

58th Annual
**Research and
Development Forum**

Friday, May 1, 2020 & Saturday, May 2, 2020

**Student, Parent, and Teacher
Information Booklet**



SHAWNEE MISSION
SCHOOL DISTRICT

Acknowledgments

The Research & Development Forum Inf was developed to help teachers guide students and parents through the Research & Development (R&D) process of preparing and entering a project in the Forum.

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Deputy Superintendent

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Research & Development Forum Leadership Team

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Christopher Villarreal, *Curriculum Coordinator*

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General Information

The Research and Development Forum is a showcase of student projects and displays that illustrate the academic excellence of Shawnee Mission Schools. Projects displayed at the Forum include art and science projects from elementary, middle school, and high school students. Additionally there are student projects submitted from the middle and high school grade levels in the Career and Technical Education (CTE) areas—Business, Family and Consumer Sciences, Industrial Technology, Teacher Education, PLTW-Engineering, and Health Science Careers.

Schedule

Event	Date	Time
Exhibit Project Check-In and Drop Off	Friday, May 1, 2020	4:00 - 6:00 PM
Closed for Judging	Friday, May 1, 2020	6:30 - 9:30 PM
Interactives & Exhibits Open to the Public	Saturday, May 2, 2020	9:00 AM - 3:30 PM
Awards Ceremony & Reception	Saturday, May 2, 2020	4:00 - 5:00 PM
Project Pickup	Saturday, May 2, 2020	4:00 - 5:00 PM

Location

The R&D Forum is held at Shawnee Mission West High School, 8800 W 85th St, Overland Park, KS. Additional parking is available on the lower level on the south side of the building. Handicapped parking is available on both the upper and lower levels.

Project Check-In and Drop Off

Students may check-in and set up their Science or Career and Technical Education (CTE) projects on Friday, May 1st from 4:00 – 6:00 PM. Art teachers are responsible for bringing and displaying student artwork for the Forum on Friday, May 1st from 4:00-6:00 PM

Interactive Area (PreK-12):

What is the Interactive Area?

This area will include hands-on demonstrations that will highlight both Shawnee Mission student groups and local agencies that promote science, technology, engineering, art and math. The interactive area will be a place for families to participate and learn. These activities will be open to the public from 9:00 AM to 3:30 PM on May 2nd. This is not part of the judged R&D Forum.

Awards

Entries are judged according to established criteria for each category. Entries prejudged at the building level should meet the standard for a blue ribbon or red ribbon in order to be submitted to the Forum. Each entry is judged on its own merit. Entries may receive one of several types of awards including trophies, scholarships, and/or ribbons based on the level of the awards. The decisions of the R&D Forum judges are final. Late entries are eligible to be submitted for display.

Regnier Award: This is the highest award given in the R&D Forum. The award honors Mr. Vic Regnier and the Regnier family, the program benefactors.

Award of Distinction: This award signifies superior quality, merit or skill. The quality of the entry must surpass the criteria established for grand awards.

Grand Award: This award signifies truly unique achievement. Only blue ribbon recipients are considered for this recognition.

Judge's Choice: High School Art Projects Only

Blue Ribbon: Superior

Red Ribbon: Excellence

White Ribbon: Display only (participant)

Awards Ceremony

An awards ceremony will be held at the conclusion of the R&D Forum on Saturday, May 2, 2020 from 4:00 to 5:00 PM in the Shawnee Mission West Auditorium. The awards ceremony is held to honor the winners of the Regnier Awards, Awards of Distinction, and Grand Awards. Winners are notified by telephone on Saturday morning. Students should dress appropriately for the ceremony to receive their award or trophy.

Project Pickup

Students are responsible for picking up all Science or CTE project entries on Saturday, May 2nd between 4:00 – 5:00PM. Art Teachers are responsible for picking up all art work on Saturday, May 2nd between 4:00 and 5:00 PM. For security reasons, artwork will not be released to students.

All projects that are not picked up will be stored at the CAA building located at 8200 W 71st Street and will be available for pick up on Monday, May 4th through Friday, May 8th. Please call the CAA (913-993-6200) to arrange a time to pick up your project.

Group Sizes

An entry by a single student is classified **individual**. Awards are received by that student.

An entry submitted by two, three, or four students is considered a **group project**. Duplicate awards are given to each member of the group. All members of a group project may participate in the awards ceremony.

An entry submitted by five or more students is considered a **class project**. A single ribbon, trophy or other award is given for the project. One student is designated to represent the class at the awards ceremony.

Copyright

Students retain all rights to their projects. No project may be copied or photographed in any format without the direct consent of the student(s) submitting the project. All entries must include proper referencing and permission for use of copyrighted materials. Any violation of copyright laws is the student's responsibility. The Shawnee Mission School District shall not be held liable.

Security

The staff of the Shawnee Mission School District assumes NO responsibility for any project or exhibit. The Forum will be supervised by school staff and efforts will be made to protect projects, but security is NOT guaranteed.

R&D Forum Entry Procedures

Online application for student projects will open Thursday, December 19, 2019 and remain open to accept entries until April 10, 2020.

The student must be enrolled during the current school year in the appropriate Art, Science, or Career and Technical Education course to be eligible to submit an entry.

The following projects must be entered using the online entry form:

Art: High School Only

Science: Elementary, Middle and High School

CTE: All projects

The entry form can be found on the R&D Website:

<https://www.smsd.org/academics/rd-forum/student-entry-information>

The R&D Forum Entry Registration Form can also be accessed here:

<https://forms.gle/eqCFqPCq6YUwLDP9>

Information Needed for Online Entry Registration Form

- Student's Email Address (*must be their Shawnee Mission School District email address*)
- School Name (*select from the drop-down list*)
- Teacher Name (*should be the teacher for your Art, Science or CTE course*)
- Teacher's Email Address (*should be the teacher's Shawnee Mission School District email address*)
- Project/ Exhibit Title
- Entry Type (*Individual = 1 student, Group = 2-5 students, Class = More than 5 students*)
- Project Category (*select appropriate category from list; If you have questions about the category, please ask your teacher*)
- Include Special Accommodations (*if applicable*)
- Student ID and Name (*include information for all students involved in the project if more than one*)

Teacher Responsibilities

- Promote the Forum and encourage students to enter their projects
- Complete instructions to review student entries (*this information will be sent to teachers from Dan Gruman in April once the entry window has closed*)
- Use the rubric or criteria sheets to prejudge all projects submitted by your students

Art

Elementary and Middle School Artwork

Student artwork from each elementary and middle school will be showcased at the R&D Forum. Art teachers will select the student art projects to be on display. Students and families will be notified prior to the event if they will have artwork being showcased at the R&D Forum.

High School Artwork

High school students may enter their artwork into the R&D Forum to be judged and considered for an award. High school art entries will be evaluated on the criteria listed below. High school art projects must be submitted through the online registration form.

High School Art Judging Criteria

Content (Elements of Art): shows insight, knowledge, experience

Structure (Principles of Design): purposeful construction, craftsmanship

Innovation (Visual "Voice"): individual, original, genuine

High School Art Categories

Category	Category Name
901	Intro to Studio Art
902	Ceramics
903	Drawing
904	Painting
905	Jewelry/ Sculpture Studio
906	Photography
907	Digital Media

Career and Technical Education

Career and Technical Education Categories

Category	Category Type	Category Name
Business Education		
120	Business Education	Digital Design Projects
121	Business Education	Digital Design Portfolios
161	Business Education	Animation – Game Creation
162	Business Education	Animation – 2 Dimensional
164	Business Education	Animation – 3 Dimensional
Family & Consumer Sciences		
212	Family & Consumer Sciences	Apparel Clothing Construction
225	Family & Consumer Sciences	Teacher Education Career Portfolio-Notebook
226	Family & Consumer Sciences	Teacher Education Career E-Portfolio
260	Family & Consumer Sciences	Interior Design Essentials Sketchpads
261	Family & Consumer Sciences	Interior Design Essentials Room Design
265	Family & Consumer Sciences	Interior Design Studio Total House Design
274	Family & Consumer Sciences	Food Presentation, Styling and Photography
Health Science		
291	Health Science	Research & Development
Industrial Technology		
302	Industrial Technology	CO2 Car Competition Best Design
303	Industrial Technology	Projects in Industrial Technology

Industrial Technology (continued)		
304	Industrial Technology	GTT – Design and Modeling
305	Industrial Technology	GTT – Automation and Robotics
313	Industrial Technology	Welding – Novice
315	Industrial Technology	Welding – Open/ Advanced
320	Industrial Technology	Wood Design – Novice Large (1st year)
321	Industrial Technology	Wood Design – Novice Small (1st year)
322	Industrial Technology	Wood Design – Open Large (2nd year)
323	Industrial Technology	Wood Design – Open Small (2nd year)
324	Industrial Technology	Wood Design and Fabrication (3rd year)
325	Industrial Technology	Computer-Aided Manufacturing (4th year)
328	Industrial Technology	Wood Turning Projects (1st and 2nd year)
329	Industrial Technology	Wood Turning Projects (3rd and 4th year)
331	Industrial Technology	Architectural Design 1 House Plans – Stills or Animation
332	Industrial Technology	Industrial Working Drawings & Plans with 3D Model
333	Industrial Technology	Industrial Design Animation
335	Industrial Technology	Architectural Design 2 – Stills or Animation
351	Industrial Technology	PLTW Engineering Design Novice
353	Industrial Technology	PLTW Engineering Design Advanced
360	Industrial Technology	Engineering Project Display

Science Guidelines

All Science projects submitted for competition must meet the criteria for Experimental or Invention and will be evaluated for a white, red, or blue ribbon.

Experimental (4-12): This category is an entry that describes experimental investigations. For grades 7-12, each entry should include a Lab Report that follows the detailed scientific method and a digital display or a tri-fold display board. (See Rubric for Criteria)

Invention (4-12): This category is an entry that displays a unique and useful creation. (See Rubric for Criteria)

Showcase Projects: Grades 2 & 3 may submit showcase projects for display only. These projects will not be judged.

Science Categories

Category	Category Name
702	Science Experimental Grades 4-5
702	Science Experimental Grade 6
707	Science Experimental Grades 7-8
705	Science Experimental Grades 9-12 Biotechnology
706	Science Experimental Grades 9-12 Open
710	Science Inventions Grades 4-6
711	Science Inventions Grades 7-8
712	Science Inventions Grades 9-12
722	Science Showcase (Any Grade) Display Only- will not be judged

Rules and Policies

Vertebrate Animals: Students in grades 4-8 are prohibited from entering projects that involve the use of vertebrate animals in the experiments or testing of the project. Human subjects are an exception. The International Rules for Human Subjects must be followed. Students in grades 9-12 are allowed to use both vertebrate animals and human subjects. The students must follow the guidelines of the [International Rules for Pre-college Science Research](#).

Bacteria and Mold: Only students in grades 7-12 may enter bacteria culture studies. Proper safety protocols must be utilized and included in the procedure. Studies should take place in a laboratory or classroom supervised by a teacher or a microbiologist. Bacteria and mold studies are not allowed to be conducted in the student's home. Bacteria or mold cultures must be disposed of properly. Bacteria or mold cultures should not be included in the display. [The students must follow the guidelines of the International Rules for Pre-college Science Research](#).

Science Experimental Rubric, Grades 4-12

	4 Full Accomplishment	3 Substantial Accomplishment	2 Partial Accomplishment	1 Little or no Accomplishment
Introduction				
Is the Literature Reviewed ?	Yes , it demonstrates a thorough search.	Yes, but some areas were not addressed.	No, but some sources were used.	No , background material is missing.
Is the problem identified and precisely stated?	Yes , and it is realistic and appropriate limits have been established.	Yes, but the way it is stated may lead to erroneous conclusions.	No, but the reader has some idea of what is being attempted.	No , or it is stated in a way that was confusing to the reader.
Are the variables identified ?	Yes , the Independent, Dependent and Control Variables are all evident and stated clearly.	Yes , the Independent, Dependent and Control Variables are mostly evident, but not stated clearly.	No , all types of variables are not evident, but some are implied.	No , there are no clear evidences of the study variables.
Is the hypothesis testable and relevant to the problem?	Yes , it is logical, leads to the experiment and makes appropriate predictions.	Yes, but it may contain some illogical ideas or it may not precisely lead to the experiment.	No, but there is enough information that allows the reader to assume a hypothesis.	No , it is missing, or it does not lead to the experiment that follows.
Procedure				
Is the procedure logical, repeatable and appropriate to the hypothesis?	Yes , it is clear and could easily be replicated.	Yes, but there are some elements that may be difficult to replicate.	No, but there is enough information so that the reader has a general idea of what was done.	No , the procedure is missing or very confusing.
Are sample sizes large enough to create confidence?	Yes , sample sizes were large enough to be statistically significant.	Yes, but there could have been more.	No, but there was an attempt to collect enough data.	No , sample sizes were too small.
Is the investigation designed so that it tests the hypothesis ?	Yes , the data directly addresses the hypothesis.	Yes, but there may be some question as to its reliability.	No, but there is an awareness of the hypothesis.	No , the stated hypothesis wasn't tested.

Science Experimental Rubric, Grades 4-12 (continued)

Results

Are the data appropriate for the stated hypothesis?	Yes , they are clearly identified and appropriate statistics are included.	Yes, but it is difficult to determine trends, or appropriate statistics are not included.	No, but trends may be suggested, or maybe inappropriate statistics are included.	No , the data are missing or are inappropriate for the hypothesis.
Are the data presented correctly in graphs and/or tables ?	Yes , the data appear in correctly labeled tables and/or graphs.	Yes, but they are either incomplete or unclear in some details.	No, but there was an attempt to include data in a table.	No , the data were not presented in tables or graphs.
Are the results summarized accurately?	Yes , trends are recognized.	Yes, but there are a few areas that need clarification.	No , there may have been statements but some details of the data were ignored or incorrect.	No , there was no summary of the results.

Conclusion/Discussion

Are appropriate inferences and conclusions stated?	Yes , and it demonstrates an understanding of this research.	Yes, but it may not be completely logical or there may be some bias indicated.	No, but there was an attempt to infer relationships which were partly correct.	No , either it was missing or the data were misunderstood.
Display/Lab Report				
Does the display effectively communicate the experimental process used?	Yes , it is clear and easy to read.	Yes, but there are elements that are unclear.	No, but information is presented.	No , little can be understood from the display.
Is the Lab Report comprehensive? (Grades 7-12 Only)	Yes , the Lab Report contains all essential elements.	Yes, but there are elements that are unclear or missing.	No, but some additional information is presented in the report.	No , there is no additional information in the report.

Scoring

Add the Student Score and then place a checkmark in the appropriate box

Scale for Grades 4-6

____ 34 and Below White Ribbon (Participant)
 ____ 35-39 Red Ribbon
 ____ 40-48 Blue Ribbon/Consider for Higher Award

Scale for Grades 7-12

____ 38 and Below White Ribbon (Participant)
 ____ 39-43 Red Ribbon
 ____ 44-52 Blue Ribbon/Consider for a Higher Award

Science Invention Rubric, Grades 4-12

	4 Full Accomplishment	3 Substantial Accomplishment	2 Partial Accomplishment	1 Little or no Accomplishment
Report				
Is there a summary statement that identifies the problem or need?	Yes , it allows the reader to grasp the entire scope of the process.	Yes, but there are some areas that were not addressed.	No, but there are statements that have some relationship to the process.	No , there is no summary statement.
Is there documentation to show that this invention is original ?	Yes , many different sources were surveyed to determine that this product does not now exist.	Yes, but there is still some doubt as to its originality.	No, but the product may be original.	No , there is no documentation that any research was done.
Is the invention described ?	Yes , the problem being solved is clearly stated and the advantages of this invention are obvious.	Yes, but the description is lacking in some aspects.	No, but there are statements that refer to the invention.	No , there is no description.
Are there final drawings and/or schematics ?	Yes , they are accurate, detailed and all parts are labeled.	Yes, but they are somewhat different than the working model.	No, but rough sketches are included.	No , there are no drawings.
Is there evidence that the invention was tested ?	Yes , a description of the tests and their results are included (comments or graphs).	Yes, but the results are not complete.	No, but there is evidence that some testing was done.	No , there is no evidence of any tests being done.
Is there an analysis of the cost of this product?	Yes , all materials are accounted for and the selling price is included.	Yes, but there are some costs that were not anticipated.	No, but mention was made of costs.	No , there is no indication of cost analysis.
Are examples of benefits of the invention included?	Yes , the slogan is catchy and visuals are appropriate.	Yes, but it isn't clear what the product does.	No, but parts of the display might be useful for advertising purposes.	No , the invention is not advertised.

Science Invention Rubric, Grades 4-12 (continued)

Working Model

Was the working model constructed so that integrity with the original design is maintained?	Yes , it is constructed as it is illustrated or described in the report.	Yes, but there were a few minor changes.	No, but there was some semblance to the schematic.	No , the final model did not resemble the original design.
Is the model functional ?	Yes , the model was constructed well enough to function as desired.	Yes, but the operator needed to be careful to make it work right.	No, but one could make it function with effort.	No , it was not functional.

Display

Does the display represent the invention and research clearly ?	Yes , it is clear and easy to read.	Yes, but there are elements that are unclear.	No, but information is presented.	No , little can be understood from the display.
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Scoring

Add the Student Score and then place a checkmark in the appropriate box

- _____ 26 and Below White Ribbon (Participant)
- _____ 27-31 Red Ribbon
- _____ 32-40 Blue Ribbon/Consider for Higher Award