

THE WARBLER

AN EDUCATIONAL WEEKLY

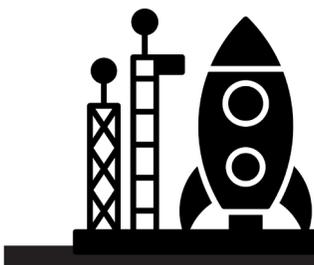


Dear Student, Artist, Thinker, Friend,

Mars, the fourth planet from the sun and the second smallest planet in the solar system. With a fire red color and below freezing temperature, Mars is quite the confusing planet. The red planet's color is due to all of the iron in the soil. The color reminded the Romans of blood and warfare, which resulted in the naming of the planet being "Mars," referring to the Roman god of war. The color of Mars, red, is engrained in the human psyche as a very powerful and emotional color. Usually signifying love and hate, red is considered a bold hue. The vibrance of the color is an attention grabber, making it nearly impossible to avoid eliciting some sort of emotional response. Considering the connection between the color, its emotional responses, and the planets historical background, the labeling of Mars seems spot on. Though the temperature may not reflect the name, all other aspects of Mars seem to line up.

One thought I have is, if the red planet was named long ago after warfare, could that mean we were taught by the Romans and other past historical figures to associate red with anger? If Neptune and Mars had switched names, would we have different feelings towards red and blue? It would be hard to imagine being angry when looking at a baby blue color, but it's interesting to think about. We hope you enjoy this issue of *The Warbler*!!

Abigail and the APAEP Team



“Mars is there, waiting to be reached.”

BUZZ ALDRIN // American Astronaut

SEPTEMBER 28, 2022

WORDS INSIDE

FOUND INSIDE RANDOM NEST ...
astronomical | an extremely large amount, celestial

FOUND INSIDE "MARS COMPARED TO EARTH ..."
desiccated | having had all moisture removed, dried out

inclination | a slope or slant

silicate | a salt which contains both silicon and oxygen

FOUND INSIDE "NASA SCIENTISTS ..."
regolith | the layer of unconsolidated rocky material covering bedrock

FOUND INSIDE POEM ...
phobos | natural satellite of Mars

deimos | moon of Mars

FOUND INSIDE "ASTRONAUTS ON A MARS MISSION ..."
analogous | comparable in certain respects

GEOGRAPHY

Mars Compared to Earth

BY MATT WILLIAMS | *Universe Today* | December 7, 2015

At one time, astronomers believed the surface of Mars was crisscrossed by canal systems. This in turn gave rise to speculation that Mars was very much like Earth, capable of supporting life and home to a native civilization. But as human satellites and rovers began to conduct flybys and surveys of the planet, this vision of Mars quickly dissolved, replaced by one in which the Red Planet was a cold, desiccated and lifeless world.

However, over the past few decades, scientists have come to learn a great deal about the history of Mars that has altered this view as well. We now know that though Mars may currently be very cold, very dry, and very inhospitable, this wasn't always the case. What's more, we have come to see that even in its current form, Mars and Earth actually have a lot in common.

Between the two planets, there are similarities in size, inclination, structure, composition, and even the presence of water on their surfaces. That being said, they also have a lot of key differences that would make living on Mars, a growing preoccupation among many humans, a significant challenge.

Sizes, Masses, and Orbits

In terms of their size and mass, Earth and Mars are quite different. Earth is the fifth largest and fifth most-massive planet in the Solar System, and the largest of the terrestrial planets. Mars is the equivalent of roughly 0.53 Earths.

The Earth has an orbital period of 365.25 days, while Mars has an orbital period of 686.971 days (1.88 Earth years).

Structure and Composition

Earth and Mars are similar when it comes to their basic makeups, given that they are both terrestrial planets. This means that both are differentiated between a dense metallic core and an overlying mantle and crust composed of less dense materials (like silicate rock). However, Earth's density is higher than that of Mars – which indicates that Mars' core region contains more lighter elements than Earth's.

Both planets have a silicate mantle surrounding their cores and a surface crust of solid material. Earth's mantle – consisting of an upper mantle of slightly viscous material and a lower mantle that is more solid

– is roughly 2,890 km thick and is composed of silicate rocks that are rich in iron and magnesium. The Earth's crust is on average 40 km thick, and is composed of rocks that are rich in iron and magnesium (i.e. igneous rocks) and granite (rich in sodium, potassium, and aluminum).

Comparatively, Mars' mantle is quite thin, measuring some 1,300 to 1,800 kilometers in thickness. Like Earth, this mantle is believed to be composed of silicate rock that are rich in minerals compared to the crust, and to be partially viscous (resulting in convection currents

which shaped the surface). The crust, meanwhile, averages about 50 km in thickness, with a maximum of 125 km. This makes it about three times as thick as Earth's crust, relative to the sizes of the two planets.

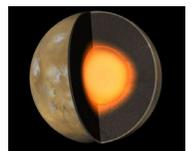
Surface Features

When it comes to the surfaces of Earth and Mars, things once again become a case of contrasts. Naturally, it is the differences that are most apparent when comparing Blue Earth to the Red Planet – as the nicknames would suggest. Unlike other planet's in our Solar System, the vast majority of Earth is covered in liquid water, about 70% of the surface to be exact.

The surface of Mars is dry, dusty, and covered in dirt that is rich iron oxide (aka. rust, leading to its reddish appearance). However, large concentrations of ice water are known to exist within the polar ice caps – Planum Boreum and Planum Australe. In addition, a permafrost mantle stretches from the pole to latitudes of about 60°, meaning that ice water exists beneath much of the Martian surface. Radar data and soil samples have confirmed the presence of shallow subsurface water at the middle latitudes as well.

So while they look quite different today, Earth and Mars were once quite similar. And similar geological processes occurred on both planets to give them the kind of varied terrain they both currently have

In short, compared to Earth, Mars is a pretty small, dry, cold, and dusty planet. It has comparatively low gravity, very little atmosphere and no breathable air. And the years are also mighty long, almost twice that of Earth, in fact. However, the planet does have its fair share of water (albeit mostly in ice form), has seasonal cycles similar to Earth, temperature variations that are similar, and a day that is almost as long. ●



Color mosaic of Mars' greatest mountain, Olympus Mons, viewed from orbit (top). Artist's impression of the interior of Mars (bottom).

Images from NASA/JPL

Edited for space

SCIENCE

NASA in Alabama Watches Closely as Mars Rover Looks for Signs of Life

BY LEE ROOP | *AL.com* | July 22, 2021

NASA is making its final plans for the Perseverance Mars rover to collect its first samples of Martian rock in the search for past life on the Red Planet, and Alabama scientists and engineers are watching closely. One of them suggested the sample site years ago, and others will be responsible for getting the samples home.

Scientists at the Jet Propulsion Laboratory in California, operators of the rover, briefed reporters Monday on its maneuvers into and around Jezero Crater. The crater was, indeed, the site of a lake that drained and refilled multiple times in Mars' past, scientists said.

Marshall scientist Dr. Caleb Fassett wrote the scientific paper nearly 20 years ago concluding the crater was an ancient lake that ultimately gave Perseverance its destination.

"This particular place on Mars was something I had spotted in very low-resolution data in 2003, 2004," Fassett told *AL.com* in 2020. "In that data, it was really clear that there were these valleys in this crater."

What Fassett saw in images sent back from the Mars Odyssey spacecraft were signs of sedimentary deposits on one side of the crater and "an outlet" on the other side. "To have an outlet form, you have to fill the whole (crater) up and have it overflow," Fassett said. "That basically demands the existence of a lake."

Fassett and other scientists who shared his theory were right. Researchers said again at this week's briefing that the crater "was indeed a lake" and that it was "active" with multiple phases flooding and draining.

Perseverance's mission is to sample that lake bed for possible evidence of microbial life, seal the samples in a protected cylinder and leave them to be picked up by a later sample return mission. That retrieval mission is also spectacular in design and daring, and NASA in Huntsville is again involved. The Marshall center is leading the development of the Mars Return Vehicle that will lift the rover's samples off the surface.

Marshall awarded a contract worth potentially \$85 million to Northrop Grumman Systems to provide parts of the retrieval system. That retrieval system itself will involve landing on Mars and launching the rock and soil samples from the surface back into orbit. There, they will be grabbed by a spaceship that brings them back to Earth. Once back on Earth, the Martian lake bed rocks will be examined by scientists from



around the world using instruments "too large and too complex to send to Mars," NASA said.

At the NASA mission briefing Wednesday, researchers said they "would only expect life to be microbial" if evidence of life is found at all. "Life hadn't enough time to evolve" before Mars became uninhabitable, one researcher said.

Scientists think Mars, Venus and Earth all had gravity, atmospheres, oceans and volcanoes more than 4 billion years ago. But Venus was too close to the Sun to keep any life it might have had. Mars was a better candidate for life for more than a billion years, scientists think, but it cooled and lost its atmosphere and eventually its water. ●

This illustration shows a concept of how the NASA Mars Ascent Vehicle, carrying tubes containing rock and soil samples, could be launched from the surface of Mars in one step of the Mars sample return mission.



A light-colored stone like the ones in this mosaic image, will be the likely target for first sampling by the Perseverance rover. This image was taken July 8, 2021, in the "Cratered Floor Fractured Rough" geologic unit at Jezero Crater.

MATHEMATICS

Sudoku

#257 PUZZLE NO. 4239083

						1	4	
	4	1					5	
	8	5					6	2
	6	4		8		3		
2	5							4
		7		9	3			
								9
	7			5	6	2		
			3		2	4		

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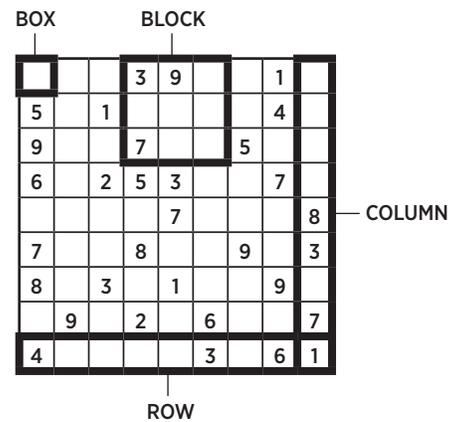
#258 PUZZLE NO. 3073997

			9		4		8	
	8			1				
	7				8			
9		7	6			8		
6				9	5			1
5	3						7	
3			4					
						1		
	5		2		1		3	9

©Sudoku.cool

SUDOKU HOW-TO GUIDE

1. Each block, row, and column must contain the numbers 1-9.
2. Sudoku is a game of logic and reasoning, so you should not need to guess.
3. Don't repeat numbers within each block, row, or column.
4. Use the process of elimination to figure out the correct placement of numbers in each box.
5. The answers appear on the last page of this newsletter.



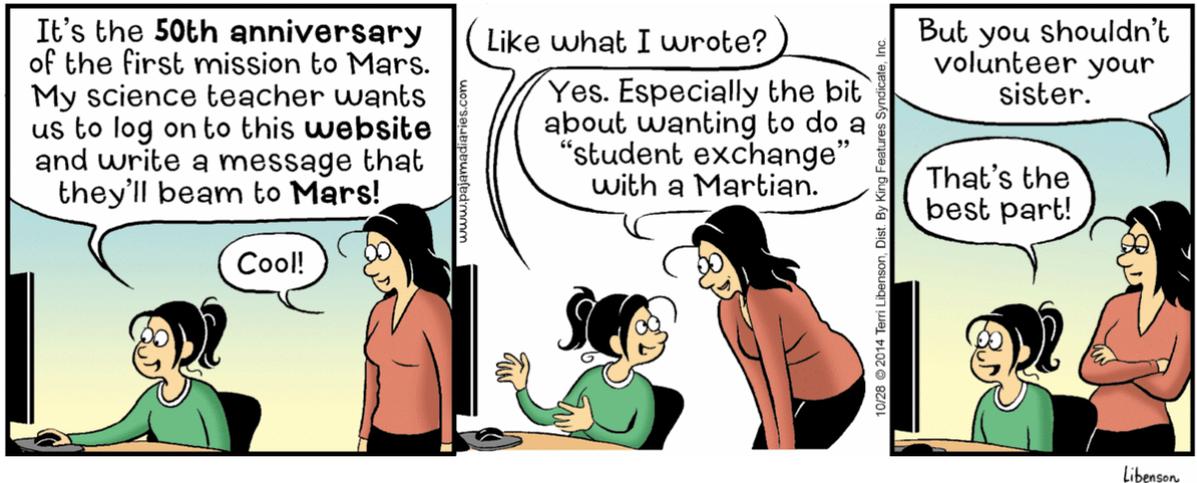
What the example will look like solved

2	4	8	3	9	5	7	1	6
5	7	1	6	2	8	3	4	9
9	3	6	7	4	1	5	8	2
6	8	2	5	3	9	1	7	4
3	5	9	1	7	4	6	2	8
7	1	4	8	6	2	9	5	3
8	6	3	4	1	7	2	9	5
1	9	5	2	8	6	4	3	7
4	2	7	9	5	3	8	6	1



“Surely, if we can land a spaceship on Mars, we can certainly put a voter ID card in the hand of every eligible voter.”

ANDREW YOUNG // American politician, diplomat, activist, and pastor from Georgia



DID YOU KNOW?

Mars has **two moons**, and their names are Phobos and Deimos.

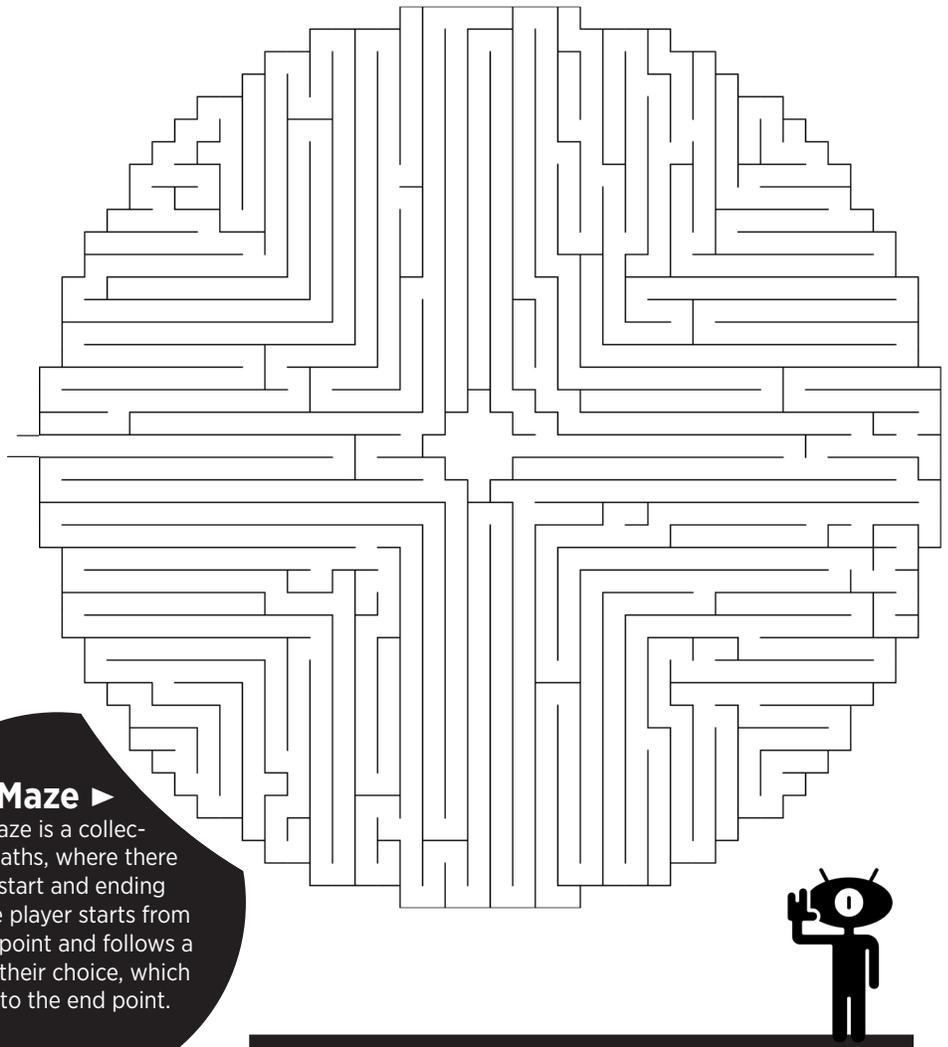
Mars can have huge **dust storms** which last for months and can cover the entire planet.

A day on Mars is 24.6 hours, not much longer than an Earth day, but a **year on Mars is 687 Earth days** long. That's almost twice as long as an Earth year. (Imagine only recognizing your birthday every two Earth years!)

The atmosphere on Mars is about **100 times thinner** than the Earth's atmosphere, and it has very little oxygen. You wouldn't be able to breath the Martian air and would need a spacesuit with oxygen when you went outdoors.

Mars is called the **Red Planet** because of all the iron in the soil. This iron rusts and as a result, makes the surface and atmosphere look red.

Source: Xxxxxxx



Maze ▶
This maze is a collection of paths, where there is both a start and ending point. The player starts from the start point and follows a path of their choice, which leads to the end point.



“I think space exploration is very important. I think there is very intelligent life on Mars. I believe that Martians are spying on us from the bottom of the ocean.”

ANNABELLA SCIORRA // American Actress

ART + CULTURE

Mars in a Million Years

BY EVELYN JUDY BUEHLER

pink dawn on red mars
as far off sun glimmers gold
more probes are coming

someday red roses
when the greenery arrives
and with it fresh air

blue lakes and swimming
with the clouds, winds and the rain
red planet next door

phobos and deimos
glow throughout a martian night
when skies are dreaming

WRITING PROMPT

In this poem, it seems the author is writing of a place she has never seen, and can only imagine. Maybe you have similar ideas or thoughts about a place you have heard of but never visited. Using this as a prompt, write or create a short essay, poem, blog, or illustration to describe an image or place you have in your mind.

Word Search

PHOBOS
MARTIAN
BRIGHT
MARS
SWIMMING
DREAMER
CREATIVE
RAINING
IMAGINATION
DEIMOS
GREENERY
GLIMMERING

R	B	R	I	A	Y	R	E	N	E	E	R	G	N
R	A	G	G	N	G	O	C	M	A	E	M	G	M
N	M	N	I	M	A	G	I	N	A	T	I	O	N
E	I	G	B	B	A	I	A	T	M	T	O	I	R
R	I	L	R	I	R	E	T	S	E	R	I	S	M
A	I	I	I	I	T	E	G	R	I	I	E	S	S
I	C	M	G	P	G	R	E	M	A	E	R	D	S
N	R	M	H	H	M	G	O	S	I	M	N	R	G
I	E	E	T	O	N	S	G	E	S	N	A	T	O
N	A	R	O	B	G	N	O	I	A	M	M	S	I
G	T	I	N	O	G	N	I	M	M	I	W	S	W
N	I	N	C	S	P	E	N	G	I	I	D	I	M
E	V	G	R	A	E	R	I	A	O	E	G	G	T
N	E	I	D	I	D	R	N	N	T	E	D	A	R

Resources

Listed below are a few organizations able to offer support, community, and engagement for persons who have been or are currently incarcerated. Please contact them with concerns or questions you might have. These organizations are primarily volunteer organized and operated, so please allow time for response. We would also love to hear from you. Feel free to write to us at **APAEP**.
1061 Beard-Eaves
Memorial Coliseum
Auburn University, AL 36849

OAA (Offender Alumni Association) Based out of Birmingham and able to offer resources for individuals currently incarcerated and those who have been released.
1000 24th Street South
Birmingham, AL 35205

FIGCN (Formerly Incarcerated College Graduate Network) supports persons who have been or are currently incarcerated and are involved or looking to get involved in post-secondary education (college). They offer access to job and internship opportunities, job fairs, and other educational resources.
600 Park Offices Drive
Ste 300 #54
Durham, NC 27709

Evelyn Judy Buehler became interested in poetry as a teenager. She writes “My late mother always had a big love of books, and she passed this love on to me. I was also very fortunate to have mentors who inspired me to write. Over the years, I’ve had my poetry and short stories featured in numerous anthologies. My poetry is inspired in large part by a great love of nature and the beauty in this world.”

SPACE

Astronauts on a Mars Mission Will Need to be ‘Conscientious’ to Work Well Together

BY ASHLEY STRICKLAND | CNN | November 24, 2020

The astronauts selected for the first human mission to Mars will need to have more than “the right stuff.” People on this very long mission will need to possess an eagerness for doing the right thing, too.

Conscientiousness, defined as “wishing to do what is right, especially to do one’s work or duty well and thoroughly,” has emerged as the key trait requirement for astronauts that will live and work on the surface of Mars millions of miles from Earth, according to a new study.

“Conscientiousness, an individual personality trait, can be thought of as a pooled team-resource,” said Julia McMenamain, the study’s first author and a doctoral student in psychology at Western University in Canada, in a statement. “The more conscientiousness a team is, the better they will likely be at accomplishing tasks.”

Simulating a mission to Mars

Currently, NASA is targeting the 2030s for the first human mission to Mars. Depending on the alignment of Mars and Earth for launch and landing and the duration of the mission on the Martian surface, this crew could spend five years together – not including training together beforehand.

To test what this crew dynamic might be like ahead of a real mission, researchers studied a team of five “astronauts” during an exercise analogous to a Mars mission. This event was hosted by the Austrian Space Forum in Oman in 2018. The Dhofar region of Oman is a good analog for the Martian environment in terms of isolation and extreme conditions.

Before, during and after the mission, the astronauts filled out surveys addressing the performance of their team and any team conflicts as well as their stress levels.

At the end of the mission, the astronauts rated themselves and each teammate. They also answered questions about their behavior in their respective roles and identified any counterproductive behaviors, including social loafing.

This particular team worked well together as a team, but the researchers were not surprised because they had prepared for their “mission.” The team was also supported by field and mission control teams.

Stress is a common negative factor that can influence team performance on Earth and in space. It’s distracting, increases anxiety, causes cooperative

difficulty, increases task overload and contributes to destructive emotions.

“Anyone who has worked on a team knows conflict amongst team members can harm team performance and make for a negative experience. When people argue about how to get things done, or get into personal disagreements, there is less time and energy left for completing tasks,” McMenamain said.

“Major issues caused by psychological distress and interpersonal problems don’t tend to show up until months or even years spent in an isolated, confined, and extreme environment, which highlights the need for longer-duration simulations,” McMenamain said.

Teamwork makes the dream work

Former NASA astronaut Mike Massimino spoke to CNN in September about the Netflix series “Away,” which focuses on an international crew leading the first human mission to Mars. Massimino served as a consultant for the show.

The show crew was most interested in hearing about the human side of being an astronaut, Massimino said. For example, they asked him about the

emotional aspects of leaving your family behind on Earth, the camaraderie between the crew and “what it’s like in your heart and soul, rather than the process,” he said.

Massimino was selected to be an astronaut in 1996. When asked about the traits that would be important for astronauts going to Mars, he said he feels that the selection process would be similar to the way NASA chooses astronaut candidates now for long-term spaceflight on the International Space Station.

“We’re looking for people who would be good candidates for long-duration spaceflight that get along, personalities that would let things roll. If things go wrong, you make mistakes because you’re not perfect, you need to be able to roll with it. They should be able to contribute and be a good positive crew member, not only for their crewmates, but the people helping them back on Earth.” ●



Analog astronauts Iñigo Muñoz Elorza and Carmen Köhler perform an experiment during the 2018 mission in Oman.

From OeWF/
Florian Voggeneder

SCIENCE

NASA Scientist | Yes, Humans Can One Day Live on Mars

BY FABIENNE LANG | *Interesting Engineering* | June 22, 2021

NASA's JPL Caltech science team has spent years analyzing and researching data about Mars. The hope is that there is life beneath the Red Planet's surface and that this will further scientists' understanding of planetary evolution and, ultimately, of our galaxy.

In an interview with *Interesting Engineering*, Jesse Tarnas, a planetary scientist at JPL Caltech and NASA post-doctoral fellow, discussed where we currently are in the search for life on Mars, the future of Martian habitation, and what that means for us here on Earth.

Tarnas explained that part of his motivation comes from, "The idea of us living in a future where humans are collectively inhabiting Earth in a much more honorable and sustainable way." He believes that many of the ways this could be possible, and how we could learn to do so, come from exploring space, and from learning to inhabit other planets, like Mars.

Tarnas is part of the Mars Rover Perseverance 2020 team that looks at the rover's data as it comes in. The team uses a blend of the rover's current data, orbital data gathered from planetary satellites floating above in orbit, and data from past rovers and landers to try and evaluate different aspects of the planet's history and the potential of using space resources.

To gather that data, the team works hard to optimize a solution for exploration that gets the maximum scientific benefit out of the rover, for example, by planning out the rover's next ports of call.

For instance, the Perseverance rover is currently in the Jezero Crater on Mars, looking for as diverse a rock sample as possible to bring to Earth for further analysis, which the team is hoping will be some time in the 2030s. The hope is that the samples will enhance our understanding of the kind of environments the crater supported in the past, as well as its potential for habitability, and whether or not those rocks could host biosignatures that give scientific evidence of past or present life.

Looking further beneath Mars' surface, Tarnas' research also involves working on the science behind the Mars subsurface, and the potential for life on the Martian subsurface if there's ground water. He pointed out that he's not looking for fossilized life but life that could currently exist there today if there's groundwater.

On Earth, the fact that we have living organisms has fundamentally affected the way the planet has evolved, and this, in turn, has impacted Earth's climate and atmospheric composition, among other factors.

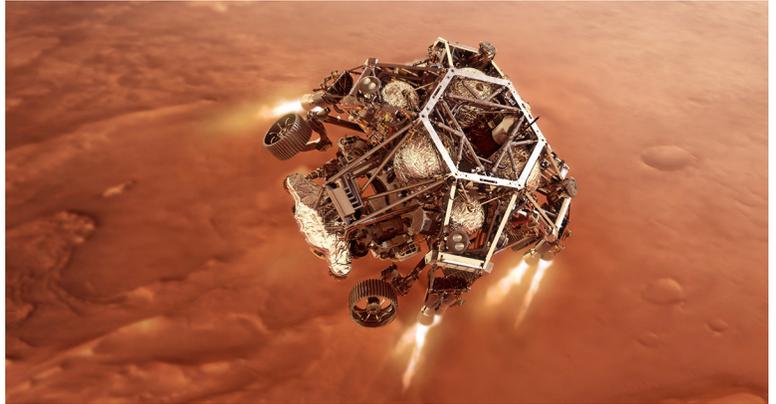


Illustration of the Perseverance rover firing up on Mars.

Image from NASA/JPL-Caltech

There are lots of different directions that planetary evolution can take if organisms are present where planets are habitable. "In fact, there are potentially many habitable objects in our solar system — largely in the subsurfaces of those objects — and so far, Earth is the only object with a habitable surface environment that we know of," said Tarnas.

We already know that there were past environments on Mars that could have harbored life, so really the question is, "Were they inhabited?" said Tarnas.

Answering that question could help us to determine the probability that life exists on planets where similar environmental conditions occur. This can then help researchers to determine the conditions necessary for life to exist in other worlds and the mechanisms by which biochemical systems involving rocks, water, and life interact together.

This would allow researchers to fundamentally map out a planet's evolution, depending on what types of gases it's producing, for instance.

Is it possible to inhabit the Moon or Mars?

"I definitely think it's possible," per Tarnas.

He continued by explaining that "We've had people living up on the ISS (International Space Station) now for decades. That's a controlled environment where you're constantly exposed to some pretty harsh conditions in space, but they're able to pull off doing it."

However, he also pointed out that there are constant resupplies sent up to the ISS from Earth. The more we can figure out ways to generate resources on site, and to use the materials from a planetary surface, the less necessary sending supplies from Earth becomes.

"I would love to set foot on another planet — lunar or Mars or somewhere."

PEGGY WHITSON // American astronaut

“The ISS has no on-site resources that the team can use, but if you’re on the Lunar or Mars surface, there are potential creative ways you can come up with to extract water, bulk materials, and to construct habitats,” Tarnas assured us.

For Tarnas, one of the things that really inspires him to work in this field is finding ways for humans to inhabit planets other than Earth. He is also motivated to do so in a way that’s based on the very nature of space exploration: Being frugal with your resources without wasting anything.

“You can’t just depend on extracting more resources from your environment, you have to make sure you’re reusing everything to the greatest extent possible, and I think there are a lot of lessons that can be learned from that process,” he stated.

Tarnas hopes that ethics can then be brought back to Earth to help us inhabit this planet in a more efficient and sustainable way. Exploring ways of sustaining life on Mars will eventually feed back into finding ways to sustain life on Earth.

In addition to developing rockets than are able to land and launch on Mars, like SpaceX’s Starship, Tarnas points out that extracting water is the keystone to enabling humans to inhabit the planet.

Water would not only be necessary for humans to be able to drink and breathe on a future Mars base, but it would also be used to develop fuel for the rockets that will land and launch from the base. The key is finding enough water on the planet for these uses.

There are a few different ways to do so based on the available data from Mars. Tarnas explains that we can either try and draw water from regoliths and hydrated minerals, which may contain a great deal of water in the form of molecules bound to other minerals in the soil, or we can try and collect it from nearby frozen ice-cements, some of which may be as much as 40% water.

However, before jumping in and choosing a focus for the first missions, there are many considerations to be made. There are a number of restrictions NASA and other space agencies have to adhere to, such as not taking too many big risks with as pricey a piece of equipment as the Perseverance rover.

Mars rovers have mobility limitations, but that doesn’t deter Tarnas and the team. “That’s what games are,” explained Tarnas. “We have these restraints and then we have to figure out a way to win the game given the restraints. So it’s just another rule that the game has that makes it exciting and interesting. But it does make you realize how much benefit you can get from mobile

human exploration on Mars and how much exploration from Mars can be done via helicopters like the Ingenuity.”

Ultimately, having humans inhabit Mars would hugely add to the exploration of the planet, just like we are able to do here on Earth. ●

Edited for space

RANDOM-NEST

Mars is Named After ...

BY JERRY COFFEY | UNIVERSE TODAY | JUNE 2008



Mars is named after the Roman god of war. Many believe that ancient peoples associated Mars with bloodshed and war because of its red color. The Romans were not the only society to associate the planet with bloodshed. The ancient Babylonians called it Nergal, after their god of fire, war, and destruction. In keeping with the planet’s association with the god Mars, its symbol is a circle with an arrow pointing outwards from its right corner. This is meant to represent Mar’s shield and spear.

That information is not nearly enough to satisfy anyone’s interest in the Red Planet, so here are a few interesting facts about Mars and its environs.

The largest mountain in the Solar System is on Mars. Olympus Mons is 27 km tall. It is a shield volcano that was able to erupt for millions of years because Mars does not have tectonic plate movement. This allowed the same volcanic hotspot to erupt undisturbed until the giant mountain was formed.

The chemical symbol for iron is the same as the astronomical symbol for Mars. This is fitting, since the planet gets its reddish appearance from the iron oxide in the dust on its surface.

A year on Mars lasts 686.98 Earth days or 1.88 Earth years. There are four seasons throughout the year like here on Earth, but each season is longer than a typical Earth season.

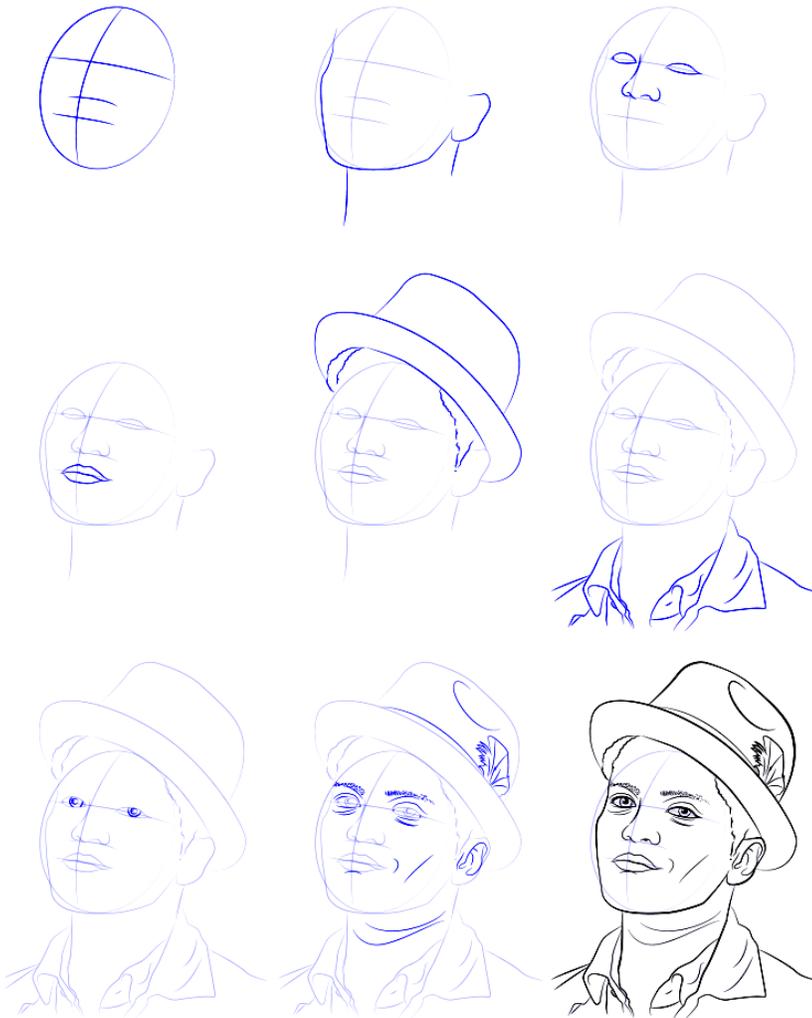
Mars is full of water. Not liquid water like we see here on Earth, but water ice under the surface and at the bottom of craters. There is even evidence that there may be ice inside of caves on the Martian surface. These deposits are safe from the solar radiation that bombards the surface, so they are able to stay in place.

Mars does not have a magnetic field at this time, but spacecraft have detected residual magnetism in rocks on the surface. That would suggest an active magnetic field millions, if not billions, of years ago. Scientist believe that the core of Mars has become too solid to rotate and is no longer capable of generating a dynamo effect. A dynamo effect is essential in producing a magnetic field.

<p>STANDARD conditions conditions</p>	<p>FEE du lmp du lmp NG</p>	<p>RD Placing AY</p>
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WORD PLAY A Rebus puzzle is a picture representation of a common word or phrase. How the letters/images appear within each box will give you clues to the answer! For example, if you saw the letters “LOOK ULEAP,” you could guess that the phrase is “Look before you leap.” *Answers are on the last page!*

HOW TO DRAW BRUNO MARS



drawingtutorials101.com



WORDS OF ENCOURAGEMENT

This week we brought you information about the planet Mars. As science progresses, we have the opportunity to witness things that I never thought would be possible in my lifetime. We have heard new and interesting sounds emitted from space and witnessed amazing images that brought us even more questions. Mars seems to be the most closely related planet to earth, as far as inhabitable, and I wonder if that is a good thing or a bad thing. What have we learned as a society that we will carry forward to a new land and how do we know we won't just repeat our past mistakes? I have faith in our younger generations to attempt to create a more equitable society, and also recognized the powers that be.

We hope you have enjoyed this edition of *The Warbler!* We look forward to bringing you more information in the weeks to come. Have a great week!!

Tammy, APAEP Editor

Answers

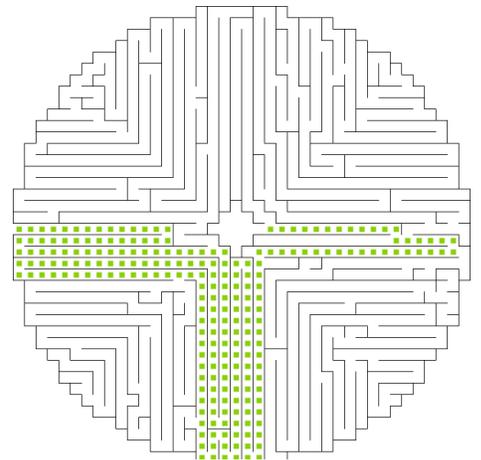
SUDOKU #257

6	2	9	5	3	7	1	4	8
7	4	1	6	2	8	9	5	3
3	8	5	1	4	9	7	6	2
9	6	4	2	8	5	3	1	7
2	5	3	7	6	1	8	9	4
8	1	7	4	9	3	5	2	6
5	3	2	8	1	4	6	7	9
4	7	8	9	5	6	2	3	1
1	9	6	3	7	2	4	8	5

SUDOKU #258

1	6	3	9	2	4	5	8	7
2	8	5	3	1	7	6	9	4
4	7	9	5	6	8	2	1	3
9	1	7	6	4	3	8	5	2
6	2	8	7	9	5	3	4	1
5	3	4	1	8	2	9	7	6
3	9	1	4	5	6	7	2	8
7	4	2	8	3	9	1	6	5
8	5	6	2	7	1	4	3	9

Page 5 MAZE



Rebus Puzzle

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1. Substandard conditions
2. Feeling down in the dumps
3. Playing in the backyard

UNTIL NEXT TIME !