

Paper Roller Coaster Electronic Templates

To get started, follow these steps:

1. Make copies of the templates onto card stock (65 lb). If possible copy the structural pieces (i.e. columns, beams, diagonal supports, shelves, and brackets) on white paper. Then copy each of the other pieces on different colored paper. This makes it easier for the students to find the desired piece. It also helps you to see which pieces are getting low. Another option is to use white paper for the structure and a single color for all of the other pieces. This still makes it easy to see the path for the marble. The chart below shows suggested number of copies of each template to make one large coaster.
2. Cut the sheets into strips using a paper cutter. Cut along every thin black line.
3. Cut pieces of sturdy cardboard or foam board so that you will have one for the base of each roller coaster. A suggested size is 12 $\frac{3}{4}$ " x 22 $\frac{3}{4}$ ". With this size, columns can be mounted in the corners of the board and midpoints of the long edges, leaving exactly the right amount of space to attach beams without any trimming necessary.
4. Gather other supplies, such as scissors, rulers, ball point pens, and enough rolls of tape so that each person or group has at least one roll.
5. Use the instruction manual to learn how to build each piece. Practice making each piece so you'll be able to explain it to your students.
6. Have your students work in teams and have fun being creative!

Page Number	Template name	Suggested number of copies per roller coaster	Suggested colors
2	Columns	15	White
3	Beams	10	White
4	Diagonal Supports	4	White
5	Shelf	2	White
6	Brackets	1	White
7	Straight Track	3	Red
8	Sharp Curve	3	Green
9	Wide Curve	3	Yellow
10	Funnel	2	Orange
11	Merge	1	Purple
12	Loop	1	Light Blue

Name _____

Date _____ Lab Partner(s) _____

PAPER ROLLER COASTER LAB

The Great Paper Roller Coaster Challenge

INTRODUCTION AND OBJECTIVES

The local amusement park has issued a challenge to roller coaster designers to determine who should build their next roller coaster. You'll need to prove that you can make an exciting roller coaster, have fun working together and testing your model for the challenge day.

EQUIPMENT NEEDED

- Paper Roller Coaster pieces on card stock
- Scissors
- Tape
- cardboard base
- Paper Roller Coaster instruction manual
- ruler (optional)
- pen (optional)
- magazine (optional)

OBJECTIVE

Your Paper Roller Coaster must meet all of the following requirements:

1. height between 30 cm and 100 cm
2. track length must be at least 150 cm
3. at least one loop
4. at least six turns
5. bucket at end to catch marbles
6. decorations

Checklist			
Column		Straight track	
Beam		Sharp turn	
Diag. Support		Wide turn	
Shelf		Funnel	
Bracket		Loop	

PROCEDURE

Build a Paper Roller Coaster using the supplies that your teacher provides. The roller coaster should be exciting, reliable, and take a long time for the marble to travel from the start to the finish. Look at the scoring sheet below before you begin. Good luck!

TESTING

After you're done building, your teacher will test your Paper Roller Coaster by placing one marble at a time on it. Record the amount of time that it takes for each marble to reach the bucket at the end of the track. If the marble gets stuck or falls off of the track, write N/A for that trial.

Trial #1 _____ seconds

Trial #2 _____ seconds

Trial #3 _____ seconds

Trial #4 _____ seconds

Trial #5 _____ seconds

Total time for all trials = _____ seconds

Enter your total time for the five trials in the chart at the right. Your teacher will help you complete the rest of the chart.

Category	Points
Total time (5 trials) each second = 1 point	
Reliability Bonus (30 points if all trials reached the bucket)	
Height > 30 cm and < 100 cm (10 points)	
Track length > 150 cm? (10 points)	
At least one loop? (10 points)	
At least six turns? (10 points)	
Bucket at end to catch marbles (10 points)	
Uphill sections (5 points for each section of the track where the marble goes uphill)	
Decorations (up to 30 points)	
Construction quality (up to 30 points)	
Excitement value (up to 30 points)	
total construction score	



column

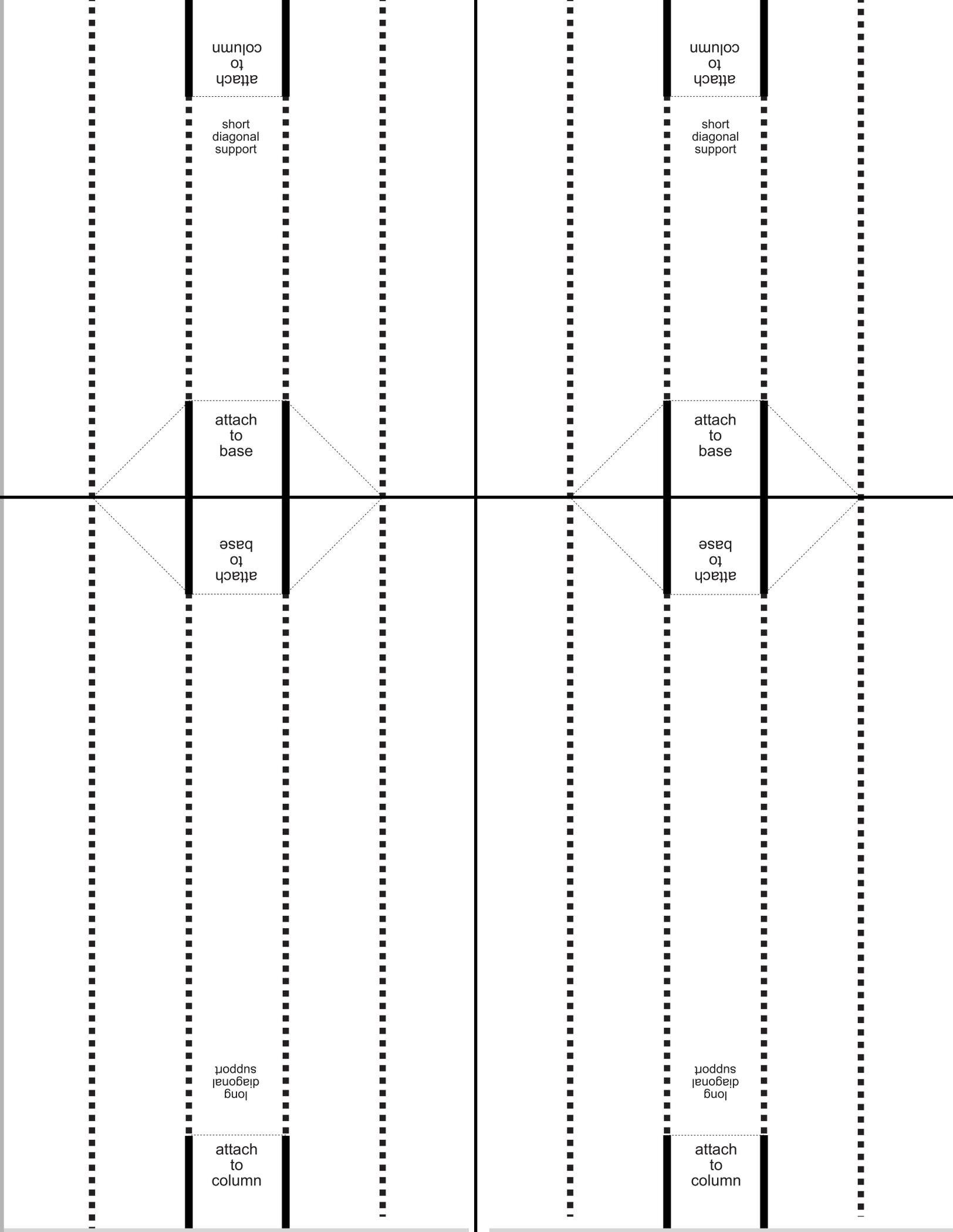
column

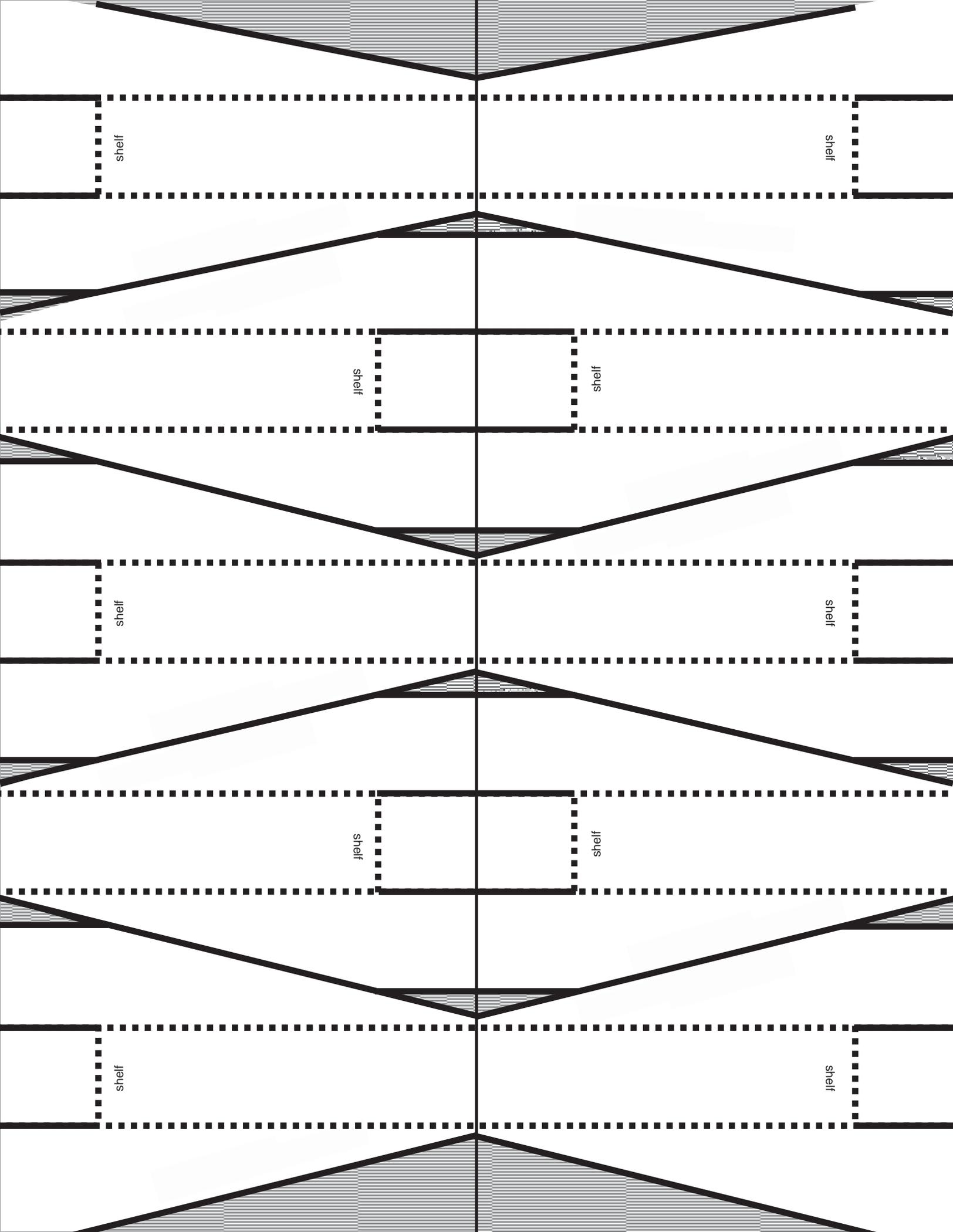
beam

cut to length
desired

beam

cut to length
desired





shelf

fold

straight
track

fold

fold

straight
track

fold

fold

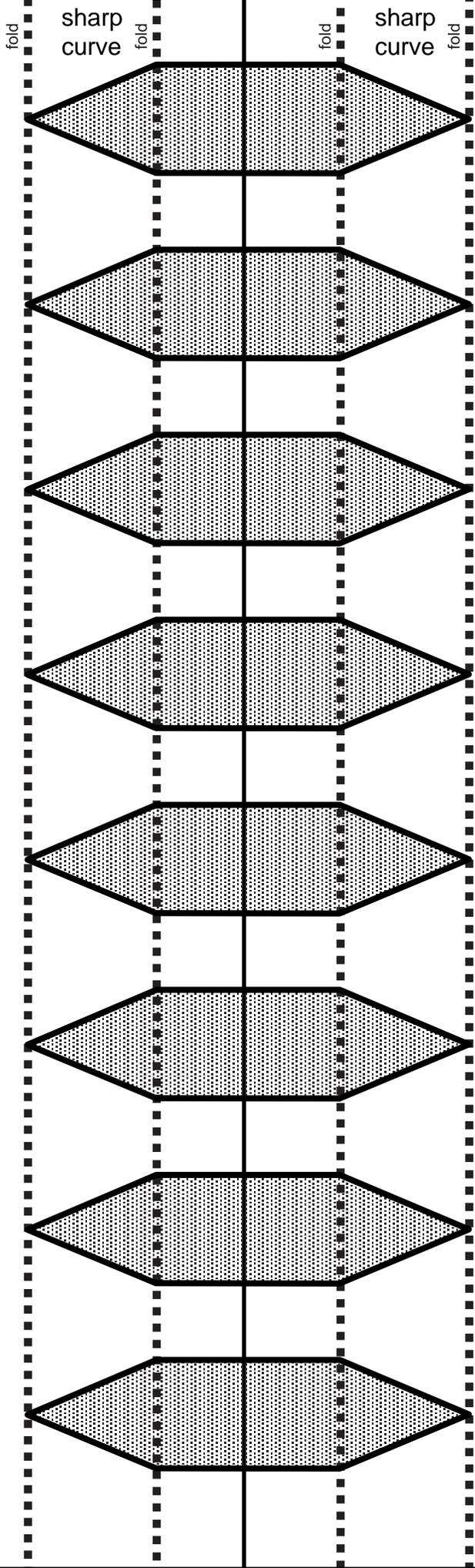
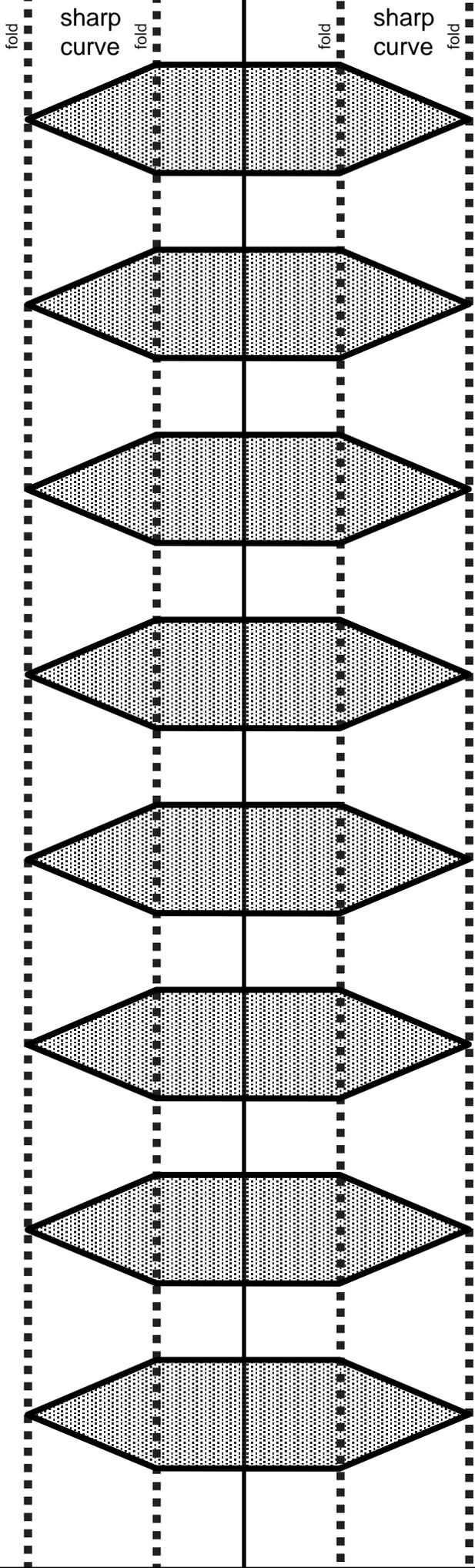
straight
track

fold

fold

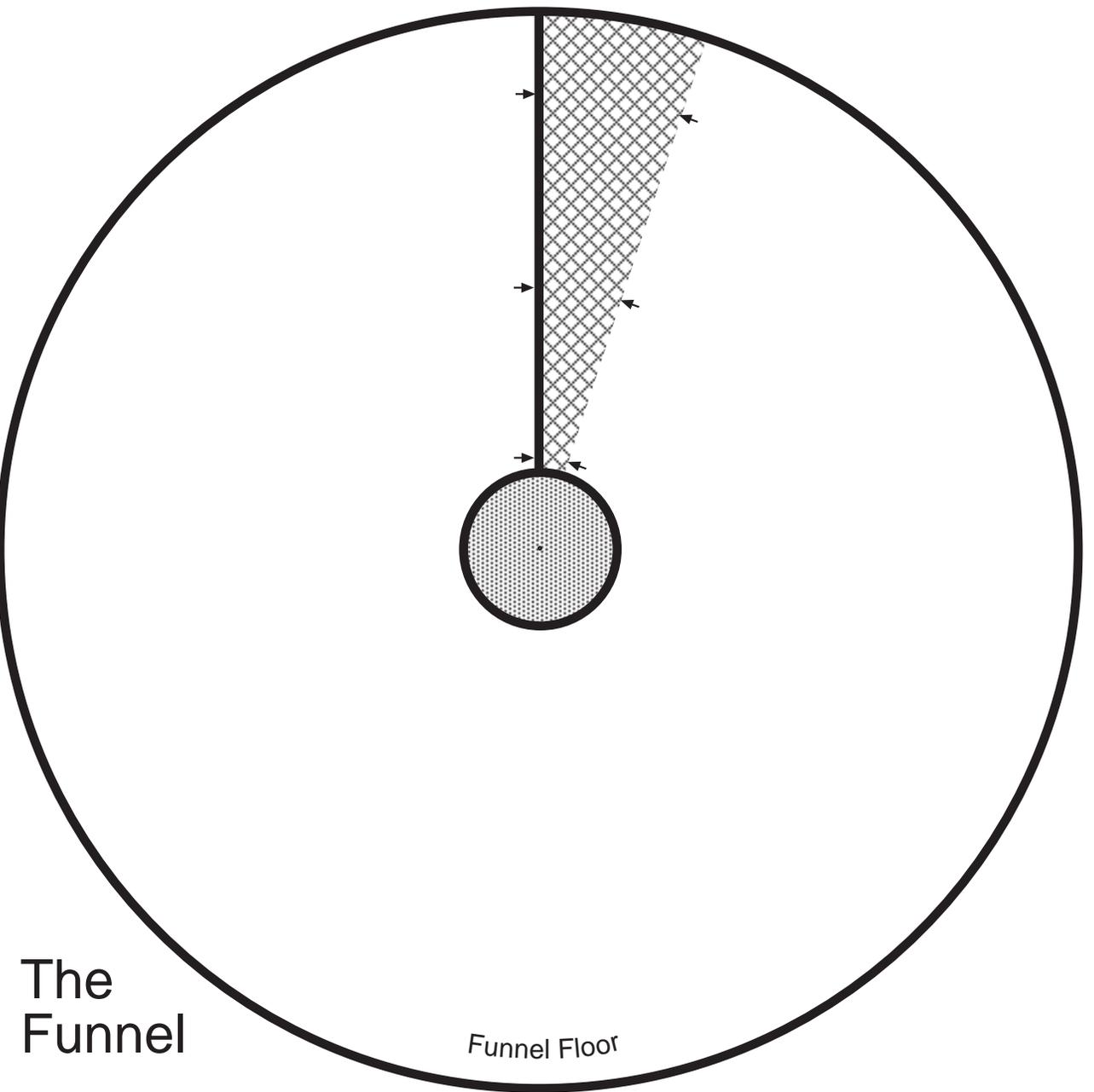
straight
track

fold





Long Funnel Wall

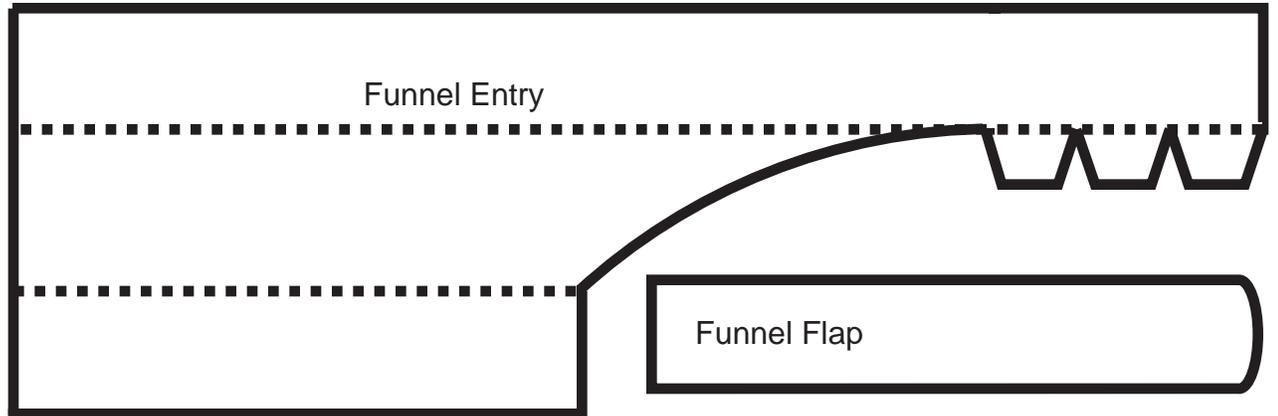


The Funnel

Funnel Floor



Short Funnel Wall



Funnel Entry

Funnel Flap

