

2. What is the name of the “underwater bugs”?

Trilobites

3. When did the EXPLOSION OF LIFE occur on earth?

500 million yrs ago

4. Move the rock over the Geiger counter. What happens?

Ticking Sound (decay of radioactivity!) Dial moves

5. When did the first complex, multicellular animals evolve?

600 million yrs ago

6. What is the “recipe” for life?

N, H, S, C, O, P

Second Diorama) Title: *Diversity of the Sea*

1. How long ago did this scene take place?

425 Million yrs ago

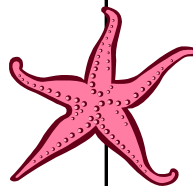
2. Do we have any sedimentary rocks of this age in the Denver metro area? Why or why not?

Yes, Underwater at one time! Or in the Ocean!

3. Study the diorama:

a) Are the “lilies” plants or animals? **Animals**

b) What are the long, pointy, cigar shaped things? **Cephalopods**



T-Rex Encounter

Watch movie in entrance

1) How long ago was the Cretaceous period? **67 million yrs ago**

2) How can scientists tell that Velociraptors had feathers? **Quill knobs**

3) How many Triceratops nests have been found? **NONE**

4) How was it discovered that T-Rex ate Triceratops? **Frills found in Dung of T-Rex**

5) What part of the T-Rex brain was larger than expected? **Olfactory**

6) Why do they think Saurornitholestes may have been scavengers? **Teeth found in carcass of a larger dino**

7) Were T-Rex bones really hollow? **YES!**

8) How were T-Rexes' eye sight different than other dinos? **Front on**

9) Could T-Rex see as well as humans? **13X better!**

10) What is the oldest age for a T-Rex? **28 years old**

11) How do they tell the age of a T-Rex? **Layers in the ribs**

12) What are fenestrae? **Holes in the head bones where muscles attach**

13) What does “CT” stand for? **Computed Tomography**

Minerals Visit the mineral hall and the meteorite exhibit to answer these questions.

Rhoda's Chrosite:

1. What is the name of the giant rhodochrosite crystal?

Alma King

2. What mine did it come from?

Sweet Home

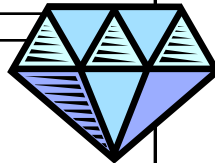
It's the Natives:

1. How many elements occur in nature in a pure state?

20

2. Which were the first metals humans used? **Gold, Silver, Copper**

3. What is the symbol for gold? **Au** for silver? **Ag**



Sulfides:

1. What kind of mineral is magnetite? **Iron Oxide**

Carbonates:

1. What are Carbonates? **C and O**

2. The Malachite and Azurite specimens are mostly from what state? **AZ**

3. How can you make carbonates fizz? **Acids**

Silly Cate:

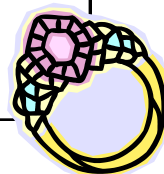
1. Describe the basic building block of a silicate. **SiO₂**

2. How was the giant amethyst formed? **Gas and Lava**

Gems 'R' Us:

1. What is the chemical formula for a diamond? **C or C₈**

2. How are gems different than other minerals? **Reflectivity, Luster, Hardness**



Second Diorama, continued

Continue through this area to answer these questions about LIFE IN PALEOZOIC SEAS

4. a) How long did the sea scorpions (eurypterids) get?

Bathtub size! 3M

- b) What did the sea scorpion's claws do?

Paddling!

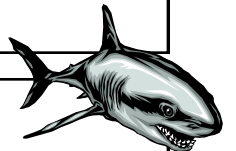
- c) What does "Cephalopod" mean?

Head-Foot

- d) Name the animal that was the the "Terror of the Seas":

Dunkleosteus

- e) Draw the picture of it here:



Third Diorama) Title: Leaving the Water

1. What vital evolutionary step is shown here?

Leaving the water and living on Land!

2. What was the first kind of animal to make its home on land?

Arthropods

3. What are modern-day relatives of the Eurypterids?

Scorpions

Plants changed the world

4. What gas is responsible for making our atmosphere blue?

Ozone, or Oxygen

Extinctions

5. What was the largest extinction in history?

Permian

6. What makes the pteridosperm NOT a true fern?

Reproduced by Seed rather than spore



Fifth Diorama) Title: Time of the Dinosaurs

1. What were the claws covered with?
Keratin (same thing as finger nails and hooves!)
2. What are Scuts?
Bones in the skin
3. How big is the Stegasaur's brain?
Walnut size
4. How does Diplodocus manage to hold up its head with such a long neck?
Hollow vertebrae and a cantilever system with the neck and tail
5. Did Duckbills have teeth?
1,000 small ones behind the bill
6. What are gastroliths?
Stomach Stones
7. What is the KT boundary?
End of Dinosaurs, Tertiary and Cretaceous boundary

Mesozoic Air force and Navy

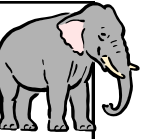
8. What were the flying reptiles called? **Pteronodons, or Pterodactyls**
9. How do Ammonites help us to tell time? **Index Fossils**



Seventh Diorama) Title: Expanding Grasslands

1. What were the dominant predators of the Eocene? **Terror Birds**
2. Look for each of these animal species in the diorama. List a modern relative of each:
 - Dinohyus: **Pig or Boar**
 - Stenomylus: **Deer, Camel, Gazzel, Antelope**
 - Parahippus: **Horse, Zebra, Donkey**
3. Horses:
 - a) How large were the first horses? **Size of a dog**
 - b) Draw a picture of the first horse.

Seventh Diorama Continued) Mammoths & Mastodons:



- a) What modern animals do these resemble? **Rhinos or Elephants**
- b) Did these ever live in Colorado? **Yes**
- c) What evidence do we have that stone age humans hunted these enormous animals? **Spear points found in bones**
- d) What is the difference in Mammoth and Mastodon teeth?
Mastodon ridges are larger, Mammoth have more ridges and smaller
- e) When did modern humans evolve in African? **200,000 yrs ago**

Space Odyssey Exhibit-Downstairs

1. In front of the bathrooms. What are the 2 Mars Rovers called?
Spirit and Opportunity
2. On the wall of the entry way, How far is the Spiral Galaxy NGC3370?
98 million light years away!
3. Watch the movie on the left: What is the new mission to Mars called?
MSL
4. What star is at the end of the handle of the big dipper?
Alkaid
5. Which stellar mass creates a Brown Dwarf?
.07
6. Draw the paths of light for refracting and reflecting telescopes:
7. Spectroscopy exhibit: How is it possible to use light to find out what something is made of? **Burn it and look at Spectral Lines through prism or dif-fraction grating**
8. Touch your hand on the cold plate and look at the IR screen. What color is your hand in relation to the background? **Darker than the rest**

