

Middle Years Programme International Baccalaureate (IBMYP)

Mathematics: Assessments, Rubrics and Differentiation

Thomas Jefferson Middle School, Arlington, Va.

Friday, April 5, 2013

"The greatest thing in this world is not so much where we are, but in what direction we are moving."

~~ O.W.Holmes

AGENDA

Objective: Participants will demonstrate knowledge and understanding of IBMYP Math Rubrics through rubric development using Criterion-based tasks.

Welcome & Introductions

Assessments

Let's Talk About It!

The IB Math Rubric

Review One!

The IB Math Rubric

Try it with a Partner!

The IB Math Rubric

Create Your Own!

MYB IB Mathematical Criterion

Knowledge and understanding

Criterion A

Investigating patterns

Criterion B

Communications in mathematics

Criterion C

Reflection in mathematics

Criterion D

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Annapolis Middle School, Annapolis, Maryland 21403



IBMYP Mathematics
Networking Session
Rubric Writing

Verita Mason-Frempong
Math Department Chair

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Special Educator, Math Co-Teacher

Annapolis Middle School
Annapolis, MD

6 Word Memoir

Use an index card to write a memoir of
yourself using only 6 words

Marcia

Verita

Teaching is not all I
am.

I love, cherish, and
enjoy life.

Participant topics

- › assessment in MYP
- › assessment tasks
- › rubrics
- › different lesson plans and how to fit the IBMYP curriculum in with most math curricula
- › help with criterion B—not sure how to use this
- › sample math test that uses criterion A
- › creating and implementing unit plans
- › Concepts
- › next chapter info
- › teach through AOI
- › unit planning
- › critical thinking skills/student engagement

Objective

Participants will demonstrate knowledge and understanding of IBMYP Math Rubrics through rubric development using Criterion-based tasks.

Agenda

1. Let's Talk About It! – Why Assess?
2. Review One! – Grade Assessments using MYP rubric
3. Try it with a Partner! – Rubric Writing part a
4. Create Your Own! – Rubric Writing part b

Assessment?

Why do we assess?
 When do we assess?
 How do we assess?
 What types of assessments have you given?
 What do you know about assessments in IBMYP?

What should be the most important reason we assess?

To support and encourage student learning!

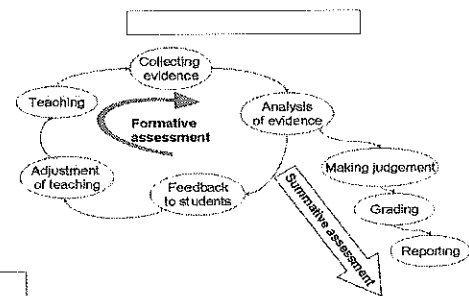
Purpose of Assessment

- › To promote student learning
- › To inform students, teachers, and parents
- › To contribute to teaching, planning, and learning
- › To promote reflection, self- and peer-evaluation

Purpose of Assessment

Diagnostic	Formative	Summative
Prior to learning or as part of everyday learning	During the teaching and learning process	Generally at the end of the teaching/learning process
Diagnoses students' strengths and weaknesses	Provides feedback to the student and teacher	Provides a judgment on learning
	Helps students to reflect on learning	Students demonstrate their learning
Informs teacher and helps to plan instruction	Helps teacher plan his/her teaching	Teacher records achievement for recording purposes

The assessment cycle



IB Criterion Based Assessment

How does this work?

Tailoring Assessment to Objectives

Three questions before designing any task:

1. What are the objectives to be achieved?
2. How will students demonstrate achievement?
3. How will I teach to enable this achievement?

It is important that the answers to the first two questions are made clear to the students.

IB Criterion Based Assessment

- › A student's work is compared to subject specific criteria (rather than to the work of other students)
- › Student's achievement result reflects the degree to which his/her work meets the criteria for the task
- › Standards of achievement remain consistent from year to year, from class to class

Which student has the best chance of meeting with success?

Student A: "Create a presentation to share your research on the history of the internet."

Student B: "Create a multimedia presentation of no more than 5 minutes. You will be scored on content, delivery, use of multi-media, design layout...etc."

Formative Assessment...

- › guides the teaching and learning process
- › is based on mathematical objectives
- › is applied to ongoing work
- › provides regular feedback sessions

Summative Assessment

- › judgment made by teacher at predetermined intervals
- › based on shared objectives
- › applied to suitable assessment tasks

Assessment Rubrics

A good assessment rubric:

- › is clear, uses student language
- › reflects the main aspect of the task
- › describes what is expected from the student
- › gives guidance to the student without giving elements of the solution

Why use a rubric for assessments?

Rubrics are very useful because they:

- › Clarify expectations, describe successfully results, and tell students how to get there
- › Give students a clear path to follow with specific steps and expectations before they begin an assignment
- › Show students how to improve and take responsibility for their improvement through reflection
- › Provide criteria for consistent grading practices

Assessment Rubrics – Generalities

- ▶ Rubrics
 - Measure the level of achievement
 - Describe what is expected from the students
 - Inform the student on their degree of achievement.

MYP Q&A

Question: How much leeway do we have with these rubrics?

Answer:

1. You should make all rubrics task-specific without changing the intent of the original descriptors.
2. Schools may not modify the bands i.e. change the levels of the original descriptors

MYP Q&A

Answer:

1. You should make all rubrics task-specific without changing the intent of the original descriptors.
2. Schools may not modify the bands i.e. change the levels of the original descriptors

Use of Published Criteria

All MYP schools **MUST** use the published assessment criteria (achievement levels and descriptors) when assessing student work in the final year of the programme (year 5). Years 1 – 4 can be modified.

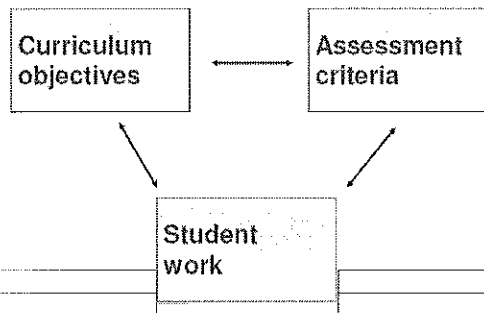
Assessing Student Work

- ▶ Years 1–4 adaptation of criterion level descriptors is allowed
- ▶ General intent of criteria must be maintained
- ▶ Published assessment criteria must be used in the final year of the programme (year 5)
- ▶ Only whole numbers are used
- ▶ Each criterion is independent

Assessment Rubrics – What do they look like?

- ▶ A good assessment rubric:
 - Is clear, uses student language
 - Reflects the main/important aspects of the task
 - Describes what is expected from the students
 - Gives guidance to the student without giving elements of the solution.

Criterion-related Assessment



Criterion-related Assessment

Assessment should model learning:

Objectives

Assessment

Knowledge and understanding	→	Criterion A
Investigating patterns	→	Criterion B
Communications in mathematics	→	Criterion C
Reflection in mathematics	→	Criterion D

A – Knowledge and Understanding

- Know and demonstrate understanding of the concepts from the five branches of mathematics.
- Use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations, including those in real-life contexts.
- Select and apply general rules correctly to solve problems, including those in real-life contexts.
- Assessment tasks are likely to be class tests, examinations, real-life problems and investigations.

B – Investigating Patterns

- Select and apply appropriate inquiry and mathematical problem-solving techniques.
- Recognize patterns.
- Describe patterns as relationships or general rules.
- Draw conclusions consistent with findings.
- Justify or prove mathematical relationships and general rules.
- Assessment tasks** should be mathematical investigations of some complexity.
- Teachers should clearly state whether the student has to provide a justification or proof.

C – Communication in Mathematics

- Use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations.
- Use different forms of mathematical representation (formulae, diagrams, tables, charts, graphs and models).
- Move between different forms of representation.
- Assessment tasks** are likely to be real-life problems, tests, examinations and investigations.

D – Reflection in Mathematics

- Explain whether his/her results make sense in the context of the problem.
- Explain the importance of his/her findings in connection to real life.
- Justify the degree of accuracy of his/her results where appropriate.
- Suggest improvements to the method when necessary.
- Assessment tasks** are most likely to be investigations and real-life problems.

Sample Tasks and Rubrics

- ▶ Refer to the sample assessment labeled *Algebra Readiness 7 Unit 1 Patterns and Functions* in the left hand corner.
- ▶ Review the student work and grade the assessment.

Create rubric for a task and discuss

- ▶ Refer to the sample assessment with the MYP Unit Title *Expressions and Equations - It's All Algebraic*.
- ▶ Review the assessment.
- ▶ Write a rubric if you were to grade the assessment based upon Criterion C - Communication.

Teachers create rubrics

- ▶ In your school team or with a partner, create a rubric for the assessment that your brought.

6 Word Memoir

Using the same index card, write a memoir of yourself after this session using only 6 words

- ▶ How do you feel about rubric writing after this session?
- ▶ Use at least one IB Learner Profile in your memoir.

Thank you!

Verita Mason-Frempong
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Marcia Moore
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Brain Break - Rock Paper Scissors

PLEDGE: I have neither given nor received help on this assignment,
nor am I aware of any violation of the IB Honor Code.

Signed _____

PRE-IBDP ALGEBRA 2/TRIG STATISTICS PROJECT

DUE DATE: _____

Project Notes:

1. Go to the website www.collegeboard.org for your research. Create an account, and record your username and password for future reference.
2. Choose and record the criteria that you are going to use for a college search – i.e. program, campus housing, distance from home, tuition cost, etc. – you must have at least 4 specific criteria including program offered.
3. From the list created, choose a minimum of 25 colleges with a minimum of 10 instate to find the necessary data.
4. Create a table using the middle 50% of students and record the following: minimum gpa required, minimum SAT scores required, and minimum ACT scores required. From the table, find the relative mean and standard deviation of each.
5. Use the above data to create 3 line plots. Describe those plots: are they 'normal' or 'skewed'? Explain your reasoning.

Project Extension:

For the purpose of this extension, assume your data create normal distributions.

1. Pick one safety school and two reach schools (each must be at least 1σ above the mean).
 - a. What minimum gpa, SAT score and ACT score would you have to have to be considered for admission to each school?
 - b. Describe the distance from the mean for each school and how you found it.
 - c. What percentile do you have to be in for each category to be considered for acceptance?
 - d. Fred received a 530 on the math portion of his SAT and a 21.5 on the math portion of his ACT. Which score would he rather send to colleges and why? Would Fred be considered for acceptance for any of the 3 schools you chose? Why or why not?

The following data are the national and Virginia averages for students taking the tests in 2012.

SAT results for 2012		
Test section	National Average	Virginia average
Critical reading	496	500
Mathematics	514	501
Writing	488	485
Total score	1498	1486

ACT results for 2012		
Test section	National Average	Virginia average
Composite	21.1	22.4
English	20.5	22.1
Mathematics	21.1	22.3
Reading	21.3	22.7
Science	20.9	21.9

2. Use the above data to answer the following questions.
 - a. Using the data that you collected, at what percentile is the national average for SAT scores?
 - b. Using the data that you collected, at what percentile is the state average for SAT scores?
 - c. Using the data that you collected, at what percentile is the national average for ACT scores?
 - d. Using the data that you collected, at what percentile is the state average for ACT scores?

PLEDGE: I have neither given nor received help on this assignment, nor am I aware of any violation of the IB Honor Code.

Signed _____

Additional information:

Average time per student is 2 to 3 hours of research and 2 to 3 hours of work. **The report is to be word processed.** If you do not have access to a computer or printer at home, please see your teacher after school and we will make sure you get computer access to type up the project in the Career Center. **Do NOT email your project to your teacher, or bring it in on a flash drive to be printed. Only printed copies will be accepted.**

IB Honor Code: The only resources you are authorized to use for this project are enumerated below.

1. Your Pre-IBDP Algebra 2/Trig teacher and Ms. Grimm (school counselor).
2. www.collegeboard.org website
3. Your notes and textbook for information on mean, standard deviation and z scores.

This is intended to be an independent investigation and therefore you may not use any other resource, including but not limited to other students, family members, or the internet, other than the website specified. If you have a question, ask your teacher — she can give you additional guidance and help point you in the right direction, if necessary. Do not discuss the project with other students. Failure to adhere to these instructions will constitute a violation of the IB Honor Code and a zero on the project.

Order of paperwork for submission:

- 1st: This document. Your name must be clearly printed on the front, and the IB Honor Pledge must be signed.
- 2nd: Project notes with word processed tables and data included
- 3rd: Project extension with questions answered, methodology used, and conclusions drawn.
- 4th: Self-Assessment & Reflection

Assessment Criteria

Application and Reasoning – maximum 6 out of 8 points

1. Student drew accurate scatter plots from the data collected.
2. Student used the data to correctly answer the questions asked.
3. Student interpreted the data correctly.
4. No pattern was discovered, so 8 points is not possible.

Communication – maximum 6 points

1. Student clearly and concisely explained the steps taken and the conclusions drawn above.
2. Student used correct mathematical terminology when appropriate.

Reflection and Evaluation – maximum 6 points

Student will do a self assessment to:

1. Reflect upon the methods chosen and the processes used – don't restate the steps, tell why you did what you did. Was this the best/only method to use? Specify any alternative methods.
2. Could additional technology be used in the problem? If so, how? If not, why not?
3. Is the answer accurate, and to what degree of accuracy should it be given? How do you know that it is accurate? What did you do to test it?

MATHEMATICS – Year- 2012-2013

Student: _____

Date - February 19/20, 2013

The Honor Pledge Statement

"I have neither given nor received help on this assignment, nor am I aware of any infraction of the IB honor code."

Student's Signature _____

Assignment: Pre IBDP Algebra 2/Trig Statistics Project

This IB MYP Mathematics activity will assess the following assessment criteria:

Criterion A: Knowledge and Understanding

Maximum: 8

Maximum 6 out of 8 points as no patterns were being discovered. Students will be able to do the following:

1. Draw accurate line plots to represent all data collected
2. Interpret the plots drawn and decide what type of distribution was shown
3. Correctly use the data to discover and interpret both measures of central tendency and measures of dispersion.
4. Answer real world application questions using the distribution and the measures of dispersion.

Descriptor	Achievement Level	
• The student does not reach a standard described by any of the descriptors given below.	0	
• The student generally makes appropriate deductions when solving simple problems in familiar contexts.	1	2
• The student generally makes appropriate deductions when solving more complex problems in familiar contexts.	3	4
• The student generally makes appropriate deductions when solving challenging problems in a variety of familiar contexts.	5	6
• The student consistently makes appropriate deductions when solving challenging problems in a variety of contexts including unfamiliar situations .	7	8

Criterion C: Communication in Mathematics

Maximum: 6

Students will be able to:

1. Clearly and concisely explain steps taken to find the measures used above and the interpretation of the data.
2. Correctly used the appropriate mathematical terminology

Descriptor	Achievement Level	
• The student does not reach a standard described by any of the descriptors given below.	0	
• The student shows basic use of mathematical language and/or forms of mathematical representation.	1	2
• The lines of reasoning are difficult to follow .	3	4
• The student shows sufficient use of mathematical language and forms of mathematical representation.		
• The lines of reasoning are clear though not always logical or complete .	5	6
• The student moves between different forms of representation with some success .		
• The student shows good use of mathematical language and forms of mathematical representation.		
• The lines of reasoning are concise, logical and complete .	5	6
• The student moves effectively between different forms of representation.		

Criterion D: Reflection in mathematics**Maximum: 6**

Student will be able to:

1. Reflect upon the methods chosen and the processes used to explain why they chose the method they used. Students were to decide whether their method was the best to use, or if alternatives were available.
2. Decide whether additional technology could have been used to complete the task, and explain how.
3. Decide if their answers were accurate and to what degree.

Descriptor	Achievement Level	
• The student does not reach a standard described by any of the descriptors given below.	0	
• The student attempts to explain whether his or her results make sense in the context of the problem. • The student attempts to describe the importance of his or her findings in connection to real life where appropriate.	1	2
• The student correctly but briefly explains whether his or her results make sense in the context of the problem. • The student describes the importance of his or her findings in connection to real life where appropriate. • The student attempts to justify the degree of accuracy of his or her results where appropriate.	3	4
• The student critically explains whether his or her results make sense in the context of the problem. • The student provides a detailed explanation of the importance of his or her findings in connection to real life where appropriate. • The student justifies the degree of accuracy of his or her results where appropriate. • The student suggests improvements to his or her method where appropriate.	5	6

Assessment Comments:**PWCS Grade:**

The student will earn 3 summative grades for this assessment, one for each criteria used. All three criteria could earn a maximum of 6 points each.

The following is the grade conversion used:

6/6	100%
5/6	87%
4/6	74%
3/6	60%
2/6	40%
1/6	20%

Student summative grades earned:

Criterion A	
Criterion C	
Criterion D	

PRE IBDP ALGEBRA 2/TRIG

PROJECT:

INVESTIGATING THE QUADRATIC FUNCTION

This is an IBMYP assessment.

You may use your graphing calculator for this assignment.

Work should be done on the paper with your graphs.

The final project will be completed individually in class.

The final project will be written neatly in pen in complete sentences.

Please read your answers to be sure they are logical.

INVESTIGATING THE QUADRATIC FUNCTION

WORK DONE ON THIS ASSIGNMENT WILL BE ASSESSED AGAINST KNOWLEDGE, INVESTIGATION, COMMUNICATION AND REFLECTION.

1. Graph each of the following on the same set of axes:

a) $y = x^2$

b) $y = x^2 + 3$

c) $y = x^2 - 2$

State in words what you notice about all three graphs.

Write a GENERAL RULE (formula) for all three equations.

2. Graph each of the following on the same set of axes:

a) $y = x^2$

b) $y = (x - 2)^2$

c) $y = (x + 3)^2$

State in words what you notice about all three graphs.

Write a GENERAL RULE (formula) for all three equations.

3. Based on the information you gathered from the previous problems, where would you expect the vertex of the graph of $y = (x - 4)^2 + 5$ to be?

(____,____)

Explain why the vertex is placed here.

4. WITHOUT factoring, express each of the following in the form $(x - h)^2$:

a) $x^2 - 10x + 25$

b) $x^2 - 8x + 16$

c) $x^2 - 14x + 49$

Describe the method you found.

5. Using the information from #4, express each of the following in the form $(x - h)^2 + g$:

a) $x^2 - 10x + 32$

b) $x^2 - 8x + 23$

c) $x^2 - 14x + 61$

Describe the method you found.

6. Describe the shape and position of the graph of $y = (x - h)^2 + g$.

Give one specific example to verify your explanation.

7. If the **linear coefficient** was an odd number, would the method you used in #5 work as easily? Give one example to back your answer.

8. What did you discover about quadratic functions?

MATHEMATICS – Year-2012

Student: _____

Date: 10/15-16/2012

Assessment Comments:

PWCS Grade:

The Honor Pledge Statement

"I have neither given nor received help on this assignment, nor am I aware of any infraction of the IB honor code."

Student's Signature

Assignment: Investigating the quadratic function – in class assessment

This IB MYP Mathematics activity will assess the following assessment criteria:

Criterion B: Investigating Patterns

Students are expected to investigate a problem by applying mathematical problem-solving techniques, to find patterns, and to describe these mathematically as relationships or general rules and justify or prove them.

This criterion examines to what extent the student is able to:

- *select and apply appropriate inquiry and mathematical problem-solving techniques*
- *recognize patterns*
- *describe patterns as relationships or general rules*
- *draw conclusions consistent with findings*
- *justify or prove mathematical relationships and general rules.*

Assessment tasks for this criterion should be mathematical investigations of some complexity, as appropriate to the level of MYP mathematics. Tasks should allow students to choose their own mathematical techniques to investigate problems, and to reason from the specific to the general. Assessment tasks could have a variety of solutions and may be set in real-life contexts. Teachers should clearly state whether the student has to provide a justification or proof.

Teachers should include a good balance between tasks done under test conditions and tasks done at home in order to ensure the development of independent mathematical thinking.

Descriptor	Achievement Level	
• The student does not reach a standard described by any of the descriptors given below.	0	
• The student applies, with some guidance , mathematical problem-solving techniques to recognize simple patterns.	1	2
• The student selects and applies mathematical problem-solving techniques to recognize patterns, and suggests relationships or general rules.	3	4
• The student selects and applies mathematical problem-solving techniques to recognize patterns, describes them as relationships or general rules, and draws conclusions consistent with findings.	5	6
• The student selects and applies mathematical problem-solving techniques to recognize patterns, describes them as relationships or general rules, draws conclusions consistent with findings, and provides justifications or proofs .	7	8

Notes

1. Pattern: the underlining order, regularity or predictability between the elements of a mathematical system. To identify pattern is to begin to understand how mathematics applies to the world in which we live. The repetitive features of patterns can be identified and described as relationships or generalized rules.
2. Justification: a clear and logical mathematical explanation of **why** the rule works.
3. Proof: a mathematical demonstration of the truth of a given proposition.
4. Find a pattern of how the quadratic function is graphed when transformations occur.
5. Find a method of graphing a quadratic function from the standard form without factoring first.

Criterion C: Communication in Mathematics

Students are expected to use mathematical language when communicating mathematical ideas, reasoning and findings—both orally and in writing.

This criterion examines to what extent the student is able to:

- use appropriate mathematical language (notation, symbols, terminology) in both oral and written explanations
- use different forms of mathematical representation (formulae, diagrams, tables, charts, graphs and models)
- move between different forms of representation.

Students are encouraged to choose and use appropriate ICT tools such as graphic display calculators, screenshots, graphing, spreadsheets, databases, drawing and word-processing software, as appropriate, to enhance communication.

Assessment tasks for this criterion are likely to be real-life problems, tests, examinations and investigations.

Tests and examinations that are to be assessed against criterion C must be designed to allow students to show complete lines of reasoning using mathematical language.

Descriptor	Achievement Level	
• The student does not reach a standard described by any of the descriptors given below.	0	
• The student shows basic use of mathematical language and/or forms of mathematical representation. The lines of reasoning are difficult to follow .	1	2
• The student shows sufficient use of mathematical language and forms of mathematical representation. The lines of reasoning are clear though not always logical or complete . • The student moves between different forms of representation with some success .	3	4
• The student shows good use of mathematical language and forms of mathematical representation. The lines of reasoning are concise, logical and complete . • The student moves effectively between different forms of representation.	5	6

Notes

1. Mathematical language: the use of notation, symbols, terminology and verbal explanations.
2. Forms of mathematical representation: refers to formulae, diagrams, tables, charts, graphs and models, used to represent mathematical information.

Criterion D: Reflection in mathematics

Reflection allows students to reflect upon their methods and findings.

This criterion examines to what extent the student is able to:

- explain whether his or her results make sense in the context of the problem
- explain the importance of his or her findings in connection to real life
- justify the degree of accuracy of his or her results where appropriate
- suggest improvements to the method when necessary.

Assessment tasks are most likely to be investigations and real-life problems. Generally these types of tasks will provide students

Descriptor	Achievement Level	
• The student does not reach a standard described by any of the descriptors given below.	0	
• The student attempts to explain whether his or her results make sense in the context of the problem. The student attempts to describe the importance of his or her findings in connection to real life.	1	2
• The student correctly but briefly explains whether his or her results make sense in the context of the problem and describes the importance of his or her findings in connection to real life. • The student attempts to justify the degree of accuracy of his or her results where appropriate.	3	4
• The student critically explains whether his or her results make sense in the context of the problem and provides a detailed explanation of the importance of his or her findings in connection to real life. • The student justifies the degree of accuracy of his or her results where appropriate. • The student suggests improvements to the method when necessary.	5	6

Notes

1. Describe: present an account without providing reasons or explanations.
2. Explain: give a detailed account including reasons, causes or justifications. Explanations should answer the questions “why” and “how”.

Subject: Common Core Mathematics 6, STEMathematics 6/7**Criterion: C Communication**MD State & Common Core Standard (s): [Click here to enter text.](#)

Level	Descriptors	Check	Task Specific Indicators
0	The student does not reach a standard described by any of the descriptors below.		<ul style="list-style-type: none"> Student does not complete the assignment. Student makes a good faith attempt to complete the assignment.
1-2	The student: <ul style="list-style-type: none"> demonstrates a basic use of mathematical language (notation, symbols, terminology) in oral and/or written communications uses different forms of mathematical representation that is difficult to follow (simple formulae, diagrams, tables, charts, graphs and models), with guidance from the teacher rarely states, in writing and/or verbally, the steps followed in solving simple problems. 		Click here to enter text.
3-4	The student: <ul style="list-style-type: none"> demonstrates a sufficient use of mathematical language (notation, symbols, terminology) in oral and/or written communications uses different forms of mathematical representation that is mostly clear and complete (simple formulae, diagrams, tables, charts, graphs and models), with guidance from the teacher usually states, in writing and/or verbally, the steps followed in solving simple problems. 		Click here to enter text.
5-6	The student: <ul style="list-style-type: none"> demonstrates a good use of mathematical language (notation, symbols, terminology) in both oral and written communications uses different forms of mathematical representation concisely, logically, and completely (simple formulae, diagrams, tables, charts, graphs and models), with guidance from the teacher states, in writing and/or verbally, the steps followed in solving simple problems. 		Click here to enter text.
Your MYP Score = _____/6 Your AACPS Grade = _____/100 Teacher Comments:			

Subject: Algebraic Thinking 7 Criterion: B Investigating Patterns MD State Standard (s): 7.1.B.1.a Write an algebraic expression to represent unknown quantities			
Level	Descriptors	Check	Task Specific Indicators
NHI			<ul style="list-style-type: none"> Student does not complete the assignment.
0	The student does not reach a standard described by any of the descriptors below.		<ul style="list-style-type: none"> Student makes a good faith attempt to complete the assignment.
1-2	The student rarely applies basic inquiry and mathematical problem-solving techniques, with guidance from the teacher, by: <ul style="list-style-type: none"> identifying variables, posing relevant questions, organizing data and using an appropriate model. recognizing simple patterns similar to previously seen examples. describing simple patterns and relationships in words and/or diagrams. arriving at a result or set of results and making predictions based on extending the pattern(s). 		The student rarely : <ul style="list-style-type: none"> identifies the pattern between the figures. correctly writes the rule for the given pattern. explains how they came up with the rule.
3-4	The student sometimes applies basic inquiry and mathematical problem-solving techniques, with guidance from the teacher, by: <ul style="list-style-type: none"> identifying variables, posing relevant questions, organizing data and using an appropriate model. recognizing simple patterns similar to previously seen examples. describing simple patterns and relationships in words and/or diagrams. arriving at a result or set of results and making predictions based on extending the pattern(s). 		The student sometimes : <ul style="list-style-type: none"> identifies the pattern between the figures. correctly writes the rule for the given pattern. clearly explains how they came up with the rule.
5-6	The student usually applies basic inquiry and mathematical problem-solving techniques, with guidance from the teacher, by: <ul style="list-style-type: none"> identifying variables, posing relevant questions, organizing data and using an appropriate model. recognizing simple patterns similar to previously seen examples. describing simple patterns and relationships in words and/or diagrams. arriving at a result or set of results and making predictions based on extending the pattern(s). 		The student usually : <ul style="list-style-type: none"> identifies the pattern between the figures. correctly writes the rule for the given pattern. clearly explains how they came up with the rule.
7-8	The student always applies basic inquiry and mathematical problem-solving techniques, with guidance from the teacher, by: <ul style="list-style-type: none"> identifying variables, posing relevant questions, organizing data and using an appropriate model. recognizing simple patterns similar to previously seen examples. describing simple patterns and relationships in words and/or diagrams. arriving at a result or set of results and making predictions based on extending the pattern(s). 		The student always : <ul style="list-style-type: none"> identifies the pattern between the figures. correctly writes the rule for the given pattern. clearly explains how they came up with the rule.

Subject: STEMathematis 8, Algebra I, Geometry

Criterion: A Knowledge and Understanding

MD State & Common Core Standard (s): [Click here to enter text.](#)

Level	Descriptors	Check	Task Specific Indicators
0	The student does not reach a standard described by any of the descriptors below.		<ul style="list-style-type: none"> Student does not complete the assignment. Student makes a good faith attempt to complete the assignment.
1-2	The student rarely demonstrates understanding of mathematical concepts by: <ul style="list-style-type: none"> using appropriate mathematical concepts and skills to solve simple problems in both familiar situations including those in real-life contexts. selecting and applying basic rules correctly to solve problems including those in real-life contexts. 		Click here to enter text.
3-4	The student sometimes demonstrates understanding of mathematical concepts by: <ul style="list-style-type: none"> using appropriate mathematical concepts and skills to solve simple problems in both familiar situations including those in real-life contexts. selecting and applying basic rules correctly to solve problems including those in real-life contexts. 		Click here to enter text.
5-6	The student generally demonstrates understanding of mathematical concepts by: <ul style="list-style-type: none"> using appropriate mathematical concepts and skills to solve simple problems in both familiar and unfamiliar situations including those in real-life contexts. selecting and applying basic rules correctly to solve problems including those in real-life contexts. 		Click here to enter text.
7-8	The student consistently demonstrates understanding of mathematical concepts by: <ul style="list-style-type: none"> using appropriate mathematical concepts and skills to solve simple problems in both familiar and unfamiliar situations including those in real-life contexts. selecting and applying basic rules correctly to solve problems including those in real-life contexts. 		Click here to enter text.
	Your MYP Score = _____/8 Your AACPS Grade = _____/100 Teacher Comments:		