SAU 39
Mathematics Task Force

A Report on Grouping Practices
And Recommendations for Mathematics Instruction
Thursday, April 24, 2008

Committee Membership

Clark and Wilkins Schools

- Toni Toniolo, Math Specialist and Curriculum Coordinator
- David Wright, 4th Grade Teacher
- Gerry St. Amand, Principal of Clark/Wilkins

Mont Vernon Village School

- Charlene Brown, 6th Grade Teacher
- Meghan Silva, 2nd Grade Teacher
- Kim Tighe, 4the Grade Teacher and Curriculum Coordinator
- Meredith Nadeau, Principal

Amherst Middle School

- Christine Estabrook, 5th Grade Teacher
- Donna Hamel, 7th Grade Teacher and Curriculum Coordinator
- Heather Hector, 8th Grade Teacher
- Porter Dodge, Principal

Souhegan High School

- Barbara Brunelle, Math Teacher
- Kristen Gallo, Dean of Faculty – Co-chair
- Joann McDeed, Math Teacher and Curriculum Coordinator
- Scott Prescott, Principal

SAU Office

- Nicole Heimarck, Director of Curriculum and Professional Development – Co-chair

The Four Phases of Curriculum Revision

➢ **Phase 1 – Research and Identifying the Target**

What are our needs?

What could/What should our students know and be able to do?

How will we know what our students know?

If this curriculum is considered successful, what will we see?

What are our "indicators of success?"

➢ **Phase 2 –Development**

How will our students reach the target

What is needed to meet the target?

How is the developing curriculum matching with the assessments identified in Phase 1: Research and Identifying the Target?

How does the developing curriculum honor/celebrate/explore diversity?

What financial support is necessary to implement this curriculum?

➢ **Phase 3 – Implementation**

➢ **Phase 4 – Evaluation**

How are our students performing?

Did we implement the curriculum as designed?

How well is it working?

How well did we address our needs?

Curriculum Revision Cycle

Curriculum Area	2008	2009	Special Notes
Math	4	4	LR = 2002, Secondary alignment study = summer 2007
Reading/E/LA	4	4	Needs assessment to be deployed Sept. 2008
Social Studies	3	4	UbD=focus for 2008/2009
Science	2	3	Seeking board adoption May 2008
Music	1	1	Last R-8 Revision, significant progress made during the winter and spring of 2008.
Art	1	1	Last revision =1987
Health/PE	1	2	Integrated approach
Life Skills			Never included in the original design of the revision cycle
Foreign Language	4	4	Completed as a 7-12 revision
Technology	1	2	*See Information Literacy*
Guidance	1	2	Never included in the original design of the revision cycle, Collaborating w/health
Information Literacy			Library/Media Specialists and Technology working collaboratively. Never included in the original design of the revision cycle.

* The curriculum revision cycle enters evaluation beginning May 2008

Defining Purpose

The Charge

- Evaluation of mathematics instruction.

Rationale

- Inconsistent practices observed in the delivery of instruction within and/or across our 3 school districts: Amherst, Mont Vernon, and Souhegan.

Points of Interest

➢ Grouping

➢ Acceleration

➢ Placement Process

➢ Course/Grade level Competencies

➢ Program

Committee Outcomes

➢ A vision for mathematics instruction

➢ Local case study

➢ Placement Process

Timeline for Placement

Student Work Habits Rubric

Acceleration Rubric

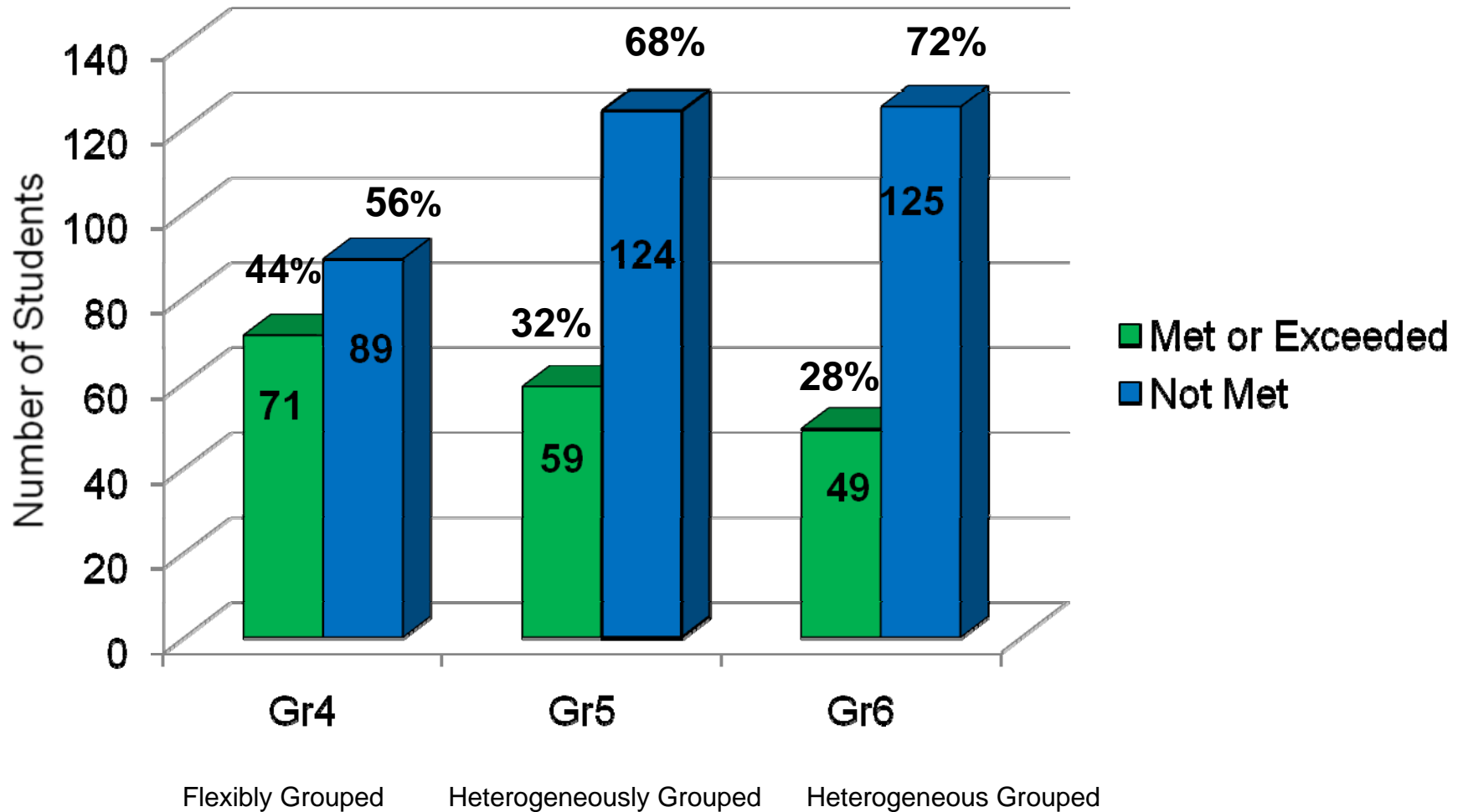➢ Recommendations for future curriculum work

A Local Case Study

Examining Student Grouping Practices in Mathematics
Flexible Grouping, Heterogeneity, and Tracked Pull-Out

The Amherst School District

Grades 4,5, and 6
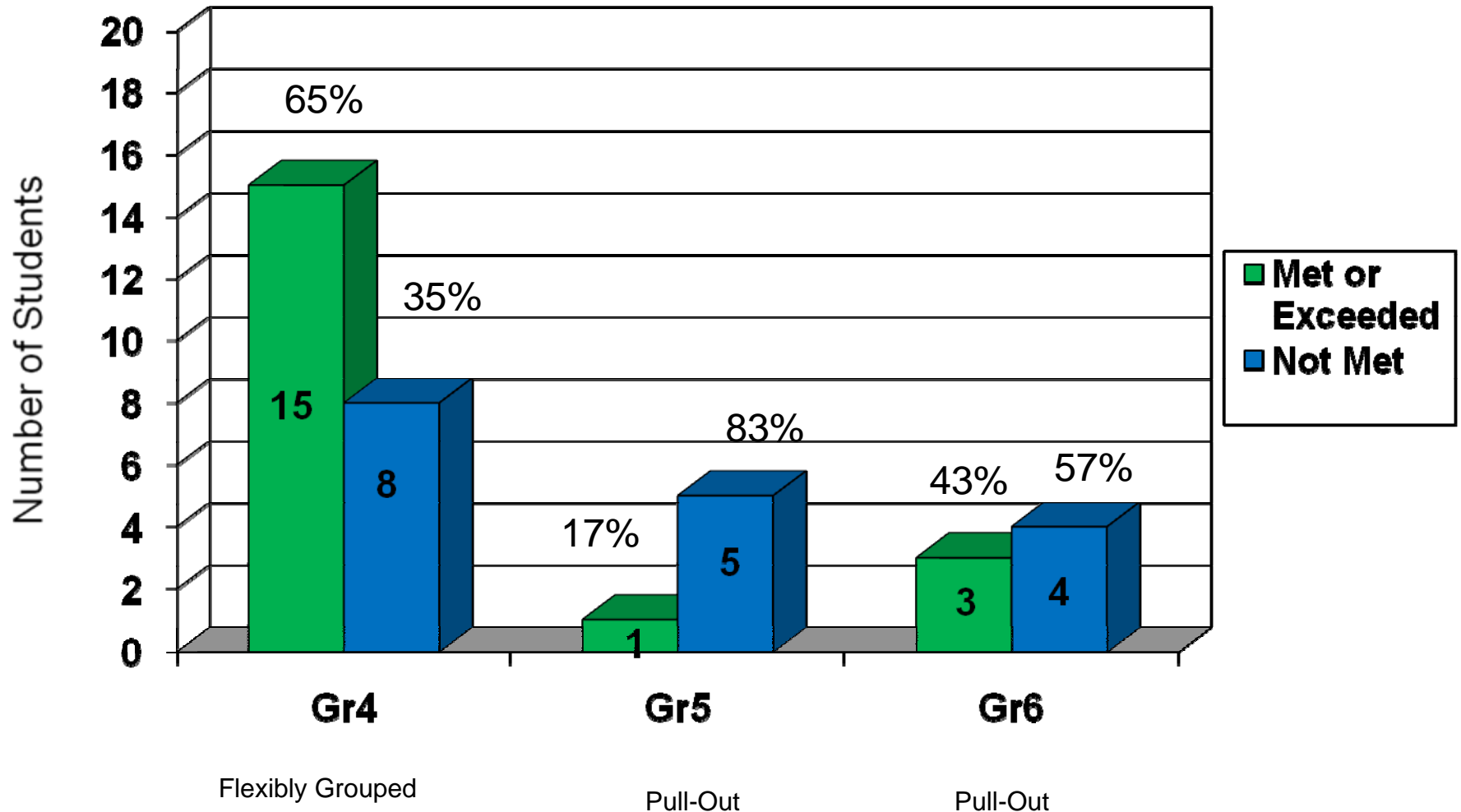
The Amherst School District
2008 Grouping Practices, Grades 4,5,and 6
Students Who Met or Exceeded EOY NWEA Target Growth

The Amherst School District
2008 Advanced Math, Grades 4-6
Students Who Met or Exceeded EOY NWEA Target Growth

Flexibly Grouped   Pull-Out   Pull-Out

A Vision for Mathematics Instruction

The vision is based on the desire to increase student learning in mathematics for all students and to enable mathematical comprehension to become a way of thinking, along with a mastery of skills, creating more understanding and knowledge around those skills (Math Revision, 2002).

Implementation

➤ This is best achieved by flexibly grouping students at the K-6 grade levels

and

➤ Offering multiple entry points into accelerated mathematics or advanced mathematics at the 7-12 grade levels

What does this look like K-6?

Flexible Grouping

What it is	What it is not
Age-appropriate	Tracking
Need-appropriate	Stagnant/ pigeon-hole
Fluid/permeable	Homogeneity
Based upon pre-assessments	Labeling /stigmatizing
Narrows scope of skills	Driven by school calendar
Varies by unit	
Content and skill driven	
Readiness driven	
Learning style	
Individualized	
Ever-changing	
Multiple access points	

Resources Designed to Support the Instructional Model

➢Math Coach
  ➢.5 Math Coach Wilkins (2-4)
  ➢1.0 Math Coach AMS (5-6)
  ➢.25 Math Coach MVVS (funded by a grant)
➢NWEA (Descartes)
➢Pre-assessments

Report: NWEA Class by RIT

A local example of how we use the data to inform flexible grouping and instruction.

	< 161	161-170	171-180	181-190	191-200	201-210	211 +
Mathematics		B. B. Jones (161) B. B. Jones (166) B. B. Jones (167)	B. B. Jones (171) B. B. Jones (173) B. B. Jones (177) B. B. Jones I (179)	B. B. Jones (181) B. B. Jones (185) J. B. Jones (186) M. J. Smith (186) M. M. Bobs (186) T. B. Small (189) B. B. Jones (190)	B. B. Jones (192) B. B. Jones (195) B. B. Jones (196) B. B. Jones (198) B. B. Jones (199)	B. B. Jones (209)	
Reading	B. B. Jones (153)	G. B. Jones (161) J. B. Jones (166) K. B. Jones (169)	K. B. Jones (172) G. B. Joness (173) I. B. Jones er (175)	M. B. Jones tten (181) M. B. Jones (182) T. B. Joneult (183) C. B. Jonesn (185) M. B. Jonesd (189) J. B. Jones (190)	K. B. Jones (192) B. Jonesne (193) B. Joneson (193) S B. Jonean (197)	B. Jonesh (205) S B. Jonewe (208)	B. Jonesred (214)

NWEA: Class by RIT in Goal Area

	< 161	161-170	171-180	181-190	191-200	201-210	211 +
Data / Stats / Probability		<all students in cell> C. B. Jonesa (161)	<all students in cell> B. Jones (166) C. B. Jones (167) I. B. Jones (171) G. B. Jones s (173) B. Jones s (177) J B. Jones (179)	<all students in cell> K. B. Jones (181) J. B. Jones (186) M. B. Jones (186) M. B. Jones (195)	<all students in cell> M B. Jones (185) M. B. Jones (186) B. Jones t (189) K. B. Jones r (190) B. Jones (192) B B. Jones (196) S. B. Jones 198) H. B. Jones r (199)		<all students in cell> S. B. Jones (209)
Functions & Algebra	<all students in cell> C B. Jones (161) K. B. Jones (166) C. B. Joneson (167)	<all students in cell> B. Joneser (171)	<all students in cell> G. B. Jones (173) G. B. Jones s (177) K. B. Jones on (181) J. B. Jones 186)	<all students in cell> J. B. Jones (179) B. Jones (185) M B. Jones (186) B. Joneslt (189) K. B. Jones (190)	<all students in cell> B. Joneslev (186) J B. Jones (192) H. B. Jonesr (199) S. B. Jones (209)	<all students in cell> B. Joneson (195) B B. Jonese (196) S. B. Jonesn (198)	
Geometry & Measurement		<all students in cell> C. B. Jones (161)	<all students in cell> K. Bobbin (166) C. B. Joneson (167) B. Jones (171) G. B. Joness (173) G. B. Jones is (177) J. B. Jonesll (179) T. B. Jones (189)	<all students in cell> B. Jonesn (181) M. B. Jones (185) M. B. Jonesev (186) M. B. Jones n (186) B. B. Jones (196)	<all students in cell> B. Jones (190) J B. Jonesh (192) M B. Jones (195)	<all students in cell> B. Jonese (186)	<all students in cell> S. B. Jones (198) B. Jones (199) S B. Jones (209)
Number & Operations	<all students in cell> K. Murber (166) C. B. Jonesn (167) G. B. Jonesds (173)	<all students in cell> B. Jones (161)	<all students in cell> I B. Jones (171) G. B. Jones (177) J. B. Jones 179) K. B. Jones (181) J. B. Jones (186) M. B. Jones ev (186) B. Jonesten (186)	<all students in cell> M B. Jonesd (185) B. Jones r (190) J. B. Jones (192) S. B. Jonesan (198)	<all students in cell> B. Joneslt (189) B. Jonesn (195) B. B. Jonesane (196) H. B. Jones r (199)		<all students in cell> S. B. Jones (209)

Subject: Mathematics
Goal Strand: Geometry and Measurement
RIT Score Range: 181 - 190

DesCartes: A continuum of learning designed to help teachers target instruction to individual learning needs

Skills and Concepts to Enhance 171 - 180	Skills and Concepts to Develop 181 - 190	Skills and Concepts to Introduce 191 - 200
Properties or Attributes of Angles or Sides	**Properties or Attributes of Angles or Sides**	**Properties or Attributes of Angles or Sides**
• Identifies and names a triangle • Identifies and names a square • Identifies and names a rectangle* • Identifies and names a circle* • Recognizes geometric shapes in real-world objects	• Classifies polygons by sides and vertices	• Identifies angles* • Sorts 2-D shapes and objects according to their attributes
Properties or Attributes of 3-D Shapes	**Properties or Attributes of 3-D Shapes**	**Properties or Attributes of 3-D Shapes**
• Identifies and names a cube	• Identifies and names a cube • Identifies and names a sphere	• Identifies the number of faces on rectangular prisms • Identifies and names a cylinder • Identifies and names a sphere
Congruency and Similarity	**Congruency and Similarity**	**Congruency and Similarity**
• Identifies figures that are similar	• Identifies congruent figures • Identifies figures that are similar • Identifies plane figures with line symmetry • Identifies transformations of plane figures (rotations/turns) • Identifies transformations of plane figures (translations/slides)*	• Creates a new shape by combining different shapes, or identifies the different shapes that were used to make the original shape* • Identifies figures that are the same size and shape (analysis)* • Identifies congruent figures • Identifies plane figures with line symmetry • Identifies the number of lines of symmetry in plane figures • Identifies transformations of plane figures (reflections/flips)
Perimeter, Area, Volume	**Perimeter, Area, Volume**	**Perimeter, Area, Volume**
• Determines the area of irregular shapes by counting square units*	• Determines the perimeter of a figure where all sides are labeled • Compares squares (larger, smaller) • Determines the area of irregular shapes by counting square units*	• Determines the perimeter of a figure where all sides are labeled • Determines the perimeter of a figure where some sides are labeled • Solves simple problems involving the perimeter of squares, rectangles, or triangles • Estimates the area of rectangles using square units
Measurement, Units, Conversions, Time	**Measurement, Units, Conversions, Time**	**Measurement, Units, Conversions, Time**
• Estimates and measures length of an object to the nearest centimeter using a picture of a ruler* • Measures length with customary measures to the inch mark*	• Identifies the appropriate instrument used to measure length* • Selects and uses the appropriate type and size of unit in customary system (length)	• Selects and uses the appropriate type and size of unit in customary system (length) • Selects and uses the appropriate type and size of unit in customary system (height)*

* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.
Blank cells indicate data are limited or unavailable for this range or document version.

NH 3.4.1

What does this look like 7-12?

➤ Multi-age classrooms

➤ Cluster grouping on teams

➤ Math Specialist and Learning Specialists embedded in the classrooms (SHS)

➤ Honors challenge available to all students in all math classes (SHS)

➤ Math 3 co-teaching model (SHS)

➤ Ongoing cross district collaboration

Products of the Committee's Work

Timeline

Rubrics

Timeline for Data Collection for Grade 5 Middle School Transition

General Time-Frame	Activity	Who is Responsible?	Additional Notes/Directions
February (first two weeks of the month)	Winter NWEA is given to all students in the 4th grade	Building principal or designee	Because 5th grade is a transition year for students in the ASD this data collection will allow the transition process to occur in a more timely fashion.
March	Classroom teacher completes *Student Work Habits Rubric* for all students.	Student's math instructor	Because it is not as easy for teachers from different buildings to converse we see this as valuable data for next year's teacher.
April-June	Master scheduling of students	Principal's Office	

Timeline for Placement into Accelerated Math, Grades 7-11

General Time-Frame *May vary slightly by school or district	Activity	Who is Responsible?	Additional Notes/Directions
January	• Letter is sent home to all families inviting their student(s) to participate in a screening process for advanced mathematics placement. • Grade 6 teachers give Orleans Hannah to all students	Math Curriculum Coordinators and Building Principals	Dir. Of Curriculum will create a form letter that will be adapted by the individual schools.
February (first two weeks of the month)	Winter NWEA is given to students who have elected to participate in advanced math screening	Building principal or designee	Cut points will be re-aligned on placement rubric when new NWEA norms are released.
February (third week of the month)	• Conference with students who should not proceed in the screening process. • Dialogue with student's parents.	Student's math instructor and/or math curriculum coordinator	This decision would be based upon concerning fall and winter NWEA score and current classroom performance.
March	• All assessments evaluated • Student Work Habit Rubric completed. • Placement rubric completed identifying course for next year.	Math Curriculum Coordinators in consultation with student's math instructor	
March (completed by the end of the month)	Placement rubric sent home with parent letter identifying placement for next year.	Principal and Math Curriculum Coordinators	
April (first 2 weeks of the month)	Parent appeals process	Parent initiates the process by contacting the building principal	*To be designed
April-June	Master-scheduling of students	Principal's Office	Depending on all assessment results students may be contained to one team, cross-teamed, or assigned cross grade levels. *This decision may vary from year to year

Student Work Habits Rubric – Grades 4, 6-10

Student Name _____   Grade _____

Current Math Program _____   Teacher/team Completing the Form _____

Point Value	Motivation & Effort	Persistence in Difficult Tasks	Homework Completion	Independent & Self-Advocate
4	Highly motivated, always tries hard.	Pursues to successful completion multi-step or complex problems. Tenacious.	Completes homework nearly 100% of the time.	Has confidence working independently and seeks help when needed. Strong self-advocate.
3	Good motivation, usually displays good effort.	Mostly completes complex problems with only some frustration or assistance.	Completes homework nearly 80% of the time.	Sometimes works independently.
2	Fair motivation, sometimes shows effort.	Easily frustrated and expects teacher assistance often.	Completes homework nearly 60% of the time.	Usually needs assistance. Occasionally seeks help when needed.
1	Poor motivation, rarely puts in effort.	Easily gives up when immediate solution is not found.	Seldom completes homework - nearly 40% or less.	Needs constant assistance. Will not seek help or self-advocate.

Total Point Value Earned _____ / 16

Additional Teacher/Team Comments

_____

_____

_____

_____

_____

_____

_____

The student mathematics placement rubric is designed to fulfill 2 purposes
  ➢ A communication mechanism for transition years (4, 6, and 8)
  ➢ A placement mechanism for accelerated mathematics beginning in grade 7
April 21, 2008

Accelerated Math Placement Rubric

Student Name _____   Grade _____

Current Math Program _____   Teacher/team Completing the Form _____

| Point Value	Math NECAP	Math NWEA Numbers represent the minimum score	Orleans Hannah Grade 6 only	Classroom Performance	Work Habits Rubric
3	Proficient w/Distinction Level 4	93-100%	60 Points	A (93%-above)	15-16
2	Proficient Level 3	85-92%	55-59 Points	A- B+ (87-92%)	13-14
1	No points awarded below proficient	77-84%	50-54 Points	B (83-86%)	11-12
Points Earned					

Placement for current grade 6 students
2-year acceleration: 14-15 points
1-year acceleration: 12-13 points

Placement for current grade 7-11 students
Strong candidate for acceleration: 10-12 points
Candidate with reservation: 8-9 points

Earned

_____
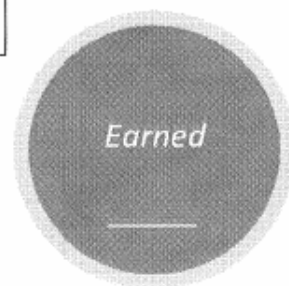
Please circle the recommended course for next year

Grade 8 Math   Integrated 1   Integrated 2   Integrated 3   Pre-Calculus   AP Calculus AB   AP Calculus BC

Additional Teacher/Team Comments

_____

_____

_____

Recommendations for the Future

➢ Create common EOY (End of Year) or EOC (End of Course) assessments for all grade levels

➢ Support teachers in implementing flexible grouping through PD and release time

➢ Evaluate the process and materials used for placement into accelerated mathematics

➢ Evaluate the effectiveness of flexible grouping for grade levels K-6

➢ Continue with the curriculum alignment that has occurred at grade levels 7-10, mirror process for other grade levels

➢ Pursue common curriculum adoption across the school districts

➢ Pursue common programming across the school districts

➢ Examine other entry points into advanced mathematics at the secondary level

➢ Identification of "Power" skills/standards for each grade level

➢ Research opportunities that may become available beyond the 2-year acceleration path. Such opportunities could become available to those students who demonstrate truly exceptional needs in mathematics