Independent Investigation ***Summer Brainstorming***

During the school year, you will embark on a six week inquiry based journey implementing the science investigation. You will use the scientific method to explore an area of science to learn more about how the natural world around us works.

In order to achieve this goal, you must EXPLORE, EXPLORE, EXPLORE!!! However, exploration is only a fraction of the journey, for every journey requires dedication.

As, Thomas Edison, one of the world’s greatest inventors was quoted to say, "Genius: one percent **inspiration** and 99 percent **perspiration**."

**Step 1**: Observe the world around you and think about questions that explore relationships and patterns between life occurrences. You may also use books and the internet to help generate your ideas.

**Step 2**: Using the brainstorm worksheet, write down a list of your inquiry based questions.

 Some examples of **acceptable** investigative questions include:

* What helps plants grow faster, water or saline solution?
* What concentration of rock salt can cement tolerate before it cracks?
* Does the material of a soccer ball influence the speed of a kick?

(notice these questions have variables that can be changed)

Some examples of **invalid** questions include:

* Why is the sky blue?
* How hot is Venus?
* What helps plant growth?

**Step 3**: Use the “Narrowing your ideas” worksheet to help you eliminate questions that are not suitable for an inquiry based investigation. ***READ*** *the directions carefully!*

**STOP** – if you are an incoming sixth grader.

**CONTINUE**- if you are an incoming seventh or eighth grader.

**Step 4:** After filling in the brainstorm sheet with thirteen possible inquiries and checking off the boxes that relate to your question, choose and star the top three inquiries that you would like to investigate. All three questions must have four of the five categories checked (purpose, change, measure, observation).

**Step 5:** For each of the three questions that you will choose, write exactly how your inquiry has a purpose, how it can be changed, measured and observed. Be specific and clear in your description of how the inquiry meets these standards.

IName Date Class

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nquiry #1: What helps plants grow faster, water or saline solution?

Purposeful:

Changeable:

Measureable:

Observable

Inquiry #2 Does the material of a soccer ball influence the speed of a kick

Purposeful:

Changeable:

Measureable:

Observable

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Independent Investigation

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date \_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_

Part 1: Brainstorming

*For part one you are going to decide on something to investigate. This deserves a lot of thought because you are going to be spending a lot of time investigating your question.*

Spend at least 45 minutes looking around you, looking through books and magazines, think about the things that we have learned about this year. These can be any questions that have peeked your interest from the past or ones that you always ask adults who could never give you the answer you are looking for. Then write down 15 ideas of for things that you could investigate under “Idea to Investigate”. After you’ve completed this section, refer to “Narrowing your Ideas” sheet to complete the five other columns on this sheet.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Idea to Investigate** | Interesting | Purpose | Change | Observe | Measure |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |
| 11 |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  |
| 13 |  |  |  |  |  |  |
| 14 |  |  |  |  |  |  |
| 15 |  |  |  |  |  |  |

Independent Investigation

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date \_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_

**Part II: *Narrowing your choices***

IMPORTANT NOTE:

> **A good scientific question is based on careful observation and can be investigated.**

There are many ways to investigate things but for this assignment we want to focus on things that we can investigate using an experiment. This is a little harder than just reading a book or visiting Wikipedia but it will be more interesting too. The following steps will help you to make sure that you have a question that you can investigate with an experiment. This should not be difficult, so have fun and see what you can do!

*1. In order for you to do a good job on this investigation the question you are investigating should be something that you are really interested in. You have to remember the investigation you choose has to be so interesting to you that you are willing to put forth 5 months of effort in investigating it****.* Label the first column on your question brainstorming page “interesting”. Put a check in the box next to the idea if the idea is really interesting to you.**

*2. In order to be a good question to do a science investigation it should have a purpose to humankind. It should be a project in which you can extend your findings to help others who may be struggling with a problem. It should be a solution to a problem or at least the beginning processes of a solution.* **Label the second column “Purpose”. Put a check in the box next to the idea if the idea is purposeful to humankind.**

*3. In order for you to do an experiment you must be able to change some part of the thing that you are investigating. For example you may be interested in what would happen if a car ran into a truck but it will be hard for you to do an experiment with cars or trucks since you don’t have a driver’s license. On the other hand you may wonder if some kinds of balls bounce higher than others and you can drop different types of balls to see how high they bounce.* **Label the fourth column “change”. Put a check in the box next to the idea if it involves something that you could change.**

*4. A good scientific question is based on observation.* **Label the third column “observation”. Read each of your ideas and put a check in the box next to the idea if the idea came from something that you learned or observed.**

*5. In order for you to do an experiment about this idea you must be able to measure something. Things that you can measure include temperature, size, a change of distance or height, a change of color, speed, hardness or softness, the volume or amount of something and probably a few others I haven’t thought of.* **Label the fifth column “measure” and put a check in the box next to the idea if it has something that you could measure.**

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**Part III: *Analyzing the Narrowed Ideas***

After completing part I and II, check which of the questions have all of the five right columns checked. If you do not have any columns with all five checked, then you must brainstorm more ideas to complete the investigations accurately. Place the top three questions that have all five columns checked below.

|  |
| --- |
| **Top Three Narrowed Ideas** |
| 1 |  |
| 2 |  |
| 3 |  |

For each of the top three narrowed ideas, explain why you believe they are interesting, purposeful, changeable, observable, and measureable in brief statements on the space provided to you.

|  |  |
| --- | --- |
| **Question #1 :**  |  |
| **How is this investigation interesting to you?** |  |
| **How is it purposeful to society?** |  |
| **How is it an investigation that allows for variables to be changed?** |  |
| **How will you be able to observe your investigation using your senses?** |  |
| **How is your investigation measureable?** |  |

|  |  |
| --- | --- |
| **Question #2 :**  |  |
| **How is this investigation interesting to you?** |  |
| **How is it purposeful to society?** |  |
| **How is it an investigation that allows for variables to be changed?** |  |
| **How will you be able to observe your investigation using your senses?** |  |
| **How is your investigation measureable?** |  |

|  |  |
| --- | --- |
| **Question #3 :**  |  |
| **How is this investigation interesting to you?** |  |
| **How is it purposeful to society?** |  |
| **How is it an investigation that allows for variables to be changed?** |  |
| **How will you be able to observe your investigation using your senses?** |  |
| **How is your investigation measureable?** |  |