SOUTHERN NEVADA REGIONAL SCIENCE AND ENGINEERING FAIR

K-5 Project Categories

Option I: Scientific Collections

Scientific collections are examples of materials that are gathered and organized by specific characteristics of the objects in the collection. These types of projects involve the identification, sorting and classification of materials based on characteristics such as pattern, size, shape, texture, etc. You can check out http://www.mos.org/whats_happening/new_exhibits/natural_mysteries.html for further information on this option.

Examples *

Field	Collectible Objects (Topic)
Botany	leaves, seeds, flowers, wood, fossils, bark
Zoology	insects, shells, fossils, footprints
Medicine-Health	hair (color), hair (texture)
Chemistry	solids, liquids, solutions, mixtures…transformation of physical and/or chemical properties of objects
Engineering	switches, gears, building equipment, tools
Physics	simple machines, electrical circuits or parts
Earth Science	rocks, soils, clouds
Space Science	star types, constellations
Mathematics	shapes in nature

* adapted from Wasden Elementary School Science Fair Packet

Display Format

1.	Title:	Field of Study, Topic
2.	Purpose:	What you collected; why/how you collected it
3.	Description:	Characteristics of objects in your collection
4.	Scientific Organizations/ Thinking:	Sequential account of different ways you grouped the objects; final grouping/classification; explanations for groupings
5.	Data/Results:	Patterns/relationships within the collection; information discovered from the collection
6.	Explanation/Conclusions:	What you learned and would like others to know
7.	Questions/Plans:	New questions and plans for your collection

Self-Assessment

Communication: Clear, concise descriptions of . . .

- scientific thinking, design, and product
- collection characteristics
- scientific organization
- findings, results
- evidence-based explanations/conclusions

through . . .

- science log
- photos, drawings/diagrams with descriptive captions/labels
- narrative writing
- tables, charts, and/or graphs

CRITERIA FOR SCIENCE PROJECTS AND/OR JUDGING FIFTH GRADE PROJECTS
(K-4 ARE NOT JUDGED)

Please remember that these projects are the products of elementary students, whose application of and skills with science are still developing. While you should certainly look for adherence to the scientific principles outlined above, your scoring should keep in mind that the interest and excitement of exploring science are of the greatest importance in this age group.

Science conferences are part of science fairs at some schools. Students share their project design, results, and findings with peers, teachers, and families. The audience interacts with the student researcher to address questions such as the examples listed below. The following topics and questions can be used for science conferences, and/or as criteria for judging.

Option I: Scientific Collections

Purpose: What did you collect and why? In which field of science does your collection belong?

Description: What are the characteristics of the objects in your collection?

Scientific Organizations/Thinking: Where did you find the objects in your collection? Describe the different ways you grouped/classified the objects in your collection. Explain the thinking behind this process. Why did you choose this way to group your collection for the display?

Data/Results: What patterns and relationships did you see? What did you notice, discover when collecting/organizing this collection?

Explanation/Conclusions: What did you learn that you would like others to know?

Questions/Plans: What are you still thinking about after organizing you collection?
What questions do you have now? What plans do you have for your collection?

Communication: How does the display communicate scientific thinking, design and product?

Science Log: What did you consider and what choices did you make when designing the display to include a sequential account of the collection, organization and study of your collection?

SOUTHERN NEVADA REGIONAL SCIENCE AND ENGINEERING FAIR

K-5 Project Categories

Option II: Scientific Observation History

An observation history is a record of an observation of objects, organisms, or phenomena. The history may be recorded in many ways and includes questions, drawings, photos, and descriptions of changes observed over time. The project display presents the record of the observations (evidence), questions, explanations, and conclusions, showing what was learned.

Examples

Raisins from Grapes: A student puts grapes on a diving board, photographs the changes over time and displays labeled photos in order to share observations and conclusions (Kindergarten ex.).

Display Format

1.	Title:	Topic; objects, organisms, phenomena
2.	Purpose:	The question: how/why the objects, organisms, or phenomena were identified/chosen to observe
3.	Description:	What you did; materials, tools, or techniques used; what happened; what changed
4.	Data/Records:	Data collected over time, including measurements, drawings, descriptions, narrative writing, and labeling; records collected
5.	Results/Analysis:	Organization and interpretation of data; patterns and relationships
6.	Explanations/Conclusions:	Explanation of questions based on evidence; what you learned and would like others to know
7.	Questions/Plans:	New questions and possible new directions; modifications of original design; new inquiries/ observation designs

Self-Assessment

Communication: Clear, concise descriptions of . . .

- scientific thinking, design, and product
- construction methods and materials
- findings and results
- evidence-based explanations/conclusions

through . . .

- science log
- photos, drawings/diagrams with descriptive captions and/or labels
- narrative writing
- tables, charts and/or graphs

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Option II: Scientific Observation History

Questions/Purpose: How/why did you identify the question? Why did you choose this object, organism, or phenomena to observe?

Description: How did you observe the object, organism, or phenomena? What materials, tools, or techniques did you use? What happened? What changed?

Data/Records: Describe the data/records you collected. What did you find from your observations?

Results/Analysis: How do you interpret your data? What patterns and relationships do you see?

Explanations/Conclusions: Based on the evidence that you collected, how would you answer your questions? What did you learn that you would like others to know?

Questions/Plans: What are you still thinking about after conducting this observation?
What questions do you have now? What modifications would you make to your plan? What new inquiry/observations would you like to conduct next?

Communication: How does the display communicate scientific thinking, design, and product?

Science Log: What choices did you make when designing the display to include a sequential account of the story of this observation?

SOUTHERN NEVADA REGIONAL SCIENCE AND ENGINEERING FAIR

K-5 Project Categories

Option III: Science Experiment

A scientific experiment is one component of a scientific inquiry. In scientific experiments, students identify questions, formulate and test ideas/conjectures/hypotheses, use tools, collect and analyze data, describe relationships, and formulate explanations based on evidence.

Display Format

1.	Title:	Question
2.	Purpose:	How/why the question was identified
3.	Research:	Consulting books/experts; web searches; personal observations due to interactions with objects, organisms, and phenomena
4.	Hypothesis	Predict an answer to the question using research
5.	Experimental Design:	Plan; techniques and materials; tools used to gather data to answer the question. *Fifth grade experiments require repeated trials and controlled variables where appropriate.
6.	Results/Analysis:	Organization and interpretation of data, patterns and relationships
7.	Explanations/Conclusions:	Explanations of questions based on evidence; what you learned and would like others to know
8.	Questions/Plans:	New questions and possible new directions/ modifications of original design; new inquiries/ experimental designs

Self-Assessment

Communication: Clear, concise descriptions of . . .

- scientific thinking, design, and product
- methods and materials
- findings and results
- evidence-based explanations/conclusions

through . . .

- science log
- photos, drawings/diagrams with descriptive captions and/or labels
- narrative writing
- tables, charts, and/or graphs

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Science conferences are part of science fairs at some schools. Students share their project design, results, and findings with peers, teachers, and families and the audience interacts with the student researcher to address questions such as the examples listed below. The following topics and questions can be used for science conferences, and/or for criteria as judging.

Options III: Scientific Experiments

Purpose: How/why did you identify the questions?

Research: What did you learn from the experiment(s)? What did you find that is already known about this topic when you consulted other sources? What did you learn from other sources (books, web searches, experts)? What surprised you?

Hypothesis: What do you predict the answer of your question to be? What research and evidence was used to come up with your hypothesis?

Experimental Design: Describe the plan for your experiment. What techniques and tools did you use to gather data to answer the question? How many times did you repeat the experiment? Did you consider any alternative experiments?

Data/Results: What data did you collect? What patterns and relationships did you see?

Explanations/Conclusions: Based on the evidence that you collected, how would you answer your questions? What else did you learn that you would like others to know?

Questions/Plans: What are you still thinking about after conducting this experiment?
What questions do you have now? What modifications would you make to your experiment? What new inquiry/experiment would you like to conduct next?

Communication: How does the display communicate scientific thinking, design, and product?

Science Log: Does the display include a sequential account of the story of this experiment?

SOUTHERN NEVADA REGIONAL SCIENCE AND ENGINEERING FAIR

K-5 Project Categories

Option IV: Technological Design/Inventions

Technology enjoys a special relationship with other fields of study, especially science and mathematics, and is the result of applying the best of what we know to the modification of natural materials to meet both our needs and wants. Technology is our effort at problem solving for basic needs and comforts. The study and undertaking of technological design provides opportunities to develop understanding of its core concepts, including systems, resources, requirements, optimization and trade-offs, processes and controls.

Examples

- bird cage seed catcher
- comparison of two types of string to determine which is best for lifting objects
- simple system to hold two objects together
- solve problems that improve communication, such as:
    - redirecting/redesigning hall traffic
    - distributing and collecting science equipment efficiently

Display Format

1.	Title:	Problem
2.	Problem Description:	How and why this problem was selected
3.	Proposed Solution:	Ways a solution to the problem was attempted; resources (materials, information, capital), requirements (safety needs, physical laws, cultural norms, criteria, constraints), optimization and trade-offs considered
4.	Product:	Design and construction of one solution
5.	Results/Evaluation:	How well the product addressed the problem; data/analysis
6.	Explanations/Conclusions:	What you learned and would like others to know in consideration of the product's efficiency/limitations
7.	Questions/Plans:	New questions and plans for your technological design; additional solutions to the problem; problems these solutions may create

Self-Assessment

Communication: Clear, concise descriptions of . . .

- scientific thinking, design, and product
- construction methods & materials
- findings and results
- evidence-based explanations/conclusions through . . .
- science log
- photos, drawings/diagrams with descriptive captions and/or labels
- narrative writing
- tables, charts and/or graphs

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Option IV: Technological Design/Invention

Problem Description: What is the problem? How was this problem identified and selected?

Proposed Solution: In what ways was a solution to the problem attempted? What resources (materials, information, capital), requirements (safety needs, physical laws, cultural norms, criteria, constraints) and trade-offs were considered?

Product: Explain why you selected this solution.

Results/Evaluation: How was the design and construction evaluated? How many times was it tested? Under what conditions was it tested? What variables were controlled for? How well does the system, process or product address the problem?

Explanations/Conclusions: What did you learn during the design/invention process? How efficient is the solution? What are the limitations?

Questions/Plans: What additional solutions are there to the problems? What problems might these solutions create? What questions do you have now?

Communication: How does the display communicate scientific thinking, design, and product?

Science Log: Does the display include a sequential account of your technological design/invention process?