

**“Trip to the Grand Canyon”
Newcomer Academy
Visualization One**

All words that are **bold-underlined-yellow** will be pre-taught; however, depending on the schedule, some words could be addressed in the middle of the Unit as we move at a pace of 5-8 words per week [explicit instruction]; Jameson frontloads many more words as he goes [implicit instruction]. Non-bolded vocabulary are not science-specific words but rather ordinary words that students may need instruction on.

Chapter	Media	Key Points of Discussion	Notes/Vocabulary
Introduction	Title SOS Movie w/Music Various Pics of Canyon	NA	NA
Planning the Trip	Car (Change to Bus) Fuel Food and Water Money	<p><i><u>Hook/Building & Activating Background Knowledge</u></i></p> <p>What items would one need to travel from Louisville, KY to the Grand Canyon by school bus?</p> <ul style="list-style-type: none"> • Food and Water (to make us go) • Gasoline (to make the bus go) • Money (to pay for food & gasoline) • Map (some may say GPS) <p>How many miles is the distance of the trip? (How far do we need to go to get from KY to AZ? How many miles/kilometers?) 1700 miles (average)</p> <p>How many hours would the trip take? (How many hours will we be traveling?) 28 hours (@ 60 mph)</p> <p>How many gallons of gasoline would be used? (How much gasoline—the food for the bus—will we need?) 57 gallons of gas (@ 30 mpg)</p> <p>How much money is needed for gasoline? \$188.00 (@ \$3.30 per gallon)</p>	<p><u>Distance</u> (how far we need to go from KY to AZ)</p> <p><u>Gasoline</u> (fuel “food” for the bus)</p>
Inference Skills: License Plates	Indiana Kentucky UofL 1970 Kentucky 1977 Kentucky	<p><i><u>This section allows students to use inferences to determine location during a trip.</u></i></p> <p>Introduce various license plates and show where information (state, date, etc) can be found: Kentucky 2012 Indiana 2012 UofL 2012 – Infer that the driver is a University of Louisville fan (UofL is the biggest university of Louisville; it prepares students like you to get a profession such as teacher, scientist, engineer, writer)</p> <p>Use the last two plates to show that dates found on plates can be used to determine age (use later when discussing strata of the Grand Canyon): 2012 Kentucky (How old are you in 2012?)1977 Kentucky (How old were you in 1977? I was ... and</p>	<p><u>License Plate</u> (is the number with letters that identify a car, show the car’s ID—much like your student ID identifies you)</p> <p>Inference (when named the state by looking at the license plate, you made inferences; an inference is a good guess based on what you know and see)</p>

		attended the school) 1970 Kentucky (How old were you in 1970?)	
Orientation	SOS Globe Map of USA Map of Arizona Map of Grand Canyon Map for Trip	<p style="text-align: center;"><i>Find our place on the planet.</i></p> <p>Refer to various continents and have students guide you to their current location (North America). (How many of you are from Africa? From Asia? From Europe? From Latin America? Where are we now?)</p> <p>Outline the USA with a laser pointer and bring up the map of the United States. Have students identify the location of Kentucky and Arizona. (Can anyone show where (a) Louisville, (b) KY, (c) AZ is?)</p> <p>Bring up the map of Arizona. Guide students to the Grand Canyon and display the map of the canyon.</p> <p>Display the "Trip" map. Discuss the 3 available routes and the amount of time, gasoline and money that is needed for each.</p>	<p><u>North America</u> <u>United States</u> <u>Kentucky</u> <u>Arizona</u> <u>Grand Canyon</u></p> <p><u>Highway (road connecting cities, towns; when your bus takes you home it could take you on the highway)</u></p> <p><u>Interstate (connects different states)</u></p>
The Trip	Bus Icon St. Louis Oklahoma City Flagstaff	<p style="text-align: center;"><i>Inference Scenarios (everyday life)</i></p> <p>Using the "Trip" map, take the students on a virtual trip to the Grand Canyon. Along the route there will be two inference scenarios and a panoramic view of the waypoint. Bring up the Bus Icon and use live modification to place it on the picture of Louisville.</p> <p>Alert students that we are beginning our trip. As the trip begins, move the bus towards St. Louis. Display the picture of the storm clouds and have the students infer the situation that they are driving towards. Bring up the license plate for Illinois and have the students determine, which state they are currently located. Fly into the St. Louis panorama and show the students the Arch.</p> <p>Move the bus along the route and stop at Oklahoma City. This is the halfway point of the journey. Display the inference pictures and have the students determine the state and scenario in the picture. (Look at the picture and use your inference skills to tell where we are/what is happening in the picture. How do you know? This is a very good example of inference.) Fly into the panorama of OKC and display the memorial.</p> <p>Continue the trip to Flagstaff, AZ. Display pictures and have students determine scenario and location. (Look at the picture and use your inference skills to tell where we are/what is happening in the picture. How do you know? This is a very good example of inference.) Inform them that we are extremely close to our destination. Fly into the pano for Flagstaff.</p>	<p>Indiana (is a state, like Kentucky)</p> <p>Illinois (is a state, like Kentucky and Illinois)</p> <p>Missouri (another state)</p> <p>Oklahoma (another state)</p> <p>New Mexico (last state that we will need to cross to get to AZ)</p> <p>Strata (layers of rocks)</p>

		<p>Finally, move the bus icon to the Grand Canyon. Pull up visualizations of the canyon. Launch the last panorama. This skymap will be the final pano and will remain up for the rest of the experience. Pan around and discuss the dimensions of the canyon and its strata (below). (Now we have arrived to our destination—Grand Canyon [GC]. Say it with me, “GC.” How big do you think GC is? How do you know? What do you see when you look at GC—when SS say “stripes”, highlight that this is a good observation; in science we call this... “STRATA.” Say it with me, “STRATA.”</p>	
Arrival at Grand Canyon	Fly Through Movie 360 Panoramic	<p><i>Intro to Grand Canyon and its Formation via River</i></p> <p>Dimensions: 277 Miles (443 km) Long 18 Miles (29 km) Wide 6000 Feet (>1 Mile or >1.5 km) Deep</p> <p>Importance of Colorado River: Colorado River and smaller rivers that go into CR (we call those tributaries) cut through the rock to form the canyon.</p> <p>Rocks Range in Age: 200 Million – 2 Billion Years Old Will not find dinosaur fossils in the Grand Canyon, because the rock layers do not fall within the age range – dinosaurs are about 65 million years ago.</p>	<p>Colorado River (show the river; say it with me, “CR”)</p> <p>Million (a very large number; it has... how many zeros? 6)</p> <p>Billion (an even bigger number; it has... how many zeros? 9; a thousand times bigger than a million)</p> <p>Fossil (part [a leaf, skeleton, a footprint] from a plant or animal which lived in ancient times [long long ago] preserved [saved] in some rocks)</p>
Formation of Strata/Layers	Strata Formation Movie Layer Pic (Period, Date, Colors) Rock Sample Stack	<p><i>Strata – oldest on bottom. Sedimentation & Erosion</i></p> <p>Highlight the strata of the Grand Canyon. (What do you see? What colors? What sizes of grains? Where do you think the oldest rocks are? The youngest?)</p> <p>We are about to watch a short movie, as we do, I want to check your prediction about where are the oldest rocks and where are the youngest) Show movie, “Strata Formation”.</p> <p>Oldest rocks on the bottom. Youngest rocks at the top.</p> <p>After movie clip, bring up the Rock Layer Pic and the</p>	<p>Strata</p> <p><u>Oldest/Youngest</u> (How old are you? you?—for the two of you, you are THE OLDEST ; you are the YOUNGEST; Who is the oldest in your class? The youngest?)</p> <p>Layer (how thick [gesture] or thin [gesture] is the</p>

		<p>sample stack visuals.</p> <p>Discuss the layering process (oldest on bottom).</p> <p>Sedimentation, shifting and erosion playing a role in the layers and their current appearance. (After watching the clip, where do you think the oldest rocks are? The youngest? All of them? Why?)</p>	<p>“stripe” of rocks)</p> <p>Formation (a process how something comes to be)</p> <p>Sedimentation (a process in which stones, sand, and other materials are moved to the bottom of a river [or other body of water] and form a solid layer)</p> <p>Shift (move to another place)</p> <p>Erosion (the gradual destruction of something by natural forces (such as water, wind, or ice)</p>
Schist	<p>Layer Pic remains</p> <p>Schist layer and Colorado River</p> <p>Close up of rock samples</p> <p>Stack of cardboard to illustrate the thin flat pieces of the rock</p> <p>Physical rock samples (if available)</p>	<p><i>Oldest rock on bottom = Schist</i></p> <p>Use layer picture and laser pointer to identify the oldest rock layer of the Grand Canyon (1.7 Billion Years Old). Reinforce the oldest rocks are located at the bottom layer.</p> <p>Discuss the composition of the schist rocks—rocks that can be broken into thin, flat pieces (illustrate with pieces of cardboard stacked to be a ‘rock’ and then separate into layers)— and how pressure from the upper layers has started to deform (break down) the minerals.</p> <p>Illustrate ‘pressure’ by pressing the cardboard stack in your hands, and then slip it out and replace with rock sample to illustrate how pressure changed it.</p> <p>If available, have samples of different types of rock present to demonstrate & to possibly pass around.</p>	<p>Schist (rock that can be broken into thin, flat pieces)</p> <p><i>NOTE: Don’t overemphasize rock type names since this type of knowledge is less important</i></p> <p>Pressure (when something presses or pushes against something else)</p>
Tonto Group & Fossil Inference of probable Environment	<p>Layer Pic remains</p> <p>Trilobite Fossil</p> <p>Opabinia Fossil</p> <p>Anomalocaris Fossil</p> <p>Drawing of Cambrian life</p> <p>Cambrian Period Movie</p>	<p><i>Fossils and Cambrian period</i></p> <p>Use the Tonto Group and fossil evidence to infer what the environment was like millions of years ago. Scientists use the fossil evidence and minerals of the rocks to infer what was happening.</p> <p>Cambrian Period 500 Million Years Ago Trilobite (say it with me) Opabinia (say it with me)</p>	<p>Organism (kids know this; ask them to provide examples of organisms they know)</p> <p>Evidence (things that give hints or ideas about what might be true)</p>

		<p>Anomalocaris (say it with me)</p> <p>The environment was located in a huge sea that covered the Grand Canyon. Though we may not know the exact color or diet of each <u>organism</u>, scientists can use evidence to infer (much like you inferred/guessed where we were on our trip looking at the license plates). Do you know what evidence is? Evidence is stuff that gives hints or ideas about what might be true—when you give your teacher your homework, you give him evidence that you thought about it—you have worked at home on the task he gave you; the teacher can infer that you worked at home and that you thought about it—did he see you work at home? Does he know that you thought about it? No, he used your completed work to make an inference.)</p>	Environment (the conditions in which something is living)
Shale	<p>Layer Pic remains</p> <p>Shale Layer Shale Rock Close up</p> <p>Physical sample</p>	<p style="text-align: center;"><u>Conclusion/Elaboration</u></p> <p style="text-align: center;"><i>(as time permits to review a few more layers)</i></p> <p>Continue to reinforce that as we go up, we come across younger and younger rocks.</p>	<u>Shale</u> (a soft kind of rock that splits easily into flat pieces)
Sandstone	<p>Layer Pic remains</p> <p>Sandstone Layer Rock Close ups</p> <p>Physical samples</p>	Evidence is Fossilized Footprints/Tracks	<p><u>Sandstone</u> (a type of soft stone that is made from grains of sand stuck together)</p> <p>Trace Evidence (evidence that isn't a thing but rather a mark or something left behind by the thing. Like a footprint isn't a foot or part of an animal, but rather is left behind by an animal)</p>
Limestone	<p>Layer Pic remains</p> <p>Limestone Layer Rock Close ups</p> <p>Physical samples</p>		<u>Limestone</u> (a type of white stone)