SUMMER!
FUN ACTIVITY BOOK

Michigan LEARNING CHANNEL
A PUBLIC MEDIA PARTNERSHIP

On TV. Online. Statewide. VISIT MichiganLearning.org
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Content Partners:
- 826Michigan
- American Chemical Society
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- Career Girls
- Chris Anderson Science Around Cincy
- City Opera House
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- Detroit Institute of Arts
- Detroit Zoo
- Grand Rapids Ballet
- Huron-Clinton Metroparks
- Illustrative Mathematics
- INPACT at Home
- Kinetic Affect
- LearningSciencesFun
- Library of Congress
- Little Kids Rock
- Lucky Cat Productions
- MAISA Literacy Essentials
- Michigan Architectural Foundation
- Michigan DNR
- Michigan EGLE
- Michigan Humanities Council
- Midland Center for the Arts
- Mindful Practices
- Mr. E in the D
- MSU Extension
- NASA
- North Carolina Department of Public Instruction
- Positive Impact for Life
- SchoolKit
- Roadtrip Nation
- SciGirls
- Signing Time
- SIS4Teachers
- Speak It Forward
- Square One Education Network
- STEM Greenhouse
- Story Pirates
- Storycorps
- The Diatribe
- Traverse City Area Public Schools
- United States Air Force
- WORLD Channel
- YouCubed

Local PBS Stations
- WKAR - East Lansing
- Detroit Public Television
- WCMU - Mount Pleasant
- WDCQ - Saginaw
- WGVU - Grand Rapids
- WNIT - South Bend
- WNMU - Marquette

Partner PBS Stations
- PBS
- PBS Books
- PBS Kids
- APT (Alabama Public Television)
- LPB (Louisiana Public Broadcasting)
- PBS SoCal
- PBSNC
- TPT (Twin Cities PBS)
- WCMU
- WHRO
- WIMAGE
- WNET (New York Public Media)
- WQED
- WUCF

WATCH on the Michigan Learning Channel
or stream the channel at MichiganLearning.org

Visit MichiganLearning.org and follow
@MichLearning on social media to find out more.

The Michigan Learning Channel is funded through a grant awarded by the Michigan Department of Education and the U.S. Department of Education.
Dear Grown-Ups,

Summer is full of opportunities to play and learn and we want to make it easy to find inspiring, kid-friendly activities! That’s why we’ve worked with PBS stations and content creators from across the country to bundle up some of our favorite activities into one, easy-to-carry-anywhere book. We hope you and your kids will use this to inspire learning all summer long!

Here are a few quick tips to keep your kids excited about learning this summer:

• **Ask Lots of Questions.** Encourage your kids to participate in conversations by asking them questions like: Why do you think that happened? What will happen next?

• **Encourage Kids to Search for Answers.** When your children ask you “why?” see if you can work together to figure out what they need to know or do to find the answer.

• **Try Something New.** Summer is a great time to try new things like reading a new kind of book, tasting a new food or exploring a new park.

• **Just Have Fun.** Summertime only comes along once a year, so be sure to take the time to relax and have fun while you’re learning.

• **Build Lasting, Positive Memories That Will Last a Lifetime!**

**How to Use This Book**

• Keep in mind that this book spans multiple grade levels. Your child won’t be using every single page, but choosing a few lessons each week. The goal is to keep kids’ brains engaged with a taste of reading, writing, math, art, science, and physical activity every week.

• The grade levels are merely guides to get you started. We recommend starting with the grade that your child just completed and adjusting as needed. Don’t be shy about using a different grade level or just picking and choosing lessons that look interesting. This has been a tough year for our children and we want your child to feel proud and confident.

• This book aligns with the content on the Michigan Learning Channel, which can be used on live tv or on demand. There are about 2-3 hours a week of video lessons, plus lots of activities in this book that don’t use a screen. We recommend getting outside everyday, reading everyday and having enjoyable moments together as a family!

• This book is designed to use for 8 weeks of summer. We suggest spreading it out over a few days each week and finding a time that works for your family. If you have older children they may do better in the evenings.

• As you go through the weeks, you will find each week has a theme and a link to videos that go with the activities. You can find all the video lessons, plus interactive virtual events and more at [www.michiganlearning.org/summer](http://www.michiganlearning.org/summer).

How do the students in your life use the Michigan Learning Channel? We would love your feedback! Feel free to contact us at mlc@dptv.org.

Michigan Learning Channel Team
MichiganLearning.org
Take Flight (June 20-26):
From planes and kites to butterflies and birds, discover the fables and physics of things that fly.

Under Water (June 27-July 3):
Dive deep into oceans, rivers, and our own Great Lakes to discover what it takes to live beneath the waves.

Heroes (July 4-10):
Celebrate our nation’s birthday and the people we call heroes, whether they are veterans, everyday helpers, or the kind who wear capes.

Creatures (July 11-17):
From the prehistoric to the present, learn about the fascinating features of creatures near and far.

Engineering (July 18-24):
Meet the people who design bridges, cars, and video games and learn how to think like an engineer.

Great Outdoors (July 25-31):
Explore the world outside your door and the incredible parks and waters that belong to us all.

When I Grow Up (August 1-7):
All summer we’ll learn about different careers—this week, think about all the exciting possibilities in your future!

Shoot for the Stars (August 8-14):
Look up at the night sky and into outer space and meet people who risked everything to follow their dreams.

Learn more about the Michigan Learning Channel at Facebook Live at fb.me/michlearning
www.michiganlearning.org/summer
Where to Find the Michigan Learning Channel
Find your favorite shows anywhere you go!

Scan the QR Code:
Scan any of the QR codes in this book to see the accompanying video right on your device.

On Demand:
Video lessons and activities at MichiganLearning.org
Click your grade level for this week's selected lessons
Or, use “Find a Lesson” to search by grade, subject, and educational standard

On the App:
Find shows on the free PBS app
The PBS App is available for mobile devices, Roku, Apple TV, and on many Smart TVs.
Search for Read Write Roar, Math Mights, Extra Credit, DIY Science Time, Wimee’s Words, InPACT at Home, Simple Gift Series, and more great programs.

On the Livestream:
Watch the 24/7 livestream at MichiganLearning.org/live-tv

On TV:
Find us on broadcast television with an antenna

Coming soon to:
Charter Cable services in Northern Michigan and the Upper Peninsula.
Visit MichiganLearning.org/Schedule for details

Learn more about the Michigan Learning Channel at
Facebook Live at fb.me/michlearning
www.michiganlearning.org/summer

On TV. Online. Statewide.
Follow @MichLearning on social media to find out more.

The Michigan Learning Channel is funded through a grant awarded by the Michigan Department of Education and the U.S. Department of Education.
Your remote control and TV menus may vary, but the steps are the same. Your TV will scan for all available channels. TV sets connected to cable, satellite or other pay TV providers do not need to scan.

How to Scan
1. Press menu on your remote control.
2. Select setup.
3. Choose antenna then channel scan or auto tune.
# WEEKDAY SUMMER SCHEDULE

<table>
<thead>
<tr>
<th>TIME</th>
<th>GRADE</th>
<th>WHAT'S ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>5AM</td>
<td>Preschool - Kindergarten</td>
<td>Let's Learn</td>
</tr>
<tr>
<td>6AM</td>
<td></td>
<td>PBS Kids shows</td>
</tr>
<tr>
<td>6:30AM</td>
<td></td>
<td>Wimée's Words, Simple Gifts Series</td>
</tr>
<tr>
<td>7AM</td>
<td></td>
<td>Let's Learn</td>
</tr>
<tr>
<td>8AM</td>
<td></td>
<td>Read, Write, ROAR! (Kindergarten)</td>
</tr>
<tr>
<td>8:30AM</td>
<td></td>
<td>Math Mights (Kindergarten)</td>
</tr>
<tr>
<td>9AM</td>
<td>1st - 3rd Grade</td>
<td>Read, Write, ROAR! (1st Grade)</td>
</tr>
<tr>
<td>9:30AM</td>
<td></td>
<td>Math Mights (1st Grade)</td>
</tr>
<tr>
<td>10AM</td>
<td></td>
<td>Read, Write, ROAR! (2nd Grade)</td>
</tr>
<tr>
<td>10:30AM</td>
<td></td>
<td>Math Mights (2nd Grade)</td>
</tr>
<tr>
<td>11AM</td>
<td></td>
<td>Read, Write, ROAR! (3rd Grade)</td>
</tr>
<tr>
<td>11:30AM</td>
<td></td>
<td>Math Mights (3rd Grade)</td>
</tr>
<tr>
<td>12PM</td>
<td></td>
<td>Live From the City Opera House: It's Storytime</td>
</tr>
<tr>
<td>12:30PM</td>
<td></td>
<td>PBS Kids shows</td>
</tr>
<tr>
<td>1PM</td>
<td>4th - 6th Grade</td>
<td>Extra Credit</td>
</tr>
<tr>
<td>1:30PM</td>
<td></td>
<td>Math &amp; Movement</td>
</tr>
<tr>
<td>2PM</td>
<td></td>
<td>Story Pirates</td>
</tr>
<tr>
<td>2:30PM</td>
<td></td>
<td>DIY Science Time, SciGirls</td>
</tr>
<tr>
<td>3PM</td>
<td></td>
<td>Curious Crew</td>
</tr>
<tr>
<td>3:30PM</td>
<td>1st - 3rd Grade</td>
<td>Cyberchase, Into the Outdoors</td>
</tr>
<tr>
<td>4PM</td>
<td></td>
<td>Read, Write, ROAR! (2nd &amp; 3rd Grade)</td>
</tr>
<tr>
<td>4:30PM</td>
<td></td>
<td>Math Mights (2nd &amp; 3rd Grade)</td>
</tr>
<tr>
<td>5PM</td>
<td>Preschool - Kindergarten</td>
<td>Read, Write, ROAR! (Kindergarten &amp; 1st Grade)</td>
</tr>
<tr>
<td>5:30PM</td>
<td></td>
<td>Math Mights (Kindergarten &amp; 1st Grade)</td>
</tr>
<tr>
<td>6PM</td>
<td></td>
<td>Let's Learn</td>
</tr>
<tr>
<td>7PM</td>
<td>4th - 6th Grade</td>
<td>Extra Credit</td>
</tr>
<tr>
<td>7:30PM</td>
<td></td>
<td>Math &amp; Movement</td>
</tr>
<tr>
<td>8PM</td>
<td></td>
<td>Story Pirates</td>
</tr>
<tr>
<td>8:30PM</td>
<td></td>
<td>DIY Science Time, SciGirls</td>
</tr>
<tr>
<td>9PM</td>
<td>6th - 12th Grade</td>
<td>Nature, NOVA, American Experience, Ken Burns and other PBS programming</td>
</tr>
</tbody>
</table>

Details at MichiganLearning.org/schedule

WATCH on the Michigan Learning Channel.
Episodes are available on-demand or stream the channel at MichiganLearning.org/summer

Visit MichiganLearning.org and follow @MichLearning on social media to find out more.
Learn at Home with PBS KIDS

Explore reading, math, science, life lessons, and more on the PBS KIDS 24/7 channel and live stream! The TV schedule below offers you and your child a chance to learn anytime alongside your friends from PBS KIDS.

**TIME (M-F)** | **SHOW** | **GRADE** | **LEARNING GOALS**
--- | --- | --- | ---
6/5c am | The Cat in the Hat Knows a Lot About That! | PK-1 | Science & Engineering
6:30/5:30c am | Ready Jet Go! | K-2 | Science & Engineering
7/6c am | Peg + Cat | PK-K | Math
7:30/6:30c am | Super WHY! | PK-K | Literacy
8/7c am | Daniel Tiger's Neighborhood | PK-K | Social & Emotional Learning
8:30/7:30c am | Daniel Tiger's Neighborhood | PK-K | Social & Emotional Learning
9/8c am | Sesame Street | PK-K | Literacy, Math, Social & Emotional Learning
9:30/8:30c am | Elinor Wonders Why | PK-K | Science & Engineering
10/9c am | Clifford the Big Red Dog | PK-K | Social & Emotional Learning, Literacy
10:30/9:30c am | Dinosaur Train | PK-K | Science
11/10c am | Let's Go Luna! | K-2 | Social Studies
11:30/10:30c am | Curious George | PK-K | Math, Science & Engineering
12 pm/11c am | Nature Cat | K-3 | Science
12:30 pm/11:30c am | Xavier Riddle and the Secret Museum | K-2 | Social & Emotional Learning
1/12c pm | Molly of Denali | K-2 | Literacy
1:30/12:30c pm | Hero Elementary | K-2 | Science & Engineering
2/1c pm | Cyberchase | 1-5 | Math & Science
2:30/1:30c pm | Pinkalicious & Peterrific | PK-1 | The Arts
3/2c pm | Pinkalicious & Peterrific | PK-1 | The Arts
3:30/2:30c pm | Elinor Wonders Why | PK-K | Science & Engineering
4/3c pm | Donkey Hodie | PK-K | Social & Emotional Learning
4:30/3:30c pm | Curious George | PK-K | Math, Science & Engineering
5/4c pm | Alma's Way | K-1 | Social & Emotional Learning
5:30/4:30c pm | Xavier Riddle and the Secret Museum | K-2 | Social & Emotional Learning
6/5c pm | Molly of Denali | K-2 | Literacy
6:30/5:30c pm | Hero Elementary | K-2 | Science & Engineering

Access FREE, at-home learning activities, tips, and more on pbskidsforparents.org

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LIVE Virtual Events

As part of the Summer Program, students can participate in live virtual events via Facebook Live. Events are interactive and presenters will take student suggestions and questions in real time. Recorded versions of these events will also be available online.

Live virtual events will be hosted on the Michigan Learning Channel Facebook page.

Wimee’s Words Live!
Recommended for ages 4-8

Join the loveable robot puppet Wimee and his friends as they discover more about the weekly theme. Wimee needs your help to write stories! Give Wimee your favorite words and ideas in the comments and watch as he incorporates them into stories and songs in real time. Your ideas may even be featured in future episodes of “Wimee’s Words” on PBS!

Wimee’s Words Live! with the Michigan Learning Channel
Every Wednesday, June 21-August 9, 4pm
Live on the Michigan Learning Channel Facebook page

Great Lakes Now Watch Party
with the Belle Isle Aquarium
Recommended for ages 8 and up

The monthly PBS show Great Lakes Now explores the water, people, and environmental issues that tie together the whole Great Lakes basin. Once a month, they team up with the Belle Isle Aquarium to take a deep dive into the themes of the show. Students will have the chance to ask questions of the guest scientists and meet fantastic fish and other creatures.

Great Lakes Now Watch Party
Friday, July 1, 1pm
Friday, August 5, 1pm
Live on the Michigan Learning Channel Facebook page

Learn more about the Michigan Learning Channel at
Facebook Live at fb.me/michlearning
www.michiganlearning.org/summer

Follow @MichLearning on social media to find out more.
Learn Anywhere!
On Air. Online. On Demand.

Serving students statewide through your local PBS station, the Michigan Learning Channel has everything kids need to build their brains and engage in learning key concepts to succeed in school!

Preschool
Read, sing, and play with your little one.
- **Wimee’s Words**
  Join Wimee, the fun, lovable robot that inspires kids to learn through creativity.
- **Simple Gift Series**
  Make music, find something new, and read with Betty the Bookworm.
- **POP Check**
  Mindful practice tools to Pause, Own what we are feeling, and Practice relaxing.

Kindergarten to 3rd Grade
Keep kids learning with fun lessons taught by Michigan teachers.
- **Read, Write, Roar**
  Kids build literacy skills with engaging ELA lessons.
- **Math Mights**
  Build number sense and learn strategies for solving math problems.
- **InPACT**
  Get moving with this home-based physical activity program.

4th to 6th Grade
Short, engaging videos and hands-on lessons keep tweens engaged.
- **Extra Credit**
  Creative writing, math, fitness, career exploration, and more!
- **Curious Crew**
  Dr. Rob Stephensen and inquisitive kids take a hands-on approach to scientific exploration.
- **Story Pirates**
  Bite-sized literary lessons with comedians, authors, and teachers.

VISIT us online to view all shows, learn about events, and download activities!
www.michiganlearning.org
Follow @michlearning to find out more.
Learn at Home with PBS KIDS

Play and learn anytime and anywhere with free apps from PBS KIDS! Use the chart below to find the app that aligns to your child’s grade, learning goal, and favorite PBS KIDS show - then download it on your on your mobile or tablet device to play online, offline, or anytime.

### Apps for Social & Emotional Learning

<table>
<thead>
<tr>
<th>App Name</th>
<th>Grade</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daniel Tiger for Parents</td>
<td>PK-K</td>
<td>Social &amp; Emotional Learning</td>
</tr>
<tr>
<td>PBS KIDS Games app</td>
<td>K-2</td>
<td>Multiple Learning Goals</td>
</tr>
<tr>
<td>PBS KIDS Video app</td>
<td>K-2</td>
<td>Multiple Learning Goals</td>
</tr>
</tbody>
</table>

### Apps for Literacy Learning

<table>
<thead>
<tr>
<th>App Name</th>
<th>Grade</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinosaur Train A to Z</td>
<td>PK-K</td>
<td>Literacy, Science</td>
</tr>
<tr>
<td>Molly of Denali</td>
<td>K-2</td>
<td>Literacy</td>
</tr>
<tr>
<td>PBS KIDS Games app</td>
<td>K-2</td>
<td>Multiple Learning Goals</td>
</tr>
<tr>
<td>PBS KIDS Video app</td>
<td>K-2</td>
<td>Multiple Learning Goals</td>
</tr>
</tbody>
</table>

### Apps for STEM Learning (Science, Technology, Engineering & Math)

<table>
<thead>
<tr>
<th>App Name</th>
<th>Grade</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBS Parents Play &amp; Learn</td>
<td>PK-K</td>
<td>Literacy, Math</td>
</tr>
<tr>
<td>Play &amp; Learn Engineering</td>
<td>PK-K</td>
<td>Science and Engineering</td>
</tr>
<tr>
<td>PBS KIDS Measure Up!</td>
<td>PK-K</td>
<td>Math</td>
</tr>
<tr>
<td>Play &amp; Learn Science</td>
<td>PK-K</td>
<td>Science</td>
</tr>
<tr>
<td>Splash and Bubbles for Parents</td>
<td>PK-K</td>
<td>Science</td>
</tr>
<tr>
<td>Splash and Bubbles Ocean Adventure</td>
<td>PK-K</td>
<td>Science</td>
</tr>
<tr>
<td>The Cat in the Hat Builds That!</td>
<td>PK-K</td>
<td>Science and Engineering</td>
</tr>
<tr>
<td>The Cat in the Hat Invents</td>
<td>PK-K</td>
<td>Science and Engineering</td>
</tr>
<tr>
<td>Jet's Bot Builder: Robot Games</td>
<td>K-2</td>
<td>Science and Engineering</td>
</tr>
<tr>
<td>Photo Stuff with Ruff</td>
<td>K-2</td>
<td>Science</td>
</tr>
<tr>
<td>Ready Jet Go! Space Explorer</td>
<td>K-2</td>
<td>Science</td>
</tr>
<tr>
<td>Ready Jet Go! Space Scouts</td>
<td>K-2</td>
<td>Science and Engineering</td>
</tr>
<tr>
<td>Nature Cat's Great Outdoors</td>
<td>K-3</td>
<td>Science</td>
</tr>
<tr>
<td>PBS KIDS ScratchJr</td>
<td>I-2</td>
<td>Coding</td>
</tr>
<tr>
<td>Outdoor Family Fun with Plum</td>
<td>I-3</td>
<td>Science and Engineering</td>
</tr>
<tr>
<td>Cyberchase Shape Quest</td>
<td>I-5</td>
<td>Math</td>
</tr>
<tr>
<td>PBS KIDS Games app</td>
<td>K-2</td>
<td>Multiple Learning Goals</td>
</tr>
<tr>
<td>PBS KIDS Video app</td>
<td>K-2</td>
<td>Multiple Learning Goals</td>
</tr>
</tbody>
</table>

pbskids.org/apps
**Week 8: Shoot for the Stars**  
**August 8-14**

Look up at the night sky and into outer space and meet people who risked everything to follow their dreams.

Use the sheet below to mark off this week’s activities as you complete them. See if you can get a BINGO!

**Playlists this week: www.michiganlearning.org/stars**

<table>
<thead>
<tr>
<th>Build an air cannon (pg. 77)</th>
<th>60 mins. of activity</th>
<th>Read 20 minutes</th>
<th>Draw a cartoon story (pg. 75)</th>
<th>Watch Extra Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read 20 minutes</td>
<td>Watch Story Pirates</td>
<td>Draw an alien planet</td>
<td>Stargaze</td>
<td>60 mins. of activity</td>
</tr>
<tr>
<td>60 mins. of activity</td>
<td>Watch Math Park</td>
<td>HAVE FUN! (Free Space)</td>
<td>Build a moon rover (pg. 72)</td>
<td>Read 20 minutes</td>
</tr>
<tr>
<td>Watch Extra Credit</td>
<td>Observe the clouds (pg. 74)</td>
<td>Watch Math Park</td>
<td>Watch Story Pirates</td>
<td>Watch InPACT at home</td>
</tr>
<tr>
<td>Stargaze</td>
<td>Read 20 minutes</td>
<td>Watch DIY Science Time</td>
<td>60 mins. of activity</td>
<td>Watch Math Park</td>
</tr>
</tbody>
</table>
Can you imagine driving an all-terrain vehicle (ATV) on the moon? NASA can. It’s building a fleet of ATVs (called rovers). Some can be driven by astronauts. Others are remote-controlled. All of them can handle the moon’s dusty, rugged terrain. Talk about off-road adventure!

WE CHALLENGE YOU TO...

...design and build a rubber band-powered rover that can scramble across the floor.

BUILD

1. **First, you have to make the body.** Fold the cardboard into thirds. Each part will be about 2 inches (5 cm) across. Fold along (not across) the corrugation (the tubes inside a piece of cardboard).

2. **Then, make the front wheels.** On the two 5-inch (13-cm) cardboard squares, draw diagonal lines from corner to corner. Poke a small hole in the center (that’s where the lines cross). On the body, poke one hole close to the end of each side for the axle. Make sure the holes are directly across from each other and are big enough for the pencil to spin freely.

3. **Now attach the front wheels.** Slide the pencil through the body’s axle holes. Push a wheel onto each end. Secure with tape.

4. **Next, make the rear wheels.** Tape the straw under the back end of the rover. Slip a candy onto each end. Bend and tape the axle to stop the candies from coming off.

5. **Finally, attach the rubber band.** Loop one end around the pencil. Cut small slits into the back end of the body. Slide the free end of the rubber bands into the slits.

TEST, EVALUATE, AND REDESIGN

Test your rover. Wind up the wheels, set the rover down, and let it go. Did everything work? Can you make your rover go farther? Engineers improve their designs by testing them. This is called the design process. Try redesigning the wheel setup or rubber band system. For example, if:

- **the wheels don’t turn freely**—
  
  *Check that the pencil turns freely in the holes. Also, make sure the wheels are firmly attached and are parallel to the sides.*

MATERIALS (per rover)

- corrugated cardboard body (6-inch/15-cm square)
- 2 corrugated cardboard wheels (5-inch/13-cm square)
- 1 sharpened round pencil
- 2 rubber bands
- ruler
- tape
- 2 round candies (the hard, white, mint ones with a hole in the middle)
- 1 plastic drinking straw
- scissors
CUSTOM WHEELS

The moon doesn’t have an atmosphere—there’s no air there! So air-filled tires like the ones on a bike or car would explode—the air inside would push through the tire to escape into outer space (where there’s no air to push back against the walls of the tire). Imagine you’re a NASA engineer who has to design a tire that:

- works in space, where there’s no atmosphere
- withstands extreme hot and cold temperatures—on the moon, they range from roughly 250° to –250° Fahrenheit (121° to –157° Celsius)
- weighs 12 pounds (5.5 kg), which is half the weight of an average car tire
- won’t get clogged with the fine dust that covers the moon

Despite these challenges, engineers designed a tire that worked perfectly when it was used on the moon. It’s made of thin bands of springy metal. That helps it be lightweight, have good traction, and work at any temperature the moon can throw at it. Plus, it flexes when it hits a rock, and it doesn’t need to be pumped up. Dependability is important. There’s no roadside service when you’re on the moon, 250,000 miles (400,000 km) from home.

RIDE IN “STYLE”?

A rover may not be the hottest-looking vehicle around, but with a price tag of over ten million dollars, it’s one of the most expensive. And it sure is convenient to bring along. Rovers can be folded and stored in a landing module the size of a small room. Look at the picture of the rover. Which features are also found on cars designed for use on Earth?

-答案: Chassis, wheels, fenders, motor, seats, seat belts, antenna, batterry, camera (some cars), and steering controls.

The farthest trip anyone has ever taken on the moon with a rover is 2.8 miles (4.5 km).
DEDICATED TO EDUCATION

As a major part of our mission, Celebrating and Saving Wildlife, the Detroit Zoological Society is dedicated to conservation education. Our education programs are designed to inspire learners of all ages to make small changes and take action to protect animals and the wild places they live. Learn more at www.detroitzoo.org.

GLOBE Observer Clouds - Citizen Science

EDUCATION ACTIVITY

MATERIALS:

- Smartphone or tablet
- GLOBE Observer app

Directions:

- Download and familiarize yourself with the GLOBE Observer app (Clouds).
- Step outside, take a walk around your home, in your neighborhood or to a local park to find a good view of the sky.
- Click through the app to enter your observations on what the sky looks like, percentage of cloud cover, sky color, visibility, type of clouds present, opacity, surface conditions, and photos.

Guiding Questions:

1. What do you notice about the clouds today?
2. What predictions can you make about the weather from looking at the clouds?
3. Describe what features, shapes, and heights of the clouds you see.
4. Use the Interactive Cloud Key to answer questions that guide you to identify what clouds you may be looking at.

How it Works:

Weather is the conditions we see day to day within the atmosphere, while climate refers to conditions seen over a time. Clouds impact both local weather and climates across the planet. Clouds can provide information about temperatures, humidity, and wind throughout the atmosphere. Using this information helps to predict weather conditions.

Continue Exploring

- How do cloud conditions compare across different seasons? Different areas of the world? Make predictions, research, and make observations at different times and places.
DIY Air Cannon

MATERIALS
- Plastic or styrofoam cups
- Scissors
- Balloon
- Various items to knock over

DIFFICULTY

Fun Fact
Dolphins can create vortex rings to play with in the ocean by blowing air through their blowholes. The quick burst of air combined with the round shape of the blowhole creates a vortex ring of bubbles.

Air Pressure
Air pressure, also known as atmospheric pressure, is the force exerted on a surface by the weight of air. Even though it is invisible to our eyes, the air surrounding us puts about 14.7 pounds per square inch of pressure on everything on the surface of Earth. That’s a lot of pressure!

Why do scientists love renewable energy so much?
*Answer on the next page
DIY Air Cannon

EXPERIMENT

Step 1: Gather your materials.
Step 2: Cut the neck off of the balloon and keep the large part.
Step 3: Carefully cut a hole in the bottom of the cup about the size of a dime with your scissors.
Step 4: Attach the cut balloon to the mouth of the cup. Be sure to stretch it tightly and reinforce by wrapping a rubber band around the lip of the cup.
Step 5: Tap or gently pull back the balloon and let it go to force the air out of your cannon.
Step 6: Set up a target, such as hanging toilet paper, to test to see how far your air rings can reach.

WHY IT WORKS

Although you can't see it, your cup is filled with air. When you apply a force to the air molecules by pulling back the balloon and letting it snapback, the air molecules are pushed towards the opening. This movement sets off a quick chain reaction of collisions with other air molecules and the sides of the cup. The only way for the air molecules to escape is through the opening at the bottom of the cup. The quick escape of these air molecules forms a stream of air that flows straight out of the cannon.

EXTEND YOUR LEARNING

- What might happen if you used a different sized cup? Could you cut a 2 liter bottle to make a larger cannon?
- Could you try another stretchy material to take the place of the balloon?
- Does it change the experiment if you make the hole a different shape? What if you place it in a different spot?
- Experiment with your air cannon to see what changes allow you to shoot air the furthest.
- Have a target competition with a friend.

WORKFORCE CONNECTION

A meteorologist studies interactions between temperature, humidity, air pressure, precipitation and vortices in the atmosphere. They develop an understanding of how vortices such as tornadoes, waterspouts and hurricanes form so they can predict the weather to keep people informed and safe. They also study and learn about the polar vortex and how it affects the weather during winter.

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Introducing Decimals: Hundredths

Directions: Scan the QR code to watch the video, and then write each fraction as a decimal.

\[
\frac{1}{100} = 0.01 \quad \frac{3}{100} =
\]

\[
\frac{8}{100} = \quad \frac{2}{100} =
\]

\[
\frac{5}{100} = \quad \frac{9}{100} =
\]

\[
\frac{10}{100} = \quad \frac{7}{100} =
\]

\[
\frac{6}{100} = \quad \frac{4}{100} =
\]
SPECIAL THANKS TO OUR MICHIGAN LEARNING CHANNEL FUNDERS:

Elaine and Leo Stern Foundation

The Donald and Mary Kosch Foundation

The State of Michigan

W.K. Kellogg Foundation

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The Kresge Foundation

Michigan Department of Education
**What is Meet Up and Eat Up?**
Meet Up and Eat Up provides FREE nutritious meals for children and teens 18 years and younger.

**How do I sign up?**
No application or sign-up needed, just come and join us!

**Where is it?**
To find a location near you
Visit: [www.michigan.gov/meetupeatup](http://www.michigan.gov/meetupeatup)
Call: 211
Text: Food to 304-304
Mande por texto “Comida” al 304-304