GRES 5TH GRADE SCIENCE FAIR
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| S.5.3.1  | Identify the steps in the scientific method (question/purpose, research/observation, hypothesis, materials, procedures, results, and conclusion). | | ▪ Asking Questions and Defining Problems  
▪ Planning and Carrying Out Investigations  
▪ Constructing Explanations and Designing Solutions | Connections to Engineering, Technology, and Applications of Science  
▪ Influence of Science, Engineering, and Technology on Society and the Natural World |
| S.5.3.2  | Analyze a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1) | |  |
| S.5.3.3  | Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. (3-5-ETS1-2) | |  |
| S.5.3.4  | Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. (3-5-ETS1-3) | |  |

**Common Terminology**
- hypothesis, conclusion
Expectations

All students are expected to present a complete scientific experiment to present at the Science Fair in early April, as part of this previously mentioned curriculum.
Steps

- Question
- Hypothesis
- Variables
- Materials
- Procedure
- Data/Results
- Conclusion

Key Vocabulary

- Independent Variables
- Dependent Variables
- Quantitative Data
- Qualitative Data
- Confounding
- Constants
- Trials
Key Dates

- **February 5th** – Experimental Question Due
- **February 14th** – Procedure Write-Up Due
- **February 29th** – Try to start testing by this date
- **March 20th** – Try to conclude testing by then
- **March 27th** – All board elements typed and ready
- **March 30th** – Completed board at school
- **April 2nd** – Science Fair!!
  - Public viewing 3:35 – 6:00
Designing A Question

• Get ideas from your interests.
• Shouldn't be a demonstration.

• Should be written in one of these two ways:
  ○ Does A affect B?
  ○ Does A have an effect on B?
Demonstration to Experiment

Using this acronym, students can take their demonstration and turn it into an experiment.

SCAMPER

S - SUBSTITUTE: Replace a thing, or concept with something else.
A - ADAPT: Adjust to a new purpose. Re-shape? Tune-up?
M - MODIFY, MAGNIFY, MINIFY: Change the colour, sound, motion form, size.
M - Make it larger, stronger, thicker, higher, longer.
M - Make it smaller, lighter, slower, less frequent, reduce.
P - PUT TO ANOTHER USE: Change when, where, location, time, or how to use it.
E - ELIMINATE: Omit, get rid of, cut out, simplify, weed out...
R - REARRANGE, REVERSE: Change the order, sequence, pattern, layout, plan, scheme, regroup, redistribute...

Bob Eberle (1971); SCAMPER: Games for Imagination Development
Demonstration: How Does A Plant Grow?

To turn into an experiment, we could...

- **Substitute** different types of soil
- **Modify** the temperature of the soil
- **Eliminate** water, soil, etc.
Hypothesis

- Educated guess/prediction.
- Should be done *before* you start the experiment.
- Use an “if/then” statement

*A hypothesis should always:*
- explain what you expect to happen
- be clear and understandable
- be testible
- be measurable
- contain an independent and dependent variable
Variables

**Independent** - What the experimenter is changing.

Should have **one** independent variable only.

**Dependent** - What is being measured.

Can have more than one, as long as the main question is being answered.
The Extras

**Confounding** - Students don't want anything that might make their results unreliable. A thorough, detailed procedure write-up helps a lot.

**Constants** - Conditions of the experiment that remain the same. (What you’re not changing)

**Control** - The testing group that would occur under normal circumstances
Materials

- Everything should be collected before beginning your experiment.
- **Quantities and measurement amounts** should be as accurate as possible
- Should be in a detailed list which is bulleted or a numbered.
Trials

Need more than 2 trials for each condition tested.

Should be an odd amount of trials. (The more the better!)

Control Trials are always better.

Example:

A plant grown in no sunlight, another in partial sunlight, and a third in full sunlight is only ONE trial.
Procedure

● Should be a step-by-step list for the experiment and how’s it going to be completed.
● Numbering this list is also preferred.
● Steps for the first trial needs to be in sequential order.
  ○ Additional trials can be typed as “repeats steps 1–8 for additional 4 trials.”
● Make it as detailed as possible.
Data/Results

Should be as **quantitative** as possible. Observational data, while an interesting extra, is hard to make objective

- Should be in a table or graph.
- There's always help in class. (No worries)
- Be careful when averaging data. May skew results.
QUANTITATIVE

The quantity or number of something

/'kwantɪ,teɪtɪv/ - quan-ti-ta-tive

quantitative

(1) (adjective) expressible as a quantity or relating to or susceptible of measurement; (2) (of verse) having a metric system based on relative duration of syllables; (3) relating to the measurement of quantity;

Tip: you can create your own flashcards by adding this video to favourite list
Support me by liking / leaving a comment if it helped you

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QUALITATIVE

The observational quality or how “good” it appears

qualitative (adjective)
1. Of descriptions or distinctions based on some quality rather than on some quantity.
Conclusion

- Should state whether hypothesis was proven or not.
- A disproven hypothesis does not mean it wasn't a successful project.
- Also state what could be done in an experiment based on these finished results.
Be bold. Be realistic.

Out of the box experiments

No harmful experiments

No life effective experiments
Background Knowledge

Your child has done some recent experiments in class.
All of these components are taught in class and have already been discussed.

If you have any questions then please feel free to contact your child's teacher or visit their website if information is posted there.
Judging

Students will present their experiments on April 2nd during school.

They will all be judged by professionals (Science teachers, Administrators, and 4H faculty).

Ribbons will be awarded based on the scoring. GRES 5th grade teachers do not judge. Grades from project does not interfere with ribbons.
Display

- 36" Display boards are the biggest we allow. Headers optional.
- Make sure your information is in a logical place on your board.
- Everything Typed...Spell check, spell check, spell check!!!
- Don’t overdo decor. Shouldn’t detract from the information.
- Glue: Less is More!!!
Have Fun

Enjoy this time to work on a meaningful science experiment with your child.

It can be a rewarding and an exciting experience.

Thanks For Coming!!!