Science fair projects for 8th graders that are not a volcano

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Science fair projects that fit 8th grade and stand up as full investigations: two variables, means, a two-line graph, sources of error and a next question.

An 8th grade science fair project should be a full investigation, not a demonstration: a question where the answer isn't obvious, a hypothesis with a reason, at least three trials per level, a mean and a graph, a second variable, and a conclusion that names what could have gone wrong and what to test next. Twenty-five of the forty projects on Peabody fit 8th grade, and none of them is a volcano that just erupts. Even the baking soda one is a test: change the amount, measure the foam, then change the vinegar.

I built the science fair pages on Peabody so each project is a question with its own results table, a mean column, a board plan and, for older students, a "Going further" line with the second variable. Here is what an 8th grade fair expects, twelve projects with a twist, and how to turn one into a full investigation.

What an 8th grade fair expects

An 8th grade project has to make its case without anyone explaining it. In practice that means:

- A clear, testable question. One thing changed, one thing measured.
- A hypothesis with a reason, written before testing.
- A procedure someone else could follow exactly, numbered.
- Three or more trials at every level, and a mean for every level of both tests.
- A second variable, so the graph has two lines or two sets of bars.
- Sources of error. What might have nudged the numbers: a timer started late, a draught, a ruler read at an angle.
- A next question. What would you test if you did it again?

The grown-up's job by now is to advise; the student runs it. Many middle school fairs feed regional fairs that follow stricter rules, often built on the international science fair rules from Society for Science, with forms and sign-offs for anything involving people, animals or microbes. Check your school's sheet early.

Why "not a volcano"

A baking soda volcano that erupts shows something happening, but nothing is changed and measured, so there's no question being answered. A judging rubric gives that its lowest score: "a topic or a demonstration, nothing tested". Eighth graders are past it. Peabody's Does more baking soda make a bigger fizz? takes the same kitchen chemistry and asks a question (1, 2

and 3 teaspoons of baking soda, foam height in centimetres), then a second one: keep 2 teaspoons and try a quarter, a half and a whole cup of vinegar, and find which one runs out first. That's an investigation.

Twelve with a twist

These fit 8th grade. The last column is each project's second variable, shortened from its Going further line. All twenty-five are on the 8th grade page.

- Project: Does a longer string swing slower? · Grades: 4th–8th · Testing: 1 day · Cost: free · The twist: does the weight change the count?
- Project: How much does a rubber band stretch with each extra weight? · Grades: 5th–8th · Testing: 1 day · Cost: free · The twist: two bands side by side
- Project: Which wing shape flies farthest? · Grades: 3rd–8th · Testing: 1 day · Cost: free · The twist: does a nose clip change the best wing?
- Project: Does more baking soda make a bigger fizz? · Grades: 3rd–8th · Testing: 1 day · Cost: free · The twist: which runs out first, soda or vinegar?
- Project: Does dish soap stop oil and water from separating? · Grades: 3rd–8th · Testing: 1 day · Cost: free · The twist: 10, 20 and 40 shakes
- Project: Do the heaviest liquids always sink to the bottom? · Grades: 4th–8th · Testing: 1 day · Cost: about $2 · The twist: the same liquids cold from the fridge
- Project: Which grows crystals faster: salt or sugar? · Grades: 4th–8th · Testing: 5 days · Cost: free · The twist: a warm spot and a cool spot
- Project: Does grass grow best under red, blue or green light? · Grades: 4th–8th · Testing: 14 days · Cost: about $3 · The twist: sunny and shady shelves
- Project: Does a higher start make a marble roll faster? · Grades: 3rd–8th · Testing: 1 day · Cost: free · The twist: steeper slides
- Project: Does a longer arm make a catapult throw farther? · Grades: 3rd–8th · Testing: 1 day · Cost: free · The twist: a heavier ball of foil
- Project: Which colour of paper warms up most in the sun? · Grades: 3rd–8th · Testing: 1 day · Cost: about $3 · The twist: morning, noon and afternoon
- Project: Does a bigger water drop make letters look bigger? · Grades: 4th–8th · Testing: 1 day · Cost: free · The twist: the drop's height above the page

The pendulum, the rubber band and the paper airplane with a nose clip are the three I'd point an 8th grader at first: each has a real twist in its second test.

Turning one into a full investigation

1. Write the question and the hypothesis with a reason. The hypothesis sheet has the If-Then-Because frame and a variables card: what's changed, what's measured, what's kept the same.

2. Keep a logbook from day one. Dated lines: what I did, what I saw, what I think.
3. Run the first test. Three trials minimum at every level; five if there's time. Write each one in the results table as it happens.
4. Find the means, then look at the spread. Tries that land close together mean more than tries that are all over the place. Say which it was.
5. Run the second variable, with its own table and means.
6. Graph both tests on one set of axes. Two lines for numbers that grow, or paired bars for separate kinds.
7. Write the conclusion with sources of error and a next question. The conclusion sheet asks for both.
8. Lay out the board. The board plan fits a 36 × 48 inch tri-fold, which sits inside the common size limit of 30 inches deep, 48 wide and 96 high. Practise the judge's questions out loud.

Safety, checked in code

Every project on Peabody is checked in 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 people as the thing tested. Those are the areas where the international rules add forms and review, which is why Peabody leaves them out. Your school's sheet wins, always.

Try tonight

Tape five pennies into a stack, tie them to a string, and hang them 40 cm below a pencil taped to the edge of a table. Pull them out until the string is straight, let go, and count swings in 15 seconds (over and back is one). Three tries. Now the twist: keep 40 cm and hang 3, then 8 pennies (you already have 5), three tries each. Does the weight change the count? Write the guess down before you find out. That's the second variable of Does a longer string swing slower?. For a different starting point, Pick my project asks four questions and hands over one.

Questions grown-ups ask

My 8th grader wants to test people: a survey, reaction times, a taste test. Can they?

Every rule set I read says projects that test people need a review and consent before they start, and that's true all the way up to the international fair. Peabody leaves them out. Ask the teacher first; the school decides.

What are "sources of error"?

The things that could have nudged the numbers without being the variable: a timer started a beat late, a draught on one try, a ruler read from an angle, a slightly different start line. Naming them honestly scores well; pretending there were none doesn't.

Are these projects enough for a regional fair?

They can be a solid start. A regional fair will have its own rules and forms, so read them before you begin, add more trials, and keep the logbook dated. Your school's sheet and your regional fair's rules win over anything here.

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 longer stories for older readers too.

Free at peabody.kids/blog/science-fair-projects-for-8th-graders