



# AT-HOME SUMMER GUIDE

## for **SCHOOL-AGE** (Kindergarten–6th Grade)

Week of August 31, 2020

Welcome to week two of the  
Champions learning guides for  
**Circus Science!**



Continue these physics-defying experiences as you practice your engineering skills by building models for structures and creating a roller coaster in your own home.

This week's activities will continue to explore how circus performers defy gravity and the science behind making the circus an exciting show that demonstrates marvels of human ability. These acts take patience and practice, but with effort you can become the ringmaster of your own circus.

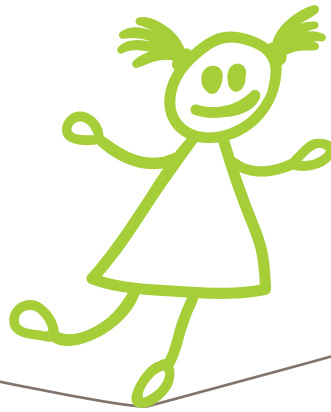
### FAMILIES WITH KINDERGARTENERS:

Our summer school-age guide incorporates **first grade readiness activities** to keep your kindergartener's mind sharp through the summer!



This Week's Theme:

# And Now for the Show!



## CIRCUS SCIENCE

### Clown-Face Symmetry

Explore how clowns use symmetry to design unique patterns for their costumes and face paint.

### Centrifugal and Centripetal Forces

Explore the science behind how trapeze artists spin around poles high in the air without falling down.

### Ringmaster Megaphones

Create your own megaphone to amplify your voice just like a ringmaster.

### Spinning Spectacles

Learn to defy gravity and balance spinning objects.

### Write a Ringmaster's Script

With your megaphone in hand, write a ringmaster's announcement for the circus skills you've mastered.

## PREVENTING LEARNING LOSS

### Toothpick Structure

Ignite innovation using your engineering skills to design and build 3-D model structures.

### Roller Coasters

Use your engineering skills to create a functioning roller coaster.

## FIRST GRADE READINESS

### Phonics Activity: Letter Sounds Bingo

Practice the connections between sounds and letters with this bingo game.

### Math Activity: Shape Detective

Send your child on a scavenger hunt to learn about flat and solid shapes!

# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Getting Ready for the Week: Materials to Gather

#### For Circus Science Activities:

- Bucket with handles
- Child-size scissors
- [Clown-Face Outline sheet](#)
- Crayons or colored pencils
- Duct tape
- Frisbee® disc
- Paper
- Poster board or paper (1 sheet)
- Ruler
- Stick such as chopsticks, wooden dowels, or rhythm sticks
- Water
- Writing and drawing tools

**Tip:** At the beginning of your week, gather materials and place them in a container so you're ready to go!

#### For Preventing Learning Loss Activities:

- Books
- Bowl
- Child-size scissors
- Cups
- Marbles
- Poster board
- Tape
- Toothpicks
- Water
- Whole dried peas (1 package)

#### For First Grade Readiness:

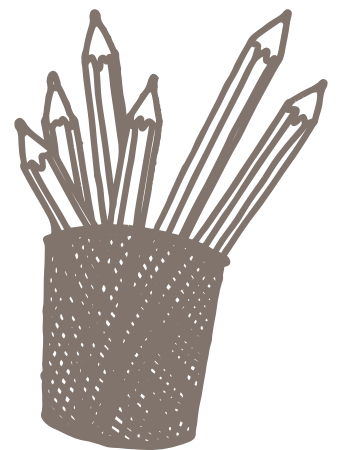
- Bingo game markers, like quarters, poker chips, or other small objects

##### If you have access to a printer:

- [Bingo letter tiles sheet \(printed\)](#)
- [Bingo game boards, 3 pages \(printed\)](#)
- Child-size scissors

##### If you don't have access to a printer:

- [Bingo letter tiles sheet](#) (viewed on a device)
- [Bingo game boards, 3 pages](#) (copied onto a sheet of paper by hand)
- Index cards
- Pencil



# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Circus Science: Clown-Face Symmetry

Explore how clowns use symmetry to design unique patterns for their costumes and face paint.

**Length of activity:**  
20 minutes



**Level of Engagement  
Required by Adult:** Low



**Level of Prep Required:** Low



**What you need:**

- [Clown-Face Outline sheet](#)
- Rulers
- Writing and drawing tools
- Crayons or colored pencils

#### What you will do:

Even the silliest parts of a circus use science to put on a show. Symmetry is the exact matching of the parts of a design placed on opposite sides of a line, creating a mirror image.

Take a copy of the [Clown-Face Outline sheet](#) and fold your page vertically so that the clown's face is folded in half. Now open the page and draw a line down the middle of the clown's face along the fold creating a line of symmetry.

Next, use a ruler to measure how wide and tall the clown's face is, then divide each measurement in half to find the middle point on the line of symmetry. Draw a dot on the middle point and a round nose around the dot. Be sure to keep the dot in the center of your circle.

Next draw in the rest of the clown's face, trying to keep all of the facial features symmetrical (mirror images). Use your ruler to measure the distance between each part of the face and the line of symmetry, keeping two matching features at an equal distance from the line. An easy way to see if the clown's face is symmetrical is to fold your paper in half to see if the features line up. Draw eyes, ears, and a mouth on your clown. When your clown face is complete, draw additional makeup designs and patterns, then color them in.

# At-Home Summer Guide for School-Age

Week of August 31, 2020

## Clown-Face Outline



# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Circus Science: Centrifugal and Centripetal Forces

Explore the science behind how trapeze artists spin around poles high in the air without falling down.

#### Length of activity:

15 minutes



#### Level of Engagement

Required by Adult: Low



Level of Prep Required: Low



#### What you need:

- Bucket with handles
- Water

#### What you will do:

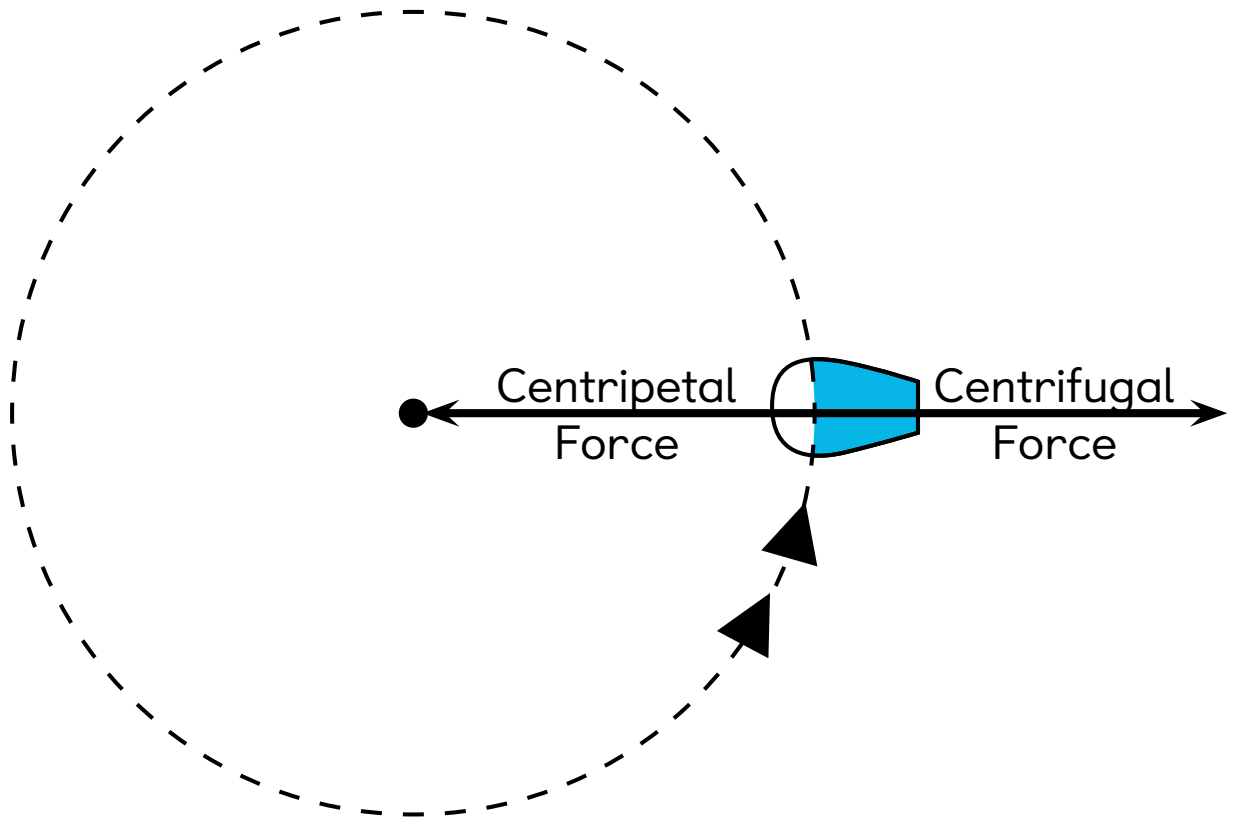
Have you ever wondered how trapeze artists defy gravity while spinning in the air? Well, conduct this science experiment demonstrating centrifugal (pronounced sen-TRIF-uh-gull) and centripetal (pronounced sen-TRIP-uh-tull) forces to discover all your answers. Centrifugal force is felt by an object moving in a curved path that acts outwardly away from the center, while a centripetal force keeps an object moving in a curved path that is directed inward toward the center of rotation.

Find an outdoor area to conduct your experiment. First practice swinging your bucket in a vertical circle, like a Ferris wheel, as fast as you can. Once you get the hang of it, fill your bucket about halfway with water. Swing your bucket as fast as you can again. Make sure you have enough space to avoid hitting anyone or anything with the swinging bucket. If water spills out, refill your bucket halfway and try spinning it faster.

Why didn't all the water come out of the bucket? Look at the [diagram](#) on the next page. Gravity tries to pull the water toward the ground. However, the whirling action, when done quickly enough, creates centrifugal force, a force that pushes outward from the center of rotation and causes the water to stay in the bucket. Centripetal force, an inward-pulling force, keeps the bucket moving in a circle. How do you think circus performers use these forces? Trapeze artists who perform upside-down flips must spin fast enough to counteract gravity, so they won't fall, relying on centrifugal and centripetal forces.

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# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Circus Science: Ringmaster Megaphones

Create your own megaphone to amplify your voice just like a ringmaster.

**Length of activity:**  
25 minutes



**Level of Engagement  
Required by Adult:** Low



**Level of Prep Required:** Low



**What you need:**

- Child-size scissors
- Duct tape
- Poster board or paper (1 sheet)
- Writing and drawing tools

#### What you will do:

Ringmasters build excitement and energy in the crowd for each act using a megaphone, which is a funnel-shaped device that increases the volume of their voice. Now it's your turn to create a device to amplify your voice.

Take your sheet of paper or poster board and roll it into an ice-cream-cone shape, making one end smaller to serve as a mouthpiece. Secure the seam of the rolled-up poster board with duct tape and cut off any uneven edges. Next, use writing and drawing tools to decorate your megaphone.

After you have completed your megaphone, think of a circus announcement, for example, "Distinguished guest, today I will be your ringmaster!" Say the phrase without the megaphone, and then repeat the phrase at the same volume using the megaphone. Experiment with the volume of your voice using the megaphone. Did the megaphones make your voice louder or softer? Megaphones amplify sound, meaning they make sound stronger and louder. Amplification can also be done electronically, such as with amplifiers. Use your megaphone to make important announcements or to put on a show.





# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Circus Science: Spinning Spectacles

Learn to defy gravity and balance spinning objects.

**Length of activity:**  
20 minutes



**Level of Engagement  
Required by Adult:** Low



**Level of Prep Required:** Low



**What you need:**

- Frisbee® disc
- Stick such as chopsticks, wooden dowels, or rhythm sticks

#### What you will do:

From spinning plates on sticks to spinning a basketball on the tip of a finger, balancing spinning objects takes patience and practice. Find space outdoors to practice gyroscopic stability with your Frisbee disc. Try to balance the disc on a stick or on your index finger, without trying to spin the disc. Next, try to balance the disc on the stick or on your index finger while spinning the disc with your other hand. Try spinning the top of the stick in small circles to help keep the disc moving. Which was easier to balance, the spinning disc or the non-spinning disc?

The spinning disc should be easier to balance because of gyroscopic stability. Gyroscopic refers to a spinning wheel, and stability means non-changing. The spinning of the disc creates stability so the disc remains more balanced and leveled on your finger. Now, wow your family with your new gravity-defying spinning tricks!

# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Circus Science: Write a Ringmaster's Script

With your megaphone in hand, write a ringmaster's announcement for the circus skills you've mastered.

**Length of activity:**  
30 minutes



**Level of Engagement  
Required by Adult:** Low



**Level of Prep Required:** Low



**What you need:**

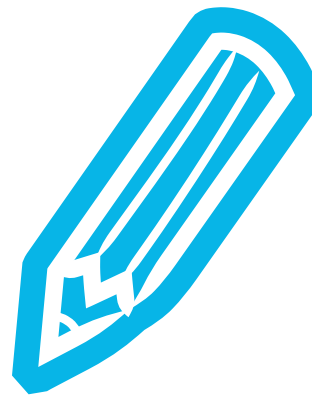
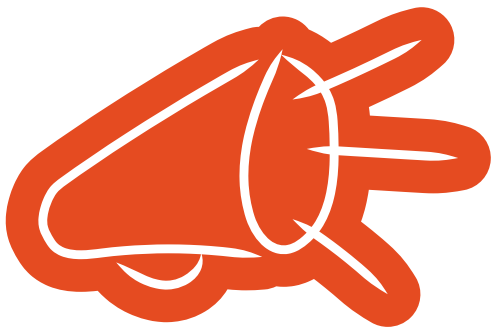
- Megaphones created in the Ringmaster Megaphones lesson
- Paper
- Writing and drawing tools

#### What you will do:

Think about the many different roles of the ringmaster in a circus, such as naming performers, announcing and describing acts, and narrating each act in an exciting way.

Next, review the circus activities and talents you have learned from your two weeks exploring Circus Science. Think of adjectives a ringmaster could use to describe each act. Adjectives are words that describe things, such as **amazing** circus acts or **spectacular** spinning tricks. The adjectives ringmasters use makes each act sound impressive, exciting, and entertaining.

Write a ringmaster's script for the activities you have learned such as balancing discs, tightrope walking, and juggling. Remember to include descriptive adjectives when writing about each act. When you are finished, read your scripts using your megaphones to your family and see which act sounds the most amazing based on how you wrote your script.



# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Preventing Learning Loss: Toothpick Structure

Ignite innovation using your engineering skills to design and build 3-D model structures.

**Length of activity:**  
20 minutes



**Level of Engagement  
Required by Adult:** Low



**Level of Prep Required:** Low

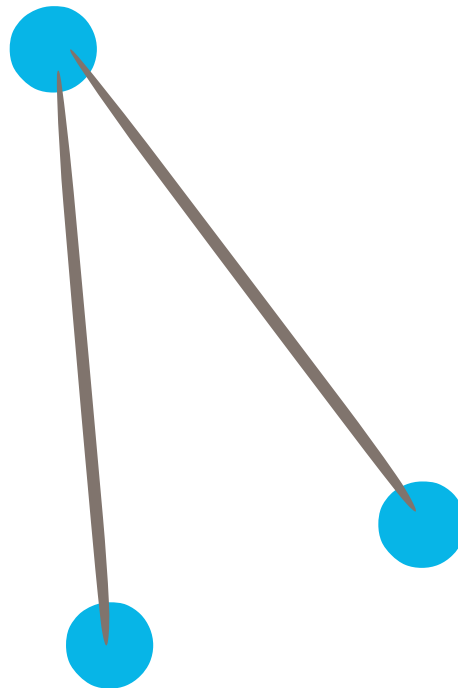


**What you need:**

- Bowl
- Toothpicks
- Water
- Whole dried peas (1 package)

#### What you will do:

- Soak the peas in a bowl of water overnight.
- Use the peas to hold the toothpicks together as you create 3-D structures such as a circus tent, a house, a cube, or a tower.
- Store the structures where they will not be disturbed to allow the peas to dry out and preserve the structures.



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## Preventing Learning Loss: Roller Coasters

Use your engineering skills to create a functioning roller coaster.

### Length of activity:

30 minutes



### Level of Engagement Required by Adult: Low



### Level of Prep Required: Medium



### What you need:

- Books
- Child-size scissors
- Cups
- Marbles
- Poster board
- Tape

### What you will do:

- Use the materials to build roller coasters for the marbles to travel along.
- Cut the poster board into strips approximately 2 inches wide by 11 inches long to serve as roller-coaster “tracks” for the marbles.
- Tape the strips together to make roller-coaster tracks.
- Use books to create ramps and inclines for the tracks. Try to create turns and loops if possible.
- Place the cups at the end of their roller coasters for the marbles to land in.



# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### First Grade Readiness

Our summer school age guide incorporates **first grade readiness activities** to keep your kindergartener's mind sharp through the summer.

### Phonics Activity: Letter Sounds Bingo

Practice the connections between sounds and letters with this bingo game.

**Length of activity:**  
15–20 minutes



**Level of Engagement  
Required by Adult:** High



**Level of Prep Required:** Medium



#### What you need:

- Bingo game markers, like quarters, poker chips, or other small objects

#### If you have access to a printer:

- [Bingo letter tiles sheet](#) (printed)
- [Bingo game boards, 3 pages](#) (printed)
- Child size scissors

#### If you don't have access to a printer:

- [Bingo letter tiles sheet](#) (viewed on a device)
- [Bingo game boards, 3 pages](#) (copied onto a sheet of paper by hand)
- Index cards
- Pencil

#### What your child is learning:

- What sounds are made by what letters
- How to listen to a sound and use it to guess how a word is spelled

#### What you will do:

If you printed the Bingo Letter Tiles sheet, have your child cut the sheet along the dotted lines to create a separate tile card for each letter or letter combination. If you haven't printed this sheet, ask your child to write each letter of the alphabet on its own index card. Shuffle the letter cards together into a stack of bingo tiles or put all the letters together in a bowl. This will be the draw pile for your bingo game.

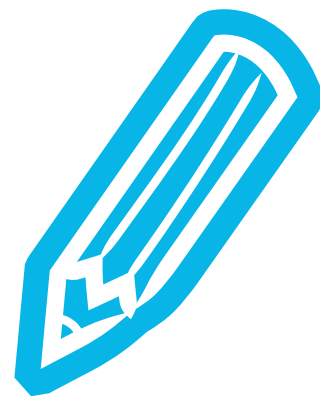
# At-Home Summer Guide for School-Age

## Week of August 31, 2020

To play Letter Sounds Bingo, you or another game leader will draw a letter from the draw pile. Then, you will say the sound the letter makes and ask your child if they can find the letter that makes this sound. Your child should look at their game board, find the letter that makes the sound, and cover that letter with a game marker. For example, if you as the game leader draw the letter combination *Qu*, you should say /kw/ and ask which letter makes the /kw/ sound. If your child covers five letters in a row, either vertically, horizontally, or diagonally, then they have a bingo and the game is over!

Accept all reasonable answers. For example, if you drew the letter *k* and ask which letter makes the /k/ sound, the letter *c* is also an appropriate answer because it can also make the /k/ sound. The goal of the exercise is to draw the connection between sounds and letters, not necessarily to find the exact bingo match.

**If your child is ready:** To add a twist to the game, you can turn it into beginning letter bingo! To do this, just think of words that start with the letters you've drawn and call those words out as your bingo clue. For example, if you drew the letter combination *Qu*, you could say the word queen and ask your child to cover the letter combination at the beginning of the word queen.



# At-Home Summer Guide for School-Age

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## Bingo Letter Tiles Cut-Outs



# At-Home Summer Guide for School-Age

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## Letters Bingo Board #1

<b>D</b>	<b>Qq</b>	<b>S</b>	<b>Y</b>	<b>V</b>
<b>I</b>	<b>L</b>	<b>J</b>	<b>R</b>	<b>P</b>
<b>N</b>	<b>G</b>	<b>E</b>	<b>B</b>	<b>W</b>
<b>T</b>	<b>A</b>	<b>C</b>	<b>F</b>	<b>X</b>
<b>Z</b>	<b>O</b>	<b>H</b>	<b>U</b>	<b>K</b>



# At-Home Summer Guide for School-Age

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## Letters Bingo Board #2

<b>Y</b>	<b>T</b>	<b>Z</b>	<b>S</b>	<b>N</b>
<b>V</b>	<b>A</b>	<b>I</b>	<b>L</b>	<b>G</b>
<b>R</b>	<b>J</b>	<b>P</b>	<b>K</b>	<b>B</b>
<b>F</b>	<b>X</b>	<b>O</b>	<b>Qq</b>	<b>D</b>
<b>H</b>	<b>C</b>	<b>M</b>	<b>W</b>	<b>E</b>

# At-Home Summer Guide for School-Age

Week of August 31, 2020

## Letters Bingo Board #3

<b>O</b>	<b>G</b>	<b>B</b>	<b>R</b>	<b>S</b>
<b>A</b>	<b>E</b>	<b>H</b>	<b>P</b>	<b>K</b>
<b>Z</b>	<b>U</b>	<b>C</b>	<b>T</b>	<b>X</b>
<b>N</b>	<b>D</b>	<b>F</b>	<b>I</b>	<b>J</b>
<b>Y</b>	<b>Qq</b>	<b>L</b>	<b>V</b>	<b>M</b>

# At-Home Summer Guide for School-Age

## Week of August 31, 2020

### Math Activity: Shape Detective

Send your child on a scavenger hunt to learn about flat and solid shapes!

**Length of activity:**  
15–20 minutes



**Level of Engagement  
Required by Adult:** High



**Level of Prep Required:** N/A



**What you need:**  
No materials required

#### What your child is learning:

- Shapes can be two- and three-dimensional
- How to recognize three-dimensional versions of shapes they are familiar with

#### What you will do:

Review with your child the names of basic shapes, like circles, triangles, squares, and rectangles. Talk with them about what makes these shapes special. For example, triangles have three straight sides and three corners. Squares and rectangles both have four straight sides and four corners, but for squares all sides are an equal length.

Now look at a ball with your child. Ask what shape the ball is (a circle). What do they notice that is different about the ball when compared with a drawing of a circle? What is the same?

Explain that some shapes are flat, with no or almost no depth to them, and some shapes are solids, which have depth.

Now, challenge your child to be a shape detective! Ask them to look around the house and see if they can find examples of flat and solid shapes. If they need help, find the first few examples with them. An example of a flat circle might be a clock set in the wall. A flat rectangle might be a framed picture, and a flat square might be a small window. You might find a flat triangle in a pattern or on a painting. An example of a solid circle might be a bouncy ball. A solid cube could be a wooden block, and a solid rectangle might be a block of cheese. A solid triangle might be a cone-shaped party hat.

As your child discovers shapes, ask them to say which shape it is and whether it's a flat or a solid shape. As they go, discuss which shapes seem the easiest to find. Is it easier to find flats or solids? Are there some types of shapes—for instance, rectangles vs. circles—that are easier to find?

# At-Home Summer Guide for School-Age

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**If your child is ready:** If your child is a pro at shapes, flats, and solids, you can also use this activity to introduce some shape-based vocabulary. Flat shapes are *two-dimensional*, because they have length and width but not depth. Another word for solids is *three-dimensional* shapes, because these shapes have length, width, and depth.

When two-dimensional shapes become three-dimensional, they don't always look the same! For example, balls and cans are both types of three-dimensional circles. Compare these different types of three-dimensional circles with your child and ask them what they notice that is different and the same about these shapes. This could be an opportunity to introduce more advanced shape-based vocabulary like sphere, cylinder, cone, and cube.