HELLO, OPPORTUNITY:

The Story of Our Friend on Mars

By Shaelyn McDaniel
Illustrated by Cornelia Li
Published by Page Street Kids

ACTIVITY GUIDE

Humans wanted to soar through the sky, and we did. We wanted to go to the moon, and we did. Then we set our sights on a little red planet, so far out we couldn't go ourselves. Instead, we sent a friend. We named her Opportunity because it means "a good chance" and feels like hope.

With nine eyes, three ears, one arm, and six wheels, Oppy explored the mysterious terrain of Mars, gathering samples, snapping photos, and discovering vast craters. Everywhere held new and exciting surprises!

Until one day, a storm came, and it was time to say goodbye...for now. We still hope Oppy may wake up someday.

Kids will be amazed by Opportunity's groundbreaking Mars mission as they see the red planet through her eyes, and the eyes of the scientists who loved her.

Shaelyn McDaniel grew up in South Florida before moving to New York for a digital marketing career with kids books. In college, she majored in English. As a kid she assumed humans had already been to Mars, and as an adult she remains incensed that we haven't (yet). *Hello, Opportunity* is her debut picture book.

Cornelia Li loves the challenge of making factual but emotional art for scientific topics. For this book, she was inspired by mid-century art and printmaking to match the focus on space and technology. She studied illustration at OCAD University. She now lives in Toronto, Canada, where she works as a full-time illustrator. She has illustrated several children's books, including the *Glow in the Dark* series and *The Trouble with Time Travel.*

For more information about Mars and Opportunity, a bibliography, and further reading suggestions, please scan the QR code below.

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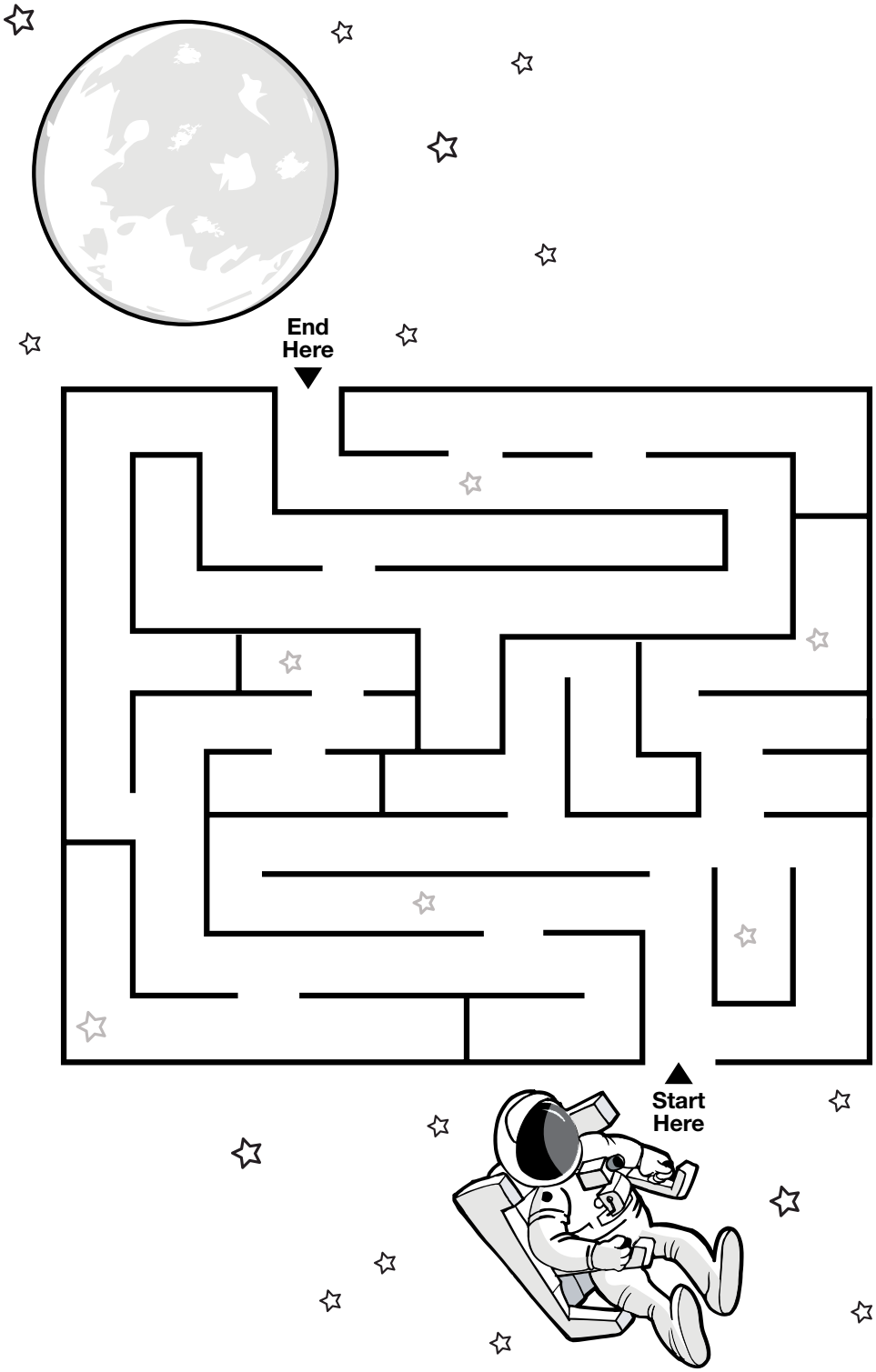
MAZE

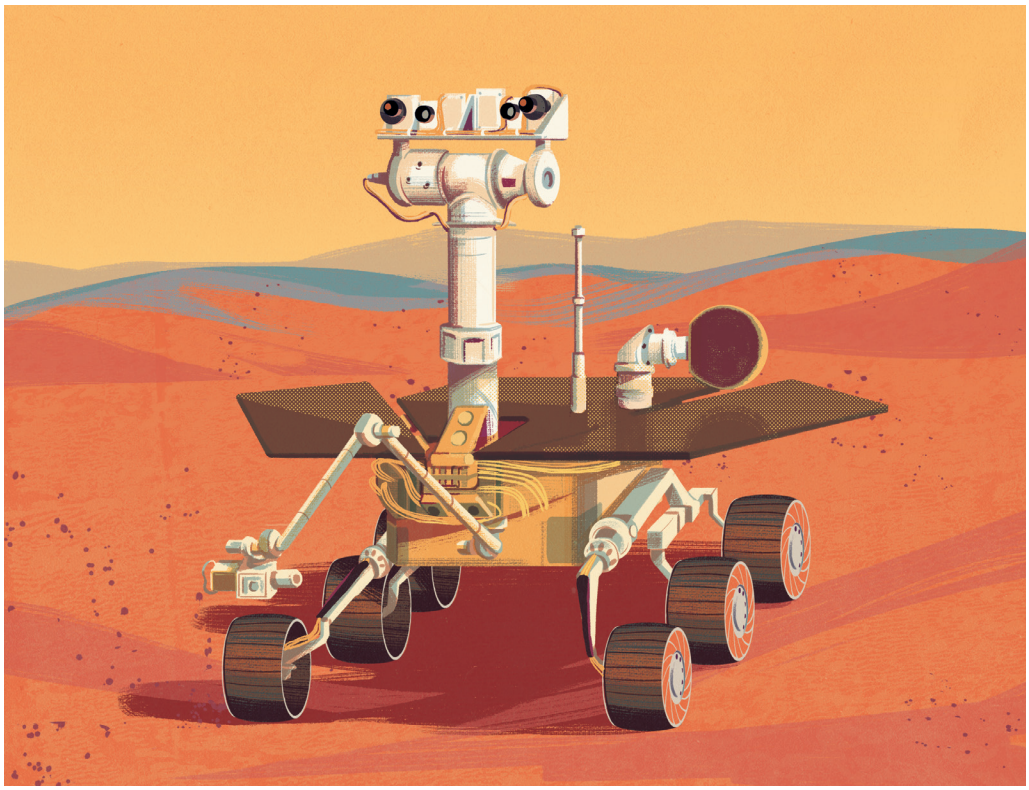
Can you help the astronaut get to Mars?



Source: https://science.nasa.gov/science-red/s3fs-public/atoms/files/Surviving%20on%20Mars.pdf]

LABEL THE PARTS

Circle these parts on Oppy!



Solar panels

Panoramic cameras

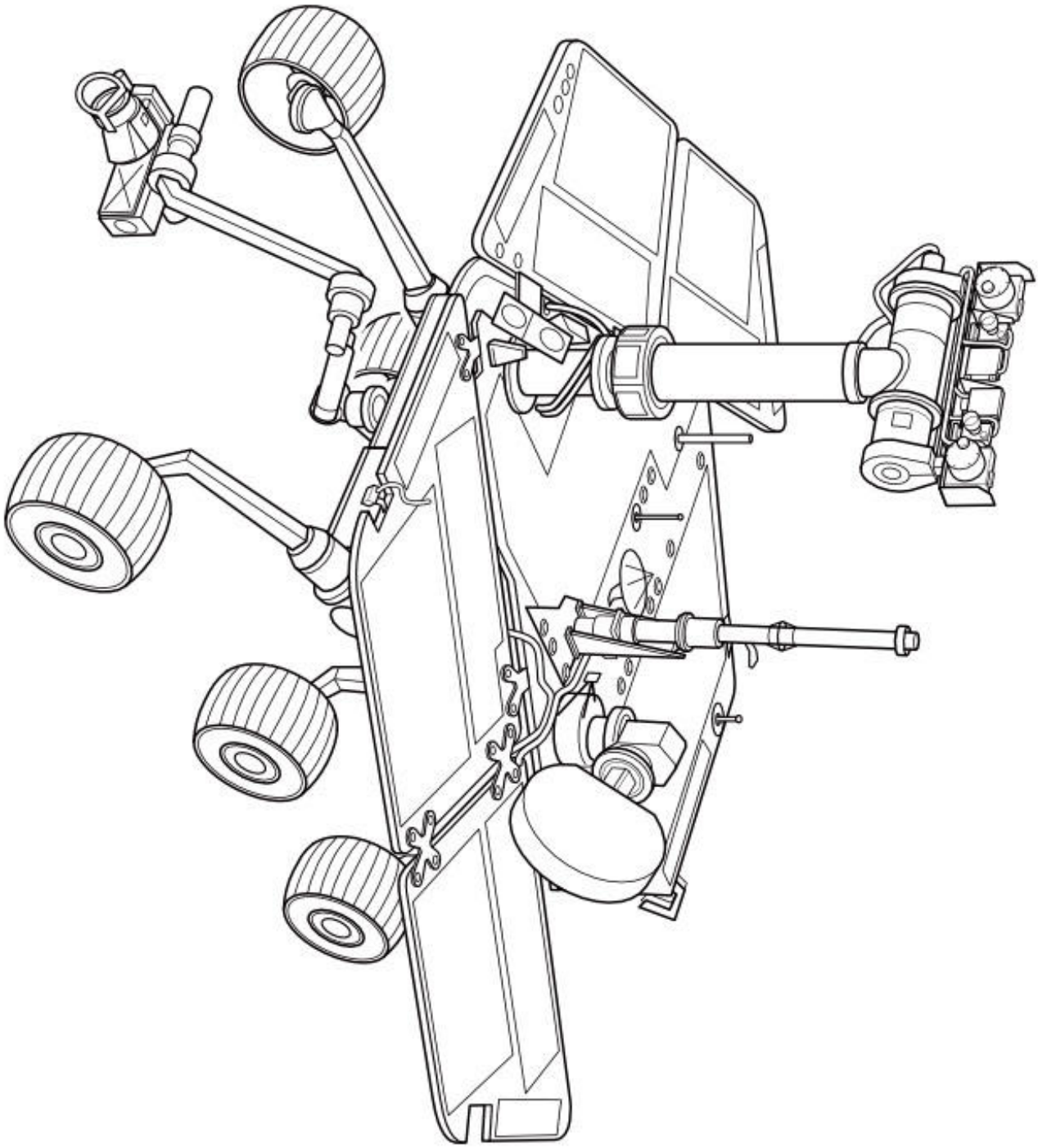
Cameras

Wheels

Arm

Antenna

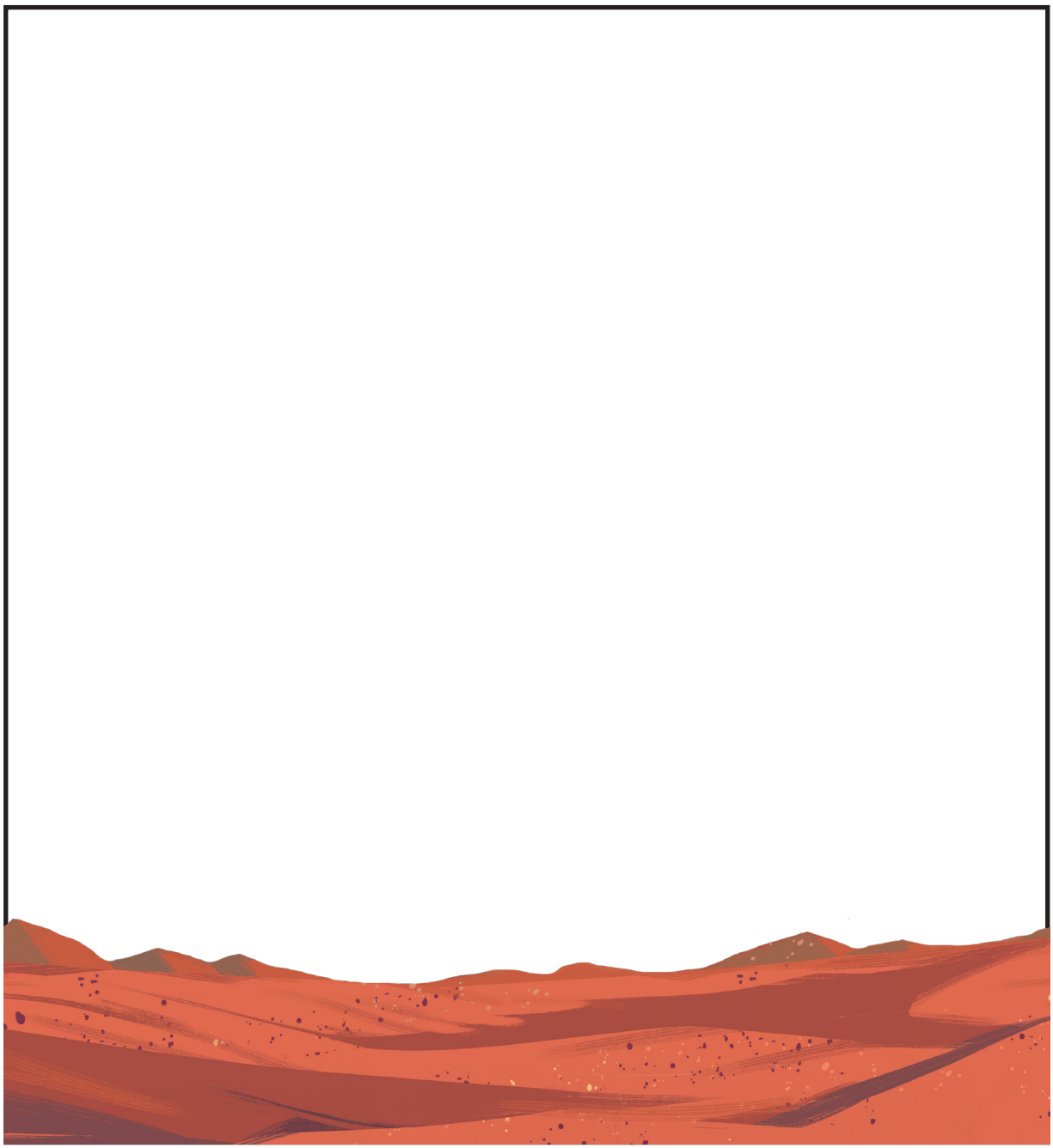
COLOR YOUR OPPORTUNITY



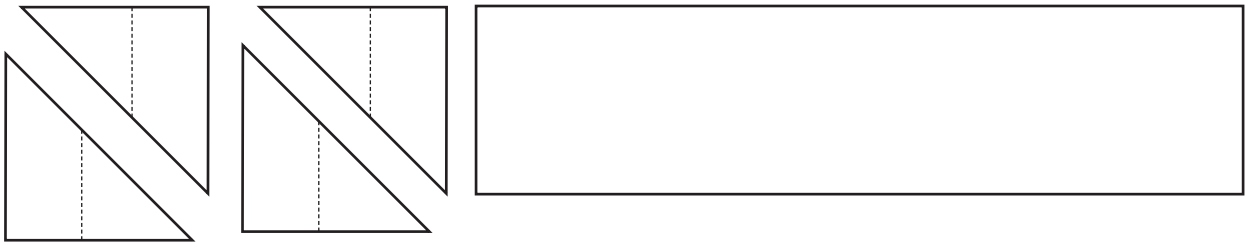
Source: https://www.edupics.com/coloring-page-mars-rover-i9960.html

DRAW YOUR OWN ROVER

Create your own rover in the space below! What would you include if you were sending it to Mars?



MAKE A STRAW ROCKET



Materials:

- Paper
- Scissors
- Tape
- Pencil
- Soda straw
- Yard Stick or measuring tape

Steps:

1. Color and then cut out the shapes below.
2. The rectangle will be the body of the rocket. Wrap the rocket body around a pencil length-wise and tape it closed to form a tube. Check that the diameter of the rocket body then fits around the straw. It should be loose enough that it slides off the straw, but not so loose that there are large gaps between the straw and paper.
3. Twist the top of the body tube into a nose cone around the sharpened end of your pencil. Tape the cone so that it doesn't untwist.
4. The triangles will be your fins. Bend the triangles at the dotted lines and tape the bent pieces to the rocket body. Tape the other side as well so that the fins are at a 90 degree angle to the rocket body.
5. Remove the pencil and replace it with a soda straw.
6. Mark your launch point with tape or an object.
7. Blow into the straw to launch your rocket! Record the distance the rocket travels on your data log below.
8. Now try making changes to your rocket. Try making the fins smaller or cutting them into a different shape, make the nose cone longer or shorter, or add a weight to the bottom of your rocket body. Make these changes one at a time and record the differences in your rocket log below.

Rocket log:

DESIGN	TRIAL 1 DISTANCE	TRIAL 2 DISTANCE	TRIAL 3 DISTANCE	NOTES
DESIGN #1				
DESIGN #2 CHANGE: _____				
DESIGN #3 CHANGE: _____				
DESIGN #4 CHANGE: _____				

SCAVENGER HUNT

Look for clues like Oppy does on Mars!

What you need:

An indoor or outdoor area where kids can explore the world around them and a pen/pencil and piece of paper or notebook for them to write their observations.

Before you start, ask some questions:

- What does it mean to make an observation?
- What are the five senses?
- How are they used for observation?
- What might the NASA engineers have been hoping for Opportunity to find?
- What are you hoping to find on your exploration?

Now, go explore! Make a list of things you'd like to find, or use the list below. Collect two things (without disturbing anything living!) that you can share with your classmates later.

- Something big
- Something small
- Something wet
- Something dry
- Something round
- Something sharp
- Something smooth
- Something bumpy
- Something silent
- Something loud
- Something that smells good
- Something that smells bad
- Something that tells you what was here before you (a puddle, fossil, footprint, etc.)

Now head back to your base camp. Can you answer these questions?

- What observations did you make?
- What clues did your observations give you about your natural environment?
- Did you find anything you weren't expecting to see?
- Did you not find something you did expect to see?

MISSION CONTROL

What you need:

- At least four people
- A blindfold
- A bag with handles
- Rocks
- Cones or something to navigate around
- A bucket or glass of water
- Rope or string

How to play:

1. Assemble two teams with at least two people on each team. One person will be the "rover," the other(s) will be "mission control."
2. Arrange an obstacle course with activities for the rover to do. Place rocks on the ground. Put a bucket or glass of water on a table. Hang the rope or place it on the ground.
3. Blindfold the team member who will be the rover. The other team member(s) will guide the rover using spoken instructions only. The rover can only move if taking directions from mission control.
4. Both mission control teams will guide the rover through the obstacle course. Guide them to the rock and tell them to pick it up and put in their bag. Tell them to spin around three times, weave through the cones, jump over the cones, or tie a knot in the rope and then place it in their bag. Have them drink the glass of water or carry the bucket. Or come up with your own tasks! Just be sure that each team is giving their rover the same tasks to complete.
5. Once the rover has completed all of their missions, guide them back to home.
6. The first rover to make it back after completing their missions is the winner!

SEND A POSTCARD TO OPPY

Write a message to the Opportunity Rover and team on the NASA website using the link below or the QR code on the first page of this guide.

https://mars.nasa.gov/participate/postcard/opportunity-rover/

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