Science Fair Brainstorming

Name: _____

Date: _____

It's that time of the year, time to start thinking about your Science Fair topic for the 2018-2019 school year. Please complete the guide below and have it turned in to your science teacher by August 17th. Topic selections are in a first-come basis. All projects must be unique and cannot be duplicated among each grade level. Remember, pick a topic to explore that solves a problem.

COMING UP WITH A PROJECT IDEA…

STEP 1 - BRAINSTORMING: ***First, you need to think of things that actually interest you in science.*** Do you like plants? Do you have a particular hobby? Do you like chemistry? This is the place to start brainstorming. You can come up with some possible questions about your topic that will take an experiment to answer. In the space below, outline three interests, and identify problems and questions that you can design an experiment around. Pick at least three possible topics and write a question for each topic. When you are finished, pick your top choice and write your experiment question on step 2.

THINGS I LIKE:	**What is a problem you see within this topic?**	**QUESTIONS ABOUT TOPIC:**
EXAMPLE: Gardening, and taking care of the environment	*PROBLEM: High levels of carbon dioxide in house hold air.*	*What type of house plants give off the most oxygen?*

PICKING A TOP CHOICE…

STEP 2- WHAT IS YOUR TOP CHOICE ON YOUR SCIENCE FAIR TOPIC?

Write the question that you are going to answer with an experiment for your TOP CHOICE on the line below.

_____

IS IT A GOOD PROJECT IDEA?

STEP 3 -Answer the questions below to ***see if you have a good topic/question to explore.***

Go to (https://sites.google.com/palmbeachschools.org/pbrsef/home?authuser=0) for guidelines on your science fair project.

1) **Does it meet guidelines?** *(no models, avoid human testing, no animal testing, no product testing, no brand testing, no projects that come from a pre-purchased kit, etc.)*

   ☐ *Yes, I know it meets guidelines because* _____

2) **Am I interested in the answer?**

☐ *Yes, I am interested in the answer because* _____

_____

3) **Can I find research on the topic?**

☐ *Yes. I did some research over the summer, and I found the following 4 websites that had really great information on my topic.*

_____

_____

4) **Does it solve a <u>problem</u> or address a <u>concern</u> or <u>need</u>? (circle one)**

☐ *Yes, the problem/concern/need is* _____

_____

5) **Can I do all or most of the project on my own?**

☐ *Yes, I can do the following on my own:* _____

6) **All projects need an experiment so that you may collect data. What kind of experiment will I do and what kind of data can I collect?**

☐ *The experiment I can do is* _____

☐ *The data I can collect is* _____

☐ *In order to collect this data, I would need to measure* _____

7) **What are the materials I think I'll need?**

☐ *I think I will need the following materials in order to conduct the experiment:* _____

_____

☐ I think I will need the following tools to measure my data: _____

8) **Will my parents and teacher approve of it?**

☐ *Yes, I'm sure they will approve my project choice because* _____

_____

FIGURING OUT YOUR CATEGORY…

STEP 4- WHAT CATEGORY WOULD YOU BE COMPETING UNDER?

Each project is entered into our school's Science Fair. You will be competing under one of the categories below. For more information about each category, please visit: https://student.societyforscience.org/intel-isef-categories-and-subcategories. You can also see the subcategories on the next page.

____ Animal Sciences
____ Behavioral & Social Sciences
____ Biomedical & Health Sciences
____ Cellular/ Molecular Biology & Biochemistry
____ Chemistry
____ Earth & Environmental Sciences
____ Engineering
____ Environmental Engineering
____ Intelligent Machines, Robotics and
____ Systems Software
____ Microbiology
____ Mathematics & Computational Sciences
____ Physics & Astronomy
____ Plant Sciences

Intel ISEF Categories and Subcategories

The categories have been established with the goal of better aligning judges and student projects for the judging at the Intel ISEF. Local, regional, state and country fairs may or may not choose to use these categories, dependent on the needs of their area. Please check with your affiliated fair(s) for the appropriate category listings at that level of competition.

Please visit our website at student.societyforscience.org/intel-isef-categories-and-subcategories for a full description and definition of the Intel ISEF categories:

ANIMAL SCIENCES
Animal Behavior
Cellular Studies
Development
Ecology
Genetics
Nutrition and Growth
Physiology
Systematics and Evolution
Other

BEHAVIORAL AND SOCIAL SCIENCES
Clinical and Developmental Psychology
Cognitive Psychology
Neuroscience
Physiological Psychology
Sociology and Social Psychology
Other

BIOCHEMISTRY
Analytical Biochemistry
General Biochemistry
Medical Biochemistry
Structural Biochemistry
Other

BIOMEDICAL AND HEALTH SCIENCES
Cell, Organ, and Systems Physiology
Genetics and Molecular Biology of Disease
Immunology
Nutrition and Natural Products
Pathophysiology
Other

BIOMEDICAL ENGINEERING
Biomaterials and Regenerative Medicine
Biomechanics
Biomedical Devices
Biomedical Imaging
Cell and Tissue Engineering
Synthetic Biology
Other

CELLULAR AND MOLECULAR BIOLOGY
Cell Physiology
Cellular Immunology
Genetics
Molecular Biology
Neurobiology
Other

CHEMISTRY
Analytical Chemistry
Computational Chemistry
Environmental Chemistry
Inorganic Chemistry
Materials Chemistry
Organic Chemistry
Physical Chemistry
Other

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS
Computational Biomodeling
Computational Epidemiology
Computational Evolutionary Biology
Computational Neuroscience
Computational Pharmacology
Genomics
Other

EARTH AND ENVIRONMENTAL SCIENCES
Atmospheric Science
Climate Science
Environmental Effects on Ecosystems
Geosciences
Water Science
Other

EMBEDDED SYSTEMS
Circuits
Internet of Things
Microcontrollers
Networking and Data Communications
Optics
Sensors
Signal Processing
Other

ENERGY: CHEMICAL
Alternative Fuels
Computational Energy Science
Fossil Fuel Energy
Fuel Cells and Battery Development
Microbial Fuel Cells
Solar Materials
Other

ENERGY: PHYSICAL
Hydro Power
Nuclear Power
Solar
Sustainable Design
Thermal Power
Wind
Other

ENGINEERING MECHANICS
Aerospace and Aeronautical Engineering
Civil Engineering
Computational Mechanics
Control Theory
Ground Vehicle Systems
Industrial Engineering-Processing
Mechanical Engineering
Naval Systems
Other

ENVIRONMENTAL ENGINEERING
Bioremediation
Land Reclamation
Pollution Control
Recycling and Waste Management
Water Resources Management
Other

MATERIALS SCIENCE
Biomaterials
Ceramic and Glasses
Composite Materials
Computation and Theory
Electronic, Optical and Magnetic Materials
Nanomaterials
Polymers
Other

MATHEMATICS
Algebra
Analysis
Combinatorics, Graph Theory, and Game Theory
Geometry and Topology
Number Theory
Probability and Statistics
Other

MICROBIOLOGY
Antimicrobials and Antibiotics
Applied Microbiology
Bacteriology
Environmental Microbiology
Microbial Genetics
Virology
Other

PHYSICS AND ASTRONOMY
Astronomy and Cosmology
Atomic, Molecular, and Optical Physics
Biological Physics
Condensed Matter and Materials
Mechanics
Nuclear and Particle Physics
Theoretical, Computational and Quantum Physics
Other

PLANT SCIENCES
Agriculture and Agronomy
Ecology
Genetics/Breeding
Growth and Development
Pathology
Plant Physiology
Systematics and Evolution
Other

ROBOTICS AND INTELLIGENT MACHINES
Biomechanics
Cognitive Systems
Control Theory
Machine Learning
Robot Kinematics
Other

SYSTEMS SOFTWARE
Algorithms
Cybersecurity
Databases
Human/Machine Interface
Languages and Operating Systems
Mobile Apps
Online Learning
Other

TRANSLATIONAL MEDICAL SCIENCES
Disease Detection and Diagnosis
Disease Prevention
Disease Treatment and Therapies
Drug Identification and Testing
Pre-Clinical Studies
Other

Science Fair Websites

Need help coming up with an idea? You can try the website below. Please remember that your project should be unique though, and not just a copy of a project you read about. Nonetheless, this should provide you with a good start.

Science Buddies: http://www.sciencebuddies.org/