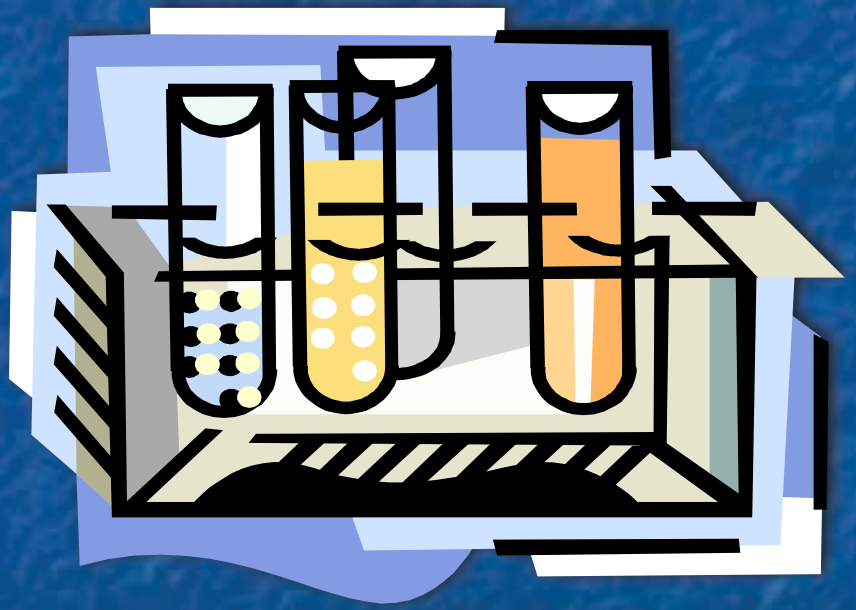
Alaska Science & Engineering Fair

Safety Inspector Training

Judy Onslow

Agenda

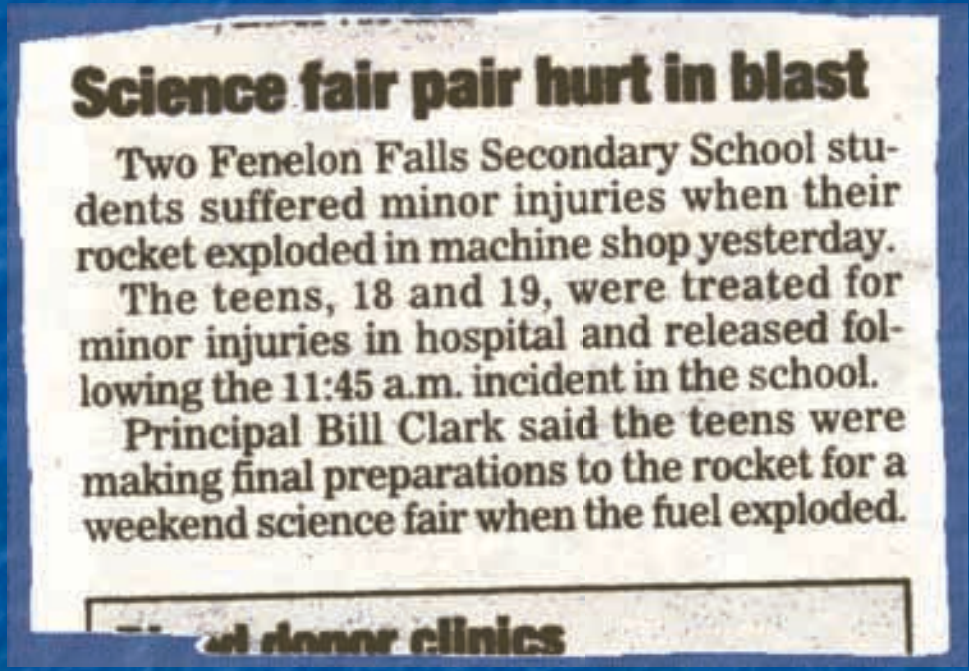


- Rationale
- Your Mission, should you accept it…
- Schedule
- Modifications
- Display Guidelines
- Practice
- Tips for Good Experience

Reasons for Safety Inspections

- Ensure safety of participants, judges, and public

  <u>Safety of the public</u> is a prime consideration. Suitable precautions must be taken to prevent the possibility of personal injury, property damage, and the legal action that could result from a lack of concern for safety
- Reinforce ISEF rules



Science fair pair hurt in blast

Two Fenelon Falls Secondary School students suffered minor injuries when their rocket exploded in machine shop yesterday.

The teens, 18 and 19, were treated for minor injuries in hospital and released following the 11:45 a.m. incident in the school.

Principal Bill Clark said the teens were making final preparations to the rocket for a weekend science fair when the fuel exploded.

Keep in mind… the Science Fair Registration and Project set-up comes…

…at the end of what may have been a long and frustrating time for families and/or students - please:

- **Strive to put students and parents at ease**
- **Review the Checklist items verbally with the students**
- **Give positive reinforcement whenever possible**

Safety Inspectors Mission

- Our goal is to help kids display their projects during the fair in a safe manner for all involved.
- First time students and their parents being required to comply with formal safety requirements may need explanations of the reasoning behind the rules.
- We must ensure the rules are followed in as accommodating a manner as possible.

Personalize your language

“To pass the safety check, the following needs to be done…”

“What we require here is to…”

“The safety regulations state that ___ must be done …”

“Good job, Item ___ passed…”

Schedule

- Arrive at Begich Middle School at 4:00pm and meet Judy at the “Safety Station.” (Your coat and other personal items can be left in the hospitality room .)
- Participants with projects will arrive between 5:00 pm and 8:00 pm.
- Plan to be at Begich until around 9:00 p.m.
- Some food will be provided during the evening.

How this will work…

- You will wait at the “Safety Station” for participants to arrive after the first step of registration.
- You will escort the participant to the location where their project will be set up and you can wait for them to put up their display board and items.
- You can begin the safety check while they set up.
- You will use the safety checklist and check off each item as you inspect.
- When the safety check is complete you will escort the participant to the next station.

Modifications

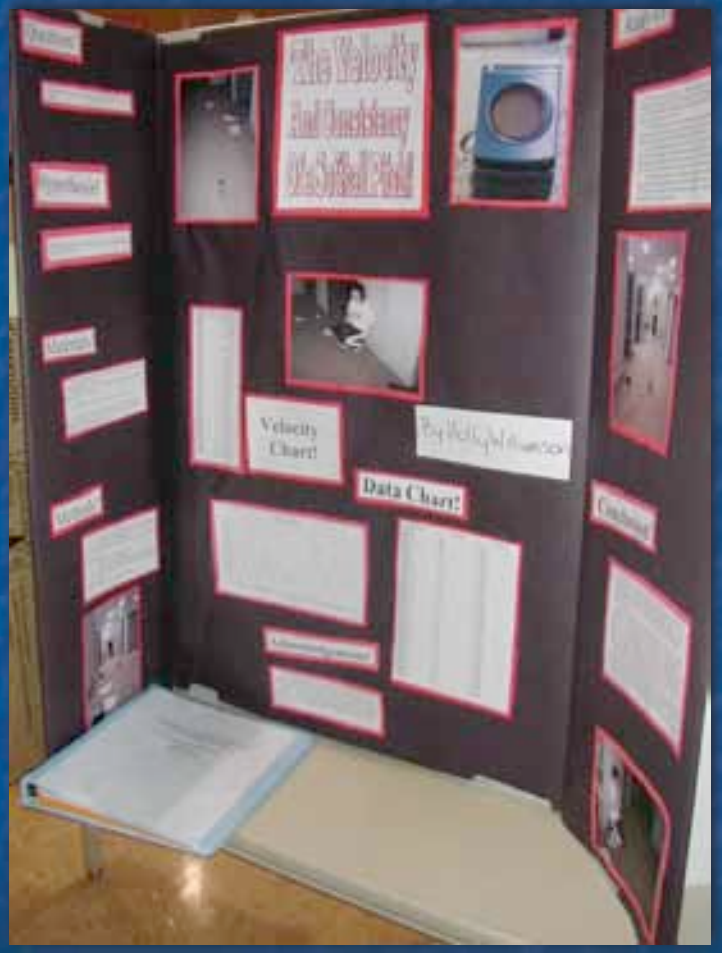
- If modifications need to be made to the display we will have some tape, glue, scissors, markers, paper and blank labels at the Safety Station for participant use.

- If the modifications are going to take some time, you can tell the participant that you will return in 5 minutes, and that they should not leave until you return. You can go do another safety check and then return to the first participant. (Don't have more than 2 safety checks going at one time.)

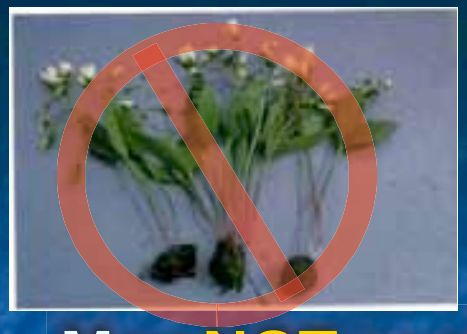
Display

- Exhibit size is limited to 76 cm (30”) front to back, 122 cm (48”) side to side, and 274 cm (108”) top to bottom.
- The exhibit is self-standing and stable, with no sharp edges, corners, etc. <u>All materials must fit within the display area.</u>
- A project that does not fit in the space allotment must be modified.
- Suggest a photograph as a substitute (we will have a digital camera and printer available).

Backboards



- Adjacent walls may not be used for support of the backboard
- Light or unstable displays can be secured to the table with tape
- The display should have no loose items that can fall
- Materials attached to the backboard should be securely attached
- Awards or medals from other fairs may not be displayed



Displays

May NOT contain the following:

- Live animals or plants or dried plants.
- Food materials (NO EXCEPTIONS.)
- Soil, solutions, chemicals, household products or water, dry ice or other sublimating solids.
- Drugs or drug look alikes.
- Microorganisms, algae, mold, bacteria, or protists.
- Preserved animal parts. (Teeth fingernails, feathers, hair and bones may be OK if preserved and sealed in plastic.)
- Photos of animals in surgical or lab procedures.

Remember: the display is a visual display and not a working experiment

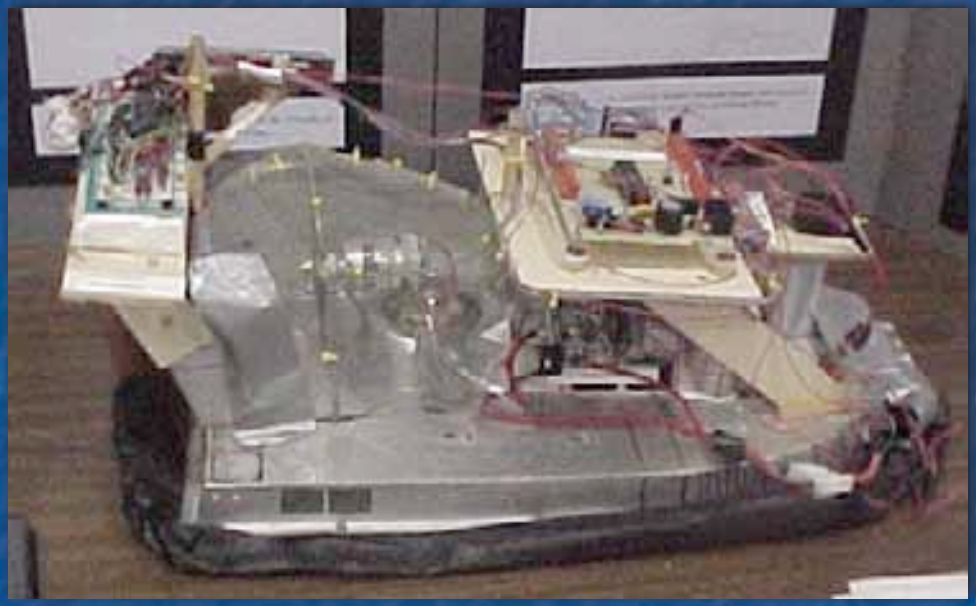
Displays

May NOT contain the following:

- Exposed electrical apparatus or open batteries; wiring must be insulated.
- Flammable gases or open flames
- Unshielded fans, light bulbs, belts, pulleys, chains or moving parts with tension or pinch points.
- Sharp items such as needles, scissors, or glass tubing, syringes, pipettes.
- Awards, medals, flags, business cards or student name.
- Display of clean, empty containers is acceptable.

Remember: the display is a visual display and not a working experiment

Apparatus



- The participant must supply all equipment except display tables.
- Apparatus can be run only if approved and its operation can not injure anyone.
- Project as displayed must be self supporting and not subject to falling.
  - Moving exhibits are to fit within the display space.

-Consider a photograph as a substitute.

- Powered aircraft may not be activated.

Apparatus

- Gears and moving parts that could be dangerous should be guarded.

Animals

- **Live animals are not to be displayed.**
- **Pictures that could be interpreted as harm or distress to animals may not be displayed.**
- **Displayed materials must comply with all safety, animal care and ethical regulations.**

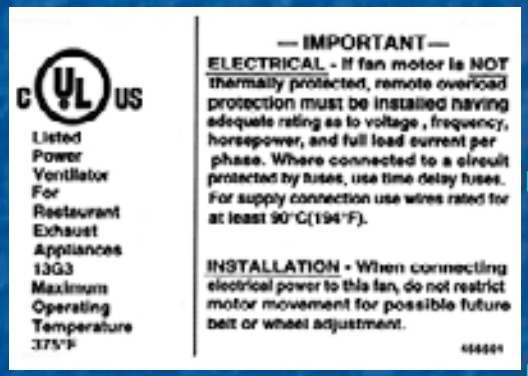
Chemical Safety

- Chemicals that are: hazardous, flammable, explosive or highly toxic; carcinogens; mutagens or pesticides may not be displayed. They are to be simulated.
- Dangerous chemicals are not allowed - this includes prescription drugs, over-the-counter medication and many kitchen and laundry supplies.
- Chemicals that come with hazard warning labels or have a MSDS sheet indicating any hazard are not to be displayed at the Fair.

Chemical Safety

- **Exposed insulation is a fibrous material that can be inhaled, resulting in lung damage. It should not be included in any display.**

Electrical



- **Only UL-approved, 3 wire extension in good condition shall be used.**
- **110-volt AC circuits must have UL approved cord (9’ minimum) and grounded plug; bare wire and knife switches used only on circuits of 12 volts or less.**
- **All electrical connectors, wiring, switches, fuses, etc. must be UL-listed and must be appropriate for the load and equipment.**
- **All electrical cords to be set up in a manner that they do not create tripping hazards.**
- **High voltage equipment must have grounded metal shield or cage; high voltage wiring, switches, etc. must have insulation and overload safety.**

Electrical

- High voltage electrical projects such as Van de Graff Generators, spark gaps, etc. for display must be disabled so that they are non-operational.
- Cell or battery-fed circuits are to be safe in design and operation.
- Displays producing high temperatures must be insulated from surroundings.
- Large vacuum tubes and ray-generating devices must be shielded.

Electrical

- These both require being disabled.

Light Emitting Devices

- Class II lasers only if operated only during judging by the participant and labeled with a sign reading “Laser Radiation: Do Not Look into Beam” and enclosed in protective housing that prevents physical and visual access to the beam. Laser should be disconnected when not operating.
- Lasers are to be affixed to the apparatus. (not removable)
- Lasers are not to point upward or into the viewing arena.
- Lenses, mirrors, etc. are to be securely mounted to maintain a fixed orientation.
- A fixed beam stop is present, to prevent the beam from escaping into the viewing arena.
- Pre-manufactured lasers in completely enclosed apparatus such that the beam cannot be seen by an observer under any condition may be operated.

Light Emitting Devices

- Class III and IV lasers are allowed for display only and may not be operated.
- L.E.D. (non focused light emitting diodes) are not lasers and are acceptable for operation.
- Any lights used as a heat source must be thermally guarded.

Living or Non-living organisms

The following may not be displayed:

- **Cultures of microbes, algae, mold, bacteria or protists**
- **Biological toxins**
- **Microorganisms (the use of mixed cultures obtained from the environment - e.g. soils, mouth swabs - is acceptable for experimentation, but not for display.)**

- **The display of clean, empty containers is acceptable.**

Living or Non-living organisms

The following may not be displayed:

- **Non living decomposing plant tissue or soil.**
- **Plant materials (living, dead, or preserved) which are in their raw, unprocessed, or non-manufactured state.**

(Exception: manufactured construction materials used in building the project or display.)

Pressure Systems - Explosives

- **All air and hydraulic systems that employ pressure pumps and or holding tanks must be non operational, depressurized, open to the atmosphere and free of compressed gas, or fluids.**
- **Pressurized vessels should have a safety valve.**
- **Pressurized canisters or compressed gas cylinders are not allowed.**
- **Firearms and explosive material must not be displayed.**
- **Pictures may be used.**

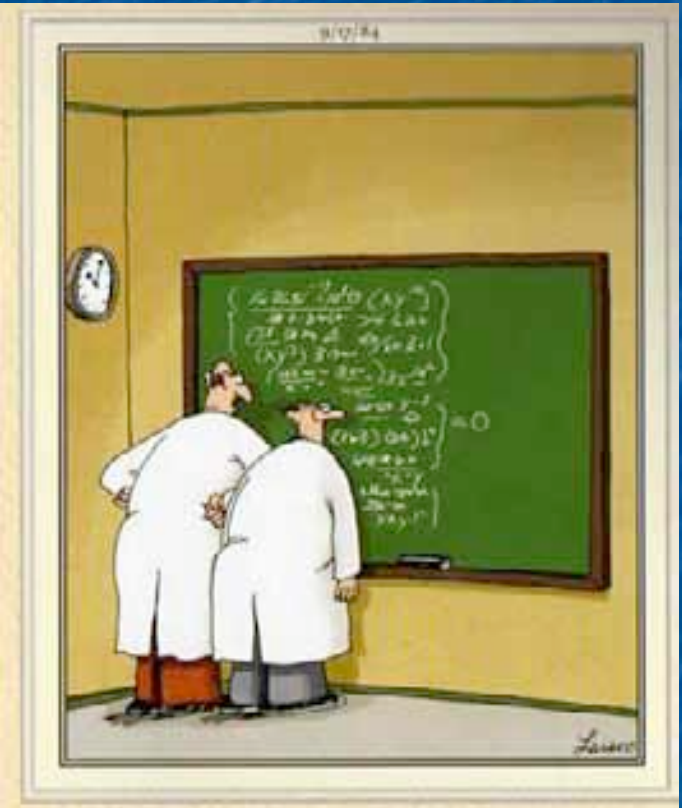
Finishing the Inspection

Once the safety inspection is complete and you sign off on the Science Fair Checklist …

- Place a “Passed safety inspection” sticker on the project card (which stays with the display.)
- Hand the signed checklist to the participant and walk them to the T-shirt table for their shirt and certificate (their last step).
- Then return to the Safety Station to pick up a new participant and project.

- PLEASE try to limit the Safety Inspections to 5 minutes or less.

Final Comments



"No doubt about it, Ellington—we've mathematically expressed the purpose of the universe. God, how I love the thrill of scientific discovery!"

- Err toward safety.
- If not sure get a second opinion.
- Always suggest to the student a way to fix the project so that it will fit within the safety guidelines.
- Have fun!

Thank you!

BASEF

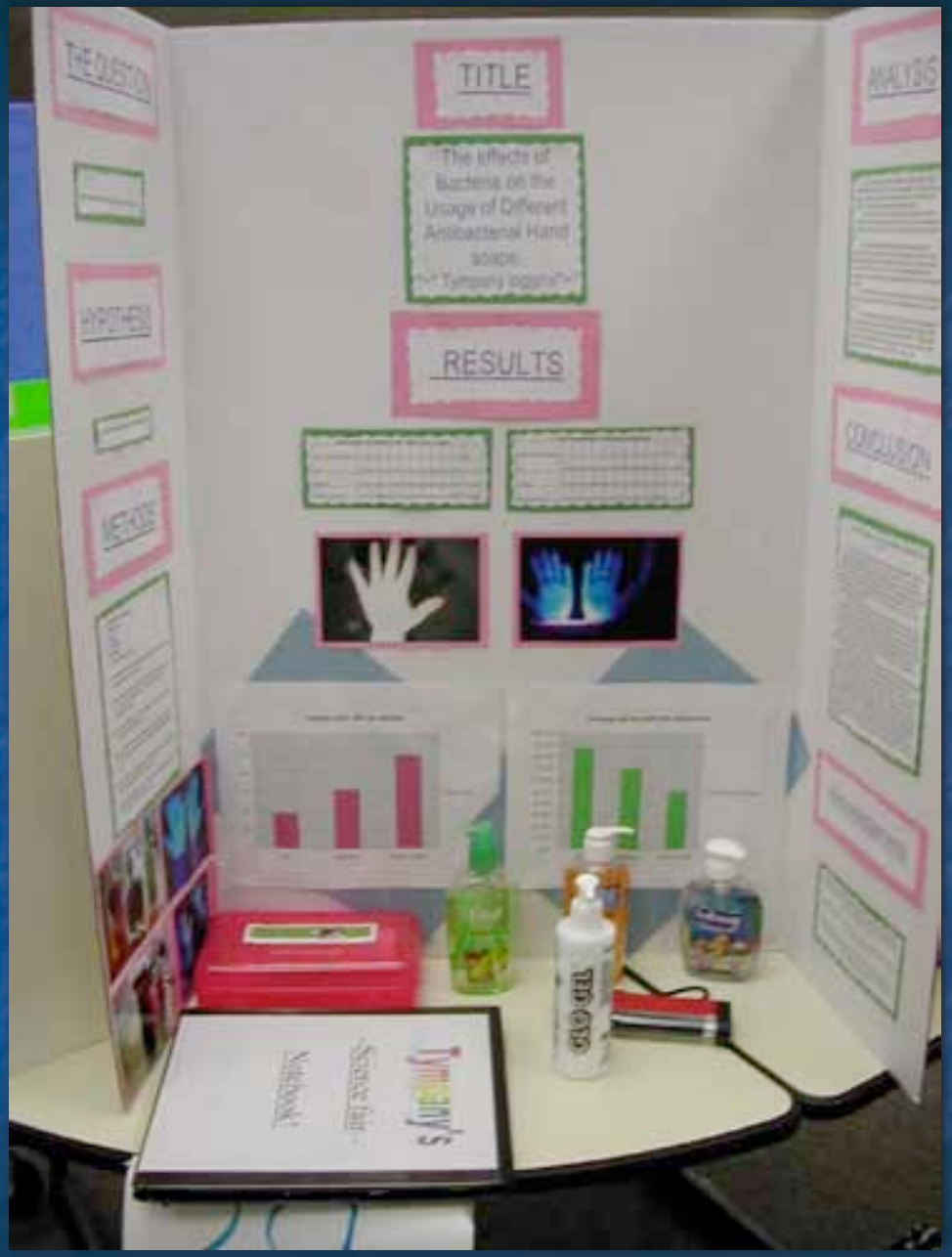
Bay Area Science and Engineering Fair

http://basef.mcmaster.ca

Sponsored by **The Ontario Trillium Foundation**

Begich Middle School Science students and their awesome teachers!

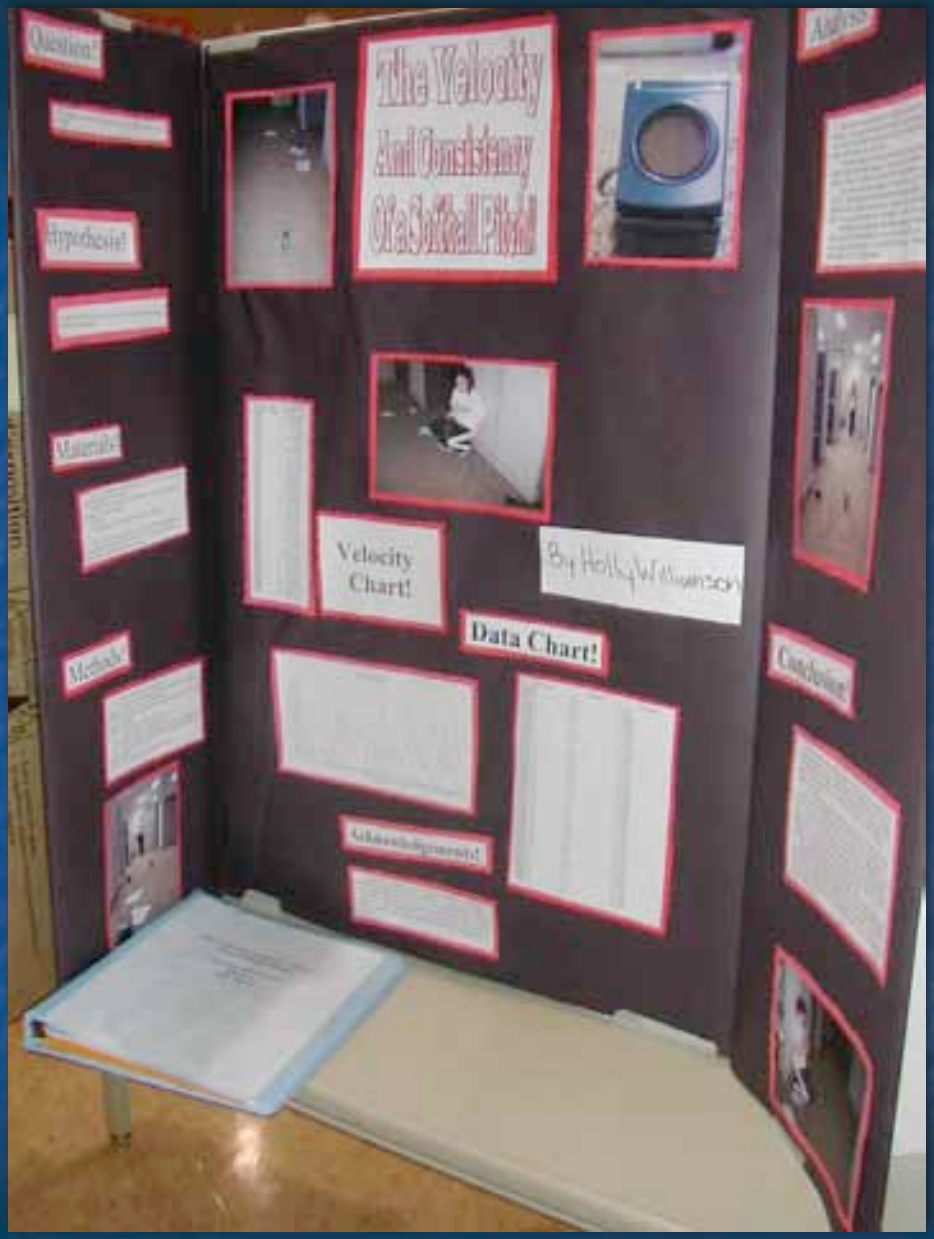
Let's Practice



Practice

Practice


QUESTION
HYPOTHESIS
METHODS
ANALYSIS
CONCLUSION
Pictures



Practice

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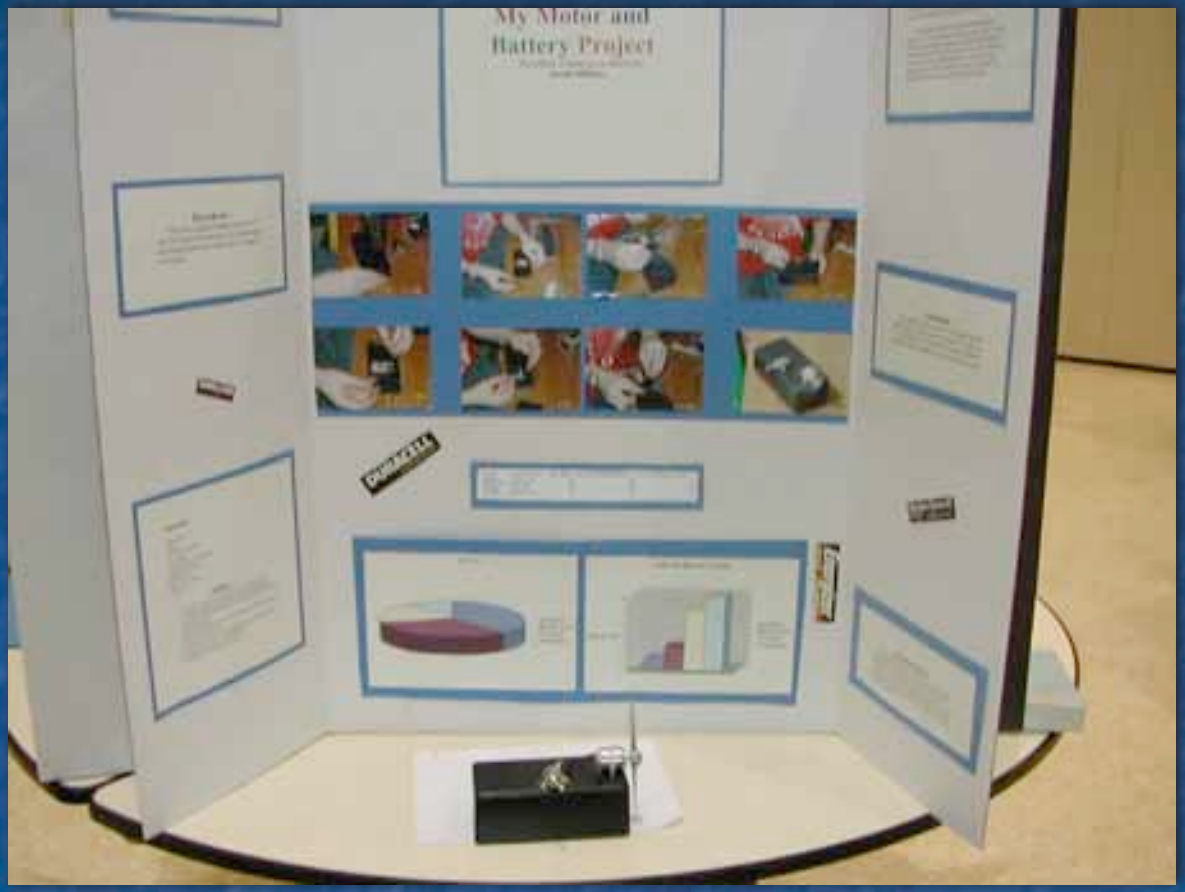

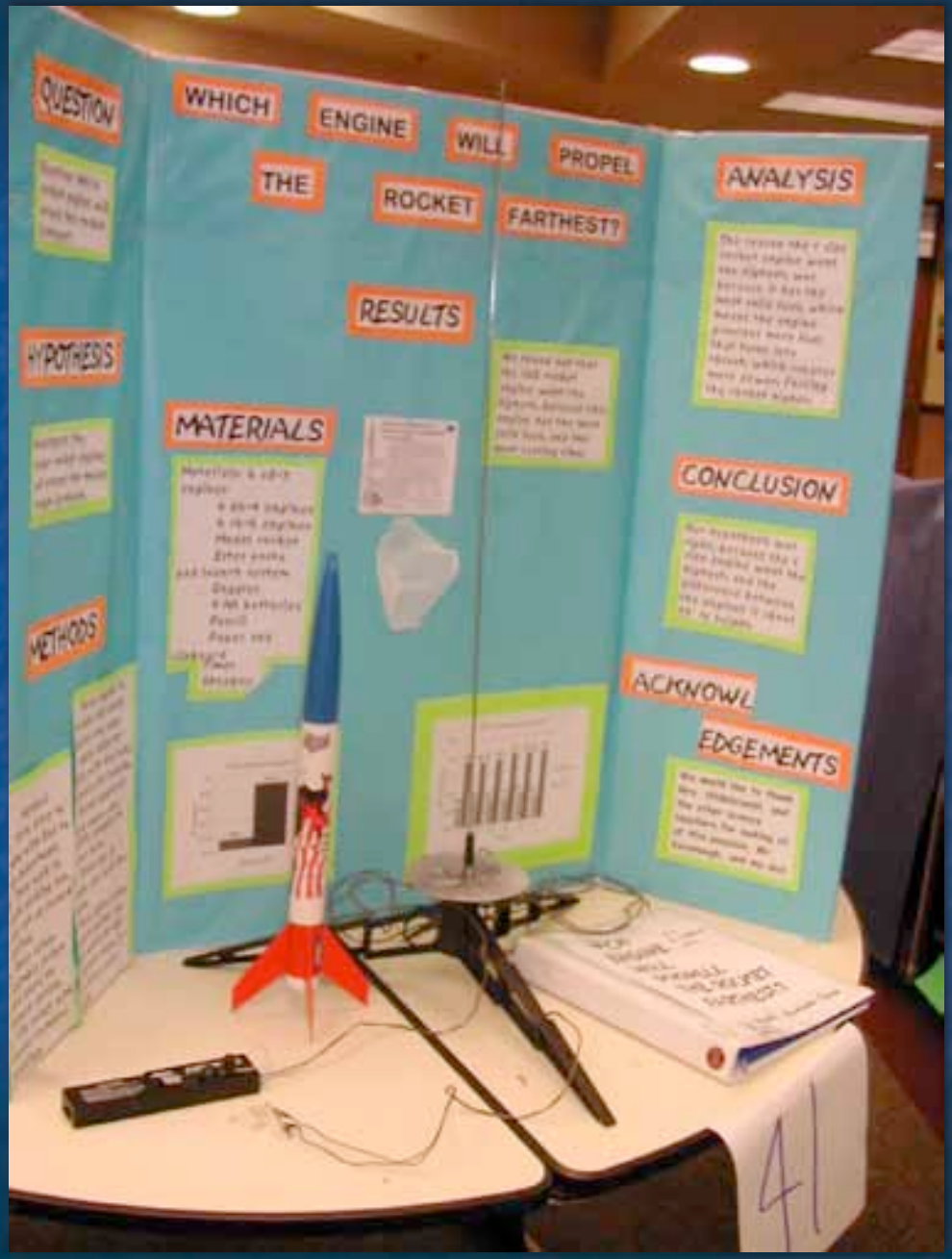
QUESTION
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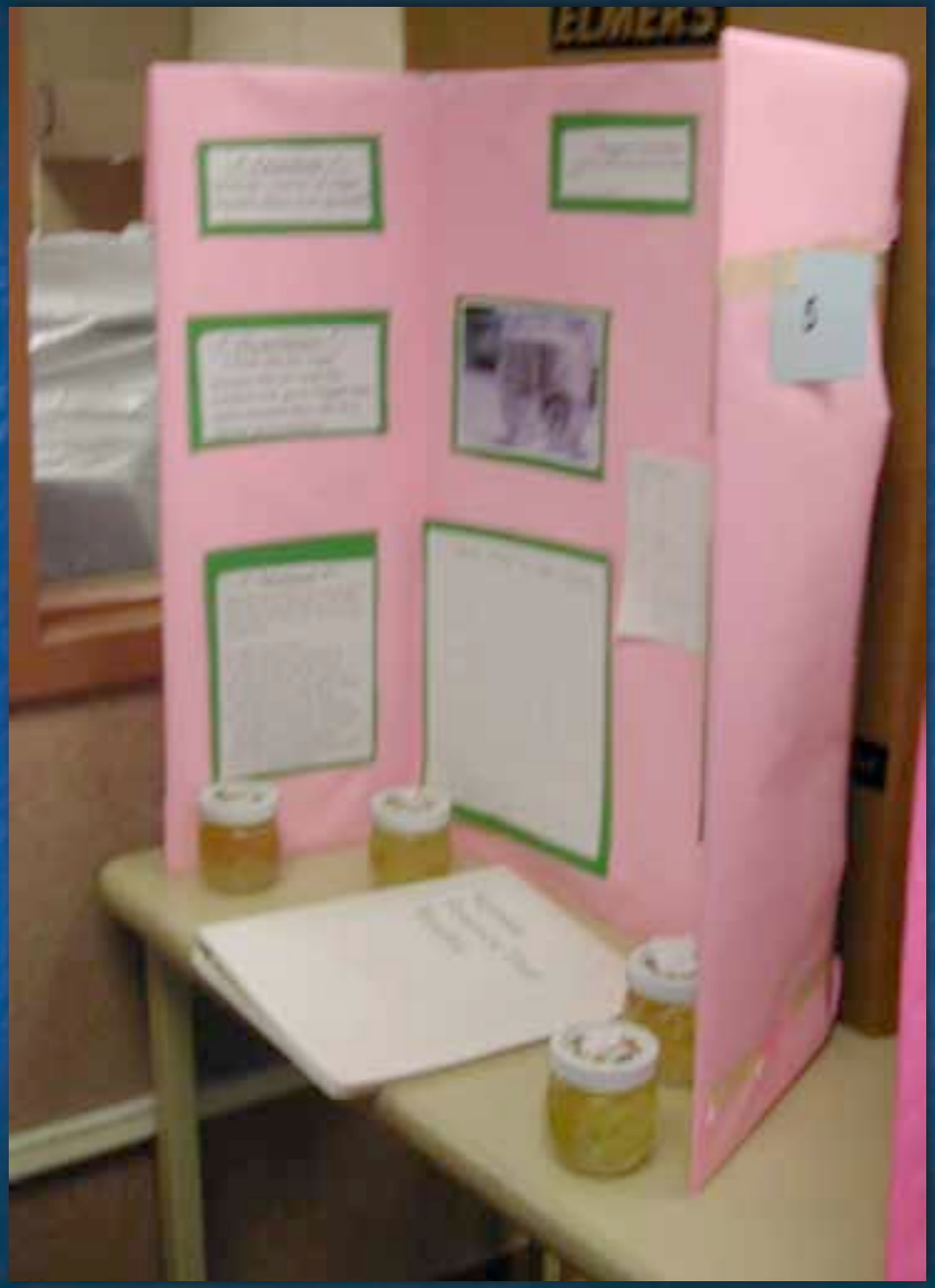
Practice

Practice



Practice

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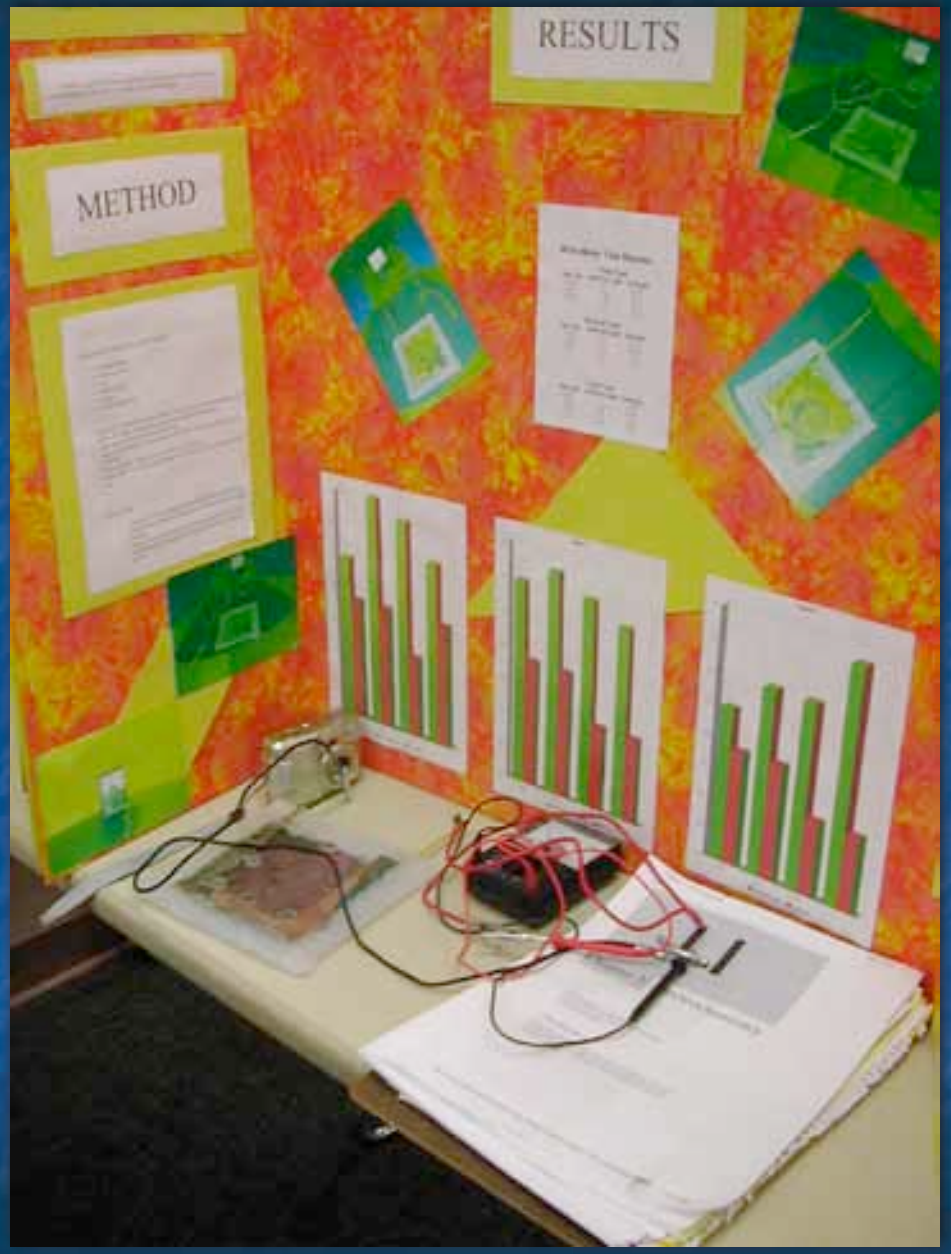

Do your best to provide a good experience for the participants!

- **Be friendly and genuine!**
- **Show interest in their work!**
- **Demonstrate a commitment to safety and to having participants pass the safety check!**

Tips for positive interactions

- Remember when you were a kid!
- If a project does not pass the inspection at first, be firm about the rules, while being positive about their ability to fix the project.
  - Congratulate the student on passing the safety check
- End the interaction on a positive note (e.g., wish the student good luck in the fair)

Thank you!

- We will see you Friday afternoon at 4:00-4:15 at Begich Middle School