www.dcheeducators.com/sciencefair

Hello,
DeKalb Christian Home Educators would like to invite members of the homeschooling community to participate in our Science and Engineering Fair. This fair will give students the opportunity to present their area of interest from a variety of Science, Technology, Engineering, and Mathematical (STEM) fields. Participation is free for families with a current membership and $3 per student for non-members.

Requirements:

There are 3 things that you must have to show during the science and engineering fair.

1. Report with bibliography or sources page.
2. Poster or Trifold showing your experiment or project and what you did
3. 2-minute speech explaining your experiment or project and what you learned.

Guidelines:

- Each project will be the student's work.
- If animals are used, no harm may come to them before, during, or after the project.
- **No** animals, weapons, bodily liquids, heating elements, or Petri dishes can be displayed.
- Projects will be Inquiry Projects (more detailed in this packet).
- Projects are due by **Friday, March 29, 2019** at
  Crossroads Presbyterian Church, 5587 Redan Road, Stone Mountain, GA 30088.
- Set-up at **11:30am.**
- Judging at **12:00pm.**
- Winners announced at **1:00pm.**

Coordinator: Coretta Ponder 678-230-0209 or mommycanwe@gmail.com. Visit us at www.dcheeducators.com/sciencefair.

Science Project Evaluation

Student Name (s)			
Grade Category (circle)	Elementary	Middle	High School
Project Title			

Grading standards: **0**: Not Done/absent; **1**: Below minimal criteria; **2**: Meets minimal criteria **3**: Exceeds minimal criteria; **4**: Excellent Overall; thoroughly understands concepts

Knowledge of the Scientific Process	
Question: Question is testable and relates to an area of science	**0 1 2 3 4**
Prediction/Hypothesis: Student explains their expected answer to the question	**0 1 2 3 4**
Procedure: ● Sequence of steps to do the experiment (detailed, clear, easy-to-follow) ● Evidence of controlled variable (factor that stayed the same) ● Evidence of manipulated variable (only one changed) ● Measured Variable (something measured and recorded) ● Repeated Trials (must have been done at least three times)	**0 1 2 3 4**
Data & Analysis: Organized through charts, tables, and/or graphs	**0 1 2 3 4**
Conclusion: References prediction/hypothesis and uses data to support the conclusion	**0 1 2 3 4**
Research: Bibliography with minimum two grade-appropriate sources (2: meets minimal criteria)	**0 1 2 3 4**
Oral Presentation: ● Demonstrate knowledge of project and communicate clearly ● Give the audience the "I know what I'm talking about" feeling	**0 1 2 3 4**

Demonstrations of Student Knowledge	
Experiment: Used scientific principles and/or mathematical formulas correctly	**0 1 2 3 4**
Project Log and Report: Record of student observations and data results, including analysis of data (0:Not done; 2-3: Partial log; 4-5:Complete & thorough data)	**0 1 2 3 4**
Display: Neat, organized poster or trifold about experiment with pictures and diagrams	**0 1 2 3 4**

Judge Comments/ Notes:	**TOTAL POINTS: ____/ 56**

Engineering Project Evaluation

Student Name (s)			
Grade Category (circle)	Elementary	Middle	High School
Project Title			

Grading standards: **0**: Not Done/absent; **1**: Below minimal criteria; **2**: Meets minimal criteria **3**: Exceeds minimal criteria; **4**: Excellent Overall; thoroughly understands concepts

Knowledge of the Scientific Process	
Ask *(Brainstorm)*: Student had a problem to solve. Has ideas on how to solve the problem	**0 1 2 3 4**
Student identifies the criteria, constraints, and intent of the problem.	**0 1 2 3 4**
Imagine: Student brainstorms a clear, focused idea. Ideas are aligned to the problem.	**0 1 2 3 4**
Design Plan: Student proposes and designs a plan that aligns with the criteria, constraints, and intent of the problem.	**0 1 2 3 4**
Create: Student builds a working model that aligns with the criteria, constraints, and intent of the problem.	**0 1 2 3 4**
Testing: Student tests the working model's effectiveness to solve the problem.	**0 1 2 3 4**
Data & Analysis: Testing data organized through charts, tables, and/or graphs.	**0 1 2 3 4**
Validation & Verification: References problem/objective and uses data to support their final design.	**0 1 2 3 4**
Improve: Student describes steps they would or did take to improve their design.	**0 1 2 3 4**
Research: Bibliography with minimum two grade-appropriate sources (2: meets minimal criteria)	**0 1 2 3 4**
Oral Presentation: ● Demonstrate knowledge of project and communicate clearly ● Give the audience the "I know what I'm talking about" feeling	**0 1 2 3 4**

Products: Demonstrations of Student Knowledge	
Experiment: Used scientific principles and/or mathematical formulas correctly	**0 1 2 3 4**
Project Log and Report: Record of student observations and data results, including analysis of data (0:Not done; 2-3: Partial log; 4-5:Complete & thorough data)	**0 1 2 3 4**
Display: Neat, organized poster or trifold about experiment	**0 1 2 3 4**

Judge Comments/ Notes:	**TOTAL POINTS: ____/ 56**

Plan for a great Science Experiment	Example
1. Ask a question ● Must be able to test ● Related to science	How much water is best for a plant to grow?
2. Research ● Find information about your project	Internet search about plants
3. Prediction/Hypothesis ● Predict: I think_____ ● Hypothesis: I think_____because_____	I think plants need about ½ cup of water every 3 days
4. Materials List ● Make a list of materials listed in bullet points with specific quantities listed for each item	Materials List ● 4 pea plants ● 4 1 inch pots ● ½ cup of dirt for each pot ● water ● masking tape ● plastic cups ● ruler with centimeter unit
5. Write a Procedure ● Determine your variables 1. Control Variable: what remains the same 2. Manipulated variable: what changes 3. Measured variable: what is measured ● Write the steps to do your experiment ● Make sure you include when to collect data and record observations and plan to perform the experiment more than once! Three times is preferable.	Procedure: 1. Plant the plants with ½ cup of dirt in the pots 2. Label three pots "1/4 cup", three pots "1/2" cup", and three pots "3/4 cup". 3. Put them in a sunny place. 4. Water each plant every 3 days according to their labels 5. When watering, measure the height of the plant 6. Record observations and height over 3 weeks.
6. Data Collection ● Record data according to your procedure in a data table. ● You should also make a bar graph, pie chart, or other graphic from the data you collected. ● Don't forget to take pictures!	
7. Conclusion ● Write a conclusion about your experiment ● What happened? What conclusions can you draw from your experiment? How does it relate to the real world?	The plants that received ¾ cups of water each day grew 3 inches more than the other two plants. The plants that received ¼ cups of water every 3 days died. In conclusion, plants need ¾ cups of water per day. This is useful to know for at home gardening.
8. Speech/Presentation ● Present to the judges about what you did ● Be prepared to answer questions about your project , the scientific process, and what you learned.	

Depending on grade level, these items might be present on your poster or trifold and in a typed paper.

Plan for a great Engineering Project	Example
1. Identify a Problem, Goal, or Objective ● Must be able to test ● Clearly define your goal	Program a robot to get through a maze in less than 5 minutes
2. Research ● Find information about your project	Internet search about robots and programming
3. Requirements ● Indicate what Criteria will be applied in your project	Criteria: ● Less than 5 Minutes ● Get through Maze
4. Write a Design Plan & Build Your Project ● Make a list of materials listed in bullet points with specific quantities listed for each item ● Describe your design solution	Materials List ● 1 Lego Mindstorms Ev3rstorm robot ● 1 Laptop with Mindstorms program ● A Maze that is 10ft square
5. Write a Test Plan ● Determine your variables 1. Control Variable: what remains the same 2. Manipulated variable: what changes 3. Measured variable: what is measured ● Write the steps to do your test	Procedure: 1. Build robot according to the directions 2. Write a program 3. Place robot at start of maze. Press start. 4. Measure the time it takes for the robot to figure out the maze. 5. Record time and observations of pathway taken in data table. 6. Repeat steps 3 through 5 three additional times.
Data Collection 1. Record data according to your procedure in a data table. 2. You should also make a bar graph, pie chart, or other graphic from the data you collected. 3. Don't forget to take pictures!	
6. Conclusion ● Write a conclusion about your experiment ● What happened? What conclusions can you draw from your experiment? How does it relate to the real world?	The robot was able to travel through the maze three out of 4 times in less than five minutes. The robot was successful in figuring out the blocks quickly. This is useful in programming robots to explore unknown, dangerous territories.
7. Speech/Presentation ● Present to the judges about what you did ● Be prepared to answer questions about your project , the engineering process, and what you learned.	

Depending on grade level, these items might be present on your poster or trifold and in a typed paper.