SciFi 2018

INTRODUCTION & ACKNOWLEDGEMENTS

WHAT IS SCIFI

Science Fair International (SciFI) was created in 2010 by Ravi Narayanan as an additional event for his live-in-japan.com not-for-profit organization. In 2011 Christopher Holland became the sole organizer of this event. In an attempt to promote the concept of week-end science, we bring to you this event, where children are free to exhibit any models [working or non-working] or any investigation or theoretical experiments or displays.

At the event, you will find science projects displayed by grade groups, and guest judges from the field of science will be available for children to receive feedback on their projects both the inquiry and presentation aspects. There will also be short presentations by the judges who happen to be scientists themselves and they will share with guests and children the work that they do.
We are happy to receive annual support for this event, by schools, and organizations. A special thanks go to RIKEN, JAXA and NASA for their continued support of this event and future generations of children passionate about science.

This event is open to all school going children in Japan who are able to present their research in English.

PARTICIPATION

We would like to thank the following for participating in SciFI 2018

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PARTICIPATION

WHO CAN PARTICIPATE

SciFI 2018 is for English speaking students.

Grades 1, 2: peer reviews of other projects only
Grades 3, 4: Small group entries of three to four students
Grades 5-8: Individual entries

Schools who participate, it is expected that each school supervises and manages their own students.
Individuals who participate should be accompanied by an adult.

FOR GROUPS

Students who are in third or fourth grade have the option of working in groups of no more than three or four students. Teachers may allow multiple groups in a grade to research the same topic. For example, a third-grade class is investigating which amount of water is the best for plant growth. After the class is broken into groups, each group has their own plant, which they water daily at their given level. At the end of the trial period, the students analyze each other's results as a class.

Please indicate when registering the names of all students in the groups, and their project title.

FOR INDIVIDUALS

For students in grades five to eight, all entries must be made individually. Schools, coordinators, and parents are free to decide how much if any of the experiment and display-making should take place during school hours. Parents of individual entry students are advised to help their children, but be mindful of letting your children experience the excitement and satisfaction of doing their own science experiment. Under special circumstances, SciFI 2018 can allow group entries in this category, especially for students with disabilities. For these considerations please feel free to contact us.

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ENTRY REQUIREMENTS

DISPLAY REQUIREMENTS

All entries must have both a display board and a written report. Both should be brought to the fair on the day of the fair. You will have an available space of 90cm (width) x 75cm (height) to work with, ideally using a trifold display board. A trifold example can be found in the appendix section. Group entries are required to have only one display.

TYPES OF ENTRIES

While traditional experiments with variables and a hypothesis are a core focus of any science fair, SciFi acknowledges the role Engineering and Design play in our everyday lives. For this reason, we allow two different types of entries in SciFI: Experimental and Design. While both types of entries still require a display board and report, the contents of each will look different.

EXPERIMENT ENTRY

The experimental entry type is the more traditional entry and closely follows the scientific method. An overview of a good experimental would have all of the following

1- Question
2- Hypothesis
3- Carrying out an experiment
4- Analyzing results
5- Drawing a conclusion

DESIGN ENTRY

The design process is more similar to how an engineer solves a problem, an overview of a good design project should include.

1- A real-world problem
2- Creating design standards
3- Building a prototype
4- Stages of testing and re-design
5- Analysis of the results

Rubrics, display examples, and student-friendly guides can be found in the appendix section.

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SAFETY

SAFETY IN SCIENCE

The primary concern of SciFI is the application of best safety practices. When making their entry, students should always be supervised by an adult.

PROHIBITED ITEMS

Entries involving the below items are strictly prohibited

- Vertebrate animals (living or dead)
- Firearms
- Explosives
- Human tissue samples (including blood)
- Open flame
- Live wires connected to facility outlets
- Extremely reactive or corrosive materials

BACTERIAL CULTURES

Microbiology projects can be exciting and educational entries. SciFI will allow for cultures in entries under the condition that they are not grown from vertebrate (including human) tissues. Growth plates must be sealed with tape and properly disposed of. Tokyo YMCA does not have facilities to sterilize materials.

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JUDGING AND EVALUATION

GROUPING

1-Middle Elementary: Grades 3 and 4 - Will not be judged
2-Upper Elementary: Grades 5 and 6 - Projects are judged, will have their own 1st, 2nd, and 3rd place awards
3-Middle School: Grades 7 and 8 - Projects are judged, will have their own 1st, 2nd, and 3rd place awards

Each group will have the same working set of rubrics.

JUDGES

Each of our guest speakers will act as an official judge for SciFi 2018. Each participating school will also be asked to provide one judge to meet the needs of growing event participation.

EVALUATION RUBRICS

The rubrics that the judges will use will be provided in the appendix section to this document. There are different rubrics from design and experiment projects, however the same rubric is used at all grade levels.

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RESOURCES AND LOCATION

PROJECT IDEAS

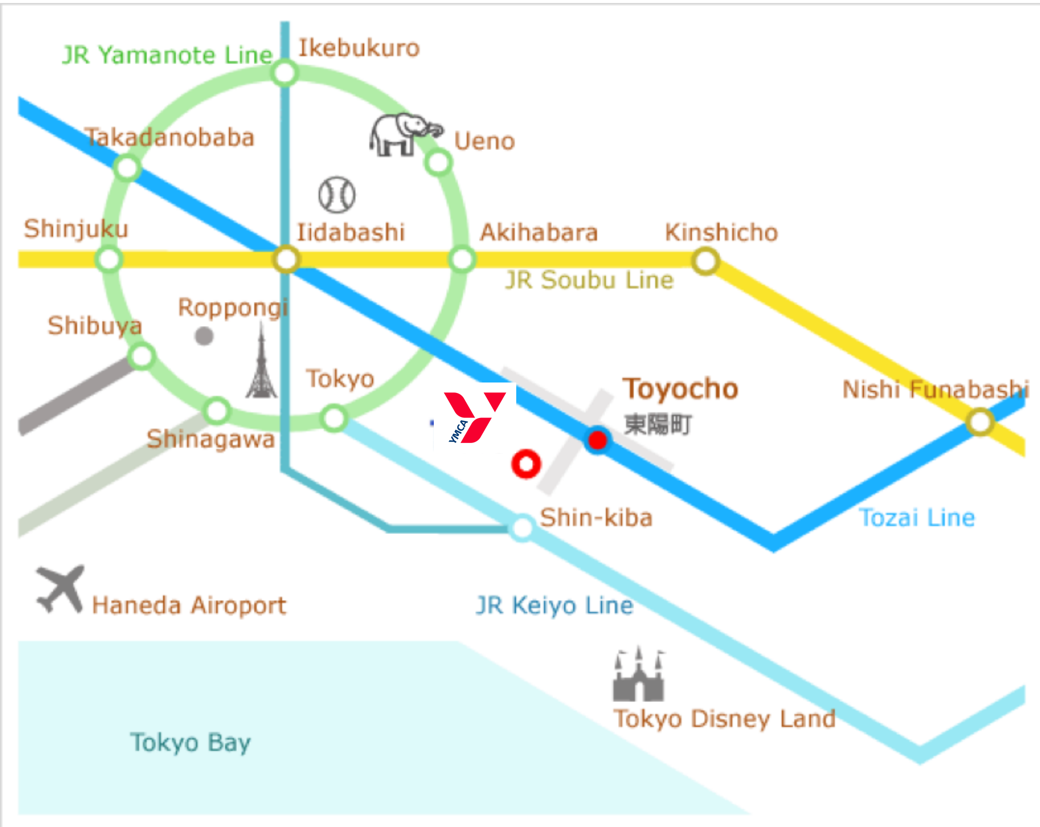
Finding a project that is cost-effective, age-appropriate, and scientifically rigorous can be a challenge. These resources may help you find a project that is right for you.

Scholastic: http://tinyurl.com/zpwk8am
Environmental Protection Agency (USA): http://tinyurl.com/j64a4ry
Education.com: http://tinyurl.com/7lx9lpp
The NEED project: http://tinyurl.com/jxwogtf

TOKYO YMCA

Tokyo YMCA is located at: 2-2-20 Toyo, Koto-ku, Tokyo, 135-0016

Take the Tozai Line to Toyocho Station. Take the West Exit (Exit #2) to street level. Out of the exit turn left and walk around the corner (south) approximately 500m to the white YMCA building on the right (west) side of the street. The science fair will be held on the first floor.



SciFI 2018 Design Rubric			
Name		**Grade**	

Criteria	Value
Clearly stated problem or need	
Students can point to a specific problem, describe it in detail, and explain why the problem is important.	**/4**
Science Report	
Student has a report with at least problem, materials, blueprint, and criteria.	**/3**
Three or more sources cited	
Three sources is three points, 2 sources is two points, etc.	**/3**
Clearly labeled blueprint and materials	
Student knows the materials they used, blueprint is easy to read.	**/3**
Clearly stated design criteria	
Student understands what design criteria are, can state them.	**/3**
Working prototype that meets the criteria	
Student has a working prototype present.	**/3**
Effective analysis of test results, attempts to correct design flaws present	
Good analysis of results, students tried to improve their design.	**/4**
Demonstration of in-depth knowledge and related vocabulary	
Use of academic vocabulary demonstrated in explanation or on the display board.	**/3**
Well elaborated results-based conclusion	
Students conclusion is clear, matches their analyses, proposes further research idea or correction to the methods of current project.	**/4**

Total		**Project Number**	

SciFI 2018 Experiment Rubric			
Name		**Grade**	

Criteria	Value
Clearly stated title, purpose, and reasonable hypothesis	
Title, purpose, and hypothesis are logical and visible.	**/4**
Science Report	
Student has a report with at least hypothesis, materials, results, and conclusion.	**/3**
Three or more sources cited	
Three sources is three points, 2 sources is two points, etc,	**/3**
Thoroughly stated procedures and materials, and results	
Procedures, results, and materials are logical and visible.	**/3**
Clearly stated independent and dependent variables	
Student, either has on display, or can explain themselves, their variables.	**/3**
Measurable data that includes 3 or more trials/test subjects	
Student has evidence of doing an actual science test.	**/3**
Effective analysis of data, clearly stated results.	
Students analysis matches their results, results are clear and easy to understand.	**/4**
Demonstration of in-depth knowledge and related vocabulary	
Use of academic vocabulary demonstrated in explanation or on the display board.	**/3**
Well elaborated results-based conclusion	
Conclusion is clear, matches their analysis, proposes further research idea or correction to the methods of current project.	**/4**

Total		**Project Number**	

Experiment and Design guide

Here is a step-by-step guide for each type of entry. Please read them before you start, and make sure you follow each step closely while you do your experiment to make sure you staying on track! If you are doing an experiment, follow the left side; if you are doing a design follow the right side.

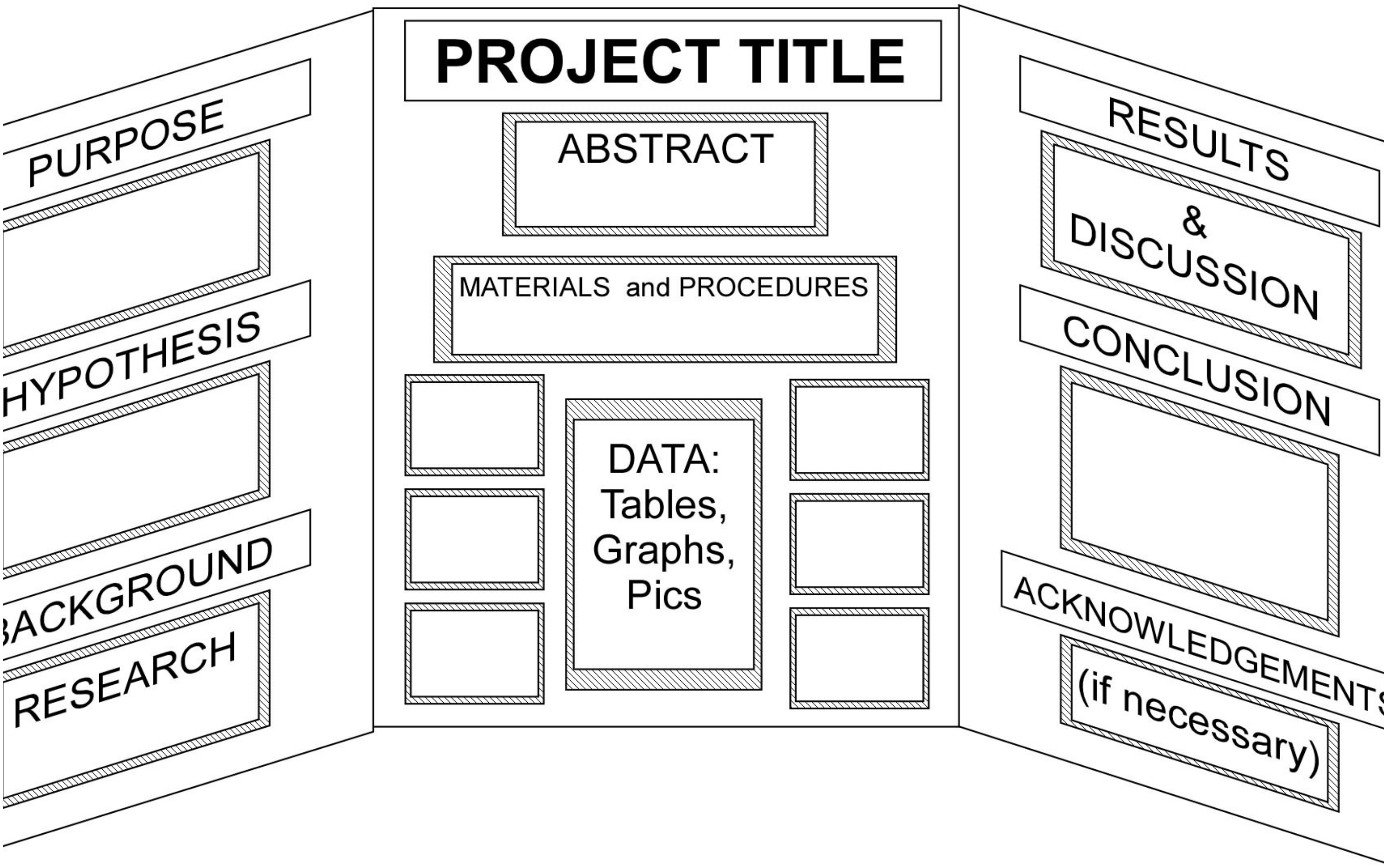
Experimental Process	Design Process
1. Make a question you can test. The best questions start "How does…." For example, **"How does the color of light effect the growth of plants."**	**1. What does the world need?** Start with what people need or a problem. For example, **"Eggs are fragile and need to be packaged well"**
2. Doing The Research Read, read, and read! Magazines, the web, and books! Get background information. If my project was **"How does temperature effects balloon size?"**, I may research air pressure and temperature.	**2. Doing The Research** Read, read, and read! Magazines, the web, and books! Get background information. If my project was "**designing a cardboard rocket**," I would research things like gravity, velocity, and thrust.
3.Write A Hypothesis Use your background research to make a guess at answering the question you wrote. If you get stuck, try using "If and Then" to help you. For example, **"If I use only red light on my plants, then they won't grow as well as plants with normal light."**	**3. Make Your Design Criteria** Criteria are the rules for your design. They will be the features your design must have such as size, weight, cost, performance, or power. For example, "**My rocket costs less than 2,000 yen."**, or "**My rocket will travel at least 10m into the sky."**

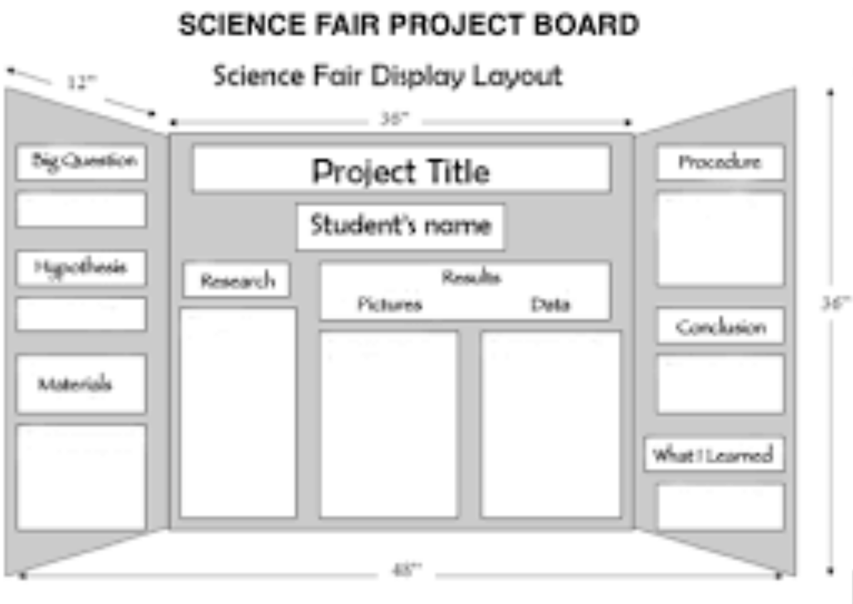
4. Get Ready to Experiment Three things you need to have done before you can get started. A- **Gather up material** Anything you need to do your experiment. B- **Write your procedure** This is a list of steps that you do in the experiment. C- **Identify your variables** Test one variable at a time. If you test plants they should have the same conditions, these are dependent variables: same dirt, same plant, same location, etc. The only variable you change would be the amount of water. This is the independent variable. **Remember, you should only have one independent variable.**	**4. Make a Blueprint** **Before you start building your project, you need to;** **A- Sketch out a blue-print** **A blueprint is a detailed sketch of your design. Anything you plan on putting into your final design should be in the blueprint.** **B- Label everything clearly** **Anyone looking at your blueprint should be able to remake your project!**
5. Conduct your Experiment This is where you finally jump in and do your experiment! Here are some tips; • Do as many tests as possible • Don't throw out tests! Even if they don't match your hypothesis • Do every test the same way • Take lots of photos! You will use them for your display board	**5. Build Your Prototype** A prototype is an early model of your design that will be a test of your ideas. Your prototype should do three things: 1- Follow all your criteria 2- Follow your blueprint closely 3- It should solves your problem that you stated when you started!

6. Collect the Data Write down the results of every test. Some people keep a science journal of everything they did! If you are growing plants, your data might be the size of the plant or the number of leaves. Use graphs and pictures to report your data. Make graphs as clear and organized as possible! Most scientists use tables, graphs and other organizers to show their results.	**6. Test and Redesign** **Test out your prototype! Does it work the way you wanted to? If it works 100% perfectly, then you are done! If it is not quite ready yet, make any changes you need to and retest. Make sure you tell people in your report what changes you made; this will show people you learned something.**
7. Report the Results Remember your hypothesis? Tell us if your hypothesis is right or not! Does your data agree with the hypothesis or does it disagree? Why or why not? Every section here should be part of your display board, and should be part of your report. Graphs, charts, and lots of details are the best. Also, please don't forget to take lots and lots of photos! They will go well on your display.	**7. Report the Results** Remember the problem you started with? Tell us if you solved the problem! Is your design good enough to be used by everyone? Why or why not? Every section here should be part of your display board, and should be part of your report. Graphs, charts, and lots of details are the best. Also, please don't forget to take lots and lots of photos! They will go well on your display.

Display Examples

Here are some examples of what your display should look like when it is completed. Just a warning, these examples may not have every heading you need for your display, so please follow the guidelines above.





Writing your report

Along with your display board, you will need to bring your science report on the day of the science fair. It should be a written report with lots of details about your science fair project. Below this is an outline for your report. You should write a few sentences about each. It should be typed out and printed, and it should have almost no spelling mistakes.

Experiment Project	Design Project
1.Your Question Here you should clearly write your question, and say why you chose this question. Was it interesting?	1. Your Problem or Need Here you should clearly write your question, and say why you chose this question. Was it interesting?
2.Your Research After you read some books or looked on the Internet, what kind of new stuff did you learn? Remember, you need three different sources of information.	2. Your Research After you read some books or looked on the Internet, what kind of new stuff did you learn? Remember, you need three different sources of information.
3.What type of Hypothesis Here you should write about what kind of answer you think you might have to your question. Your hypothesis should be a statement, not a question. For example, “Plants who get water will grow taller than plants who get soda.”	3. Your Design Criteria What are your design Criteria? Write the list of rules that you followed to make your design project.
4.Your variables Here you should mention what things are your variables. Make a list of which things are your dependent variable, and which things are your independent variables.	4.Your Blueprint This part is easy, just include the Blue-print you made for your display here. The best way to do it is to make sure it is labeled accurately.
5.How did you do the experiment? Here you should list the different steps of your experiment. The more details the better! For example, if you used plants, you can say what time you watered them every day, and how much water you gave them.	5.Testing your prototype Here you should write about how you tested your prototype. Use as many details as possible
6. What were the results of your experiment? Did the results of your experiment help or hurt your hypothesis. If your plants actually got taller when you gave them soda, then the results *hurt* your hypothesis. If the plants that got water were taller, then water *helped* your hypothesis.	6. Redesign, and retest. After your test, write about the results. Did it succeed or fail? What did you change to try and get it working again?