ClubZOOM Finale

Four activities have flown by and it's time to wrap up ClubZOOM. A great way to conclude is to have a celebration of the kids and their ideas. Here are some suggestions of things to do during your finale.

- Invite families. You can print invitations from the ZOOM Web site (**pbskids.org/zoom/party**) and send them to your kids' families. At the finale, you can show family members the ClubZOOM bulletin board and invite them to try out some activities. Another option is to hold an activity fair. One pilot site held a fair that was run by the kids and their families. Each family chose an activity from the ZOOM Web site, collected the necessary materials, and set it up for other families to try.
- Set the scene. Decorate the room with balloons and colored streamers to make the atmosphere festive. Check out the ZOOM Party section of the Web site (**pbskids.org/zoom/party**) for printable ZOOM name tags and other decorating ideas. You can also set up a VCR and monitor and play the ClubZOOM video. Kids will enjoy pointing out the activities they tried during ClubZOOM.
- Do the final activity. Make Balloon Flinkers, a festive activity that challenges kids to design ways to make helium balloons "flink"—neither float nor sink. All the information you need to run the activity can be found on the following pages.

- Eat! Bring in snacks or bake something from the CafeZOOM section on the ZOOM Web site (**pbskids.org/zoom/cafe**).
- Play ZOOM games. The ZOOM Web site lists many games for large and small groups. Visit **pbskids.org/zoom/games** to find a game that works for your group.
- Award ClubZOOM certificates. Make color copies of the ClubZOOM certificate (see Appendix) for each ClubZOOMer.
- Send it to ZOOM! Send us a collection of your activity results, ideas for new engineering activities, pictures of your ClubZOOMers in action, and anything else you'd like to share with ZOOM. On a separate piece of paper, be sure to include the names and addresses of each ClubZOOM member so we can mail them a ZOOMerang.

Note: All submissions become the property of ZOOM and will be eligible for inclusion in all ZOOM media. This means that we can share your ideas with other ZOOMers on TV, the Web, in print materials, and in other media.

Mail your package to:
ZOOM
Box 350
Boston, MA 02134

In return, we'll send each ClubZOOMer a free ZOOMerang, a newsletter that's filled with cast trivia and lots of fun ZOOM activities!

Balloon Flinker

Make a helium balloon "flink," neither float away nor sink to the ground!

Get Ready

- Watch the Balloon Flinker video segment and review the Engineering Scoop to become familiar with the activity. Then cue the tape to the beginning for the meeting.
- You can buy helium balloons at a party supply store or many supermarkets. If you get the balloons the day of the activity, you can buy inflated latex ones that cost about $.60 a piece. If you need to buy your balloons the day before, Mylar™ balloons (about $2.50 each) keep helium longer.
- Attach a small paper cup to the ribbon on each balloon. Use a pencil or hole punch to make a hole on opposite sides of each cup. Then thread the ribbon through and tie a knot as shown. The cups should make the balloons sink to the ground; if not, switch to larger cups.

- If possible, don't work in a room with a high ceiling because it will be hard to retrieve balloons that float away.
- Collect activity materials. For each kid, make copies of the Balloon Flinker activity sheet and the Stay Tuned message (see end of section).
- Post the new ClubZOOM Board activities (see end of section).

What You Need

Design & Build (per team)

- helium balloon with ribbon attached
- pencil or hole punch
- scissors
- small paper cup (6 to 9 oz.)
- Balloon Flinker activity sheets

Redesign (for the group)

- large paper cups (16 oz.)
- napkins
- paper bowls
- popped popcorn (2 big bags)
- yarn

Time

1 hour

Engineering Scoop

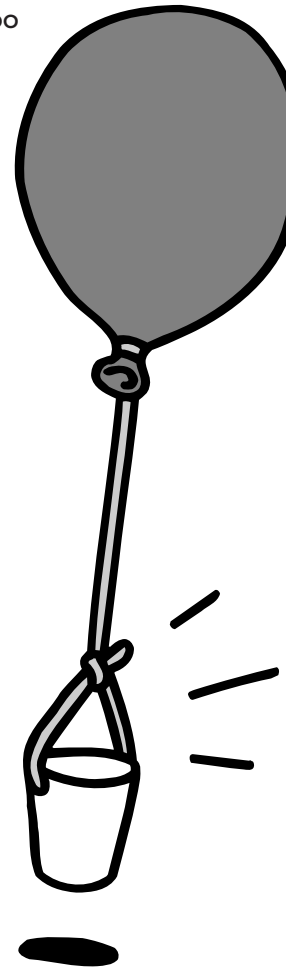
Try This First

Tie the ribbon of a balloon to a small paper cup so that the balloon sinks to the ground. Now make changes to the cup or the balloon until the balloon "flinks"—neither floats nor sinks. (For example, you might start by cutting away small pieces of the cup.)

The Scoop

Gravity is pulling down on your balloon, the helium inside the balloon, and on the air around the balloon. The helium inside your balloon is a gas, just like air. But helium weighs less than air. So a balloon filled with helium weighs less than the air around it. The air around the balloon pushes up the balloon harder than gravity pulls it down, so the balloon floats to the ceiling.

If you add weight to the balloon, you make the balloon heavier. Too much weight means that gravity pulls down harder than the air pushes up, so the balloon sinks to the ground. If you add the right amount of weight, the balloon flinks—it doesn't float or sink.



Find Out More

Books

Balloons, Kites, Airships, and Gliders
Loves, June. Broomall, PA: Chelsea House Publishers, 2002.
Learn how hot air balloons, blimps, kites, and other aircraft fly. You may be surprised, but hot air balloons fly in a way very similar to your balloon flinker!

Floating and Sinking
Challoner, Jack. Austin, TX: Raintree Steck-Vaughn Publishers, 1997.
Explore floating and sinking in water and in air.

Web Sites

Air Travelers
www.omsi.edu/visit/physics/air/science/helium
Plug the diameter of a balloon into this Lift Calculator and find out how much weight the balloon can carry.

How Helium Balloons Work
www.howstuffworks.com/helium.htm/
Find out what makes helium balloons float in air.

Up, Up, and Away!
www.smm.org/sln/tf/u/upupandaway/upupandaway.html
Try this experiment to show that warm air rises.

Run the Meeting

1 Get Started (5–10 minutes)

Welcome kids and ask for a volunteer to share the Stay Tuned coded message. *(Answer: Up, up, and not away.)* Then read the Challenge Letter together.

Hold a balloon by its ribbon. Ask kids what will happen if you let go. Then tie the cup to the ribbon. Ask kids what they think will happen if you let go. Then let go and watch the balloon sink. Ask kids to brainstorm what they could do to make the balloon "flink," neither float to the ceiling nor sink to the ground.

Talk to kids about floating and sinking. They are probably most familiar with floating in water, so you can ask:

- *What kinds of things sink in water?*
- *What kinds of things float?*
- *What happens if you are in water? What does floating feel like?*

2 Design & Build (10–15 minutes)

Organize teams of 2 kids and distribute the activity materials. As kids try to get their balloons to flink, ask:

- *How can you remove weight from your balloon?*
- *How can you add weight to your balloon?*
- *Why do you think your balloon tends to go up and down instead of staying at one height?*

3 Test (5–10 minutes)

Bring the teams to the "testing area" and have them take turns demonstrating their flinking balloons. Talk about the changes they made to get their balloons to flink. Compare different approaches that worked. If a team is having trouble getting their balloon to flink, ask the rest of the group to offer suggestions. When everyone has a balloon that flinks, move to the redesign.

Activity Tips

- Suggest that kids cut off small pieces of their paper cup. If they remove too much, simply drop some pieces back in the cup. The difference between floating and sinking can be a very small amount of weight.
- Kids can tie yarn to the cup or ribbon to increase the weight. They can shorten the yarn to decrease the weight.
- If a balloon floats out of reach, you can use another balloon to get it back. Put a loop of masking tape on top of a balloon and attach a long string. Let this balloon float up to the first balloon. The tape will stick to the first balloon, and then you can pull both balloons down together.
- For fun, you and your kids can use static electricity to make "pet" balloons. Just rub a balloon on your hair to make static electricity. Then hold your hand near a "flinking" balloon, and it will follow your hand around the room like a pet.

4 Redesign (15 minutes)

For your ClubZOOM finale, you can have kids pass out popcorn with their balloon flinkers! (Note: Tell the kids not to eat the popcorn until they're done with the activity. You can use styrofoam peanuts if you prefer not to work with food.)

Give each team a cup of popped popcorn, napkins, and paper bowls. Let them experiment to find a way for their balloons to flink while carrying popcorn. One way is to cut off the rim of a paper bowl, put a paper napkin in the middle to form a bowl shape, and fill it with popcorn. If kids are having trouble getting their balloons to lift the popcorn, suggest that they join a few balloons together.

5 Share Results (5–10 minutes)

Ask for volunteers to demonstrate their new designs. Talk about different ways groups solved the problem.

- *How did you change your design so the balloon could carry popcorn?*
- *What happened when someone took out a piece of popcorn?*
- *Compare one design to another. What's the same? What's different?*

You can also show the Balloon Flinker video segment and talk about how the ZOOM cast made a flinker.

Then connect the activity to engineering by talking about other ways to use helium balloons. You can use the "Engineering the Future" posting to launch discussion.

6 Wrap Up (5 minutes)

Hand out club card stickers.

ZOOM Links

Try these related activities on the ZOOM Web site.

Flinker
pbskids.org/zoom/sci/flinker.html
Make an object that neither floats nor sinks in water.

Hot Air Balloon
pbskids.org/zoom/sci/hotairballoon.html
Make a homemade hot air balloon.

ClubZOOM™ Finale!

Now it is time to celebrate everything your kids have learned during ClubZOOM.
See page 107 for ideas for your finale.

Challenge

Dear ClubZOOM Engineers,

Ima Hungree here. I am the owner of Get On the Horn for Popcorn. People hire my company to pass out popcorn at their parties.

I have a problem. My next party is really big, and I don't have enough staff to pass out the popcorn. But I do have balloons. What's a party without balloons, right?

So I was thinking maybe the balloons could pass the popcorn. Of course, the balloons can't float out of people's reach. Do you think you can help?

Happy Poppin'!

Ima Hungree

Ima Hungree
Owner
Get On the Horn for Popcorn!

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Balloon Flinker

Make a helium balloon "flink"—neither float away nor sink to the ground.

What You Need

- small paper cup (6 to 9 oz.)
- pencil or hole punch
- helium balloon with ribbon attached
- scissors

Engineering Scoop

Gravity is **pulling down** on your balloon, the helium inside the balloon, and on the air around the balloon. The helium inside your balloon is a **gas**, just like air. But helium **weighs less** than air. So a balloon filled with helium weighs **less** than the air around it. The air around the balloon **pushes up** the balloon harder than gravity pulls it down, so the balloon **floats** to the ceiling. If you add **weight** to the balloon, you make the balloon **heavier**. Too much weight means that gravity **pulls down harder** than the air pushes up, so the balloon **sinks** to the ground. If you add the right amount of weight, the balloon will **flink**—it doesn't float or sink.

1 Use the pencil or hole punch to **poke** a hole on each side of a small paper cup.

2 **Put** the balloon's ribbon through both holes and **tie** a knot. **What happens** when you let the balloon go?

3 How can you make the balloon **flink**—neither float nor sink? Try changing the **length** of the ribbon. Or **cut** off small pieces of the cup.

4 **Keep changing** the design of your flinker until it flinks for **10 seconds**.

Redesign It!

Redesign your flinker so it can **carry** something. Add some popcorn, a message, or something else that is **light**. What do you have to **change** to make your flinker flink again? Choose **one thing** to change, like the **length** of the ribbon, the objects you add, or the **weight** of the cup. Then **test it** and **send** your results to ZOOM.

Sent in by Daniel T. of Hitson, TN

PBS KIDS
pbskids.org/zoom

Balloon Flinker

Engineer's Notebook

Here's my balloon flinker.

(Draw your design here and label the parts.)

Here's how my flinker works:

Meet an Engineer

Fanny Zuniga

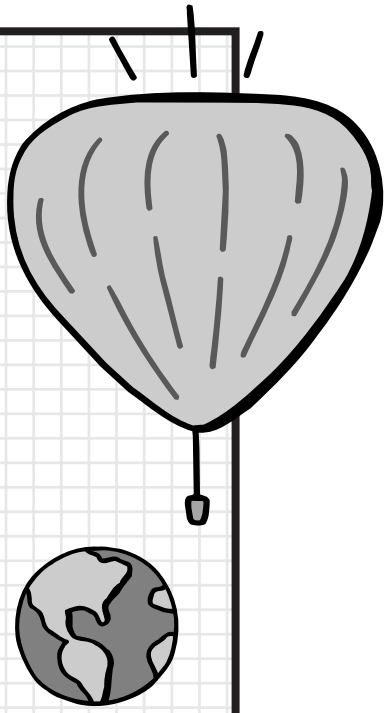
Sending astronauts into space is an amazing event. But once they're up, they need to get down . . . and safely. That's the job of Fanny Zuniga. She's an aerospace engineer who designs airplanes and space shuttles for NASA. One of the projects Fanny works on is making the space shuttle safer to land. One day, Fanny hopes to become an astronaut and ride in the shuttles she helps design.

pbskids.org/zoom

Photo credit: Women of NASA, NASA Quest.

Engineering the Future

Have you ever seen a space shuttle launch on TV? Sending astronauts into space is a great way to explore, but it's expensive and can be dangerous. So instead of sending humans, sometimes scientists **use helium balloons to collect information about space**. Engineers have designed huge helium balloons that circle the Earth and carry equipment to collect data for scientists. Many of these balloons can stay afloat for only a few days. Future engineers like **you** could find new ways to keep these balloons afloat for weeks, months, or even years!



pbskids.org/zoom

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Can You Solve This?

Toothpick Squares

Can you use 6 toothpicks to make 2 squares? Grab some toothpicks and give it a try!

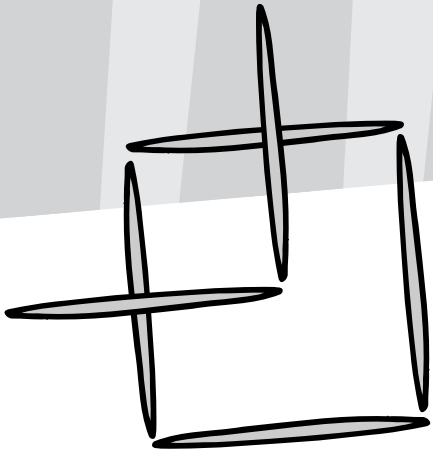
Hint: One square can be inside the other.

Sent in by Tremaine R. of Breaut Bridge, LA

Ready to check your answer? Look inside!

Answer

Here's how you make 2 squares out of 6 toothpicks.



To keep teasing your brain, visit ZOOMzingers at pbskids.org/zoom/zingers

pbskids.org/zoom

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How could you right a tipped truck?

Mind Blaster
...brought to you by
dragonfly tv

Have you ever seen a truck tipped over on the highway? Trucks are large and heavy and hard to move. How could you get it back up?

a. Use a hot air balloon to pick up the truck.
b. Inflate balloons under the truck.
c. Use a huge fan to blow air under the truck.

Ready to check your answer? Look inside!

DragonflyTV is a show about real kids doing real science. Visit the DragonflyTV Web site at **pbskids.org/dragonflytv** to find out when the show is on in your area and explore more science.

Major funding for DragonflyTV is provided by Best Buy Children's Foundation and the National Science Foundation. Any opinions, findings, and conclusions expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

pbskids.org/zoom

Answer

Using a hot air balloon would be very expensive. And it would be too difficult to control **air blown by a fan** under the truck.

So the answer is B—balloons are inflated under the truck! Can you believe that road crews get trucks upright by inflating balloons under the trucks? It's all about pressure. If there's enough pressure from the balloon pushing on the truck, up it goes.

You may not be able to lift a truck, but you can lift a book. Check out ZOOM's Air Lift activity at **pbskids.org/zoom/sci/airlift**