

Ramp Test Plan

Plan a fair test and collect useful measurement data.

3.1.b “planning and carrying out investigations with guidance, plan and conduct investigations use appropriate methods and/or tools for collecting data estimate length, mass, volume, and temperature measure length, mass, volume...”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the tools Mina chose. Circle the one thing she changed, and number three things she kept the same so you can see how her test was fair.

Mina Tests a Marble Ramp

- ① Mina wanted to build a cardboard ramp that would guide a marble into a cup. First, she made a plan. She predicted that taller sides might keep the marble on the ramp. She chose a ruler to measure side height in centimeters, a stopwatch to measure travel time in seconds, and a paper data table to record three trials for each design.
- ② For a fair test, Mina made two ramps from the same cardboard. One ramp had sides 2 centimeters high, and the other had sides 5 centimeters high. Both ramps were the same length and rested on supports at the same angle. Mina used the same marble, cup, and starting mark. She released the marble without pushing it each time.
- ③ Before testing, Mina estimated that both designs would take about 2 seconds. She timed each marble trip three times and wrote every time in her table. She also wrote whether the marble reached the cup. Afterward, she compared the results. If a marble rolled off the ramp, she could change the side height and test again to improve her device.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What two tools did Mina choose, and what did she measure with each tool?

2 What part of the ramps did Mina change? Name the two measurements.

3 Name three things Mina kept the same to make her test fair.

4 What two kinds of data did Mina write down for each trial?

Plan a fair test for a paper device that guides a marble into a cup. Complete five rows in this order: device and tested change, what stays the same, tool and unit, estimate, and data to record from three trials. Then carry out a guided comparison. Teacher supplies matching pre-cut cardboard ramps 60 cm long and 6 cm wide, tape, side strips, a ruler, a stopwatch, one marble, a stable cup and a floor-level catch tray. Build side walls 2 cm high on one ramp and 5 cm on the other. Teacher secures each ramp in turn at the same gentle angle and pretests a clear route into the cup. Keep the same ramp material, marble, cup and start mark; release without pushing. Estimate travel time, then run three trials per design. On extra paper make six rows with Side height (cm), Trial, Time to cup (seconds), Reached cup? Record actual times; if it misses, write did not reach instead of a time to cup. Compare successes and completed-trip times with your estimate; propose one improvement supported by results. Keep marbles away from mouths and collect them after each trial.

PLAN PART	YOUR PLAN

PART 1 • READ AND MARK

Underline the tools Mina chose. Circle the one thing she changed, and number three things she kept the same so you can see how her test was fair. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What two tools did Mina choose, and what did she measure with each tool?	She used a ruler to measure side height in centimeters and a stopwatch to measure travel time in seconds.
2	What part of the ramps did Mina change? Name the two measurements.	She changed the side height. The sides were 2 centimeters high and 5 centimeters high.
3	Name three things Mina kept the same to make her test fair.	Answers include the cardboard, ramp length, ramp angle, marble, cup, starting mark, and releasing the marble without pushing.
4	What two kinds of data did Mina write down for each trial?	She wrote the travel time and whether the marble reached the cup.

PART 3 • YOUR TURN (SAMPLE ANSWER)

PLAN PART	YOUR PLAN
Device and tested change	Cardboard ramp with side walls; test side height
What stays the same	Same ramp length, angle, marble, cup, and starting mark
Tool and unit	Ruler in centimeters and stopwatch in seconds
Estimate	A 4-centimeter side will keep the marble on the ramp for about 2 seconds
Data to record	Time in seconds for three trials and whether the marble enters the cup

Accept reasonable fair-test plans that name one change, several controlled conditions, an appropriate measuring tool and unit, an estimate, and data from three trials. Controls may differ from Mina's if they make sense for the student's device. Teacher guides construction, verifies measured 2 cm/5 cm walls and equal ramp lengths/angles, operates or supports timing, and keeps equipment on the floor inside a catch tray. Require both actual designs, six recorded trials and honest comparison to the learner estimate. Original five-row plan remains required. Accept ties, misses and no improvement; do not prescribe taller-wall superiority. Human reaction time limits precision for short trips: report approximate seconds, not unjustified extra decimals. A miss has no time to cup and must not be counted as a faster success. The sample 4 cm design is a valid planning example; execution uses the specified 2 cm/5 cm comparison.