ARCADIA CHRISTIAN SCHOOL

2nd Grade - 4th Grade

Research is formalized curiosity. It is poking and prying with a purpose.

Zora Neale Hurston

In creating an atmosphere that pushes our students to use their critical thinking skills and ingenuity, I would like to take this moment to introduce the ACS Science, Technology, and Engineering Showcase. Our students will be challenged to create a project that uses the Scientific Method: Ask a question, Research the topic, State the Hypothesis, Test the Hypothesis, Analyze the Data, and Report the Conclusion.

Each student will receive a packet via email for your convenience, from their teacher; please check your email after March 4. The email will be named **ACS Science, Technology, and Engineering Showcase PDF Packet**.

Each packet focuses on a grade group (Example: K-1st, Grades: 2-4, 5-8), and will include:

- ACS Showcase Rules
- The Do's and Don'ts of the Project
- ACS Showcase Registration Form which needs to be signed and returned to your teacher
- A Showcase Planning Guide
- Project Board Examples
- Project Ideas (students are encouraged to come up with their own ideas, but must be cleared by their teacher)
- Judges's guidelines
- Project Rubric

IMPORTANT DATES

Project Assigned:	Friday, March 4th, 2022
Project Due Date:	Thursday May 12th, 2022

Showcase Schedule:

Thursday, May 12th, 2022	◆Projects displayed in classroom ◆Students will present Project to their peers ◆Judging takes place in class in the morning ◆Blue Ribbon Recipients will be recognized in All-School Ceremony during 7th period

Friday, May 13th, 2022

ACS Science, Technology, and Engineering Showcase
1:00 to 3:00 pm

- Special Schedule will be created for that day
- "Blue Ribbon" Winner Projects will be displayed in the Auditorium
- Classrooms will be set-up by 12:15pm
- Open Doors: by 1:00 pm
- Parents will take Project home after 3:00pm

Students that are recipients of the Blue Ribbon Award are expected to:

- Remain in the auditorium during Showcase to present and answer any questions in regards to their project
- Dress Code: School uniform or semi-formal attire. Dress to impress!
- Gentlemen: Clean, pressed pants (no jeans); School Polo or dress shirt neatly tucked in.
- Ladies: Ladies should wear a nice, neat outfit.

If you have further questions please do not hesitate to contact your teacher, who will be happy to serve you. Please remember, **this is your student's project**. It is **alright to help and assist**, but **not to oversee the project**. We want your child to grow and feel proud of their accomplishment, no matter the outcome. We hope that this will create a learning experience that will challenge our students to excel! We thank you for your support and look forward to a great Showcase!

Mrs. Lun

MS/HS Science Teacher and Showcase Coordinator

Project Requirements

The student's project needs to be experimental. A project is experimental if it meets the following criteria:

a) A hypothesis is posed (a statement, not a question)

b) A student experiment is conducted using the scientific method

c) Data/records are collected and analyzed

d) The solution to a problem is sought

Projects are to be done on an individual basis.

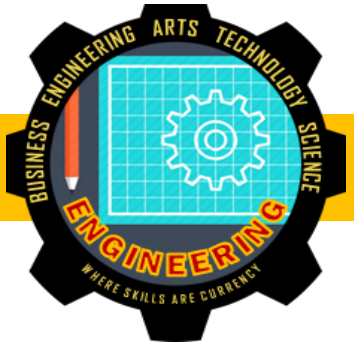
No team projects are permitted.

Students may seek help from an adult or another student with typing, backboard construction, and critique methods.

Student must do 90 percent of the total work.

The Do's and Don'ts of Project

1. Number one rule. . . think safety first before you start. Make sure you have recruited your adults to help you.
2. Never eat or drink during an experiment and always keep your work area clean.
3. Wear protective goggles when doing any experiment that could lead to eye injury.
4. Do not touch, taste, or inhale chemicals or chemical solutions.
5. Respect all life forms. Animals are not allowed to be used in experiments. Do not perform an experiment that will harm a person.
6. All experiments should be supervised by an adult.
7. Always wash your hands after doing the experiment, especially if you have been handling chemicals.
8. Dispose waste properly.
9. Any project that involves animals, drugs, firearms, or explosives are NOT permitted.
10. Any project that breaks school policy, and/or local, state, or federal laws are NOT permitted.
11. Use safety on the Internet! NEVER write to anyone without an adult knowing about it. Be sure to let an adult know about what websites you will be visiting, or have them help you search.
12. If there are dangerous aspects of your experiment, like using a sharp tool or experimenting with electricity, please have an adult help you or have them do the dangerous parts. That's what adults are for so use them correctly. (Besides, it makes them feel important!)



Display Board Criteria

1. Maximum Size may not exceed 48” wide by 30” deep by 72” high.

✓ For Grades 2-4 - Preferably Elmer’s Tri-Fold 28 x 40 Display Board

2. Display Board

✓ Should be free-standing for table display

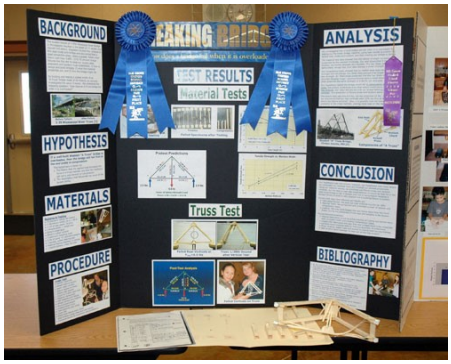
✓ Should be attractive, creative, eye-catching, neat and informative

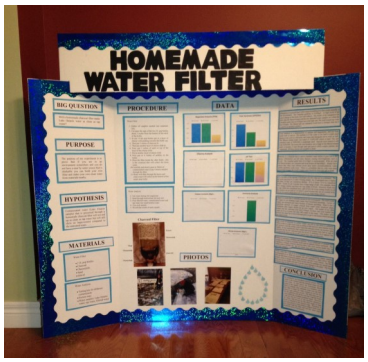
✓ Computer-generated graphics and lettering must be the student’s work

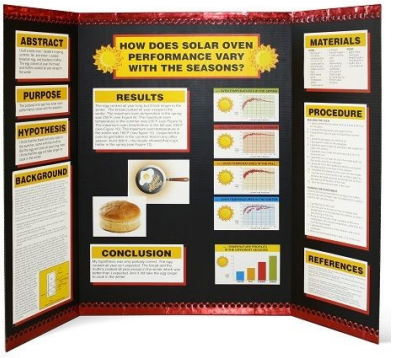
✓ Student’s name must be placed on the back of project (lower, right-hand corner)

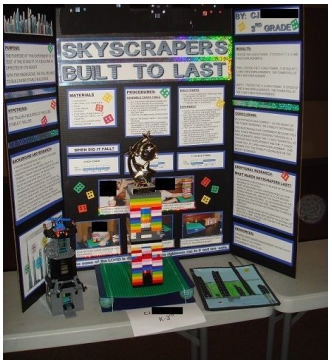
✓ The following shows how the board should be put together:

Left Side	Middle	Right Side
1. Problem / Question 2. Background Information 3. Hypothesis 4. Abstract	1. Title 2. Design (procedure/material) 3. Data 4. Log Book	1. Results 2. Conclusion 3. Future Application 4. Biblical Application









3. Display / Project Information

A) TOPIC

A good project is one that is chosen to fit your interests and abilities, so the time you spend selecting a topic is very important for your future success. You will be working with this project for a long time.

Do not choose a topic that you will be unable to do, or a topic that is too costly to obtain. Stay within your abilities and means.

Be sure that topics encompassing sensitive issues are dealt with from an appropriate Christian perspective, and avoid any topic that may be offensive.

B) TITLE

Make it short, yet descriptive, conveying specific information about your project.

C) PROBLEM / QUESTION

State the problem in 1-2 sentences. It is the question you set out to answer. It should be in the form of a question.

D) BACKGROUND INFORMATION

Include any background information that you have researched on this topic. What have other people learned about the topic that you are testing? Define the terms that most people will not understand in your project. This should be approximately 2-4 paragraphs (1/2 page).

E) HYPOTHESIS

The hypothesis should be in the form of an “If… then” statement. This is your prediction on what you believe will happen in your experiment. This should be written out after you have done careful research into any background information related to your topic. Be sure to include your rationale.

F) ABSTRACT (approximately 50 words)

An abstract is a summary and description of what was done and what happened as a result.

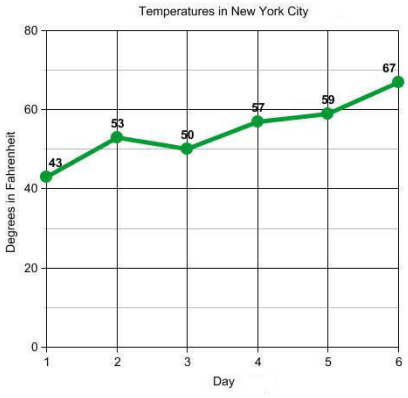
Example: “Three brands of tennis balls were tested to determine which one retained its bounce over the longest period of time. The balls were regularly bounced over a five-week period. Of the three brands tested, Brand A, Brand B, and Brand C, Brand A retained its bounce best.

G) EXPERIMENTAL DESIGN

Includes all the steps and materials you will need to complete the experiment. Be specific with your steps; number them. Include drawings, diagrams, or photo of the project to help illustrate. Make sure you have done the appropriate number of trials. Indicate what your variables are as well as your control group and all constants.

H) DATA

Your data should be comprehensive. This would include all observations of your experiment, both qualitative (descriptions) and quantitative (measurements), as needed. They could be in the form of charts, tables, graphs, lists, drawings, etc.



I) RESULTS

This section should be an abbreviated representation of your data. This could also be in the form of a chart (pie), graph, table, etc.

Include a **written explanation** of your results, pointing out comparisons or trends.

J) CONCLUSION

1. Specifically state whether the hypothesis is correct or incorrect and your reason why it was this way.

2. State what further experimentation could be done to broaden the scope of the problem or ways to improve upon your experiment.

K) FUTURE APPLICATIONS

Based on your experiment and the results you received, how could someone use this information in the future? What benefit could it have? How practical and affordable is it? Could this be used in the near future or are we still a long way off?

L) LOG BOOK / JOURNAL

The logbook is the history and record of the progression of you science project. It begins the first day you receive the assignment and ends the day you turn it in. It is a diary of your science project. Every time you work on your project, you need to record your work in your logbook. When your experimentation begins, you will refine your procedure in detail and write it out in your logbooks, step-by-step, drawing and labeling any apparatus you use and explaining how all the variables are controlled.

Your data is first taken in your logbook. Your results are first formulated here. Include a bibliography as your first page; listing any sources you used during your investigation, example: website, people, magazines, books, etc. Keep adding to this list as you use more sources. You need to have at least three sources.

EVERYTHING you do in your project is in your logbook!

Remember: from start to finish, everything must be in your book. Keep the book neat and clean. You will turn your logbook in with your display board; it will be displayed with your project.

M) EXAMPLES / EQUIPMENT

Equipment, samples, or other items from your experiment may be included as a part of your display. These can be brought in on the day of the Open House.

N) BIBLICAL APPLICATION / ILLUSTRATION

Each project must include a related biblical application/illustration, and it must be included on the visual display.
What truth from God's Word does your experiment help show?
What lesson can be drawn from your experiment?
Is there an analogy?

O) ORAL PRESENTATION

An oral presentation will be given on May 12th.
Be prepared to give a 5 minute presentation on your project. Give a general description of what you did in your experiment, what happened, biblical application, and what would you do differently next time. Notes are allowed.

PROJECT IDEAS FOR EACH GRADE

2nd Grade:

20 Simple and Fun Second Grade Science Experiments and Activities

https://www.weareteachers.com/2nd-grade-science/

3rd Grade:

27 Third Grade Science Projects

https://www.weareteachers.com/3rd-grade-science-projects/

4th Grade:

The Best 4th Grade Science Experiments

https://www.weareteachers.com/4th-grade-science-experiments/

ACS Showcase Registration Form

Name:_____ **Grade:**_____

Teacher: _____

What field of discipline will you be experimenting?

❑Science ❑Technology ❑Engineering

What will you be experimenting? _____

_____

I read the ACS Showcase Packet and Rubric. I understand the due dates and rules.

_____ _____

Student Signature **Parent Signature**

PLEASE TURN IN TO YOUR TEACHER. THANK YOU!

ARCADIA CHRISTIAN SCHOOL

B.E.A.T.S.

SHOWCASE

PLANNING GUIDE

2nd Grade - 4th Grade

Name_____

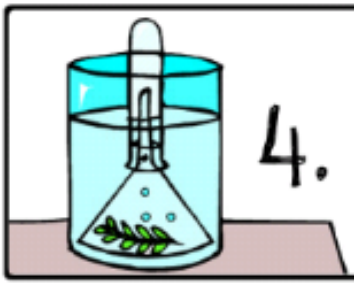
SCIENTIFIC METHOD WORKSHEETS

The Scientific Method

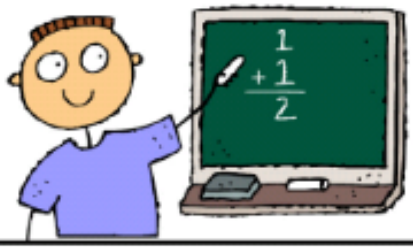
1. Ask a Question

2. ReSearch your Topic

3. State your Hypothesis



4. Test your Hypothesis



5. Analyze your Data

6. Report your Results

1. Ask a Question

What is something you find interesting?
What things are you curious about?

Make Observations and Form Questions:

I wonder why.....
How come.....
What happens when...

Make a list of all your questions

Choose one question to explore. Circle it and write it on your worksheet.

2. ReSearch your Topic

Look for information about your topic

Visit your library
Find online reSources
ASk an expert

ReCord your new information

Was your question answered? _____

Form your final question:

_____

_____

_____

3. State your Hypothesis

A Hypothesis is an EDUCATED Guess

Write your question here;

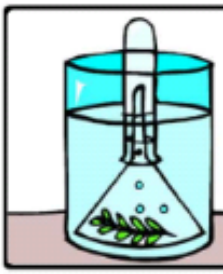
Make your question testable:

BrainStorm a way to test your question:

Form your hypothesis: (What do you guess will happen?)

_____

_____



4. Test your Hypothesis

Control Group	Experimental Group

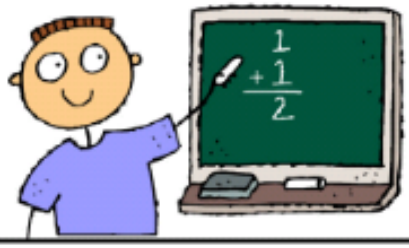
Independent Variable: _____
(What you will change)

Dependent Variable: _____
(What you will measure)

Controlled Variable: _____
(What stays the same)

Steps you will take:

1. _____
2. _____
3. _____
4. _____
5. _____



5. Analyze your Data

Gather your Data into a chart:

Record what happened:

Was your Hypothesis correct? Why or why not?

6. Report your Results

Title: _____

What judges will be looking for….

A lot of kids are scared of talking to a judge. Just imagine the judge as a fellow scientist who just wants you to share what you learned… But just so it's not such a mystery, we've listed all the stuff that is on the judges form that they want you to do:

Criteria	Worth how many points?	
1. Clearly stated title, purpose and reasonable hypothesis	2 points	*Introduce yourself, point out the title of your display and tell the judge why you chose to study this. State your problem that you studied (your question) Also tell them about your hypothesis (what you think might happen)*
2. In depth report on science topic	2 points	*Hand a copy of your report to the judge so that they can review your research. Talk about what you learned while researching your topic*
3. 3 or more resources cited	2 points	*Talk about the sources (books, websites and interviews) that helped you understand your topic. To get top marks you need to have at least 3 sources.*
4. Thoroughly stated procedures and materials	2 points	*Tell about your experiment, the steps you took to do it . Be sure to mention all the materials involved and point out all of those lovely pictures!*
5. Clearly stated variables and controls	2 points	*Point out the controlled variables, independent variable and responding variables to the experiment, (you know the stuff you kept the same, the thing you tested and the results)*
6. Measurable data that includes 3 or more trials or when testing human subjects, 10 people or more	3 points	*Be sure to show them that you tested your experiment at least 3 times. Show them all of the cool graphic organizers that you made, like your tables and charts. Remember to point out the labeled parts of your graph or table to show that you know what it represents.*
7. Effective analysis of data clearly stated results (graphs charts and tables)	3 points	*Be sure and explain what your data means. Make sure you can read your graphs and tables. Let them know if you were surprised by the results, or if you knew what would happen because you studied about it.*
8. In-depth knowledge base of topic with use of related vocabulary at grade level	3 points	*Make sure you sound like an expert at your topic. Always use the appropriate vocabulary especially by using words from the Scientific Method like: Problem, Hypothesis, Procedure, Variables, Results and Conclusion.*
9. Well elaborated conclusion based on results	3 points	*Let the judge know if you were right about your hypothesis. What did you conclude about your problem? Did you find another problem to investigate based on what you learned? The conclusion is all about what you learned from doing this.*
10. Stated real life connections.	2 points	*Judges love this one, because it gives a real world purpose to your topic. It makes you sound like a real scientist in a real lab… which you are!! For example, "My experiment about paper towel absorbency could help people save money by buying the right type of paper towels" See how useful that sounds?*
11. Effective closure of presentation	2 points	*Nothing makes a judge feel worse than to make a kid so nervous that they repeat themselves or they stop their presentation before they are really done. If you get lost or forget where you are, look at your display and follow it piece by piece. It is better to discuss everything than to forget to tell the judge something. When you are done, shake hands with the judge and thank them for their time, remember that they are volunteers who care about you!*
Total possible points	25 Points	

What you should do the day of the Showcase...

Relax, smile and have fun, remember you are the expert and you had fun doing the project. But if you are a little nervous, we listed the stuff you need to do during the presentation to meet the criteria of the judges form.

Helpful Hint: Look sharp, feel sharp and you will be sharp. Dress nice that day, be polite and speak clearly and you will show the judges that you have confidence. Don't forget to look them in the eyes, they really are quite nice.

B. E. A. T. S. SHOWCASE

SCIENCE FAIR JUDGING FORM:GRADE___ PROJECT #____

GENERAL INSTRUCTIONS TO JUDGES

Award a number from 1 to 10 for each category, with 1 as the lowest and 10 the highest. In each category to be evaluated there are questions to guide you in making your evaluation. Don't try to determine the best at this point, simply award points as merited by each project. If a project lacks one of the components then give it a 0 for that category. Thank you so much for your time and effort!

SCIENTIFIC METHOD [NOTE: K – 3 projects may be demonstrations, 4-6 must involve problem solving.]

1. Is the **PROBLEM** clearly stated in the form of a question? Is it a testable problem? _____/10
2. Is a **HYPOTHESIS** offered? Is their reasoning explained? (I think… because…) _____/10
3. Is the **PROCEDURE** explained in terms the student and you can understand? Are the methods described step by step? Are the **MATERIALS** listed? Is the procedure appropriate for the question and hypothesis given? _____/10
4. Are the **RESULTS** easy to understand? If appropriate, are the graphs and charts clearly labeled? For measurements, are the appropriate units given? If there is no way to represent the results in chart or graph format, is there some kind of graphic display? _____/10
5. Is the **CONCLUSION** supported by the results? Does the conclusion relate back to the hypothesis? If the hypothesis is not proven correct by the results, is there an attempt to explain this, or a suggestion of further research that would be needed? _____/10
6. Was the experiment controlled – i.e. was there a comparison made to show that the variable under investigation was in fact responsible for the results, and that it was not merely coincidental? _____/10
7. Were multiple trials done to verify results? Was it an appropriate number of trials? _____/10

SCIENTIFIC ACCURACY and KNOWLEDGE

8. Did the student give credit to sources of any information used? Is the factual information correct? Are any calculations done correctly? Is the spelling correct? _____/10

NEATNESS, TIME, EFFORT, and CREATIVITY

9. Are the labels and title neat? Is it typed, or the handwriting as neat and legible as you could expect for grade level? Is the board layout and design as attractive as might be expected for grade level? Are there props, pictures or sketches included? _____/10
10. Is it apparent that the student used creativity and put appropriate effort into the project? _____/10

Total Score _____/100

Judge Sign-off: _____

Comments: _____

_____

Gold Ribbon: 100 **Blue Ribbon: 97-99** **White Ribbon: 96-90** **Red Ribbon: 89-85**

OVERVIEW of the SCIENCE FAIR PROJECT

The grade earned for the completed project will count toward the fourth quarter's science grade.

There will be intermediate due dates given by the teacher, but the finished Showcase Project will be presented, May _____.

Due date #1: _____

Due date #2: _____

Due date #3: _____

Final due date: _____

May 12: Project Due
Project Presentations and Judging
All-School Ceremony

May 13: ACS Showcase 1pm-3pm

Rubric for Science Fair Project

Name_____

Category	Points possible	Considerations	Points achieved
Creativity	30	• The questions asked are student-initiated and original • The approach to solving the problem is creative • Equipment is creatively used or had to be made/modified • Interpretation of the data shows creative and original thinking by student • Student has understanding of project implications beyond their research	
Scientific Thought	30	• Clear and unambiguous statement of problem • Clearly defined procedural plan for obtaining a solution • Variables clearly recognized and defined; proper controls used correctly • Data adequately supports student's conclusions; limitations recognized • Student understands project's ties to other research • Scientific literature cited, not just popular literature (i.e. newspapers, web)	
Thoroughness	15	• Original question was completely addressed • Conclusions are based on repeated observations (not single experiments) • Project notes/lab notebook are complete • Student is aware of alternate approaches or theories • Student spent an appropriate amount of time on the project	
Skill	15	• Data was obtained and analyzed appropriately by student • Student worked largely independently • Student has required skills and understanding to continue research on own	
Clarity	10	• Clear discussion of project (not a memorized speech) • Written material/poster reflects understanding of research project • Data and results are presented clearly. • Presentation is forthright • Student designed and created poster largely independently	

Total of points possible: 100 Total of points achieved: _____