

THE WARBLER

AN EDUCATIONAL WEEKLY



Dear Student, Artist, Thinker,

I think we can say that as long as there have been humans that the night sky has offered intrigue. What is it like up there? How did all those planets and moons and stars come to be? Are there other life forms? For us humans on this planet earth, the place we first wanted to reach in the sky beyond was our moon.

We are fascinated by the moon. People plant crops by the cycles of the moon. As you will learn inside, our moon impacts all kinds of creatures in the animal kingdom, us included. Who reading this has ever found themselves WIDE AWAKE in the middle of the night during a full moon? Maybe Galileo Galilei (1564-1642) had some questions about the giant orb that emerged in the early evening and descended with the rise of the sun, like the two heavenly bodies were tied on the same string. He made copious notes of observations which became a foundation for all modern astronomy. Galileo was inspired by the work of Nicolaus Copernicus (1473-1543). Both Galileo and Copernicus inspired Johannes Kepler, Issac Newton, and Albert Einstein, among many many others. All of these explorers, scientists, and thinkers inspired Carl Sagan, an astronomer who created the TV series *Cosmos*, bringing the wonder of astronomy into homes across the world starting in the early 1980s.

We are inspired to learn by questions and ponderings, but also by the people who have come before us, as well as those standing right next to us. The point being, it takes everyone to conceive of new ideas/understandings and to even try and find answers to wicked problems. (*A wicked problem is a social or cultural problem that is difficult or impossible to solve for as many as four reasons: incomplete or contradictory knowledge, the number of people and opinions involved, the large economic burden, and the interconnected nature of these problems with other problems.*)

At one point, people on this planet earth did not believe it possible to put a human into space, let alone on the moon. But someone, actually lots of someones, imagined it possible, and started a path to achievement. When I look at the moon, I see constantly shifting beauty and the incredible collective power of people to do the extraordinary.

We hope you enjoy this newsletter. Maybe it will inspire you to ponder more about the majestic immensity of our universe and where we are in it.

Kyes Stevens and the APAEP Team

“We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard.

JOHN F. KENNEDY // 35th President of the United States



WORDS INSIDE

FROM “ABOUT THE MOON” ...
satellite | an artificial body placed in orbit around the earth or moon or another planet in order to collect information or for communication; a celestial body orbiting the earth or another planet

regolith | the layer of unconsolidated rocky material covering bedrock

celestial | positioned in or relating to the sky, or outer space as observed in astronomy; belonging or relating to heaven; supremely good

FROM “THE MOON AFFECTS” ...
nocturnal | done, occurring, or active at night

circadian | recurring naturally on a twenty-four-hour cycle, even in the absence of light fluctuations

arachnid | an arthropod (an invertebrate [lacking a backbone] animal) of the class Arachnida, such as a spider or scorpion



ASTRONOMY

About the Moon | FROM NASA.GOV

The regular daily and monthly rhythms of Earth's only natural satellite, the Moon, have guided timekeepers for thousands of years. Its influence on Earth's cycles and ocean tides have been charted by many cultures in many ages.

Born in 1564, Italian astronomer Galileo Galilei's observations of our solar system and the Milky Way revolutionized our understanding of our place in the Universe. Galileo sparked the birth of modern astronomy with his observations of the Moon, phases of Venus, moons around Jupiter, sunspots, the news that seemingly countless individual stars make up the Milky Way Galaxy, and proof that the sun--not the earth, as commonly believed--was the center of our solar system. His discoveries laid the foundation for today's modern space probes and telescopes.

After learning of the "spyglass," a device that made far objects appear closer, Galileo soon figured out how it worked and built his own, improved version. In 1609, using this early version of the telescope, Galileo became the first person to record observations of the sky made with the help of a telescope. At the time, most scientists believed that the Moon was a smooth sphere, but Galileo discovered that the Moon has mountains, pits, and other features, just like the Earth.

The Moon moderates Earth's wobble on its axis, leading to a relatively stable climate over billions of years. From Earth, we always see the same face of the Moon because the Moon is spinning on its axis at the same speed that it is going around Earth (that is, it is in synchronous rotation with Earth).

The leading theory of the Moon's origin is that a Mars-sized body collided with Earth approximately 4.5 billion years ago, and the resulting debris from both Earth and the impactor accumulated to form our natural satellite. The newly formed Moon was in a molten state. Within about 100 million years, most of the global "magma ocean" had crystallized, with less-dense rocks floating upward and eventually forming the lunar crust. The early Moon may have developed an internal dynamo, the mechanism for global magnetic fields for terrestrial planets.

Nearly the entire Moon is covered by a rubble pile of charcoal-gray, powdery dust and rocky debris called the lunar regolith. Beneath is a region of fractured bedrock referred to as the megaregolith. With too sparse an atmosphere to impede

impacts, a steady rain of asteroids, meteoroids, and comets strikes the surface. Over billions of years, the surface has been ground up into fragments ranging from huge boulders to powder.

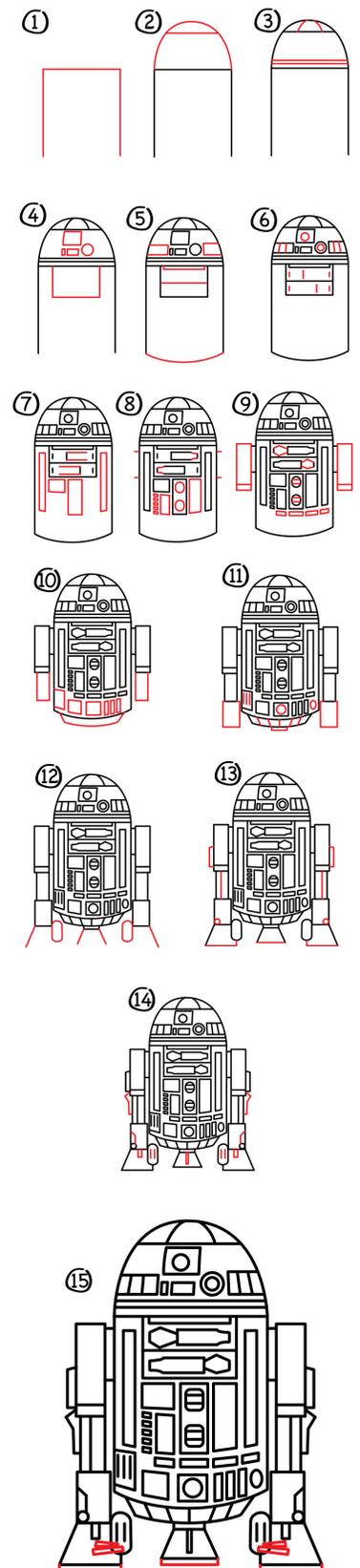
The light areas of the Moon are known as the highlands. The dark features, called maria (Latin for seas), are impact basins that were filled with lava between 4.2 and 1.2 billion years ago. These light and dark areas represent rocks of different composition and ages, which provide evidence for how the early crust may have crystallized from a lunar magma ocean. The craters themselves, which have been preserved for billions of years, provide an impact history for the Moon and other bodies in the inner solar system.

The Moon was first visited by the Soviet Union in 1959, and, as of April 2019, seven nations have followed. From 1961-1968, the US sent three classes of robotic missions to prepare the way for human exploration: the Rangers (impact probes), the Lunar Orbiters (surface mappers), and the Surveyors (soft landers).

The first human landing on the Moon was on July 20, 1969. During the Apollo missions of 1969-1972, 12 American astronauts walked on the Moon and used a Lunar Roving Vehicle to travel on the surface and extend their studies of soil mechanics, meteoroids, lunar ranging, magnetic fields, and solar wind. The Apollo astronauts brought back 842 pounds of rock and soil to Earth for study.

After a long hiatus, lunar exploration resumed in the 1990s with the U.S. robotic missions Clementine and Lunar Prospector. Results from both missions suggested that water ice might be present at the lunar poles, but a controlled impact of the Prospector spacecraft produced no observable water.

In 2009, the U.S. began a new series of robotic lunar missions with the joint launch of the Lunar Reconnaissance Orbiter (LRO) and Lunar Crater Observation and Sensing Satellite (LCROSS). In 2011, a pair of repurposed spacecrafts began the ARTEMIS (Acceleration, Reconnection, Turbulence, and Electrodynamics of the Moon's Interaction with the Sun) mission. In 2012, the Gravity Recovery and Interior Laboratory (GRAIL) twin spacecraft studied the Moon's gravity field and produced the highest-resolution gravity field map of any celestial body. In March 2019, NASA announced plans to send U.S. astronauts back to the surface of the Moon by 2024. ●



HOW TO DRAW R2D2

Source: ArtHubForKids.com

HISTORY

These Six Big Moon Mysteries Remain Unsolved

BY NEEL V. PATEL | *Popular Science* | July 18, 2019

ORIGINS “The fundamental question of how the moon formed, and how that relates to the Earth, is really the most important of the unknowns,” says Noah Petro, a scientist for the Lunar Reconnaissance Orbiter.

You can thank Apollo 11 for giving us our first insight into that mystery. The mission brought back 50 pounds worth of moon rocks and initiated decades’ of investigations focused on learning how the moon formed and evolved.

Scientists used them to come up with the strongest existing hypothesis: that the moon began as a magma ocean—a giant ball of molten lava—orbiting Earth. This in turn led, decades later, to the hypothesis that the moon was borne out of Earth itself, when a giant impact with a Mars-sized object ejected debris into orbit. Further studies of the rock also show the material that formed the moon also formed our own planet.

WATER There’s water on the moon, and we’re not just talking about a little sprinkling of interstellar H₂O—we’re talking about troves and troves of water-ice that could be sitting just beneath the surface, especially at the lunar poles. This water could be harvested to help generate a new form of spacecraft fuel or used to help sustain a future lunar colony.

How did all that water-ice get there? Nobody really knows yet. Theories range from outgassing reactions that pushed water embedded in the interior out toward the surface, to meteorite impacts and cometary bombardments that delivered the water from outer space, to chemical interactions catalyzed by solar wind.

MOONQUAKES There are earthquakes happening on the moon pretty frequently—otherwise known as moonquakes. Apollo-era seismometers installed on the surface measured these shakes, which shows us that the moon is an active body, not the stale lifeless rock many have assumed.

We’re already aware of a few phenomena that cause these quakes, like thermal expansion, tidal stress induced by Earth’s gravity, and meteorite impacts. But with such limited data, we’re not entirely sure. Moreover, there are other, shallower moonquakes without any obvious cause, which seem to be occurring more recently than the others.

TIDAL LOCKING There’s a reason we’ve only ever seen one side of the moon. It’s tidally locked, which means only one side of it faces us because it rotates in exactly the same time as it takes to orbit the Earth. This is not

uncommon for moons in our solar system, but it’s still unclear exactly when this occurs, what conditions encourage it, and how it happens. In Noah Petro’s mind, this mystery of tidal locking harkens back to the question of the origin of the moon, and what was happening in early lunar history. It’s another piece of the 4-billion-year puzzle.

SOUTH POLE-AITKEN BASIN ANOMALY One enigma that’s sprung up only recently has to do with the discovery that something massive is lurking underneath the south pole of the moon, below the largest impact crater ever made in the entire solar system. Scientists have no idea what it could be, but it’s certainly big enough to affect the gravitational force exerted by the moon’s mass.

Predominant theories suggest it’s some sort of heavy metal body from a projectile that impacted the surface a long time ago, but this is far from certain. And it’s hard to understand what this mass is doing suspended underground: We know the moon’s interior is still active to some degree, and heat should have caused this mass to shift around instead of staying trapped like Hans Solo in carbonite.

VOLCANOES We don’t see volcanoes erupting on the moon these days. But research suggests lunar volcanoes were active within the last 100 million years, and on the scale of the cosmos, that may as well have been last week. The problem is, we just don’t know enough about volcanism on the moon to determine what this activity was actually like and what it did to the moon’s geology. Different lunar rocks and observations based on orbiter imaging show that some surfaces seem younger than others, and we’re not sure why.

It is time to plan a return trip and start solving some of these mysteries. Especially because the moon is really just a small step toward the giant leap of unraveling the origin of everything we know. ●



ALL THE ELECTRICITY WAS OUT IN TOWN AND NONE OF THE STREET LIGHTS OR TRAFFIC SIGNALS HAD POWER. A DARK LIMOUSINE WAS CRUISING DOWN THE NEWLY PAVED BLACKTOP, WITH ITS HEADLIGHTS OFF. A YOUNG BOY DRESSED TOTALLY IN BLACK (WITH NO REFLECTORS) STEPPED OUT TO CROSS THE STREET. THE MOON WASN'T OUT AND THE BOY HAD NO FLASHLIGHT, YET THE DRIVER STOPPED TO LET THE BOY CROSS THE STREET. **HOW DID THE DRIVER SEE THE BOY?**

www.riddles.com

🔗 Edited for space.

MATHEMATICS

Sudoku

#9 PUZZLE NO. 4055342

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

©Sudoku.cool

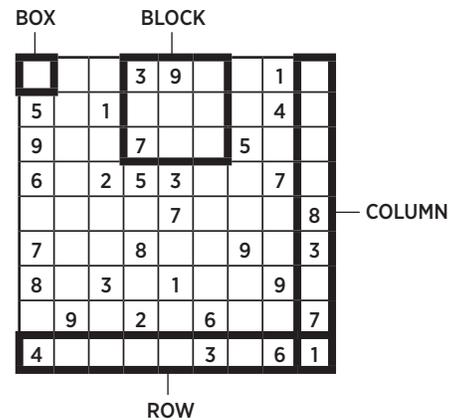
#10 PUZZLE NO. 8269107

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

©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



“We are going to the moon — that is not very far. Man has so much farther to go within himself.”

ANAÏS NIN // American-French-Cuban essayist

THE MOON BY NUMBERS

Distance from the Earth: About **239,000 miles**.

Year (time to orbit the Earth) = About **27 Earth days**. Day = About 27 Earth days.

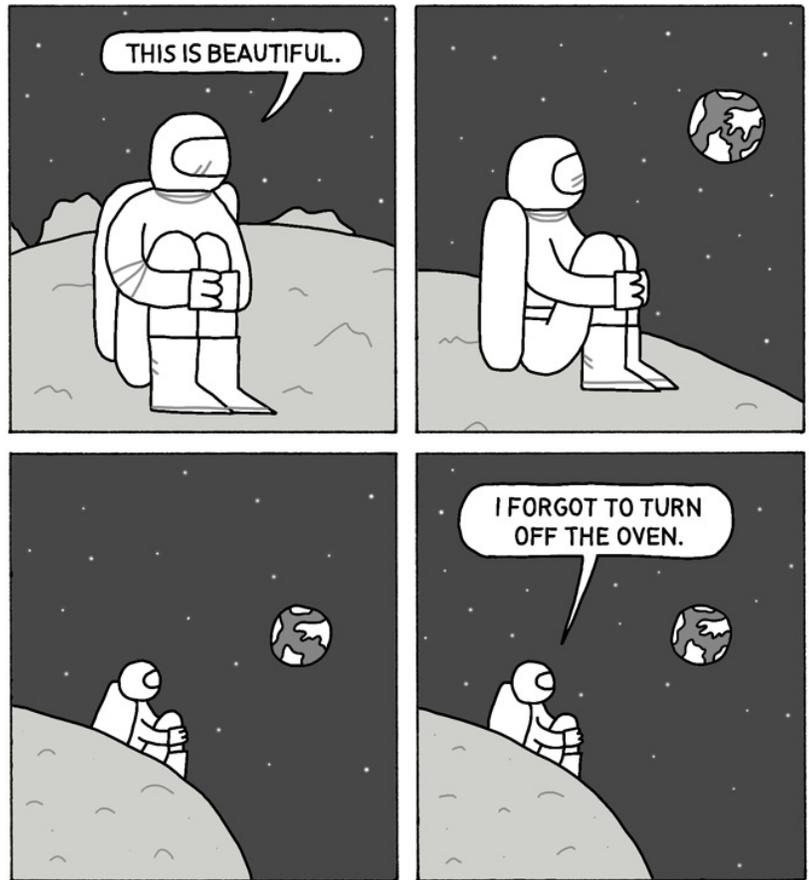
Minimum temperature: **-387 degrees Fahrenheit**.
 Maximum temperature: **253 degrees Fahrenheit**.

Mons Huygens is the **tallest mountain** on the Moon at over 4700 metres tall, about half the height of Mt Everest (8848 metres).

The Moon has only been walked on by **12 people**; all American men. The first footprints on the moon will remain there for a million years.

Objects that have been **left on the moon** by astronauts: nail clippers, a hammar, urine collection samples, a gold olive branch, a color television, a camera and tripod, ear plugs, golf balls, a Bible, a family photo, a helmet, a bar of soap, and two one-hundred dollar bills.

Sources: NASA and "100 Interesting Facts About the World to Blow Your Mind" by Alec. ATI (All Things Interesting) 2019.



MOONBEARD.COM

WARANDPEAS.COM

Idiom

“Once in a blue moon”

Meaning Very rarely.

Origin Ask a person the question ‘What is a blue moon exactly?’ and you are likely to get one of three answers:

- 1) Duh. 2) It’s the second full moon in a calendar month. 3) It’s when the moon looks blue.

Let’s start with #2: Very occasionally, the moon actually does appear to be blue. This sometimes occurs after a volcanic eruption, like that of Krakatao in 1883. Dust particles in the atmosphere are normally of a size to diffract blue light, making the moon appear reddish at sunset. Larger volcanic dust particles diffract red light, making the moon appear bluish.

To explain #3, we have to follow a long trail of etymological research, leading back to an American amateur astronomer called James Pruett. Since 1819, The Maine Farmers’ Almanac has listed the dates of forthcoming blue moons. The compilers of the almanac had their own definition of what blue moons are. This derives from the fact that lunar and calendar months aren’t quite the same and that some years have 13 full moons. In a typical 12-moon year, the moons all have names, like the familiar ‘Harvest Moon’, ‘Hunter’s Moon’ etc. In a 13-moon year the extra moon is, somewhat arbitrarily, deemed to be the third moon in the season that has four rather than the usual three, and is called the ‘Blue Moon’. The aforementioned James Pruett read an edition of the Maine Farmers’ Almanac, but misinterpreted the system and printed the ‘second full moon in a month’ version in a 1946 edition of the Sky & Telescope Magazine. Two full moons in a month isn’t really all that rare an occurrence - it happens approximately every three years. Despite it being both inaccurate and coined by mistake, Pruett’s is now widely accepted as a definition of ‘blue moon’.

Source: *PhraseFinder*

ART + CULTURE

Haiku

BY BASHŌ | VARIOUS TRANSLATIONS

Moon woke me up
 nine times
 —still just 4 a.m.

*

Whore and monk, we sleep
 under one roof together,
 moon in a field of clover

*

Poverty's child -
 he starts to grind the rice,
 and gazes at the moon.

*

Clouds come from time to time -
 and bring to men a chance to rest
 from looking at the moon.

*

Black cloudbank broken
 scatters in the
 night ... Now see
 Moon-lighted mountains!

*

tonight
 I have no time to sleep
 Moon-viewing

Matsuo Bashō, born 松尾 金作, was the most famous poet of the Edo period in Japan. Today, Bashō is recognized as the greatest master of haiku. A traditional Japanese haiku is a three-line poem with seventeen syllables, written in a 5/7/5 syllable count. Often focusing on images from nature, haiku emphasizes simplicity, intensity, and directness of expression.

WRITING PROMPT

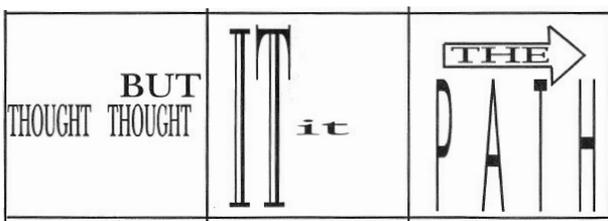
A syllable is a single sound/beat in a word or part of a word — it's based on how many different vowel sounds (a, e, i, o, u) you have to make. For example, "kid" has 1 syllable/beat, but "child" has 2: [chi] and [ild], same as "children": [chil] and [dren]. "Neighbor" has 2, and "neighborhood" has 3. As mentioned in the poet's bio, a haiku is a poem of 3 lines that use 5, 7, then 5 syllables. Try writing a poem in this form.

DON'T WORRY IF YOU HAVE TROUBLE COUNTING SYLLABLES — IN SOME CASES, A PERSON SIMPLY CAN'T HEAR THE DIFFERENCES!

Word Search

P	E	E	S	M	E	G	N	L	N	S	E	C	P
G	R	F	V	O	R	E	O	O	N	K	N	O	M
U	O	N	I	Z	N	E	O	A	T	E	K	I	P
L	B	E	E	S	R	M	N	B	D	S	O	E	E
C	R	T	W	I	O	E	O	C	O	N	E	N	N
L	O	C	I	O	G	H	D	L	E	L	N	R	O
O	K	S	N	L	N	W	I	N	S	E	E	O	N
V	E	C	G	G	A	L	N	R	U	L	H	O	G
E	N	L	H	N	G	P	N	O	N	N	E	N	L
R	R	I	P	I	N	L	E	O	S	E	Z	A	G
O	C	R	E	K	L	R	N	F	G	W	O	N	T
R	E	D	M	O	M	D	O	K	R	I	C	E	L
O	C	L	I	O	G	T	N	G	L	I	R	E	F
I	N	I	T	L	O	S	C	A	T	T	E	R	S

- | | | | |
|-------|---------|----------|--------|
| MOON | BROKEN | SCATTERS | UNDER |
| RICE | LOOKING | CHILD | GAZES |
| MONK | REST | TIME | CLOVER |
| SLEEP | ROOF | VIEWING | |



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!*

INTERVIEW

Thousands of Tardigrades are Stranded on the Moon After a Failed Lunar Mission

ALL THINGS CONSIDERED | August 8, 2019

ARI SHAPIRO, HOST: There may be life on the moon, and humans may have put it there. In April, a failed lunar mission crash landed and spilled its cargo of a few thousand tardigrades. Tardigrades are tiny, adorable to some, and one of the toughest creatures around. Daniel Oberhaus wrote about the failed lunar mission for WIRED Magazine.

SHAPIRO: I'm embarrassed to say I'd never heard of a tardigrade before this story. What are they?

OBERHAUS: So these are microorganisms. They're a little under a millimeter in size. They have four pairs of legs. And a lot of people think they look like bears, hence the name water bear. They are found everywhere on Earth, from jungles, to the top of the Himalayas, to the Antarctic. And as you had mentioned, they can survive pretty much any sort of environment, from extremely hot temperatures to extremely cold temperatures. They can survive in the vacuum of space. They're pretty much indestructible.

SHAPIRO: And how did a few thousand of them potentially end up on the moon?

OBERHAUS: A non-profit organization called the Arch Mission Foundation sent a lunar library to the surface of the moon with the Beresheet lander.

SHAPIRO: The Beresheet lander. This is an Israeli mission.

OBERHAUS: Yes. And on this lander, there is a disc about the size of a DVD made of several ultrathin layers of nickel. And sandwiched in between those layers of nickel are thin layers of epoxy that contain DNA from humans in the form of hair follicles and blood samples as well as several thousand tardigrades.

So the idea here was to — in addition to all the digital information stored on the layers of nickel — was to preserve biology from Earth.

SHAPIRO: And if the tardigrades did survive this crash landing, are they still sandwiched in this kind of DVD type thing?

OBERHAUS: That's the hope. No one knows for sure. They did some mathematical modeling after the crash and determined that in all likelihood, this disc was actually probably the only thing that survived the crash. So there is a pretty good chance that there are tardigrades on the moon.

SHAPIRO: Does that matter? I mean, are they going to, like, breed and take over the moon? I mean, is it some kind of moon pollution? Like, what's the importance of this?

OBERHAUS: Well, there's no reason to worry about

tardigrades becoming our lunar overlords anytime soon. They're in a state called cryptobiosis, which is where they actually shed all the water in their cells. They tuck in their legs, and they almost turn into a



glass. And they can last for decades in this form. But they can't reproduce. Their metabolism all but stops. So they're there. They're kind of alive depending on your definition of life, but until someone brings them back to earth, they're not going to be moving around on the moon.

SHAPIRO: OK, so this seems relatively harmless. But this was a privately funded lunar mission. What's to stop some other billionaire from crash landing something on the moon that's not as harmless as a tardigrade and could actually do real damage?

OBERHAUS: I think that's a concern for a lot of people. The fortunate thing, I suppose, is that the moon is considered a relatively low risk for this sort of thing. When the Apollo astronauts went there 50 years ago, they left dozens of bags of human excrement on the surface of the moon, so they were the first to actually leave DNA there.

But I think looking to the future, this is something we need to discuss with private missions to places like Mars where introducing DNA into that environment could potentially contaminate the science that they want to do to perhaps find traces of life. So, think it's a great entryway for this discussion about who gets to determine what is placed on other celestial bodies.

SHAPIRO: Well, compared to bags of human excrement, I think I would prefer a few thousand tardigrades. ●

Tardigrades are the world's most resilient creatures.



THEY TOUCH THE MOON, BUT NOT THE SUN. THEY TOUCH THE MOUNTAINS, BUT NOT THE SKY, THE SEAS, OR THE CLOUDS. **WHAT ARE THEY?**

Source: <https://old.reddit.com>

🗨 Edited for space.

SCIENCE

The Moon Affects the Nocturnal World of Animals

BY LAURA POPPICK | NBC News | July 3, 2013

Plenty of myths and fables have tried to explain the loony effects the moon seems to have on animals, but these are not proven by science (for example, wolves do not really howl at the moon). Now, in a comprehensive review, scientists have found direct and indirect ways the lunar cycle drives animal behaviors.

Those who believe in true lunacy — the craziness stirred in animals by the lunar cycle — will be disappointed to learn that many animals simply adjust their behaviors in response to changes in light levels and tides, rather than to anything supernatural. Still, other behaviors do follow more mysterious circadian clocks controlled by the lunar cycle.

“The moon may act as a synchronizing cue between individuals, as a cue for other environmental parameters — spring tides, food availability — or simply allow animals to use vision,” said Noga Kronfeld-Schor, a biologist at Tel Aviv University and co-author on the report. “The behaviors it affects are wide and diverse, ranging from long-term processes such as timing reproduction and migration to direct response to light levels.”

In order to understand the broad effects of natural moonlight on nocturnal creatures, the team organized the effects into the categories of reproduction, communication and foraging/predation, and addressed each of these categories across a variety of animal groups.

One of the most stunning behaviors the team covers in their report is a moon-induced mass-spawning event that occurs every December in Australia’s Great Barrier Reef. In other cases, the moon’s effects are more mundane. Communication patterns change with increased light availability at night for certain species of birds. Eagle owls use white throat feathers to communicate with other birds at night, and tend to increase this activity during nights surrounding the full moon when their feathers are more visible. Other owls, on the other hand, avoid activity during full moons, a behavior that scientists think helps them avoid predators.

Reducing activity to avoid predation during periods of brighter light is a common way that land animals react to the lunar cycle. Marine animals, however, often react more to the opportunities associated with changes in tides. Some species of sea turtles wait for the full moon’s high tide to ride waves onto shore and lay their eggs far up on the beach.

Still, many details of the moon’s effects on animal behavior remain largely unknown. “As humans, we rely on vision and are less aware of the nocturnal world,” said Kronfeld-Schor. “Many of us are afraid of night

creatures, and it is more difficult to see and study them.”

The team hopes their review will provide a stepping stone for future research in nocturnal life.

6 WILD WAYS THE MOON AFFECTS ANIMALS

1) European badgers tend to raise their leg up when they pee more often during the new moon (when the moon is between the Earth and sun so the side facing us receives



RANDOM-NEST

Shoot for the Moon! How to Set Goals (and Make them Happen)

ADAPTED FROM ACTIONFORHAPPINESS.ORG AND ENTREPRENEUR.COM

- 1. Decide on a goal.** Think of something you want to do or work towards. This can be as small as meditating every day (a short-term goal) or as large as starting your own business (a long-term goal).
- 2. Write it down.** Include as many details as you can.
- 3. Tell someone.** Telling someone we know about our goals also seems to increase the likelihood that we will stick at them.
- 4. Break your goal down.** This is especially important for big goals-- what steps will you need to take?
- 5. Plan your first step** and then take action toward accomplishing it.
- 6. Keep going.** Even if you fall short of your own expectations or encounter unexpected hurdles, don’t give up!

Helpful tips

- Find your daily energy peak and schedule tasks accordingly. This will not be the same for everyone. Some people might feel most motivated first thing in the morning, or right before bed.
- Work on one short-term goal at a time. Though multitasking might seem productive, it often slows people down and produces poor results.
- Track your progress! It will be helpful to see how far you’ve come.
- Celebrate each small step. Every accomplishment brings you that much closer to achieving your goal.
- Eliminate distractions! Find what clogs your focus and figure out how to avoid those things.
- Find your motivation! You might have to dig deep for this, but if you can find a good enough reason for working toward your goals, then it will be so much easier to keep going even when it gets hard or seems impossible.

Final Thoughts

Mark Twain once said, “If it’s your job to eat a frog, it’s best to do it first thing in the morning. And if it’s your job to eat two frogs, it’s best to eat the biggest one first.” It might help to apply this advice while you shoot for the moon, as well.

no direct sunlight) than the full moon, which makes them pee-shy. Badgers use this move to mark territory, especially when they are getting ready to mate. And the new moon seems to be prime time for badger mating, with scientists suggesting the increased darkness provides the badger couple protection from lurking predators. Pairs of badgers can take up to 90 minutes to mate, and become easier targets during that time. So while the pee pattern may seem to be a loony habit, it appears to have a practical root in self defense.

2) On a particularly moonlit night each December, corals off the coast of Australia synchronize the most massive release of egg and sperm on Earth. While a variety of environmental factors likely work together to trigger the event — including temperature, salinity and food availability — researchers have found that levels of moonlight seem to play a major role: the event always occurs on or near a full moon.

By synchronizing spawning, the corals increase the odds that free-floating sperm will contact and fertilize eggs. Hundreds of coral species do this around the world, but the events in Australia are the largest, visible from shore as undulating pink plumes.

3) Cats and dogs seem to find more mischief and get injured more often during the full moon. One study investigating this correlation — frequently noted by veterinarians and other workers in animal care — found a 23 percent increase in cat visits and 28 percent increase in dog visits to emergency rooms on nights when the moon was fuller. The researchers were unable to determine why, exactly, pet behavior becomes more precarious during this time, but suggested that it could simply result from pets spending more time outside at night when the moon is brighter.

4) Doodlebugs — the larvae of dragonfly-like insects called antlions — scurry around sandy environments in search of

places to catch prey, leaving winding doodles in their paths. Once they find their spot in the sand, they dig funnel-shaped holes in which they sit and wait for prey to fall in.

Doodlebugs dig new traps every day, and researchers have found that these holes get bigger during full moons. This surge in hole size may be the result of their insect prey becoming more active under the light of the full moon, making the extra effort of digging larger holes pay off. However, researchers have found that this habit persists even within complete darkness of a laboratory, suggesting that other components of the lunar cycle play a role as well.

5) Lions hunt best at night, but will sometimes kill during the day, especially after a full moon. Research has shown that lions consume less food during moonlit nights, possibly because prey is less active during these times. To make up for a slow-night's hunt, the lions must find extra fuel during the day following a particularly well-lit night.

Another study found that African lions are more likely to attack and kill humans in the days right after the full moon. The phenomenon is likely due to the gap in darkness between sunset and moonrise that happens in the days after the full moon. During these dark evenings, more people are likely to be outdoors still, the researchers suspect, accounting for the lion-human run-ins.

6) The UV rays of moonlight react with a protein in scorpions that makes them glow in the dark. These arachnids seem to react to glowing the way that people react to blushing: the brighter the signal, the deeper they try to retreat. They tend to be more active during the new moon, and seek shelter later in the lunar cycle. Researchers are still not quite sure why this is, but some suggest prey may be more available during darker nights. And with less prey roaming about during the full moon, the scorpions shy away from the spotlight. ●

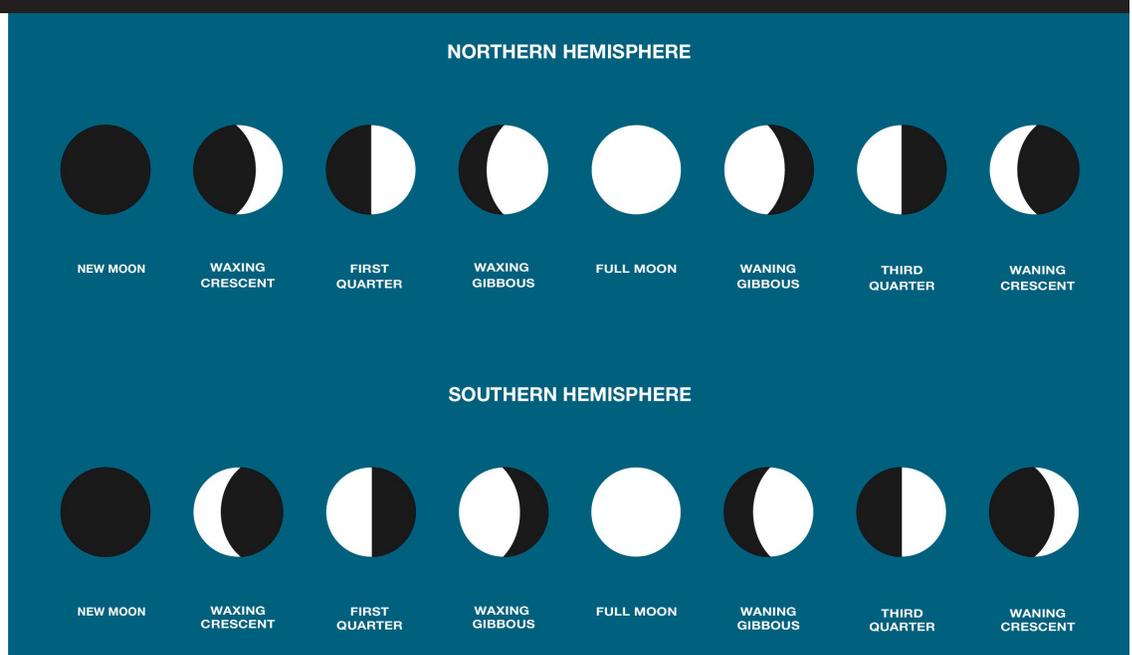


AT NIGHT THEY COME WITHOUT BEING FETCHED, AND BY DAY THEY ARE LOST WITHOUT BEING STOLEN. WHAT ARE THEY?

Source: riddles.nu/topics/space

Edited for space.

PHASES OF THE MOON



Words of Encouragement

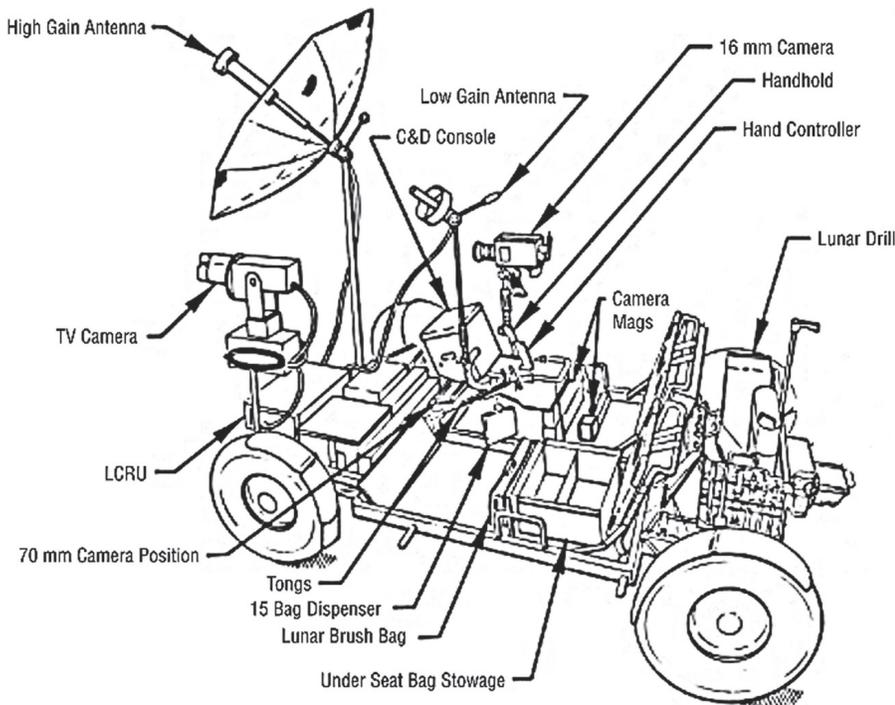
I was recently struck by these words of author Arundhati Roy:

“Historically, pandemics have forced humans to break with the past and imagine their world anew. This one is no different. It is a portal, a gateway between one world and the next.”

As people, change is very hard work, made more challenging by the fact that we first must bear witness to our own faults. As a society, I think we are at one of these crossroads now. With this in mind, the pandemic is shining a painfully bright light on the ways in which our society is failing. I will leave you with the hope that as these weaknesses are exposed, we will begin to see ways in which our society could grow that seemed impossible before.

Alexa

LUNAR ROVER VEHICLE



Answers

SUDOKU #9

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

SUDOKU #10

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



Brainteasers

Page 3 The driver saw the boy because it was during the day-light hours.

Page 6 Rebus Puzzle:

1. But on second thought
 2. The tall and short of it
 3. The straight and narrow Path
- Page 7** Your lips (when you say moon and mountain, your lips touch, but not with sky, seas, or clouds).

Page 9 Stars.

Send ideas and comments to:

APAEP
1061 Beard-Eaves
Memorial Coliseum
Auburn University, AL 36849

