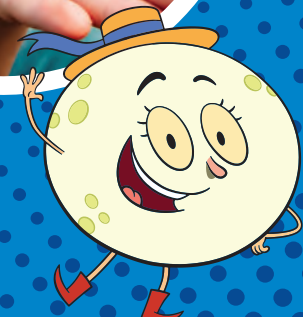




SUMMER!

FUN ACTIVITY BOOK



**UPPER
ELEMENTARY**

On TV. Online. Statewide. VISIT MichiganLearning.org










Week 4: Engineering

July 10-16

Tinker, design, build, rebuild, and find engineering everywhere. Our featured careers this week are engineers from all kinds of specializations, auto design director, and software developer. Scan the QR code or visit MichiganLearning.org/Summer/Engineering to explore all of our videos this week.

Use the sheet below to mark off this week's activities as you complete them. See if you can get a BINGO! Some of them are in this book, and some ask you to use your imagination or go outside.



Watch DIY Science Time	 60 mins. of activity	 Read for 20 minutes	Watch ArchiTREKS	Try the Daring Design Challenge
 Read for 20 minutes	Find a green building outside	Watch Career Girls	Ask a family member about their job	 60 mins. of activity
 60 mins. of activity	Watch Story Pirates	 HAVE FUN! (Free Space)	Design a robot	 Read for 20 minutes
Research a featured career	Redesign something in your house	List things that use electricity	Watch InPACT at Home	Design an invention
Watch InPACT at Home	 Read for 20 minutes	Watch Math Park	 60 mins. of activity	Find a tall building in your neighborhood

MATH PARK

Equivalent Fractions

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

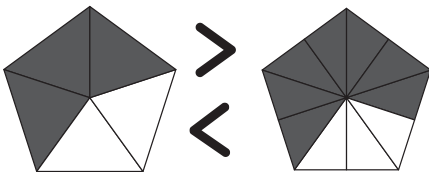
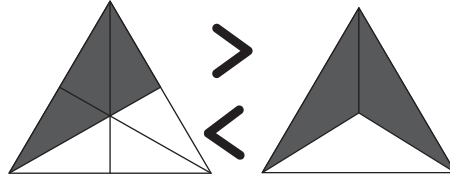


$$\frac{5}{10} > \frac{5}{5}$$

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

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

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

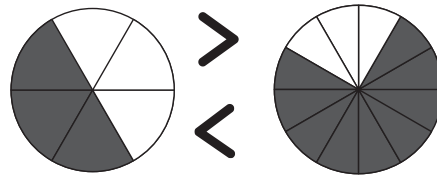


$$\frac{5}{5} > \frac{5}{15}$$

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

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

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





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?



Daring Design Challenge



Work together to build something new.

Sally and Nick build a bridge that's long and strong, a boat that floats, and a vase with a cool base. What can YOU create? Work together with a friend and challenge your building brains by designing some amazing creations in this collaborative game.

Materials

- Daring Design Challenge cards (print two-sided)
- The Engineering Design Process wheel
- Paper
- Pencil
- Tape
- Various household items
(Examples: wooden craft sticks, paper, straws, building blocks, fabric scraps, cans, aluminum foil, paper plates and cups, string, etc.)



Play the Game

1. Print and cut out the Daring Design Challenge cards and the Engineering Design Process wheel.
2. Together, select a game card from the pile.
3. Follow the challenge and make something amazing as you move step by step—along with THE CAT IN THE HAT—through the Design Process wheel.

Tip

The shape and weight of a design can affect how it works. You may need a wider base or different material for your designs to balance, float, or move.

Remember

Accidents happen — if you're lucky! It's okay if things don't always happen how we planned. Sometimes we discover something unexpected that makes our designs even better.

More Ways to Play

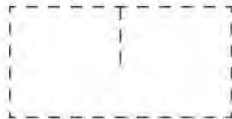
1. Think of a problem that needs to be solved. Using the four blank Daring Design Challenge cards (included in this printout), create four more design challenges. Try them with a friend.
2. Choose a design you already created and make it again using a different material.
3. Time how long it takes you to build a design. Then try it again. Can you beat your time?

pbskidsforparents.org



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The Engineering Design Process



Stabilizer

THE CAT IN THE HAT

1. With an adult's help, cut out THE CAT IN THE HAT figure, the stabilizer, and the wheel. Then cut along the vertical lines at the base of THE CAT IN THE HAT and the top of the stabilizer.
2. Push the stabilizer into the base of THE CAT IN THE HAT to create a "+". THE CAT IN THE HAT should now stand.
3. Use THE CAT IN THE HAT to guide you around the wheel.



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Create a musical instrument that can make three different notes or sounds.

Imagine & Plan!

Sounds can come from hitting or plucking an object, or blowing on or through objects of different lengths. What objects can help your design work?

Make a boat that floats.

Test!

Fill the bathtub or a sink with water to test your boat. Hope it floats!

Design something taller than you.

Create!

Have fun building together. Accidents happen, if you're lucky! Use a mistake to make it even better.

Build something that will balance a pencil.

Improve!

Can it balance two pencils? Three?

Design something that can launch a coin into the air.

Test!

How do you know if it is balanced?

Create something beautiful—just because.

Imagine & Plan!

Ask a friend how your creation makes him or her feel.

Make a ball that bounces.

Improve!

Can you make something that helps you move it faster?

Build a tower as tall as your table using only paper.

Imagine & Plan!

What can you do to make paper stronger and taller?



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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



Why are chemists great at solving problems?

**Answer on the next page*

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!

VISIT
DIYSCIENTIME.ORG
FOR MORE SCIENCE FUN!



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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.

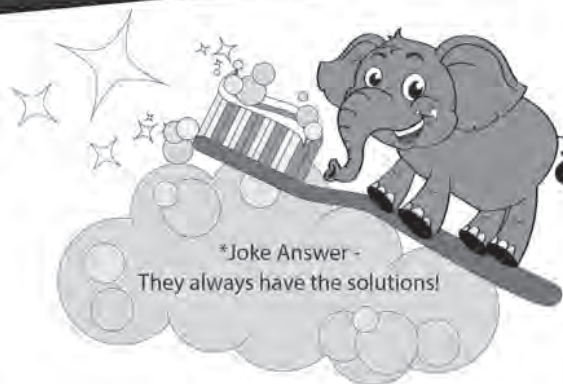
Step 3: Mix yeast and warm water, let stand until it gets frothy (about 3 minutes).

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

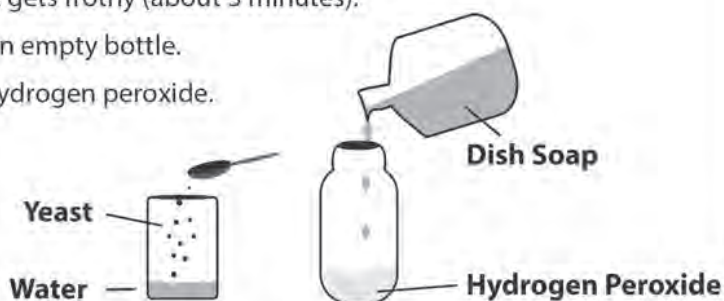
Step 5: Squirt 1 tablespoon of dish soap into the hydrogen peroxide.

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.



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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