Casis Elementary School

Science Fair
2024/25

FOURTH Grade
Student Experiment Manual

Dear Fourth Grade Parents:

Casis fourth grade students have the opportunity to conduct a science experiment and enter the Casis Science Fair. This is optional for all fourth graders. The Casis Science Fair will be held on **TUESDAY, DECEMBER 10TH.** Projects will be sent home shortly after the fair. The information in this packet should help you assist your child in developing his/her Science Fair Project. Once projects are judged, we will announce the winners to move onto the "Regional Science Fair," which will take place on **SATURDAY, FEBRUARY 22nd.** If your child makes it to regionals, you will need to also be available in the evening of **FRIDAY, FEBRUARY 21st** briefly so they can set up their project.

Included in this packet is a detailed set of expectations (a rubric) for evaluating an **Experiment.** An Experiment follows the steps of the Scientific Method (to be discussed in class) and clearly asks a question. An experiment is an operation or set of tests carried out under controlled conditions in order to discover an unknown effect or to test a hypothesis. Most significantly, the results of the experiment are unknown to the student prior to conducting the experiment. There must be some level of originality to the idea being tested. The rubric for an Experiment, bibliographic format, planning sheet, and the definitions in the Glossary should make the learning more focused and successful. These items are attached.

Additional Do's and Don'ts:

- **Do** help your child brainstorm Science Fair ideas. Please **don't** choose one for them.
- **Do** go to the library, or other places with your child to help them find reference materials. Please **don't** find all the materials yourself and give them to the child.
- **Do** help type information for the child. Please **don't** type information the child cannot read or understand. They will need to explain the entire project to a teacher or judge.
- **Do** go over the expectations as explained in the rubric for the science project with the child.
- **Do** get information from textbooks, library books, and the Internet. **Don't** let children copy information word for word.
- **Do** help students edit their work. **Don't** revise a student's work.
- **Don't** use any dangerous or harmful materials.

If you have any additional questions, please ask your classroom teacher.

Experiment Rubric

Point Value	1 - Beginning	2 - Developing	3 - Accomplished	4 - Exemplary
Title	No title.	Title with problems in *writing mechanics.*	Student has title with correct *writing mechanics.*	The title is in the form of a question with correct *writing mechanics.*
Problem	No question is asked. No problem is identified.	Incomplete problem statement.	Complete problem written as a question with correct *writing mechanics.*	Complete problem written as question and including the information that led student to ask the question. Correct writing mechanics.
Background Information (Research)	No background information.	Incomplete background information.	Background information states some work done prior to experiment with correct *writing mechanics.*	Details which show that student has gathered information and learned about the topic(s) in the project, referring to specific references. Correct *writing mechanics*.
Definitions	No definitions of terms.	Some definitions, but incomplete.	Complete definitions of terms with correct *writing mechanics*.	All key vocabulary for experiment and research correctly defined. Student understands definitions. Correct *writing mechanics*.
Hypothesis	No *hypothesis.*	Incomplete *hypothesis* or hypothesis does not follow "If…. then…." format	*Hypothesis* written with correct *writing mechanics* but is not completely testable.	The *hypothesis* is a "If … then…." statement. The *hypothesis* is testable. Hypothesis is linked to background information. Correct *writing mechanics*.
Experimental Procedure	Experimental procedures not listed.	Experimental procedures listed but are incomplete and/or not listed step by step.	Experiment procedures are listed in sequential order with correct *writing mechanics*. Include materials list.	Experimental procedures are *quantitatively* and/or *qualitatively* expressed and are listed step by step. Includes complete materials list and correctly identifies *dependent* and *independent variables*.
Results	No results.	Results are written but not connected to hypothesis.	Results are clearly written with correct *writing* mechanics and connected to hypothesis.	Student gives brief, clearly written description of what happened and shows results using clearly labeled graphs, charts, time lines, etc., clearly indicating variables.
Conclusion	No conclusion.	Student's conclusion is not based on the results and/or is not connected to the hypothesis.	Student makes a conclusion based on the hypothesis with correct *writing mechanics*.	Student answers question formed by *hypothesis* based on results, using an "I did. … and then… happened" statement. Student explains why (or why not) specific results were achieved. Conclusion is based on the results and answers the question.
References & Acknowledgments	No *references* or *acknowledgments.*	*Reference*s or *acknowledgments* but not both, incorrect format.	*References* and *acknowledgments* but in incorrect format.	Complete list of *references* and *acknowledgments* in correct bibliographic format.

Rules

1. Space limitation: Each project is limited to a size that allows display on one student desk (approximately 24" x 18"). Display boards can be purchased at local hobby supply stores.
2. Living things: Students should not cause injury or stress to any animals for their project. This includes giving chemicals to an animal, killing or dissecting an animal, or keeping an animal in a container not similar to its usual habitat. Live animals should not be brought for display at the science fair.
3. **RULES to REMEMBER**:
    a. **Students are not allowed to grow mold or bacteria at their homes for their science fair projects.**
    b. Firearms, explosives, or discharge air pressure canister devices will not be allowed.
    c. Any activity or substance that presents a danger to the student or the environment, including hazardous chemicals or radioactive material is not allowed.
4. Acknowledgment of help: All students must have an acknowledgment of help on their entry form with their project. This form lists the names of persons who have helped the student with the project.
5. Safety: Electrical projects may use batteries as sources of electricity. Projects using electrical current must indicate upon registration that they require an outlet.
6. The following items WILL NOT be permitted at the Palmer Events Center exhibit floor:
    a. Glass containers
    b. Liquids
    c. Live animals
    d. Open food items
    e. Bacteria
    f. Mold Cultures
    g. Dirt

    Students may have projects involving these items at the Casis fair, but must simulate and/or photograph and document the use of these items if the project goes to the Palmer Events Center.

7. Pictures: Pictures of the students and the project in progress or at conclusion are encouraged.
8. Place the student(s) name(s) on the back of the display board.

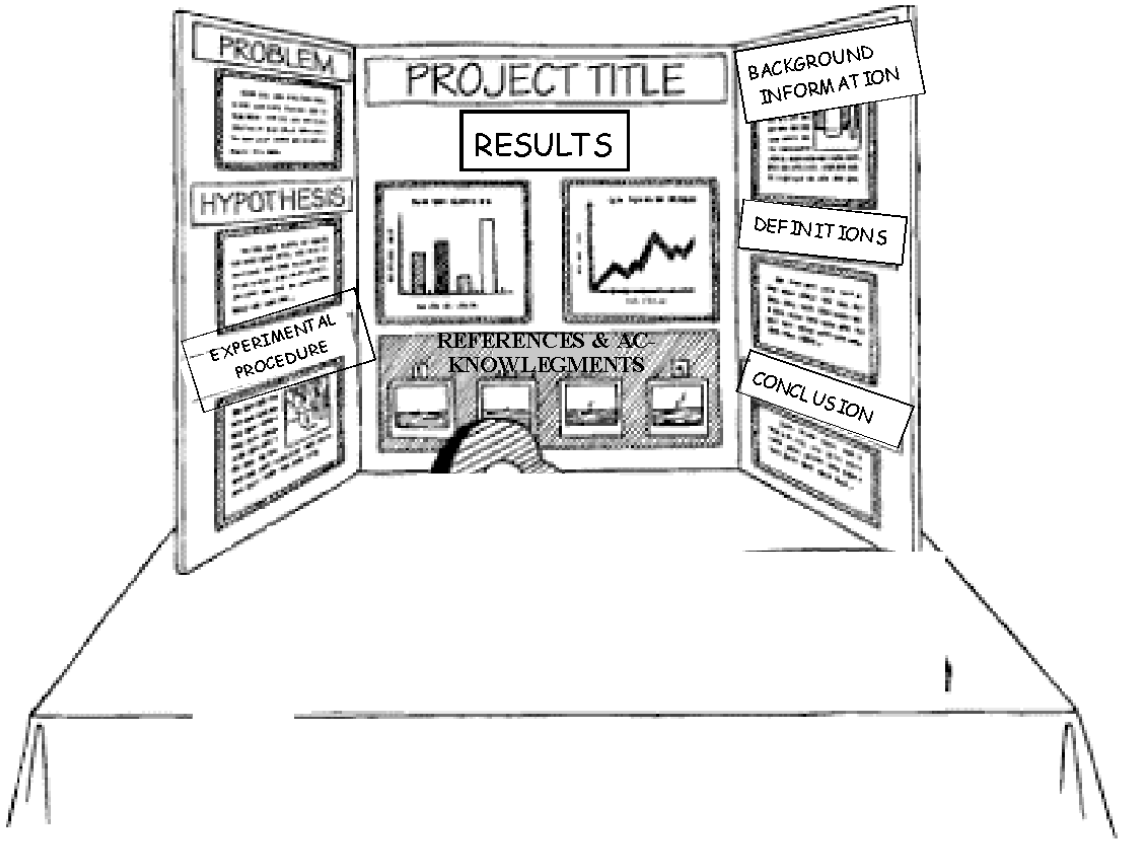
Display of Project

The illustration below gives an example of how a student might want to set-up his/her display board using the Scientific Method. Students may be creative if they choose, but the steps of the Scientific Method must be included in the project.

The students are not required to use a display board, but the dimensions of the project may not be any larger than 24 inches across the back. For example, most standard poster board is 36 inches wide, and if used for a science project, must be folded or cut to meet the measurement requirements. The project must fit entirely on a school desk and not overlap onto another desk. Projects may be smaller, but not larger.

Display boards are available at teachers' supply stores and hobby/craft shops. Hobby Lobby usually has them available in a variety of colors; call the store before you go.

An actual display will be set up for each grade level in the school library. If students would like to view a real example, please encourage them to come by the library to see these displays.



Glossary

Word	Definition
Acknowledgments	Names of people (teachers, parents, others) who helped the student. Explain the nature of their assistance.
Classification scheme	Defining the characteristics used to group or classify objects or events according to similarities and differences. Classification schemes can be one, two or multistage.
Classify	To group objects or events according to similarities and differences. Classification schemes can use one or more properties, for example, just weight or weight **and** color.
Communicate	Giving or receiving information. Precise language is needed for describing an observation, reporting a measurement or interpreting data.
Conclusion	A statement of how the results of the experiment (what happened) relate to the hypothesis and how this solves or does not solve the problem.
Data	Information and measurements gathered from the project. Data should be presented in a graph, table or chart.
Demonstrate	To show how an object or a process works by relating effects to causes.
Demonstration	Using known facts and known results to show how an object or a process works.
Experiment	To test an idea or hypothesis using controlled, scientific methods and measurements. Also, "an experiment" is the specific testing procedure.
Hypothesis	An idea about the solution to a problem, based on information from books or other sources. A hypothesis is an educated guess, such as: "Because I know this much, *if* I do…. *then* I predict that…. will happen." In science, a hypothesis must be tested with an experiment to prove (or disprove) the prediction.
Infer	To use experience and information to draw conclusions and make explanations about events not directly observed. For example: "I infer that lions eat impalas because there are lots of impala bones around lions' dens."
Measure	To count, or to use standard units to determine dimension, volume, mass, weight, electrical property, time, etc. Units of measurement include centimeters, inches, grams, pounds, volts, amperes, minutes, etc.
Model	To develop a physical, mechanical or conceptual representation to explain an idea, object or event. Anything that represents an actual object or process can be called a model.
Observe	To use one or more of our senses to find out about objects, events or living things. An observation is a fact about something learned directly through the senses.
Predict	To make a forecast about what will happen in the future using knowledge from previous events and experiences. If a prediction is to be useful, it must be based on thorough reasoning.
Qualitative	Relating to qualities or properties of something such as color, odor, texture, size, liquid or solid, better or worse, etc. Many "qualities" can be measured (and are therefore "quantitative". A qualitative statement: "Cube 1 is larger than cube 2."
Quantitative	Relating to measurement of an amount, volume, magnitude, time, degree, etc. expressed mathematically.
References	Books, magazines, web sites, etc. used to get background information (research) for the project. Reference list should include title, author and page numbers. For web sites, include complete web page address.
Variable	The **manipulated or independent variable** is the thing that you change on purpose to test your hypothesis. The **responding or dependent variable** is what changes when you change the manipulated variable. **Controlled variables** are aspects of an experiment that you keep the same each time you change the manipulated (independent) variable. **Uncontrolled variables** can influence your results and they are not under your control. You want to minimize the number of uncontrolled variables.
Writing Mechanics	Using standard English-language punctuation, capitalization, grammar, spelling and sentence structure.

Bibliographic Format

Book by one author:

Author Last name, First name. *Book*. City of Publication: Publisher, Year of Publication.

Book by two authors:

Author Last Name, First name and Author Last Name, First Name. *Book*. City of Publication: Publisher, Year of Publication.

Unsigned Encyclopedia Article:

"Title of Article." *Name of Encyclopedia*. Date of edition.

Signed Encyclopedia Article:

Author Last Name, First Name. "Title of Article." *Name of Encyclopedia*. Date of edition.

Periodical Article:

Author Last Name, First Name. "Title of Article." *Periodical*. Date: Pages.

Newspaper Article:

Author Last Name, First Name. "Title of Article." *Newspaper*. Date, edition. Pages

Interview

Person interviewed Last name, First name. Type of interview. Date interviewed.

Lecture

Instructor Last name, first name. Class Lecture. Class. School, City, State, Date.

Internet

(when available) Author Last Name, First name. "Title of Article." Date published. http://internet address. Internet. Date accessed.