Problem Statement

DUE FRIDAY, 9/11/2020. Upload your problem statement to Archie.

Your Problem Statement should explain what it is you are trying to discover or prove. In other words, what question are you trying to answer with your experiment?

The following details must be included:

1. What are you going to **VARY**? (for example: Type of_____; amount of _____). "Vary" means that you are changing a detail to have **different groups**. Note: you can only change one detail between your different groups.
2. What are you going to **MEASURE**? Remember, data must be **quantifiable**; you must be able to measure and collect **data using numbers**.

You may want to consider the following formats as building blocks for your own problem statement:

- The purpose of this experiment is to study the effect of (insert what you will have different groups of) on (insert what you will be measuring)
    - For example: The purpose of this experiment is to study the effect of ball material on how high the ball will bounce.
- What is the effect of (insert what you will have different groups of) on (insert what you will be measuring)?
    - For example: What is the effect of chemical type on the removal of permanent marker?
- How does (insert what you will have different groups of) influence (insert what you will be measuring)?
    - For example: How does the number of trees influence the damage caused by hurricanes?

PROJECTS/ TOPICS THAT ARE NOT ALLOWED:

- No bacteria, live cultures, humans, or animals
- No building projects (volcanoes, bridge, etc), unless there is an independent variable. Projects that **don't** have an independent variable usually begin with "how to" statements
- No explosive projects/ launching rockets (alka-seltzer, soda, etc) because there isn't an accurate way to collect data, and it may be deemed unsafe by the district.
- Projects must have a reasonable application

Name: _____ Date: _____ Section: _____

PROBLEM STATEMENT FOR SCIENCE FAIR

Directions: Write your problem statement on the lines below and submit to Archie. You may also type your problem statement in a word/Google Doc and upload (don't forget to save it to your computer!! You will have to print and turn in your problem statement again for your final project)

_____

_____

_____

Students, please check with your parents to make sure they are OK with the project you are choosing!

SCIENCE FAIR IDEAS

You may use any of the ideas below for your science fair project.

TOPIC: CHEMISTRY

- How does temperature affect the ability of sugar (or salt) to dissolve?
- Do all red flowers have the same pigments/ chemicals that produce color?
- What brewing technique makes the strongest tea? Or coffee?
- Which fruits can ruin your gelatin dessert?
- Does one bad apple really spoil the rest of the bunch?
- Does the pH of juice change over time?
- Which type of orange has more vitamin C?
- Does lemon juice or sugar water preserve apple slices better?
- How fast does acid erode limestone?

TOPIC: EARTH AND ENVIRONMENTAL SCIENCES

- Which filtering method for water is best?
- Does pH affect copper corrosion in pennies?
- What is the Effect of Biodegradable Dye on the Evaporation Rates of Salt Water?
- Do different oceans in Miami have different salt contents?
- How do plants influence soil erosion?

TOPIC: ENGINEERING

- Does the size (or shape) of a boat change how much weight it can carry?
- Which bridge design holds the most weight - the arch bridge or the suspension bridge? (using LEGOS)
- What is the best material to put in a sandbag to prevent flooding?
- How does a change in the construction of a parachute affect flight? Parameters you could examine could include size, shape, material, or method of attachment.
- What material (or structure) would make the best catapult?

TOPIC: PLANT SCIENCES

- What natural pesticide is best?
- What chemicals in water affect plant growth the most?
- What conditions are the best for compost?
- Can plants tolerate grey water?
- What are the effects of hydrogen peroxide on the roots of plant cuttings or seed germinations?
- What type of underwater plants are best for keeping healthy water in fish tanks? (REMEMBER, YOU ARE JUST TESTING THE WATER, NOT THE FISH!! YOU CAN'T USE FISH)

TOPIC: ENVIRONMENTAL ENGINEERING

- Which type of bag/ storage will preserve food the longest?
- Does light affect the rate at which foods spoil?
- What food storage method is best for fruit ripening?
- Can all types of milk be turned into plastic?

TOPIC: PHYSICS

- Does temperature affect the height at which a ball can bounce?
- Radar Detection: what shapes make airplanes invisible?
- Can you use a magnet to find traces of iron in food, dollar bills, and other household materials?
- Compare the effectiveness of different types of insulation. Which keeps out the most heat or cold?

TOPIC: ASTRONOMY

- Do stars in constellations ever move apart? (compare at least 2 different constellations)
- What is the best model for making a home-made telescope? (you must compare at least 2 different models).
- What direction do stars appear to move in the night sky, eastward or westward?

TOPIC: CELLULAR/MOLECULAR BIOLOGY AND BIOCHEMISTRY

- What household product method is best for extracting DNA?
- What is the effect of heat on enzyme activity?