The Dana Foundation

Design a Brain Experiment Competition

The Dana Foundation is dedicated to promoting curiosity about brain research in schools across the country. Encouraging students to take an interest in scientific research, especially related to the brain, is crucial, not only for students, but also for the future development of neuroscience. As part of this commitment to education, the Dana Foundation is sponsoring a competition for high school students in the United States.

The competition challenges students to use their knowledge of the brain and the scientific method of inquiry to develop innovative ideas and theories about the human brain. These original experiments should be designed to test creative theories about daily brain activity, brain disorders and diseases, and brain functions. However, **students/classrooms should not complete their experiments**. Students should view these submissions as research proposals rather than completed research.

Experiments will be judged on creativity and originality as well as adherence to the scientific method. Students and classrooms must submit their experiments through a teacher or other school or program official. They will compete for a $500 first place prize and a $250 second place prize to be awarded to the winning schools or sponsoring nonprofit institutions.

Deadline:

Send entries saved as Microsoft Word documents to competition@dana.org no later than **Wednesday, January 11, 2017**.

Please download and attach a completed Entry Cover Sheet to each submission.

First and second place winners will be announced during Brain Awareness Week (March 13-19, 2017).

Guidelines

1. The competition is open to public and private high schools, school-affiliated after-school programs, and after-school programs sponsored by not-for-profit institutions (e.g. museums and universities).
    a. Homeschooled students are welcome to apply through their designated parent/teacher, however are not eligible to collect cash prizes. Please see the "Winners" section for details.
2. All experiments must be submitted by a **high school teacher, school official,** or **after-school program coordinator**.
    a. Limit of **five submissions per instructor**.
3. Only students in **grades 9-12** may compete.
4. Students who place first or second must wait one year before they may compete again.
5. Submissions are limited to six pages (One Entry Cover Sheet + four pages for experiment + one page for references).
6. Submissions must come from the **United States** only.
7. Experiments must be the work of the students.
    a. Experiments must be original work (Students cannot copy or use a previously tested brain-related experiment)
    b. Citations are required for sources used.
8. Submissions received after the deadline will not be eligible for consideration.
9. Experiment designs not related to the brain and its functions and/or malfunctions will not be eligible.
10. Each submission must consist of a written description of the experiment following the scientific method including:
        i. **Purpose:** What is the goal of the experiment? What scientific question is it attempting to answer and why is it important?
        ii. **Hypothesis/Question:** What is the general theory that you are testing? What do you think the outcome of the experiment will be and why? What is the experiment anticipated to demonstrate if the hypothesis is correct?
        iii. **Background:** What current scientific information suggests that the hypothesis might be correct? Be sure to cite sources.
        iv. **Methodology:** Provide a detailed plan/blueprint of the step-by-step process for how you would conduct your experiment. The methodology section should contain a description of each step of the experiment including the necessary equipment (MRI, CAT, PET etc. scanners, electrical brain recording devices, videos, electron microscopes etc.), materials (such as autopsy tissue cultures etc.), and numbers of test participants. Describe what outcomes you will measure, and how you will measure them (include images/figures/charts if necessary).

v. **Results:** The Dana Foundation **does not want completed experiments** for submission. Instead of completing their experiments, students should describe how they would use their hypothetical results to prove or disprove their hypothesis if they were to carry out the experiment. This section need only include a brief description of how data would be utilized, organized, and analyzed in order to test the validity of the hypothesis.
vi. **Conclusions:** Students should discuss the implications of their proposed experiment on neuroscience and our understanding of the brain. First, a discussion of the implications if their hypothesis was proven correct. Second, a discussion of alternate outcomes and what they might suggest about the brain. And finally, the conclusion should also mention any further research that would be needed if the data were to suggest that their hypothesis was correct. Because the experiments are focused on the human brain, students should discuss any relevant ethical issues that might arise if they conducted their experiment.
vii. **Bibliography:** List 5-10 sources used for background scientific research.

Judging/Criteria

Experiments will be judged and scored based on a set of four categories. These categories will be judged on a 1-5 scale, five being the highest rating and one being the lowest. Thus, the highest possible score would be a 20. In the event that multiple experiments receive the same high score, the tiebreaker will go to the experiment that is judged to be most innovative and creative.

1. **Significance:** Experiment should have a meaningful purpose that is designed to improve our understanding of the brain. This includes brain disorders, brain health, brain anatomy, and function. Basically, experiments should attempt to prove or disprove a theory related to the brain that is both interesting and important to understanding the brain and how it functions or malfunctions.
2. **References & Scientific Knowledge:** Experiments should illustrate a knowledge and understanding of related scientific facts and theories. Students must cite all outside sources referenced or used in their submission.
3. **Adherence to the Scientific Method:** Experiments should show a basic adherence to the Scientific Method for scientific inquiry. To do so, the experiment should follow the steps detailed previously.
4. **Overall Presentation:** The highest ranking experiments in this category will be well organized, well-presented, and provide a clear and thoughtful design for an experiment that follows the guidelines.

Winners:

One winner and one runner-up will be chosen and announced during Brain Awareness Week in March 2017. The school or sponsoring not-for-profit institution affiliated with the winning submission will receive a $500 prize and the runner-up will receive a $250 prize. Additionally, both experiments will be posted on the Dana Foundation website and the students will receive a certificate from the Dana Foundation.

Homeschooled students are welcome to apply through their designated parent/teacher, however are not eligible for the cash prizes. If awarded first or second place, the student will receive the award certificate and be acknowledged in Dana Foundation media. The cash prize will be donated in the student's name to the Charles A. Dana Center.