Ada the Astrobiologist: Exploring Planets

Meet Ada!

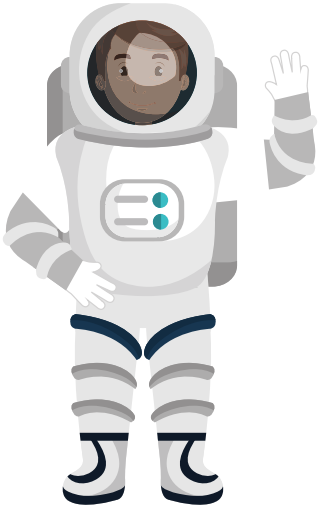
Hi! My name is Ada, and I am an astrobiologist. Astrobiologists study how living things might survive in places other than Earth.

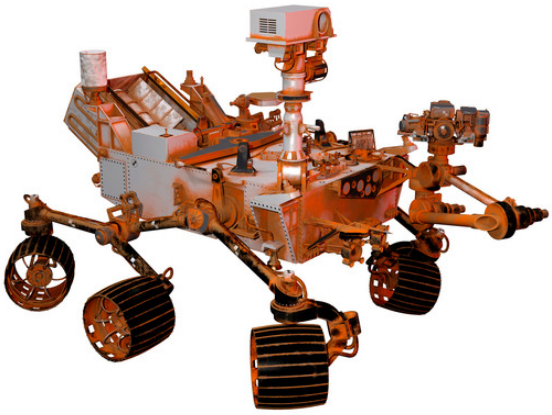
Europa

For example, an astrobiologist might study the oceans on Europa to see if they can support life. Europa is one of Jupiter's moons and its oceans might be a lot like Earth's oceans.

What I am Working On

Right now, I work for NASA. NASA is the leading space organization in the United States. I am working on a special project called “Journey to Mars.” The goal of this project is to figure out if humans can someday live on Mars. So far, NASA has sent robots to learn about Mars. However, people have never traveled there!

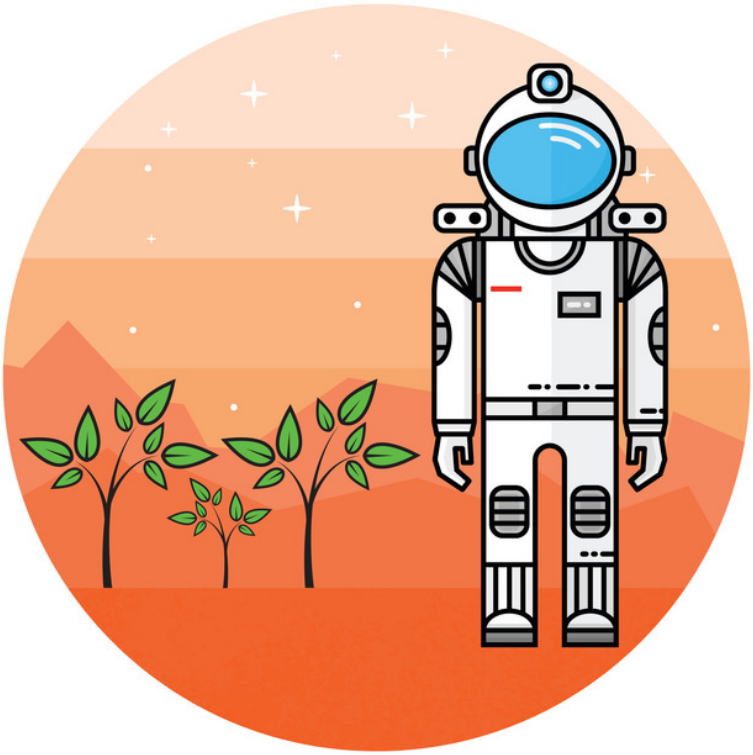


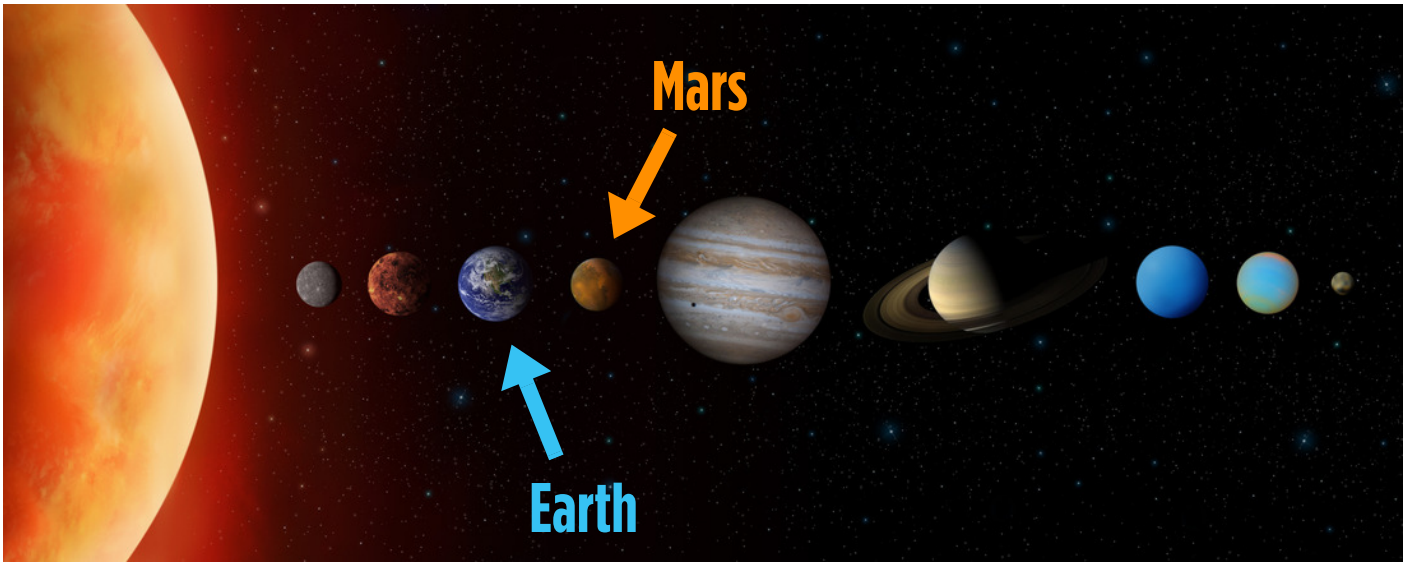


Did you Know?
NASA stands for the National Aeronautics and Space Administration.

Plants on Mars

Today, I am working with a team of astrobiologists to understand how plants will grow on Mars. Mars is further away from the sun than Earth is from the sun. This means plants on Mars would not get the same amount of sunlight as plants on Earth. If people live on Mars one day, they will need to know how to grow plants with less sunlight.



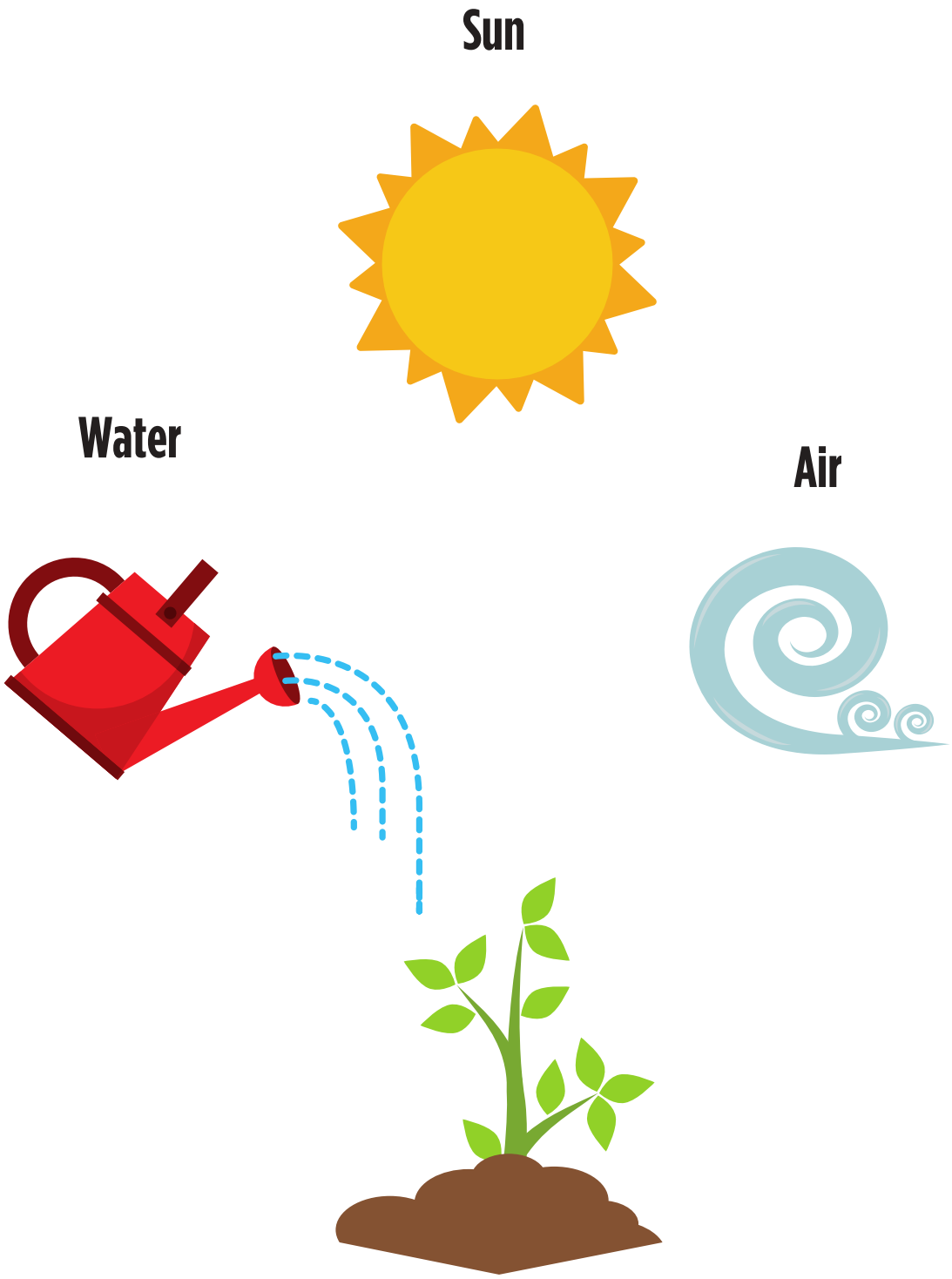


Making a List

This a big project to work on! I want to do things in the right order. I make a list of steps on my iPad so I don't skip anything. Creating a list will keep me organized so I don't forget any important steps! Here are the steps I am going to take:

Understanding What Plants Need to Grow

To get started, I need to understand what plants need to grow. Plants need water, sunlight, and air to grow. For plants to grow on Mars, there needs to be enough light, air, and water!



Sunlight on Mars

The next step is to understand how sunlight is different on Mars compared to Earth. When people live on Mars, they will look up, and the sun will look much smaller than it does from Earth. This is because Mars is further from the sun than the Earth is from the sun.

This is the same reason that the stars that you see at night look so small and do not help plants grow. Most stars are many, many times further away from Earth than the sun is from Earth. This is why stars look so small and we do not get much light or energy from stars on Earth.

Mars gets less energy from the sun than Earth does. The reason the sunlight is different on Mars compared to Earth is that Mars is much further away from the sun. Because of this, there will be less energy from sunlight for plants to grow on Mars.

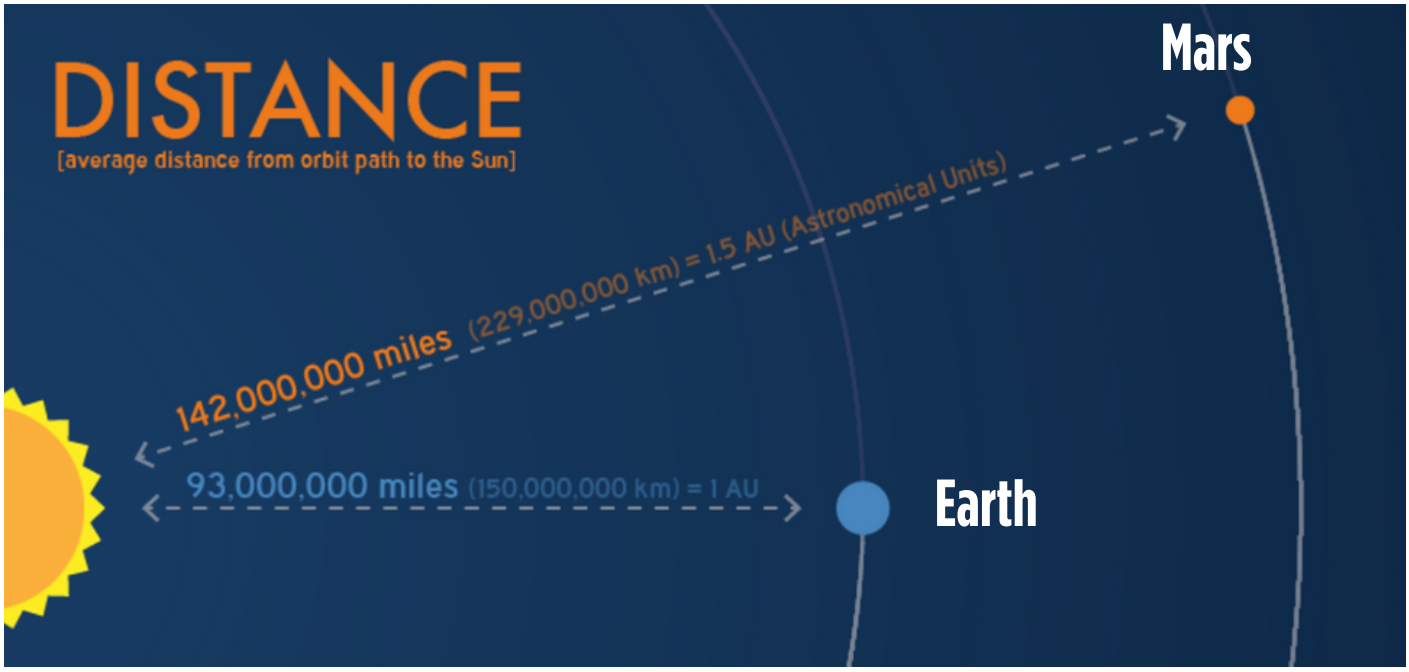


Photo Source: NASA, Mars Facts

Testing the Difference in Sunlight

The next step is to do an experiment to test how plants are affected by different amounts of sunlight. By doing an experiment, I can see what will happen when plants gets less sunlight on Mars.

To compare the energy that plants receive on Mars compared to Earth, I will place 2 plants under special lights. The lights are like the sun. Each plant will get a different amount of light. One will get more light, like a plant on Earth. The other plant will get less light, like a plant on Mars.

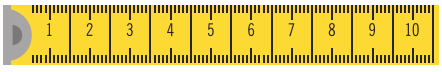
Materials for Experiment:

Plant (labeled Earth)

Plant (labeled Mars)

2 lights

Water

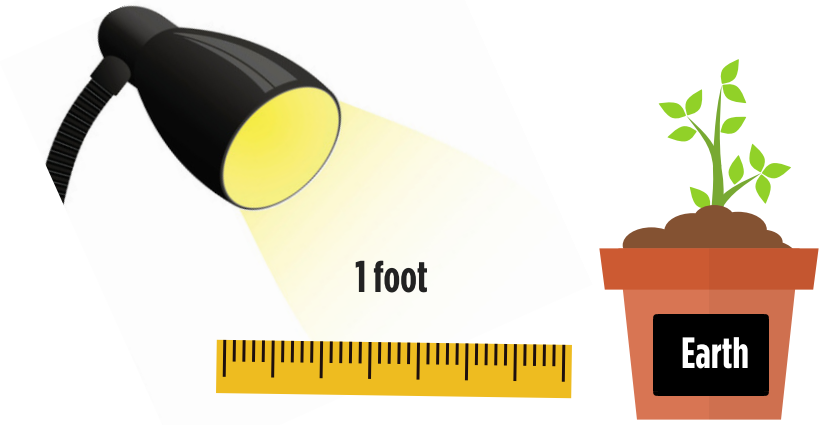


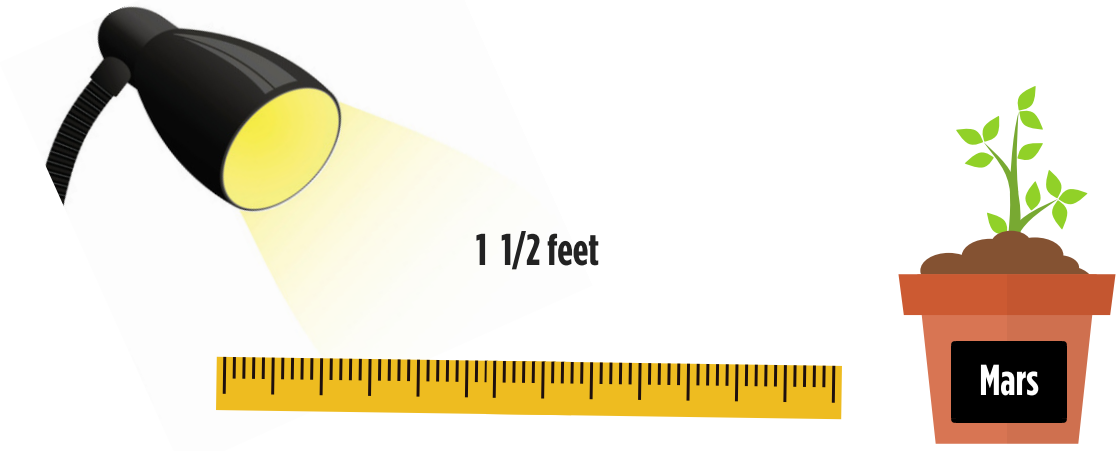
Ruler

Testing the Difference in Sunlight

Experiment Steps:

- Place Plant 1 (Earth) one foot away from the light
- Place Plant 2 (Mars) one and a half feet away from the light
- Water each plant with 1/2 cup of water each day
- Measure the height of each plant every day





Testing the Difference in Sunlight

Results:

At the end of two weeks, I can review my results to make a conclusion. I can see that the plant labeled Earth has grown more than the plant labeled Mars. The Earth plant has grown 3 inches. The Mars plant has also grown, but it only grew 1 1/2 inches. Since the only thing that was different was the amount of light the plants received, I conclude that more sunlight causes the plant to grow more.

Day 1

Height: 5 in.

Height: 5 in.

Day 14

Height: 8 in.

Height: 6 1/2 in.

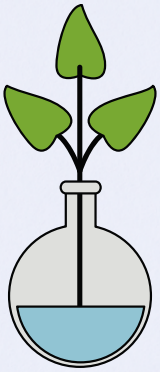
Recommendations

Making a Recommendation:

The last step is to make a recommendation to NASA about how to best grow plants on Mars.

Here is what I am going to suggest!

- Create new plants that don’t need as much energy from sunlight to grow on Mars. This is because plants grown on Mars won't get as much energy from the sun as plants grown on Earth.



- Create special light bulbs to provide extra energy to plants.