Summer Project Program

WEEK 2

How to Plan Your Project

We hope you have now found a great project idea that you are excited about working on! If you are still deciding, don't worry – that's fine! We will send a new step every week, but you can work on the project at your own pace. The Lakota Science & Engineering Fair is not until January 2022, so if you don't finish over the summer, you will still have plenty of time to get it done.

START YOUR PROJECT NOTEBOOK - You should keep notes and records of everything you do related to your project, so you will have all the information you need at the end, when you are writing your project report. Each time you add notes, record the date on each page you use. Record your science project idea and hypothesis – what do you think is going to happen? Or for engineering projects, record your problem and prototype idea.

SELECT A COACH (OPTIONAL) - It can be helpful to have a teacher or other adult with expertise in science or engineering serve as a project Coach. A Coach is a resource who can provide insight and expertise to guide you. It is not their responsibility to direct you through the steps of the project.

RESEARCH YOUR IDEA - You probably already did some research when you were choosing a project idea, but now you can research your specific project to see what has been done before, what has worked and not worked, and how you can reimagine or improve upon similar projects you find. Record your research in your project notebook – write down ideas you have and where you got them.

HYPOTHESIS – For Science projects, what do you think is going to happen? Based on what you know or find out in your research, what do you think the results of your experiment will be? You should pick a hypothesis that you will be able to clearly prove or disprove with your testing. Record your hypothesis in your notebook, but it's OK if your experiment proves your hypothesis wrong.

DESIGN CRITERIA - For engineering projects, establish a design statement or criteria. Design criteria are the explicit goals that a project must achieve in order to be successful. Design criteria can be divided into primary and secondary criteria. Primary criteria are those that constitute a successful project; the project will be unsuccessful if it does not meet these goals. Your design criteria should be short but specific. You may find your first prototype does not meet your design criteria, and you need to modify it. That's OK – you can keep redesigning until you find a version that meets your design criteria, but record each version and why it was or was not successful.

GOOD PROJECT DESIGN

SCIENE – The judges will be looking to see that your project addresses a clear, focused problem or question with a hypothesis that is testable using scientific methods. You should have a well-designed plan that identifies your variables (things that you will change in your experiment) and controls (things that will be the same through the experiment). Sufficient data should be collected – think about how many times you should perform the experiment or how many data points you need to be confident your results are correct.

ENGINEERING – The judges will be looking to see that your project addresses a clear, focused engineering design problem or need, and your prototype is created and tested using engineering principles. They will want to see that your prototype testing is complete, and your data is accurately measured and analyzed. Your final prototype should meet your project design criteria.

PLAN YOUR TIMELINE - Make a list of the steps you will need to take in your project and estimate how long each one will take. Think about how much time you will need to gather your materials, set up, experiment, or build and test. Allow extra time in case you need to modify your experiment or redesign your prototype. If you would like to finish by the end of the summer, make sure your project timeline finishes by then. After your experiment is complete, you will still need to allow time to write your project report and create your trifold display (we will provide guidance on these steps in future weeks).

PLAN YOUR MATERIALS - Think through all the steps of your project and make a list of the materials you will need. You may be able to find some of the things you need in your home, but others may need to be purchased. If you need help with funds to buy the materials you need for your project, please reach out to us at LakotaScienceFair@gmail.com BEFORE you buy your materials. We may be able to help.

PROJECT DISPLAYS – Later in the summer, we will be talking about how to create a trifold display for your project. We have trifolds in a variety of colors that we can provide, so you don't have to buy one of these unless you want to.

HUMAN/ANIMAL RESEARCH – If you planning to do a project that involves researching using human or animal subjects, please read our relevant "Human Research" or "Animal Research" documents to understand what types of research we allow for projects entering in our fair. These documents are posted on our website at LakotaLEADS.org → Science Fair, or you can email us at LakotaScienceFair@gmail.com to request them. After reading the relevant document, if you believe your type of research will be acceptable, please email us with your name, grade, and a detailed description of the type of human or animal research you plan to do and wait for our approval before you begin.

Lakota LEADS
Lakota's Enrichment and Academic Development of Students

Do you want to discuss questions or concerns about your project?
Next Optional Zoom – Wednesday, June 16 at 2:00 PM.

Or e-mail us your question at LakotaScienceFair@gmail.com!
NEXT WEEK: How to Get Started