

# ACHS Honors Science Summer Assignment

## When is the summer assignment due?

Your assignment is due on the 1<sup>st</sup> day of class.

## Why do I have to do a summer assignment and what is the summer assignment?

Students taking honors science course are required to complete a Science Fair project throughout the class. In order to get a head start on the project we are requiring the completion of a summer assignment.

The summer assignment is researching and developing **2 possible science fair topic** ideas. You are not required to have the exact title of your project developed over the summer; however, a general topic is needed. You must provide an explanation of how each project will be completed along with a list a materials needed to complete the project.

You will need to provide **3 sources** (book or internet) that provide information about each topic. Include as much information about the source as possible, such as URL, title, author, publication information, etc. This work beforehand eliminates issues later concerning cost of experimentation and availability of materials.

In addition, students must also begin identifying adult sponsors for the project. An adult sponsor is one who is knowledgeable about the subject being tested and will be able to assist the student in setting up and completing the experiment. Sometimes it is sufficient for the parent or guardian to act as the adult sponsor. However, please keep in mind that all projects using hazardous materials such as bacteria, mold, yeast, and any other microorganisms must be done in an approved lab setting. Such projects also require the advisement of a qualified scientist (someone with a degree in the subject area) as well as an adult sponsor. For example, local colleges can be contacted to request use of their facilities and will require a faculty member of that institution to be the qualified scientist. Teachers will not call and set up appointments with scientists for students. It is the responsibility of students to communicate with scientists.

Your ideas need to be testable, and can be from any of the following categories: Life Sciences, Chemistry, Earth Sciences, Engineering, Math, Computer Science or Physics. **Science fair projects must be experimental, not demonstrations. In other words, you need to generate an idea that can be tested using the scientific method.** Building a volcano is an example of a demonstration, and is not allowed. Also, think about how testable your idea is. Trying to determine the effect of height on gravity is not testable unless you are able to travel to a very high elevation to do your testing (we do not have elevations that high in Texas). **Also, your idea must be original.** Do not copy a science fair project idea from the internet, i.e. science fair buddies, etc.

Not all projects are acceptable. Read over the list of bad science fair project ideas and why they are bad before you choose your project idea. Make sure you will have access to the resources you need.

On the next two pages are examples of good and bad science fair project ideas, followed by the requirements for the summer project.

Category	Bad Science Fair Project Idea	Good Science Fair Project Idea
Animal Sciences	What effect do lost fishing lures have on the growth of fish? <b>NOT TESTABLE – YOU CAN NOT USE ANY VERTEBRATE ANIMALS INCLUDING FISH, MICE, GERBILS, CATS, DOGS, BIRDS, ETC. IN YOUR PROJECT.</b>	What effect do lost fishing lures have on the growth of crawfish? <b>YOU CAN TEST ON INVERTEBRATES SUCH AS CRAWFISH, SHRIMP, MEALWORMS, SNAILS, FRUIT FLIES, EARTHWORMS, ETC. LOOK FOR WHAT ORGANISMS ARE EASY TO PURCHASE ON-LINE OR AT A PET STORE.</b>

Category	Bad Science Fair Project Idea	Good Science Fair Project Idea
Medicine and Health Sciences	Does drinking caffeine affect your heart rate? <b>NOT TESTABLE – YOU CAN NOT GIVE YOUR FRIENDS ANYTHING TO EAT OR DRINK FOR YOUR PROJECT.</b>	Does caffeine affect the heart rate of daphnia? <b>YOU CAN USE A MODEL ORGANISM (INVERTEBRATE) TO TEST THE AFFECTS OF CHEMICALS SUCH AS CAFFEINE.</b>
Behavior and Social Sciences	Does playing violent video games for 4 hours a day make a person angry? <b>NOT TESTABLE – YOU CAN NOT DO ANYTHING THAT COULD MENTALLY OR PHYSICALLY HARM A PERSON. YOU CAN ONLY USE T OR E RATED VIDEO GAMES AND AGE APPROPRIATE MOVIES. NO R-RATED VIDEOS. ALL SONG LYRICS PEOPLE LISTEN TO NEED TO BE G- RATED.</b>	What is the correlation between the number of hours of video game playing and reaction time? <b>YOU CAN DO A SURVEY TO ASK PEOPLE HOW MANY HOURS THEY PLAY VIDEO GAMES AND THEN DO A REACTION TEST? THERE ARE A LOT OF SAFE SURVEYS AND TESTS THAT CAN BE DONE WITH PEOPLE.</b>

Microbiology	What kind of bacteria do I have growing in my house? <b>NOT TESTABLE – YOU ARE NOT ALLOWED TO GROW BACTERIA AT HOME.</b>	Does washing fruit reduce the amount of bacteria found on the fruit? <b>THERE ARE A LOT OF EXPERIMENTS THAT YOU CAN DO AT SCHOOL USING BACTERIA. JUST MAKE SURE THAT YOU GET YOUR PROCEDURE APPROVED BEFORE CARRYING OUT THE EXPERIMENT AND THAT YOU DO THE EXPERIMENT AT SCHOOL.</b>
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Physics	Can a hoverboard travel faster than a car? <b>NOT TESTABLE – YOU CAN'T BREAK ANY LAWS BY DRIVING A CAR OVER THE SPEED LIMIT TO SEE HOW FAST IT CAN GO. YOU ALSO PROBABLY CAN'T GET ACCESS TO A HOVERBOARD.</b>	What type of metal is the best conductor? <b>THERE ARE A LOT OF GOOD PHYSICS EXPERIMENTS THAT CAN BE DONE. YOU JUST HAVE TO MAKE SURE YOU HAVE THE SUPPLIES TO DO THEM. CHECK THE LIST OF EQUIPMENT AND TEST KITS THAT VRHS HAS AS WELL.</b>
Plant Sciences	Which makes a plant grow better: milk or soda? <b>NO SCIENTIFIC VALIDITY; NO FARMER WILL WATER THEIR PLANTS WITH SODA OR MILK.</b>	How does increasing the amount of nitrogen in the soil affect the height or number of leaves on a plant? <b>THERE ARE A LOT OF GOOD EXPERIMENTS THAT YOU CAN DO WITH PLANTS. YOU JUST NEED TO MAKE SURE YOU HAVE THE SUPPLIES TO DO THEM. CHECK THE LIST OF EQUIPMENT AND TEST KITS.</b>
Chemistry	What happens when you mix different chemicals together? <b>TOO VAGUE AND POTENTIALLY DANGEROUS.</b>	How does temperature affect the rate of a chemical reaction? <b>THERE ARE A LOT OF SAFE CHEMICAL EXPERIMENTS THAT YOU CAN DO. JUST MAKE SURE THAT YOU GET YOUR PROCEDURE APPROVED BEFORE CARRYING OUT THE EXPERIMENT.</b>

## Requirements (must be completed for all 2 ideas):

1. Choose a topic: pose a question. If internet resources are used for ideas, the project should be modified by the student. The student should design a new project and not copy a project already completed.
2. Research- Find books, journals, magazines, resource people, videos, and any other source that contains information pertaining to your chosen topic. You must find at least 3 sources and write a brief description of each source.
3. Methods and Materials (Procedures) - Written plan of how to carry out the experiment and what materials will be needed. Remember to check availability and price of materials. (This is not final but is a great way to avoid choosing a project that cannot be completed in the time allotted or being too expensive.
4. Identify Adult Sponsors
5. Identify qualified labs and scientists if applicable. (Non-hazardous materials do not require a lab)

All students are required to complete the Science Fair Topic Plan worksheet for each topic. They should turn all both topic worksheets on the first day school.

## Science Fair Topic Worksheet

(You should complete 1 worksheet for each of the 2 topics you choose)

Name: \_\_\_\_\_

### Proposed

Topic/Idea: \_\_\_\_\_

\_\_\_\_\_

### Research: You may write URLs or book titles

#### Source #1

URL or Book Title: \_\_\_\_\_

Summary: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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#### Source #2

URL or Book Title: \_\_\_\_\_

Summary: \_\_\_\_\_

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#### Source#3

URL or Book Title: \_\_\_\_\_

Summary: \_\_\_\_\_

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**Materials List**

**Cost:**

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**Proposed**

**Methods:** \_\_\_\_\_

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**Adult Sponsor:** \_\_\_\_\_ **Title:** \_\_\_\_\_

If working with hazardous materials please list the approved lab you will be conducting the experiment and the qualified scientist.

**Lab Name/Location:** \_\_\_\_\_

**Qualified Scientist:** \_\_\_\_\_

Please refer to the rules and guidelines located at [www.societyforscience.org/isef](http://www.societyforscience.org/isef) if you have any questions.

Parent Signature: \_\_\_\_\_ Student Signature: \_\_\_\_\_