Investigation in Science – Written Exhibition Rubric – updated 9/24

	POV	Evidence	Connections	Supposition	Significance	Communication
Mastery with Distinction (4 points)	• Explicitly states clear and workable hypothesis/thesis that completely addresses the investigative question • Introduction is clear, interesting and original • Conclusion is highly relevant to hypothesis/thesis • Constructs a creative and effective experimental design that tests the hypothesis/thesis • Design addresses subjectivity/bias or potential for inaccuracy	• Demonstrates obvious command and in-depth understanding of vocabulary and concepts beyond that required to address investigative question • 5 or more credible sources cited from a variety of resources and appropriate to investigation and are credible • Inclusion of all raw data as an appendix • Deep analysis of raw data that links to hypothesis/thesis	• Demonstrates sophisticated and complete understanding of how separate areas within investigation relate to one another • Accurately and thoroughly connects investigation with areas outside of immediate investigation • Representation of data is accurate • Results are interpreted accurately and deeply	• Demonstrates sophisticated and complete understanding of how the outcome would be affected by changing any of the relevant variables • Demonstrates understanding of cause & effect by deeply examining experimental design procedure, revising procedure, and redoing experiment at least 2 times • Experimental design addresses ALL relevant variables, and conditions	• Thoroughly and accurately addresses the significance of data and its patterns using statistical tools • Convincingly demonstrates importance of investigation to scientific development • Applies concepts within investigation to real world applications including those which are less than obvious • Offers an unique and deep discussion on further questions for investigation in the conclusion	• Logical outline of hypothesis/thesis, arguments, and evidence • Consistently uses clear, specific and elegant language • Consistently adheres to conventional standards of grammar, syntax, spelling, and citing • Bibliography conforms to MLA format for outside research, diagrams, graphs, data, pictures, quotes • Student worked diligently with sponsor on all aspects of the investigation – an accountability sheet is evidence of student's involvement
Mastery (3 points)	• Explicitly states clear and workable hypothesis/thesis that strongly addresses the question • Introduction is clear and interesting • Conclusion is mostly relevant to hypothesis/thesis • Constructs an experimental design that mostly addresses the problem • Design addresses subjectivity/bias or potential for inaccuracy	• Demonstrates thorough understanding of vocabulary and concepts necessary to address investigative question • 4 or more sources are from a variety of resources • Majority of internet sites are credible • Inclusion of all raw data as an appendix • Accurate and sufficient analysis of raw data to linked to hypothesis/thesis	• Demonstrates thorough understanding of how separate areas within investigation relate to one another • Connections with areas outside of immediate investigation are mostly accurate • Accurate representation of data and its interpretation	• Demonstrates thorough understanding of how the outcome would be affected by changing relevant variables • Demonstrates understanding of cause & effect by deeply examining experimental design procedure, revising procedure, and redoing experiment at least once • Experimental design addresses MOST relevant variables, and conditions	• Accurately addresses the significance of data and its patterns using statistical tools • Demonstrates importance of significance to scientific development • Applies concepts within investigation to multiple real world applications • Offers a sufficient discussion on further questions for investigation in the conclusion	▪ Logical outline of hypothesis/thesis, arguments, and evidence ▪ Consistently uses clear language ▪ Consistently adheres to conventional grammar, syntax, spelling, and citing ▪ Bibliography conforms to MLA format for outside research, diagrams, graphs, data, pictures, quotes ▪ Student worked with sponsor on most aspects of the investigation - an accountability sheet is evidence of student's involvement
Satisfactory (2 points)	• States a workable hypothesis/thesis that adequately addresses the question • Conclusion is relevant to hypothesis/thesis, but may not be thorough enough • Experimental design partially addresses the investigative question • Design does not address subjectivity/bias nor potential for inaccuracy	• Demonstrates adequate understanding of vocabulary and concepts necessary to address investigative question • 4 or more sources are used. • Many internet sites are questionable/not credible • Inclusion of all raw data as an appendix • Only a surface analysis of raw data is performed	• Demonstrates basic or superficial understanding of how separate areas within investigation relate to one another • OR Makes connections to and demonstrates some understanding of areas outside of immediate investigation • Accurate representation of data and its interpretation	• Demonstrates some understanding of how the outcome would be affected by changing at least one relevant variable • Demonstrates some understanding of cause & effect by examining experimental design procedure and revising procedure • Experimental design addresses some relevant variables, and conditions	• Uses basic arithmetic to address data and its patterns • Recognizes some importance of investigation to scientific development • Demonstrates adequate level of application of investigation to at least 2 real world examples • Applications are too simple and/or too superficial for grade level	▪ Some outline of hypothesis/thesis and evidence is apparent ▪ Paper is readable without much confusion or frustration ▪ Attempts to conform to conventional grammar, syntax, spelling, and citing ▪ Inappropriate visuals or diagrams ▪ Partial or Bibliography that does not meet MLA formats ▪ Student worked with sponsor on aspects of the investigation as the student deemed fit – accountability sheet is missing or incomplete.
Needs Revision (1 point)	• Unclear or NO hypothesis/thesis • Conclusion is not entirely relevant to hypothesis/thesis • Experimental design does not address the investigative question	• Does not demonstrate sufficient understanding of vocabulary and concepts necessary to address investigative question • More than half the sources are from internet and are not credible • Raw data is missing, incomplete or seems questionable.	• Does not demonstrate a link between separate areas within investigation nor anywhere in the investigation	• Demonstrates incorrect, incomplete, or no understanding of how the outcome would be affected by changing any of the relevant variables • Demonstrates inaccurate or incomplete understanding of cause & effect AND/OR does not examine or revise experimental design procedure	• Does not recognize or demonstrate importance of investigation to scientific development or field of mathematics • Does not apply concepts within investigation real world applications • The data remains to be unorganized	▪ Paper requires significant re-editing ▪ Paper is confusing to read because of lack of logical outline and/or inappropriate or incorrect grammar, syntax, spelling ▪ Does not include visuals or diagrams ▪ No Bibliography or citations ▪ Student did not work effectively with sponsor at all.

Investigation in Science – Performance Exhibition Rubric – updated 9/24

	POV	Evidence	Connections	Supposition	Significance	Communication
Mastery with Distinction (4 points)	• Explicitly states a clear and workable hypothesis/thesis that completely addresses the investigative question • Introduction is clear, interesting and original • Hypothesis/thesis is creatively displayed and is the overwhelming focus of the presentation • Conclusion is highly relevant to hypothesis/thesis • Experimental design is creative, accurate and thorough	• Demonstrates obvious command and in-depth understanding of vocabulary and concepts beyond that required to address investigative question • Inclusion of all raw data • Deep analysis of raw data to link to hypothesis/thesis	• Demonstrates sophisticated and complete understanding of how separate areas within investigation relate to one another • Makes connections to and demonstrates thorough understanding of areas outside of immediate investigation • Thorough and accurate representation of data and its interpretation	• Demonstrates sophisticated and complete understanding of how the outcome would be affected by changing any of the relevant variables • **I**ncludes outcomes & complete analysis of revised investigation	• Convincingly demonstrates importance of investigation to scientific development • Applies concepts within investigation to real world applications including those which are less than obvious • Powerful applications made are different than those presented in the paper • Deep reflection on the practice as a scientist • Student appreciation of statistical significance of results	▪ Presentation is clear, creative, and organized ▪ Effectively incorporates visuals and/or multimedia to enhance presentation ▪ Commanding voice, body language, and eye contact ▪ Demonstrates impressive understanding of content and/or issues surrounding immediate investigation ▪ Can effectively and thoughtfully answer questions posed by the committee ▪ Notebooks as evidence of progress – progression and original work is highly evident
Mastery (3 points)	• Explicitly states clear hypothesis/thesis that strongly addresses the question • Introduction is clear and interesting • Conclusion is relevant to hypothesis/thesis • Experimental design is accurate and thorough	• Demonstrates thorough understanding of vocabulary and concepts necessary to address investigative question • Inclusion of all raw data • Accurate and sufficient analysis of raw data to linked to hypothesis/thesis	• Demonstrates thorough understanding of how separate areas within investigation relate to one another • Makes connections to and demonstrates some understanding of areas outside of immediate investigation • Sufficient and accurate representation of data and its interpretation	• Demonstrates thorough understanding of how the outcome would be affected by changing relevant variables • Includes outcomes & analysis of revised experiment	• Demonstrates importance of investigation to scientific development • Applies concepts within investigation to multiple real world applications • Adequate reflection on the practice as a scientist • Thorough applications made are different than those presented in the paper • Statistical significance of results are discussed	▪ Presentation is clear and organized ▪ Incorporates some visuals and/or multimedia that is relevant and appropriate to investigation ▪ Confident voice, body language, and eye contact ▪ Demonstrates an overall solid understanding of content and/or issues surrounding investigation ▪ Effectively answers most questions posed by the committee ▪ Notebooks as evidence of progress – progression and original work is evident
Satisfactory (2 points)	• States hypothesis/thesis that adequately addresses the question • Conclusion is relevant to hypothesis/thesis • Experimental design is accurate	• Demonstrates adequate understanding of vocabulary and concepts necessary to address investigative question • Inclusion of all raw data • Only a surface analysis of raw data is performed	• Demonstrates basic or superficial understanding of how separate areas within investigation relate to one another • Accurate representation of data and its interpretation – some connections unaddressed	• Demonstrates some understanding of how the outcome would be affected by changing at least one relevant variable • Includes hypothesis of outcomes of revised design procedure	• Recognizes some importance of investigation to scientific development • Demonstrates adequate level of application of investigation to at least 2 real world examples • Superficial reflection on the practice as a scientist • Surface discussion of statistical significance of results	▪ Presentation demonstrates some organization and preparation ▪ Uses few or ineffective visuals and/or multimedia ▪ Occasionally reads directly from note cards ▪ Struggles to answer questions posed by the committee ▪ OR can answer questions only with leading or prompting ▪ Notebooks as evidence of progress – progression is questionable
Needs Revision (1 point)	• Unclear or NO hypothesis/thesis • Conclusion is not entirely relevant to hypothesis/thesis • Experimental design is sloppy and does not consider bias, variables and conditions at work	• Does not demonstrate sufficient understanding of vocabulary and concepts necessary to address investigative question	• Does not demonstrate a link between separate areas within investigation • Graphical representation of data is missing or is inaccurately done	• Demonstrates incorrect, incomplete, or no understanding of how the outcome would be affected by changing any of the relevant variables • No analysis or reflection of design procedure	• Does not recognize or demonstrate importance of investigation to scientific development • Does not apply concepts within investigation real world applications • Student does not understand implications of using math as a tool in science • Student's experience as a scientist requires further investment in time.	• Presentation is disorganized and/or demonstrates lack of preparation • Does not use visuals and/or multimedia OR visuals do not enhance presentation • Reads directly from paper or notes • Cannot answer questions posed by the committee • No notebook presented