



Gurukul Technicals Institute

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FREE EBOOK

SCIENCE PROJECTS AND KITS

Your Science Exhibition Guide

Choose a project, build it, present it and answer the judges with confidence

INSIDE THIS BOOK

- What a science exhibition is
- Choosing a topic that suits you
- Checking that it works and is safe
- Planning your time and budget
- Building neatly
- ...and 6 more chapters, practice questions and a glossary

Beginner

Students of class 3 to 12, parents and teachers

engineergurukul.com

+91 97116 99511

Your Science Exhibition Guide

A step-by-step guide for students of class 3 to 12, with tips for parents and teachers. Learn the kinds of entries, how to pick a topic that suits your class, how to plan your time and budget, build neatly, make charts, write a one-page summary, explain your project in one or three minutes, and answer judges' questions with confidence.

WHO IT IS FOR	Students of class 3 to 12, parents and teachers
LEVEL	Beginner
SUBJECT AREA	Science projects and kits
WHAT IS INSIDE	11 chapters, practice questions with answers, and a glossary

HOW TO USE IT

Read one chapter at a time and try the examples as you go: on a computer, at your workbench or in your notebook. The boxes give tips, safety points and short activities. When you finish, test yourself with the practice questions and check your answers at the end. Words you may not know are explained in the glossary.



Gurukul Technicals Institute

A-10, Chief Commissioner Colony, opposite Rana Pratap Bagh, Delhi 110007

Phone 011 2721 1512 · Mobile and WhatsApp +91 97116 99511

engineergurukul@yahoo.co.in · engineergurukul.com

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What a science exhibition is

A **science exhibition** is an event where students show science projects they have made. Each student or team gets a table. Visitors walk around, look at the projects and ask questions. A group of teachers or experts, called **judges**, visit each table and decide which projects are the best.

Exhibitions happen at many levels: in your own school, between schools in a town, and at district, state and national levels. The bigger the exhibition, the stricter the rules usually are. But the basic skills are the same at every level, and that is what this book teaches.

Why take part?

- You learn science by doing it, not just by reading it.
- You practise planning, building, writing and speaking.
- You learn to work in a team and to finish what you start.
- You meet students from other schools and see their ideas.
- It is fun, and it builds confidence that lasts long after the day.

The four kinds of entries

Most exhibitions accept some or all of these kinds of projects. Always read your exhibition's rules to see which ones are allowed.

Kind of entry	What it is	Example
Working model	A model that moves, lights up or does a job when you switch it on	A wind turbine that lights an LED
Still model	A model that shows how something looks or is arranged, but does not move	A model of the layers of the Earth
Investigatory project	An experiment that answers a question with tests and results	Which paper soaks up water fastest?

Kind of entry	What it is	Example
Best out of waste	A useful or interesting thing made mostly from waste materials	A bird feeder made from old bottles

Working model

A **working model** shows a science idea in action. Judges like to see it work, so it must work reliably, again and again, all day.

Still model

A **still model** does not move, but it must explain an idea clearly. A model of a rainwater harvesting system, with labels showing how water flows, is a good still model.

Investigatory project

An **investigatory project** starts with a question. You make a guess, test it fairly, record your results and draw a conclusion. It needs less building but more careful thinking.

Best out of waste

A **best out of waste** entry reuses things that would have been thrown away. It shows creativity and care for the environment. It should still connect to a science idea.

DID YOU KNOW

You do not need an expensive project to win. Judges usually care far more about a clear idea, good understanding and honest work than about costly parts.

REMEMBER

Read the rules first. They tell you which kinds of entries are allowed, the size of the table, the time limits and any safety rules.

Choosing a topic that suits you

Choosing the topic is the most important step. A good topic makes everything easier. A poor one makes every step a struggle.

Four questions to ask yourself

- 1. Does it interest me?** You will spend weeks on it. Choose something you are curious about.
- 2. Do I understand the science behind it?** You must be able to explain it in your own words.
- 3. Can I build or test it with the time, money and help I have?**
- 4. Is it safe?** If it needs fire or strong chemicals, choose something else, or check the rules and get an adult's help. Never use mains electricity.

Ideas by class

These ideas are a starting point. Change them, combine them, or use them to think of your own.

Class	Working or still model ideas	Investigatory project ideas
3 to 5	Water filter with sand, gravel and cotton; rain gauge from a bottle; a simple periscope	Do plants grow towards light? Which things float in water?
6 to 8	Hydraulic arm with plastic syringes; electromagnet with a nail and a battery; wind turbine with a toy motor	Which material keeps ice from melting longest? Does salt change how fast ice melts?
9 and 10	Automatic street light with a light sensor; soil moisture alarm; solar water heater model	Does the colour of a surface change how hot it gets in the sun?
11 and 12	Sensor projects with a microcontroller board; water quality tester model	Which fruit has more vitamin C, tested with a school lab method under a teacher?

SAFETY

Water filter projects show how dirt is removed, but the water is still not safe to drink. Never drink water from your model.

Make the topic your own

Many students make the same popular models, such as the volcano or the rainwater harvesting model. That is not wrong, but judges see them every year. To stand out, add something of your own:

- **A new use:** an automatic street light is common; one that also counts how many hours it stayed on is more interesting.
- **A local problem:** a model about water-logging in your own colony, or crop waste burning near your village.
- **A test:** do not just build a solar cooker; test three shapes and compare.

EXAMPLE

Tanvi in class 7 in Nashik wanted to make the usual water filter. Her teacher asked, "Which layer does the most work?" Tanvi built three filters, each missing one layer, and compared how muddy the water looked. Her plain water filter became an investigatory project, and she could answer every judge's question.

TIP

Write down five topic ideas. Then cross out any that fail one of the four questions. Pick from what is left.

CHAPTER 3

Checking that it works and is safe

Before you spend money and weeks of work, make sure your idea will work and will be safe on the day.

Make a quick test version

A **prototype** is a rough first version made to test an idea. Make it quickly from cheap materials, such as cardboard, tape and old bottles. Does the main idea work? If the wind turbine cannot light the LED, find out now, not the night before the exhibition.

Ask "what could go wrong?"

Question	Example
Will it work for a whole day?	Batteries can run down; bring spares
Will it work in a noisy, crowded hall?	A sound sensor may react to the crowd
Can it break while travelling?	Glue joints can crack in a school bus
Does it need water?	Spills can damage the table and the charts
Does it need sunlight?	The hall may be indoors; bring a lamp or show results instead

Safety rules for your project

SAFETY

Use batteries of 12 V or less for all electrical projects. Never use mains electricity from a wall socket in your model. Soldering, hot glue guns, cutters, sharp tools and any chemicals need an adult beside you, especially for younger students. Do not use open flames, and do not bring animals or anything that could hurt a visitor.

Many exhibitions do not allow open flames, mains wiring, dangerous chemicals or live animals. Check the rules for your exhibition, and ask your teacher if you are unsure.

Fair tests for investigatory projects

In an investigatory project, your test must be **fair**. A fair test changes only one thing at a time.

- The **thing you change** is called the **independent variable**.
- The **thing you measure** is called the **dependent variable**.
- **Everything else you keep the same**. These are the **controlled variables**.

Before you test, write down your **hypothesis**: a sensible guess about what will happen, with a reason. For example: "I think cloth will keep ice frozen longest, because cloth traps air, and air is poor at carrying heat." Your results will show whether the guess was right. A hypothesis that turns out wrong is not a failure. Explaining why it was wrong is good science.

EXAMPLE

Aditya in class 8 in Bengaluru tested which material keeps ice from melting longest. He changed the wrapping (cloth, newspaper, foil, nothing). He measured how many minutes each ice cube took to melt. He kept the same size of ice cube, the same room and the same type of cup for all. That is a fair test. He also repeated each test three times, because one test can be a fluke.

REMEMBER

Test early, think about what could go wrong, and change only one thing at a time in an experiment.

CHAPTER 4

Planning your time and budget

Plan backwards from the day

Start with the date of the exhibition and work backwards. Many good projects take about four to six weeks. Here is an example plan for four weeks:

Week	Main jobs
Week 1	Choose the topic, read about it, make a prototype, list materials
Week 2	Buy or collect materials; build the main model or run the experiments
Week 3	Finish and test the model; make charts and labels; write the summary
Week 4	Practise your explanation; do a full rehearsal; pack and check everything

Keep the last few days free for problems. Something always takes longer than you expect.

TIP

Stick your plan on the wall and tick off each job when it is done. If you fall behind, you will see it early and can ask for help in time.

Make a budget

A **budget** is a plan of how much money you will spend. Write down every item, where you will get it and what it costs. Use waste and things from home wherever you can.

EXAMPLE

Kavya in class 6 in Nagpur made a rainwater harvesting model. Here is her budget. Shop prices vary from place to place, so these are only example figures.

Item	Where from	Cost
Cardboard base from an old carton	Home	! 0
Two plastic bottles	Home, cleaned	! 0
Sand and small stones	Collected	! 0
Thin plastic pipe, 1 metre	Hardware shop	! 40
Three chart papers	Stationery shop	! 30
Glue and tape	Stationery shop	! 60
Sketch pens	Already at home	! 0
Total		! 130

She kept ! 50 aside for things she might forget. In the end she needed ! 20 more for extra glue, so her final spend was ! 150.

Saving money

- Reuse cartons, bottles, caps, old toys and broken battery gadgets (with the batteries removed). Never open anything that plugs into the wall, such as an old charger, television or microwave oven: parts inside can give a dangerous shock even after it is unplugged.
- Borrow tools from school instead of buying them.

- Share materials with friends who are making different projects.
- Buy only after your prototype works, so you do not waste money on a failed idea.

DID YOU KNOW

A small, clever project made for very little money often impresses judges more than an expensive kit. It shows that you thought hard about the problem.

CHAPTER 5

Building neatly

A neat project looks cared for. It is also easier to understand and less likely to break.

Start with a strong base

Build on a firm base, such as thick cardboard, an old wooden board or a plastic tray. A wobbly base makes the whole model look weak and can break when carried. Make sure the base fits your exhibition table with room to spare for charts and your summary sheet.

Tips for a neat build

- **Measure twice, cut once.** Mark lines with a pencil and ruler before cutting.
- **Hide the mess.** Run wires along the edges or underneath the base. Tie them neatly with thread or tape.
- **Use the right glue.** White glue for paper and card, and a stronger glue for plastic. An adult should use the hot glue gun with younger students.
- **Paint before you join.** It is easier to paint parts before you glue them together.
- **Label as you go.** Put small tags on wires: "battery +", "motor".

SAFETY

An adult must do or watch any cutting with a cutter or a saw, and any soldering or hot gluing. Work on a table covered with old newspaper. Keep paints and glues away from your mouth and eyes, and wash your hands after using them.

Making it last the day

Your model may work twenty times at home, but it must work a hundred times on the day. Use fresh batteries, test every joint and carry spare parts: an extra LED, wires, tape and a spare battery.

EXAMPLE

Mohit and Sneha in class 9 in Indore built an automatic street light. At home, the wires were loose but it worked. At the exhibition, a wire came out while they were carrying the model. Luckily, Sneha had brought tape and spare wires and fixed it in two minutes. After that, they always fixed every wire firmly and packed a small repair kit.

TRY THIS

Ask a friend to carry your finished model across the room and back. Does anything wobble, fall off or come loose? Fix it before the day.

CHAPTER 6

Charts, labels and the display table

Your model is only half the project. The other half is how you show it. Visitors may only spend a minute at your table. Your charts and labels must explain the project even when you are busy talking to someone else.

What your charts should show

Most projects need two or three charts. A good set covers:

1. **Title and question:** the name of your project and the problem it solves.
2. **How it works:** a simple diagram with arrows and short labels.
3. **Results or uses:** your results table and graph, or the uses of your model in daily life.

Making charts easy to read

- Use a big, clear title that can be read from three or four steps away.

- Write short points, not long paragraphs.
- Use dark ink on a light background. Black or dark blue on white is easy to read.
- Draw diagrams large and simple, with arrows to show the flow.
- Leave space. A crowded chart is hard to read.
- Check your spelling twice, and ask someone else to check it too.

Graphs for investigatory projects

Show your results in a table first, then in a graph. A **bar graph** compares different things, such as four types of wrapping. A **line graph** shows how something changes over time, such as the height of a plant each day. Always label both axes and give the graph a title.

EXAMPLE

Here are Aditya's ice cube results, the average of three tests each:

Wrapping	Minutes to melt
Nothing	38
Foil	46
Newspaper	64
Cloth	71

He drew a bar graph with the wrapping along the bottom and the minutes up the side. His conclusion: in his test, cloth kept the ice from melting longest.

Labels on the model

Labels name the parts of your model so visitors understand it without you. Make them small, neat and the same style.

- Write each label on a small card or a strip of chart paper, in capital letters or neat print.
- Fix labels close to the part, with a thin arrow pointing to it if needed.
- Use one or two words: "Light sensor", "Battery box", "Sand layer".
- Use the same colour of card and pen for every label, so the model looks planned.

Setting up the display table

- Put the model in the centre, at the front, where visitors can see it closely.
- Stand charts behind or beside it, at eye level if you can.
- Place your summary sheet or a folder of notes at one side.
- Keep spare parts and your bag under the table, out of sight.
- Leave space for you and your partner to stand and talk.

TIP

Practise setting up your table at home, on a table of the same size. Take a photo, and use it to set up quickly on the day.

CHAPTER 7

Writing a one-page summary

A **one-page summary** is a short written report about your project. Some exhibitions ask for it, and judges often read it before or after they visit your table. Even when it is not required, writing it helps you understand your own project.

What to include

Heading	What to write
Title	The name of your project
Names and class	Your names, class and school, if the rules allow
Aim	One sentence: what you wanted to show or find out
Science behind it	Three or four sentences explaining the main idea
Materials	A short list
Method	Numbered steps of how you built it or tested it
Results	What happened, with a small table if you have one
Conclusion	What you found and what it means
Uses and next steps	How it could help people, and what you would improve

Writing tips

- Use short, clear sentences. Write as if explaining to a friend in a lower class.
- Write in your own words. Judges can tell when text is copied, and copying is dishonest.
- Say honestly who helped you and what you bought ready-made.
- Keep it to one page. If it is too long, cut words, not ideas.

EXAMPLE

Here is the aim and conclusion from Tanvi's water filter project. Aim: To find out which layer of a simple water filter removes the most mud. Conclusion: In our tests, the filter without the fine sand layer let through the muddiest water, so fine sand did the most work in our filter. The filtered water was clearer, but it was still not safe to drink.

A sample summary

Here is a short summary for Mohit and Sneha's automatic street light, written under some of the headings from the table above.

Title: The Light That Knows When It Is Dark

Aim: To build a model street light that switches on by itself at dusk and off at dawn.

Science behind it: A light-dependent resistor, or LDR, is a part whose resistance changes with light. In bright light its resistance is low, and in the dark it is high. Our circuit uses this change to switch an LED on when it gets dark.

Method:

1. We built the circuit on a small board with a 9 V battery, an LDR, a transistor, resistors and an LED.
2. We fixed it inside a model lamp post made from a pipe and cardboard.
3. We tested it by covering the LDR with our hands and by switching the room lights on and off.

Results: The LED came on every time the LDR was covered, and went off when light returned.

Uses and next steps: Lights like this can save electricity in streets, gardens and staircases. Next, we would add a way to adjust how dark it must get before the light comes on.

REMEMBER

A good summary is short, honest and in your own words. It says what you did, what you found and why it matters.

CHAPTER 8

Your 1-minute and 3-minute explanation

At an exhibition you will explain your project many times. Some visitors have only a minute. Judges may give you three minutes or more. Prepare both versions.

The 1-minute explanation

Cover four things, in this order:

1. **Hello and name:** "Good morning. I am Pooja, and this is my partner Imran."
2. **The problem:** "Street lights are sometimes left on during the day, which wastes electricity."
3. **Our idea:** "We built a street light that switches on by itself when it gets dark."
4. **How it works, in one line:** "A light sensor tells the circuit when it is dark, and the circuit switches on the LED."

Then invite them to try: "Would you like to cover the sensor and see?"

The 3-minute explanation

Start with the 1-minute version, then add:

- **The science:** explain the main idea in simple words.
- **A demonstration:** show it working, and explain what is happening as it happens.
- **Your results or testing:** what you tried, what went wrong and how you fixed it.
- **Use to society:** who could use this and how it could help them.
- **Next steps:** what you would add or improve with more time.

Practising

- Practise in front of family, friends and teachers. Ask them to time you.
- Speak slowly and clearly. Nervous people speak fast.
- Look at the listener, not at the floor or your chart.
- Use your hands to point at parts of the model as you explain.
- Learn the ideas, not a word-by-word script. A memorised script breaks down when someone interrupts with a question.

DID YOU KNOW

When people talk clearly, they often speak about 120 to 150 words a minute. So a 1-minute explanation is only about eight to twelve short sentences. Keep it simple.

TRY THIS

Record yourself on a phone giving the 1-minute explanation. Watch it back. Did you speak too fast? Did you say "umm" a lot? Try again and compare.

CHAPTER 9

Answering the judges

Judges are not there to trick you. They want to find out whether you understand your project and whether the work is your own. Most of them enjoy talking to young scientists.

Questions judges often ask

Question	What they want to know
How did you get this idea?	Is the idea your own?
How does it work?	Do you understand the science?
What was the hardest part?	Did you really build it?
What would you change?	Can you think beyond what you made?
How can it help people?	Do you see its use in real life?

Question	What they want to know
Who helped you?	Are you honest about help?
What happens if...?	Can you think on your feet?

How to answer well

- 1. Listen to the whole question.** Do not start answering halfway through.
- 2. Take a breath.** It is fine to pause for two seconds and think.
- 3. Answer simply.** Short, clear answers are better than long, confused ones.
- 4. Show, if you can.** Point to the part of the model you are talking about.
- 5. Be honest.** If your parent or teacher helped, say how.

When you do not know the answer

Nobody knows everything, and judges know that. Never make up an answer. Instead, say something like:

"I am not sure. I think it might be because of... but I would like to find out."

This shows honesty and good scientific thinking. Making up a wrong answer is much worse than saying you do not know.

EXAMPLE

A judge asked Harleen, a class 10 student in Jalandhar, why her solar water heater model was painted black. She said, "Black surfaces absorb more sunlight and turn it into heat." Then the judge asked why the box had a glass top. Harleen did not know. She said, "I am not sure, but I think it might stop the heat from escaping. I will find out." Later, she read that the glass lets sunlight in but traps much of the heat, and she told the judge on her next visit.

TIP

Make a list of 15 questions you might be asked. Ask family members to quiz you with them until you can answer each one calmly.

Teamwork and the on-the-day checklist

Working well as a team

Many exhibitions allow teams of two or three students. A good team shares the work and supports each other.

- **Share the jobs fairly.** For example, one builds, one makes charts, one writes the summary, and everyone helps test.
- **Everyone must understand everything.** Judges may ask any team member any question.
- **Decide who explains which part,** but practise so that each person can explain the whole project.
- **Meet regularly** and check the plan together.
- **Settle disagreements kindly.** Listen to each idea, try both if possible and choose what works best.
- **Keep a team logbook.** Write the date, what you did, what went wrong and what you decided. Judges often like to see it, and it helps you remember the hardest part when they ask.

EXAMPLE

Priya, Arjun and Zoya, class 8 students in Lucknow, made a hydraulic arm. Priya was the best builder, Arjun drew well and Zoya was a confident speaker. But they practised until each of them could explain the whole arm. On the day, Zoya lost her voice, and Arjun gave the explanation to the judges without any trouble.

The on-the-day checklist

Pack the night before, and tick each item.

Item	Ticked
Model, packed safely in a box with padding	
Charts, rolled or flat in a folder	
One-page summary, with extra copies	

Item	Ticked
Spare batteries	
Repair kit: tape, glue, spare wires, LED, scissors	
Table cloth or plain sheet for the display table	
Pins, clips or tape to fix charts	
Water bottle and snacks	
Registration papers, school ID card or letter	
Notebook with your results and rough work	

On the day

- Arrive early, so you have time to set up calmly.
- Test the model as soon as it is on the table.
- Stand, smile and greet visitors. Do not sit behind the table with your phone.
- Take turns to rest, drink water and look at other projects.
- Be polite to everyone. You never know who is a judge.

SAFETY

Keep your table tidy so nobody trips over wires or bags. Switch off your model when you are not showing it, to save the batteries and keep it from getting warm.

CHAPTER 11

What judges usually look for

Every exhibition has its own way of judging, and the rules or score sheet tell you what counts. But many exhibitions use similar ideas. Here are the criteria that are commonly used. Treat them as a guide, not as fixed rules.

Common criterion	What it means	How to show it
Originality	The idea, or your twist on it, is your own	Explain how you got the idea and what is new
Understanding	You know the science behind your project	Explain it simply and answer questions well
Presentation	Your table, charts and explanation are clear	Neat charts, a tidy table and confident speaking
Working	The model works, or the experiment was done carefully	Show it working; show your results table
Use to society	The project could help people or the environment	Explain who could use it and how

Some exhibitions also look at things like low cost, use of waste materials, teamwork or how much of the work you did yourself.

Originality

Originality does not mean that nobody has ever thought of your idea. It means that you thought about it yourself and added something of your own. If you used a ready-made kit, say so honestly, and explain the change or test that you added.

Understanding

This is often the most important. A simple project that you understand fully is better than a complicated one you cannot explain. Judges can tell the difference within a few questions.

Presentation

Neat charts, a tidy table and a clear, confident explanation help judges understand your work quickly. Presentation does not mean expensive decoration.

Working

A working model should work reliably. If it fails on the day, stay calm, explain what should happen and why it may have failed. Judges respect a student who can explain a failure.

Use to society

Think about who could use your idea. A soil moisture alarm could help a farmer save water. A cheap water filter idea could help people understand how dirty water is cleaned. Show that you have thought about real people and real problems.

REMEMBER

Winning a prize is nice, but it is not the main goal. Every student who plans, builds, explains and answers questions honestly has done real science, and that learning stays with you.

DID YOU KNOW

Some scientists and engineers say that a school science exhibition was where their interest in science began. Your project today could be the start of something big.

CHECK YOURSELF

Practice questions

1. What is a science exhibition?
2. Name the four kinds of entries described in this book.
3. What is the difference between a working model and a still model?
4. What does an investigatory project start with?
5. Give the four questions to ask yourself when choosing a topic.
6. Why should you never drink water from a model water filter?
7. How can you make a popular topic, such as a water filter, your own?
8. What is a prototype, and why should you make one?

9. What is the highest battery voltage you should use in a student project, and what should you never use?
10. In a fair test, what is the independent variable, and what is the dependent variable?
11. Why should you repeat each test more than once?
12. Why should you plan backwards from the exhibition date?
13. Kavya's budget was ! 130, and she spent ! 20 more. What was her final spend?
14. Give two ways to save money on a project.
15. Why should you carry a repair kit to the exhibition?
16. What three things should a good set of charts cover?
17. When should you use a bar graph, and when a line graph?
18. Name four headings in a one-page summary.
19. What four things should a 1-minute explanation cover?
20. Why is it better to learn ideas than a word-by-word script?
21. What should you say if a judge asks a question you cannot answer?
22. Why must every team member understand the whole project?
23. Give four items from the on-the-day checklist.
24. Name the five common judging criteria in this book.
25. If you used a ready-made kit, what should you tell the judges?

ANSWER KEY

Answers

1. An event where students show science projects they have made, to visitors and judges.
2. Working model, still model, investigatory project and best out of waste.

3. A working model moves, lights up or does a job when switched on. A still model shows how something looks or is arranged but does not move.
4. A question.
5. Does it interest me? Do I understand the science? Can I build or test it with the time, money and help I have? Is it safe?
6. A simple model filter removes some dirt, but it does not make water safe to drink.
7. Add something new: a new use, a local problem, or a test that compares different versions.
8. A rough first version made from cheap materials to test whether the idea works, before spending time and money.
9. 12 V. Never use mains electricity from a wall socket.
10. The independent variable is the one thing you change. The dependent variable is the thing you measure.
11. One test can give an odd result by chance. Repeating makes the results more reliable.
12. So that every job fits in before the day, with time left over for problems.
13. ! 150.
14. Any two: reuse waste, borrow tools, share materials, buy only after the prototype works.
15. Parts can break or come loose while travelling or during the day, and a repair kit lets you fix them quickly.
16. The title and question, how it works, and the results or uses.
17. A bar graph compares different things. A line graph shows how something changes over time.
18. Any four: title, names and class, aim, science behind it, materials, method, results, conclusion, uses and next steps.
19. Hello and your name, the problem, your idea and how it works in one line.
20. A memorised script breaks down when someone interrupts with a question. Knowing the ideas lets you explain in any order.
21. Say honestly that you are not sure, share your best thinking, and say you would like to find out.
22. Judges may ask any team member any question, and a team member may be absent or unwell on the day.
23. Any four: the model, charts, summary copies, spare batteries, repair kit, table cloth, pins or tape, water and snacks, registration papers, notebook.
24. Originality, understanding, presentation, working and use to society.
25. Say honestly that you used a kit, and explain the change or test you added yourself.

Glossary

Bar graph

a graph that uses bars to compare different things.

Best out of waste

an entry made mostly from things that would have been thrown away.

Budget

a plan of how much money you will spend, and on what.

Conclusion

what you found out from your project, and what it means.

Controlled variables

the things you keep the same in a fair test.

Criteria

the points that judges use to decide how good a project is.

Dependent variable

the thing you measure in an experiment.

Fair test

an experiment where only one thing is changed at a time.

Hypothesis

a sensible guess about what will happen, which you then test.

Independent variable

the one thing you change on purpose in an experiment.

Investigatory project

a project that answers a question with careful tests and results.

Judge

a teacher or expert who looks at projects and decides which are best.

Line graph

a graph that shows how something changes over time.

One-page summary

a short written report about your project.

Originality

the quality of being your own idea, or your own new twist on an idea.

Prototype

a rough first version made to test an idea.

Still model

a model that shows how something looks or is arranged, without moving.

Working model

a model that moves, lights up or does a job when switched on.



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CONTACT

Head office: A-10, Chief Commissioner Colony, opposite Rana Pratap Bagh, Delhi 110007

Phone: 011 2721 1512 · **Mobile and WhatsApp:** +91 97116 99511

Email: engineergurukul@yahoo.co.in

Website: engineergurukul.com · **Instagram:** [@science_projects_club](https://www.instagram.com/science_projects_club)

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