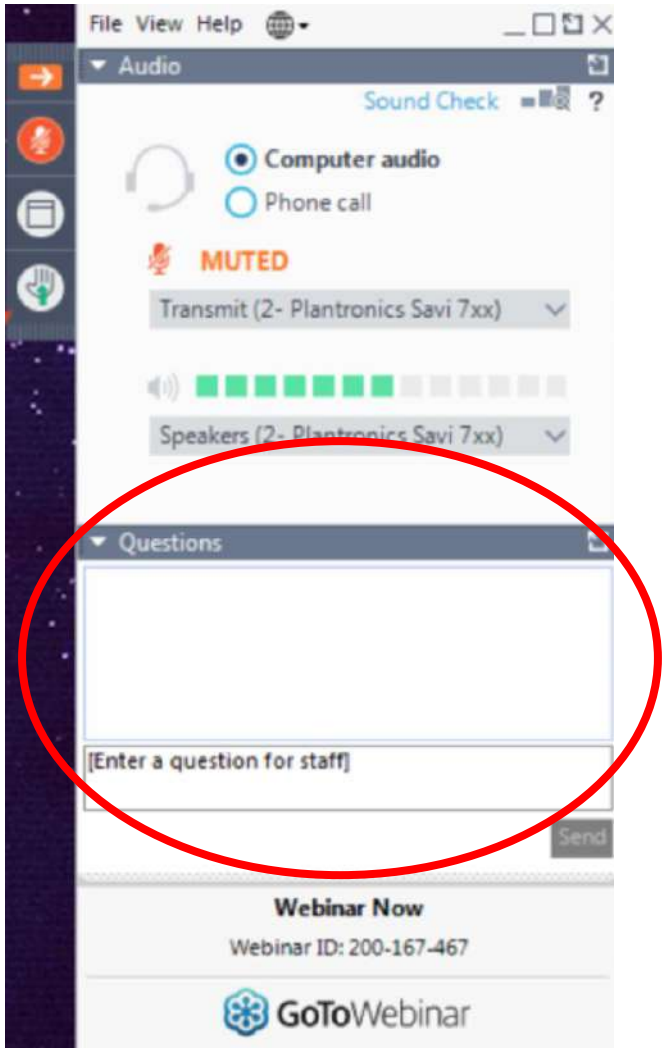
Home Learning with BrickLAB STEAMventures

A New Way to Connect with Families and Students

Quick Notes

- Everyone is in listen-only mode
- Use the questions toolbar at any time
- Questions for our panel will be asked during Q&A
- Today's webinar is being recorded and will be shared within 3 business days by email



Home Learning with BrickLAB STEAMventures

A New Way to Connect with Families and Students

About PCS Edventures

- Started as **P**at's **C**omputer **S**chool in 1988
- Grew to network of experiential learning centers in Idaho, Washington and California
- PCS Edventures learning solutions are now in more than 7000 sites in all 50 states and over 17 other countries
- Philosophy of hands-on projects that fuel a passion for learning and a lifelong love of STEM

Our Products

BrickLAB

ENRICHMENT PROGRAMS

DISCOVER SERIES

DRONES

- Turn-key solutions (everything included)
- Team programming for up to 30 students
- Student driven individual kits
- Curriculum sparks interest in STEAM
- Drone collection programming facilitates career exploration
- Training and support

Our Customers

- K-12 classrooms
- Summer schools
- After-school programs
- Libraries and makerspaces

Agenda

1. Introduction to Hosts
2. Parents as Partners: Strategies for Family Engagement
3. Introduction to Educator Panelists
4. BrickLAB STEAMventures
5. Q&A
6. Wrap-Up
7. Survey

Today's Hosts

Michelle Victor

Director of STEM Development

Erika Liebel

STEM Education Specialist
Curriculum Coordinator

Parents as Partners

The engagement and support of parents is especially important in the new Covid-19 reality to advance learning

First Steps

Reduce initial barriers to family engagement

- Understand the attitudes and obstacles that currently inhibit greater partnership and engagement with families

Take Action: Conduct a family survey to understand the greatest challenges for parents to better support learning at home in this changing environment

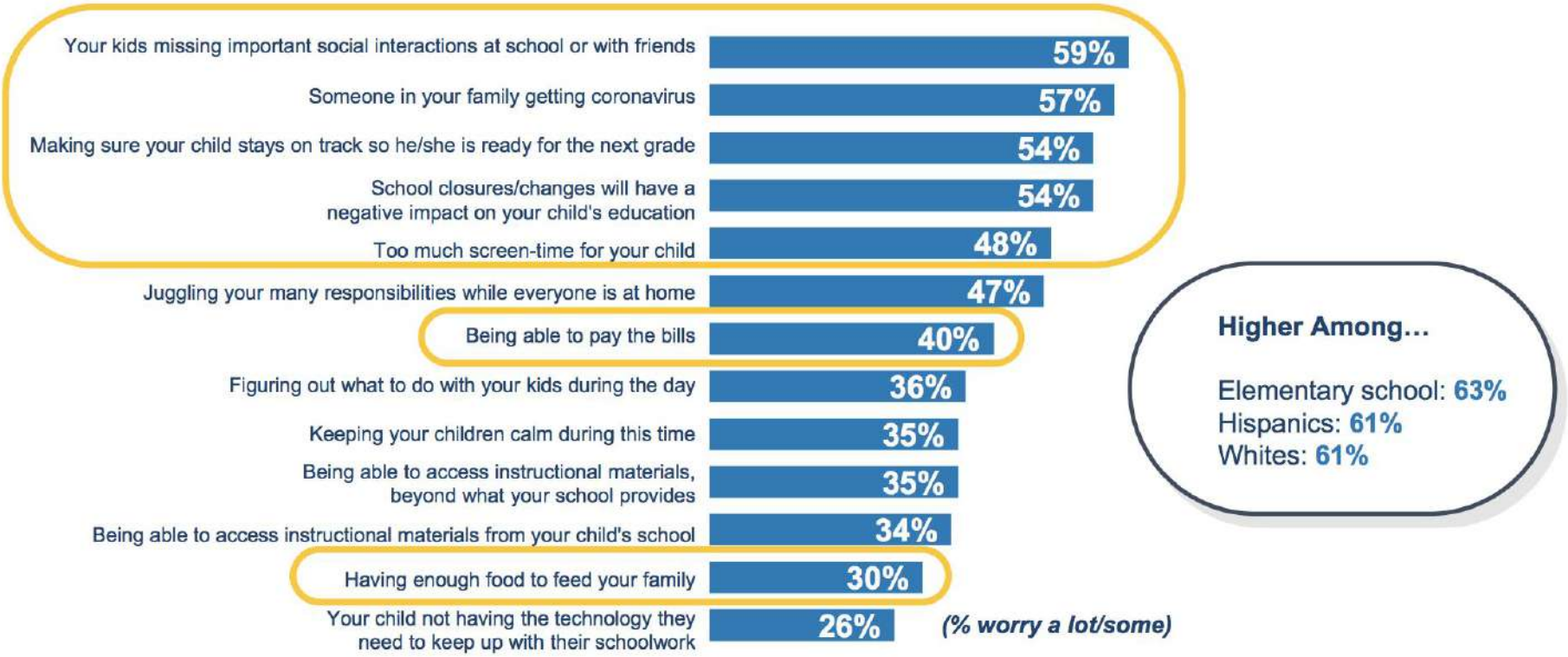
Free Family Survey Option

Family-School Relationships Survey developed by researchers at the Harvard Graduate School of Education and Panorama Education.

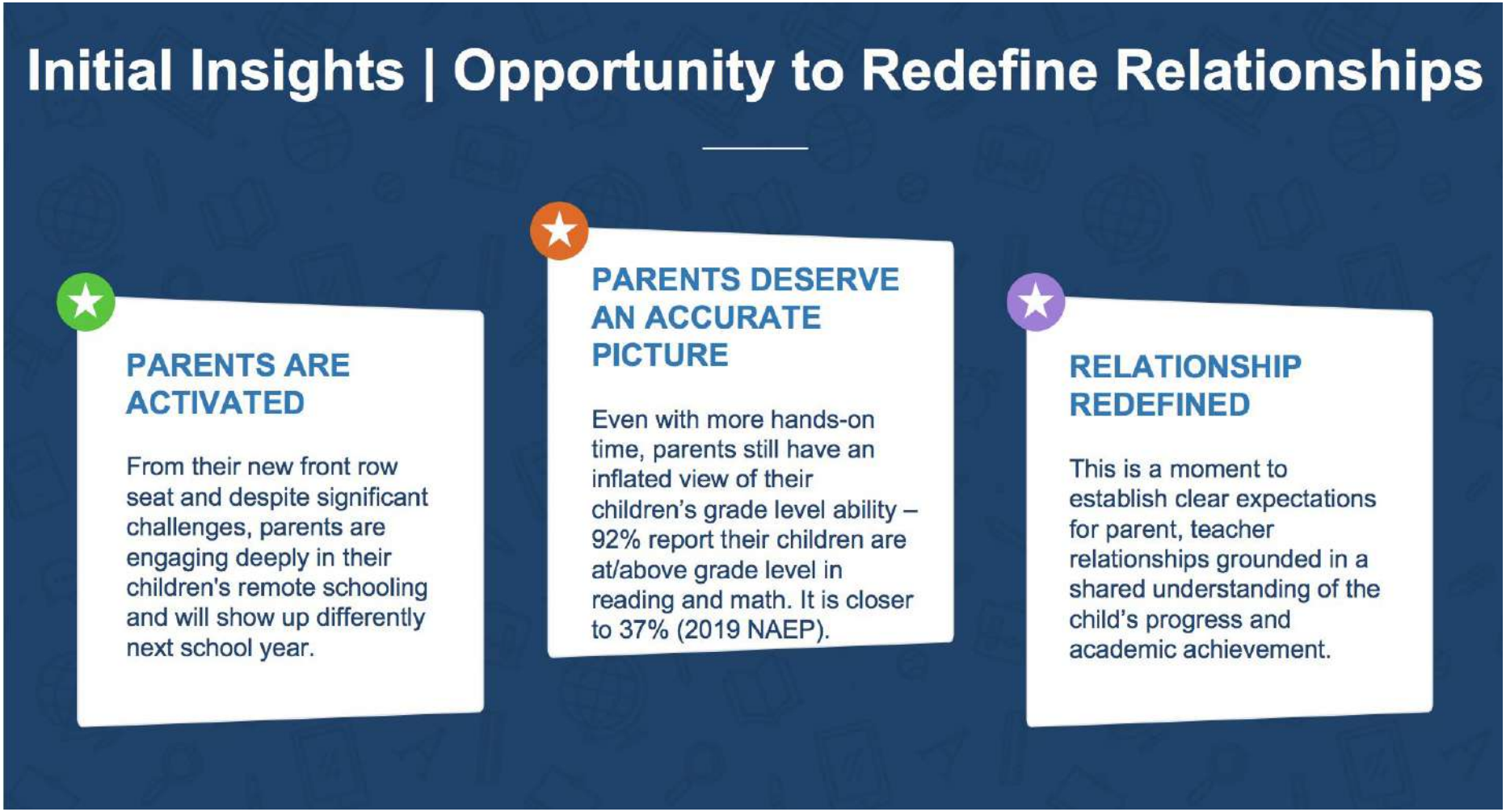
- Survey available in 10 different languages. Available online or in print.
- Measures 10 areas of family engagement such as family support, school fit, school climate and barriers to engagement

Sample Results from Learning Heroes National Survey

During COVID-19 Closures, Education a Top Priority



Sample Results from Learning Heroes National Survey



First Steps

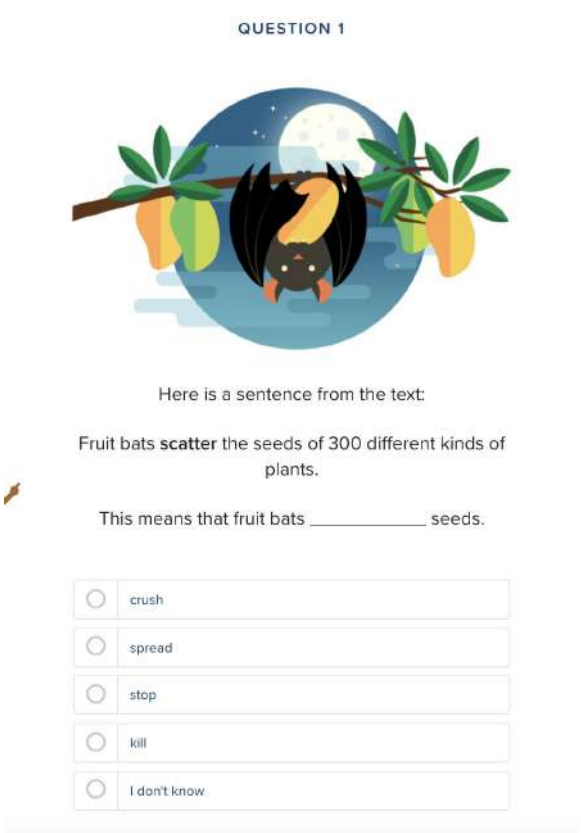
Reduce initial barriers to family engagement

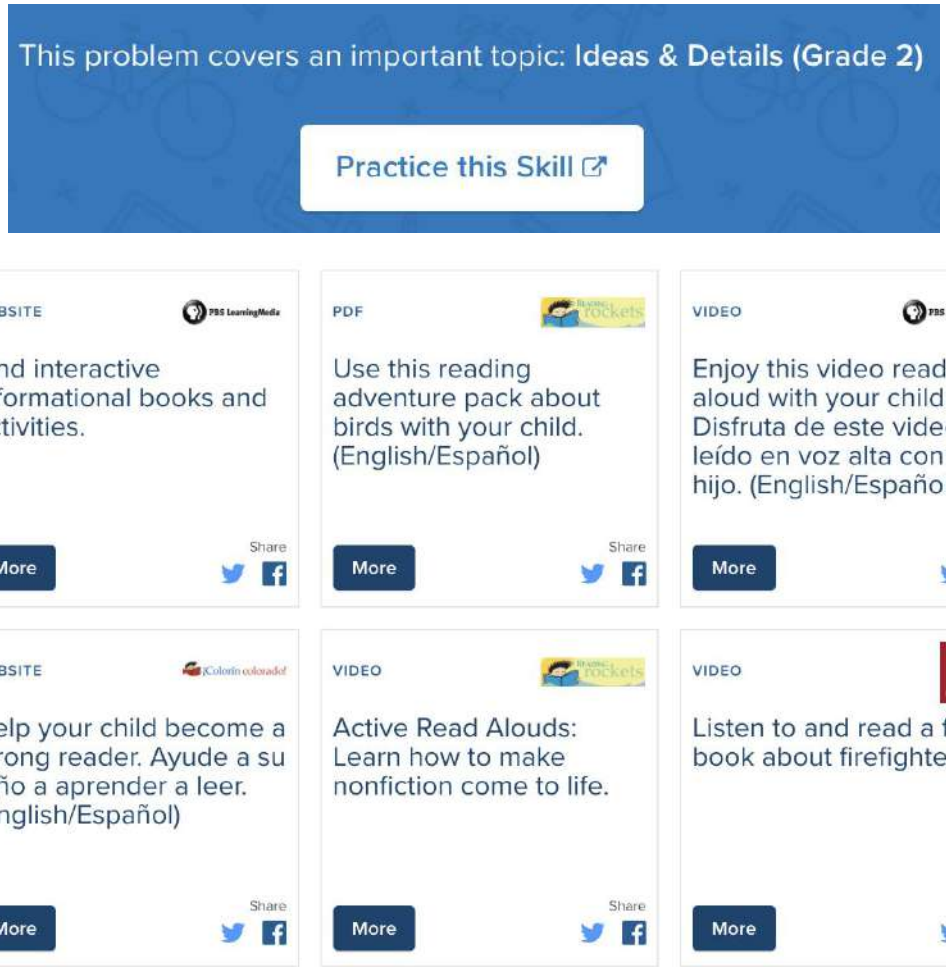
- Help parents to have a realistic view of where the student is with his/her learning to better understand learning goals

Take Action: Point parents toward Learning Readiness Checks for their child in Reading and Math (K-8) via Learning Heroes

Readiness Check from Learning Heroes

Readiness Check from Learning Heroes





Next Steps

Use feedback to guide strategies for engagement

- Continue to use multiple channels for communicating with families

Next Steps

Use feedback to guide strategies for engagement

- Implement new or adjusted approaches for engaging family learning.
  - Try new hands-on approaches for student and parent learning
  - Use the student as the learning leader and parents as assistants
  - Include flexible learning options that give families choice

Next Steps

Goal-setting with families: A recipe for success

BrickLAB STEAMventures

Grades K-1st and 2nd-3rd

Panelists

Jill Janicek — BrickLAB Developer & 2nd Grade Teacher

- 27+ years of teaching experience
- Teaches 2nd grade at Galileo STEM Academy (Stem certified)
- Life-long learner and advocate for project-based learning
- Taught at i-STEM Summer Institute for 5 years using PCS Edventures! BrickLAB kits

Dori Atterberry — BrickLAB Developer & 1st Grade Teacher

- 31+ years teaching (K-2)
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- Taught for Camp Invention Summer Camp, 5 years
- Camp Director for STEMbus Summer Camps, 3 years
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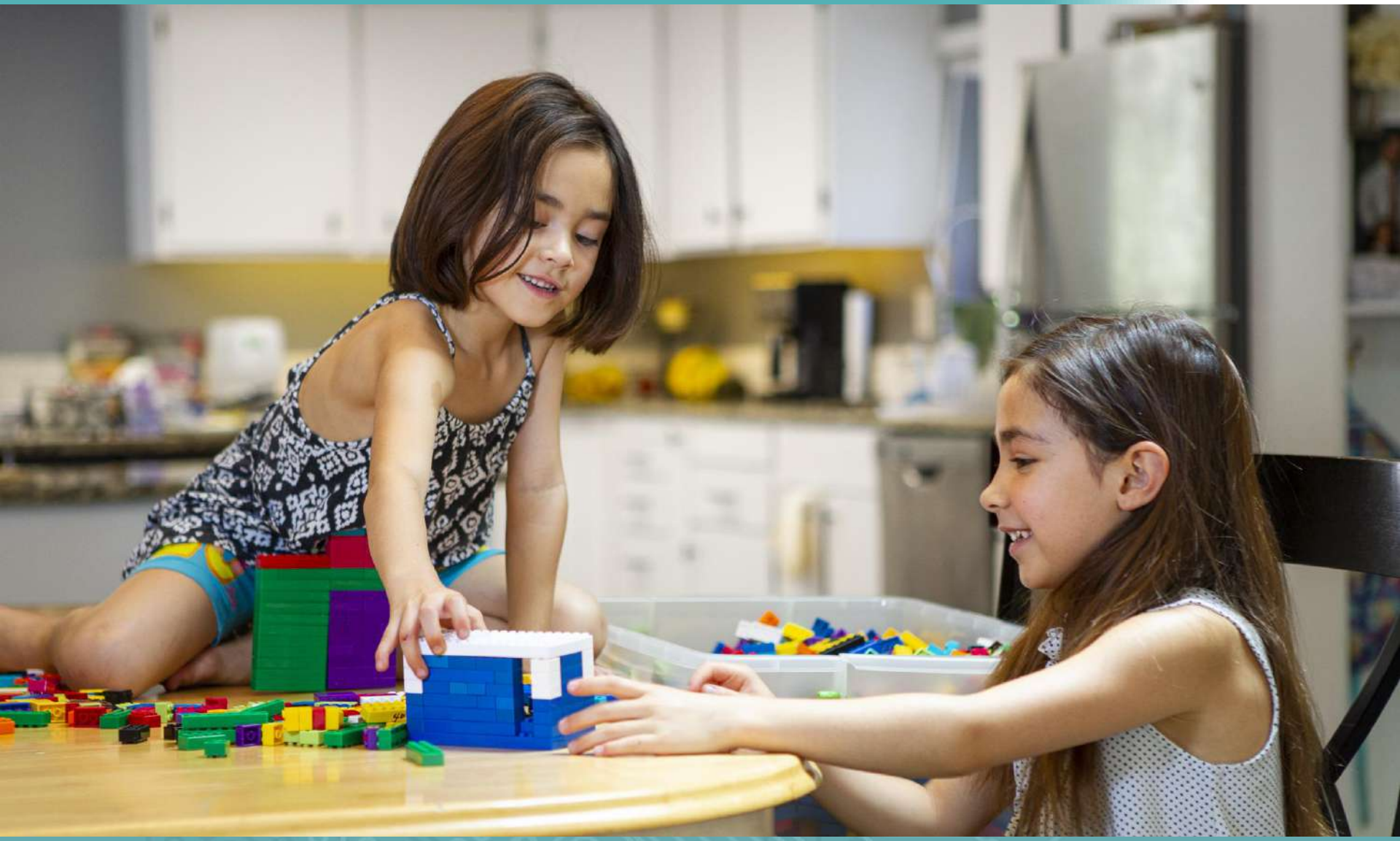
Why Bricks?

Flexibility



Project-Based Learning

Family Engagement

BrickLAB for Remote Learning

- **Bricks:** packed individually
- **Student curriculum**: magazines that can be sent home
- **Instructor curriculum**: tips for remote, blended or in-person learning environments
- **Parent curriculum**: families engaged as partners
- **Digital resources:** optional extensions

Two Versions of Student Curriculum

Each issue includes:

- Key Terms
- Step-by-Step Brick Build
- Science & Social Studies Content
- Math & Literacy Activities
- Art Integration
- Engineering Challenge
- Unplugged & Digital Family Choice Boards

Key Terms K-1

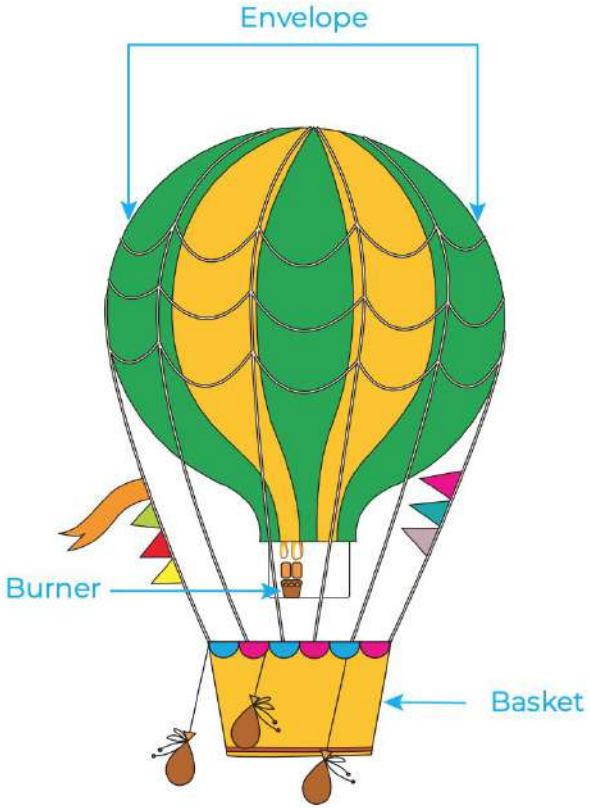
Hot Air Balloon

Key Terms:

Basket: The basket carries the pilot and passengers. The basket is light. It lets the balloon rise into the air. It is flexible to protect passengers when the balloon lands.

Burner: The burner has a noisy flame. The burner warms the air inside the balloon with puffs of fire. The fire helps the balloon rise.

Envelope: The envelope holds the air that the burner warms. Envelopes come in many shapes and colors!



Key Terms 2-3

Now that we are going to be hot air balloon pilots, let's learn about the parts of a balloon!

Hot Air Balloon

Key Terms:

Basket: The basket, or gondola, carries the pilot and passengers. The basket is made out of a vine called *rattan* that is woven together to form *wicker*. The wicker rattan is lightweight and flexible and absorbs the force from landings.

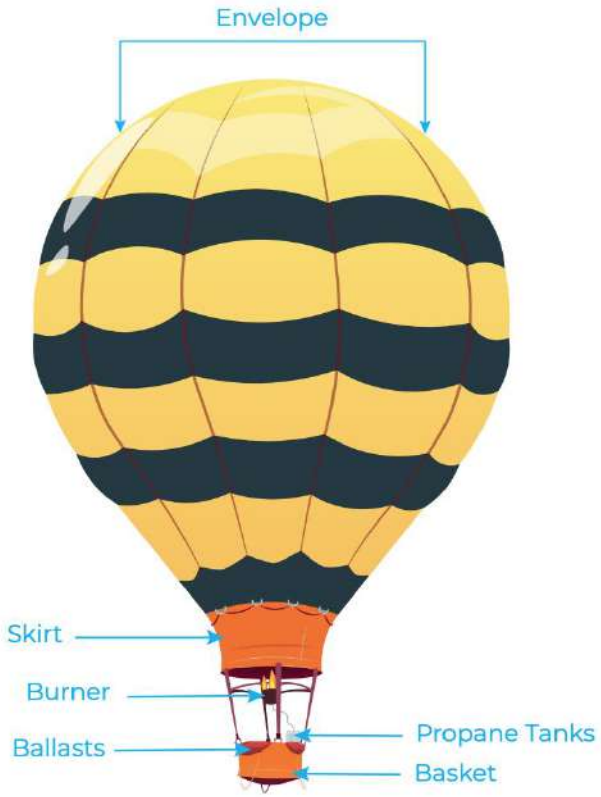
Burner: The burner has a noisy flame that warms the air so the balloon will rise. The burner is supported by the basket.

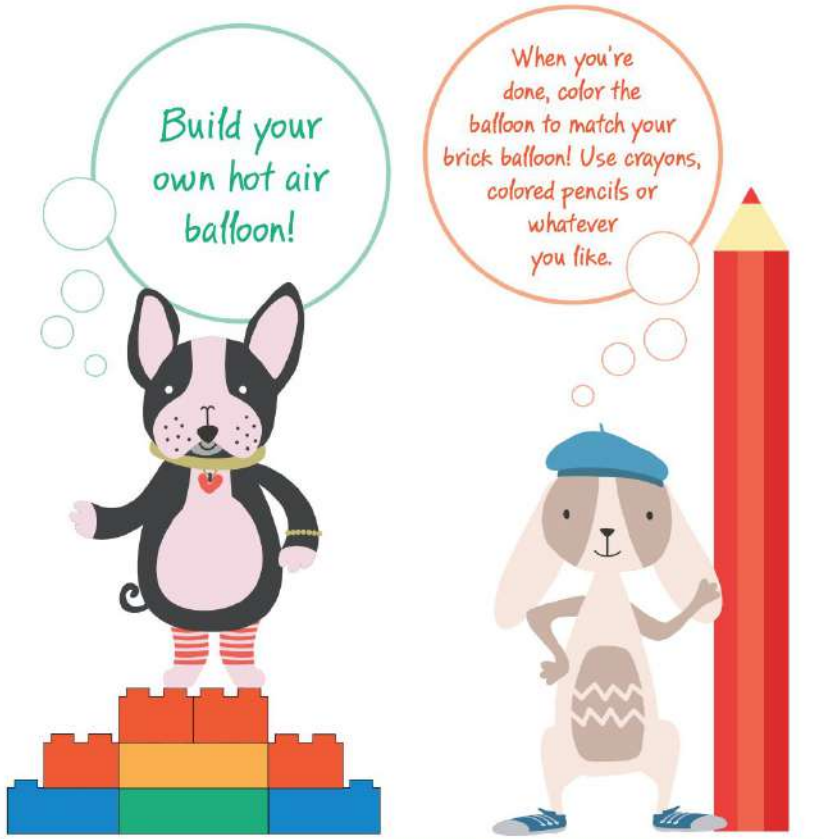
Envelope: The envelope is the part that we think of as the "balloon." Pilots also call it the "bag." The envelope holds the air that the burner warms. The hot air inside the envelope weighs less than the colder air outside, which allows the balloon to float. That is why pilots must fly early in the morning during colder temperatures. The envelope is made of nylon, the same fabric used to make lightweight jackets and camping tents.

Skirt: The skirt directs the hot air up into the envelope that is heated by the burner. The skirt protects the burner from the wind. The skirt is made of fire-resistant material so the balloon will not catch on fire.

Ballasts: Ballasts add weight to the balloon to keep it balanced and control how quickly it rises. The most common ballasts are bags filled with sand.

Propane Tanks: The tanks hold the fuel for the burner. Tanks are stored in the basket and connect to the burner with long tubes. The tanks are filled with propane, the same gas used in a lot of backyard grills!



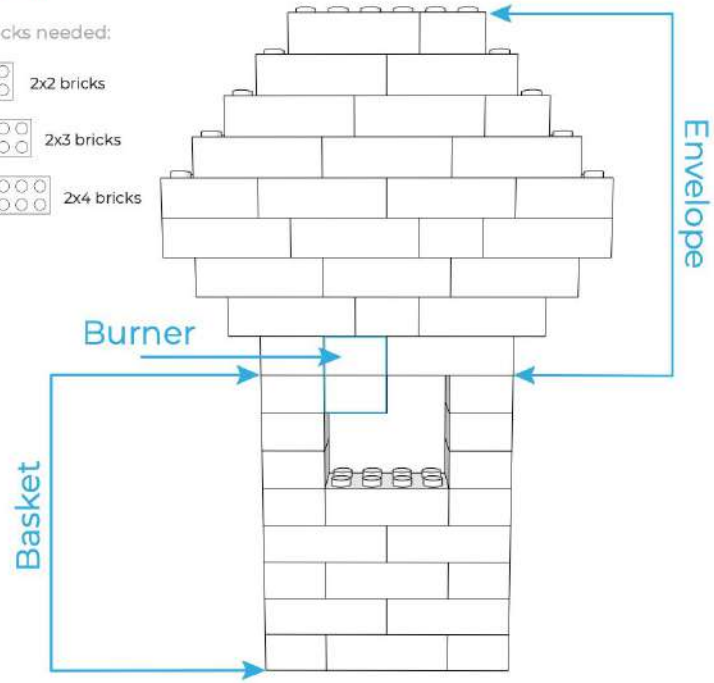


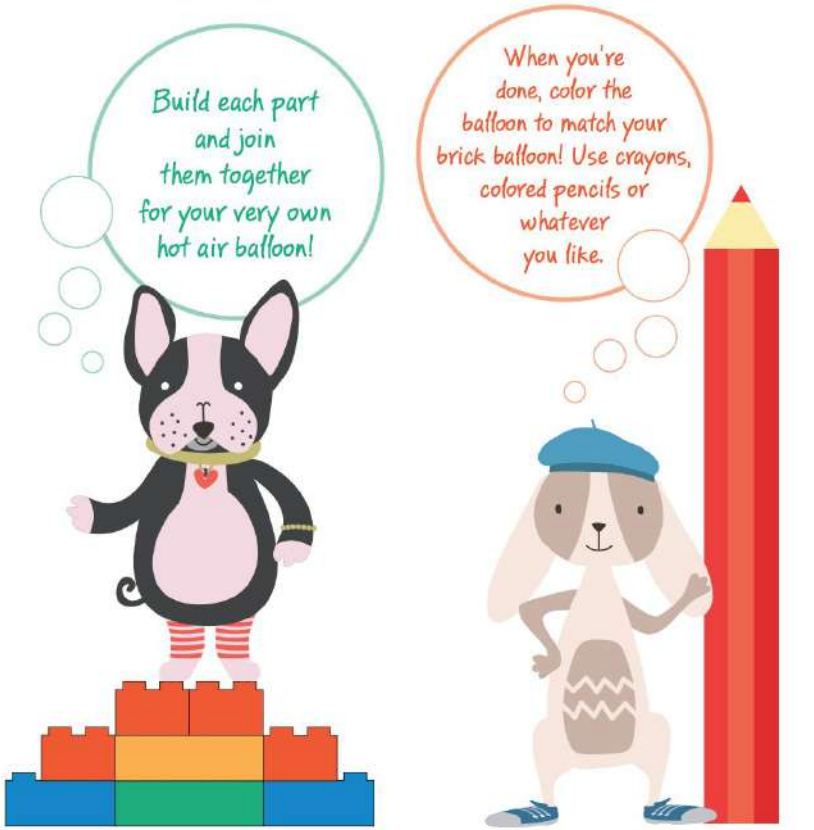
Hot Air Balloon Build

Materials

Bricks needed:

- 19 2x2 bricks
- 2 2x3 bricks
- 26 2x4 bricks





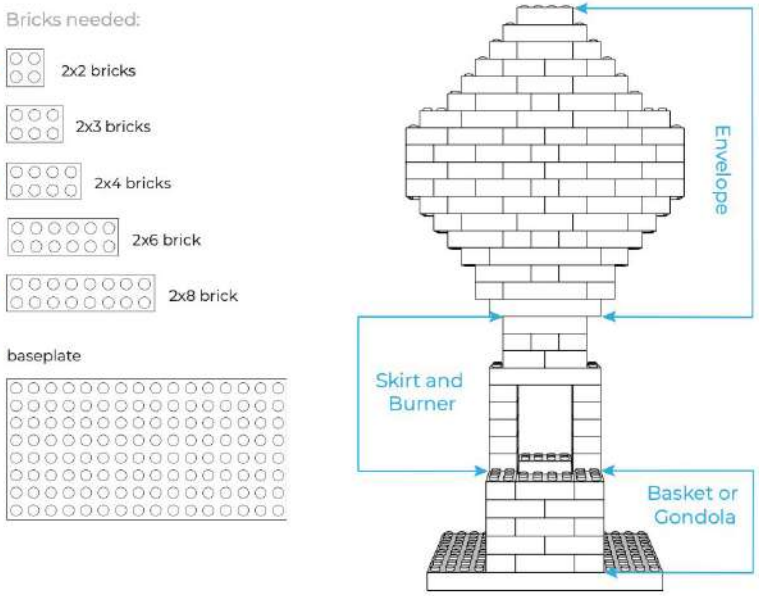
Hot Air Balloon Build

A hot air balloon has many parts that make it work. These parts can be divided into three main sections: the balloon (which is also referred to as the envelope), the skirt and burner, and the basket (or gondola). Build each section and join them together for your very own hot air balloon!

Materials

Bricks needed:

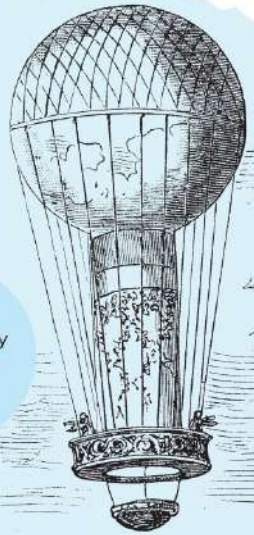
38	2x2 bricks
20	2x3 bricks
57	2x4 bricks
3	2x6 brick
3	2x8 brick
1	baseplate



Hybrid Balloons

Jean-François Pilâtre de Rozière

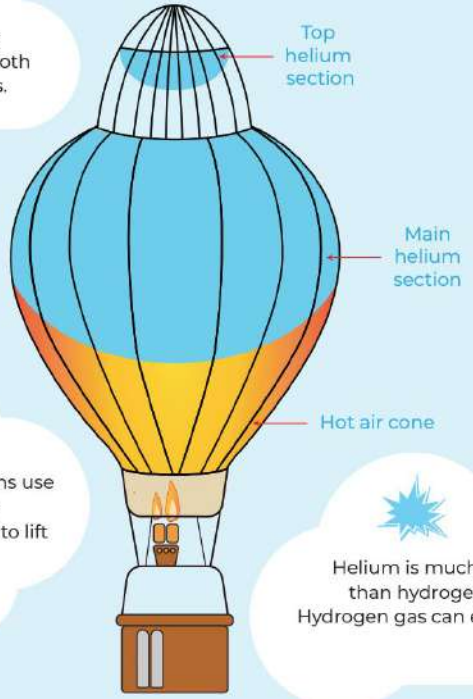
Jean-François Pilâtre de Rozière was the first person to fly in a hot air balloon. You can call him "Rozière" (row-Zee-Air) for short.



Rozière's Hybrid Balloon

Rozière wanted a balloon that could fly across the ocean, so he invented the hybrid balloon!

"Hybrid" means a mix of two things. Rozière's balloon used both air and hydrogen gas.



New hybrid balloons use a gas called helium. Helium is the same gas used to lift birthday balloons.

Helium is much safer than hydrogen. Hydrogen gas can explode!

Hybrid Balloons

Rozière dreamed of a balloon that could fly across the ocean, so he invented the hybrid balloon!

"Hybrid" means a mix of two things. Rozière's balloon used both hot air and hydrogen gas to fly longer distances.

Rozière was a science teacher. He created experiments and flight tests to make his dream come true.

In 1785, Rozière and a friend wanted to cross the English Channel to test their hybrid balloon. The English Channel is a body of water between France and England.

The 20-mile trip had some trouble. The balloon exploded in mid-air. Yikes!

ENGLAND

ENGLISH CHANNEL

FRANCE

The balloon exploded because Rozière had filled the envelope with hydrogen, a gas that can catch on fire.

Today hybrid balloons still use two gases, but now they use helium instead of hydrogen for safety. The balloon also has two separate parts to the envelope.

Top helium section

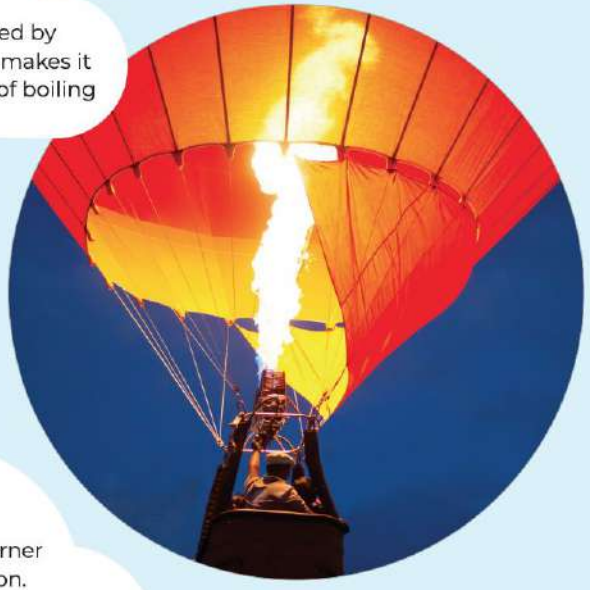
Main helium section

Hot air cone

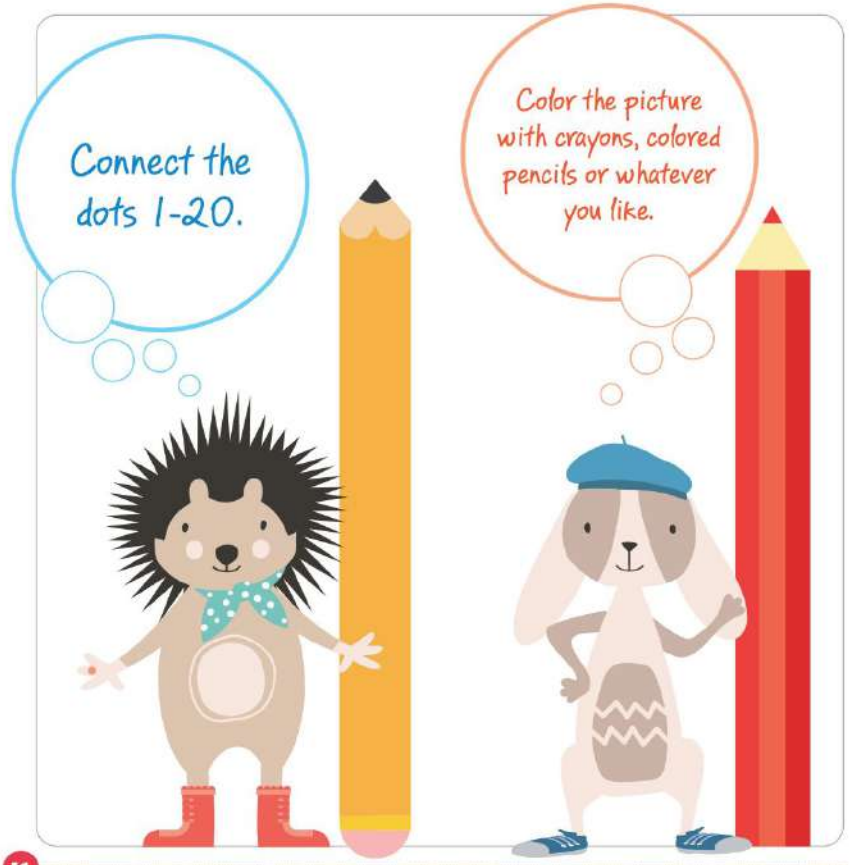
The upper part of the envelope holds helium that is not heated. This gas lifts the balloon because it is lighter than air.

Helium is the same gas used to lift birthday balloons!

The lower part of the envelope holds hot air heated by the burner. Heating the air makes it rise like a bubble in a pot of boiling water.



The pilot uses the burner to control the balloon. To rise higher in the air, the pilot heats up the air in the envelope. To sink back down, the pilot turns down the burner and lets the air cool.



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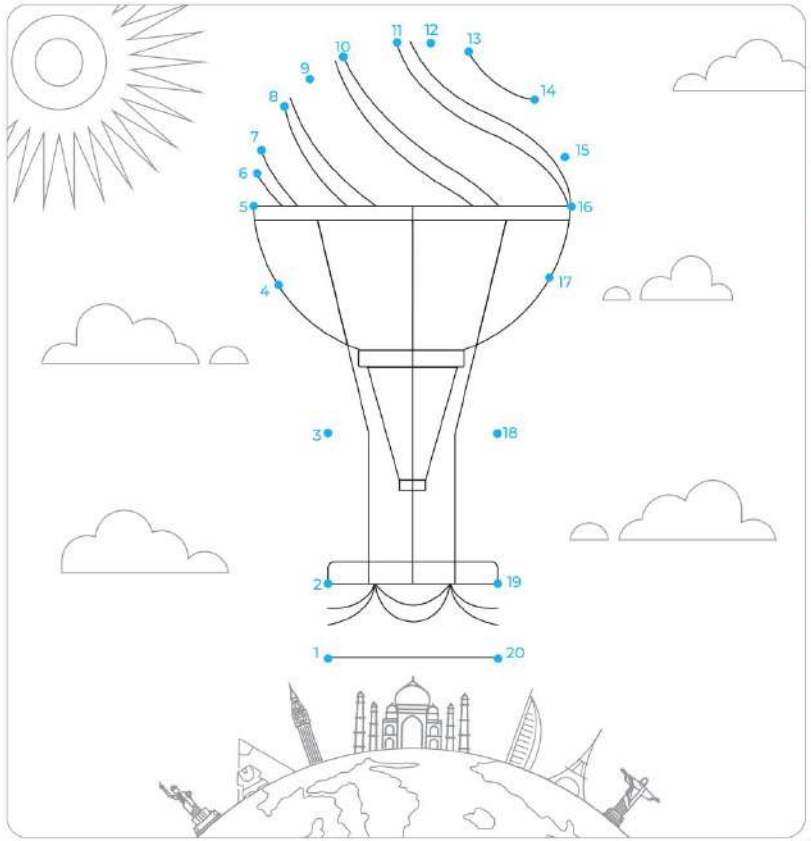

Hybrid Balloon Dot-to-Dot

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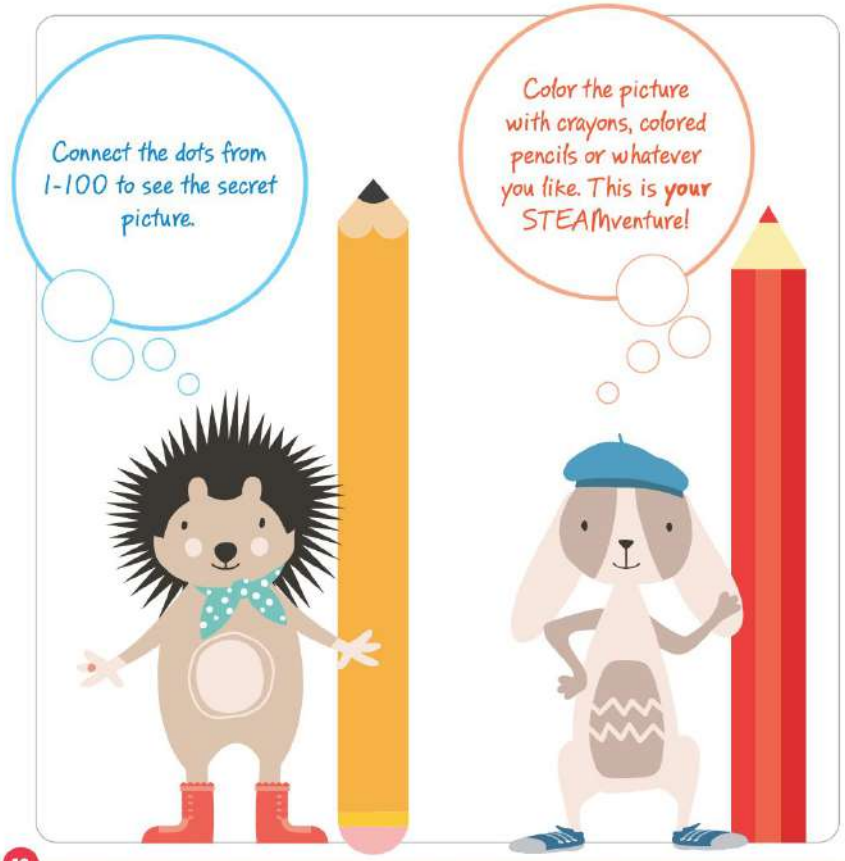
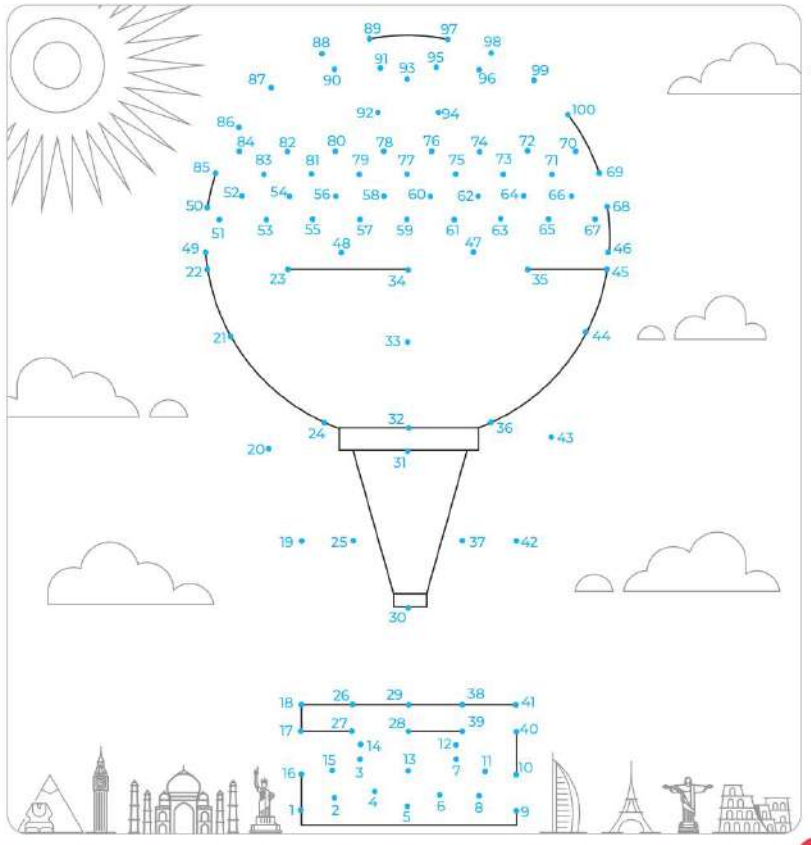




Hybrid Balloon Dot-to-Dot

The STEAMventures of Alberto Santos-Dumont

Alberto Santos-Dumont lived on a farm in Brazil. His dad called him "Santos." Santos loved all the machines on the farm.

In 1891, he moved to Paris, France. He was 18. Paris was famous for hot air balloons.

There was a famous race in Paris. Pilots had to fly around the Eiffel Tower in 30 minutes. The fastest balloon won!

Fill in the blanks or tell your favorite grown-up.

Check Your Understanding!

1. What country was Santos from?

2. How can a person win the race around the Eiffel Tower?

3. What did Santos do to make his balloon faster?

4. When did Santos win the airship race?

5. Connect with Alberto: Have you ever been in a race or contest? How did you prepare? How did you feel during the race or contest?

The STEAMventures of Alberto Santos-Dumont

Alberto Santos-Dumont lived on a coffee plantation in Brazil. His dad always called him "Santos." His dad taught him about all the newest machines.

In 1891, Santos moved to Paris, France. He was 18. Many other inventors lived in Paris. Santos was excited to meet famous hot air balloon makers. He flew in a hybrid balloon with them.

Santos practiced flying his airship every day. He tested and tested. He made new and better models of his airship.

To keep his airship light, he made the envelope out of silk and built the frame with bamboo. Instead of rope, he used piano strings to attach the basket to the envelope. To control the balloon going up or down, he used weights as ballasts.

On the day of the race, the airship leaked hydrogen. Santos was rescued from the roof of a hotel. Santos was disappointed, but he made more airships. He practiced every day. Santos never quit.

For the next race, Santos was ready. During the race, the engine had a problem. Santos had to crawl out of the basket to fix it in the air. The crowd was scared, but Santos was calm!

Santos fixed the problem. The airship rounded the Eiffel Tower. Santos steered toward the finish line. He won the great race of 1901 in 29 minutes and 30 seconds!!

Santos became famous in Paris. Santos was happy. His dad was proud of him too.

Fill in the blanks and test your knowledge of Alberto's flying machines.

Check Your Understanding!

1. What country was Santos from?

2. What did Santos learn from his dad?

3. What year was the famous airship race in Paris?

   How long was Santos in Paris before he won the race?

4. How can a person win the race around the Eiffel Tower?

5. What did Santos do to make his balloon faster? How did he make it lighter?

6. What problems did Santos have when participating in the final race? What did he do?

7. Connect with Alberto: Have you ever been in a race or contest? How did you prepare? How did you feel during the race or contest?

BUILD-It Challenge

Draw and build a hot air balloon.

1. Draw your design in the box.
   Change the shape or the colors.
2. Build your hot air balloon with your brick kit!
   Could you build it to be **bigger** or **smaller**?

Family Choiceboard

Flight Choiceboard

Choose two or three activities that interest you.
Cross off each square as you complete the activity.

Write about a hot air balloon trip. Where do you go? What do you see and do on your journey? Make a comic or map of your trip.	Go outside and run around like an airplane for 5-10 minutes.	Write about a rocket trip. Where do you go? What do you see and do on your journey? Make a comic or map of your trip.	
	Make a rocket with a cardboard tube. A toilet paper or paper towel tube will work. Decorate your rocket and then imagine your trip through space!	Pick an aircraft (hot air balloon, airplane, helicopter or rocket) and research who built the first one. Share what you've learned with a family member or friend.	Write about a helicopter trip. What do you see and do on your journey? Make a comic or map of your trip.
Take a nature walk and collect objects you see that move like helicopters or float like hot air balloons. Show your favorite grownup how each object flies when you get home.	Write about an airplane trip. What do you see and do on your journey? Make a comic or map of your trip.	Find a partner (family member). Have a paper airplane contest. Test to see which plane can fly the farthest or do the most loops.	Blow up a balloon using vinegar and baking soda. See the instructions for the experiment on the next page.
Invent a new type of flight transportation. Draw your new design and show it to a family member or friend.	Compare hot air balloons to helicopters. How are they similar? How are they different? Tell your favorite grownup about what you've learned.		Do a blast off countdown like a rocket. Count down from 10 to 0. Jump as high as you can when you get to 0. Do this 10 times.

my home LAB

Experiment

Watch the balloon inflate on its own!

What You Need:

Find these objects in your kitchen.
Ask a favorite grown-up to be your lab assistant!

- White vinegar
- An empty plastic water bottle
- A balloon
- Baking soda
- A funnel - You can make your own with paper!
- A spoon

Stretch the balloon so it is ready to inflate!

Put the balloon on the end of the funnel.

Add two spoonfuls of baking soda to the funnel.
Push all of the baking soda into the balloon.

Fill the water bottle with about 2 inches of vinegar.

Educator & Family Guides

Each issue includes:

- Aligned Standards
- Learning Targets
- Background Information
- Discussion Questions
- Book & Video Resources
- Answer Keys
- Teaching Suggestions

Upcoming Issues

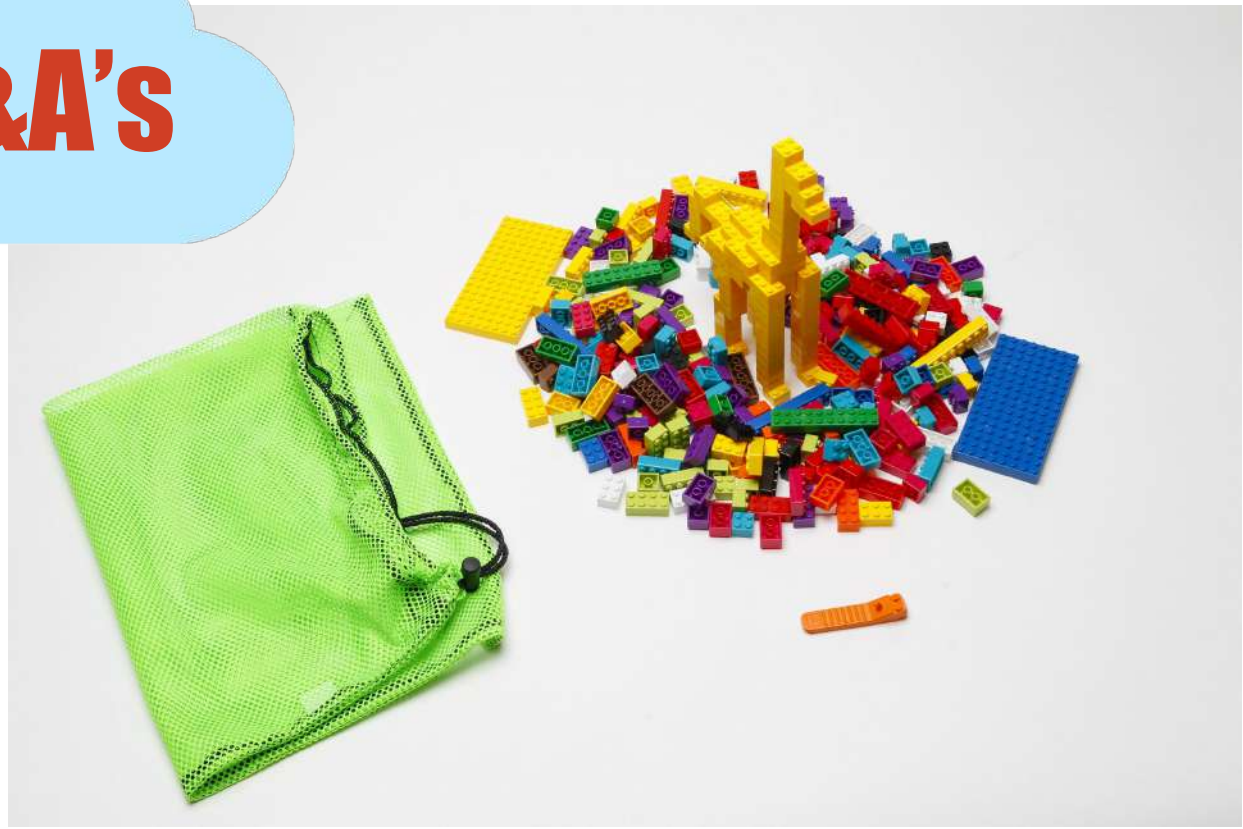
Flight Collection

- Hot Air Balloons
- Airplanes
- Helicopters
- Rockets

Future Collections:

- Transportation
- Farm/Garden

Q&A's



Type your question in questions panel and indicate who the question is for.

Panelists

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- 27+ years of teaching experience
- Teaches 2nd grade at Galileo STEM Academy (Stem certified)
- Life-long learner and advocate for project-based learning
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Wrap Up

Webinar Survey:

- Let us know how we did!
- What topics would you like to see in the future?

Webinar Video Link:

- Each registered participant will receive an email notification with a link to the webinar recording.

Free STEAM Activity:

- Digital download will be available on the website.

Home Learning with BrickLAB STEAMventures

Contact a

PCS STEMbassador

For customized solutions tailored for your learning environment

By phone:

(800) 429-3110

By email:

sales@edventures.com

Website:

edventures.com

BrickLAB ENRICHMENT PROGRAMS DISCOVER SERIES DISCOVER DRONES