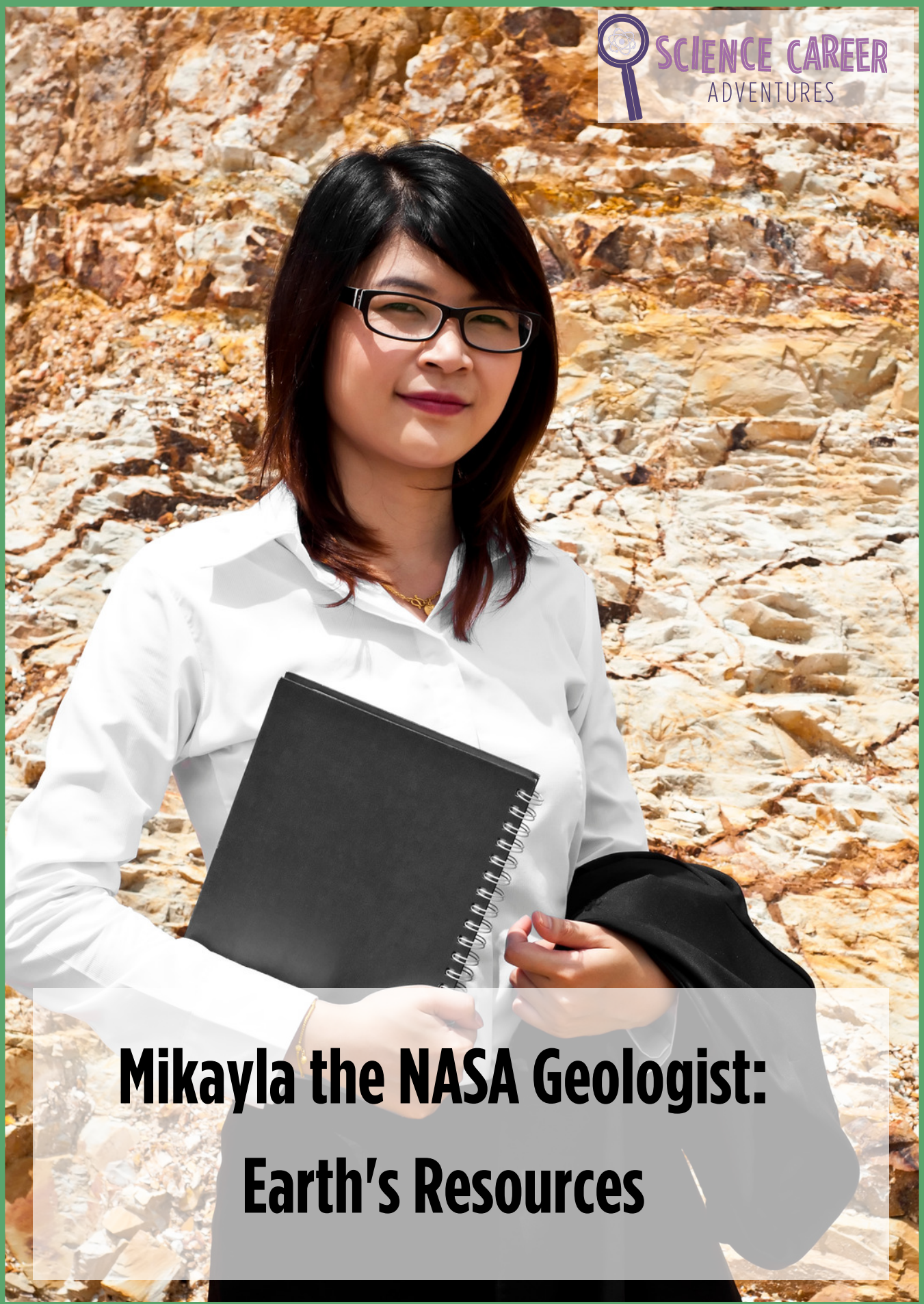


Mikayla the NASA Geologist: Earth's Resources

Who is Dr. Mikayla?

Hi! My name is Mikayla, and I am a geologist. Geologists are scientists who study Earth's history.

To study our planet's history, we look at the Earth's natural resources, like oil, rocks, minerals, and water. We also look at how our planet changes over time because of earthquakes, landslides, and volcanic eruptions.

Right now, I am a geologist at NASA! NASA stands for the National Aeronautics and Space Administration. At NASA, we study the Earth from the International Space Station. The data NASA geologists collect from the space station is shared with scientists around the world.

For example, the space station takes pictures of our planet. Pictures of volcanoes may help scientists around the world study and predict when volcanoes might erupt in the future.

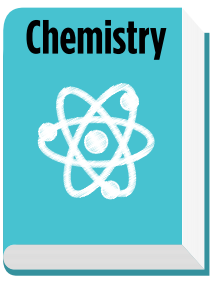
How I Became a NASA Geologist

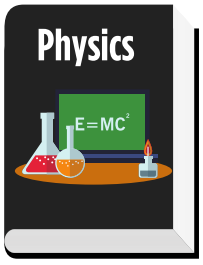
In Middle School:

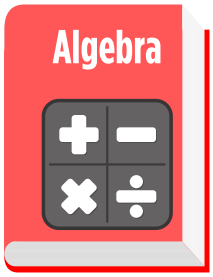
When I was a kid, my family would take me on road trips across the United States. I collected red rocks from the deserts in Utah, volcanic rocks from Washington, smooth river stones from Colorado, soft white sand from Florida, and jagged sparkly rocks from Kentucky. My science teacher in middle school taught me that these rocks were all different because of Earth's history. She said they were natural resources that were important to humans. Some of the rocks contained different metals and minerals that humans could dig out of the ground in order to use, turn into something else, or sell. Since these resources were important to humans, I wanted to grow up to have a job that protected them.

In High School:

In high school, I took a lot of classes in Earth science, chemistry, physics, and math. I also joined a STEM club! One time, we were studying earthquakes and did an experiment to see if we could build buildings that would not collapse if the earth shook.







How I Became a NASA Geologist

In College:

In college, I had to choose a major. A major is a subject, like math or biology, that you want to study in depth. I chose geology as my major so that someday I could be a geologist. I spent the summers doing field research. Field research is when a college student lives and works where scientists study a particular part of the Earth. During college, my field research was in Colorado. I lived and worked with other geology students and scientists. Every day, we would go outside and study the different types of rocks in the Rocky Mountains. Also, my professor helped me get an internship at NASA. An internship is when a college student works alongside a professional, like a NASA geologist, and learns how to do the job from an expert. At my NASA internship, I went to NASA's offices and learned how to use information collected by satellites to make maps.

After College:

When I graduated college, I went back to school to get a Ph.D. in geology. Ph.D stands for “Doctor of Philosophy.” A Ph.D. is the most advanced degree you can get! After you get a Ph.D., you are an expert in a subject. It took a few more years of school, but it was worth it because I am now a NASA geologist!

Technology I Use at Work

iPads

When NASA geologists are outside studying the Earth, they need a way to collect samples of rocks, sand, or other pieces of the ground. For example, if geologists are studying different rock formations in the desert, they need to take pictures of rock samples, measure rock sizes, and classify the types of rocks in the desert. They use iPads to take these pictures and write down notes about what they find.

Satellites

NASA geologists rely on satellites! The satellites take pictures of the Earth. This technology helps NASA geologists make maps of where our planet's natural resources are found and how our planet is changing.

GIS (Geographic Information System) computer programs

Once NASA geologists have the pictures of Earth from the satellites, they input the pictures into their computers and upload them into GIS. Geologists use the GIS program to turn the satellite pictures into three-dimensional maps of the Earth. This technology is important because many people around the world use these maps to help locate and protect our planet's resources, like rocks, metals, and minerals!

What I am Working On

As a NASA geologist, I use information collected by satellites to make maps of where minerals can be found in the United States. For example, I am creating a map that shows where minerals, like potassium, are located on Earth.

To create a map of where minerals are located, I am going to follow these steps:

Step 1

Research events that happened on Earth a long time ago that may have created potassium.

Step 2

Collect and analyze data from NASA's satellites.

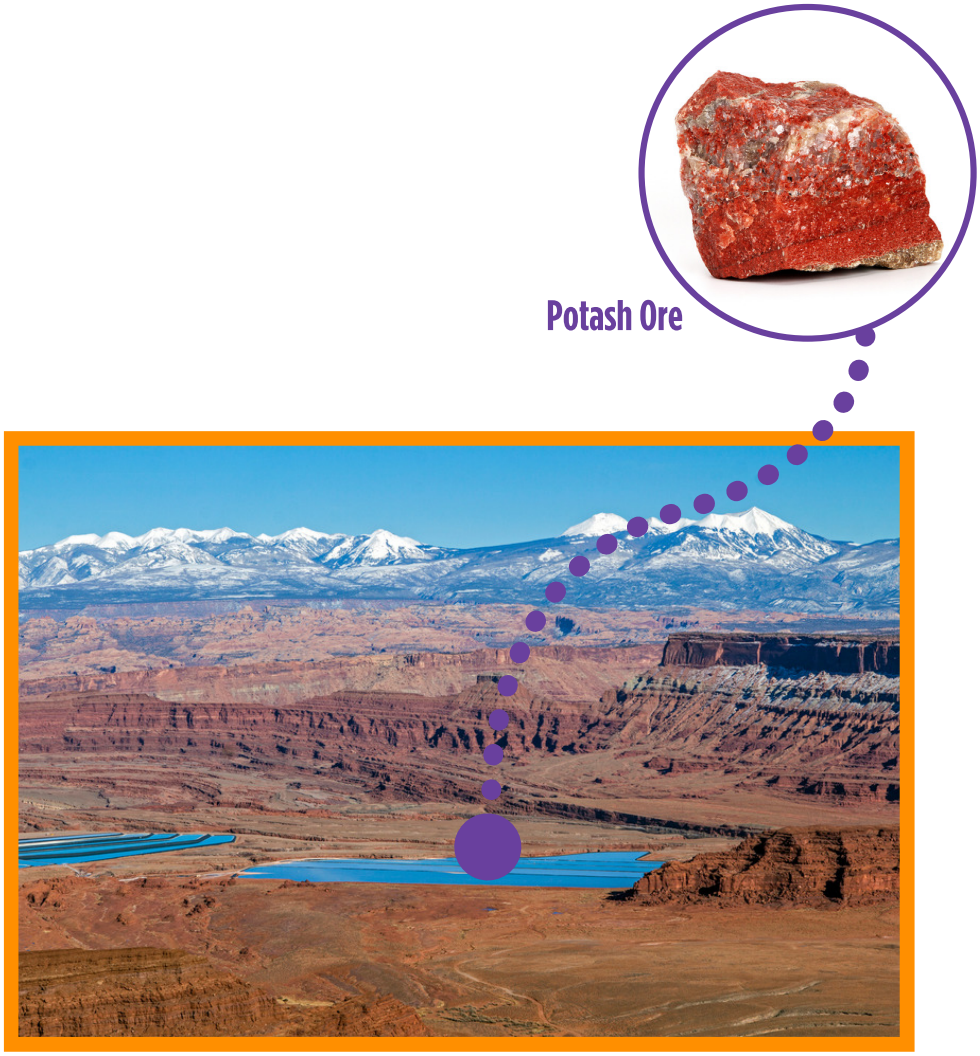
Step 3

Make a map I can share with scientists around the world.

Potassium is a very important mineral! There are many uses for potassium, like fertilizers for farms.

Research

Since I have studied Earth's history, I know that our planet has changed because of events like earthquakes, landslides, and volcanic eruptions. Millions of years ago, there were saltwater oceans in different places on our planet. These oceans eventually evaporated and left behind their salts, including potassium. Over time, the salts became buried underground, and these natural salts that contain a lot of potassium are called potash ore.

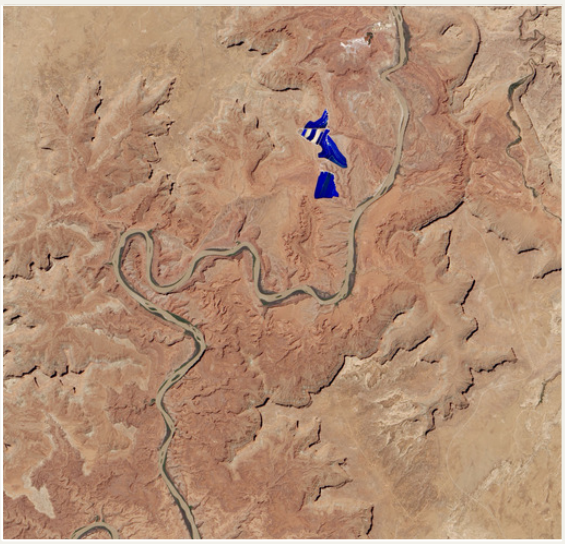


If I want to help other scientists find natural resources, like potassium, I need to find where these ancient oceans used to be!

Collect and Analyze Data from NASA's Satellites

When I look at the pictures of the Earth from outer space, I can see all the different rock formations on our planet. I can see the oceans, the mountains, and the canyons. I know that the rock formations in deserts in the United States were formed from being underwater millions of years ago. So, I will look for deserts on the satellite pictures. In the United States, I see deserts in Utah. I bet there is potash ore buried in Utah, and that is where potassium can be found!

I discover that there are already potash mines in Utah where people are pumping water underground to dissolve the potassium and then pump it back to the surface. When the water evaporates, potassium crystals form. These mines look really cool on NASA satellites. The mines are bright blue pools in the middle of a red desert!



Make a Map

My next step is to put the pictures into my GIS computer program. I use these pictures to make three-dimensional maps. I label all the geographic features on the map, like mountains, rivers, deserts, and more. I even label the Cane Creek Potash mine that is already in Utah! I use this map to predict where more potash ore may be found. This way, scientists and miners will know where natural resources, like potassium, are found on Earth.