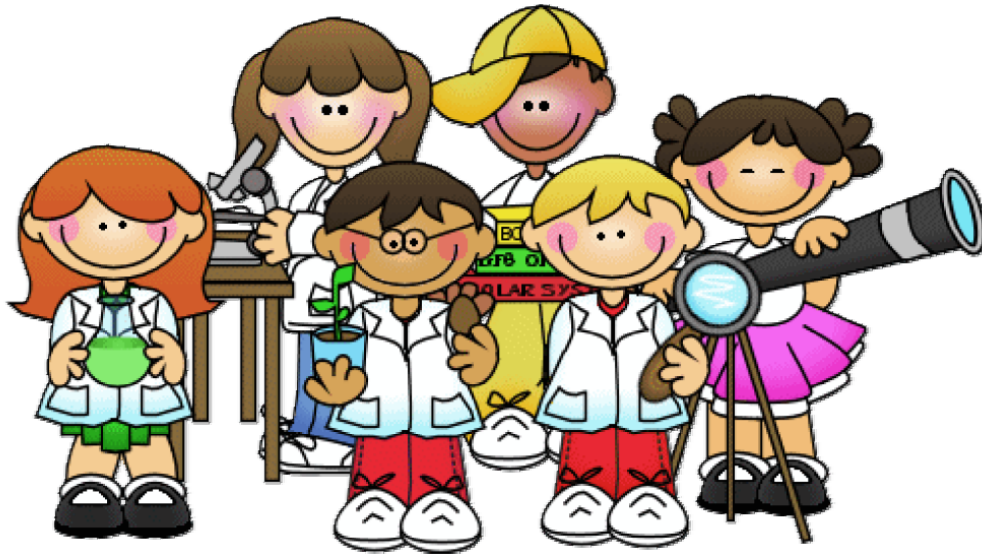


Coronado Science Fair



Student Guidebook

Science Fair: Wednesday, April 17th

**Students setup projects before school starts
Judging to be completed during the school day
Family Science Night 6:00-7:30pm**

**Guidebook adapted from Morley Elementary—Lincoln, NE



Make sure that you:

1. **Read** through this entire booklet. If you have questions, talk with the science fair coordinator listed below, or your teacher:
Heather McKay, hangel123@gmail.com, 303-549-3057
2. **Plan** out your entire project before you begin.
3. **Research** your topic. Find as many facts about your topic as possible.
4. **Make a display board** to share your discoveries. Include **photos** of you doing your project. Follow the guidelines within this booklet for the placement of items on your display board. Make certain your display is **neat** and **eye-catching**.
5. **Prepare** to share everything that you have learned and done in your project.
6. **Bring an extension cord** if you need electricity for your project.
7. **Ask Questions!** If you are not certain about what should be included in your display or how to do something....ASK!
8. **Have FUN!**

Science Fair Rules:

1. You may choose to do an Experiment or a Demonstration:

Scientific Experiment (using the Scientific Method)

You may choose to ask a science-based question and use the scientific method to conduct an experiment to determine the answer. You will develop a hypothesis and then design and complete an experiment to try to prove or disprove it by evaluating the results.

Demonstration (using the Engineering Design Process)

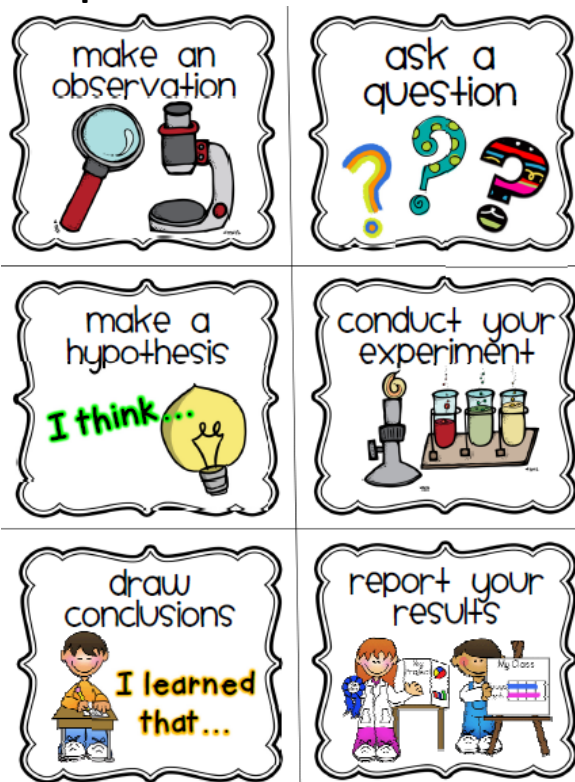
You may choose to demonstrate a scientific principle or how something works. You will design and create a demonstration or an invention.

2. Your project idea must be written in the form of a question.
3. Your project may not endanger humans or animals.
4. You may work individually or with a partner.
5. Your project must have a visual display—including a display board, models or other items used to complete your project.
6. You need to do research on your topic.
7. Commercial kits are not allowed.
8. DANGEROUS OR COMBUSTIBLE CHEMICALS may not be displayed at the fair. Rockets or engines MUST NOT contain fuel.
9. Open flames are not permitted.
10. Projects using electricity must conform to standard wiring practices and safety
11. Laser pointers are not allowed.

How Do I Complete an Experiment?

1. **Choose a topic** of interest.
2. Think of a **question** you would like answer on this topic.
3. Complete a registration form.
4. **Research** your topic.
5. Record your sources of information.
6. Write your **hypothesis**. What do you think will happen?
7. Plan your **procedure**.
8. Gather your materials.
9. Conduct your **experiment** as planned.
10. Record your **results**.
11. Review your results.
12. State your **conclusion**.
13. Prepare your display and bring it to the science fair.

Steps of the Scientific Method:



Possible Questions for an Experiment:

Physical Sciences:

- a) Which type of water evaporates faster: salt, tap, or bottled water?
- b) How does the temperature of a tennis ball affect its bounce height?
- c) Which type of material will dry faster: cotton or polyester?
- d) What kind (shape) of sail will make a boat go the fastest?
- e) What type of paper airplane will fly the farthest?
- f) How does water temperature affect the time it takes to freeze?
- g) How does the size of a drum affect its pitch?
- h) Which is a better insulator: Wool, cotton, or feathers?
- i) Do different brands of batteries last longer than others?

Earth Sciences:

- a) Which will develop faster: salt crystals or sugar crystals?
- b) What type of metals are attracted to a magnet?
- d) Which rocks are attracted to a magnet?
- e) Which materials will conduct electricity?

Life Sciences:

- a) How much salt will a plant be able to tolerate and still grow?
- b) Which kind of seed will sprout more quickly?
- c) Under what color light do plants grow best?
- d) How does the amount of yeast affect how high bread rises?
- e) Which packaging method best reduces the growth of mold or fungus on food?
- f) Where are the most germs in your school?
- g) What is the best way to keep cut flowers fresh the longest?

How Do I Complete a Demonstration?

1. Choose a **topic** of interest.
2. Think of a **question** that you would like to answer on this topic.
4. **Research** your topic.
5. Record your sources of information.
6. Plan how you will **share** your information.
7. Prepare charts, tables, graphs, models, or other visual aids to help share your information.
8. Prepare a display board and bring it to the science fair along with your other visual aids.



Possible Questions for a Demonstration:

Physical Sciences:

- a) How does a siphon work?
- b) How does air pressure work?
- c) How does sound travel?
- d) How does light travel?
- e) How does a camera work?
- f) Why do things fall?
- g) What is magnetism?
- h) How does a compass work?

Life Sciences:

- a) Why do living things need air, food, and water?
- b) How do plant cells differ from animal cells?
- c) Why are roots, stems, and leaves important to plants?
- d) How do light, air, water, and temperature affect germination?
- e) What are food chains?
- f) What are the special adaptations of plants and animals?
- g) How does the human ear work?
- f) How does the human eye work?
- h) How does the tongue detect tastes?
- i) What foods contain high amounts of acid?

Earth Sciences:

- a) What are the layers of the earth?
- b) How are rocks formed?
- c) How are crystals formed?
- d) What causes a volcano to erupt?
- e) What factors affect weathering?
- f) What are fossils and how are they formed?
- g) What is the water cycle?
- h) What are the different kinds of clouds?



Sample Display Board Layouts:

Experiment Display Board

Procedure	Title Student Name Question	Results
Sources of Information	Hypothesis (photos of your project)	Conclusion

Demonstration Display Board

Information photos, charts & diagrams	Title Student Name Question Sources of Information	Information photos, charts & diagrams

****This form is not required, but may be helpful in planning your science project:**

Project Idea: _____

Questions to help with planning a Science Experience:

Question (what will be answered?): _____

Hypothesis (what do you think will happen?): _____

Procedure (what will you measure? Include a short description of the steps.): _____

OR Questions to help with planning a Demonstration:

Question (what will be answered?): _____

Plan and Create (how will you go about answering the question?): _____

Coronado Science Fair Grading Rubric - Scientific Experiment				
Student's Name:			Grade:	
	4 - Awesome	3 - Good	2 - Limited	1 - Needs help
Problem and Hypothesis	Problem well understood, well researched, and a hypothesis presented.	Problem somewhat understood, some research, hypothesis presented.	Problem unclear, no research, no hypothesis.	No problem evident.
Procedure	Procedure is completely appropriate to solving problem. Steps and Materials listed.	Procedure appropriate and steps mostly listed. May be lacking material list.	Procedure missing several steps or not fully adequate to solving problem, no materials listed.	Procedure not appropriate to problem.
Variables and Controls	Variables identified and isolated. A control is used. More than one test is performed for each variable.	Variables mostly isolated. More than one test performed, control may be missing.	Variables somewhat isolated. No control. Only one test performed for each variable.	No tests performed, or variables not identified or isolated.
Data Collection	The data is collected neatly and displayed where appropriate in graphs, charts, or photos.	Data is collected and complete but could use additional representation on board.	Data is incompletely collected.	No data collected.
Analysis	The data is analyzed appropriately, and data supports the conclusion. Sources of error identified. Future work considered.	The data is analyzed appropriately, and the data supports the conclusion. May be missing sources of error or future work.	Data is analyzed but does not necessarily support the conclusion.	Data not analyzed appropriately.
Originality	This is a very original idea from the student's own imagination.	This is an idea from a website or suggested by someone, but with an original twist.	from a website or book, but faithfully followed, and compared to previous results.	This idea comes from a website or book, but not followed correctly.
Level of Difficulty	This problem required the student to use creativity to solve, and the student worked above their grade level to design and perform their experiment.	This problem required some thought to solve, and was appropriate to their grade level.	This problem required little effort.	This problem was too easy.
Student's Own Work	The work of the experiment and of the display were performed almost entirely by the student.	Some work performed by an adult.	Much of the work performed by an adult.	The adult did an admirable job on this science fair project.
Display	The display is easy to read, attractive, and the quality of the writing is appropriate for the child's age.	The display is easy to read, and the quality of the writing is mostly appropriate for the child's age.	The writing is legible. The display could be tidier.	The writing is not legible, or the display board is absent.
Interview	The student is enthusiastic and informed about their problem. They can answer questions easily, and offer insights about what their results mean, and what they might do differently.	The student is enthusiastic, and can answer questions about their problem with prompting. They have a rough idea about what their results mean or what they could do differently.	The student can answer some questions, but not all.	The student could not answer questions about their project.
Total Points:				
Comments:				

Coronado Science Fair Grading Rubric - Scientific Demonstration				
Student's Name:			Grade:	
	4 - Awesome	3 - Good	2 - Limited	1 - Needs help
Demonstration Objectives	Objectives are well understood and well researched.	Objective is somewhat understood, some research completed.	Objective is unclear, no research.	No objective evident.
Knowledge of Scientific Principle	Demonstrates clear understanding of principle or concept involved; accurately relates concept to demonstration	Exhibits only slightly limited understanding of principle demonstrated; minor inaccuracies in relating demonstration	Exhibits somewhat limited understanding of principle demonstrated; minor inaccuracies in relating demonstration	Lacks an understanding of the principle or concept demonstrated; inaccurately relates demonstration of principle or concept
Procedure/ Method	Procedure or method is completely appropriate to complete the demonstration. Steps and Materials listed.	Procedure or method appropriate and steps mostly listed. May be lacking material list.	Procedure or method missing several steps or not fully adequate to complete demo, no materials listed.	Procedure or method not appropriate to demonstration.
Data and Results	Data or results are collected neatly and displayed where appropriate in graphs, charts, or photos.	Data or results are collected but could use additional representation on board.	Data or results are incompletely collected.	No data or results collected.
Conclusions	The data or results are analyzed appropriately, and support the conclusion. Sources of error identified. Future work considered.	The data or results analyzed appropriately, and the support the conclusion. May be missing sources of error or future work.	Data or results are analyzed but do not necessarily support the conclusion.	Data or results are not analyzed appropriately.
Originality	This is a very original idea from the student's own imagination.	This is an idea from a website or suggested by someone, but with an original twist.	This idea is derived directly from a website or book, but faithfully followed, and compared to previous results.	This idea comes from a website or book, but not followed correctly.
Level of Difficulty	This demo required the student to use creativity to develop, and the student worked above their grade level to design and perform it.	This demo required some thought to develop, and was appropriate to their grade level.	This demo required little effort.	This demo was too easy.
Student's Own Work	The work of the demo and of the display were performed almost entirely by the student.	Some work performed by an adult.	Much of the work performed by an adult.	The adult did an admirable job on this science fair project.
Display	The display is easy to read, attractive, and the quality of the writing is appropriate for the child's age.	The display is easy to read, and the quality of the writing is mostly appropriate for the child's age.	The writing is legible. The display could be tidier.	The writing is not legible, or the display board is absent.
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Total Points:				
Comments:				