DOCTOR PROCTOR'S
SPACE 2 INSPIRE

INSPIRE

To excite, encourage, or breathe life into someone

What inspires you? Are you creative? Do you like to draw, write, sing, dance or just daydream and imagine? Are you inspired by other people? Do you think people can be inspired by you?

If you answered "yes" to any of these questions, then you and I have something in common.

Hi! My name is Dr. Sian Proctor. I have been inspired by so many people and things both in and out of this world and those inspirations have led me to have many great adventures! My hope is to help you find your next great adventure!

As you go on this creative journey, you can use the **JEDI Journal** to record your thoughts and ideas! Download it here:

JEDI *Journal*

Our mission today is to find out what inspires you!

We are going to use my love of space, art, and science to spark our creativity. Let's start by thinking about how you fit in space. Is there a job or area that interests you? Check out the next page for more information about people in space.

There is a Place For All of Us in Space!

Space is for scientists, engineers, physicians, and architects, but it is also for fashion designers, farmers, chefs, and artists! Is there a career in that list that interests you?

Check out the chart below to see how some of your everyday interests can turn into job opportunities in space!

Space4All is a national initiative that aims to inspire, prepare, and employ a diverse, inclusive Space STEM workforce. Find out more at ***space4all.us***

Interests	Mission Role	Job Description
Being a team leader or captain	Commander	In charge of the mission, vehicle, and crew safety
Playing with remote control cars or video games	Pilot	Runs the primary controls during launch and re-entry into the atmosphere, the primary navigator for extravehicular remote devices
Drawing, design or building	Astronautical Engineer	Designing space missions and the spacecraft to be used in them
Cooking	Mission Specialist: Food Prep	Planning the use and quantity of food on the mission
Party Planning	Mission Specialist: Planning	Planning crew activities relating to life in space or the mission itself
Experimenting with science	Mission Specialist: Experiments	Coordinating and completing off and on-board experiments

Are you feeling the astronaut vibe? To learn more about the qualifications you need to become an astronaut, check out this website: ***NASA Astronaut Requirements***

JEDI *Journal* #1

Have you ever pictured yourself as an astronaut? Now that you know space is a place for all of us, think about how you could fit in. In your journal, make a vision board that represents things about space that inspire you. Cut out pictures or make drawings of your goals.

Inspiration = Opportunities

While I have many different interests, my art was what finally got me into space. I was chosen to be the mission pilot of Inspiration 4, the first all-civilian mission to space. I was also chosen to serve as an artist and poet. Check out my poem that launched me to space!

Space2inspire

You've got space
I've got space
We all have Space2inspire
That's why we dream of going higher and higher
But what is space if you can't breathe
Let's stop sucking out the air of our humanity
We have a moment to seize the light
Earth from space – both day and night
We have J for justice to ignite the bold
We have E for equity to cut past the old
We have D for diversity to end the fight
We have I for inclusion to try and make it right
A J.E.D.I. space to rally behind
A universal force so big it binds
Inspiration to change the world
A new beginning for us to hold
It's not about you
It's not about me
It's about Space2inspire
For ALL of humanity

-Dr. Proctor

JEDI *Journal* #2

Do you consider yourself a word artist? I love to write poems as a way to express my feelings with the hope of inspiring the person who reads them. Do you think you could write a Space Poem? Give it a try.

Need some more ideas?

Try an acrostic poem: pick a word and write it vertically on your paper with one letter on each line. Then start each line with a word that begins with that specific letter.

Silent
Peaceful
Amazing
Cosmic
Ending never

Give a Haiku a try: it's a three-line poem with 17 syllables: 5 in the 1st line, 7 in the 2nd line, and 5 in the 3rd line.

Daring astronaut,
Soaring through the dark abyss,
Follow the stars home.
- Kelly Turley

Now that you are inspired and hopefully as excited about space as I am, let's figure out your personal mission...

My Mission

Creating a Mission Patch is the first task astronauts work on together when they begin a mission. This is a patch I made for the Inspiration 4 Mission.

My patch symbolizes my love of both space and Earth with the yin-yang design. The Moon represents me being born as a result of the Apollo 11 mission and Neil Armstrong becoming the first person to step onto the lunar surface. My dad was working at the NASA tracking station on Guam at this time and I was born 9 months after this historic mission. The sun rising on the horizon represents the transformation of sunlight into Earthlight as it enters the Earth's atmosphere.

What would you put on your mission patch?
It could include things like:

- **Your mission goal**
- **Names of your crew**
- **Unique tasks or qualities of the mission**

What is your mission or goal? It can be a creative goal, career goal, an academic goal, or any accomplishment you want to achieve.

JEDI *Journal* #3

Design a mission patch for one of your goals in your journal. Include the names of your crew (friends, teachers, family) that can help you reach your goal. Think about your strengths and unique qualities that might inspire others on their own mission.

Remember,

"A goal without a plan is just a wish."

Coming up with an actual plan on how you will accomplish your goals brings you one step closer to achieving them!

Now that you know there is room for all of us in space and your mission is clear, let's learn about how you are going to get there...

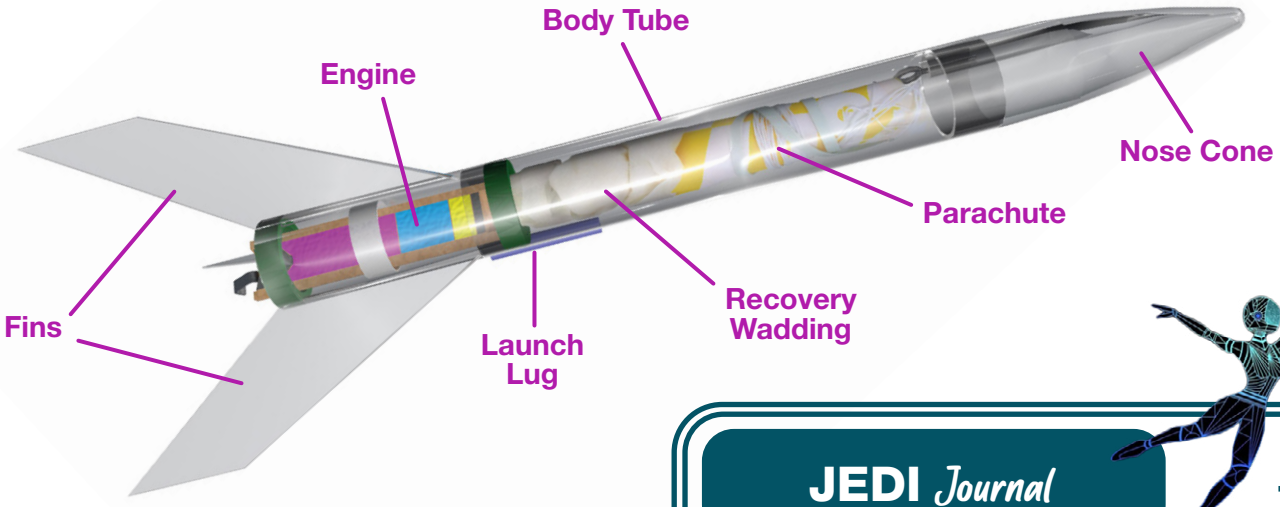
Take a Look at Your Vehicle to the Stars

I launched to space on the Falcon 9 rocket, in the Crew Dragon capsule. The Falcon 9 is a reusable, two-stage rocket designed by Space X.

Let's have a look at your rocket and see what parts are similar to the rocket I went on. Take a minute to unpack your rocket and check out the different pieces. Do you recognize my art on the body tube?

Let's learn the parts and find some places on the rocket where you can add your own personal touches.

Check out this rocket!



As you unpack your rocket, look at all the different pieces that make it work.

Body Tube A light cardboard cylinder that is the main frame for the rocket. It houses the recovery system and the engine.

Fins Help to keep the rocket stable and on course. Our fins have a special feature, you'll find out more about that later.

Parachute The recovery system that the rocket will use on its descent. The parachute increases drag, or the force that slows down the rocket, so that it has a slow, safe landing.

Nose Cone A tapered shape to allow for streamlining and to cut through the air with less resistance.

Engine The source of power, or thrust, that propels the rocket into the air.

Recovery Wadding Protects the recovery system from the heat of the engine's ejection charge.

Launch Lug Guides the rocket on the launch rod so it flies straight during the first few seconds of flight.

JEDI Journal #4

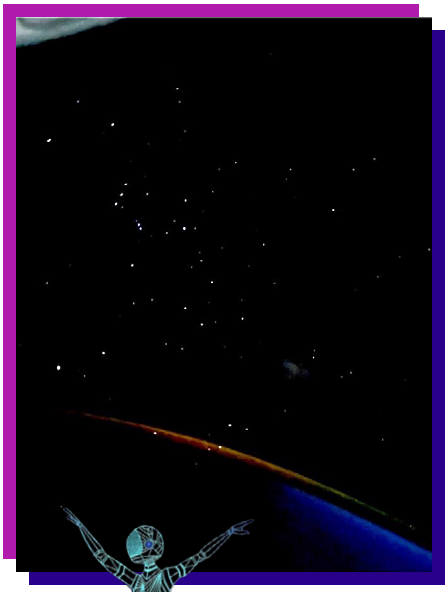
Did you notice the parachute for your rocket is plain white? This is your chance to add a little of your personality to the rocket! Add your own art to the parachute using markers (permanent will work best). Sketch your ideas out in your journal before drawing on the parachute. What will be your inspiration for the design? Will you keep the style similar to my art on the body tube or will you go in a completely different direction? Will you have a theme to your design, like planets, aliens, or stars?

I can't wait for you to make this rocket your own!

Now that you have jazzed your rocket up, read the assembly instructions that come with this kit. Follow the steps to get your rocket ready for flight...

Interstellar Inspiration

When I looked out the window of the Space X Dragon Capsule, I saw things from a new point of view. I was taking in all the new sights and then I noticed something familiar…Orion.



Orion is my favorite constellation; do you know it? I was so excited to see it that I took out my phone and snapped a picture! Can you find Orion in my picture?

Constellations are groups of stars that form a pattern when viewed from Earth. They might look like animals, mythological creatures, people, or objects. In ancient times, travelers used constellations as landmarks. They realized the stars' locations did not change during a lifetime, so they could use them to help find their way. Astronomers today use nearby constellations to name stars and meteor showers. You can see constellations with your naked eye or use a telescope to find them.

Stars are not only incredibly beautiful to look at but are very important to us. Our sun is a star. Without it, life on earth would not exist!

Need a telescope? You can borrow one from your local library!

www.librarytelescope.org

JEDI Journal #5

Use **this website** to learn more about constellations. Then see if you can recreate your favorites by following the directions below. You can even push your creativity and make up your own constellation with its very own story! Jot your ideas down in your journal.

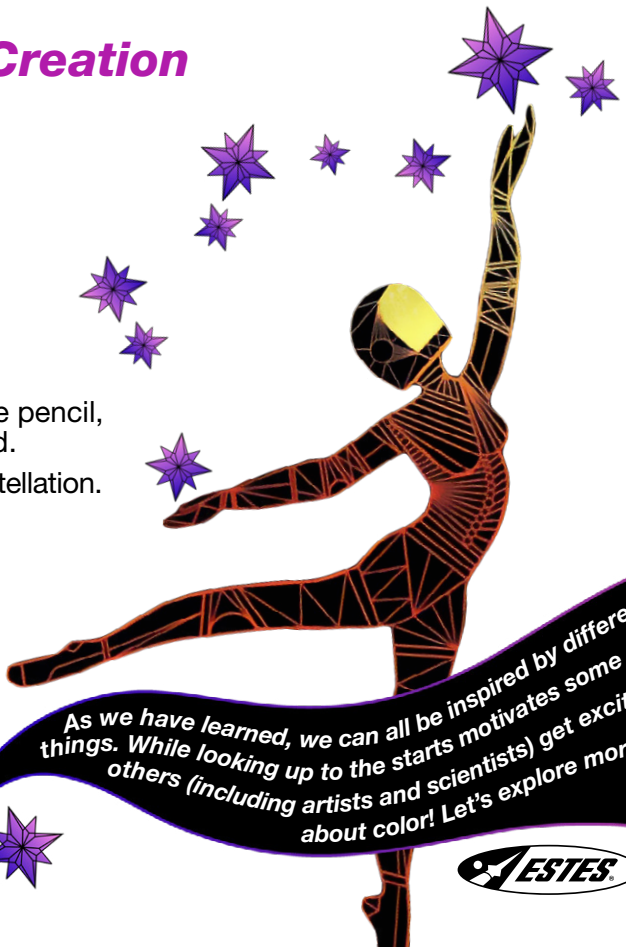
Constellation Creation

Materials:

- Black construction paper
- Hole punch
- Pencil
- Flashlight

Directions:

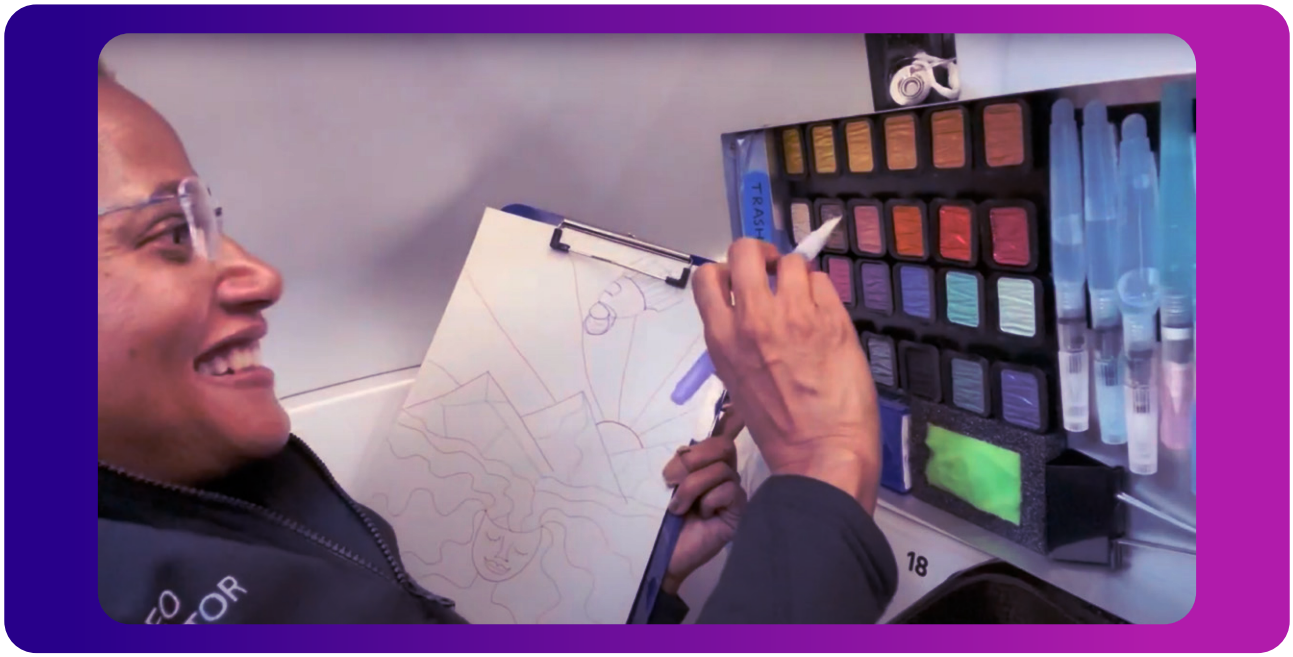
- Draw out your constellation from your notebook with the pencil, making sure to mark where each of the stars are located.
- Now use a hole punch to punch out the stars in your constellation.
- Next, use a flashlight and head to a dark room.
- Shine the flashlight up through the paper. Can you see your constellation on the ceiling?



As we have learned, we can all be inspired by different things. While looking up to the starts motivates some people, others (including artists and scientists) get excited about color! Let's explore more...

Color Makes Our Universe Beautiful

I am not just a poet; I also like to paint and make art too! I was the first African American to paint in space! **Click the photo below to watch me paint in space.**



I use color to express different things in my art. Many times, the beauty of color inspires us, but sometimes the science behind color is what is truly amazing.

Let's take a minute to be inspired by the science of color

Color Changing Plastic

This is a type of plastic that changes its color when it is heated or cooled. It is made up of a material that has molecules which change their shape and arrangement when the temperature changes. This affects how they reflect light and what colors we see. Your rocket fins are actually made from color changing plastic!

JEDI *Journal* **#6**

If you look at the fins of your rocket, you will notice that they are a fun pink color. Check out what happens when we bring them outside! What change did you notice? Record your findings in your journal. Can you think of something that you wish changed color in the sun?

Invisible Ink

Invisible Ink is another cool way to see a color change. **Click here** for a bonus experiment to try making your own invisible ink!

White Light Experiment

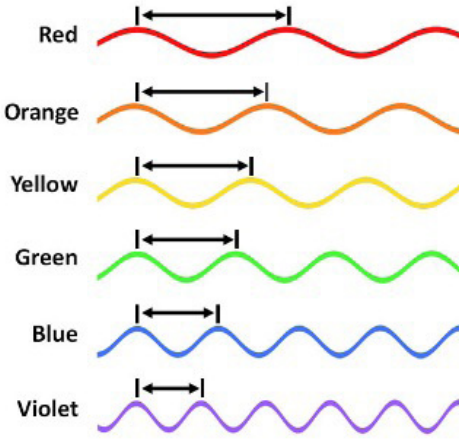
Did you know that white light like that from the sun or a flashlight is made up of colors? In this simple experiment you can separate white light into a rainbow!

Materials:

- Clear glass
- Light
- Water
- White paper

Experiment:

1. Fill a clear glass with water and set it on the edge of a white sheet of paper.
2. Use a light (from your phone, flashlight or sun) and shine it through the glass of water and onto the paper.
3. Move the glass around at different angles and distances until you see a rainbow cast on the paper.



What is going on here?

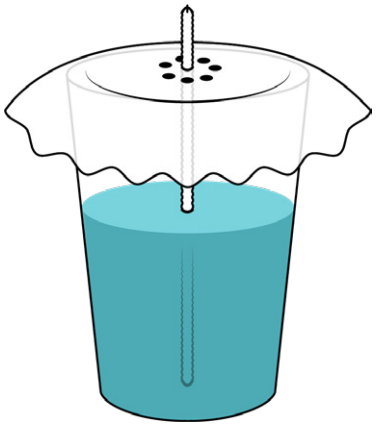
The colors that make up white light (red, orange, yellow, green, blue, indigo, and violet) all have different wavelengths. Red has the longest, and violet is the shortest. When white light passes through water, the water acts as a prism and causes the light to bend. Because each color has a different wavelength, they all bend differently through the water. This causes the white light to split into colors and show you the beautiful rainbow of colors that was inside the white light the whole time!

JEDI *Journal* #7

I like to experiment with using color in my art, as you can see in these pieces. What can you create using all the colors of the rainbow? Use your journal to jot down your ideas or even to create some pieces.

Color Chromatography

Chromatography is the process of separating mixtures. Paper chromatography is a way scientists separate different parts of a mixture, and can include color chromatography, which separates colors. Instead of separating white light like you did before, now you'll separate black ink.



Materials:

- White coffee filter
- Marker (sharpie works best)
- Water glass, 4 inches or taller
- Water
- Pipe Cleaner

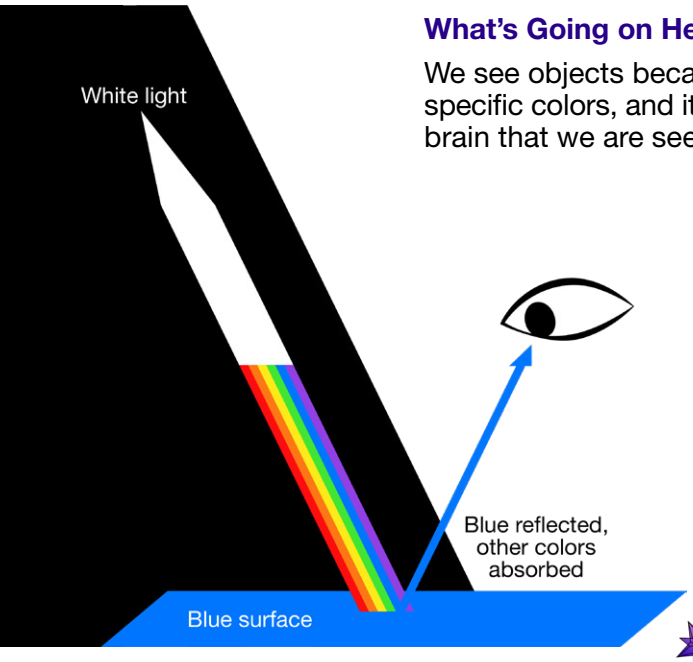
Experiment:

1. Draw dots in a circle near the center of the coffee filter. Space them out about ½ inch from each other.
2. Get the pipe cleaner wet, and then poke it through the center of the coffee filter.
3. Fill the glass with water, and place the filter on top of the glass, making sure the pipe cleaner is touching the water.
4. Wait and watch the colors separate!
5. Once the water has reached the edge of the coffee filter, take out the pipe cleaner and lay your colorful creation out to dry.
6. If you have more coffee filters, try it again with the dots in a different design and see how your art changes!

JEDI *Journal* **#8**

Record your observations in your journal. Here are some questions to think about as you watch your experiment:

- What happens to the black dots?
- Do you see any color separation?
- What colors do you see?
- Which colors are near the middle (moved slowly)?
- Which colors are near the edge (moved quickly)?



What's Going on Here?

We see objects because they reflect light into our eyes. Some molecules only reflect specific colors, and it is this reflected, colored light that reaches our eyes and tells our brain that we are seeing a certain color.

Oftentimes, the colors we see are a combination of the light reflected by a mixture of different molecules. In this experiment, the components of the mixture start out in one place in the black dot of the marker. As the water moves down the paper, it takes part of the mixture with it. Different molecules (colors) move down the paper at different rates. As a result, components of the black mixture separate and become visible as separate spots of color on the filter.

I hope that learning about the science of color gives you a new and inspiring understanding of it!

Letting Art Take Flight

My art has traveled all the way to outer space and the deepest trenches of the sea. This is the digital file that made its way all over this world!

Click the photo to watch ***Seeker***

Now it's your turn to take your art to new heights! Launch your rocket and pay close attention when it reaches apogee, or the highest point of flight. Your beautiful parachute will be released, and your art will be flying high!

Your creativity and inspiration have soared throughout this process. Now it's time to prepare to launch your rocket. Read the safety checklist on the next page prior to launching.

Launch Safety Checklist

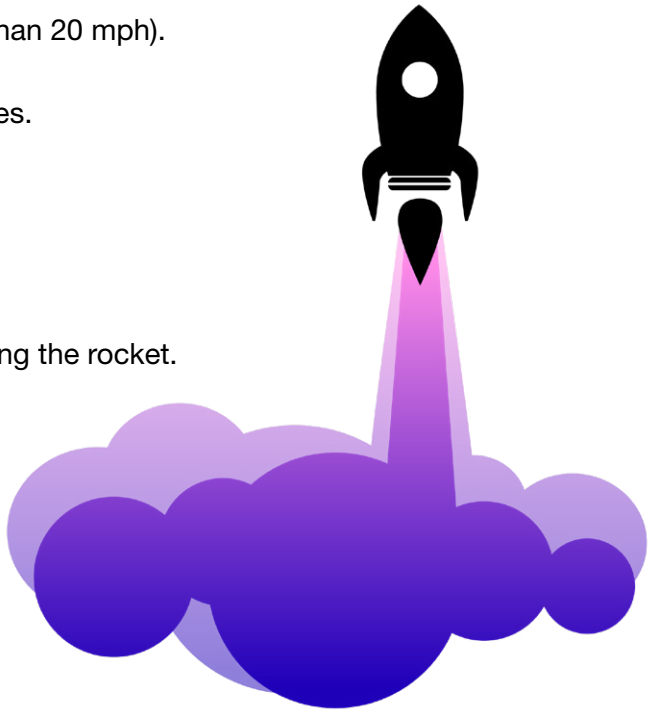
Review each of these regulations from the National Association of Rocketry before you launch and put a check next to each one to show that you understand it.

Materials

- ◊ Only use materials provided in the rocket kit.
- ◊ Do not tamper with rocket engines in any way.

Launch Site

- ◊ Launch in an open outdoor area.
- ◊ Launch only in safe weather conditions (winds less than 20 mph).
- ◊ Be sure there is no dry grass near the launch pad.
- ◊ Do not launch at targets, into clouds, or near airplanes.



Launch

- ◊ Countdown before launch.
- ◊ Be sure everyone stands at least 15 feet away.
- ◊ Launch rod must be within 30 degrees of vertical.
- ◊ In case of misfire, wait 60 seconds before approaching the rocket.

Recovery

- ◊ Do not attempt to recover rocket from tall trees, power lines, or other dangerous places.

I am so excited for you to keep learning about what inspires you! Your new self-discoveries may even help someone else find their space 2 inspire!

Doctor Proctor