

# ***Lansing D158***

***Pre-K – 8<sup>th</sup> Grade***



***Hosted by District 158  
All video project submissions are  
due by 6:00 PM on  
Friday, March 19, 2021.***

# **D158 Elementary Science and Engineering Fair 2021**

Dear Students, Parents, and Guardians:

Judging for this year's Science and Engineering Fair is scheduled for the week of March 22 and will conclude with an awards presentation on Friday, March 26 at 7:00 PM. Projects will need to be submitted online via videos on Seesaw. Research papers, worksheets, and other forms can either be dropped off at Reavis or uploaded into Seesaw. The attached packet includes information that will guide your child in creating a Science or Engineering Fair project. The topic should be age appropriate, interesting, and demonstrate that they have learned something from their experience and most of all had fun.

## **Included in this packet:**

- Fair Information – Page 1-2
- Science and Engineering Fair Entry Form, **DUE March 5** – Page 28
- Traditional Science Project Guidelines
  - Pre-K to 1<sup>st</sup> Grade – Page 3 and 14
  - 2<sup>nd</sup> and 3<sup>rd</sup> Grade – Page 4 and 14
  - 4<sup>th</sup> and 5<sup>th</sup> Grade – Page 5 and 14
  - 6<sup>th</sup> through 8<sup>th</sup> Grade – Page 6-7 and 14
- Traditional Science Fair Ideas and Websites – Page 20-25
- Engineering Project Ideas and Websites – Page 15-19
- Getting Started and Project Report Worksheets – Page 7-12
- Traditional Project Display Board Example – Page 13
- Scoring Rubrics for Traditional and Engineering Projects – Pages 26-27
- Project Checklist and Tips – Page 29

## **Fair Information**

Students participating in the fair will present their project via a 3–5-minute recording on Seesaw. A class in Seesaw has been created and titled Lansing Area Science & Engineering Fair. Your child will be linked to the class once the permission form is submitted and processed. Your child will receive an email in their D158 account inviting them to join the class. Once your child is logged into the class you will see that there are three assignments posted under

the “**Activities**” tab. The assignments are: post a picture of you with your project; complete the worksheet for your grade level; post a short video of you presenting your project (3-5 minutes) by **6:00 PM on Friday, March 19**.

The project report can either be entered into Seesaw or turned into the Reavis School Office by 6:00 PM Friday, March 19. The project report for PreK-5 is on pages 9 and 10. The project report for grades 6-8 is on pages 11 and 12.

Projects will be viewed by D158 staff and community volunteers for scoring. An awards presentation will be posted as a link within the Seesaw Science Fair portal on Friday, March 26 at 7:00 PM. Awards can be picked-up at each elementary school and Junior High on Monday, March 29 between 9:00 AM and 2:00 PM.

We have added an engineering project option to the fair this year. In lieu of a traditional science project, students can submit a 3-5 minute recorded presentation of a STEM based project presentation. There are more details about this option on pages 15-19 of this packet. The specific scoring rubric for the engineering project is located on page 27. Details and ideas about the traditional science project option are located on pages 3-14. The specific scoring rubric for the traditional science project is located on page 26.

All participants will receive an award of either Outstanding, First, or Second place. There are tri-fold display boards available for pick-up in each school office free of charge. Please call Reavis, Oak Glen, Coolidge, Memorial, or Lester Crawl ahead of time to reserve one for pick-up. If you have any other questions, please feel free to contact your child’s teacher or school office. We are looking forward to a great year at the Fair!

Respectfully,  
Mr. Kostopoulos, Principal  
W.C. Reavis Elementary School  
(708) 474-8523

# ***Traditional Science Project Guidelines***

## ***PreK, KINDERGARTEN and 1<sup>st</sup> GRADE***

### **VISUAL DISPLAY**

Your project needs:

- Experiment (repeated 3 times with results listed)
- Title
- Drawing(s) or picture(s) appropriate to your experiment placed on a 3-sided self-standing display board. Follow the sample attached toward the back of the packet.

### **RESEARCH PAPER**

- Complete the Science Experiment Worksheet

### **ORAL PRESENTATION**

You should be able to answer the following questions:

- What were you trying to find out?
- What did you think would happen?
- What materials did you need?
- What steps did you need to follow?
- What changes took place?
- What did you learn?

## **2<sup>nd</sup> and 3<sup>rd</sup> GRADE**

### **VISUAL DISPLAY**

Your project needs:

- Experiment (repeated 3 times with results listed)
- Three-sided and self-standing display
- Follow example attached toward the back of the packet.
- Demonstration of your experiment

### **RESEARCH PAPER**

- Complete the Science Experiment Worksheet

### **ORAL PRESENTATION (2 to 3 minutes)**

You should be able to explain the following:

- Background information of your topic
- What were you trying to find out?
- What did you think would happen?
- What materials did you need?
- What steps did you need to follow?
- What changes took place?
- What did you learn from this experiment that you did not know before?
- Delivery shows that you rehearsed your presentation

# *4<sup>th</sup> and 5<sup>th</sup> GRADE*

## VISUAL DISPLAY

Your project needs:

- Experiment (repeated 3 times with results listed)
- Three-sided and self-standing display
- Follow example attached toward the back of the packet.
- Demonstration of your experiment

## RESEARCH PAPER

- Complete the Science Experiment Worksheet

## ORAL PRESENTATION (3 to 4 minutes)

You should be able to explain the following:

- Background information of your topic
- What were you trying to find out?
- What did you think would happen?
- What materials did you need?
- What steps did you need to follow?
- What changes took place?
- What did you learn from this experiment that you did not know before?
- Explanation of visual aides
- Explanation of experiment along with accuracy of experiment
- The knowledge you gained from your experiment
- Delivery shows that you rehearsed your presentation.

# 6<sup>th</sup> – 8<sup>th</sup> Grade

## VISUAL DISPLAY

Your project needs:

- Experiment (repeated 3 times with results listed)
- Three-sided and self-standing display OR multimedia presentation (PowerPoint, Sway, etc.)
- Demonstration of your experiment

**ALL VISUAL PRESENTATIONS** must include:

1. Title
2. Hypothesis
3. Variables
3. Materials
4. Procedures
5. Results (Data Tables & Graph)
6. Conclusion
7. Research (facts learned from Review of Literature - relate facts to your conclusion)

## RESEARCH PAPER

- Complete the Science Project Report Worksheet

## ORAL PRESENTATION (3 to 4 minutes)

You should be able to explain the following:

- Background information of your topic
- What were you trying to find out?
- What did you think would happen?
- What materials did you need?
- What steps did you need to follow?
- What changes took place?
- What did you learn from this experiment that you did not know before?
- Explanation of experiment along with accuracy of experiment
- The knowledge you gained from your experiment (your background research)

## *Oral Presentation Tips:*

- **Practice your presentation** in front of a mirror, your family, or your friends and ask for feedback!
- Maintain **eye contact** with the camera! Don't spend the whole time looking at your screen or board – your virtual audience will be a lot more interested if you are speaking directly to them!
- Speak **LOUDLY, CLEARLY, and SLOWLY** so that you can be heard on camera

## **GETTING STARTED**

A science fair/engineering project is your attempt to answer a question that is interesting to you. You will follow the same methods of professional scientists.

**Finding a Topic:** Be creative! "Think out of the box" when searching for that perfect topic!

**Research:** Good scientists research their topics before conducting their experiments. You can use the Internet or a variety of science resources at the library. The Lansing Library's Youth Services staff is eagerly waiting to assist you.

**Supplies:** You will need a three-sided, self-standing display board. These are available free of charge at your school's office. Also, you will need supplies and equipment related to your project or experiment. A PowerPoint presentation may also be utilized in lieu of a traditional display board.

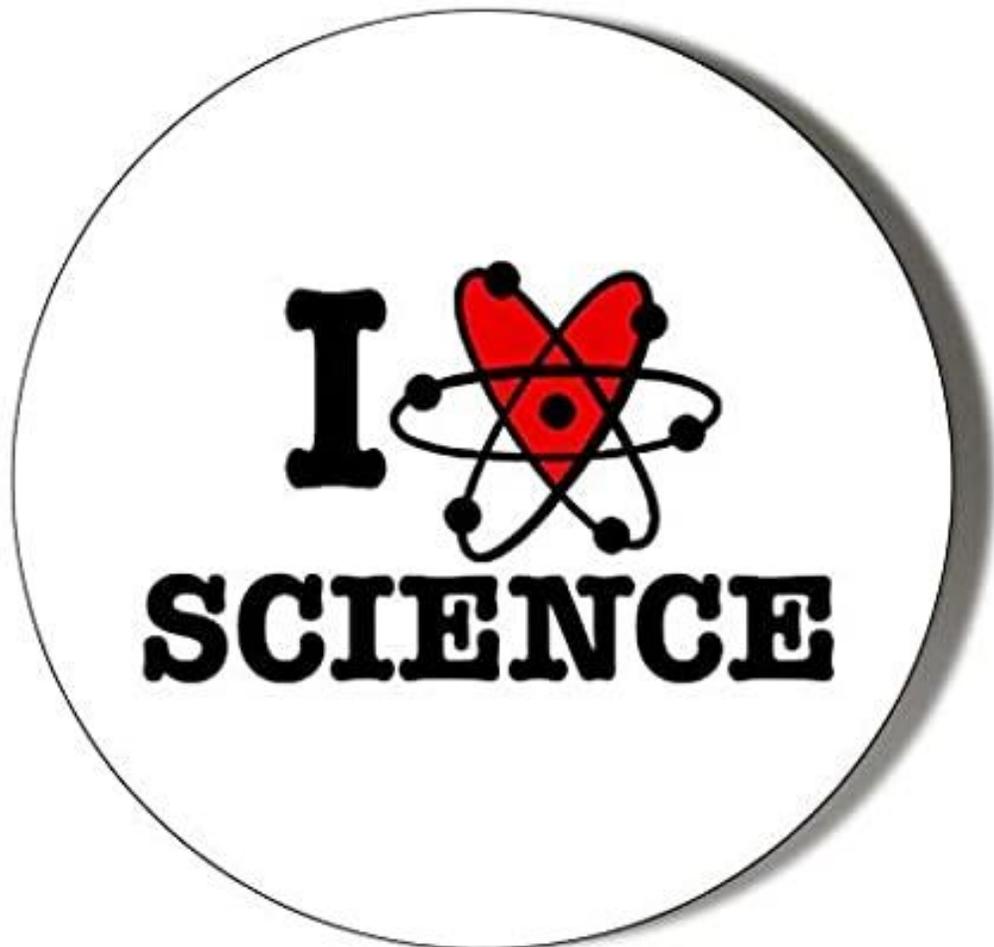
**Paperwork and Deadlines:** You must fill out the "Student Entry Form" and have your parent/guardian sign the "Student Permission and Release Form" Give this form to your teacher or school office **no later than Friday, March 5, 2021.**

Submit a 3–5-minute video of your project presentation **by 6:00 PM on Friday, March 19.** Research papers for traditional Science Projects can either be uploaded into Seesaw or turned into the Reavis School Office by **6:00 PM on March 19.**

**\*For grades K-5**, fill out the "Science Experiment Worksheet" on pages 12 and 13 of this packet and submit it via Seesaw or drop it off at the **Reavis School Office by 6:00 PM on Friday, March 19.**

**\*For grades 6-8**, fill out the Science Project Report and turn in into your Science teacher by **March 19 via Teams.**

**Final Hints: Start early! Science projects are a lot of fun, but remember to take time to research your topic, conduct your experiments, write your research, and reach meaningful conclusions.**



# SCIENCE PROJECT REPORT (PreK-5)

NAME: \_\_\_\_\_ GRADE: \_\_\_\_\_

QUESTION: \_\_\_\_\_

WHAT I THINK WILL HAPPEN (HYPOTHESIS): \_\_\_\_\_

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I WILL USE (EQUIPMENT): \_\_\_\_\_

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WHAT I PLAN TO DO (PROCEDURES): \_\_\_\_\_

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WHAT HAPPENED (RESULTS): \_\_\_\_\_

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WHAT I FOUND OUT (CONCLUSION): \_\_\_\_\_

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# Science Project Report

## Grades 6-8

<b>Student Name:</b>	
<b>Name of Project:</b>	
<b>Science Category of Project:</b>	

<b>Testable question:</b>	
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<b>Hypothesis:</b>	(if...then...because)
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<b>Description of Project:</b>	

<b>Research: ( A few paragraphs about the background of your project)</b>	

<b>Variables:</b>	
<b>Independent:</b>	
<b>Dependent:</b>	
<b>Controlled:</b>	

<b>Purpose:</b> (Please include the question you are testing, your hypothesis, and why you are conducting your experiment)	

**Materials:** (Please list any materials you will be using during this project)

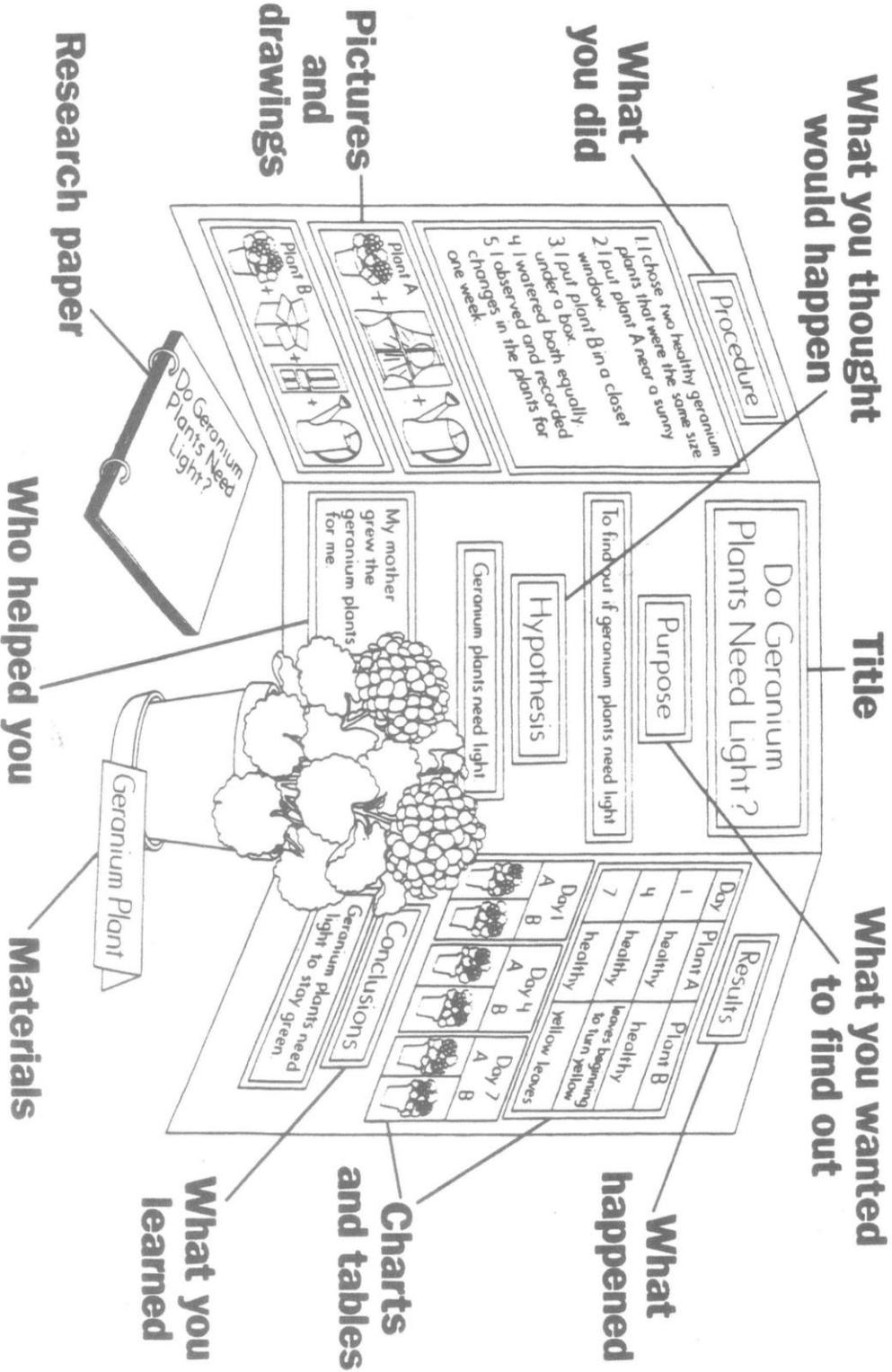

**Procedure:** (Explain what you did to test your hypothesis. Do not list each step, but give a general overview of what you did)


**Results:** (You can add a graph, chart, or describe/list your data here)


**Conclusion:** (Your findings. Summary of your experiment, hypothesis, and results. What was the answer to your testable question? According to my data, my hypothesis was...right or wrong because...I think this happened because...Connect to research...If I were to do this experiment again I would...


**Bibliography:** (List sources used when doing your research)


# Displaying a Science Fair Project



# **GUIDELINES FOR TRADITIONAL PROJECTS**

The following questions should be considered as you complete your project. However, keep in mind this is only a guideline.

1. Scientific Approach
  - a.) Has student posed a specific question?
  - b.) Has a scientific method, experimentation and recording results, been used?
  - c.) Did the student draw a conclusion based on observations and data?
  - d.) Has the student acquired scientific knowledge by doing this project?
2. Thoroughness
  - a.) How completely has the problem been investigated?
  - b.) How well did the student plan the project?
  - c.) Does the project do what it intended to do?
3. Originality
  - a.) Has material been gathered from various sources and reorganized according to the student's own thinking?
  - b.) Has the student used a creative approach?
4. Knowledge Gained
  - a.) Did the student profit educationally by doing this project?
  - b.) Considering the age and experience of the student, does the project make use of his/her abilities?
  - c.) Does the student understand the research and how it relates to the results?
5. Oral Presentation
  - a.) Can the student explain the hypothesis and the procedures used?
  - b.) Can the student speak fluently with good eye contact?
  - c.) Can the student explain all visual aids?
6. Display
  - a.) Is the display neat, attractive, and colorful?
  - b.) Are graphs and data tables clearly labeled?
  - c.) Is display 3 sided and self-supporting?
  - d.) Does the display include charts, graphs, and pictures?
7. Written Report or Worksheet on Pages 12 and 13 (Worksheet for K-5 Only)
  - a.) Does the report include cover page and bibliography?
  - b.) Is the background information thorough?
  - c.) Are materials and procedures listed?

## **Engineering Project Ideas and Websites**

Engineering projects for kids help children think creatively, critically, and prepare them for higher concepts like algebra and geometry. An engineering project is a project that kids can do that test their design skills. Engineering projects are the ultimate STEAM activity. In an engineering project, kids use science to identify a problem to correct and to find out what the best solution may be. In addition to learning about the process of trial and error, they use technology to help determine the best design solution for a project. They use math to design and build their project. And often, you can also use artistic expression in an engineering project!

Engineering projects often include building elements found around the house such as cardboard, tape, index cards, rubber bands, string, glue, velcro, foam, and bubble wrap. Other materials could include blocks, toy materials, Legos, or technology elements, like circuits and electronics.

Below are some ideas for projects along with links to websites that can get you started. Feel free to think outside the box and come up with your own version of an engineering project. Please reference the scoring rubric on page 15 to note what will need to be included with the project when presented in the video submission.

### **Egg Drop Engineering Project**

<https://www.steamsational.com/egg-drop-engineering-project/>

Kids will love this classic egg drop engineering project. Can you keep the egg from breaking? What materials are best for cushioning the fall and why?

### **Spaghetti Engineering Project**

<https://www.steamsational.com/spaghetti-engineering-project/>

Learn about how the strength of an object sometimes requires fortification in this extremely simple engineering project using dried spaghetti noodles.

### **Q-Tip Bridge Engineering Project**

<https://www.steamsational.com/q-tip-bridge/>

Test the construction skills of your children with the Q-tip bridge challenge! Use Q-tips and hot glue to create structurally sound bridges and structure.

### **Mechanical Properties Engineering Project**

<https://www.steamsational.com/engineering-activities-for-kids/>

Part of being a good engineering is knowing the mechanical properties of each material that you work with. Use this simple project to determine the mechanical properties of aluminum foil.

### **Paper Airplane Engineering Project**

<https://www.steamsational.com/paper-airplane-engineering-challenge/>

What kid doesn't like paper airplanes? Use this easy engineering project to build a better paper airplane. What modifications will cause the plane to flip, glide far, or fly in a circle?

### **Egg Crate Airplane Engineering Project**

<https://www.steamsational.com/egg-crate-airplane/>

Can you make an airplane from egg crates that will really glide? What causes the plane to be heavier or lighter? What would make it glide better? Does Styrofoam work better than cardboard?

### **Suspension Bridge Engineering Project**

<https://leftbraincraftbrain.com/engineering-201-diy-recycled-suspension-bridge/>

A suspension bridge is a bridge in which the deck (the part that you drive across) is hung below suspension cables on vertical suspender cables. Typically, suspension bridges are built with two tall towers and a cable that travels from one shore, through the two towers and to the other shore. Vertical suspender cables hang from the main horizontal cable and hold the weight of the deck.

### **Windmill Engineering Project**

<https://www.adventure-in-a-box.com/how-to-make-a-windmill-model-with-a-printable-template/>

Make a windmill model at home and hold an engineering study with children! With a printable template, building your own toy windmill is a quick and easy STEM activity.

# **Engineering Projects and Links for Upper Elementary/Middle School**

“Ball Launcher Challenge”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p052/build-ball-launcher](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p052/build-ball-launcher)

“Effect of Friction on Objects in Motion”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p012/mechanical-engineering/effect-of-friction-on-objects-in-motion](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p012/mechanical-engineering/effect-of-friction-on-objects-in-motion)

“Volleyball Machine Challenge”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p054/volleyball-challenge](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p054/volleyball-challenge)

“Engineer a Cell Phone Stand”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p053/mechanical-engineering/engineer-cell-phone-stand](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p053/mechanical-engineering/engineer-cell-phone-stand)

“Rubber Band Elasticity and Temperature”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p026/mechanical-engineering/rubber-band-elasticity-and-temperature](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p026/mechanical-engineering/rubber-band-elasticity-and-temperature)

“Cricket Wicket Knockdown Challenge”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys\\_p111/physics/cricket-wicket-knockdown-challenge](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p111/physics/cricket-wicket-knockdown-challenge)

“Bomb’s Away Ping Pong Catapult”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p008/mechanical-engineering/ping-pong-catapult](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p008/mechanical-engineering/ping-pong-catapult)

“Moving Water with the Archimedes Screw Pump”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p039/mechanical-engineering/build-archimedes-screw-pump](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p039/mechanical-engineering/build-archimedes-screw-pump)

“Marble Machine”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p051/mechanical-engineering/marble-machine](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p051/mechanical-engineering/marble-machine)

“Jack it Up! Lift a Load Using Hydraulics”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p048/mechanical-engineering/lift-a-load-using-hydraulics](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p048/mechanical-engineering/lift-a-load-using-hydraulics)

“How Do Under-Inflated Tires Affect the Difficulty of Riding a Bike?”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p029/sports-science/how-do-under-inflated-tires-affect-the-difficulty-of-riding-a-bike](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p029/sports-science/how-do-under-inflated-tires-affect-the-difficulty-of-riding-a-bike)

“Applying Hooke's Law: Make Your Own Spring Scale”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p027/mechanical-engineering/hookes-law-make-your-own-spring-scale](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p027/mechanical-engineering/hookes-law-make-your-own-spring-scale)

“Crash! Can Cell Phones Survive a Drop Test?”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p050/mechanical-engineering/can-cell-phones-survive-a-drop-test](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p050/mechanical-engineering/can-cell-phones-survive-a-drop-test)

“Feeding Fido & Fluffy: Designing an Automatic Pet Feeder”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p046/mechanical-engineering/designing-an-automatic-pet-feeder](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p046/mechanical-engineering/designing-an-automatic-pet-feeder)

“Building a Model Hydraulic Knuckle Crane”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p049/mechanical-engineering/building-a-model-hydraulic-knuckle-crane](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p049/mechanical-engineering/building-a-model-hydraulic-knuckle-crane)

“Gears-Go-Round!”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p016/mechanical-engineering/gears](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p016/mechanical-engineering/gears)

“Give Yourself a Lift: Lightening the Load with Pulleys”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p010/mechanical-engineering/pulleys-lighten-loads](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p010/mechanical-engineering/pulleys-lighten-loads)

“You Nailed It! Hammering Force for Different Types of Wood”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p024/mechanical-engineering/hammering-force-for-different-types-of-wood](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p024/mechanical-engineering/hammering-force-for-different-types-of-wood)

“Domino Theory”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p034/mechanical-engineering/domino-theory](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p034/mechanical-engineering/domino-theory)

“Jack and Jill Went Up a Hill and Came Biking Down After: Choosing the Best Gear Ratio for Speed”

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p043/mechanical-engineering/biking-best-gear-ratio-for-speed](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p043/mechanical-engineering/biking-best-gear-ratio-for-speed)



# *Traditional Science Project IDEAS*

Science Fair topics can take you as far as your imagination will allow. Be creative! Some areas of study include: Natural Sciences, Biological Sciences, Zoology, Physics, Astronomy, Consumer Science, Microbiology, Earth Science, Botany, Chemistry, and Behavioral Sciences. To get you started, here are some possible research questions. You can find other topics at the library or on the Internet. A good place to start is [www.sciencebuddies.com](http://www.sciencebuddies.com)

1. How much salt does it take to float an egg?
2. What kind of juice cleans pennies best?
3. Which dish soap makes the most bubbles?
4. Do watches keep the same time?
5. How can you measure the strength of a magnet?
6. Do roots of a plant always grow downward?
7. Can you tell what something is just by touching it?
8. How long will it take a drop of food dye to color a glass of still water?
9. Does a bath use more or less water than a shower?
10. Can you tell where sound comes from when you are blindfolded?
11. Can plants grow without soil?
12. Does warm water freeze faster than cool water?
13. Do different types of apples have the same number of seeds?
14. Do bigger seeds produce bigger plants?
15. Which materials absorb the most water?
16. Do wheels reduce friction?
17. What holds two boards together better - a nail or a screw?
18. Will bananas brown faster on the counter or in the refrigerator?
19. Does temperature affect the growth of plants?
20. Chaos vs. the double slit theory: Which affects probability?
21. Does a ball roll farther on grass or dirt?
22. Do all objects fall to the ground at the same speed?
23. Do kids in my class have the same fingerprints?
24. Can things be identified just by their smell?
25. How do trees age?

## Science Fair Project Topics/Titles/Links for Upper Elementary/Middle School

<p><b>1</b> <b>Title:</b> How is the motion of a pendulum related to its length? <b>Category:</b> Physics <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p016/physics/pendulum-motion#summary">https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p016/physics/pendulum-motion#summary</a></p>
<p><b>2</b> <b>Title:</b> How does a hula hoop's circumference and mass affect the speed at which it spins? <b>Category:</b> Physics <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p088/physics/hula-hooping#summary">https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p088/physics/hula-hooping#summary</a></p>
<p><b>3</b> <b>Title:</b> What clothes keep you safe after dark? <b>Category:</b> Physics <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p104/physics/clothes-reflective-dark-night#summary">https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p104/physics/clothes-reflective-dark-night#summary</a></p>
<p><b>4</b> <b>Title:</b> How much weight can a maglev train hold? <b>Category:</b> Physics <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p093/physics/maglev-train-weight#summary">https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p093/physics/maglev-train-weight#summary</a></p>
<p><b>5</b> <b>Title:</b> What is the relationship between magnification and optical distance of a lens? <b>Category:</b> Physics <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p021/physics/magnifying">https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p021/physics/magnifying</a></p>
<p><b>6</b> <b>Title:</b> Can exercise really make our brains work better? <b>Category:</b> Sports Science/Psychology <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/Sports_p011/sports-science/exercise-brain-body-connection#summary">https://www.sciencebuddies.org/science-fair-projects/project-ideas/Sports_p011/sports-science/exercise-brain-body-connection#summary</a></p>
<p><b>7</b> <b>Title:</b> How much energy does dribbling take? <b>Category:</b> Sports Science/Physics <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/Sports_p037/sports-science/basketball-dribbling-energy#summary">https://www.sciencebuddies.org/science-fair-projects/project-ideas/Sports_p037/sports-science/basketball-dribbling-energy#summary</a></p>
<p><b>8</b> <b>Title:</b> How do under-inflated tires affect the difficulty of riding a bike? <b>Category:</b> Sports Science/Physics <b>Website:</b> <a href="https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p029/sports-science/how-do-under-inflated-tires-affect-the-difficulty-of-riding-a-bike#summary">https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p029/sports-science/how-do-under-inflated-tires-affect-the-difficulty-of-riding-a-bike#summary</a></p>

9

**Title:** What makes ice melt the fastest?

**Category:** Chemistry

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem\\_p049/chemistry/what-makes-ice-melt-fastest#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem_p049/chemistry/what-makes-ice-melt-fastest#summary)

10

**Title:** How does soap affect the surface tension of water?

**Category:** Chemistry

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem\\_p021/chemistry/measuring-surface-tension-of-water-with-a-penny#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem_p021/chemistry/measuring-surface-tension-of-water-with-a-penny#summary)

11

**Title:** How does temperature affect the rate of a chemical reaction?

**Category:** Chemistry

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem\\_p027/chemistry/alka-seltzer-effect-of-temperature-on-reaction-time#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem_p027/chemistry/alka-seltzer-effect-of-temperature-on-reaction-time#summary)

12

**Title:** How does reactant particle size affect the rate of a chemical reaction?

**Category:** Chemistry

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem\\_p028/chemistry/big-pieces-or-small-pieces-which-react-faster#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem_p028/chemistry/big-pieces-or-small-pieces-which-react-faster#summary)

13

**Title:** Are fingerprint patterns inherited?

**Category:** Life Science/Heredity

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Genom\\_p009/genetics-genomics/are-fingerprint-patterns-inherited#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Genom_p009/genetics-genomics/are-fingerprint-patterns-inherited#summary)

14

**Title:** How do mummification practices affect organic material?

**Category:** Life Science

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/HumBio\\_p022/human-biology-health/science-of-mummification](https://www.sciencebuddies.org/science-fair-projects/project-ideas/HumBio_p022/human-biology-health/science-of-mummification)

15

**Title:** Which bridge design is most stable?

**Category:** Civil Engineering/Physics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/CE\\_p012/civil-engineering/bridges-that-can-take-a-shake#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/CE_p012/civil-engineering/bridges-that-can-take-a-shake#summary)

16

**Title:** What bridge design can hold the most weight?

**Category:** Civil Engineering/Physics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/CE\\_p007/civil-engineering/suspension-bridges#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/CE_p007/civil-engineering/suspension-bridges#summary)

17

**Title:** At what diameter does an aluminum boat sink?

**Category:** Physical Science/Hydrodynamics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero\\_p044/aerodynamics-hydrodynamics/archimedes-diameter-boat-sink](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p044/aerodynamics-hydrodynamics/archimedes-diameter-boat-sink)

18

**Title:** How do adaptations affect swimming speed?

**Category:** Hydrodynamics/Life Science

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero\\_p014/aerodynamics-hydrodynamics/swimming-duck-feet#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p014/aerodynamics-hydrodynamics/swimming-duck-feet#summary)

19

**Title:** Do catapults help airplanes fly further and more accurately?

**Category:** Physical Science/Aerodynamics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero\\_p048/aerodynamics-hydrodynamics/launching-an-airplane-by-catapult#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p048/aerodynamics-hydrodynamics/launching-an-airplane-by-catapult#summary)

20

**Title:** How much weight can your boat float?

**Category:** Physical Science/Hydrodynamics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero\\_p020/aerodynamics-hydrodynamics/how-much-weight-can-your-boat-float#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p020/aerodynamics-hydrodynamics/how-much-weight-can-your-boat-float#summary)

21

**Title:** Does the size of a parachute affect its flight?

**Category:** Physical Science/Aerodynamics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero\\_p017/aerodynamics-hydrodynamics/parachutes-does-size-matter#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p017/aerodynamics-hydrodynamics/parachutes-does-size-matter#summary)

22

**Title:** What fin design best keeps a boat from rocking back and forth?

**Category:** Physical Science/Hydrodynamics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero\\_p038/aerodynamics-hydrodynamics/bilge-keel-boats#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p038/aerodynamics-hydrodynamics/bilge-keel-boats#summary)

23

**Title:** How greasy are your potato chips?

**Category:** Food Science

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/FoodSci\\_p048/cooking-food-science/how-greasy-are-your-potato-chips#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/FoodSci_p048/cooking-food-science/how-greasy-are-your-potato-chips#summary)

24

**Title:** How do food wrappings affect spoilage?

**Category:** Food Science

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/FoodSci\\_p025/cooking-food-science/how-food-wrappings-affect-spoilage#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/FoodSci_p025/cooking-food-science/how-food-wrappings-affect-spoilage#summary)

**25**

**Title:** How much baking powder do muffins need?

**Category:** Food Science

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/FoodSci\\_p007/cooking-food-science/how-much-baking-powder-do-quick-breads-need#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/FoodSci_p007/cooking-food-science/how-much-baking-powder-do-quick-breads-need#summary)

**26**

**Title:** How is the size of a meteorite related to the size of the crater it makes upon impact?

**Category:** Physical Science/Astronomy

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Astro\\_p010/astronomy/craters-and-meteorites#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Astro_p010/astronomy/craters-and-meteorites#summary)

**27**

**Title:** Do distractions affect driving video game scores?

**Category:** Safety Science/Human Behavior

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Games\\_p018/video-computer-games/distracted-driver-do-distractions-affect-driving-video-game-scores#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Games_p018/video-computer-games/distracted-driver-do-distractions-affect-driving-video-game-scores#summary)

**28**

**Title:** How does temperature affect the expansion and contraction of gases?

**Category:** Physical Science/Chemistry

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem\\_p077/chemistry/balloon-morphing-how-gases-contract-and-expand#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem_p077/chemistry/balloon-morphing-how-gases-contract-and-expand#summary)

**29**

**Title:** How does the size of blood splatter correlate to the distance from which it fell?

**Category:** Physical Science/Forensics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys\\_p066/physics/forensics-measure-blood-splatter#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p066/physics/forensics-measure-blood-splatter#summary)

**30**

**Title:** How is rate of heat loss based on the surrounding temperature?

**Category:** Physical Science/Forensics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys\\_p079/physics/forensics-time-of-death#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p079/physics/forensics-time-of-death#summary)

**31**

**Title:** How does temperature affect the elasticity of a rubber band?

**Category:** Physical Science/Chemistry

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech\\_p026/mechanical-engineering/rubber-band-elasticity-and-temperature#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/ApMech_p026/mechanical-engineering/rubber-band-elasticity-and-temperature#summary)

**32**

**Title:** How does the length of a lever affect the effort it takes to lift an object?

**Category:** Physics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys\\_p065/physics/lever-lift#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p065/physics/lever-lift#summary)

33

**Title:** How salty does the sea have to be for an egg to float?

**Category:** Physical Science/Chemistry

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/OceanSci\\_p003/ocean-sciences/how-salty-does-the-sea-have-to-be-for-an-egg-to-float#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/OceanSci_p003/ocean-sciences/how-salty-does-the-sea-have-to-be-for-an-egg-to-float#summary)

34

**Title:** Does the temperature of a magnet affect its strength?

**Category:** Physical Science/Physics

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys\\_p025/physics/how-the-strength-of-a-magnet-varies-with-temperature#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p025/physics/how-the-strength-of-a-magnet-varies-with-temperature#summary)

35

**Title:** How does friction affect the slope angle at which a landslide occurs?

**Category:** Physical Science/Environmental Science

**Website:** [https://www.sciencebuddies.org/science-fair-projects/project-ideas/EnvEng\\_p035/environmental-engineering/landslides-what-causes-rocks-to-slide-down-a-slope#summary](https://www.sciencebuddies.org/science-fair-projects/project-ideas/EnvEng_p035/environmental-engineering/landslides-what-causes-rocks-to-slide-down-a-slope#summary)



# D158 Traditional Science Project Scoring Rubric 2021

Student Name: \_\_\_\_\_ Project Title: \_\_\_\_\_

## Presentation 1 2 3 4 5 6 7 8 9 10

What to look for- Relative to age

- Articulate speaking
- Clarity
- Eye contact with camera

## Visual Board/PowerPoint 1 2 3 4 5 6 7 8 9 10

What to look for- Relative to age

- Neat/well organized
- Visual Appeal (use of color, readable font, visible text)
- Grammar/Spelling
- Use of pictures and graphs

## Written Report 1 2 3 4 5 6 7 8 9 10

What to look for- Relative to age

- Content
- Organized
- Neatness
- Bibliography

## Knowledge gained

Student must answer the following questions in their video

- Why did you choose this project and what did you learn from it?
- What did you learn from your research, and did it match up with your conclusion?

1 2 3 4 5 6 7 8 9 10

Student must answer the following questions in their video

- What did you keep the same (controlled variable) while doing your experiment?
- What did you change (independent variable)? What did you measure and how did you measure it?

1 2 3 4 5 6 7 8 9 10

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Total Score \_\_\_\_\_ points

Outstanding (42-50) \_\_\_\_\_ First (35 - 41) \_\_\_\_\_ Second (0-34) \_\_\_\_\_

Judge's Comments:

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# D158 STEM Rubric: Engineering Project Evaluation 2021

Student Name: \_\_\_\_\_ Project Title: \_\_\_\_\_

Grading for this portion:

**1-2:** Below minimal criteria

**3:** Meets minimal criteria

**4:** Exceeds minimal criteria

**5:** Excellent; thoroughly understands concepts

<b>Overall Oral Presentation of Knowledge:</b> Student Should: <ul style="list-style-type: none"> <li>Demonstrate knowledge of project and communicate clearly</li> <li>Give the audience the “I know what I’m talking about” feeling</li> </ul>	1 2 3 4 5
<b>Ask/Identify:</b> Student had a problem to solve. Has ideas on how to solve the problem and identifies the criteria, constraints, and intent of the problem.	1 2 3 4 5
<b>Imagine:</b> Student brainstorms a clear, focused idea. Ideas are aligned to the problem.	1 2 3 4 5
<b>Design &amp; Create Plan:</b> Student designs a plan and builds a working model that aligns with criteria, constraints, and intent of the problem.	1 2 3 4 5
<b>Testing:</b> Student tests the working model’s effectiveness to solve the problem.	1 2 3 4 5
<b>Data &amp; Analysis:</b> Testing data organized through charts, tables, and/or graphs.	1 2 3 4 5
<b>Validation &amp; Verification:</b> References problem/objective and uses data or research to support their final design.	1 2 3 4 5
<b>Improve:</b> Student describes steps they would or did take to improve their design.	1 2 3 4 5
<b>Project Log/Report/Bibliography:</b> Record of student observations, data results, analysis, and evidence of research.	1 2 3 4 5
<b>Display:</b> Neat, organized PowerPoint, poster, or trifold about experiment.	1 2 3 4 5

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**Total Score** \_\_\_\_\_ **points**

**Outstanding (42-50)** \_\_\_\_\_ **First (35 - 41)** \_\_\_\_\_ **Second (0-34)** \_\_\_\_\_

**Judge’s Comments:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**PLEASE RETURN TO YOUR TEACHER OR SCHOOL  
BY MARCH 5, 2021**

**SCIENCE & ENGINEERING FAIR STUDENT ENTRY FORM**

*Please print the following information:*

Student's Name: \_\_\_\_\_ Age: \_\_\_\_\_

Teacher: \_\_\_\_\_ Grade: \_\_\_\_\_

Project Title: \_\_\_\_\_

Project Description: \_\_\_\_\_

Project Classification (circle one of the following)

- |               |                    |                  |
|---------------|--------------------|------------------|
| Electricity   | Botany             | Engineering/STEM |
| Earth Science | Zoology            | Human Biology    |
| Physics       | Astronomy          | General Biology  |
| Chemistry     | Behavioral Science | Consumer Science |

List Project Resources (reference materials, books, adult resources, etc.).

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**STUDENT PERMISSION AND RELEASE FORM DISTRICT #158**

I hereby give permission for \_\_\_\_\_ to participate in the School District 158 Science & Engineering Fair. I agree to not hold School District 158 responsible for any accidents or injuries resulting from participation in the fair. I allow for my child's video to be uploaded and viewed by D158 staff and volunteer judges. I allow D158 to post a video that includes my child, their name, entry, and award received as well as permission to utilize video submission footage from my child's project for publications made on [www.d158.net](http://www.d158.net).

Parent's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# Projects Checklist & Tips

- Pick your Topic
- Fill out and turn in Science and Engineering Entry Form (Page 28)
- Check your District Email for a Link to join the Lansing Area Science and Engineering Seesaw Class and Join
- Do Research on your Topic
- Experiments, Project Builds, Graphs, Pictures, Materials (depending on what applies to your topic)
- Display Board- Title, Purpose, Hypothesis, Procedure, Results, Conclusion (Page13 for example)
- Post a Picture of you with your Project on Seesaw (Don't forget to be proud and smile)
- Project Report (PreK-5 Page 9-10) (Grade 6-8 Page 11-12) Either post this on Seesaw or turn into Reavis School by **Friday, March 19.**
- Project Presentation Video (**3-5 minutes posted on Seesaw**)

## **Tips:**

- Choose an exciting topic that will interest and challenge you.
- Search your topic on the internet or at the Lansing Public Library and read about it. Spend time gathering background information that you can read and understand.
- Take the information you read to answer the questions on the project report.
- Display your project in a neat and organized manner.

## **Oral Presentation:**

- Practice your presentation in front of a mirror, your family, or your friends and ask for feedback!
- Maintain **eye contact** with the camera! Don't spend the whole time looking at your board – your virtual audience will be a lot more interested if you are speaking directly to them!
- Speak **LOUDLY, CLEARLY, and SLOWLY** so that you can be heard on camera.

## **Video Introduction and Tutorial for Seesaw:**

<https://youtu.be/q5jG9VoROFs>

## **Other Student Links:**

<https://www.d158.net/o/lsd158/page/student-links--71>

[www.sciencebuddies.com](http://www.sciencebuddies.com)