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## Glossary:

### Adaptations:

characteristics that help an organism survive in its environment

**Conservation:** prevent the wasteful use of a resource

**Population:** the total number of people living in a country, city, or area

**Man-made satellite:** a machine that is launched into space and moves around Earth

**Sustainably-sourced:** use natural resources in a way that we can keep doing so for a long time

# THE ADVENTURES OF Spriggy & Twiggy

Spriggy and Twiggy are Sprowteez. They live with their Sprowtee friends on Sprowt Island. They are clever, funny and kind little scientists and always very curious...





Hmmm - good point Crabby. I wonder if Earth's surface has more rocky land or water?

Remember when we flew from New York to Sydney? It felt like we flew over a lot of water.

Who cares?! That's boring. I just want to take a nap on my nice, hard rock. I'm outta here.



I think there is more ocean water, but I wonder if it is a lot more or a little more?

Wow - great question. I'm excited. Let's go find out!



We live on land, so it kinda feels like that should be more. But from the airplane, we saw much more water.

You're right. We did see a lot more water, but what kind of water do you think it was - freshwater or saltwater?

The water is flowing - let's get going!  
Join Spriggy and Twiggy as they discover cool new things about Earth's water.



# 3 - 2 - 1... LIFT OFF!



On July 16, 1969, U.S. Astronauts Buzz Aldrin, Neil Armstrong, and Michael Collins were launched from Earth on NASA's Saturn V rocket on the Apollo 11 mission. They would become the very first humans to walk on the Moon! Wow!



Neil Armstrong was the first person to set foot on the Moon. When he looked back at Earth, he said:

"It suddenly struck me that tiny pea, pretty and blue, was the Earth. I put up my thumb and shut one eye, and my thumb blotted out the planet Earth. I didn't feel like a giant. I felt very, very small."



## IMAGINE!

Imagine that you are Neil Armstrong on the Moon. Hold up your thumb and shut one eye. Do you block out Earth?



## PREDICT IT! DRAW OR WRITE:

From up on the Moon, our Earth looks small, beautiful, and blue. What might be the cause for our planet to look blue from the moon?



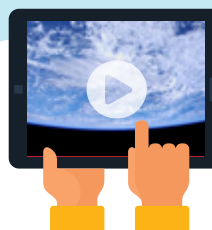
This is why we are called the Blue Planet. We are a small planet - and we need to take care of it so that we can continue to live and thrive here.



## HOW DID OUR OCEANS FORM?

According to scientists, Earth was extremely hot and humid 3.8 billion years ago. All of the water trapped in rocks and gas in that hot, humid air condensed into rain drops and fell down to Earth for hundreds of years. The rain filled the deep valleys all over the Earth and created oceans, lakes, and rivers.

Our Earth used to be all ground you could walk on, but so much rain made it mostly covered in water!



**WATCH IT!** "Earthrise" featuring Sir David Attenborough:  
<http://tiny.cc/iSprowt-earthrise>



# Experiment with Twiggy: Rocket Launch! 3-2-1 – Blast Off!

GET READY



## WHAT YOU NEED:

- Rocket kit: rocket, sodium bicarbonate, citric acid, spoon, stickers
- Syringe
- Water
- Open area free from trees, roofs, and other things that could obstruct it
- **Optional:** white vinegar for Level Up rocket launch



45 MINUTES

## LET'S DO IT!

### Step 1: Assemble your rocket

1. Screw your rocket into the fins.
2. Decorate with stickers.

### Step 2: Launch it!

1. Add a full scoop of sodium bicarbonate into the rocket base.
2. Add a half scoop of the citric acid into the rocket base.
3. Use the handle of the scoop to give the sodium bicarbonate and citric acid a little stir. This will give you a better chemical reaction! If there are any chunks, break them up while you stir.
4. Using your syringe, add 5 ml of water to the rocket. Don't fill the rocket more than  $\frac{1}{3}$  full of water.
5. Very carefully: Turn the rocket and the base on their sides so that they are parallel to the ground.
6. Quickly, attach the rocket to the base.
7. Place the assembled rocket on the ground, as fast as you can.



**Blast off! CAUTION: Step back, do not put face over rocket.**

LEVEL UP!

## SPRIGGY CHALLENGES YOU! HOW HIGH CAN YOU GO?



### PREDICT IT! DRAW OR WRITE:

Which way will give you the highest launch - using lots of water or less water? Why do you predict this?

Try launching your rocket your way. Experiment to see what gives you the highest rocket launch.

### Variables to Consider:

- Baking soda, citric acid and water: try different amounts of each to determine the best mix.

### Now try it a different way:

- If you have white vinegar, try using it instead of citric acid. Try different amounts of each to determine the best mix.

### IMAGINE IF....

You are an astronaut speeding away from Earth. Are you leaving the only planet with fresh water in the solar system?

Astronomers discovered evidence of water on asteroids, comets, Mars, Pluto, and on some moons orbiting Jupiter and Saturn. Scientists are studying water on asteroids to determine whether it could be useful to astronauts while in space.



**WATCH IT!** Tracking Water from Space:

<http://tiny.cc/iSprowt-trackwater>

