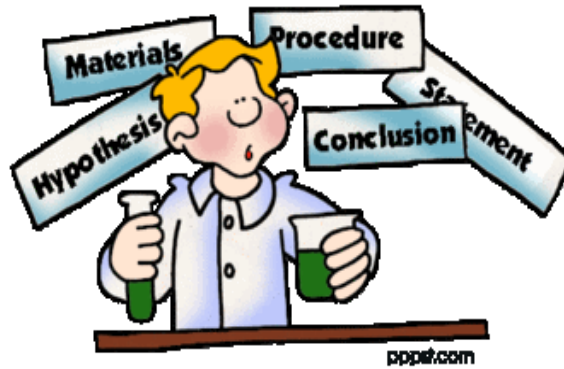


BRIDGEPREP ACADEMY SOUTH



2019 ELEMENTARY SCHOOL

SCIENCE FAIR PACKET

NAME _____

DUE _____

DEAR PARENTS AND STUDENTS,

AN ESSENTIAL COMPONENT OF THE BRIDGEPREP ACADEMY SOUTH'S SCIENCE PROGRAM FOR ELEMENTARY SCHOOL, STUDENTS ARE REQUIRED TO BE GRADED UPON THE COMPLETION OF A SCIENCE EXPERIMENT. ATTACHED YOU WILL FIND THE 2019 SCIENCE FAIR PACKET, WHICH CONTAINS ALL THE INFORMATION YOUR CHILD WILL NEED TO COMPLETE HIS/HER PROJECT.

PLEASE ENSURE THAT YOUR CHILD ADHERES TO THE GRADING CRITERIA LISTED IN THE PACKET.

YOUR SIGNATURE WILL BE REQUIRED TO CONFIRM YOU ARE AWARE OF ALL OF THE DUE DATES ASSOCIATED WITH THE PROJECT

THE SCIENCE PROJECT WILL COMPRISE A MAJOR PORTION OF YOUR CHILD'S SCIENCE GRADE FOR THE FIRST AND SECOND GRADING PERIODS. SCIENCE FAIR PROJECTS WILL BE DUE NOVEMBER 22, 2019.

YOUR REPORT AND FOLDER (THREE PRONGED) SHOULD HAVE:

- YOUR NAME,
- THE TITLE OF YOUR PROJECT AND
- CLASS PERIOD

PROJECTS ARE DUE ON: NOVEMBER 22, 2019.

* NO PROJECTS WILL BE ACCEPTED AFTER THIS DATE

*TASKS NOT COMPLETED BY SPECIFIED DUE DATE WILL EARN A 0, AND LOWER THE STUDENTS OVERALL SCIENCE PROJECT GRADE.

BRIDGEPREP ACADEMY SOUTH

SCIENCE FAIR GUIDELINES 2019

**THE COMPLETE PROJECT (LAB REPORT IN A FOLDER (THREE PRONGED) IS DUE
ON
NOVEMBER 22, 2019
THE PROJECT IS WORTH A SIGNIFICANT PORTION OF YOUR SCIENCE GRADE,
SO DO YOUR BEST!**

WEBSITES THAT MAY BE OF USE TO YOU:

[HTTP://SCIENCEFAIRPROJECT.VIRTUALAVE.NET/](http://SCIENCEFAIRPROJECT.VIRTUALAVE.NET/)

[HTTP://SCIENCEPAGE.ORG/SCIFAIR.HTM](http://SCIENCEPAGE.ORG/SCIFAIR.HTM),

[HTTP://WWW.CDLI.CA/SCIENCEFAIRS/INTERMED.HTML](http://WWW.CDLI.CA/SCIENCEFAIRS/INTERMED.HTML),

[HTTP://WWW.ALL-SCIENCE-FAIR-PROJECTS.COM/](http://WWW.ALL-SCIENCE-FAIR-PROJECTS.COM/)

[HTTP://WWW.JULIANTRUBIN.COM/SCIENCEFAIRPROJECTSAZ.HTML](http://WWW.JULIANTRUBIN.COM/SCIENCEFAIRPROJECTSAZ.HTML)

[HTTP://WWW.EDUCATION.COM/SCIENCE-FAIR/](http://WWW.EDUCATION.COM/SCIENCE-FAIR/)

[HTTP://HOMEWORKSPOT.COM/SCIENCEFAIR/](http://HOMEWORKSPOT.COM/SCIENCEFAIR/)

WWW.SCIENCE-IDEAS.COM/MIDDLE-PROJECTS.HTM

[HTTP://WWW.PREZI.COM/](http://WWW.PREZI.COM/)

[HTTP://WWW.BBCLEANINGSERVICE.COM/OFFICE/CHEMISTRY-BEHIND-CLEANING.HTML](http://WWW.BBCLEANINGSERVICE.COM/OFFICE/CHEMISTRY-BEHIND-CLEANING.HTML)

[HTTP://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/](http://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/)

[HTTP://WWW.SCIENCEBUDDIES.ORG/](http://WWW.SCIENCEBUDDIES.ORG/)

[HTTP://WWW.IPL.ORG/DIV/PROJECTGUIDE/](http://WWW.IPL.ORG/DIV/PROJECTGUIDE/)

[HTTP://SCIENCE.DADESCHOOLS.NET/SCIENCEFAIR/PDFNPPT/ALTERNATIVES TODISSECTION.DOC](http://SCIENCE.DADESCHOOLS.NET/SCIENCEFAIR/PDFNPPT/ALTERNATIVES TODISSECTION.DOC)

[HTTP://WWW.CPET.MFL.EDU/SCIPROJ](http://WWW.CPET.MFL.EDU/SCIPROJ)

[HTTP://SCIENCECLUB.ORG/SCIFAIR.HTML](http://SCIENCECLUB.ORG/SCIFAIR.HTML)

[HTTP://WWW.MADSCI.ORG/](http://WWW.MADSCI.ORG/)

[HTTP://MATHFORUM.ORG/TEACHERS/MATHPROJECT.HTML](http://MATHFORUM.ORG/TEACHERS/MATHPROJECT.HTML)

[HTTP://WWW.MADSCI.ORG/LIBS/AREAS/REAGENTS.HTML](http://WWW.MADSCI.ORG/LIBS/AREAS/REAGENTS.HTML)

[HTTP://FACULTY.WASHINGTON.EDU/CHMDLER/FAIR.HTML](http://FACULTY.WASHINGTON.EDU/CHMDLER/FAIR.HTML)

[HTTP://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/GETTING-STARTED.HTML](http://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/GETTING-STARTED.HTML)

[HTTP://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/SCIENCE-FAIR-
PRESENTATIONS/DOS-AND-DONTS.HTM](http://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/SCIENCE-FAIR-
PRESENTATIONS/DOS-AND-DONTS.HTM)

[HTTP://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/INDEX.HTML](http://SCHOOL.DISCOVERYEDUCATION.COM/SCIENCEFAIRCENTRAL/INDEX.HTML)

[HTTP://POLYMER-SEARCH.COM/TOP-SCIENCE-PROJECT-IDEAS.HTML](http://POLYMER-SEARCH.COM/TOP-SCIENCE-PROJECT-IDEAS.HTML)

WWW.CHEM4KIDS.COM

EXPLANATION OF SCIENCE PROJECT REQUIREMENTS AND PROPER DOCUMENTATION

GETTING STARTED: START A JOURNAL

ALL PROJECTS REQUIRE A FOLDER (THREE PRONGED) OR SPIRAL NOTEBOOK. THE JOURNAL IS WHERE YOU WILL KEEP ALL OF YOUR INFORMATION AND DATA TO WRITE THE REPORT AND MAKE YOUR PRESENTATION.

THINGS TO WRITE IN YOUR FOLDER AND SPIRAL NOTEBOOK (IN THIS ORDER)

1. TITLE
2. PROBLEM STATEMENT
3. BACKGROUND INFORMATION/RESEARCH
4. HYPOTHESIS
5. MATERIALS
6. PROCEDURES
7. VARIABLES
8. RESULTS AND DATA
9. CONCLUSION
10. APPLICATION
11. ABSTRACT (MIDDLE SCHOOL)
12. BIBLIOGRAPHY (MIDDLE SCHOOL)
 - ALWAYS DATE YOUR ENTRIES AND OBSERVATIONS.
 - ACCURATE MEASUREMENTS SHOULD BE IN METRIC TERMS.
 - BETTER TO HAVE TOO MUCH INFORMATION THAN TOO LITTLE.

SCIENCE PROJECT CATEGORIES

PHYSICAL SCIENCE: PROJECTS THAT STUDY THE NATURE AND PROPERTIES OF NONLIVING MATTER, ENERGY AND/OR FORCE AND MOTION.

BEHAVIORAL SCIENCE: PROJECTS THAT OBSERVE THE BEHAVIOR OF INVERTEBRATE ANIMALS. THE USE OF VERTEBRATE ANIMALS IS NOT ALLOWED EXCEPT FOR HUMAN OBSERVATIONAL PROJECTS (EXAMPLE: DO BOYS HAVE A FASTER REACTION TIME THAN GIRLS?).

BOTANY: PROJECTS THAT USE SUBJECTS SUCH AS PLANTS (MOSSES, SEED PLANTS), AGRICULTURE, CONSERVATION, AND FORESTRY. NO LIVE PLANTS MAY BE DISPLAYED. EXPERIMENTS USING MOLD OR FUNGI ARE NOT ALLOWED.

CHEMISTRY: PROJECTS THAT EXAMINE CHEMICAL REACTIONS, THE CHEMISTRY OF LIVING THINGS, PHOTOSYNTHESIS, SOLUBILITY, HEAT CAPACITY, ETC. NO PRESCRIPTION DRUGS.

DANGEROUS OR ILLEGAL SUBSTANCES SHOULD BE USED IN THE EXPERIMENTS.

EARTH AND SPACE SCIENCE: THESE ARE PROJECTS INVESTIGATING PRINCIPLES OF GEOLOGY (FOR EXAMPLE, WEATHERING AND EROSION), GEOGRAPHY, ASTRONOMY, METEOROLOGY, AND RELATED FIELDS.

ENGINEERING: PROJECTS CAN DEVELOP TECHNOLOGICAL DEVICES, WHICH ARE USEFUL TO THE GLOBAL SOCIETY WITHIN AN ENGINEERING-RELATED FIELD, SUCH AS ELECTRICITY, MECHANICAL, CHEMICAL, AERONAUTICAL, AND GEOLOGICAL.

ENVIRONMENTAL SCIENCE: PROJECTS THAT DEAL WITH GLOBAL CHANGE, ISSUES RELATED TO EARTH, SUCH AS WATER, AIR, CLIMATE, WASTE AND POLLUTION, GREEN LIVING, HUMAN HEALTH, ECOSYSTEMS AND RELATED FIELDS.

SCIENTIFIC METHOD

A SCIENCE PROJECT IS AN INVESTIGATION USING THE SCIENTIFIC METHOD TO DISCOVER THE ANSWER TO A SCIENTIFIC PROBLEM. BEFORE STARTING YOUR PROJECT, YOU NEED TO UNDERSTAND THE SCIENTIFIC METHOD. THIS SECTION USES EXAMPLES TO ILLUSTRATE AND EXPLAIN THE BASIC STEPS OF THE SCIENTIFIC METHOD. IT IS THE "TOOL" THAT SCIENTISTS USE TO FIND THE ANSWERS TO QUESTIONS. IT IS THE PROCESS OF THINKING THROUGH THE POSSIBLE SOLUTIONS TO A PROBLEM AND TESTING EACH POSSIBILITY TO FIND THE BEST SOLUTION. THE SCIENTIFIC METHOD INVOLVES THE FOLLOWING STEPS: DOING RESEARCH, IDENTIFYING THE PROBLEM, STATING A HYPOTHESIS, CONDUCTING PROJECT EXPERIMENTATION, AND REACHING A CONCLUSION.

- QUESTION /PROBLEM
- RESEARCH
- HYPOTHESIS
- INVESTIGATION/EXPERIMENTATION
- DATA/RESULT
- ANALYSIS
- CONCLUSION

TITLE OF PROJECT

BE CREATIVE AND MAKE SURE THAT IT CATCHES THE READER'S ATTENTION.

PROBLEM STATEMENT:

THE PROBLEM IS THE SCIENTIFIC QUESTION TO BE SOLVED. IT IS BEST EXPRESSED AS AN "OPEN-ENDED" QUESTION, WHICH IS A QUESTION THAT IS ANSWERED WITH A STATEMENT, NOT

JUST A YES OR A NO. FOR EXAMPLE, "HOW DOES LIGHT AFFECT THE REPRODUCTION OF BREAD MOLD ON WHITE BREAD?"

- DO WRITE YOUR PROBLEM IN THE FORM OF A QUESTION USING LEAD WORDS LIKE- HOW, DOES, WILL, CAN.
- DO CHOOSE A PROBLEM THAT CAN BE SOLVED EXPERIMENTALLY.

RESEARCH:

YOU MUST COMPLETE RESEARCH RELATED TO YOUR PROJECT. IT MUST BE IN YOUR OWN WORDS AND YOU MUST USE A MINIMUM OF FIVE DIFFERENT RESOURCES. IDEALLY, YOU SHOULD GO TO THE LIBRARY OR INTERNET AND LEARN EVERYTHING YOU CAN ON YOUR TOPIC. OBSERVE RELATED EVENTS. GATHER EXISTING INFORMATION ON YOUR TOPIC. LOOK FOR UNEXPLAINED OR UNEXPECTED RESULTS. ALSO, TALK TO PROFESSIONALS IN THE FIELD, WRITE OR EMAIL THE COMPANIES FOR SPECIFIC INFORMATION, AND OBTAIN OR CONSTRUCT NEEDED EQUIPMENT.

RESEARCH IS THE PROCESS OF COLLECTING INFORMATION FROM YOUR OWN EXPERIENCES, KNOWLEDGEABLE SOURCES, AND DATA FROM EXPLORATORY EXPERIMENTS. YOUR FIRST RESEARCH IS USED TO SELECT A PROJECT TOPIC. THIS IS CALLED TOPIC RESEARCH.

AFTER YOU HAVE SELECTED A TOPIC, YOU BEGIN WHAT IS CALLED PROJECT RESEARCH. THIS IS RESEARCH TO HELP YOU UNDERSTAND THE TOPIC, EXPRESS A PROBLEM, PROPOSE A HYPOTHESIS, AND DESIGN ONE OR MORE PROJECT EXPERIMENTS—EXPERIMENTS DESIGNED TO TEST THE HYPOTHESIS.

HYPOTHESIS:

A HYPOTHESIS IS AN IDEA ABOUT THE SOLUTION TO A PROBLEM, BASED ON KNOWLEDGE AND RESEARCH. WHILE THE HYPOTHESIS IS A SINGLE STATEMENT, IT IS THE KEY TO A SUCCESSFUL PROJECT. YOUR HYPOTHESIS MUST BE TESTABLE. YOU NEED TO THINK ABOUT HOW CHANGING YOU TEST (INDEPENDENT/TEST) VARIABLE WILL AFFECT YOUR OUTCOME (DEPENDENT/OUTCOME) VARIABLE. TO WRITE SUCH A HYPOTHESIS USE AND "IF..., THEN" SENTENCE: IF THE (TEST/INDEPENDENT VARIABLE) IS (DESCRIBE HOW YOU CHANGED IT), THEN THE (OUTCOME/DEPENDENT VARIABLE) WILL (DESCRIBE THE EFFECT) BECAUSE.....

STATE YOUR HYPOTHESIS IN THE IF/THEN/BECAUSE FORMAT, USING THE INDEPENDENT AND DEPENDENT VARIABLES TO PREDICT THE OUTCOME.

EXAMPLES: *IF THE FINGERPRINTS OF 150 DIFFERENT PEOPLE ARE TAKEN, THEN THE LOOP FINGERPRINT WILL BE THE MOST COMMON BECAUSE IT IS THE ONE MOST OF MY CLASSMATES HAVE.*

- **DO WRITE DOWN YOUR HYPOTHESIS BEFORE BEGINNING THE PROJECT EXPERIMENTATION.**
- **DO STATE THE TEST (INDEPENDENT) VARIABLE AND OUTCOME (DEPENDENT) VARIABLE IN THE HYPOTHESIS. "IF..., THEN.....BECAUSE" SENTENCE: IF THE (TEST/INDEPENDENT VARIABLE) IS (DESCRIBE HOW YOU CHANGED IT), THEN THE (OUTCOME/DEPENDENT VARIABLE) WILL (DESCRIBE THE EFFECT) BECAUSE.**
- **DON'T CHANGE YOUR HYPOTHESIS EVEN IF EXPERIMENTATION DOES NOT SUPPORT IT. IF TIME PERMITS, REPEAT OR REDESIGN THE EXPERIMENT TO CONFIRM YOUR RESULTS.**

YOUR EXPERIMENT SHOULD INCLUDE:

PROCEDURES:

THE TEST (INDEPENDENT) VARIABLE IS THE VARIABLE YOU PURPOSELY MANIPULATE (CHANGE). THE OUTCOME (DEPENDENT) VARIABLE IS THE VARIABLE THAT IS BEING OBSERVED, WHICH CHANGES IN RESPONSE TO THE TEST (INDEPENDENT) VARIABLE. THE VARIABLES THAT ARE NOT CHANGED ARE CALLED CONTROLLED VARIABLES OR CONSTANTS.

DECIDE IF YOU WILL HAVE A CONTROL GROUP (DOES NOT RECEIVE THE TEST) AND REMEMBER THAT THE GROUP THAT RECEIVES THE TEST IS THE EXPERIMENTAL GROUP.

- **DO PLACE THE PROCEDURES IN ORDER STARTING WITH THE #1.**
- **DO NOT MAKE PROCEDURES MORE THAN 6-10 STEPS. MAKE SURE TO STATE REPEAT WHEN USING MORE THAN ONE TRIAL INSTEAD OF RE-WRITING.**

MATERIALS

- **YOUR MATERIALS SHOULD BE WRITTEN AS A LIST IN BULLET FORM.**

DISPLAYING DATA: [HTTP://NCES.ED.GOV/NCESKIDS/CREATEAGRAPH/](http://nces.ed.gov/nceskids/createagraph/)

GRAPHS AND CHARTS ARE GREAT BECAUSE THEY COMMUNICATE INFORMATION VISUALLY. CONSULT WEBSITE FOR CREATION OF YOUR THREE VISUAL DISPLAYS.

- **DO CREATE A MATERIALS LIST**
- **DO MAKE SURE THAT THE GRAPH HAS A TITLE, BOTH AXES ARE LABELED CLEARLY, AND THAT THE CORRECT SCALE IS CHOSEN TO UTILIZE MOST OF THE GRAPH SPACE.**

- DO RECORD ALL OBSERVATIONS. USE QUALITATIVE (DESCRIPTIVE) DATA WHEN NEEDED. EXAMPLE THE TREE GREW TALLER, IT HAS GREENER LEAVES, AND IT LOOKS HEALTHIER. ***REMEMBER QUANTITATIVE DATA USES NUMBERS AND UNITS LIKE THE TREE GREW 4 CENTIMETERS.

RESULTS

DISCUSS YOUR FINDINGS (OR WHAT YOU DISCOVERED FROM YOUR EXPERIMENT OR INVESTIGATION).

DRAW CONCLUSIONS

ASK YOURSELF, WHAT HAPPENED? DID THE RESULTS AGREE WITH YOUR HYPOTHESIS? LOOK AT YOUR DATA TABLE, CHARTS, OR GRAPHS.

CONCLUSION:

THE PROJECT'S CONCLUSION IS A SUMMARY OF THE RESULTS OF THE PROJECT EXPERIMENTATION AND A STATEMENT OF HOW THE RESULTS RELATE TO THE HYPOTHESIS.

STUDENTS MUST ANSWER THE FOLLOWING SEVEN QUESTIONS:

1. WHAT WAS INVESTIGATED?

A. DESCRIBE THE PROBLEM.

2. WAS THE HYPOTHESIS SUPPORTED BY THE DATA?

A. COMPARE YOUR ACTUAL RESULT TO THE EXPECTED RESULT

B. INCLUDE A VALID CONCLUSION THAT RELATES TO THE INITIAL PROBLEM OR HYPOTHESIS.

3. WHAT WERE YOUR MAJOR FINDINGS?

A. DID THE FINDINGS SUPPORT OR NOT SUPPORT THE HYPOTHESIS AS THE SOLUTION TO THE RESTATED PROBLEM?

4. HOW DID YOUR FINDINGS COMPARE WITH OTHER RESEARCHERS?

A. COMPARE YOUR RESULT TO OTHER EXPERIMENTS.

5. WHAT POSSIBLE EXPLANATIONS CAN YOU OFFER FOR YOUR FINDINGS?

A. EVALUATE YOUR METHOD.

B. STATE ANY ASSUMPTIONS THAT WERE MADE WHICH MAY AFFECT THE RESULT.

6. WHAT RECOMMENDATIONS DO YOU HAVE FOR FURTHER STUDY AND FOR IMPROVING THE EXPERIMENT?

- A. COMMENT ON THE LIMITATIONS OF THE METHOD CHOSEN.
- B. SUGGEST HOW THE METHOD CHOSEN COULD BE IMPROVED TO OBTAIN MORE ACCURATE AND RELIABLE RESULTS.

7. WHAT ARE SOME POSSIBLE APPLICATIONS OF THE EXPERIMENT?

- A. HOW CAN THIS EXPERIMENT OR THE FINDINGS OF THIS EXPERIMENT BE USED IN THE REAL WORLD FOR THE BENEFIT OF SOCIETY?

APPLICATIONS: (MIDDLE SCHOOL)

THE APPLICATION IS HOW THE INFORMATION OR KNOWLEDGE GAINED IN THE EXPERIMENT CAN BE USED.

ABSTRACT:(MIDDLE SCHOOL)

[HTTP://WWW.WILLIAMSCLASS.COM/SCIENCEFAIR/SCIENCEFAIRABSTRACT.HTM](http://www.williamsclass.com/sciencefair/sciencefairabstract.htm)

WHAT IS AN ABSTRACT? THE ABSTRACT IS A SUMMARY OF YOUR SCIENCE FAIR PROJECT. YOUR ABSTRACT IS MADE UP OF A BRIEF STATEMENT OF THE ESSENTIAL, OR MOST IMPORTANT, THOUGHTS ABOUT YOUR PROJECT. ABSTRACTS SHOULD SUMMARIZE, CLEARLY AND SIMPLY, THE MAIN POINTS OF THE EXPERIMENT. SPELLING, GRAMMAR, PUNCTUATION, NEATNESS, AND ORIGINALITY ARE IMPORTANT. IT SHOULD BE 250 TO 300 WORDS IN LENGTH. IT IS ONE OF THE LAST PARTS OF YOUR SCIENCE FAIR PROJECT THAT YOU WILL COMPLETE. IT IS AN EASY PART IF YOU ARE USING A COMPUTER TO RECORD AND TYPE YOUR JOURNAL ENTRIES AND OTHER PARTS OF THE PROJECT. IF YOU ARE USING A COMPUTER THEN YOU WILL ONLY HAVE TO CUT AND PASTE THIS INFORMATION INTO THE ABSTRACT.

ABSTRACT FORMAT

PURPOSE OF THE EXPERIMENT

- AN INTRODUCTORY STATEMENT OF THE REASON FOR INVESTIGATING THE TOPIC OF THE PROJECT.
- A STATEMENT OF THE PROBLEM OR HYPOTHESIS BEING STUDIED.

PROCEDURES USED

- A SUMMARIZATION OF THE KEY POINTS AND AN OVERVIEW OF HOW THE INVESTIGATION WAS CONDUCTED.
- AN ABSTRACT DOES NOT GIVE DETAILS ABOUT THE MATERIALS USED UNLESS IT GREATLY INFLUENCED THE PROCEDURE OR HAD TO BE DEVELOPED TO DO THE INVESTIGATION.
- AN ABSTRACT SHOULD ONLY INCLUDE PROCEDURES DONE BY THE STUDENT. WORK DONE BY A MENTOR (SUCH AS SURGICAL PROCEDURES) OR WORK DONE PRIOR TO STUDENT INVOLVEMENT MUST NOT BE INCLUDED.

OBSERVATION/DATA/RESULTS

- THIS SECTION SHOULD PROVIDE KEY RESULTS THAT LEAD DIRECTLY TO THE CONCLUSIONS YOU HAVE DRAWN.
- IT SHOULD NOT GIVE TOO MANY DETAILS ABOUT THE RESULTS NOR INCLUDE TABLES OR GRAPHS.

CONCLUSIONS

- CONCLUSIONS FROM THE INVESTIGATION SHOULD BE DESCRIBED BRIEFLY.
- THE SUMMARY PARAGRAPH SHOULD REFLECT ON THE PROCESS AND POSSIBLY STATE SOME APPLICATIONS AND EXTENSIONS OF THE INVESTIGATION.

LAB REPORT

- MUST FOLLOW THE LAB REPORT GUIDELINES IN YOUR LAB MANUAL
- MAY BE TYPED (12-POINT FONT, 1" MARGINS) OR NEATLY HANDWRITTEN

PARTS OF A LAB REPORT (SPIRAL NOTEBOOK OR 3 PRONG FOLDER) A STEP-BY-STEP CHECKLIST

GOOD SCIENTISTS REFLECT ON THEIR WORK BY WRITING A LAB REPORT. A LAB REPORT IS A RECAP OF WHAT A SCIENTIST INVESTIGATED. IT IS MADE UP OF THE FOLLOWING PARTS.

TITLE (UNDERLINED AND ON THE TOP CENTER OF THE PAGE)

- IDENTIFY THE RESEARCH QUESTION/PROBLEM AND STATE IT CLEARLY IN THE FORM OF A QUESTION.

POTENTIAL HYPOTHESIS (ES):

- STATE THE HYPOTHESIS CAREFULLY. DO NOT JUST GUESS, BUT ALSO TRY TO ARRIVE AT THE HYPOTHESIS LOGICALLY AND, IF APPROPRIATE, WITH A CALCULATION.
- WRITE DOWN YOUR PREDICTION AS TO HOW THE TEST VARIABLE WILL AFFECT THE OUTCOME VARIABLE USING AN "IF" AND "THEN" STATEMENT.
- IF (STATE THE TEST VARIABLE) IS (CHOOSE AN ACTION), THEN (STATE THE OUTCOME VARIABLE) WILL (CHOOSE AN ACTION).

MATERIALS:

- RECORD PRECISE DETAILS OF ALL EQUIPMENT USED.
FOR EXAMPLE: A BALANCE THAT MEASURES WITH AN ACCURACY OF +/- 0.001 G.
- RECORD PRECISE FORMULAS AND AMOUNTS OF ANY CHEMICALS USED
FOR EXAMPLE: 5 G OF CuSO_4 OR 5 ML H_2O

PROCEDURE:

- DO NOT COPY THE PROCEDURES FROM THE LAB MANUAL OR HANDOUT.

- SUMMARIZE THE PROCEDURES IN SEQUENTIAL ORDER; BE SURE TO INCLUDE CRITICAL STEPS.
- GIVE ACCURATE AND CONCISE DETAILS ABOUT THE APPARATUS AND MATERIALS USED.

VARIABLES AND CONTROL TEST:

- IDENTIFY THE VARIABLES IN THE EXPERIMENT. STATE THOSE OVER WHICH YOU HAVE CONTROL. THERE ARE THREE TYPES OF VARIABLES.
- TEST VARIABLE: (ALSO KNOWN AS THE INDEPENDENT VARIABLE) THE FACTOR THAT CAN BE CHANGED BY THE INVESTIGATOR (THE CAUSE).
- OUTCOME VARIABLE: (ALSO KNOWN AS THE DEPENDENT VARIABLE) THE OBSERVABLE FACTOR OF AN INVESTIGATION THAT IS THE RESULT OR WHAT HAPPENED WHEN THE TEST VARIABLE WAS CHANGED.
- CONTROLLED VARIABLES: THE OTHER IDENTIFIED VARIABLES IN THE INVESTIGATION THAT ARE KEPT CONSTANT OR REMAIN THE SAME DURING THE INVESTIGATION.
- IDENTIFY THE CONTROL TEST. A CONTROL TEST IS THE SEPARATE EXPERIMENT THAT SERVES AS THE STANDARD FOR COMPARISON TO IDENTIFY EXPERIMENTAL EFFECTS, CHANGES OF THE OUTCOME VARIABLE RESULTING FROM CHANGES MADE TO THE TEST VARIABLE.

DATA:

- ENSURE THAT ALL DATA IS RECORDED.
- PAY PARTICULAR ATTENTION TO SIGNIFICANT FIGURES AND MAKE SURE THAT ALL UNITS ARE STATED. PRESENT YOUR RESULTS CLEARLY. OFTEN IT IS BETTER TO USE A TABLE OR A GRAPH.
- IF USING A GRAPH, MAKE SURE THAT THE GRAPH HAS A TITLE, EACH AXIS IS LABELED CLEARLY, AND THE
- CORRECT SCALE IS CHOSEN TO UTILIZE MOST OF THE GRAPH SPACE.
- RECORD QUALITATIVE OBSERVATIONS. ALSO LIST THE ENVIRONMENTAL CONDITIONS. INCLUDE COLOR CHANGES, SOLUBILITY CHANGES, AND WHETHER HEAT WAS RELEASED OR ABSORBED.

RESULTS:

- ENSURE THAT YOU HAVE RECORDED YOUR DATA CORRECTLY TO PRODUCE ACCURATE RESULTS.
- INCLUDE ANY ERRORS OR UNCERTAINTIES THAT MAY AFFECT THE VALIDITY OF YOUR RESULT.

CONCLUSION AND EVALUATION:

- A CONCLUSION STATEMENT ANSWERS THE FOLLOWING 7 QUESTIONS IN AT LEAST THREE PARAGRAPHS.

I. FIRST PARAGRAPH: INTRODUCTION

1. WHAT WAS INVESTIGATED?
 - A) DESCRIBE THE PROBLEM OR STATE THE PURPOSE OF THE EXPERIMENT.
2. WAS THE HYPOTHESIS SUPPORTED BY THE DATA?
 - A) COMPARE YOUR ACTUAL RESULT TO THE EXPECTED RESULT (EITHER FROM THE LITERATURE, TEXTBOOK, OR YOUR HYPOTHESIS)
 - B) INCLUDE A VALID CONCLUSION THAT RELATES TO THE INITIAL PROBLEM OR HYPOTHESIS.
3. WHAT WERE YOUR MAJOR FINDINGS?
 - A) DID THE FINDINGS SUPPORT OR NOT SUPPORT THE HYPOTHESIS AS THE SOLUTION TO THE RESTATED PROBLEM?
 - B) CALCULATE THE PERCENTAGE ERROR FROM THE EXPECTED VALUE.

II. MIDDLE PARAGRAPHS: THESE PARAGRAPHS ANSWER QUESTION 4 AND DISCUSS THE MAJOR FINDINGS OF THE EXPERIMENT USING DATA.

4. HOW DID YOUR FINDINGS COMPARE WITH OTHER RESEARCHERS?
 - A) COMPARE YOUR RESULT TO OTHER STUDENTS' RESULTS IN THE CLASS.
 - I) THE BODY PARAGRAPHS SUPPORT THE INTRODUCTORY PARAGRAPH BY ELABORATING ON THE DIFFERENT PIECES OF INFORMATION THAT WERE COLLECTED AS DATA THAT EITHER SUPPORTED OR DID NOT SUPPORT THE ORIGINAL HYPOTHESIS.
 - II) EACH FINDING NEEDS ITS OWN SENTENCE AND RELATES BACK TO SUPPORTING OR NOT SUPPORTING THE HYPOTHESIS.
 - III) THE NUMBER OF BODY PARAGRAPHS YOU HAVE WILL DEPEND ON HOW MANY DIFFERENT TYPES OF DATA WERE COLLECTED. THEY WILL ALWAYS REFER BACK TO THE FINDINGS IN THE FIRST PARAGRAPH.

III. LAST PARAGRAPH: CONCLUSION

5. WHAT POSSIBLE EXPLANATIONS CAN YOU OFFER FOR YOUR FINDINGS?
 - A) EVALUATE YOUR METHOD.
 - B) STATE ANY PROCEDURAL OR MEASUREMENT ERRORS THAT WERE MADE.
6. WHAT RECOMMENDATIONS DO YOU HAVE FOR FURTHER STUDY AND FOR IMPROVING THE EXPERIMENT?
 - A) COMMENT ON THE LIMITATIONS OF THE METHOD CHOSEN.
 - B) SUGGEST HOW THE METHOD CHOSEN COULD BE IMPROVED TO OBTAIN MORE ACCURATE AND RELIABLE RESULTS.
7. WHAT ARE SOME POSSIBLE APPLICATIONS OF THE EXPERIMENT?
 - A) HOW CAN THIS EXPERIMENT OR THE FINDINGS OF THIS EXPERIMENT BE USED IN THE REAL WORLD FOR THE BENEFIT OF SOCIETY.

ORAL PRESENTATION: WORTH ONE GRADE-PRESENTATIONS START NOVEMBER 22ND

ORAL PRESENTATION RUBRIC

CATEGORY	1 POINT	2 POINTS	3 POINTS	4 POINTS
KNOWLEDGE	STUDENT DOES NOT PRESENTS A CLEAR AND ACCURATE DEPICTION OF THE EXPERIMENT.	STUDENT PRESENTS A SOMEWHAT CLEAR AND ACCURATE DEPICTION OF THE EXPERIMENT.	STUDENT PRESENTS A MOSTLY CLEAR AND ACCURATE DEPICTION OF THE EXPERIMENT.	STUDENT PRESENTS A CLEAR AND ACCURATE DEPICTION OF THE EXPERIMENT.
AUDIENCE ATTENTION	STUDENT SPEAKS IN AN UNCLEAR AND AT LOUD ENOUGH FOR THE CLASS TO UNDERSTAND. STUDENT HAS VERY FEW OF THE CLASS ENGAGED.	STUDENT SPEAKS IN SOMEWHAT A CLEAR AND AT LOUD ENOUGH FOR THE CLASS TO UNDERSTAND. STUDENT HAS SOME OF THE CLASS ENGAGED.	STUDENT SPEAKS IN MOSTLY A CLEAR AND AT LOUD ENOUGH FOR THE CLASS TO UNDERSTAND. STUDENT HAS MOST OF THE CLASS ENGAGED.	STUDENT SPEAKS IN A CLEAR AND AT LOUD ENOUGH FOR THE CLASS TO UNDERSTAND. STUDENT HAS WHOLE CLASS ENGAGED.
AUDIENCE INTERACTION	STUDENT WAS ABLE TO ANSWER NONE OR VERY FEW OF THE QUESTIONS FROM FELLOW STUDENTS AND TEACHER.	STUDENT WAS ABLE TO ANSWER SOME OF THE QUESTIONS FROM FELLOW STUDENTS AND TEACHER.	STUDENT WAS ABLE TO ANSWER MOST OF THE QUESTIONS FROM FELLOW STUDENTS AND TEACHER.	STUDENT WAS ABLE TO ANSWER ALL OF THE QUESTIONS FROM FELLOW STUDENTS AND TEACHER.
DURATION	UNDER A MINUTE □□□□□□□□□□□□□□□□□□ □	1-2 MINUTES □□□□□□□□□□□□□□□□□□ □	2-3 MINUTES □□□□□□□□□□□□□□□□□□ □	3-4 MINUTES □□□□□□□□□□□□□□□□□□ □
GRADE SCALE	4 POINTS 25 - F	8 POINTS 50 - F	12 POINTS 5 - C	16 POINTS 100 - AT