

## INDEPENDENT INQUIRY INVESTIGATIONS

Scientific inquiry is the way scientists study the world and suggest explanations about what they see based on evidence. This includes these activities and thinking processes\*:

- ❑ Asking questions
- ❑ Proposing a hypothesis
- ❑ Planning investigations
- ❑ Conducting investigations
- ❑ Collecting data (evidence)
- ❑ Drawing a conclusion based on the evidence; developing an explanation
- ❑ Testing the explanation



Inquiry also includes\*:

- ❑ Making observations
- ❑ Asking questions
- ❑ Using books and other sources of information to see what is already known
- ❑ Reviewing what is already known from other experimental evidence
- ❑ Using tools to gather, analyze, and interpret data
- ❑ Proposing answers, explanations, and predictions
- ❑ Communicating the results

*\*Inquiry and the National Science Education Standards – A Guide for Teaching and Learning.* National Research Council. 2000. Pages 7 – 14.

Although we use different parts and different types of scientific inquiry all year long, we do not usually put all of the pieces together at one time. This project will give you the chance to do so. You will be able to conduct a complete inquiry investigation from start to finish.

Full inquiry takes a long time. We will take several weeks to do these investigations.

You will have class time to work on each part of the project; you should not have to do any of the project at home if you use your class time wisely.

The investigation is divided into six sections. Each separate part of the investigation will be assessed and graded. The sections are:

1. Asking the question or defining the problem
2. Researching the question or problem and developing a hypothesis
3. Designing an experiment to test your hypothesis
4. Conducting your experiment and collecting data
5. Analyzing your data and drawing conclusions
6. Communicating your results

Complete information about this investigation can be found on the class website at:

[www.science-class.net/photoproject](http://www.science-class.net/photoproject)

### *Parts of the Project*

**Part 1** – Asking a question or defining a problem:

- A testable, experimental / quantitative topic

**Part 2** – Research the question or problem and develop a hypothesis

- Background information from several sources / Review of Literature
- Hypothesis based on background information – use an *If, Then* statement

**Part 3** – Design an experiment to test the hypothesis

- Materials list
- Step – by – step procedure
- Drawing / photo of experimental set-up

**Part 4** – Conduct the experiment and collect data

- Chart to collect data
- Repeated trials

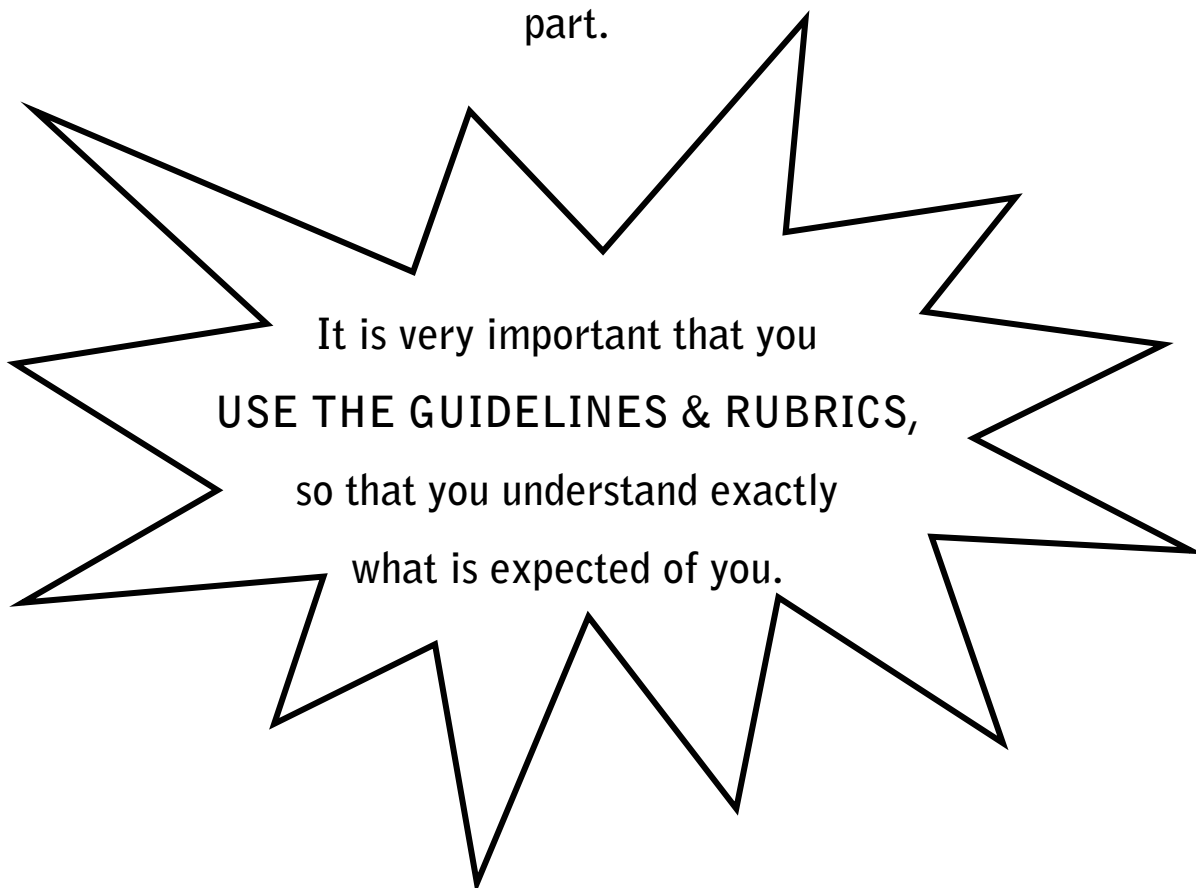
**Part 5** – Analyze data and draw conclusions

- Select and create appropriate graph to show data
- Look for patterns and trends in data
- Identify relationships in data
- Relate data to hypothesis – accept / reject hypothesis
- Infer and conclude new information from data
- Support conclusion with specific data
- Apply and expand your results

**Part 6** – Communicate results

- Investigation Journal
- Oral presentation with PowerPoint slide show

You will be given guidelines and rubrics for each part of the investigation. You will also have some class time for each part.



**NOTHING** about this project should be an unknown to you. If you are ever unsure about what you are to do: **READ YOUR HANDOUTS!** If you are still confused –**ASK!!!**

TEAMWORK



These projects will be done in teams of 3 - 5. Exceptions may be made to form smaller teams. NO EXCEPTIONS will be made to form larger teams. Don't even ask.

This is a MAJOR project; it will require a lot of work and cooperation. Sometimes your best friend is not the best work partner.

*Make your team decisions wisely.*

If a problem does arise within a team, try to problem – solve and work it out among the team first. If the situation cannot be worked out, come to me and I will resolve the issue.