

**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 that meets their requirements, using as little money as possible.

**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

**PROCEDURE**

While trying to spend as little “money” as possible, 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.

**COST OF MATERIALS**

Type	Cost	Type	Cost
Column	\$0.50	Straight track	\$1.00
Beam	\$0.50	Sharp turn	\$1.25
Diag. Support	\$0.10	Wide turn	\$1.25
Shelf	\$0.05	Funnel	\$2.50
Bracket	\$0.05	Loop	\$1.50

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	
Cost of Materials (\$1 = 1 point)	-
Final score (total construction score - cost)	