

## **SARSEF Fair Science and Engineering Judging Guidelines** **Pre K - Kindergarten**

The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

### **I. Research Question (15 pts.)**

- question/problem is something that this child or group of children genuinely might want to know or solve
- gives a reason for why this child (or children) wants to do the project
- is authentic to this age level
- question/problem is asked clearly and is something that might be possible for a child to answer/solve at this level (with assistance)
- question /problem is narrowed down in scope (specific, not too broad or too many other parts)

### **II. Design and Methodology (25 pts.)**

For ALL projects:

- evidence that the child/children thought of what needs to happen in order (“First, I will...” “Then I will...”)
- plan for how to collect data – i.e. place to make tally marks, drawing pictures along the way
- appropriate # of subjects i.e. plans to watch more than one anthill, measure speed of 2-3 toy cars
- plans adequate # of trials i.e. sends each car down ramp several times, watches ants in morning and afternoon

For those with an **Engineering** component:

- identifies a possible solution after observing/studying the problem
- comes up with an idea (drawing or note about their plan)
- develops a prototype/model that is different from what exists already
- plans at least one model variation, retrieval

**III. Execution: Data Collection, Analysis and Interpretation (25 pts.)** NOTE: adult help is allowed but somewhere in the project there should be evidence that it some or most of it was done by or with the child.

- followed same plan each time without too much variation i.e. does not change mind each trial tried to “stick to the plan”
- uses basic touch counting strategies up to ten “1, 2, 3...”
- makes a comparison, conclusion – using words like “More” or “Less” and “Bigger” or “Smaller”
- evidence that each child had their “hands-on” most parts of the project
- says what the answer to their question/ best solution was (more points if based on their collected data)
- recognizes the meaning of what was found - mentions why they did the project in the first place
- can say what they **wish** they could do next time or if there were no limits (i.e. money, time)
- For engineering component- shows changes to prototype made, based on results

### **IV. Creativity (20 pts.)**

*A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been widely done before or listed on Science Fair idea lists.*

- project demonstrates particular creativity for a young child in one or more Criteria I, II, III or V
- idea appears novel - at least to this child
- idea appears to be what student genuinely cares about as evidenced by reason given for doing project
- there is passion the project: reason, discussion of the plan, or end results

### **V. Presentation (15 pts.)**

- evidence the child experienced a science or engineering-related concept or skill and enjoyed the process
- evidence that a child did part of this project on their own
- evidence of the basic scientific/engineering process (question/problem, design, test, results, conclusion)
- logical organization of display (drawings only are fine, expected)
- visual illustration of some part of the process, hand-drawn, graph made out of Legos, M&M's, etc.

## **SARSEF Fair Science and Engineering Judging Guidelines Grades 1-2**

The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

### **I. Research Question (15 pts.)**

- question/problem is something that this child or group of children genuinely might want to know or solve
- gives a reason for why this child wants to do the project
- is authentic to this age level
- question/problem is asked clearly and is something that might be possible for a child to answer/solve at this level (with assistance)
- question/problem is narrowed down in scope, specific (can include other parts but not too many)

### **II. Design and Methodology (25 pts.)**

For ALL projects:

- evidence that the child thought of what needs to happen in order, numbered step by step plan (“1., 2., 3....”)
- plan for collecting data – i.e. place to record times or numbers observed, and/or illustrated changes to prototype
- appropriate # of subjects i.e. plans to watch more than one girl and boy race, measure several ages’ reactions
- plans adequate # of trials i.e. rolls different balls several times, watches birds in trees for several days

For those with an **Engineering** component:

- identifies a possible solution after observing/studying the problem
- comes up with an idea (drawing or notes about their plan)
- develops a prototype/model that is different from what exists already
- plans at least one model variation, retrieval

### **III. Execution: Data Collection, Analysis and Interpretation (25 pts.)**

- followed the plan without too much variation i.e. does not switch ways of doing things each time
- evidence of basic math such as counting, adding to find totals and subtracting to find differences
- compares using words like “Greater than” and “Less than” or “More” and “Fewer” or “Larger” and “Smaller”
- evidence that each child had their “hands-on” most parts of the project, were actively present, involved
- says what the answer to their question or best solution was, forms conclusion (more points if based on their collected data)
- recognizes the meaning of what was found - mentions why they did the project in the first place
- can say what they **wish** they could do next time, what hope to find/do some day
- For engineering component- shows changes to prototype made, based on results

### **IV. Creativity (20 pts.)**

*A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been widely done before or listed on Science Fair idea lists.*

- project demonstrates particular creativity in one or more Criteria I, II, III or V
- idea appears novel - at least to this child
- idea appears to be what student genuinely cares about as evidenced by reason given for doing project
- there is passion about the project: reason, discussion of the plan, or end results

### **V. Presentation (15 pts.)**

- evidence the child experienced a science-related concept or skill
- evidence that a child did some parts of this project on their own or was actively engaged in all parts
- evidence of the basic scientific process (question, test, results, conclusion)
- logical organization of display (handwritten is fine)
- visual illustration of some part of the process, graphs can be made out of Legos, M&M’s, drawn etc.

## **SARSEF Fair Science and Engineering Judging Guidelines Grades 3-5**

The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

### **I. Research Question (15 pts.)**

- project has a clear and focused purpose
- idea is a question/problem that needs solving in student's life, school, community, world
- the answer is not already obvious or out there if a simple search is conducted
- idea is testable using a scientific process, can be retested AND/OR definition of criteria for proposed solution and explanation of constraints

### **II. Design and Methodology (25 pts.)**

- exploration of several alternatives to answer need/problem
- has a step by step plan and data collection methods that are consistent AND/OR realistic plan for development of an actual prototype/model for testing
- clearly written step by step plan to follow so other could do the same test, data collection, and/or construction
- identification of variables that either cannot be controlled or were not anticipated, but might affect the results
- considered what would be the appropriate # of subjects or prototypes, adequate # of planned trials and retrials
- has a test group and a control group (if appropriate), or multiple groups for testing AND/OR identification of a possible solution that is practical, reasonable, doable

### **III. Execution: Data Collection, Analysis and Interpretation (25 pts.)**

#### For ALL projects:

- followed same planned method/process each time - not too much variation between trails
- enough data collected to reasonably answer question, allow for analysis of data
- appropriate application of mathematical methods for comparison – use of fractions, averaging
- forms a conclusion based on the data and evidence, refers to data
- recognition of potential impact of what was done
- refers back to the original question or problem, ideas for further research
- include what challenges were presented, can say what they wish they could do differently or next time

#### For those with an **Engineering** component- Construction and Testing:

- prototype demonstrates the intended design or variation
- prototype was tested in more than one condition, and in multiple trials
- documents changes made based on results

### **IV. Creativity (20 pts.)**

*A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been widely done before or listed on Science Fair idea lists.*

- project demonstrates significant creativity in one or more Criteria I, II, III or V
- idea appears novel – at least to the student (not copied or seen repeatedly)
- idea appears to be something that student genuinely cares about, passion or enthusiasm is communicated

### **V. Presentation (15 pts.)**

- clear communication and evidence of understanding basic science/engineering concepts relevant to project
- logical organization of display facilitate communication of project
- graphics (photo or drawing) including a basic graph of some kind
- extra points for mentioning references, supporting documentation listed on board or notebook