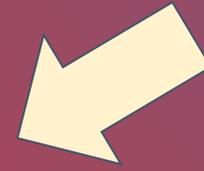


MARS
PERSEVERANCE

*Please note: This webinar is
being recorded. We will begin
at 8:30 a.m. PT*



Mission to Mars Student Challenge for Summer Camps



Leslie Lowes and Ota Lutz

Education Office

NASA Jet Propulsion Laboratory

April 29, 2021



Let's Learn about Each Other

POLLS

What are the grade levels of the youth in your program?

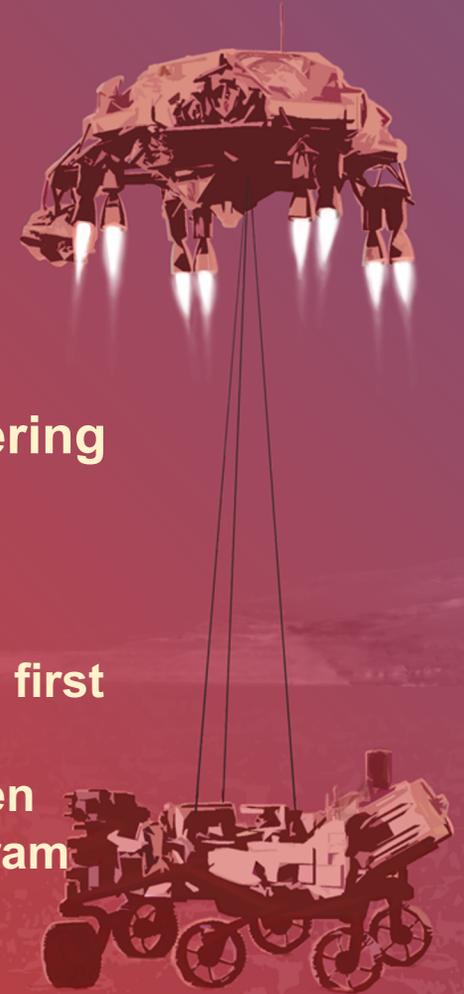
- K-2
- 3-5
- 6-8
- 9-12

What kind of program are you running this summer?

- In-person
- Virtual/At-home
- Both

What is your experience delivering STEM activities?

- I'm thinking about trying it
- I'm planning on this being my first time
- I've done it every now and then
- It's a regular part of our program
- I've done it for several years



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The Big Idea

Lead students in designing and building a mission to Mars with an education plan and resources from NASA.

<http://go.nasa.gov/mars-challenge>



Goals

- Engage youth in all 50 states
- Involve underserved communities
- Raise awareness of the ‘teachable moment’ of landing on and exploring Mars



Bringing Mars Into Summer Camps

NASA invites educators and households to participate in its Mission to Mars Student Challenge.

Participants have access to:

- A guided **7-week plan** for elementary, middle, and high school-aged youth with hands-on activities for learning about Mars, planning a mission, launch and landing, and exploring the surface
- Series of 1-hour webinars in April-June to show leaders how to guide activities from each phase of the challenge
- Series of youth Q&A with Mars 2020 Subject Matter Experts from the team in June-July



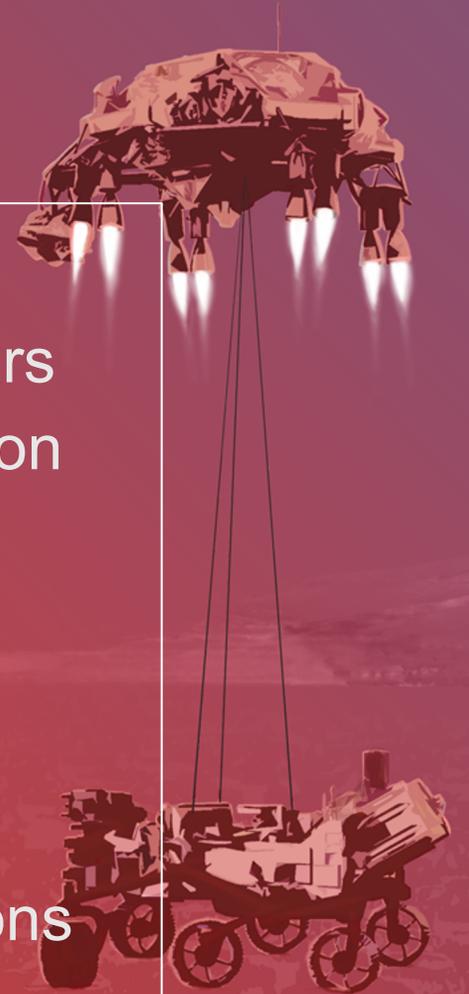
How We Will Help You

For Leaders:

- April 29: Learn About Mars
- May 13: Plan Your Mission
- May 27: Design Your Spacecraft
- June 10: Surface Operations
- June 17: Sample Handling
- July 15: Mid-Summer Check-in

For Youth:

- June 23: Learn About Mars
- June 29: Plan Your Mission
- July 8: Design Your Spacecraft
- July 14: Launch Your Spacecraft
- July 19: Land on Mars
- July 27: Surface Operations



STEM Enrichment Activities

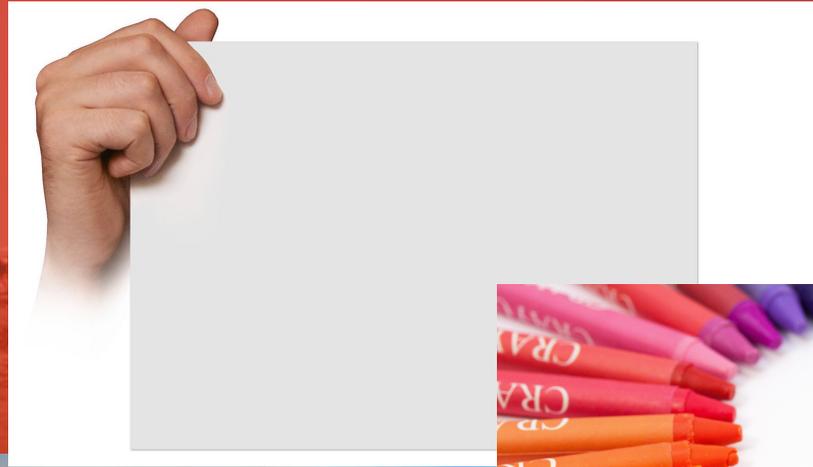


Require:

- Enthusiasm
- Craft-y-ness
- Like to move
- Wanna learn something
- Off-the-shelf materials
- And as always: safety!



Do you have your supplies?

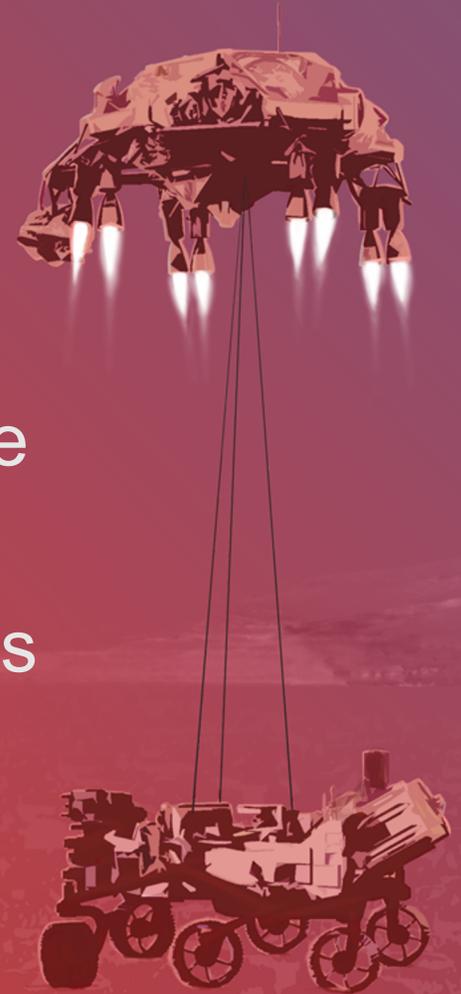


Type in chat:

A: Got 'em right here

B: I can get them together in 2 minutes

C: Supplies? What supplies?



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Why focus your program on Mars now?

Mars 2020 mission timeline



Landing site shortlist
February 2017

Design, build, and name the rover:

Launch
July 30, 2020

Cruise to Mars
Late 2020/
early 2021

Landing on Mars
February 18, 2021

Surface Operations
2021-2022

Perseverance

Helicopter technology demo:
Ingenuity



UNDERSTANDING THE POSSIBILITIES FOR LIFE ON MARS

ANCIENT MICROBIAL LIFE

**Objective A:
Geology**



**Objective B:
Astrobiology**



**Objective C:
Sample Caching**



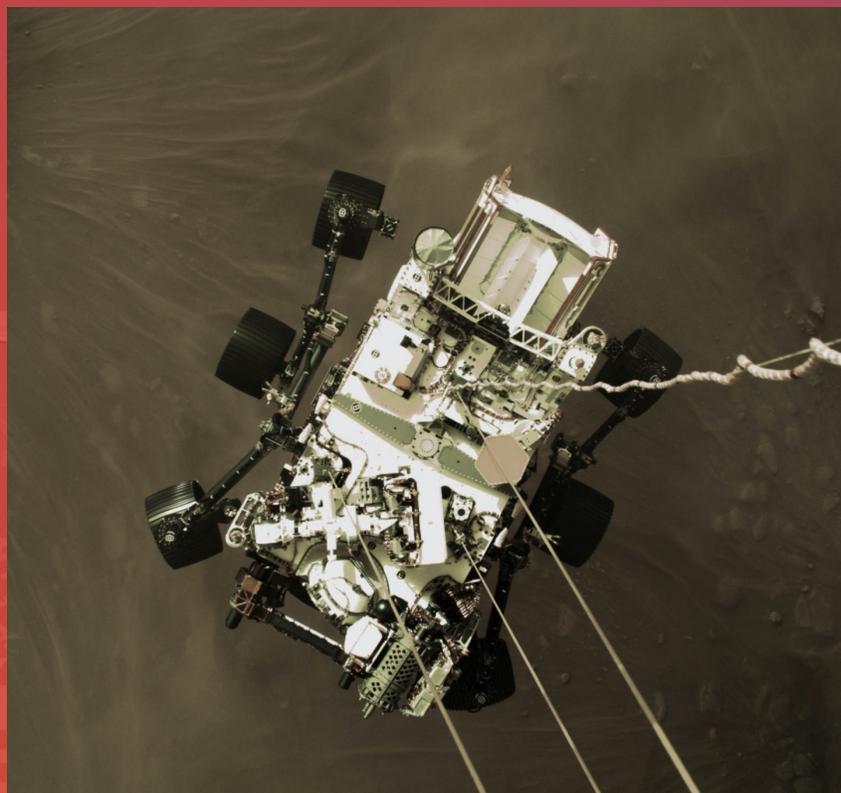
**Objective D:
Prepare for Humans**



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Perseverance Has Landed!

February 18, 2021



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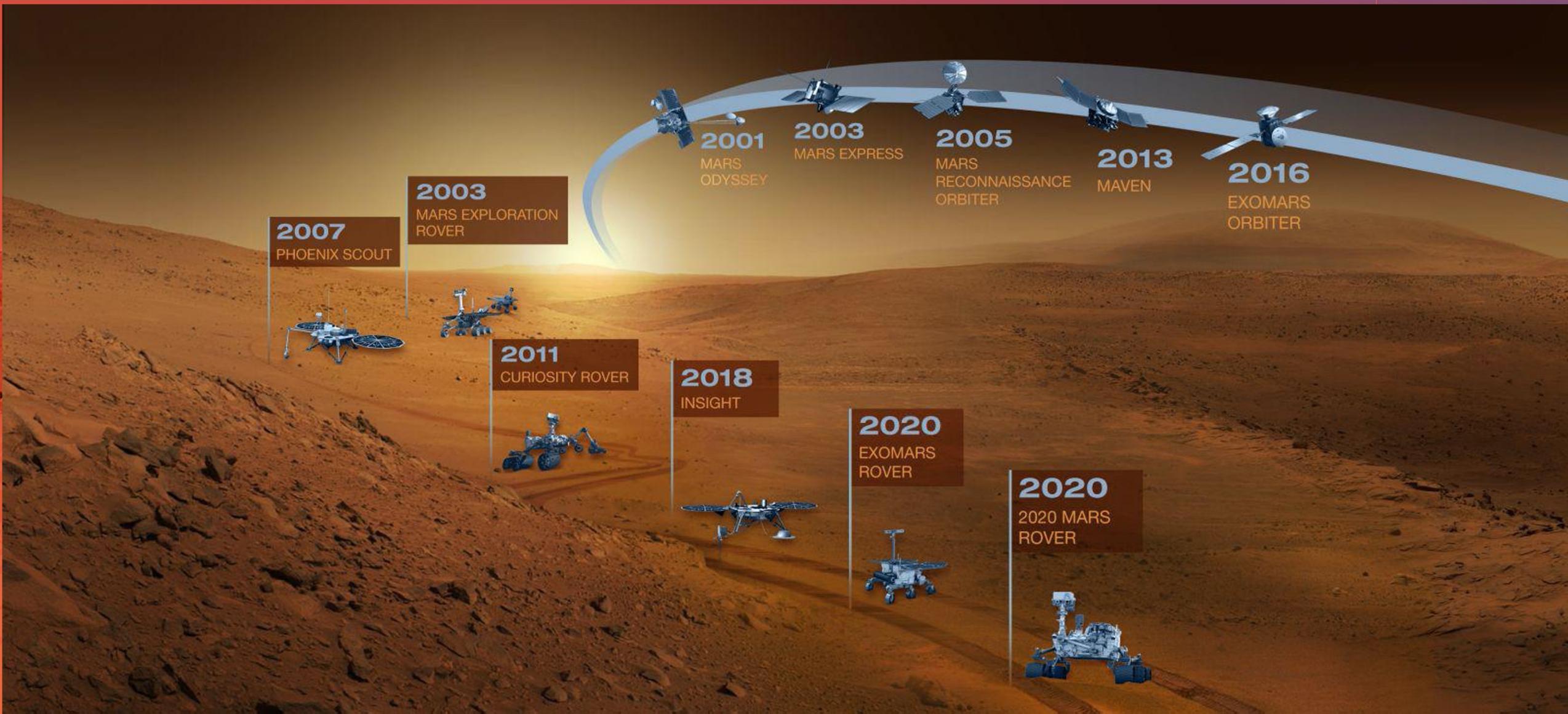
Opportunity is Flying!

April 2021 – first helicopter flights on another world





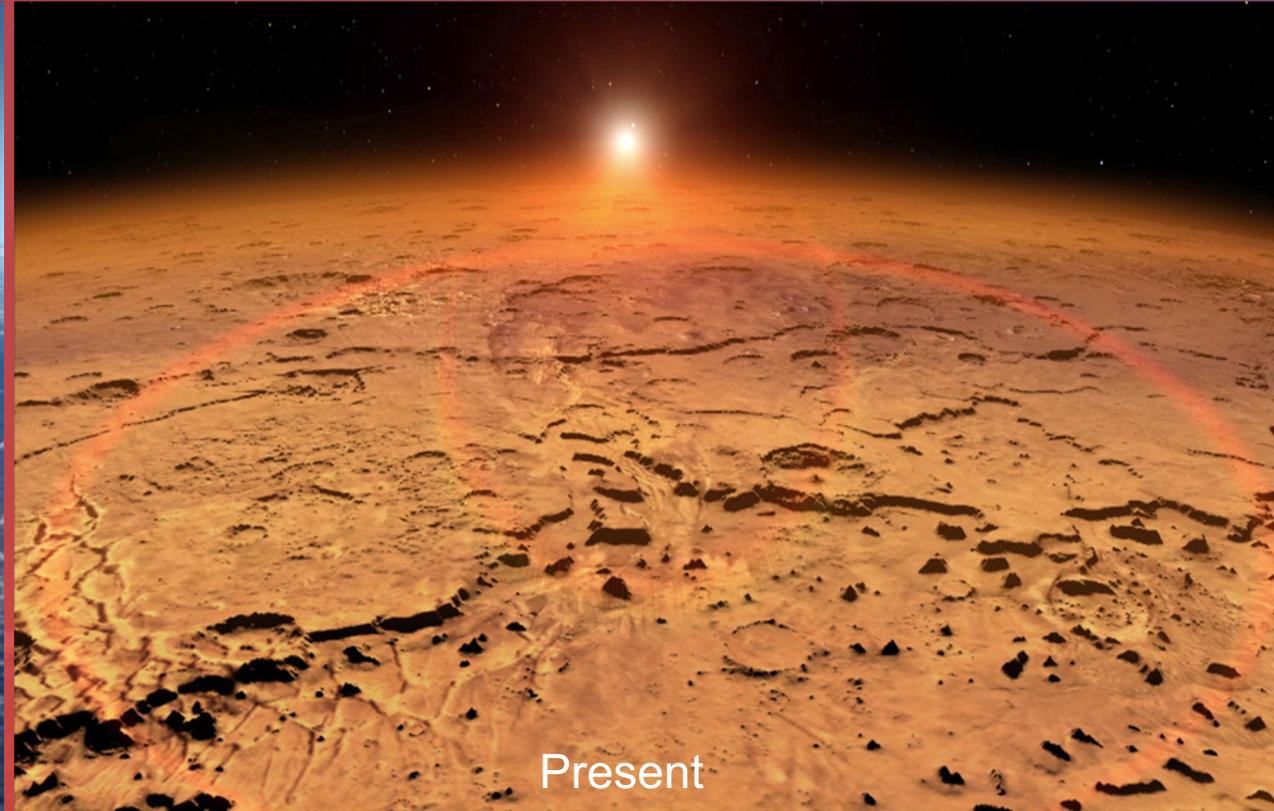
Past Mars missions have followed the water, building on each other's knowledge and discoveries.



There's plenty of evidence that water flowed on Mars in the past.



Past?



Present

We know that the planet was wet and habitable. Mars had all the basic building blocks of life, which still exist on the surface today.



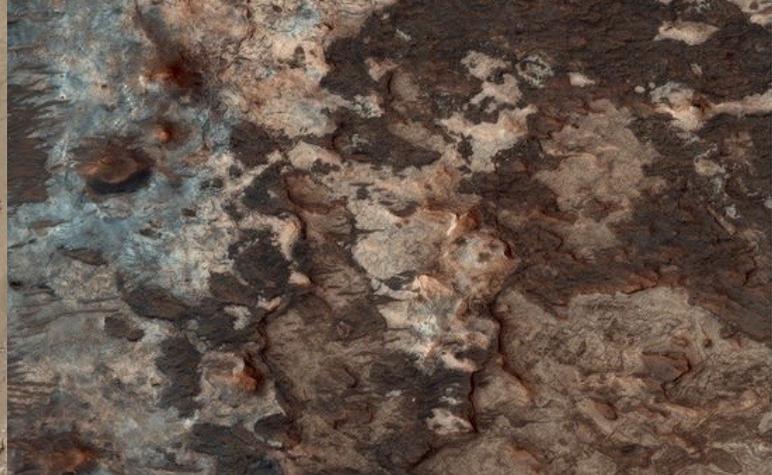
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The Mars 2020 mission
will look for “biosignatures.”



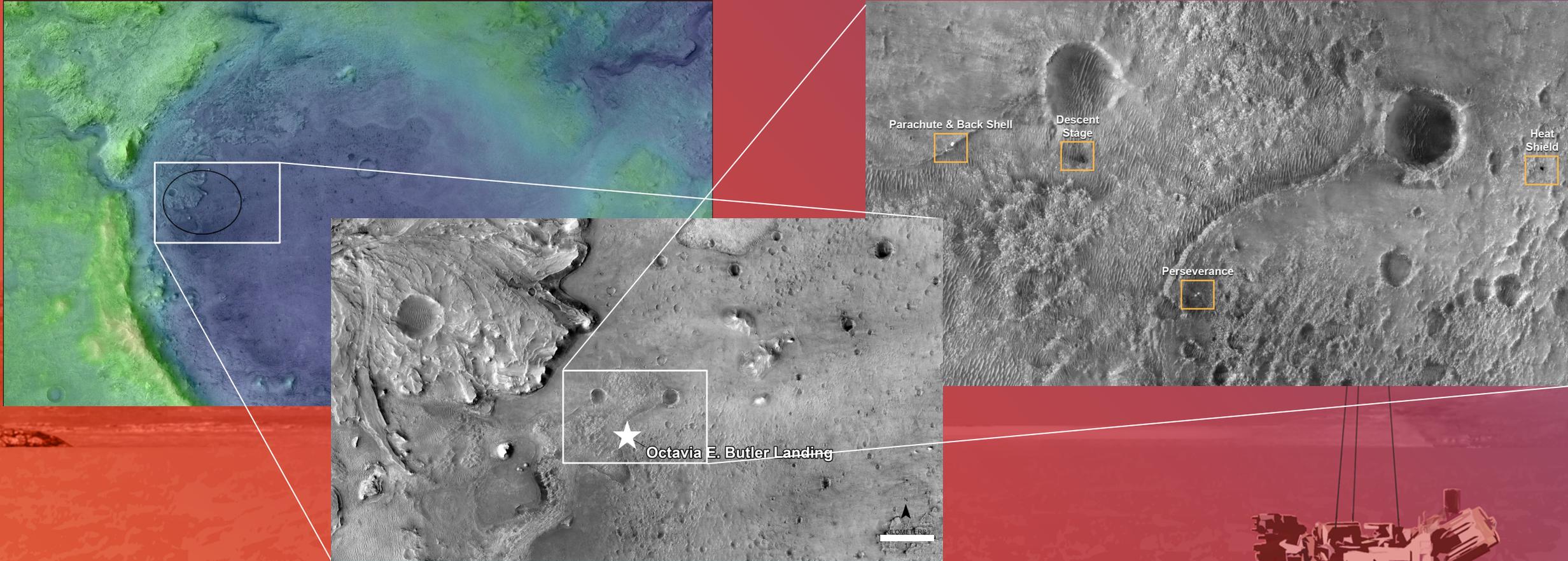
These are objects, substances, or patterns
that only life-based processes can create.

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Mars 2020 Landing Site: Jezero Crater



Two channels once flooded Jezero crater with water, carrying clay minerals.

Microbial life could have lived there.

If so, its signs may be found in the lakebed or along its shoreline.



Activity 1: Elements of Art & Planetary Image Analysis



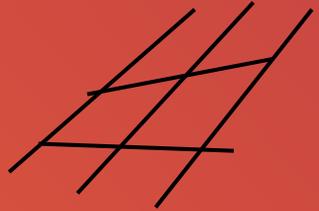
- LINE
- SHAPE
- COLOR
- VALUE
- TEXTURE



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Elements of Art and Mars

LINE



Straight lines –
tectonic activity

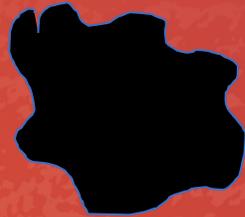


Squiggly lines –
erosion (liquid &
wind)

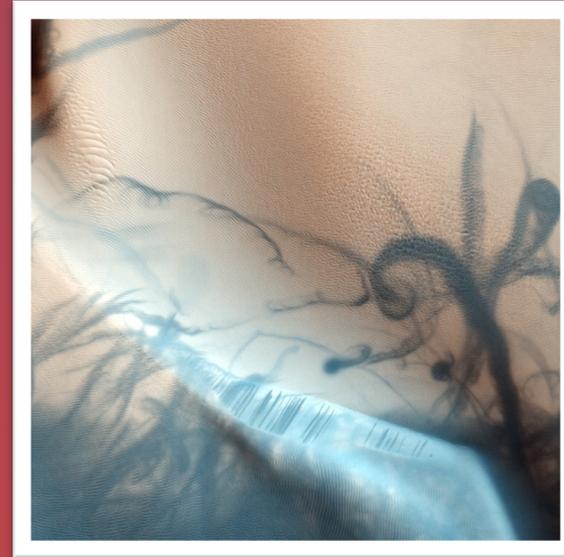
SHAPE



Circles –
Craters



Blobs – Volcanoes
or Lakes



COLOR

true and added

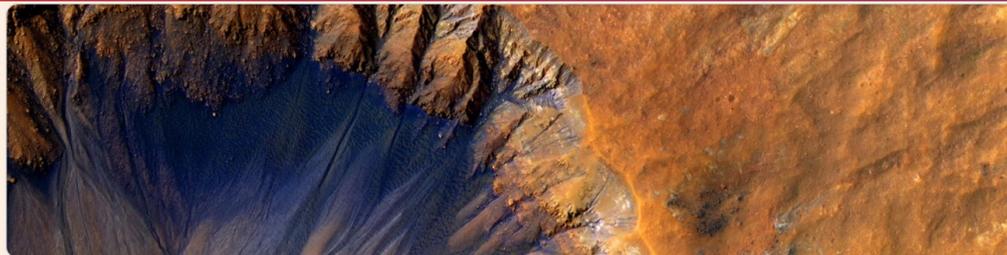
VALUE

light vs dark,
shade and highlight

TEXTURE

the quality of the surface

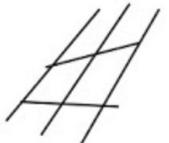




Quiz: Explore Mars With Art

Use the elements of art to identify the geologic features in these sets of Mars or Earth-Mars images, plus a bonus! (All images are credited to NASA unless otherwise stated.)

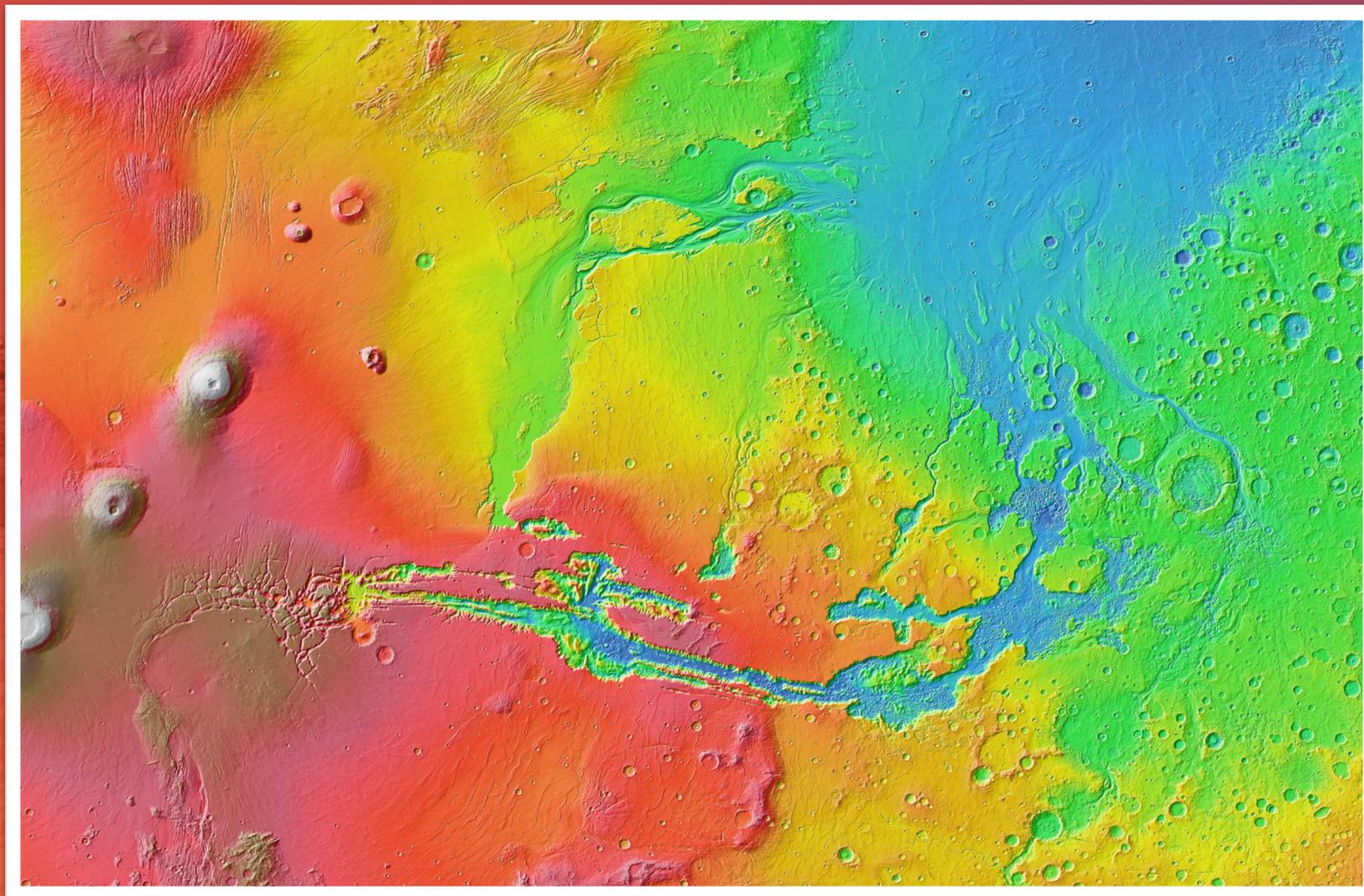
Refer to the list of "Elements of Art and Their Geology Matches" in Step 2 of the activity to help with your choices:

 <p>Circle – Craters</p>	 <p>Blobs – Volcanoes, Sea Ice, or Lakes</p>	<p>Color – true and added</p>
 <p>Straight lines – tectonic activity</p>	 <p>Squiggly lines – erosion (liquid, ice, & wind)</p>	<p>Value – light and dark, shade and highlight</p>
		<p>Texture – the quality of the surface</p>



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GEOLOGIC STORIES: Circles, Lines, Blobs, Color & Texture



Activity 2: Art and the Cosmic Connection - Mars Edition

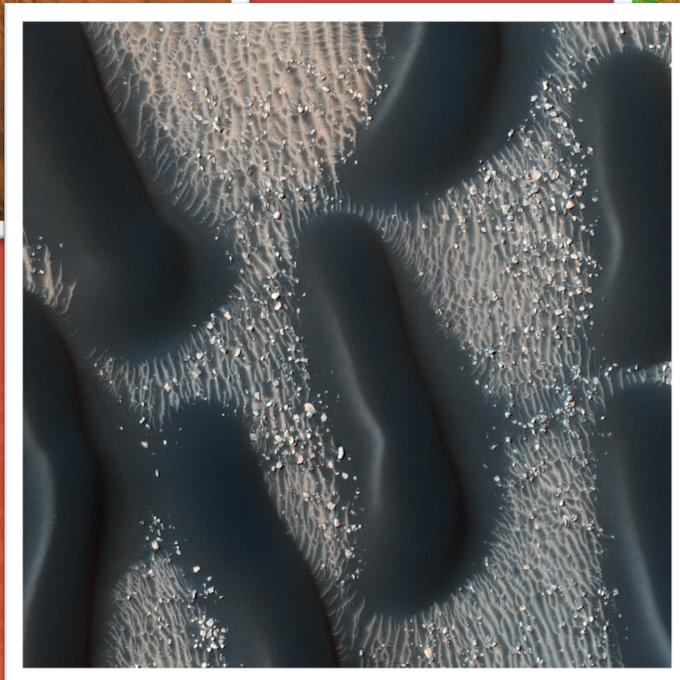
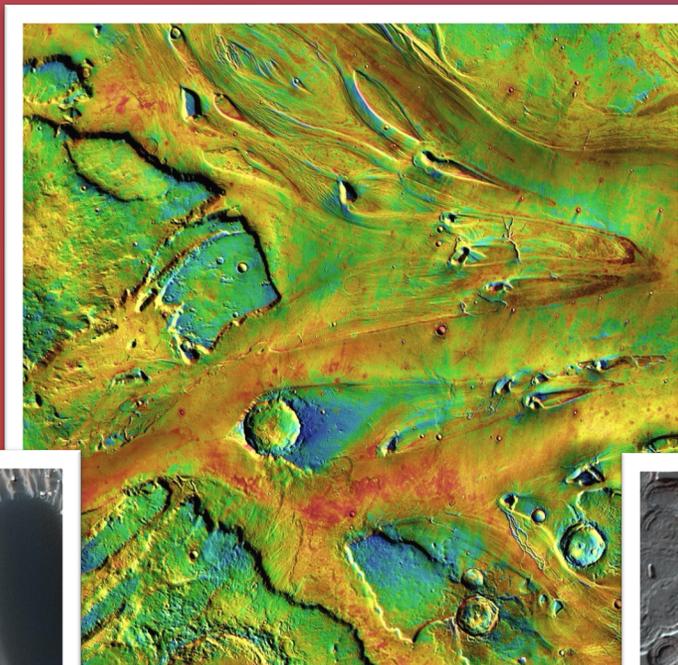
Let's create a drawing, using what you learned!

- Pick an image from the next slide, go back to the quiz, or google "NASA Mars images"
- You'll have time to work on it during Q&A
- We'll ask for volunteers to show and talk about their drawing

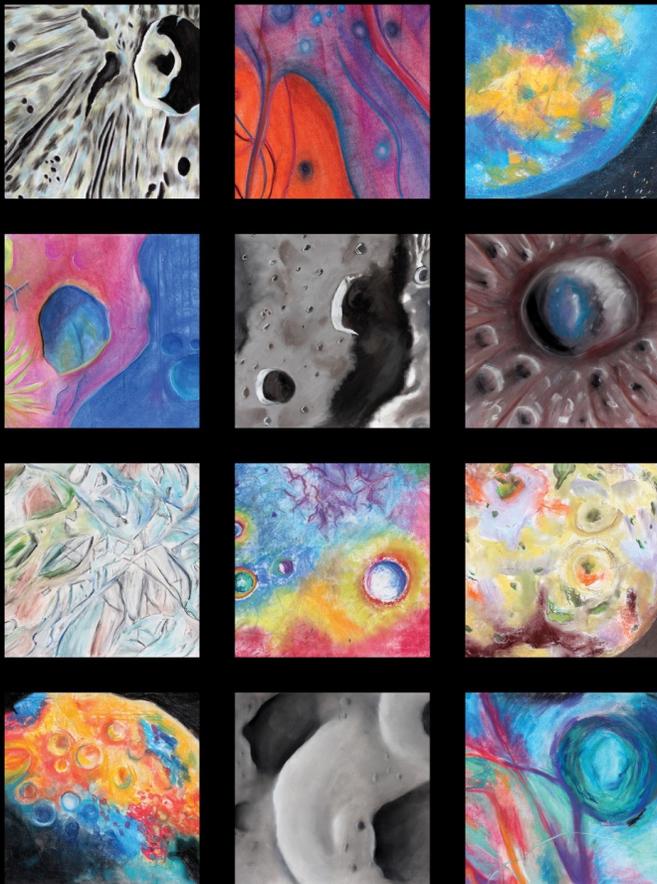


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Questions and Answers



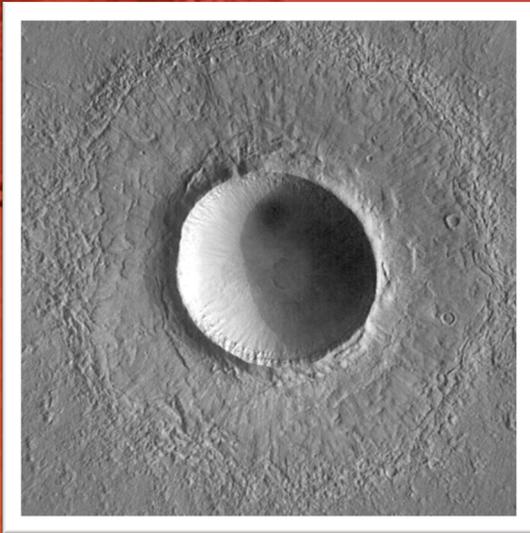
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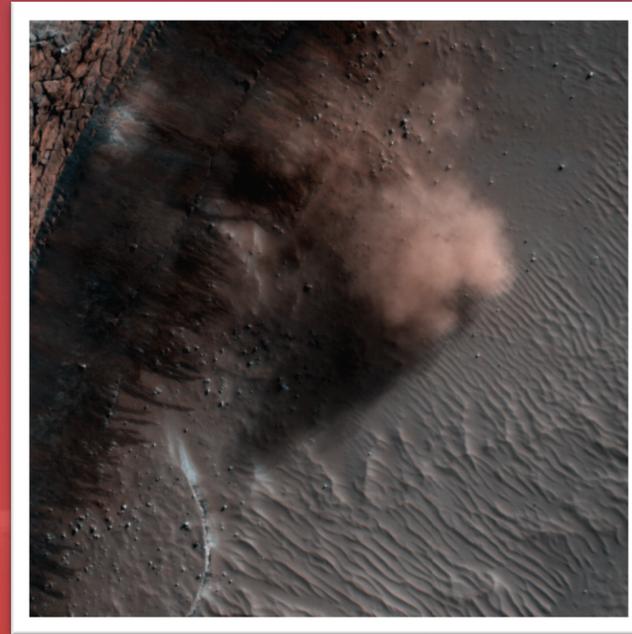
ART & THE COSMIC CONNECTION

Adaptations for Other Ages

Younger kids: match
features to shapes



=



Older kids:
geologic processes
(landslides, dunes)



MARS

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<https://boostcafe.org/author/leslielowes/>



Museum and Informal Education (MIE) Alliance

An active community of practice that provides informal educators access to NASA resources.

Direct assistance to members

Member website of searchable resources

Calendar of mission events, deadlines, trainings, anniversaries, STEM-themed days, etc

Collaborative chat forum

Regular live briefings by NASA experts

Weekly newsletter

Sign up (free!) at informal.jpl.nasa.gov/museum

NASA National Aeronautics and Space Administration

Welcome Amelia's Test Account

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NASA PRESENTS DOWN TO EARTH

THE ASTRONAUT'S PERSPECTIVE

View Earth as You've Never Seen it Before
NASA's astronauts take you on a journey to the International Space Station, exploring the life-changing experience of an orbital perspective.

JOIN OUR COMMUNITY	MEET OUR COMMUNITY	EVENTS IN YOUR COMMUNITY	COMPETITIVE PROGRAM
The Museum & Informal Education Alliance brings current NASA science and technology to free-choice learners through professional development of informal education providers and access to NASA staff and materials. More>	Over 2,000 professionals at more than 1,000 U.S. museums, science centers, planetariums, NASA Visitor Centers, Challenger Centers, observatories, parks, libraries, camps, and youth-serving organizations are partners in the Museum & Informal Education Alliance. More>	From exhibits to planetarium shows to educator workshops to special lectures, Museum & Informal Education Alliance partners present space exploration and aeronautics programs and events for their local communities. More>	NASA Teams Engaging Affiliated Museums and Informal Institutions (formerly CP4SMPVC) aligns with NASA and Federal science, technology, engineering, and math (STEM) education goals. More>

Featured Events

- **15th Anniversary (2006), New Horizons Launch**
Tuesday, January 19, 2021
- **NASA STEM Stars - Connecting Past to Present With NASA Historian Dr. Christian Gelzer**
Tuesday, January 19, 2021
- **Teaching Oceanography and Earth Science**
Saturday, January 23, 2021

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Jet Propulsion Laboratory
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go.nasa.gov/mars-challenge

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