

## Learner information

What is a scientific project? Expo is a display of scientific projects. A scientific project is an investigation in which you try to solve a problem or answer a question that you have identified. When you do an investigation, you follow a method that allows you to test an idea or solve a problem and come to a clear conclusion.

Projects for Expo should be more than just essays, models or collections of plants and animals.

TYPES OF PROJECTS	EXAMPLES
<b>1. EXPERIMENTAL INVESTIGATION</b> Definition: An investigation undertaken to test a scientific hypothesis using experiments. Experimental variables, if identified, are controlled to some extent.	<ul style="list-style-type: none"> <li>• To investigate the influence of different fertilizers on the growth of wheat.</li> </ul>
<b>2. INNOVATION / INVENTION</b> Definition: The development and evaluation of innovative devices, models, techniques or approaches in technology, engineering, computers (hard/ software). Focus on innovative ideas and inventions, rather than applied technology in a systematic manner.	<ul style="list-style-type: none"> <li>• To design and build an electronic lock and key</li> </ul>
<b>3. RESEARCH/ STUDY</b> Definition: Collection and analysis of existing data to reveal evidence of a fact or a situation of scientific interest. It could include a study of cause and effect relationships or theoretical investigations of scientific data.	<ul style="list-style-type: none"> <li>• To research the effectiveness of different anti-retroviral drugs.</li> </ul>
<b>4. APPLIED TECHNOLOGY/KNOWLEDGE</b> Definition: Application of technology or knowledge towards meeting a user need. Must indicate user need, technologies used and the final solution. Consider the human interface. Brilliant innovation is less important; rather provide a systematic method for user need identification as well as technology or knowledge application to meet the need.	<ul style="list-style-type: none"> <li>• To design a data base to manage the results of an athletics meeting.</li> </ul>

### 10 STEPS TO A GOOD SCIENTIFIC PROJECT

#### **STEP 1: Choosing a topic**

The topic for your project should be something that you are interested in and that you want to learn more about. You may think of a good topic straight away just by looking at the list of Expo categories on Page 6 or you may need to look for ideas for your topic. You can get ideas for projects from:

- Newspaper and magazine articles
- The internet
- Television programmes
- Previous Expo projects, which you can expand
- Practical problems

Your idea for a project should be an original one. This means that it should be your own idea and not somebody else's idea. Do not repeat an experiment from the school syllabus or choose a problem for which people already know the answer. For example, "Determining the specific heat capacity on iron" is not an original topic for your Expo project. The method to follow is well known from school textbooks and you can easily look up the answer.

The best Expo projects are not always complicated, but they are imaginative and well carried out. A good project is often:

- A clever solution to a problem
- A new idea for a piece of apparatus or
- A study or survey that no-one has done before.

Be original, but DO NOT choose a project that:

- Could be dangerous to yourself or others
- Needs experiments on live animals or
- Involves collecting plants or animals that are protected by Nature Conservation laws.

Ask your teacher for advice if you are not sure whether your topic will make a suitable Expo project.

### **STEP 2: Project description**

Describe your topic in short sentences or as a question and then state a hypothesis (what you think the answer is going to be).

### **STEP 3A: Collect background information**

- Use books, internet, etc.

### **STEP 3B: Generate data**

- Do experiments
- Interview people interested in your topic
- Do surveys or send out questionnaires
- Keep dated notes in a journal (e.g. file, diary or scrap book).

### **STEP 4: Evaluate your progress**

Check if you have sufficient information, if not go back to step 3B.

### **STEP 5 : Model or apparatus (if applicable)**

Make a model or apparatus to illustrate the solving of your problem. Use what is at hand e.g. use materials from home.

### **STEP 6 : Analyse results**

Use comparisons, graphs and tables and then interpret your results.

### **STEP 7 : Conclusion**

Write down your conclusion. Did the conclusion prove or disprove the hypothesis? It must answer the research question.

### **STEP 8: Evaluate the whole project**

- Review
- Revise
- Redo (IF NECESSARY)

### **STEP 9: Write a report**

- Clearly state your hypothesis
- Introduction including information collected and description of project
- Method (numbered, logical, concise, third person)
- Results (tables and graphs)
- Analysis of your results
- Conclusion
- Errors and modifications

- Bibliography / References (with a list of books, magazine articles or internet sites where you got important information) (See different guideline for this)
- Acknowledgements (this is a list of the people who helped you and the help each one gave. For example, someone might have lent you a piece of equipment, taken photographs for your poster or given you some important advice)

**STEP 10: Showing your work**

- Your presentation must be neat and interesting
- Clear large headings
- Show important aspects of your work (see page 12 and 13)

Each exhibit at Expo is given a space of maximum 1.5m table length. There is also a space behind the table to pin up a poster. The Expo in your region may allow you a little more or a little less display space. Your teacher will check with the organisers first. Display space is often limited. If you use extra space, then others will have too little.

If you make your poster with three sides you will be able to get a lot onto your table		
Left side of your poster: 1. Problem 2. Hypothesis 3. Background information	Middle of your poster: 4. Method 5. Results 6. Graphs	Right side of your poster: 7. Interpretation 8. Conclusions 9. Acknowledgements / Bibliography / References

Your poster is the most important part of your exhibit. Your poster should be easy to read and understand. It should explain what you did, how you did it and what you found out. Make your poster eye-catching and interesting. You want visitors at Expo to stop and read about what you did.

Summarised information must be laid out in a logical order. Anyone who wants more information can read your report. (Your report is **very important**).

<p><b>INTERVIEW:</b> Please take note of the following points:</p> <ul style="list-style-type: none"> <li>• Introduce yourself by name and do not chew gum</li> <li>• Know your topic</li> <li>• Be enthusiastic</li> <li>• Speak clearly with confidence</li> <li>• Use appropriate language</li> <li>• Listen to the judge's questions</li> <li>• Don't read off notes or recite a prepared speech, answer the questions</li> <li>• Make sure your answers are to the point</li> <li>• Be aware of time constraints</li> </ul>
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