



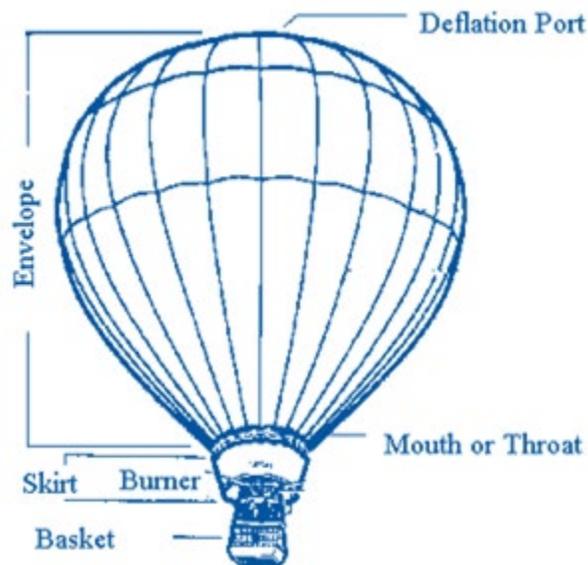
# THOMASVILLE

## HISTORY CENTER

### Up, Up, and Away! Hot Air Balloons

#### Hot Air Balloons

Hot air balloons were sewn from silk and invented in France in the late 1700s. The individual panels of the hot air balloon that are sewn together are called the gores. Together the gores form an envelope that holds the hot air created by the burner.



#### Learn more

A Short History of Ballooning, PBS,  
<https://www.pbs.org/wgbh/nova/article/short-history-of-ballooning/>

Anatomy of a Hot Air Balloon, Plano Balloon Festival  
<https://www.planoballoonfest.org/p/about/anatomy>

United States Navy Training Film, "History of Balloons," 1944 found at:

<http://www.youtube.com/watch?v=uXE2MYo43NI>

National Geographic: "I Didn't Know that: Hot Air Balloons,"

<http://video.nationalgeographic.com/video/i-didnt-know-that/idkt-hot-air-balloons>

## Hot Air Balloons (Version 1)



### Supplies:

- Construction paper, cardstock, scrapbook paper
- Brown or black construction paper
- Scissors
- Glue stick
- Printed balloon template
- Pencil
- Yarn or string
- Liquid glue or hot glue
- Cereal box for template (optional)

### Instructions

Step 1: Print template. Trace it 4 times, onto colored construction paper or scrapbook paper. If you want a fuller balloon, you can trace more! If you plan to make multiple balloons, it might be a good idea to create a sturdier template by tracing the printed balloon onto an empty cereal or snack box and cutting it out.



Step 2: Measure and cut your yarn, set aside. Yarn should be about three times as long as your template.



Step 3. Fold each balloon cutout in half lengthwise so the pattern (if any) is to the inside. If you have any pencil markings from tracing, be sure those marks are on the outside of your folded balloon. Since that's where the glue will go, the markings will be hidden!

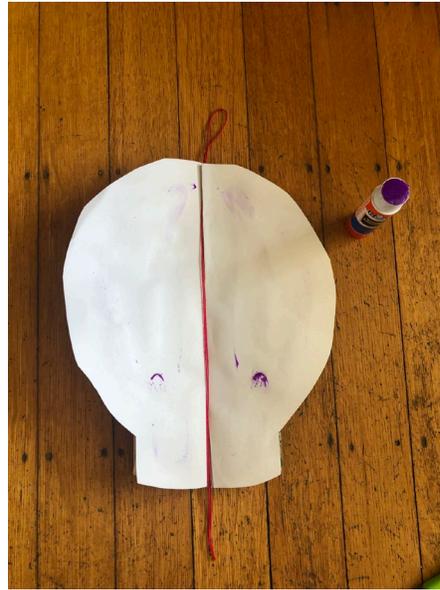


Step 4: Using your glue stick, glue one side of a folded balloon. Stack another folded balloon on top and press firmly. Repeat with the rest of the panels. On the last balloon, do not glue both sides to its neighbor (that would complete the circle).



Step 5 : Lay the glued stack and open it like a book. Take your yarn that you cut earlier and double it in half and make a small loop, about 2-3 inches, at the top. Lay your doubled string along the fold line in your "book." Use hot glue to secure the yarn down the middle of the open balloon, with the loop at the top of the balloon and the bottom

two pieces hanging at the bottom. Glue the last balloon sides together. Set aside your balloon for a few minutes to let the glue set.



Step 6: While your balloon dries, cut out two 2"x3" rectangles, these will become your basket. Get your balloon, locate the two hanging strings coming out of the bottom of your balloon. Separate the string to form an upside-down V shape from the bottom of the balloon. Glue one string to each of the top corners of the rectangle. Glue the second rectangle on top of the first rectangle to make a sandwich of the strings. Let dry.

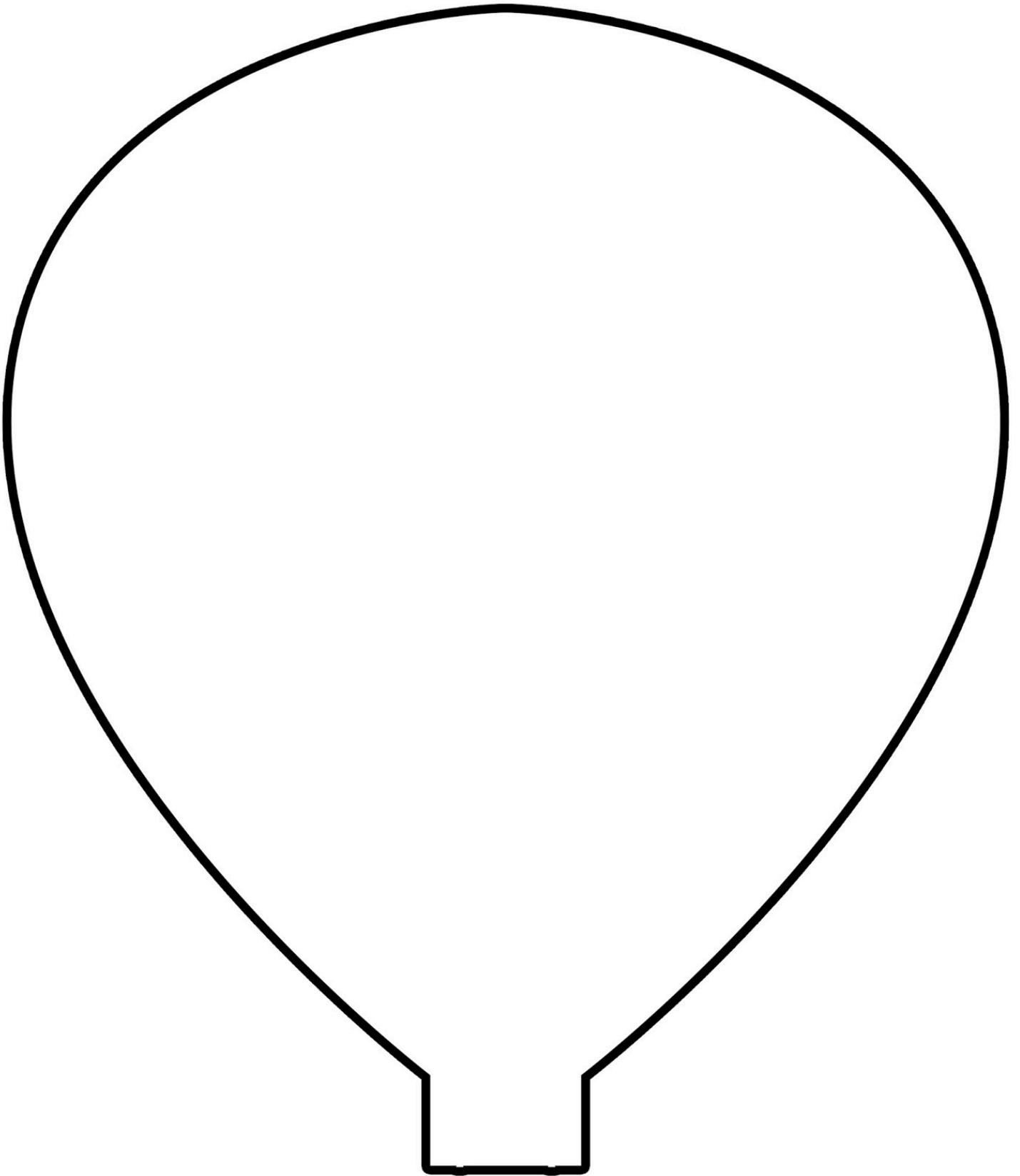


Once everything is dry, it's time to hang your balloon!

Or decorate it some more? Are there people in the basket?



Template:



## Hot Air Balloons (Version 2)

This project can be done, we promise! It's just a little challenging. Take it in stages and make sure you have adults on hand to help!

### Supplies (per balloon)

- 16 pieces of 20"x 26" strong tissue paper. (You might be able to use newspaper but we've never tried it)
- Brown Craft Paper or cardboard (for making a template)
- Marker or Pencil
- Glue Stick
- 36" piece of sturdy but flexible wire (if you have floral wire, that will work best)
- Wire cutters
- Stapler and staples
- Scissors
- Hair dryer or small fan

### Launch supplies:

- Stovepipe (24+'' length, 6-8'' diameter)- try a chimney starter for charcoal to mimic a stovepipe
- Camp Stove & Propane
- Heat proof gloves

For the launch, the stovepipe helps to concentrate the hot air into the balloon envelope. A camp stove provides heat without open flame. Don't forget your gloves! If you don't have a camp stove, try inflating your balloon with hot air from a hair dryer, it may not float but it will inflate!

## Assembly Instructions

Bolded **Instructions** indicate areas where children tend to need the most assistance

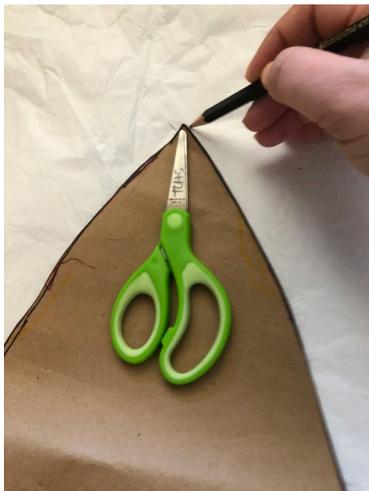
*Gores:*

1. **Create a gore template out of brown craft paper or cardboard using this guide:** [http://balloonexplorium.org/uploads/documents/Sonic\\_plans.pdf](http://balloonexplorium.org/uploads/documents/Sonic_plans.pdf). Once the template is cut out, set it aside. If the paper is rolling up, use books or heavy objects to weigh it down.
2. Overlap 2 pieces of tissue paper on their short edge and glue together to create a long rectangle 20" wide x 52" long. Repeat until you have 8 rectangles.





3. Stack rectangles so all edges line up. Staple each of the four corners to create an easy to cut bundle.
4. Trace your template carefully onto the top of the stack of paper. Cut around your tracing line. . These are your gores, or balloon panels. Don't throw away your extra tissue paper, you'll want some pieces for patching later and for other crafts.



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### Envelope

1. Now that your gores are cut out, choose one from the stack and lay it on the floor in front of you. This assembly works best on the floor where you have plenty of space.
2. **Take a second gore and lay it on top of the first one, but offset by about  $\frac{3}{8}$ . “Use your glue stick to run a thin line of glue from the tip of your gore to the base. Carefully fold the overlapping edge up and over the glue line of the gore above.**



3. Repeat this process by alternating the glued edge for each of your remaining gores.

4. Once all gores are glued lift the top gore so you can see the gores inside- it should look kind of like an accordion. Gather those inside gores and fold them back towards the sealed edge. Repeat the glue overlap step for the final two layers to create a closed envelope.



5. Once you have glued the final two panels, pick up your envelope and gently shake out your pleats, this should create the desired balloon shape (although not fully since it hasn't been filled with hot air)



Bolded **Instructions** indicate areas where children tend to need the most assistance

### Flight Prep

1. As you glued your gores together, the top (pointed end) should have mostly sealed itself. To be sure that no air can escape, you'll need to make a cap. To create the cap for your balloon, trace an 8" circle out of your remaining tissue paper scraps. Gently press down on your balloon so it is round but flat. Glue your cap down.





2. Check for holes or weak seams - Place a hair dryer on low speed or stationary fan inside the balloon and turn it on, If you feel air coming through any seams, you'll need to go back and gently re-glue them.





3. The wider mouth at the base of your envelope is called the “ring.” Shape 2 pieces of floral wire into a circle, using your balloon to measure the necessary diameter.



4. Twist the wire together to make a circle. Lay balloon on it's side. Using your wire ring as a measure, cut vertical slits all the way around the base of the balloon, extending in about 2-3 inches. One flap at a time, bring the flap over

the wire and glue the paper to itself- creating a kind of hem that holds the ring.



### Launch Instructions

**Adults:** In a safe outdoor area, preferably on brick or concrete, place your camp stove on a level surface. Place your stovepipe on top. Light camp stove and let heat for 10-15



minutes. Be sure you have your heat protective gloves ready.

Holding the balloon by the metal ring in the base, hold the opening down over the stovepipe. The wire ring should be 2-3 inches down over the top of the stovepipe. The balloon should fill with the hot air and start to bounce in your hands. Once you feel it is ready, gently release the ring and give it a little guidance over the top of the stovepipe. It should float a few feet above (or more) of the pipe. If it drifts, do not let children grab it. It will be hot! Repeat launch as desired.

**Sources:**

[http://balloonexplorium.org/uploads/documents/Sonic\\_plans.pdf](http://balloonexplorium.org/uploads/documents/Sonic_plans.pdf)

<https://www.msichicago.org/science-at-home/hands-on-science/hot-air-balloon/>

[https://www.nationalmuseum.af.mil/Portals/7/documents/education/up\\_up\\_and\\_away\\_with\\_montgolfier\\_balloon\\_lesson\\_plan.pdf](https://www.nationalmuseum.af.mil/Portals/7/documents/education/up_up_and_away_with_montgolfier_balloon_lesson_plan.pdf)