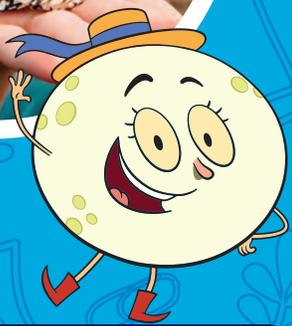




Michigan
LEARNING
 CHANNEL
 A PUBLIC MEDIA PARTNERSHIP

SUMMER!

FUN ACTIVITY BOOK



 **UPPER
ELEMENTARY**

On TV. Online. Statewide. VISIT MichiganLearning.org

Teamwork makes the dream work.

It takes teamwork to help your student make progress in school—especially when it involves special education. **Michigan Alliance for Families and Special Education Mediation Services** are here to help.

ALL SERVICES ARE FREE.

For help strengthening communication, call **Special Education Mediation Services** at **833-KIDS-1ST** or visit **mikids1st.org**.

For free resources and support, call **800-552-4821** or visit **michiganallianceforfamilies.org**.



Michigan Alliance for Families and Special Education Mediation Services are Individuals with Disabilities Education Act (IDEA) Grant Funded Initiatives through the Michigan Department of Education, Office of Special Education.

How to Use This Book

We've curated activities that inspire learning all summer long. Fight the summer slide with math and writing refreshers, then explore your world with scavenger hunts and science experiments the whole family can try. Use the guides below to make the most of this summer!



Use Grade Levels

This book spans multiple grade levels. Choose a few lessons each week and try new ones as needed. Try tougher lessons later in the summer or next year.



Follow Weekly Themes

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.



Extend the Learning

Scan the QR codes in this book to watch videos with extra instructions and examples. Find all of our summer videos at MichiganLearning.org/summer

And Don't Forget!

Share Your Thoughts

Scan this QR code to take a short survey about our Summer of Fun program to let us know what you like about our books and what you'd like to see in the future.

Or VISIT

MichiganLearning.org/SummerSurvey





Dates and Themes

The summer program runs from June 24 to August 18, 2024.

Each week has a set of lessons, plus additional programs, activities, and field trips based on the weekly theme.

Take Flight (June 24-30):

From planes and kites to butterflies and birds, discover the fables and physics of things that fly.

Under Water (July 1-7):

Dive deep into oceans, rivers, and our own Great Lakes to discover what it takes to live beneath the waves.

Heroes (July 8-14):

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 15-21):

From the prehistoric to the present, learn about the fascinating features of creatures near and far.

Engineering (July 22-28):

Meet the people who design bridges, cars, and video games and learn how to think like an engineer.

Great Outdoors (July 29 - August 4):

Explore the world outside your door and the incredible parks and waters that belong to us all.

When I Grow Up (August 5-11):

All summer we'll learn about different careers—this week, think about all the exciting possibilities in your future!

Shoot for the Stars (August 12-18):

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



On TV. Online.
Statewide.

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

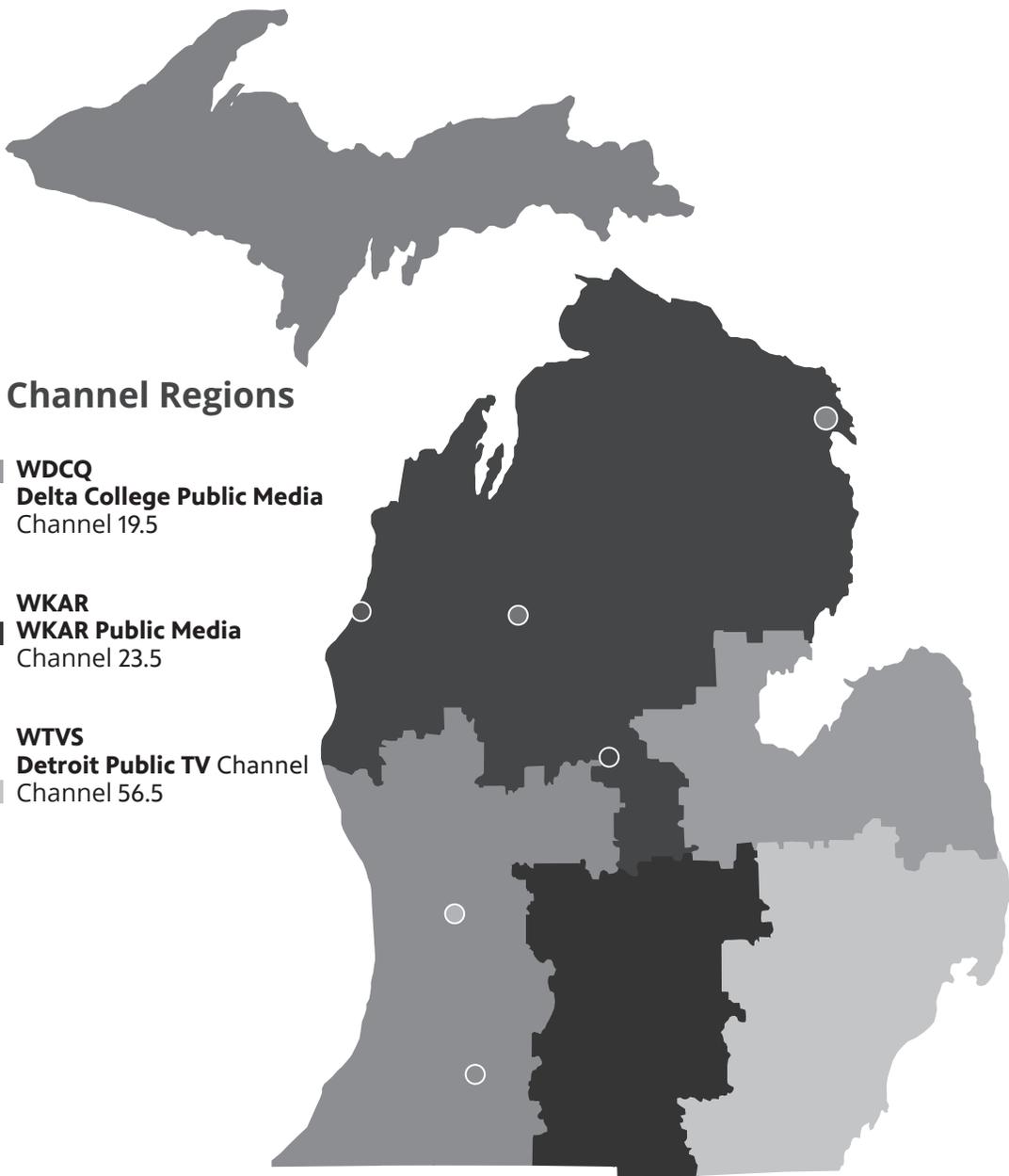
   Follow @MichLearning on social media to find out more.

Local Events



The Michigan Learning Channel has Engagement Coordinators across the state that serve as your local connection to everything happening at our channel and at your local PBS station.

Scan the QR code or visit MichiganLearning.org/Coordinators to learn more about our Engagement Coordinators and see their local event schedules by region.



Michigan Learning Channel Regions

■ **WNMU**
WNMU-TV
Channel 13.4

■ **WCMU**
Alpena
Channel 6.4

■ **WGVU**
Grand Rapids
Channel 35.6

■ **WDCQ**
Delta College Public Media
Channel 19.5

■ **WKAR**
WKAR Public Media
Channel 23.5

■ **WTVS**
Detroit Public TV Channel
Channel 56.5



On TV. Online.
Statewide.

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.



Where to Find the Michigan Learning Channel

Find your favorite shows anywhere you go!

From the QR Codes:

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 Might's, 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



On TV. Online.
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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.



WEEKDAY SUMMER SCHEDULE

TIME	GRADE	WHAT'S ON
6AM	Pre-K	Wimee's Words, Simple Gifts Series, Signing Time, PBS Kids Shows
7AM		Let's Learn
8AM	Kindergarten	Read, Write, ROAR!, Math Might's and more
9AM	1st Grade	
10AM	2nd Grade	
11AM	3rd Grade	
12:30PM - 1:30PM	4th - 5th Grade	Lunch Time Block: Live From the Opera House, Camp TV, Story Pirates TV, Math & Movement
1:30PM - 3PM	Pre-K	Wimee's Words, Simple Gifts Series, Signing Time, PBS Kids Shows
3PM - 6PM	4th - 8th Grade	Afternoon Block: Make48, Make it Artsy, Extra Credit, Into the Outdoors DIY Science Time, Curious Crew, Story Pirates TV, SciGirls
6PM - 7PM	Kindergarten - 3rd Grade	Read, Write, ROAR!, Math Might's and more
7PM - 8PM		Local Shows and Quiet Time Block: Live From the Opera House, Camp TV, AADL Storytime
8PM - 9PM	7th - 12th Grade	Road Trip Nation, Great Lakes Now, Destination Michigan, Startup, Native Report, National and Local PBS Specials
9PM - 6AM		PBS programs related to educational standards

Details at MichiganLearning.org/schedule

rev 03/23

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](https://twitter.com/MichLearning) on social media to find out more.





App Learning Goals

MULTIPLE LEARNING GOALS GRADES PK-2



Free learning games with your favorite PBS KIDS characters anytime, anywhere!

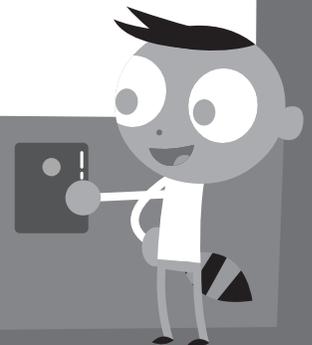


Thousands of free videos from PBS KIDS, the #1 educational media brand for kids.

App	Grade	Learning Goals
Daniel Tiger for Parents (for parents & caregivers)	PK-K	Emotions, Self-Awareness & Relationships
Jet's Bot Builder	K-2	Science & Engineering
Molly of Denali	K-2	Literacy
Nature Cat's Great Outdoors	K-2	Science
PBS KIDS ScratchJr	1-2	Critical Thinking & Coding
PBS Parents Play & Learn	PK-K	Literacy & Math
Photo Stuff with Ruff	K-2	Science
Play and Learn Engineering (for parents & caregivers)	PK-K	Science & Engineering
Play and Learn Science (for parents & caregivers)	PK-K	Science
Ready Jet Go! Space Explorer	K-2	Science
Ready Jet Go! Space Scouts	K-2	Science & Engineering
The Cat in the Hat Builds That!	PK-K	Science & Engineering
The Cat in the Hat Invents	PK-K	Science & Engineering



FREE APPS
at pbskids.org/apps



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Week 1: Take Flight

June 24-30

From planes and kites to butterflies and birds, discover the fables and physics of things that fly.

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

Scan the QR code or visit www.michiganlearning.org/takeflight to see the playlist of videos for this week.



Watch Curious About Careers	 60 mins. of activity	 Read for 20 minutes	Make a paper airplane	 Go swimming
 Read for 20 minutes	 Watch Story Pirates	 Look for birds	Spot a plane in the sky	 60 mins. of activity
 60 mins. of activity	Draw a new kind of bird	 HAVE FUN! (Free Space)	Watch InPACT at Home	 Read for 20 minutes
Watch DIY Science Time	Spot a helicopter in the sky	 Ride a bike	 Watch Story Pirates	Build a DIY Science Time hovercraft
Watch InPACT at Home	 Read for 20 minutes	Watch Extra Credit	 60 mins. of activity	 Watch Math Park

DIY Hovercraft



FUN FACT

Lee-on-the-Solent in England is where you can find the Hovercraft Museum which holds the world's largest collection of hovercraft designs, including some of the earliest and largest hovercrafts ever created!

FRICITION

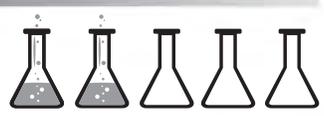
Friction is the resistance that one surface or object encounters when moving over another surface or object. Different types of materials create varying amounts of friction. Friction can be found in our everyday lives and allows us to stand without falling, drive our cars safely down the road, and allows us to even grip a racket when playing tennis.

MATERIALS

- Blank CD
- Balloons
- Glue gun
- Bottle lid (push-up type)
- Adult helper



DIFFICULTY



Why are friction jokes hard to tell at school?

*Answer on the next page

VISIT
DIYSCIENTIME.ORG
FOR MORE SCIENCE FUN!



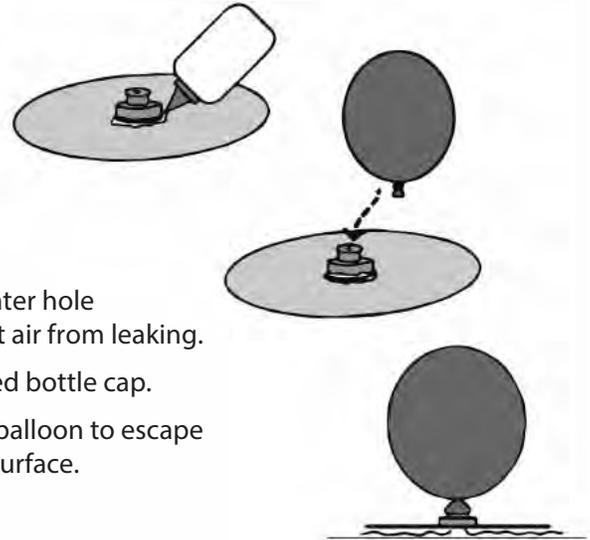
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*Joke Answer -
Most teachers won't let them slide!

DIY Hovercraft

EXPERIMENT

- Step 1:** Gather materials.
- Step 2:** Use glue to fasten the bottle cap directly over the center hole of the CD. Be sure it is sealed completely to prevent air from leaking.
- Step 3:** Blow up and connect a balloon to the top of the closed bottle cap.
- Step 4:** Open the bottle cap, allowing the air from inside the balloon to escape and observe how the hovercraft behaves on a flat surface.



WHY IT WORKS

Hovercrafts work by using air to lift the craft off of the surface. As the balloon deflates, the air is pushed out through the bottom of the CD. Because of the weight, shape and texture of the CD, a thin layer of air is formed between the CD and the smooth table top surface. This layer of air reduces the friction between the CD and the surface allowing the CD to move easily and hover over the table.

EXTEND YOUR LEARNING

- What would happen if you used a different shaped balloon?
- Will it work with a heavy plastic plate, or cardboard instead of the CD?
- How far can you get your hovercraft to go? What adjustments can be made to make it move faster?
- Can your hovercraft glide across any other surfaces? Carpet? Tile? Cement?
- How much weight can your hovercraft carry?

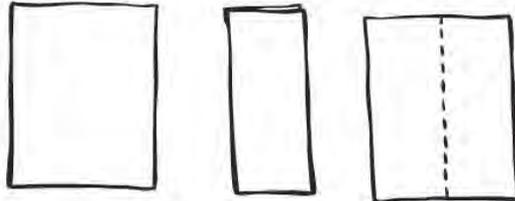
WORKFORCE CONNECTION

Fire-rescue workers use amphibious hovercraft to rescue people in flooded, muddy or icy areas. The hovercraft can easily go up to people's homes to rescue them right at their front door and works much better than a helicopter for this purpose. Fire and rescue workers also need to understand how to operate and maneuver the craft which means part of their job is to practice these rescue scenarios in the event a real situation arises.

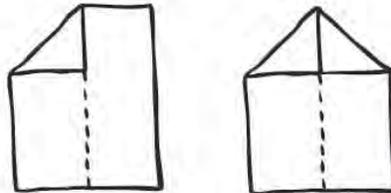


Paper Airplane

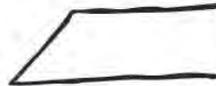
1. Fold paper in half the long way and reopen.



2. Fold the top two corners into the center spine of the paper.



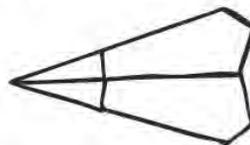
3. Refold lengthwise and rotate the paper to lay on the table like this:



4. Fold the top left corner down to lay parallel to the bottom spine. Repeat this step on the other side.



5. Turn the paper over and repeat the last two steps. Your airplane should look like this!



6. Now, try to fly it to the moon! How far can you make the airplane fly?

For more games and activities, visit pbskidsforparents.org

Produced by:

WIND DANCER
FILMS



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DESIGN A BIRD



Frankenstein with Feathers!

Birds have many adaptations for the type of lives they have. Species look different from one another depending upon their diet & habitat. Use the ideas below to design your own bird on the next page. Write a few sentences describing the adaptations of your “Frankenbird”. Don’t forget to draw your bird’s habitat too!

Beaks



For tearing meat



For pulling worms



For eating plants under-water



For cracking seeds



For spearing fish



Feet



To snatch prey



For perching



For swimming



For walking around

Feathers



For flight



To keep warm



To attract a mate

Body Shape & Wings

Streamlined for flying fast

Small and fat for staying warm

Midsized with strong muscles for migration

Coloring

Brightly colored to attract a mate (often the male is more brightly colored)

Neutral colors to blend in with its habitat

Describe your bird's adaptations here:



it's Storytime CHALLENGE

Bernoulli's Pressure Challenge



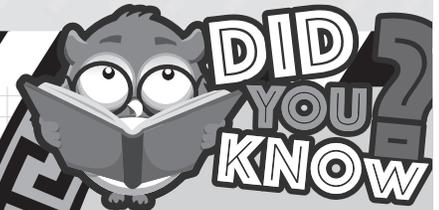
Scan here for instructions from Live From the Opera House Episode 301: Take Flight

- Strip of Paper
- Round Cheese Puff
- String
- Ping Pong Ball
- Thin Garbage Bag
- Clean Funnel
- Bendable Straw
- Aluminum Cans
- Hair Dryer

My Design Ideas:



How could I improve on my design for next time?



Bernoulli's principle explains the reason why airplanes are able to fly.

Between 1725 and 1749 alone, Daniel Bernoulli received 10 prizes from the Paris Academy of Sciences.

POWER UP WORDS

- Aviation
- Flight Path
- Cargo

CAREER LIFTOFF

- ▶ Pilot
- ▶ Air Traffic Controller
- ▶ Aerospace Engineer
- ▶ Avionics Technicians

Learning Standards: 3rd grade; Engineering Design

- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.



MATH PARK

Multiplying by 10

Directions: Scan the QR code to watch the video, and then solve the multiplication problems.



$10 \times 1 = 10$

$3 \times 10 =$

$10 \times 11 =$

$10 \times 8 =$

$10 \times 2 =$

$5 \times 10 =$

$10 \times 3 =$

$0 \times 10 =$

$9 \times 10 =$

$8 \times 10 =$

$10 \times 10 =$

$7 \times 10 =$

$10 \times 9 =$

$11 \times 10 =$

$10 \times 6 =$

$10 \times 5 =$

$4 \times 10 =$

$12 \times 10 =$

SHOW

NOT TELL!

THE STORY PIRATES CREATOR CLUB



Character Traits

Who is your character?	Choose a character trait to describe them. There are some suggestions below!
SHOW the character trait to the reader! Write about what the character is DOING because of that trait.	

Other words for "kind"

considerate
generous
helpful
thoughtful

Other words for "energetic"

exuberant
lively
spirited
vivacious

Other words for "friendly"

affable
amiable
gregarious
welcoming

Other words for "funny"

amusing
comical
hilarious
silly

Other words for "wise"

knowledgable
perceptive
prudent
shrewd

Other words for "unfriendly"

antisocial
disagreeable
hostile
rude

Other words for "lazy"

lackadaisical
lethargic
passive
weary

Other words for "hard-working"

diligent
industrious
persevering

Week 2: Under Water

July 1-7

Dive deep into oceans, rivers, and our own Great Lakes to discover what it takes to live beneath the waves.

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



Scan the QR code or visit www.michiganlearning.org/underwater to see the playlist of videos for this week.

Watch Curious About Careers	 60 mins. of activity	 Read for 20 minutes	Watch Great Lakes Now	 Go swimming
 Read for 20 minutes	 Watch Story Pirates	Make density art	 Go fishing	 60 mins. of activity
 60 mins. of activity	Make a heatless lava lamp	 HAVE FUN! (Free Space)	Watch InPACT at Home	 Read for 20 minutes
Watch DIY Science Time	 Go swimming	 Watch Math Park	 Watch Story Pirates	Watch Extra Credit
Describe an animal that lives under water	 Read for 20 minutes	Build a pond viewer	 60 mins. of activity	 Watch Math Park

Density Art



1. Scan the QR code on this sheet to watch the video and follow along with Mister C.



helps you



2. You'll need:

- a. This printout
- b. Plain printer paper or canvas paper
- c. Food coloring
- d. Vegetable Oil
- e. Pipette or straw
- f. Pan

Discussion Questions:

Does the type of paper impact the art?

How can you manipulate the colors to make more colors than you originally had in the food coloring box?

What if you added something like glitter to the oil and water mixture?

Fun Fact:

Symmetry is used in photography to create beautiful images. Butterflies have a line of symmetry down the center of their bodies.



A POND WITH A VIEW

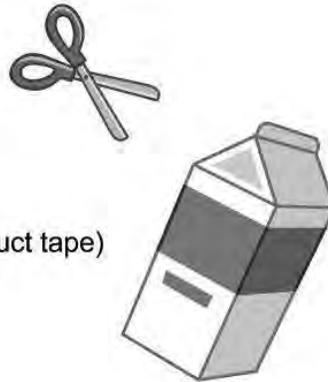
DIFFICULTY: EASY

While there is action all around a pond, what do you think is happening *in* the water? Ponds are filled with animal and plant life that have special qualities that help them spend all or most of their lives underwater. Make this pond viewer to bring on your next pond exploration!



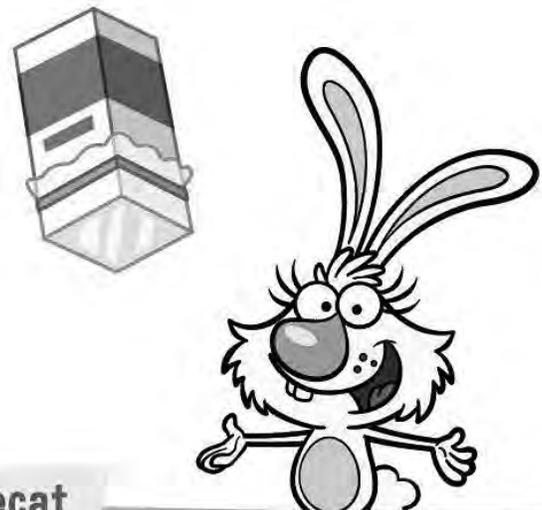
MATERIALS

- One-half gallon milk carton
- Scissors
- Waterproof, strong tape (e.g. duct tape) or a sturdy rubber band
- Heavy, clear plastic wrap



LET'S MAKE A POND VIEWER!

- 1 Have an adult cut off the very top of the milk carton and the very bottom to create a rectangular tube.
- 2 Tear off a sheet of plastic wrap and place it over one of the open ends. Fold down the plastic wrap... make sure wrap is smooth and tight for clear viewing.
- 3 Using the tape or the rubber band, secure the plastic wrap in place. Keep the plastic wrap as tight as possible so you have a flat viewing surface.



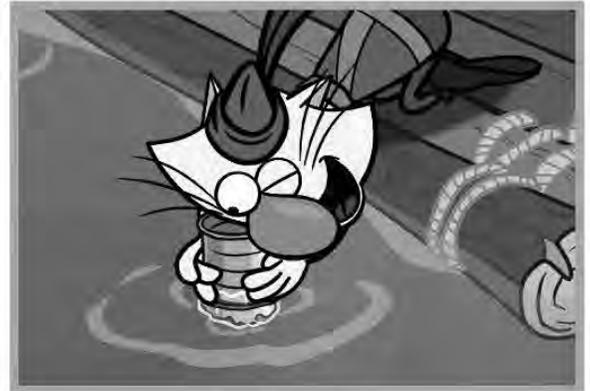
pbskids.org/naturecat

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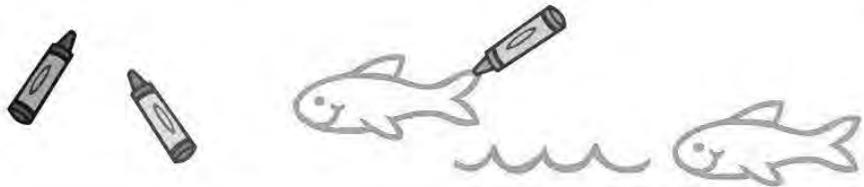
POND VIEWING TIPS

- 1 Splashing and stirring up mud will make it difficult to see into the pond. Be as still as possible when using your viewer.
- 2 Despite what NatureCat says, it is noble and fun to get wet! If the shoreline is murky, slowly wade out to your knees before using your viewer where it may be less murky.
- 3 Other ways to view: on a dock, over the side of a canoe, or in a stream, lake or tide pool!



LET'S TAKE A CLOSER LOOK

Describe a plant or animal that you see. Draw a picture of it, and ask an adult to help you identify and label your picture.



pbskids.org/naturecat

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DIY Heatless Lava Lamp



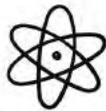
FUN FACT

Lava lamps were invented in 1948 and were originally called "Astro Lamps." The lava lamp made its television debut in the US in the 1960s on a show called "Doctor Who." Sales skyrocketed after this TV appearance!

MATERIALS

- 2-liter bottle
- Vegetable oil
- Water
- Effervescent tablets
- Food coloring
- Funnel

DIFFICULTY



DENSITY

Density is a measurement of the matter an object has within a given volume. Objects with more matter in a given volume have a higher density. Objects with less matter in the same amount of volume have a lower density. Density is found by dividing the mass of an object by its volume.

VISIT
DIYSCIENTIME.ORG
FOR MORE SCIENCE FUN!



What runs but never walks?

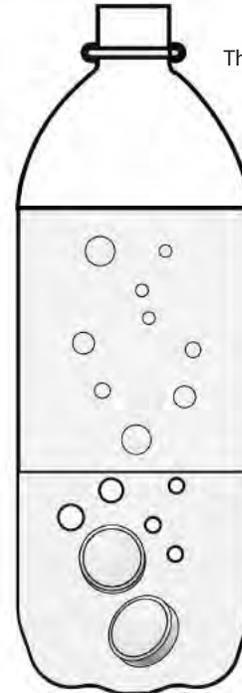
**Answer on the next page*

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DIY *Heatless Lava Lamp*

EXPERIMENT

- Step 1:** Gather your materials.
- Step 2:** Clean and rinse your empty 2-liter bottle.
- Step 3:** Pour 3 cups of water into your bottle.
- Step 4:** Add food coloring to the water.
- Step 5:** Gently pour vegetable oil into the bottle and observe how the water and oil interact.
- Step 6:** After allowing the water and oil to settle, drop pieces of the effervescent tablets into the bottle.
- Step 7:** Observe what happens!



*Joke Answer -
The water from your faucet!

WHY IT WORKS

The oil and water stay separate because they have different densities. The oil floats on the water because it's less dense than water. When the effervescent tablet sinks to the bottom, it mixes with the water and starts a chemical reaction that produces carbon dioxide, a gas that rises through the oil. When these bubbles rise, they pull some of the colored water up and through the oil. The gas eventually escapes at the top, but the water falls back down through the oil because it is more dense!

EXTEND YOUR LEARNING

- What happens if you add more pieces of effervescent tablet, or change the amount of water in the bottle?
- Try shining a light, like a flashlight, through the bottle. What can you see differently?
- Is there a limit to the number of times you can repeat the experiment?

WORKFORCE CONNECTION

Paint chemists are scientists who study the properties and use of paint. Most paints are made of the same basic ingredients: pigments, binders, liquids, and additives. How these ingredients interact due to their densities plays an important part in determining the way that paint performs. Paint chemists study things like how well a paint can cover a surface or how long a paint may be able to last outside in the weather.

it's Storytime CHALLENGE

Glorious Great Lakes



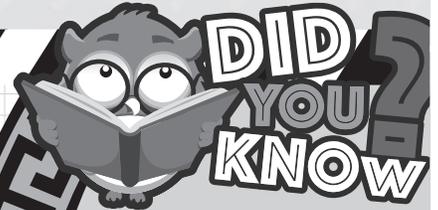
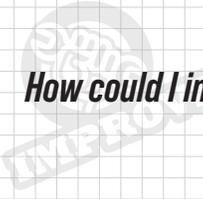
Scan here for instructions from Live From the Opera House Episode 302: Under Water

- Cardboard
- Colored Paper
- Beach Rocks
- Glue
- Paper Towels
- Scissors
- Shaving Cream

My Design Ideas:



How could I improve on my design for next time?



The five Great Lakes - Superior, Huron, Michigan, Erie and Ontario - span a total surface area of 94,600 square miles, making them the largest freshwater system in the world. More than 20% of the world's freshwater is in the Great Lakes!

POWER UP WORDS

- Peninsula
- Lake
- Fresh Water



- › Coast Guard
- › Environmental Engineer
- › Conservationist
- › National Park Service



Learning Standards: 2nd grade
 Develop a model to represent the shapes and kinds of land and bodies of water in an area.
 2-ESS2-2 MI Develop a model to represent the state of Michigan and the Great Lakes, or a more local land area and water body.

SHOW **NOT TELL!**

Emotion



What **emotion** would you like to "Show, Not Tell"? Pick one from the examples below, or just choose your own! If you're not sure what some of the words mean, look at the picture of the face for a clue.



Elated



Jubilant



Thankful



Gloomy



Sorrowful



Lonely



Anxious



Petrified



Startled



Frustrated



Furious



Irate



Amazed



Bewildered



Shocked



Inquisitive

Who is your character?	SHOW the emotion to the reader. What does the character SAY because they feel that way?
What emotion are they feeling?	

Week 3: Heroes

July 8-14

Celebrate our nation's birthday and the people we call heroes, whether they are veterans, everyday helpers, or the kind who wear capes.

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

Scan the QR code or visit www.michiganlearning.org/heroes to see the playlist of videos for this week.



Watch DIY Science Time	 60 mins. of activity	 Read for 20 minutes	 Do a good deed	Spot a mail truck outside
 Read for 20 minutes	 Watch Story Pirates	Build an inertia walker	Watch Curious About Careers	 60 mins. of activity
 60 mins. of activity	Spot a fire truck outside	 HAVE FUN! (Free Space)	Watch InPACT at Home	 Read for 20 minutes
Watch DIY Science Time	 Do a good deed	 Watch Math Park	 Watch Story Pirates	Draw a plant superhero
Watch Extra Credit	 Read for 20 minutes	Watch Extra Credit	 60 mins. of activity	 Watch Math Park



AT-HOME ACTIVITY

Design Your Own Plant Superhero

Big Idea: There are many different types of plants. Some types of plants are good at cleaning the air to make it better for us to breathe.

Explore: Below are three different types of plants. All of these plants are good at cleaning the air inside your house to get rid of pollutants. Pollutants are small, unhealthy things that can get into the air, sometimes from new rugs or cleaning supplies. These plants breathe in the pollutants when they take in air, making it healthier for us inside.



Peace Lily



Areca Palm



Snake Plant

Look at the three plants above. What do you notice that all of these plants have in common (What color are they? What parts of the plant do you see?) What do all plants need?

How are these plants different from each other?

(continued on page 2)

For more *Cyberchase* adventures with plants, watch "Plantasaurus" on pbskids.org/cyberchase.

Funding for *Cyberchase* is provided by The JPB Foundation, the Heising-Simons Foundation and Ernst & Young LLP. Additional funding is provided by Lynne and Marc Benioff, the Tiger Baron Foundation, Shailaja and Umesh Nagarkatte and Ellen Marcus.

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AT-HOME ACTIVITY

Design Your Own Plant Superhero DRAW PAGE

Take turns drawing your plant superhero on this page. Start with the top section and make sure to draw down just below the dotted line. Fold over the top section when you are done and pass on to the next person for the middle section.

Fold back here when top section is done.

Fold back here when middle section is done.

(continued on page 4)

Funding for *Cyberchase* is provided by The JPB Foundation, the Heising-Simons Foundation and Ernst & Young LLP. Additional funding is provided by Lynne and Marc Benioff, the Tiger Baron Foundation, Shailaja and Umesh Nagarkatte and Ellen Marcus.

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DIY Inertia Walker



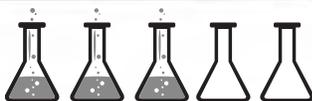
FUN FACT

Inertia combined with the gravitational pull from the sun, is what keeps our planet, Earth, orbiting the sun.

MATERIALS

- Inertia walker printout
- Scissors
- Tape
- Marble
- Ramp

DIFFICULTY



INERTIA

Newton's 1st law states an object at rest remains at rest, and an object in motion remains in motion unless acted on by an unbalanced force. In other words, we call the tendency of an object to do nothing or remain unchanged inertia.

We often experience inertia in our lives! Think about driving in a car and someone applies the brakes. Your body tries to keep moving forward, but the seatbelt holds you safely in place. Try looking at your chocolate milk while you are stirring it next time. Although you pull the spoon out, the milk keeps spinning and swirling in the cup.

Why do dentists love riding roller coasters?

**Answer on the next page*

VISIT
DIYSCIENTIME.ORG
FOR MORE SCIENCE FUN!

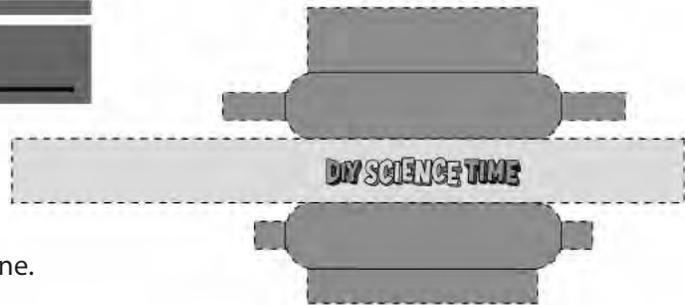


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*Joke Answer -
They know how to
BRACE themselves!

DIY Inertia Walker

EXPERIMENT



Step 1: Print and cut out the walker on the dashed line.

Step 2: Fold and crease the tabs on the solid lines.

Step 3: Tape the walker together where the tabs overlap. Place a marble inside the walker before taping closed.

Step 4: Build a ramp using books and a long flat surface such as a wood board or long box.

Step 5: Place your walker at the top of the ramp and release it!

WHY IT WORKS

Objects in motion want to stay in motion, and the marble inside the walker wants to roll down the ramp. The marble has enough inertia to push and force the rounded end of the walker down the ramp. Without that extra force from the marble, the walker would not be able to overcome the friction between its long side and the ramp's surface. This allows the walker to tumble and turn all the way down the ramp!

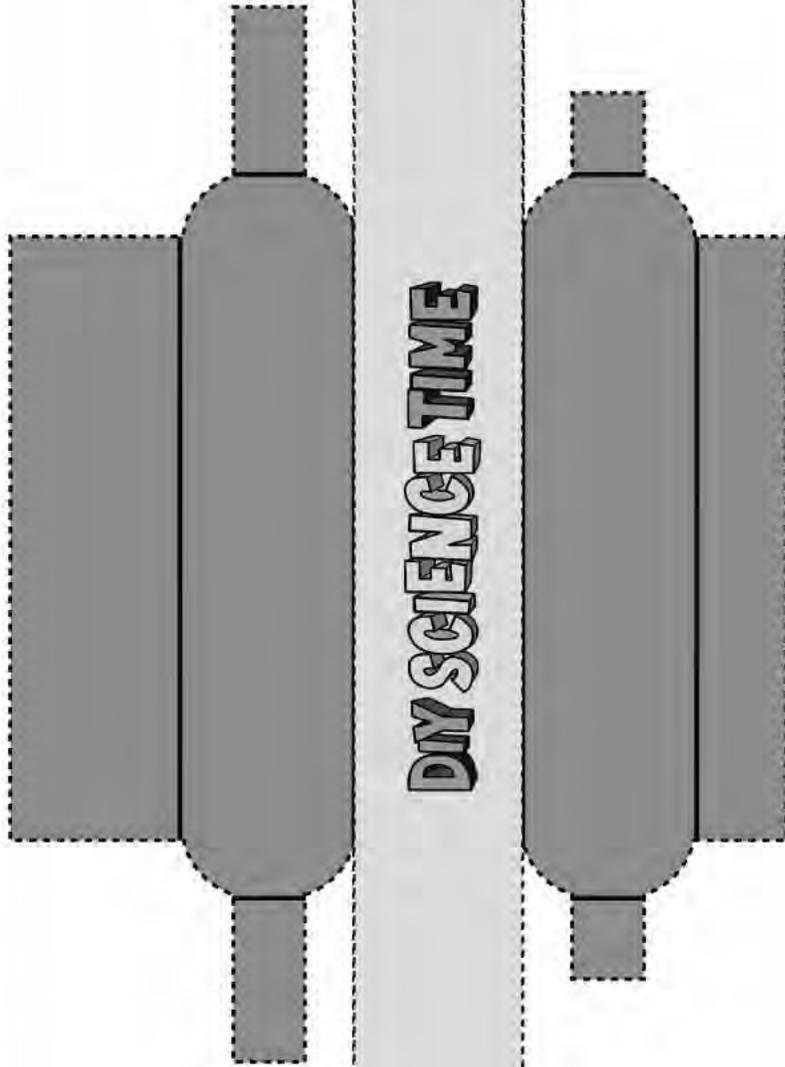
EXTEND YOUR LEARNING

- Could you design your own walker using household materials available to you?
- What happens if you use a larger or smaller marble? Can a smaller marble keep the walker moving?
- What other types of ramps could you test your walker on? Would it work on a slide at the park?
- Could you create a differently-shaped three dimensional object to be a walker? Would a cube work?

WORKFORCE CONNECTION

Biomedical engineers called kinesiologists are scientists who study how people move. Kinesiologists can help athletes improve how they perform in their sports by showing them how their motions can enhance their physical fitness and reduce chances for injuries. They must understand motion and forces, like inertia and gravity, and how they impact athletes' bodies.

DIY Inertia Walker



Fold along solid lines. ✂ Cut along dashed lines.

Directions:

- Step 1:** Cut out the walker on the dashed line.
- Step 2:** Fold and crease the tabs on the solid lines. Place a marble inside the walker before taping it shut.
- Step 3:** Build a ramp using books and a long flat surface such as a wood board or long box.
- Step 4:** Place your walker at the top of the ramp and release it!

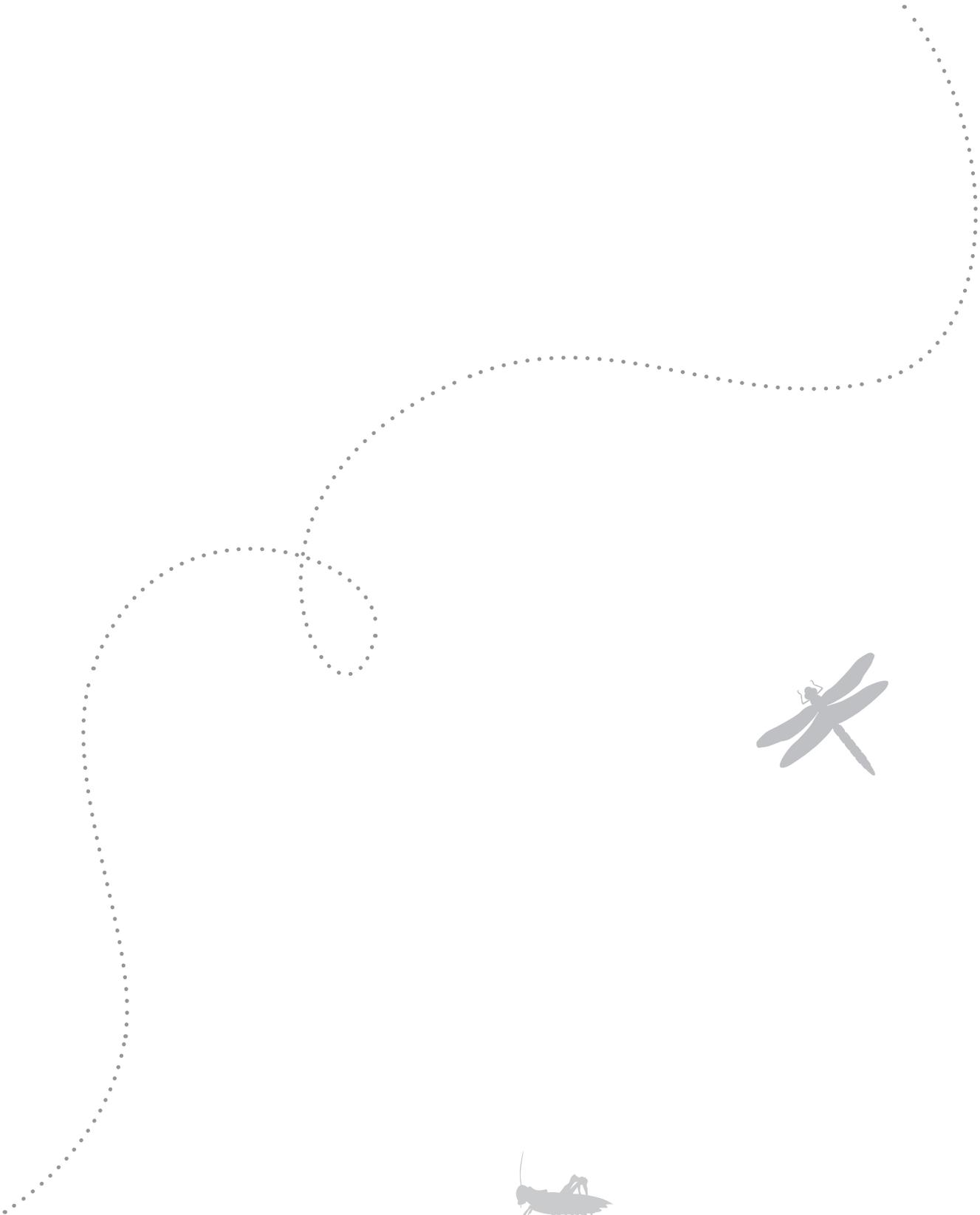


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This page was left blank to cut out the activity on the other side.





CREATE YOUR HERO

Time
to Draw!



Draw and label your hero!

Hero's name

it's Storytime CHALLENGE

Make Your Own Stethoscope



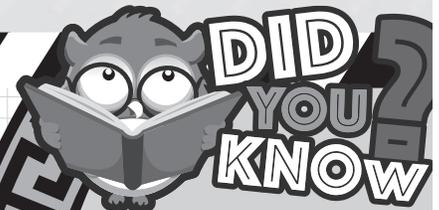
Scan here for instructions from Live From the Opera House Episode 303: Heroes

- Duct tape
- Plastic Funnel
- Stopwatch or Clock
- Scissors
- Cardboard Tube

My Design Ideas:



How could I improve on my design for next time?



Heroes are definitely in the medical field, but there are heroes everywhere! Police officers, teachers, scientists, firefighters, and soldiers are all heroes. And that's not all! Who in your community is a hero?

POWER UP WORDS

- Oxygen
- Exercise
- Heart Rate

CAREER LIFTOFF

- › Physician
- › Biomedical Engineer
- › Nurse
- › Physical Therapist
- › Veterinarian



Learning Standards: 3rd grade

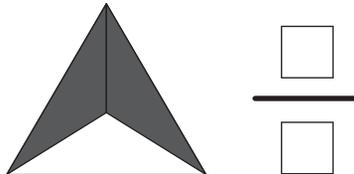
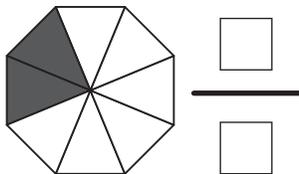
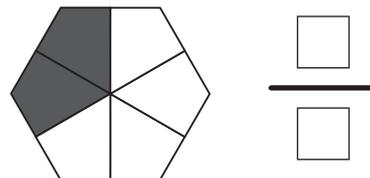
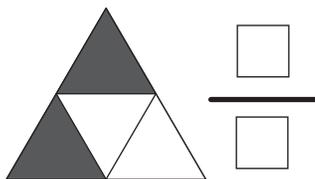
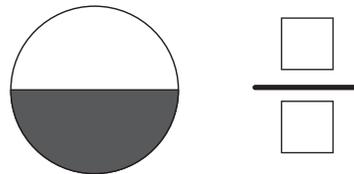
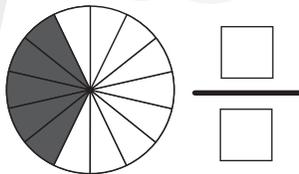
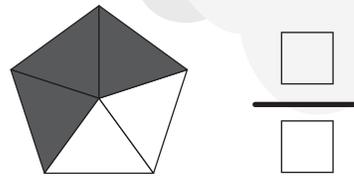
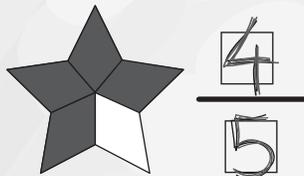
3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.



MATH PARK

Fractions of a Set

Directions: Scan the QR code to watch the video, and then write the fraction you see in the picture.



Week 4: Creatures

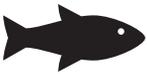
July 15-21

From the prehistoric to the present, learn about the fascinating features of creatures near and far.

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

Scan the QR code or visit www.michiganlearning.org/creatures to see the playlist of videos for this week.



 Watch Math Park	 60 mins. of activity	 Read for 20 minutes	Catch a firefly	Make pendulum art
 Read for 20 minutes	 Watch Story Pirates	Watch Extra Credit	Watch DIY Science Time	 60 mins. of activity
 60 mins. of activity	Look for creatures outside	 HAVE FUN! (Free Space)	Watch InPACT at Home	 Read for 20 minutes
Watch DIY Science Time	Watch Extra Credit	 Watch Math Park	 Watch Story Pirates	Play Trail-Tac-Toe
 Go fishing	 Read for 20 minutes	Make elephant toothpaste	 60 mins. of activity	Draw a made-up creature

TRAIL-TAC-TOE

CAN YOU GET THREE IN A ROW?

When you visit a park or take a walk in your neighborhood, draw or write in the items below and tell where you saw them.

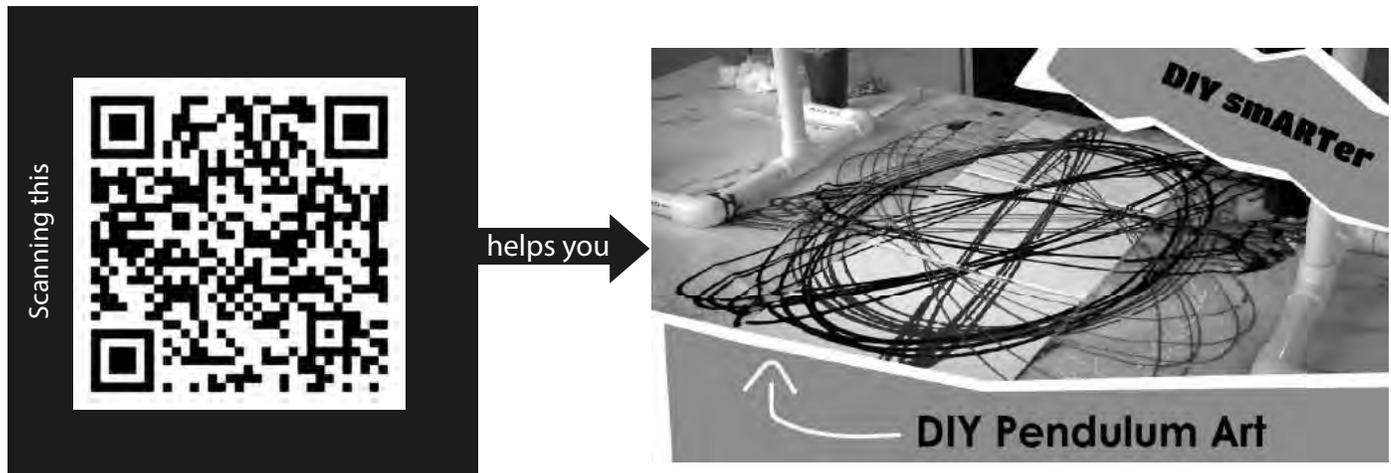
What? Where? Something that could be eaten by an animal	What? Where? A native prairie grass	What? Where? An invasive species
What? Where? Something in nature that is bright red	What? Where? Somewhere or something that helps keep water clean	What? Where? An insect home
What? Where? Something in nature older than you.	What? Where? A yellow flower	What? Where? A sign that an animal was here

METROPARKS.COM

Pendulum Art



1. Scan the QR code on this sheet to watch the video and follow along with Mr. C.



2. You'll need:

- a. This printout
- b. String
- c. Squeeze bottle or plastic cup for your bob
- d. Scissors
- e. Rubber bands and paperclips
- f. Paint
- g. Paper or canvas for painting

Discussion Questions:

What might happen if you use a longer or shorter string? How does the period of the pendulum impact your art?

What might happen if you give the condiment bottle a harder or softer push?

Does the type of paint impact the flow or pattern?

Fun Fact:

Pendulum clocks lose time when it is hot because the heat causes the metal to expand lengthening the rod. This causes the period to increase affecting the ability to keep time.



DESCRIBE YOUR HERO

What are some words to describe your hero?

What is your hero really **GOOD** at, or what is your hero's **TALENT**?

What is your hero's **WEAKNESS**, or what is your hero **AFRAID** of?

What does your hero like to do on a **NORMAL DAY**, when they don't have a big problem to solve?

DIY Elephant Toothpaste



FUN FACT

Seaweed is in our toothpaste! Seaweed acts as a thickening agent that allows toothpaste to be squeezed from its tube!

MATERIALS

- Yeast
- Dish soap
- Measuring spoons
- Empty plastic bottle
- Cup with warm water
- 3% Hydrogen peroxide

DIFFICULTY



CHEMICAL REACTIONS

Chemical reactions take place when the molecular or ionic structure of a substance is rearranged. When a chemical reaction occurs, a new substance is created and the process is irreversible. Today we will be making elephant toothpaste!

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ALABAMA PUBLIC TELEVISION

Why are chemists great at solving problems?

*Answer on the next page

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DIY Elephant Toothpaste

EXPERIMENT

Step 1: Gather materials.

Step 2: Place 2 tablespoons of yeast into 3 oz of warm water.

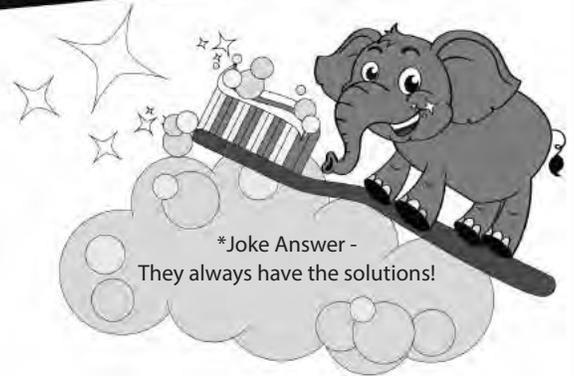
Step 3: Mix yeast and warm water, let stand until it gets frothy (about 3 minutes).

Step 4: Pour 4 ounces of hydrogen peroxide into an empty bottle.

Step 5: Squirt 1 tablespoon of dish soap into the hydrogen peroxide.

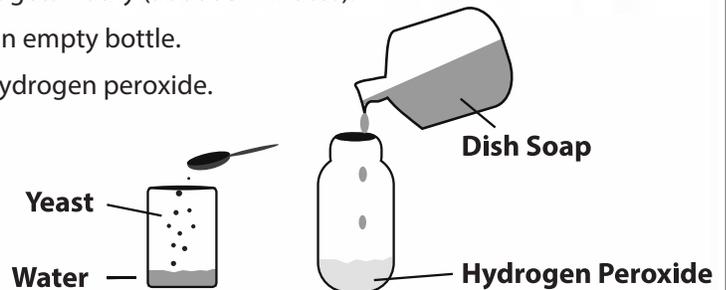
Step 6: Pour your yeast mixture into the bottle.

Step 7: Observe what happens!



WHY IT WORKS

"Elephant toothpaste" is created when a chemical reaction takes place and releases one oxygen atom from the hydrogen peroxide (H_2O_2). Hydrogen peroxide decomposes, or breaks down, into water (H_2O) and oxygen (O_2) naturally over time, but the yeast causes this to occur faster. The yeast has an enzyme in it called catalase. Catalase is a catalyst, something that increases the speed of the reaction. The catalyst is what causes the oxygen to be released quickly to create our "elephant toothpaste." So why did we add soap? We wanted to capture all of the released oxygen (gas) from the chemical reaction!



EXTEND YOUR LEARNING

- Would the experiment still work if you added more yeast?
- What happens if you don't add the soap?
- Does the shape or the size of the bottle change how the elephant toothpaste flows?

WORKFORCE CONNECTION

Cosmetologists, people who study the application of beauty treatments, work carefully with chemical reactions on a daily basis to help color people's hair. When someone's hair is bleached, a chemical reaction takes place to change the melanin from brown to a colorless (pale yellow) color. This irreversible process (chemical change) then allows the cosmetologist to apply a new color to the hair.

it's Storytime CHALLENGE

Amazing Animals



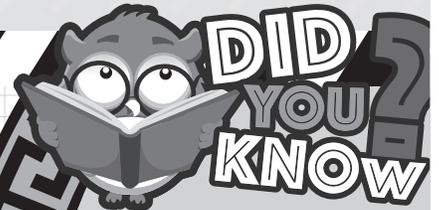
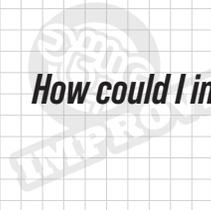
Scan here for instructions from Live From the Opera House Episode 304: Creatures

- Various Boxes
- Fun Fabrics
- Pipe Cleaners
- Foam Blocks, Cubes & Balls
- Masking Tape
- Wiggly Eyes
- Form Board
- Small Bag of Bird Seeds

My Design Ideas:



How could I improve on my design for next time?



Animals are truly amazing. Did you know that to hover, hummingbirds may beat their wings up to 200 times per second? Or that a jaguar can see in the dark six times better than a human?

POWER UP WORDS

- Adaptation
- Coexist
- Ecosystem

CAREER LIFTOFF

- › Zoologist
- › Wildlife Biologist
- › Marine Rescue Officer
- › Animal Shelter Technician

Learning Standards: 2nd Grade

2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.



MATH PARK

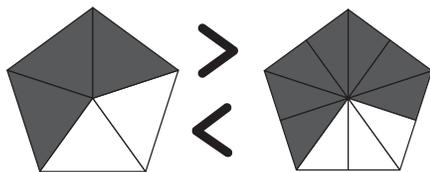
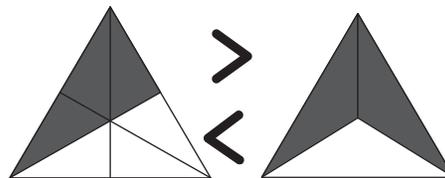
Equivalent Fractions

Directions: Scan the QR code to watch the video, and then circle the symbol that goes between them.



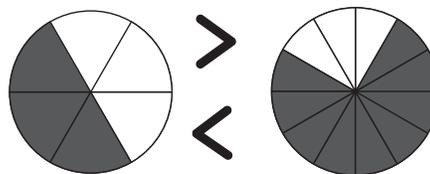
$$\frac{3}{10} > \frac{3}{5}$$
$$\frac{3}{10} < \frac{3}{5}$$

$$\frac{1}{4} > \frac{1}{8}$$
$$\frac{1}{4} < \frac{1}{8}$$



$$\frac{5}{5} > \frac{5}{15}$$
$$\frac{5}{5} < \frac{5}{15}$$

$$\frac{1}{2} > \frac{1}{4}$$
$$\frac{1}{2} < \frac{1}{4}$$



Week 5: Engineering

July 22-28

Meet the people who design bridges, cars, and video games and learn how to think like an engineer.

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

Scan the QR code or visit www.michiganlearning.org/engineering to see the playlist of videos for this week.



Look for landmarks with ArchiTREKS	 60 mins. of activity	 Read for 20 minutes	Draw a family member's car	Watch Extra Credit
 Read for 20 minutes	 Watch Story Pirates	Write in binary with Career Girls	Watch DIY Science Time	 60 mins. of activity
 60 mins. of activity	Look up engineering careers	 HAVE FUN! (Free Space)	Watch InPACT at Home	 Read for 20 minutes
Build a bridge from outdoor materials	Find a creative solution in your hero story	 Watch Math Park	 Watch Story Pirates	Try DIY Science Time marble madness
Watch DIY Science Time	 Read for 20 minutes	Make an obstacle course	 60 mins. of activity	 Watch Math Park

Why Consider AI Careers

The video "[Why Consider AI Careers](#)" teaches you about the role of AI in our everyday lives and the importance of encouraging women and girls to consider AI as a career possibility. AI careers work directly with computers and sometimes with different computer languages.

Try This!

One of the basic building blocks that computers use to send and receive information is called binary code. Binary code is a code with only two symbols. First, decode the message below using binary code. Then, try using binary code to send a short message to a friend!

Creating Secret Messages in Binary Code

A	00001	J	01010	S	10011
B	00010	K	01011	T	10100
C	00011	L	01100	U	10101
D	00100	M	01101	V	10110
E	00101	N	01110	W	10111
F	00110	O	01111	X	11000
G	00111	P	10000	Y	11001
H	01000	Q	10001	Z	11010
I	01001	R	10010		

DECODE THIS: 01000 00101 01100 01100 01111 _____

Now, try writing a short message to a friend:

A =     

The 0s and 1s of this binary code aren't the only way to make a binary code. Binary just means that there must be two options. Anything that can exist in two states or forms can be used. For example, you could replace the 0s with a heads-up penny and the 1s with a tails-up penny. What other items could you use to make a binary code?



Acting Out Structures



COLUMN



ARCH



COLUMN AND BEAM



DOME



TENSION



CANTILEVER



LOAD AND SUPPORT



VAULT / TUNNEL



COMPRESSION



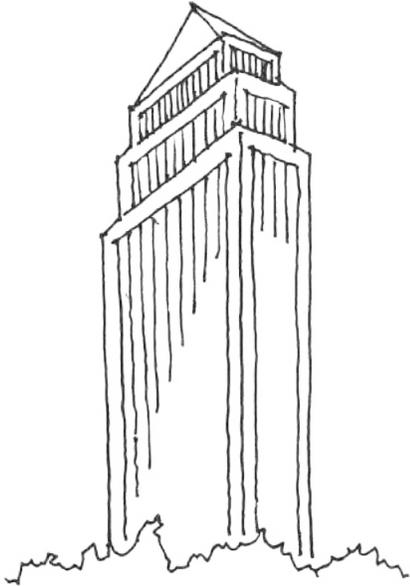
FLYING BUTTRESSES

How does your house stay standing? Architects use structures like columns, beams, and arches to make buildings strong and be sure they last for many years. Grab a grown-up or a friend and try to make columns, beams, and arches with your body!

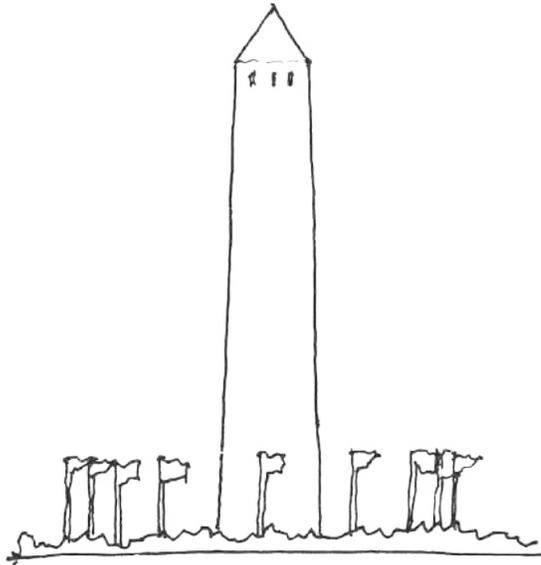


<https://michiganarchitecturalfoundation.org>

ArchiTREKS: Landmarks



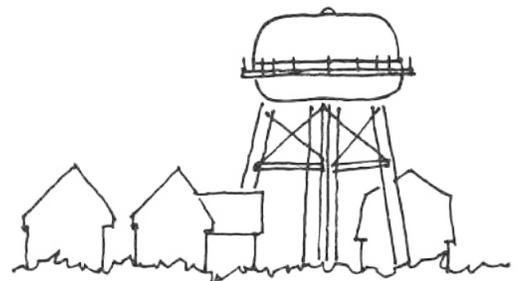
High-Rise Building



Monument



Church Steeple



Water Tower

These are examples of landmarks. What landmarks are in your neighborhood? Draw a picture of a local landmark!

DIY Marble Madness



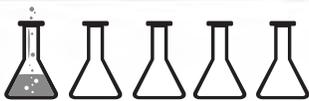
FUN FACT

Before roller coasters were even invented, mountain-side railway cars carried coal in the mornings and provided joy rides for human passengers in the afternoon. The Mauch Chunk Switchback Railway was built in 1827 and could carry its passengers 50 miles per hour!

MATERIALS

- Marbles
- Straws
- Tape

DIFFICULTY



POTENTIAL AND KINETIC ENERGY

Energy stored in an object due to its position is potential energy. Energy that a moving object has due to its motion is kinetic energy. We can observe potential and kinetic energy conversions in many different places. Roller coasters, sledding, and even playing with dominos are familiar examples of potential and kinetic energy.

VISIT

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ALABAMA PUBLIC TELEVISION

Why is wind energy becoming so popular?

**Answer on the next page*

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DIY *Marble Madness*



*Joke Answer -
Because it has so many fans!



EXPERIMENT

Step 1: Build a track that allows a marble to roll across the straws. Try to make a track 10 feet in length.

Step 2: Build a ramp for your track. This is where your marble will start and get its energy.

Step 3: Release your marble onto the track and observe the distance and speed your marble is able to reach.

Step 4: Did your marble make it the entire length of the track? How long did it take? Record your data into your science notebook.

Step 5: Redesign your track and ramp to increase the speed and distance the marble can travel.

WHY IT WORKS

Marbles have mass, and when you lift mass up off the ground, you increase the potential energy that mass has because of gravity. By adjusting the height of your ramp, you are able to increase or decrease the potential energy of the marble. Once the marble is released, it rolls down the track and the potential energy is converted into kinetic energy. If your ramp is tall enough and your track is built well, the marble may be able to successfully travel the entire track. With some simple adjustments, you can increase and decrease the speed of the marble.

EXTEND YOUR LEARNING

- What's the longest track you can build?
- Does the size of your marble change the distance that it can travel?
- Can you add hills to your track? How does that impact how the marble travels?
- Try building a second track and race a friend.

WORKFORCE CONNECTION

Hydroelectric power plants use gravitational potential energy to turn the blades of a turbine to generate electricity. A hydroelectric power plant has a water reservoir that sits above the turbines, giving the water potential energy. Scientists precisely regulate the flow of the water down and out of the reservoir, directing it across energy generating turbines. These scientist must precisely calculate the amount of water speed necessary to get the turbines moving to generate electricity.



THE HERO SIZED PROBLEM

Every story involves some sort of problem, but in a hero story that problem is SO HUGE that a whole community is in danger, and a hero needs to save the day! For more ideas on how to create a Hero Sized Problem, check out our Hero Stories videos at storypirates.com/storypiratesuniversity.

What is the **COMMUNITY** where your story takes place? A city? A town? An underground snow fortress? Use your imagination, then draw and label a picture or map!

Time
to Draw!



What is the **HERO SIZED PROBLEM** in the community?



CREATIVE SOLUTIONS

The Hero Sized Problems of today can't be solved just by punching, kicking, and blowing things up. Heroes need to be able to use their imaginations, and come up with creative ways to solve problems that nobody has ever thought of before. For more ideas on how to invent some **CREATIVE SOLUTIONS**, and then have your hero **TRY, FAIL, AND TRY AGAIN**, check out our Hero Stories videos at storypirates.com/storypiratesuniversity.

The **FIRST** solution the hero tried:

Unfortunately (what went wrong?):

The **NEXT** thing the hero tried:

Unfortunately (what went wrong?):

The solution that **FINALLY** worked:

It worked because:

it's Storytime

CHALLENGE

RUBE GOLDBERG MACHINE



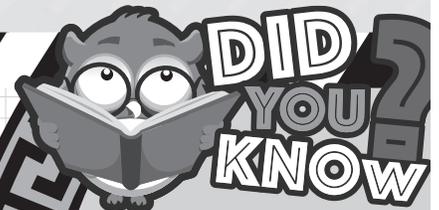
Scan here for instructions from Live From the Opera House Episode 305: Engineering

- Dominos or Blocks
- Ball
- Cardboard
- Duct Tape
- Balloon
- Push Pin

My Design Ideas:



How could I improve on my design for next time?



Engineers usually design or build things. Some engineers also use their skills to solve technical problems. There are different types of engineers that design everything from computers and buildings to watches and websites.

POWER UP WORDS

- Slope
- Tension
- Gravity



- › Civil Engineer
- › Mechanical Engineer
- › Roller Coaster Engineer

Learning Standards: Kindergarten; Forces and Interactions: Pushes and Pulls

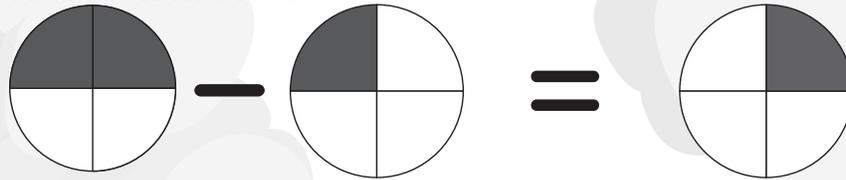
K-PS2-1 Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
K-PS2-2 Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.



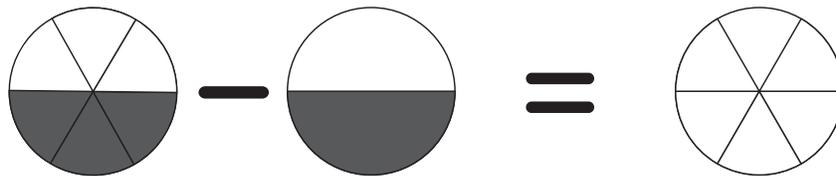
MATH PARK

Adding & Subtracting Fractions

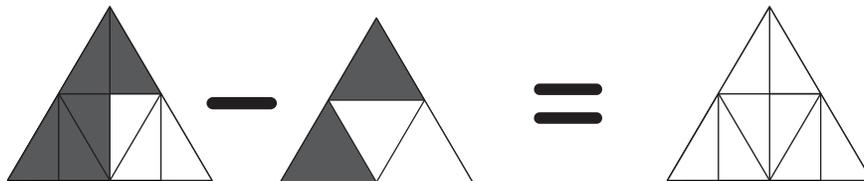
Directions: Scan the QR code to watch the video, and then add and subtract the fractions.



$$\frac{4}{8} + \frac{1}{8} = \underline{\hspace{2cm}}$$



$$\frac{2}{4} + \frac{1}{4} = \underline{\hspace{2cm}}$$



Week 6: Great Outdoors

July 29 - August 4

Explore the world outside your door and the incredible parks and waters that belong to us all.

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

Scan the QR code or visit www.michiganlearning.org/greatoutdoors to see the playlist of videos for this week.



Crush a soda can with DIY Science Time	 60 mins. of activity	 Read for 20 minutes	 Watch the sunset	Play catch outside
 Read for 20 minutes	 Watch Story Pirates	Make a composter	Watch DIY Science Time	 60 mins. of activity
 60 mins. of activity	 Watch Math Park	 HAVE FUN! (Free Space)	Watch InPACT at Home	 Read for 20 minutes
Watch Extra Credit	 Go swimming	 Watch Math Park	 Watch Story Pirates	Make leaf rubbings
Look for cool rocks	 Read for 20 minutes	Visit a new place	 60 mins. of activity	 Watch Math Park



MAKE A COMPOSTER!

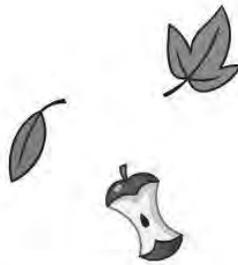
DIFFICULTY: EASY (REQUIRES ADULT ASSISTANCE)

What happens to a pile of old leaves outside when you add a dash of time, maybe some worms, and a healthy splash of moisture? Rich soil perfect for a garden just like Daisy's!



MATERIALS

- 1 empty two-liter soda bottle
- Sharp knife
- Nail
- Shredded newspaper
- Dirt (not potting soil -- use dirt from outside)
- Compost materials (such as grass clippings or vegetable scraps)
- Small handful of dead leaves
- Flat dish to hold compost
- Spray bottle with water



LET'S GET COMPOSTING!

- 1 Rinse the bottle and peel off the label.
- 2 Have a grownup cut off the top of the bottle as shown. Set the top aside.
- 3 Have the grownup use the nail to punch 8 to 10 small air and drainage holes along the sides and bottom of the bottle.
- 4 Put the bottle on the tray.



pbskids.org/naturecat

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- 5 Put some dirt, shredded newspaper and old leaves inside the composter. This is your compost starter.
- 6 Use the spray bottle to wet the compost starter. 
- 7 You're ready to add some stuff to your compost! (Try grass clippings, vegetable scraps, coffee grounds, or eggshells, but do not add dairy or meat.)
- 8 Turn the bottle top upside down and nest it in the open top of the bottle. It will act like a funnel for adding a little bit of water each day to keep the contents damp.
- 9 Place in a spot where sunlight can reach it. 
- 10 Stir every few days, keep the contents damp, and let it rot! As your compost breaks down, you can add more kitchen scraps or plant litter, as well as some more soil from outside to mix in.
- 11 Cover the top of your compost with a kitchen towel when not in use.



LET'S TAKE A CLOSER LOOK

- 1 As you check your composter each day, describe what you observe.
- 2 You may see fluffy mold growing. Some people are allergic to some types of mold, so keep your compost covered when you're not working with it.
- 3 Now take your rich, healthy soil, place it in a pot, add a seed and some water and grow your very own plant!



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Make Leaf and Bark Rubbings



What to Do:

1. Find some trees: Take some blank paper, masking tape (optional), and crayons outside. Look for several trees with different types of bark and leaves.

2. Feel the bark: Close your eyes and feel the bark of the trees. How does it feel? Which one is the smoothest? The roughest?

3. Make a bark rubbing: Use tape to hold a piece of paper on the trunk or hold the paper tightly. Lightly rub a crayon horizontally over the surface of the paper on the bark, just hard enough so that the bark's texture shows on the paper. Do this to other trees and compare the rubbings.

4. Make a leaf rubbing: Collect some leaves from different trees. Close your eyes and feel the leaves. How do they feel? Make leaf rubbings by putting the leaf on a piece of cardboard or a clipboard, covering it with the paper, and rubbing the crayon over it.

5. Make a matching game: Once you've made several leaf and bark rubbings, play a matching game with them. Mix them up and see if you can figure out which tree each leaf and bark rubbing came from.

What You Need:

- Trees
- Plain white paper
- Crayons with label removed
- Masking tape (optional)
- Cardboard or clipboard
- Paper bag for collecting leaves



Find more games and activities at pbskids.org/naturecat

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Environmental Science Issues

The video "Environmental Science Issues" discusses the importance of our environment and the steps that we can take to help protect it. Taking care of the environment is everyone's responsibility.

Try This!

Use the space below to draw your favorite environment. It might be a beautiful beach, a tranquil park, a wild forest, or anywhere that you would love to be. Then answer the questions that follow.

My Favorite Environment



What makes this your favorite environment?

What threats does your favorite environment face? For example, what might happen if someone came and cut down the trees or dumped trash on the beach?

What could you do to help protect your favorite environment?

DIY Can Crush



FUN FACT

Implode is the opposite of explode. When something implodes, it quickly collapses inward. Buildings are often imploded when they need to be demolished so that the destruction doesn't hurt nearby buildings or surroundings.

MATERIALS

- An adult helper
- Stovetop or burner
- Empty soda cans
- Large bowl of ice
- Water
- Tongs

DIFFICULTY



AIR PRESSURE

Air is EVERYWHERE! Air is the invisible gaseous substance that surrounds all of the Earth. There are five layers to Earth's atmosphere and gravity is pulling down on the air molecules in each layer. That pulling is what creates atmospheric pressure.

VISIT
DIYSCIENTIME.ORG
FOR MORE SCIENCE FUN!



What do you call the study of soft drinks?

*Answer on the next page

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*Joke Answer -
Fizz-ics!

DIY Can Crush



EXPERIMENT

Step 1: Gather materials.

Step 2: Fill a large bowl halfway with ice water.

Step 3: Add an 1/8 cup of water to the bottom of the can (just enough to cover the bottom).

Step 4: Place the can on the center of the burner. Once it's stable, turn the burner on high until it has steamed for at least 1 minute.

Step 5: Use your tongs to grasp the can so that you can safely flip the can over and into the ice water.

Step 6: Quickly flip the can over and place into the ice water so that the opening is submerged. Be careful to not splash hot water as you flip the can.

WHY IT WORKS

As the water in the can heats up, it changes from a liquid to a gas, making water vapor. The water vapor pushes the air out of the can. Once the can is upside down in the ice water, the hot water vapor is trapped inside and quickly cools after it's submerged in the ice water. The water vapor condenses leaving empty space in the can. The air outside of the can has pressure, exerting 14.7 pounds of pressure per square inch on the can! Without the air inside of the can, the air pressure is unequal and the outside air easily crushes the can.

EXTEND YOUR LEARNING

- What would happen if you used room temperature water instead of ice water?
- What happens if you use a different sized can?
- What happens if you don't heat your can up before turning over into the ice water?
- Does the size of your ice impact the experiment?

WORKFORCE CONNECTION

Aerospace engineers have to understand how pressure and a lack of pressure (vacuum) both affect the performance of aircraft and spacecraft inside and outside of the Earth's atmosphere. Aerospace engineers design and test aircraft and spacecraft as well as missiles and satellites to learn how air impacts flight. Aerospace engineers recently were able to test how the air pressure on Mars affects the flight of a drone!

it's Storytime CHALLENGE

Growing Seeds



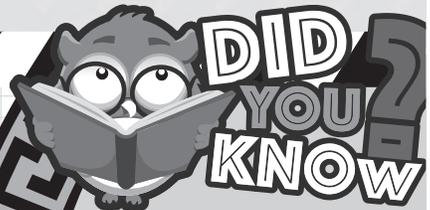
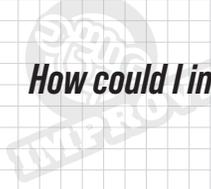
Scan here for instructions from Live From the Opera House Episode 306: Great Outdoors

- Cardboard Egg Carton
- Potting Soil
- Seeds
- Scissors
- Used Coffee Grounds
- A Waterproof Plate or Tray

My Design Ideas:



How could I improve on my design for next time?



Humans use more than 2000 different types of plants to create various delicious food items in our meals!

Seeds can be as tiny as a grain of sand or bigger than a fingernail.

POWER UP WORDS

- Seed
- Root
- Stem
- Flower

CAREER LIFTOFF

- › Gardener
- › Farmer
- › Florist
- › Agricultural Engineer
- › Forester



Learning Standards: Kindergarten

K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Week 7: When I Grow Up

August 5-11

All summer we'll learn about different careers—this week, think about all the exciting possibilities in your future!

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

Scan the QR code or visit www.michiganlearning.org/whenigrowup to see the playlist of videos for this week.



Watch a Career Girls video	 60 mins. of activity	 Read for 20 minutes	 Try a new food	Watch Extra Credit
 Read for 20 minutes	Learn about a new career	Learn about a family member's job	Make an electro-scope	 60 mins. of activity
Try an InPACT activity card	Draw yourself in 50 years	 HAVE FUN! (Free Space)	Try an InPACT Activity Card	 Read for 20 minutes
Watch Extra Credit	Write your hero story	 Watch Math Park	 Watch Story Pirates	Watch InPACT at home
Learn about a family member's job	 Read for 20 minutes	Watch DIY Science Time	 60 mins. of activity	Write a story about your future self



Career Comics 1 Career Video: _____

Scan the QR code to visit the Career Girls website and find a career video that interests you. Then ask yourself: *What is this job like?* Create a comic starring you in this career. At the top, fill in the career and sign your name. Use words and pictures to tell what happens on the job!

I Want to Be _____		By _____	

it's Storytime

CHALLENGE

Protect Your Egg

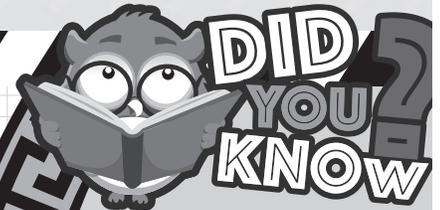


Scan here for instructions from Live From the Opera House Episode 307: When I Grow Up

- A Raw Egg
- Masking tape
- Colored Pencils
- Foam
- White paper
- Crayons
- Duct tape

My Design Ideas:

How could I improve on my design for next time?



A sports engineer focuses on preventing injury while enhancing the performance of the athletes. That includes what the athlete wears and uses, but also the sporting environment and the tools for analyzing the athlete's performance!

POWER UP WORDS

- Iteration
- Kinetic energy
- Potential energy

CAREER LIFTOFF

- › Industrial Designer
- › Physical Therapist
- › Sports Technologist
- › Simulation Engineer



Learning Standards: 3rd-5th Grade

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

MATH PARK

Introducing Decimals: Tenths

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



$$\frac{1}{10} = 0.1$$

$$\frac{3}{10} =$$

$$\frac{8}{10} =$$

$$\frac{2}{10} =$$

$$\frac{5}{10} =$$

$$\frac{9}{10} =$$

$$\frac{10}{10} =$$

$$\frac{7}{10} =$$

$$\frac{6}{10} =$$

$$\frac{4}{10} =$$

IMPACT at HOME

Activity Cards

Cut out the cards. When you're feeling antsy, try following the directions for one of the exercises!

Blast-Off Lunges

INSTRUCTIONS

1. Get into a lunge position with left leg forward, hips underneath you, and right leg behind your right hip.
2. Slowly sink into a lunge, trying to get your knee to touch the ground.
3. Immediately "blast off" by hopping upwards and into next lunge position with right leg forward and left leg behind.
4. If needed, instead of jumping into the next lunge position, jump with feet together and then bounce into lunge position.
5. Repeat as many rounds as possible.

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Side Leg Lifts

INSTRUCTIONS

1. Start by laying on your side with your legs stacked on top of each other.
2. Slowly raise your top leg up towards the sky and then back down.
3. Complete 10 repetitions and then switch legs.
4. Complete 3 sets per leg.
5. For added challenge, tape a bag of water to the top leg for some added weight!

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Tap Backs

INSTRUCTIONS

1. Stand up tall and proud with your feet together and hands on your hips.
2. Take your right foot and tap it right behind you, then place back to starting position.
3. Take your left foot and tap it right behind you, then place back to starting position.
4. Repeat as fast as can to get 100 tapbacks (50 on each leg).

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Ski Jumps

INSTRUCTIONS

1. Start by standing tall with your feet shoulder width apart.
2. Using only your right foot, jump to the left about 2-3 feet and land on your left foot.
3. Gather yourself and then using only your left foot, jump to the right 2-3 feet and land on your right foot.
4. Repeat this as many times as you can for 30 seconds.

Bonus: After each time you jump, touch the ground with the same hand as the side you landed on.
Ex: Land on your left foot, touch the ground with your left hand.

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Cereal Bowl

INSTRUCTIONS

1. Lay flat on your back with feet together.
2. Bring your knees together and raise both legs up so that your feet are facing the ceiling.
3. In slow motion, stir the imaginary bowl of cereal with feet and keep hands under your bottom.
4. Repeat 30 times.

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Lay Down Hip Stretch

INSTRUCTIONS

1. Start by sitting at the edge of a bed in a relaxed position with your feet hanging off.
2. Lay back, and pull your right knee towards your chest while keeping your left leg hanging off the bed.
3. Pull your knee until you feel a stretch in your left hip and hold for 10-15 seconds.
4. Relax, switch legs, and then repeat 2-3 times per leg.

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Aligator Breath

INSTRUCTIONS

1. Stand with legs hip-width apart.
2. Spread arms out wide and inhale as you reach outward.
3. When you exhale, clap your hands together as many times as possible like baby alligator jaws.

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Cloud Watching

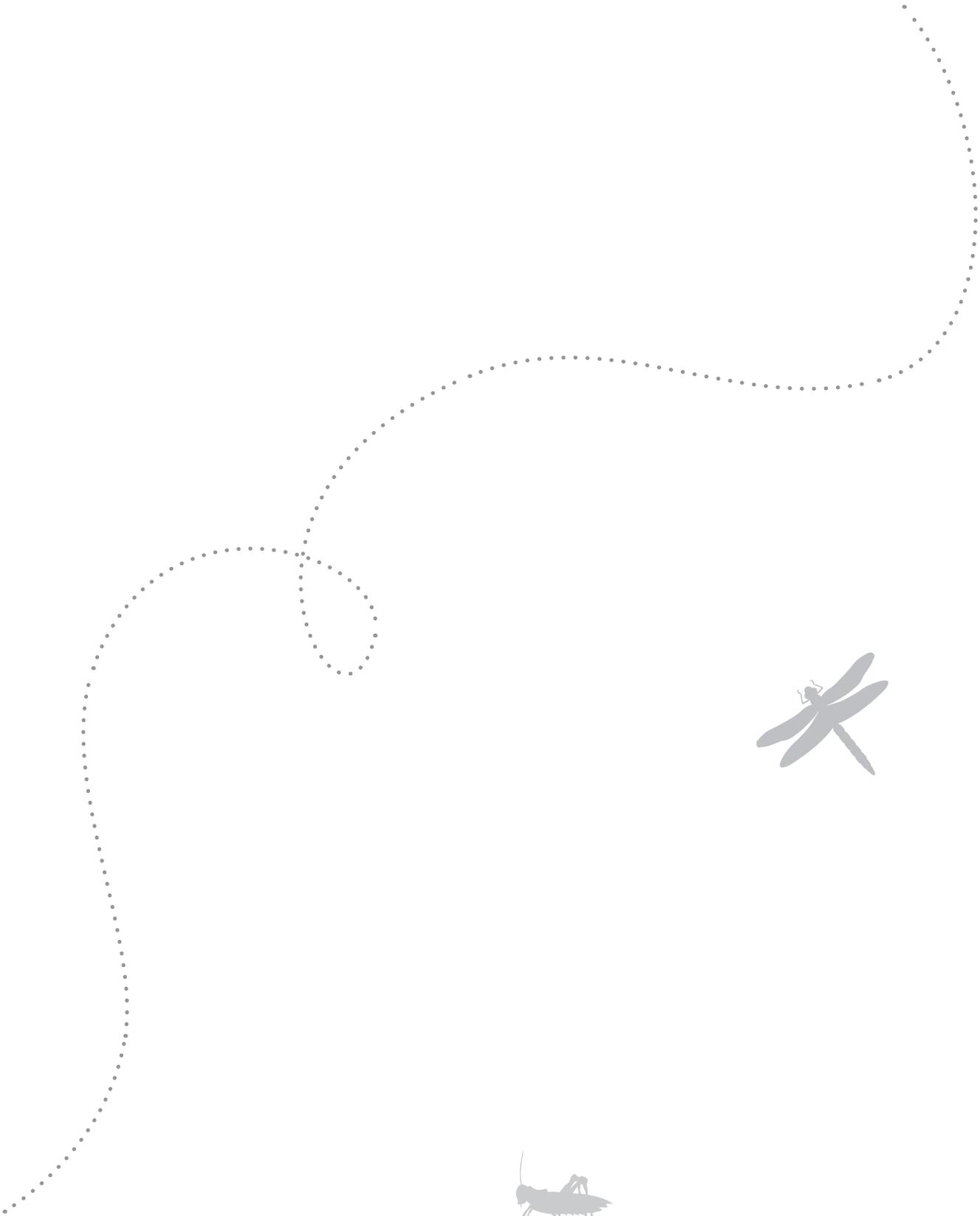
INSTRUCTIONS

1. Find a day where there are a lot of clouds in the sky.
2. Lay down on your back on the ground or in the grass and look up into the sky.
3. Watch and admire all the different clouds. Look at the different shapes they make, how fast/slow they're moving, and where they are moving to!

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DIY Electroscope



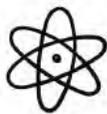
FUN FACT

Lightning is a form of static discharge and lightning strikes have been recorded at distances of 10 miles. If you are close enough to hear thunder, it's important to take shelter.

MATERIALS

- Glass jar or cup
- Straw
- Cardstock
- Scissors
- Copper wire
- Pencil
- Aluminum foil
- Balloon

DIFFICULTY



STATIC ELECTRICITY

Static electricity is a stationary electric charge. This charge is typically produced by rubbing two objects together. The friction causes electrons to transfer from one object to another to create a build up of electrons, or static charge.

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***What happens if you plant
a lightbulb in a garden?***

**Answer on the next page*

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DIY *Electroscope*

EXPERIMENT

Step 1: Create a card stock lid for the top of your jar (about 1 inch larger than the jar). Carefully pierce a hole in the center of your lid.

Step 2: Cut the straw to approximately 3 inches in length and push through the hole in your card stock lid.

Step 3: Cut a length of the copper wire approximately 10 inches. Use approximately 4 inches of one end of the wire to create a flat spiral. Run the straight end of the wire down, through the straw and into the jar.

Step 4: Carefully cut two, 1 inch oval-shaped pieces of aluminum foil. Pierce a small hole in one end of each piece and using the copper wire inside the jar as a hook, hang them next to each other inside the jar.

Step 5: Use your electroscope to detect static charge on different objects by placing them near the wire spiral.

Step 6: Hold the blown up balloon up to the wire spiral of your electroscope. Then try rubbing the balloon against your hair and then hold the balloon to the wire spiral of your electroscope and observe any differences.

*Joke Answer -
You grow a power plant!



WHY IT WORKS

Rubbing a balloon against your hair transfers electrons from your hair to the balloon. This transfer of electrons will cause the balloon to become more negatively charged. When you move the balloon closer to the electroscope, this will cause the negatively charged electrons on the copper wire to move down and away from the balloon. The electrons move down the copper wire and transfer onto the pieces of foil. Now both pieces of foil have the same charge and want to repel one another. This causes the aluminum pieces to spread apart.

EXTEND YOUR LEARNING

- What other objects can you test?
- Could you create a scale to measure how far your aluminum pieces separate?
- What do you think causes them to separate more or less?
- Could the aluminum foil be replaced with something like paper? Would your electroscope still detect charges?

WORKFORCE CONNECTION

Electrostatic discharge engineers are scientists that focus on minimizing or eliminating electrostatic discharge. Their jobs require them to understand how the build up and discharge of electrons can impact sensitive electronics. For example, eliminating sparks created by static electricity is critical for the safety of astronauts working on space equipment. Even the slightest spark of electricity could ignite catastrophic fires when working in space.

Week 8: Shoot for the Stars

August 12-18

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!

Scan the QR code or visit www.michiganlearning.org/stars to see the playlist of videos for this week.



Build an air cannon with DIY Science Time	 60 mins. of activity	 Read for 20 minutes	Draw a cartoon of your hero story	Watch Extra Credit
 Read for 20 minutes	 Watch Story Pirates	Draw an alien planet	 Stargaze	 60 mins. of activity
 60 mins. of activity	 Watch Math Park	 HAVE FUN! (Free Space)	Build a moon rover with NASA	 Read 20 minutes
Watch Extra Credit	Observe clouds with the Detroit Zoo	 Watch Math Park	 Watch Story Pirates	Watch InPACT at home
 Stargaze	 Read for 20 minutes	Watch DIY Science Time	 60 mins. of activity	 Watch Math Park

ROVING ON THE MOON



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.

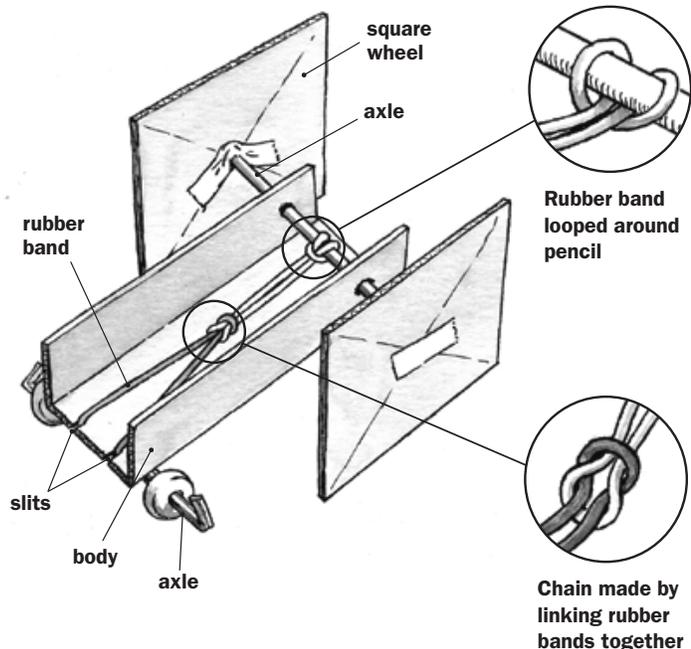
MATERIALS (per rover)

- 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

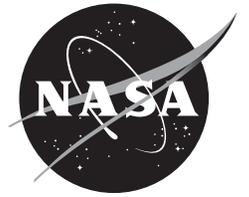
TEST, EVALUATE, AND REDESIGN

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.



- **the rover doesn't go far**—Wind up the wheels more. Try wheels of different sizes or shapes. Or, add another rubber band or use a rubber-band chain.
- **the wheels spin out**—Add weight above the square wheels; put more wheels on the pencil; use bigger wheels; or cut open a rubber band and use only a single strand of elastic.
- **the rover won't travel in a straight line**—Check that the pencil is straight and the front wheels are the same size.



Check out NASA's moon missions at moon.msfc.nasa.gov.

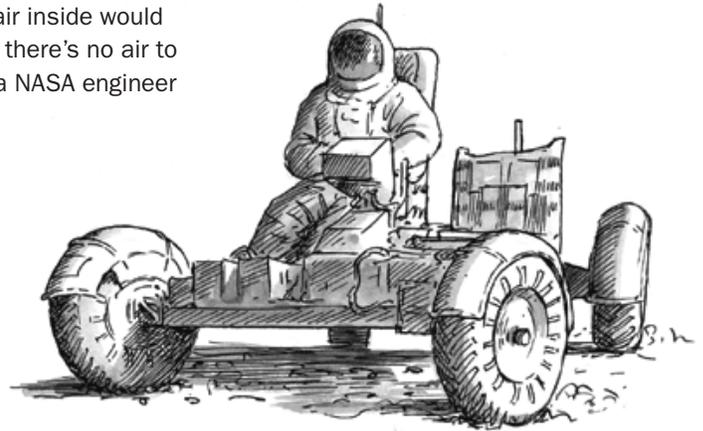
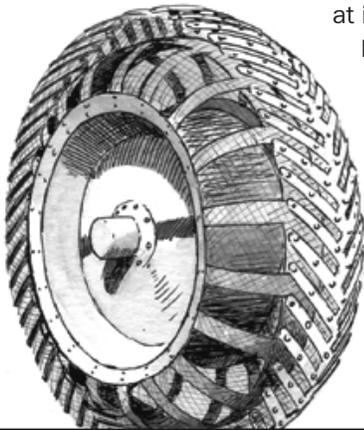
CUSTOM WHEELS

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?

Answers: Chassis, wheels, fenders, motor, seats, seat belts, antenna, battery, 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).

Watch **DESIGN SQUAD** on PBS or online at pbs.org/designsquad.

Major funding for *Design Squad* provided by



A private corporation funded by the American people



Education

Additional funding for *Design Squad* provided by



National Council of Examiners for Engineering and Surveying



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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:

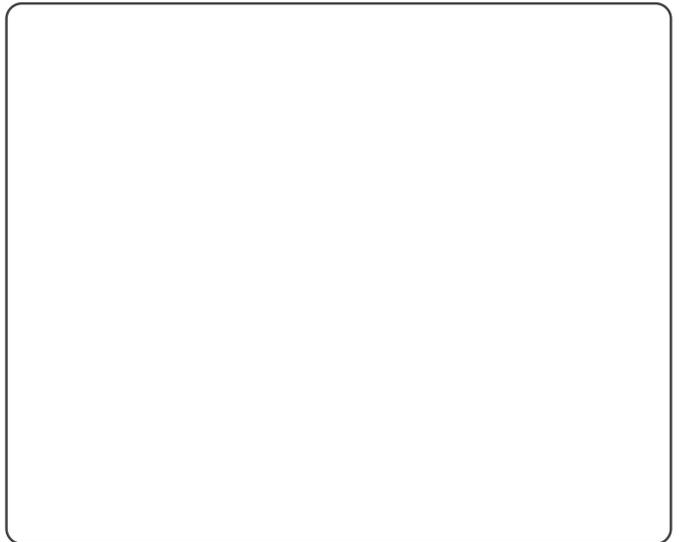
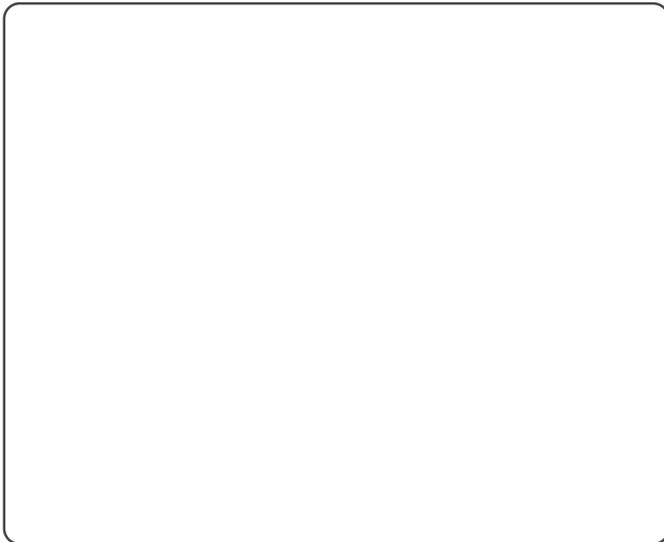
Weather is the conditions we see day to day within the atmosphere, while climate refers to conditions seen over a time. Clouds impact both local weather and climates across the planet. Clouds can provide information about temperatures, humidity, and wind throughout the atmosphere. Using this information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

Continue Exploring

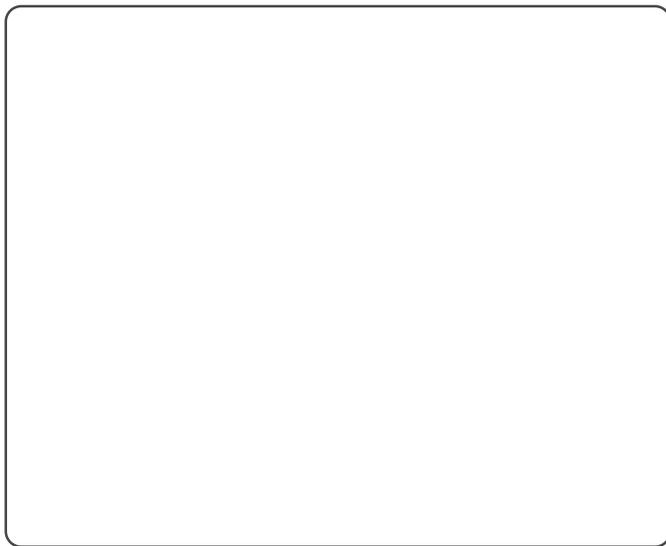
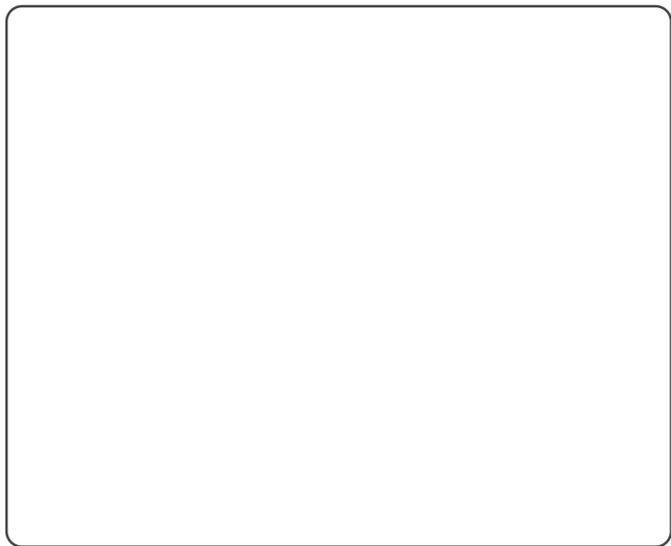
- How do cloud conditions compare across different seasons? Different areas of the world? Make predictions, research, and make observations at different times and places.



DRAW YOUR STORY!



DRAW YOUR STORY!



DIY Air Cannon



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.

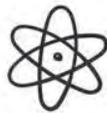
AIR PRESSURE

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!

MATERIALS

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

DIFFICULTY



Why do scientists love renewable energy so much?

*Answer on the next page

VISIT
DIYSCIENTIME.ORG
FOR MORE SCIENCE FUN!



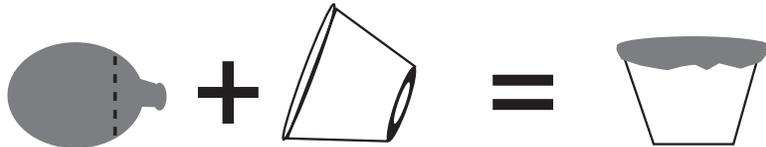
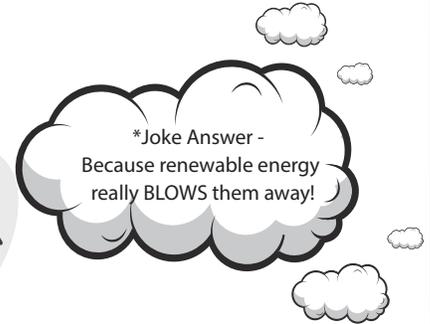
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DIY Air Cannon

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.

it's Storytime CHALLENGE

Balloon Bagpipe



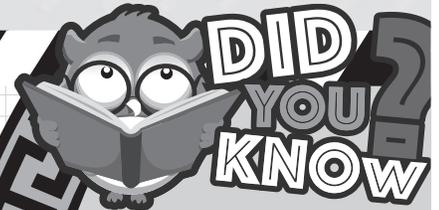
Scan here for instructions from Live From the Opera House Episode 308: Shoot for the Stars

- Large Balloon
- Plastic Bottle Top
- Tape
- Plastic Tube
- Scissors

My Design Ideas:



How could I improve on my design for next time?



DID YOU KNOW?

All musical instruments create sound through vibrations! Those vibrations create sound waves. Slower sound waves make a lower pitch, faster waves make a higher pitch!

POWER UP WORDS

- Vibration
- Pitch
- Waves

CAREER LIFTOFF

- › Musician
- › Sound Engineer
- › Music Director
- › Teacher
- › DJ



Learning Standards: 1st Grade
 1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
 K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
 K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

MATH PARK

Introducing Decimals: Hundredths

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



$$\frac{1}{100} = 0.01$$

$$\frac{3}{100} =$$

$$\frac{8}{100} =$$

$$\frac{2}{100} =$$

$$\frac{5}{100} =$$

$$\frac{9}{100} =$$

$$\frac{10}{100} =$$

$$\frac{7}{100} =$$

$$\frac{6}{100} =$$

$$\frac{4}{100} =$$



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

Call: 211

Text: Food to 304-304

Mande por texto "Comida" al 304-304

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**UPPER
ELEMENTARY**

Version 2.4

The contents of this book were developed under a grant from the U.S. Department of Education. However, those contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government. The project is funded by a Ready To Learn grant (PR/Award No. S295A200004, CFDA No. 84.295A) provided by the Department of Education to the Corporation for Public Broadcasting.