Physics science fair projects for elementary: ramps, planes, parachutes

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Sixteen motion science fair projects for elementary and middle school: ramps, paper planes, parachutes, pendulums, rockets and bridges, with grades and costs.

Physics projects make some of the best elementary science fair projects, because motion is easy to measure: how far a toy car rolls off a higher ramp, how long a bigger parachute takes to fall, how many swings a longer string makes in 15 seconds. Sixteen of the forty projects on Peabody are about how things move, and they start as young as 1st grade. Thirteen of the sixteen cost nothing, every one tests in a single day, and almost all of them need only paper, tape, string and a few toys.

I built the science fair pages on Peabody so each project comes with every sheet a fair asks for: the question, the If-Then-Because hypothesis, what to gather, the steps, a results table with the right levels and unit, and a board plan. Here are the sixteen motion projects in three groups, what a fair expects at each age, and how to run one.

Rolling, bouncing and swinging

- Project: Which floor makes a ball bounce highest? · Grades: 1st–5th · Testing: 1 day · Cost: free
- Project: Does a steeper ramp make a toy car go farther? · Grades: 2nd–6th · Testing: 1 day · Cost: free
- Project: Does a higher start make a marble roll faster? · Grades: 3rd–8th · Testing: 1 day · Cost: free
- Project: Does a longer string swing slower? · Grades: 4th–8th · Testing: 1 day · Cost: free
- Project: How much does a rubber band stretch with each extra weight? · Grades: 5th–8th · Testing: 1 day · Cost: free

Flying and falling

- Project: Does more air make a balloon rocket go farther? · Grades: 2nd–8th · Testing: 1 day · Cost: about $1
- Project: Which wing shape flies farthest? · Grades: 3rd–8th · Testing: 1 day · Cost: free
- Project: Does a bigger parachute fall slower? · Grades: 3rd–8th · Testing: 1 day · Cost: free
- Project: Does a pointed nose make a straw rocket fly farther? · Grades: 3rd–7th · Testing: 1 day · Cost: free

- Project: Does a longer tail keep a kite steadier? · Grades: 3rd–8th · Testing: 1 day · Cost: free
- Project: Does a longer arm make a catapult throw farther? · Grades: 3rd–8th · Testing: 1 day · Cost: free
- Project: Which padding keeps a dropped egg from cracking? · Grades: 3rd–8th · Testing: 1 day · Cost: about $3

Holding, floating and sticking

- Project: Which boat shape carries the most pennies? · Grades: 1st–5th · Testing: 1 day · Cost: free
- Project: Which paper bridge shape holds the most coins? · Grades: 2nd–7th · Testing: 1 day · Cost: free
- Project: Does a wider base keep a cup tower from tipping? · Grades: 2nd–8th · Testing: 1 day · Cost: free
- Project: Which gives a balloon the most static: hair, wool or cotton? · Grades: 2nd–8th · Testing: 1 day · Cost: about $1

Most of these come out of the junk drawer and the toy box; the paper, tape and toys page lists them all, and several grow from a build in Peabody's Workshop, like the ramp races and the paper airplane lab.

What a fair expects, by age

- 1st to 3rd grade: one thing changed, one thing counted or seen. Pennies in a foil boat, coins on a paper bridge, the ball against a tape on the wall. Three tries, a simple bar graph, and what happened in your child's words.
- 4th to 6th grade: measured with units (cm, seconds) and a mean for every level. This is where motion projects shine, because a 4th grader can time and measure them on their own. The pendulum, the parachute and the rockets all give clean numbers.
- 7th and 8th grade: a second variable. The paper planes with a paper clip on each nose; the parachute with 2, 4 and 6 paper clips; the pendulum with 3, 5 and 8 pennies; the catapult with a heavier ball of foil.

How to run a motion project

1. Mark a start line with masking tape. Every try starts from the same place. A judge will ask what you kept the same, and the start line is the easiest answer.
2. Write the hypothesis first on the hypothesis sheet: "If I change ___, then ___ will ___, because ___." The because is your child's guess about why.
3. Let go; don't push or throw. The car, the ball and the marble are released, not pushed, so the only change is the one being tested.

4. Three tries at every level, each written in the results table straight away.
5. The middle number or the mean, then the graph. Bars for separate kinds (wing shapes, floors, paddings); a line for a number that grows (ramp height, string length, pennies).
6. Lay out the board: a 36 × 48 inch tri-fold with Question, Hypothesis, Materials, Steps, Results and Conclusion in reading order. A drawing of the setup with the start line marked helps a judge see the test.

Safety, checked in code

Every project on Peabody passes a check in the code before it can be shown: nothing off the fair's safe-list, no flames, no chemicals beyond the kitchen, no animals, no cultures, and no glue gun, box cutter or saw. Motion projects add a few rules of their own, printed on their pages: drop from standing, never climb (the parachute and the egg drop), aim at the floor or across the room, never at anyone (the straw rocket and the catapult), and a grown-up blows up the balloon in both balloon projects. The kite is flown in an open field, far from power lines, trees and roads. Your school's sheet wins.

Try tonight

Cut three squares from plastic bags: 20, 30 and 40 cm across. Tape a 30 cm string to each corner of every square, tie each parachute's four strings together and hook on two paper clips. Stand up, hold the smallest one high over your head (never climb on a chair), and let go as a helper starts the timer; stop it when it lands. Three drops each, then the middle time for each size and a line graph. That's Does a bigger parachute fall slower?, done in about an hour. For a different one, Pick my project asks four questions, one of them "What do you like?" with "How things move" as an answer.

Questions grown-ups ask

Which motion project suits a young child best?

The two that start at 1st grade: the ball bouncing on different floors and the foil boats carrying pennies. Both are free, take under an hour, and have an answer you can see.

Do we need a stopwatch?

Five of the sixteen use one (the parachute, the pendulum, the kite, the marble run and the static balloon), and a kitchen timer works too. The rest are measured with a tape measure or by counting: pennies, books, drops.

Is this "physics"?

Yes. Ramps, swings and bounces are about energy and gravity; planes, parachutes and rockets about air pushing back; bridges and towers about forces and balance. Each project page has a short "what really happened" in plain words, for after the test.

Peabody (peabody.kids) is free through the end of 2026, with no ads and no sign-up, and nothing a child taps on the science fair pages is sent anywhere. The library has stories at every reading level for when the planes are put away.

Free at peabody.kids/blog/physics-science-fair-projects-elementary