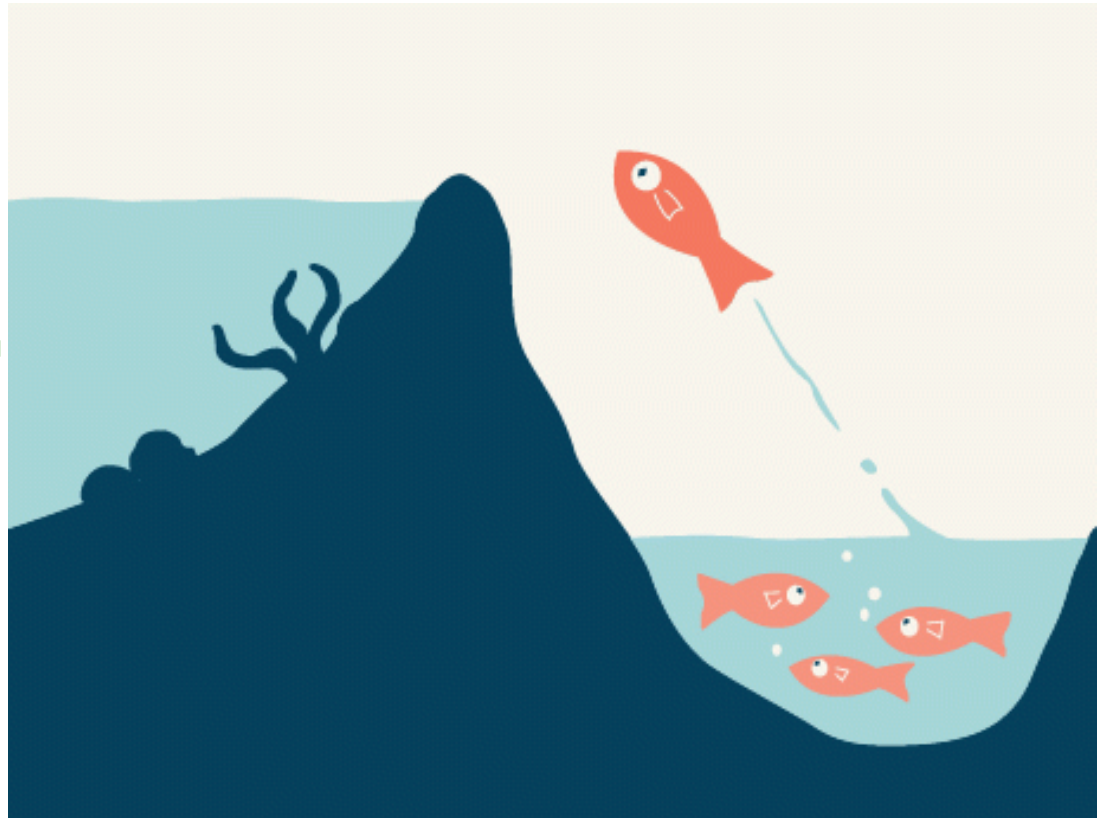# MOTIVATING STRUGGLING STUDENTS USING FORMATIVE ASSESSMENTS AND OTHER STRATEGIES

JEN PARISI

JPARISI@D125.ORG
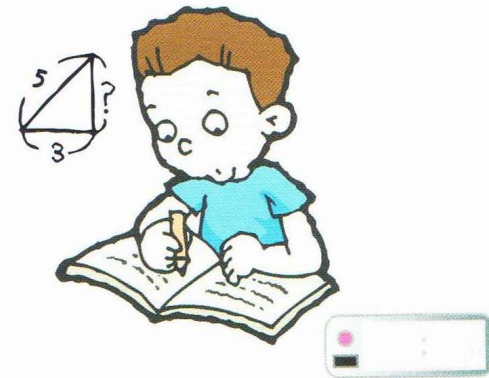
"I LOVE ALL THESE STRATEGIES BUT WHERE DO YOU FIND THE TIME!!!"
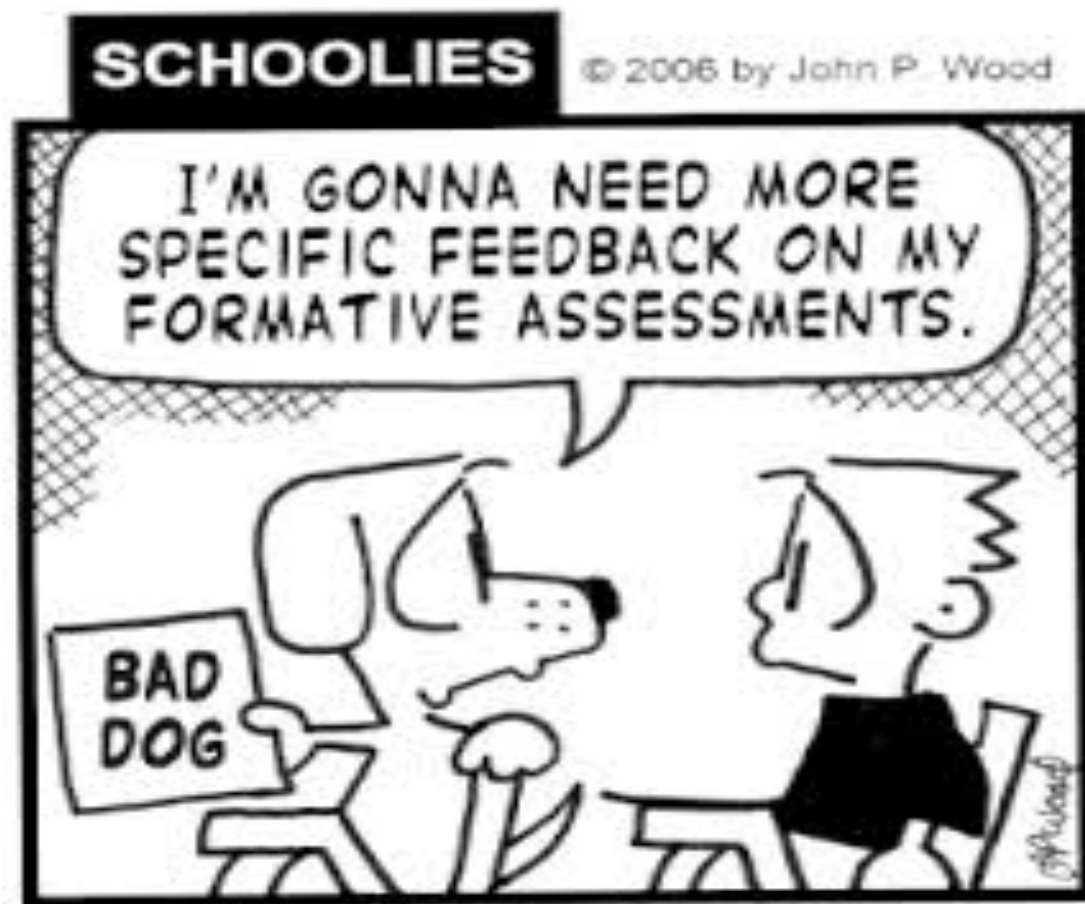
HOMEWORK PHILOSOPHY:

- It is NOT gone over in class

- Students check their work (odds in book and evens are on the assignment sheet)

- Use the warm-up to go over problems you know students will struggle with

Remember: 50 minutes of quality instruction means you do not need to go over homework

FORMATIVE ASSESSMENT

LEARNING TARGETS

- **Learning Targets:** Act as a broad description of essential skills and concepts we expect students to master.

- **Success Criteria:** The learning components that students must demonstrate understanding of in order to achieve full mastery of the learning target.

Geometry
Unit 2 Assignments

Learning Targets:
A. I can classify, measure, and construct angles
B. I can recognize when to apply angle addition with bisectors
C. I can identify and use special pairs of angles (complementary, supplementary, adjacent, vertical)
D. I can analyze a conditional statement, its converse and apply logical reasoning.

In addition to the learning targets above, I am able to apply multiple skills/concepts to solve more in depth problems

#1 Lesson 1.4   Worksheet #1 – Angles
Target A

#2 Lesson 1.4   Worksheet #2 – Angle Bisectors
Target B

#3 Lesson 1.5   Worksheet #3 – Angle Relationships
Target C

#4 Lesson 1.4-1.5   Worksheet #4 – Angles Review
Target C

Quiz on Targets A - C
Wednesday, September 14th

#5 Lesson 2.3   Worksheet #5: Conditionals
Target D

#6 Lessons 2.3/2.4   Worksheet #6: Explanations
Target D

#7 Lesson 2.5   Worksheet #7: Intro to Proofs
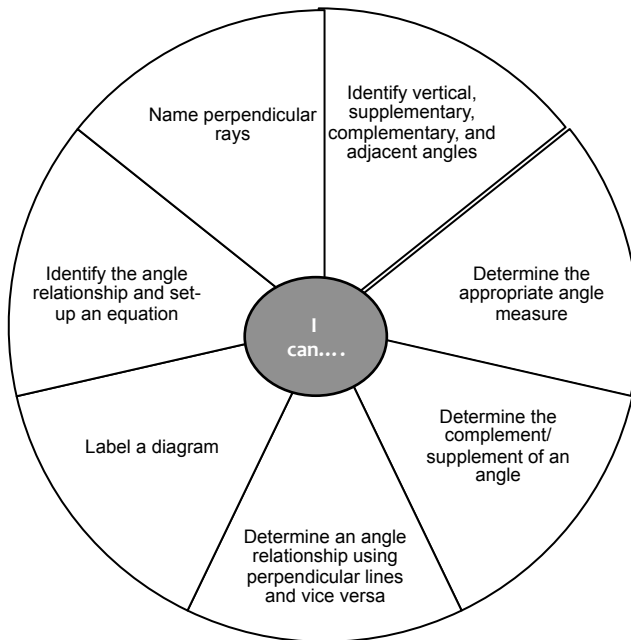*Target D*

Unit 2 Review Packet

Unit 2 TEST
Thursday September 22nd

LEARNING WHEELS

Learning Target C: Angle Relationships
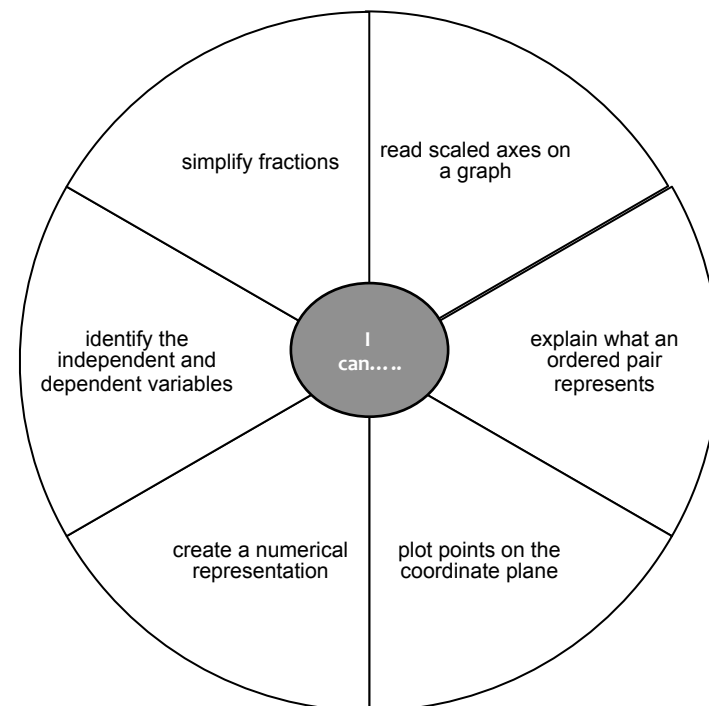
Learning Target D: Conditionals/Logic/Proof

Learning Target C wheel (center: "I can...."):
- Identify vertical, supplementary, complementary, and adjacent angles
- Determine the appropriate angle measure
- Determine the complement/ supplement of an angle
- Determine an angle relationship using perpendicular lines and vice versa
- Label a diagram
- Identify the angle relationship and set-up an equation
- Name perpendicular rays

Learning Target D wheel (center: "I can...."):
- Identify a hypothesis and conclusion
- Write a conditional
- Write a converse
- Provide a counterexample when necesary
- Write an explanation - determine the conclusion
- Label a diagram with given information
- Fill in a proof using logical reasoning

COMMON CORE

Unit 2
Learning Target Self-Assessment

Learning Target 1: Rate of Change

Include the units when determining the rate of change

calculate the rate of change of a frunction from a graph

interpret rate of change of a function from a graph, numerically, and verbally out of context

I can…..

calculate the rate of change of a function from a numerical representation

interpret rate of change of a function from a graph, numerically, and verbally in context

calculate the rate of change from a verbal representation

use the rate of change to find missing values in a numerical representation

Learning Target 1: Prerequisites

simplify fractions

read scaled axes on a graph

identify the independent and dependent variables

I can…..

explain what an ordered pair represents

create a numerical representation

plot points on the coordinate plane

HONORS COURSES
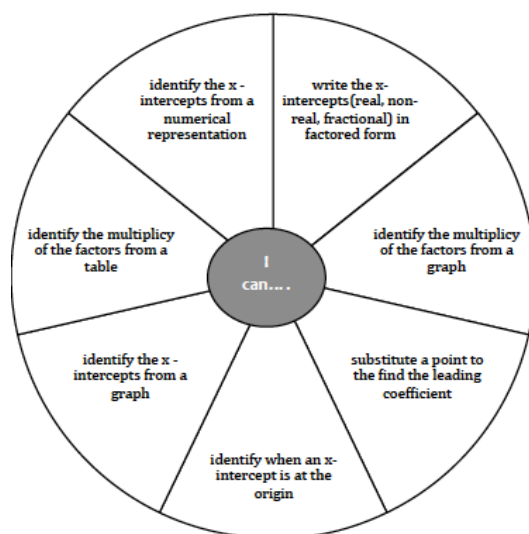
Problem Solving

MP1: Make sense and preserve in solving them
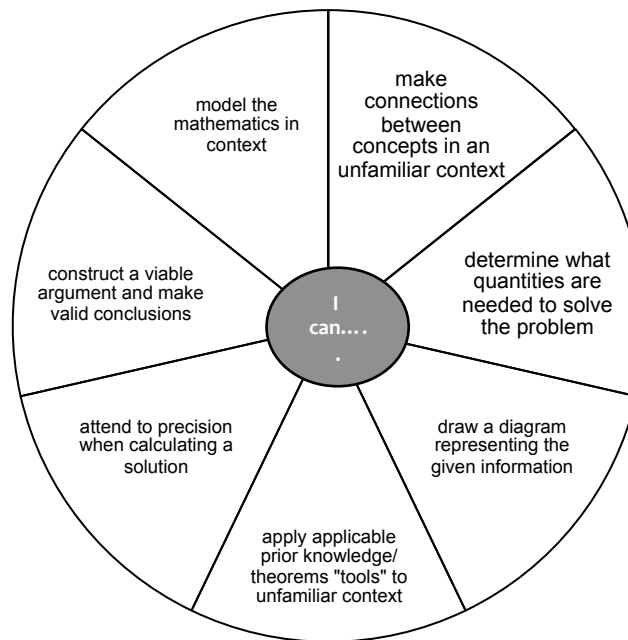
STANDARD BASED GRADING

Unit Polynomials:
Standard 1: Representations

Objective 1A: Graphing

identify the x - intercepts from a numerical representation

write the x-intercepts(real, non-real, fractional) in factored form

identify the multiplicy of the factors from a table

I can....

identify the multiplicy of the factors from a graph

identify the x - intercepts from a graph

substitute a point to the find the leading coefficient

identify when an x-intercept is at the origin

Objective 1B: Writing

identify the x - intercepts from a numerical representation

write the x-intercepts(real, non-real, fractional) in factored form

identify the multiplicy of the factors from a table

I can....

identify the multiplicy of the factors from a graph

identify the x - intercepts from a graph

substitute a point to the find the leading coefficient

identify when an x-intercept is at the origin

CREATE MATHEMATICAL REPRESENTATIONS (MP2 & MP7) - *Create a Graphical Representation (1A)*

STILL DEVELOPING (1)	APPROACHING (2)	DEMONSTRATES (3)	EXCEEDS MASTERY (4)
I can create a graphical representation in any given context.	I can create an appropriate graphical representation in any given context.	I can create an accurate graphical representation in any given context using key features.	I can create an accurate graphical representation in any given context in unfamiliar situations.

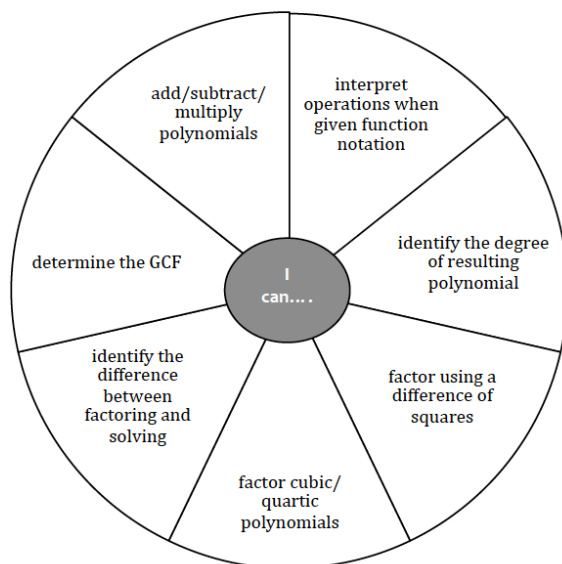CREATE MATHEMATICAL REPRESENTATIONS (MP2 & MP7) – *Create a Symbolic Representation (1B)*

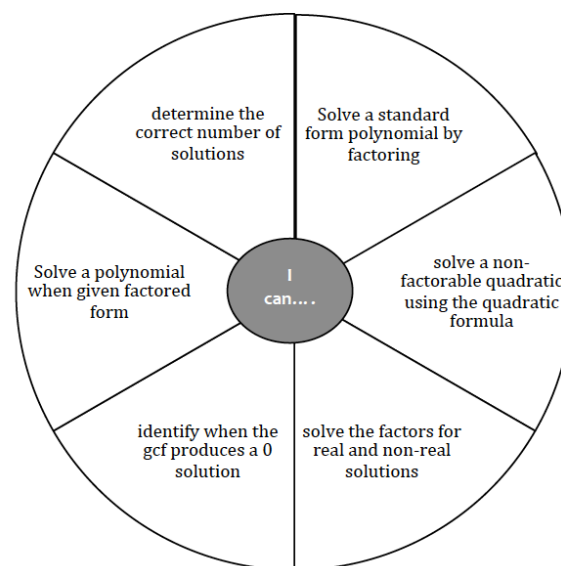| STILL DEVELOPING (1)	APPROACHING (2)	DEMONSTRATES (3)	EXCEEDS MASTERY (4)
I can create a symbolic representation in any given context.	I can create an appropriate symbolic representation in any given context.	I can create an accurate symbolic representation in any given context using key features.	I can create an accurate symbolic representation in any given context in unfamiliar situations.

STANDARD BASED GRADING

Unit Polynomials:
Standard 2: Simplify, Solve and Evaluate

Objective 2A: Rewrite and/or Evaluate

Ojective 2B: Solve Equations/Inequalities

Objective 2A wheel (I can...):
- add/subtract/multiply polynomials
- interpret operations when given function notation
- identify the degree of resulting polynomial
- factor using a difference of squares
- factor cubic/quartic polynomials
- identify the difference between factoring and solving
- determine the GCF

Objective 2B wheel (I can...):
- determine the correct number of solutions
- Solve a standard form polynomial by factoring
- solve a non-factorable quadratic using the quadratic formula
- solve the factors for real and non-real solutions
- identify when the gcf produces a 0 solution
- Solve a polynomial when given factored form

SIMPLIFY, SOLVE AND EVALUATE (MP2 & MP7) – *Rewrite and/or Evaluate Expressions (2A)*

STILL DEVELOPING (1)	APPROACHING (2)	DEMONSTRATES (3)	EXCEEDS MASTERY (4)
I attempt to rewrite and/or evaluate expressions in equivalent form(s) using mathematical properties.	I can rewrite and/or evaluate expressions in equivalent form(s) including relevant mathematical properties.	I can accurately rewrite and/or evaluate expressions in equivalent form(s) including relevant mathematical properties.	I can accurately rewrite and/or evaluate expressions in equivalent form(s) including relevant mathematical properties in unfamiliar situations.

SIMPLIFY, SOLVE AND EVALUATE (MP2 & MP7) - *Solve Equations/Inequalities (2B)*

STILL DEVELOPING (1)	APPROACHING (2)	DEMONSTRATES (3)	EXCEEDS MASTERY (4)
I attempt to solve using mathematical properties.	I can solve including relevant mathematical properties.	I can accurately solve including relevant mathematical properties.	I can accurately solve including relevant mathematical properties in unfamiliar situations.

LEARNING WHEELS
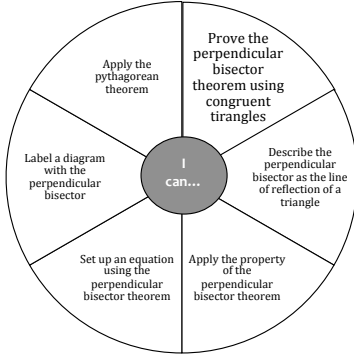
- **Exposure at the beginning of instruction of a new target**

- **As a self-assessment**

  Students shade or partially shade a component to indicate a level of understanding

Name:_____
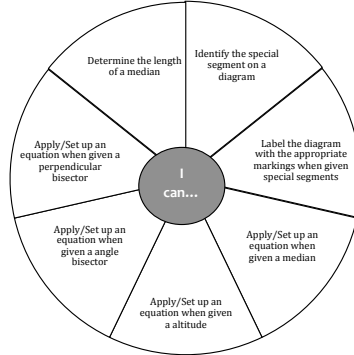
Unit 5: Special Segments

Learning Target A: Perpendicular Bisector Theorem

I can...
- Prove the perpendicular bisector theorem using congruent tirangles
- Describe the perpendicular bisector as the line of reflection of a triangle
- Apply the property of the perpendicular bisector theorem
- Set up an equation using the perpendicular bisector theorem
- Label a diagram with the perpendicular bisector
- Apply the pythagorean theorem
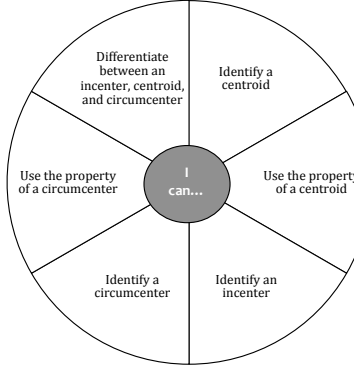
Learning Target B: Special Segments

I can...
- Identify the special segment on a diagram
- Label the diagram with the appropriate markings when given special segments
- Apply/Set up an equation when given a median
- Apply/Set up an equation when given a altitude
- Apply/Set up an equation when given a angle bisector
- Apply/Set up an equation when given a perpendicular bisector
- Determine the length of a median
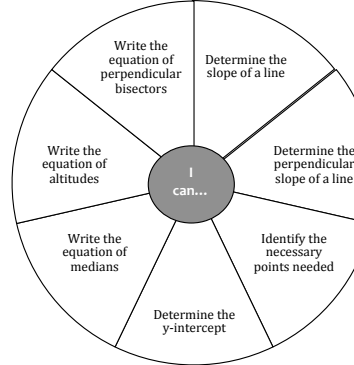
Learning Target C: Centroid, Incenter, Circumcenter of a Triangle

I can...
- Identify a centroid
- Use the property of a centroid
- Identify an incenter
- Identify a circumcenter
- Use the property of a circumcenter
- Differentiate between an incenter, centroid, and circumcenter

Learning Target D: Writing Equations

I can...
- Determine the slope of a line
- Determine the perpendicular slope of a line
- Identify the necessary points needed
- Determine the y-intercept
- Write the equation of medians
- Write the equation of altitudes
- Write the equation of perpendicular bisectors

LEARNING WHEELS – SELF ASSESSMENT
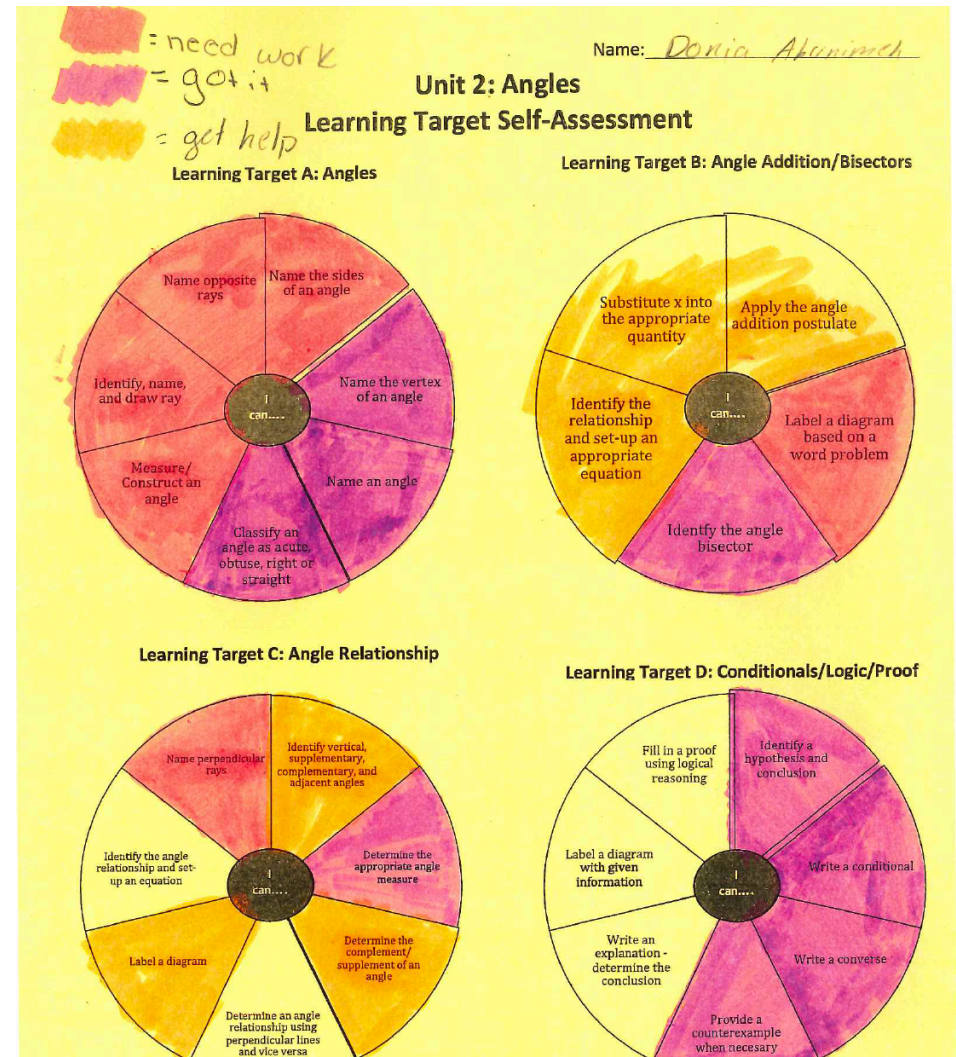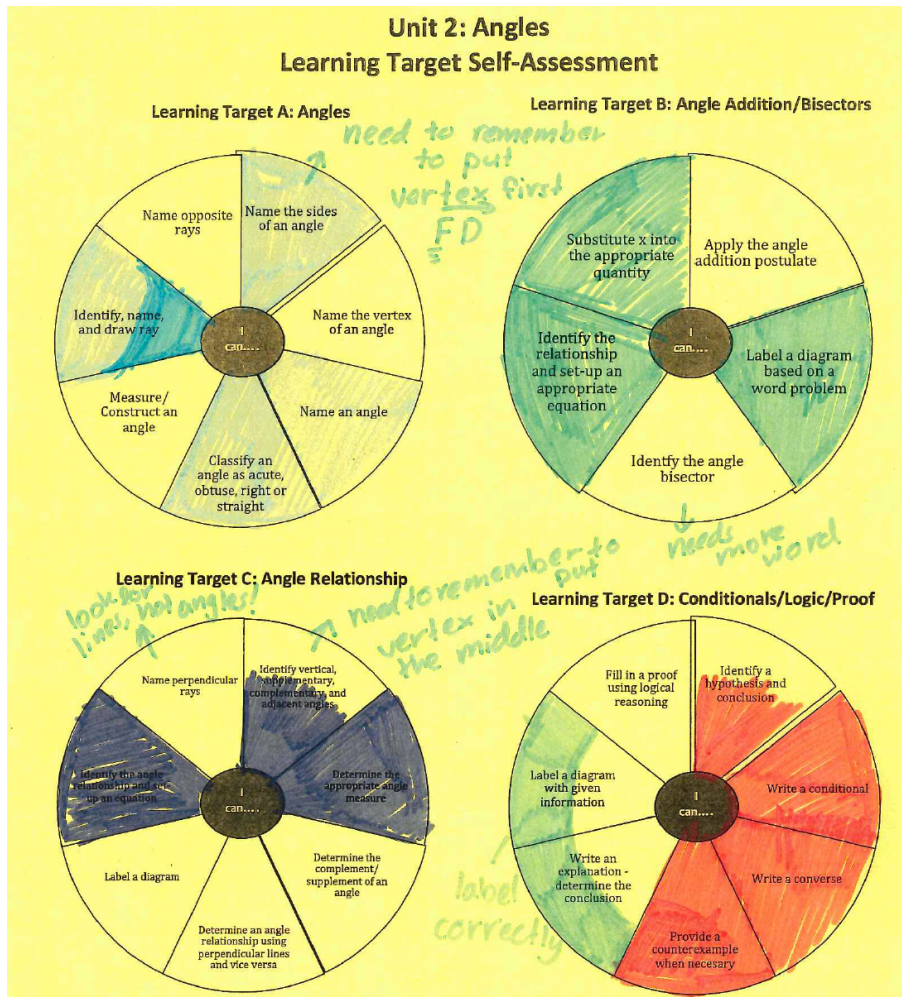
LEARNING WHEELS
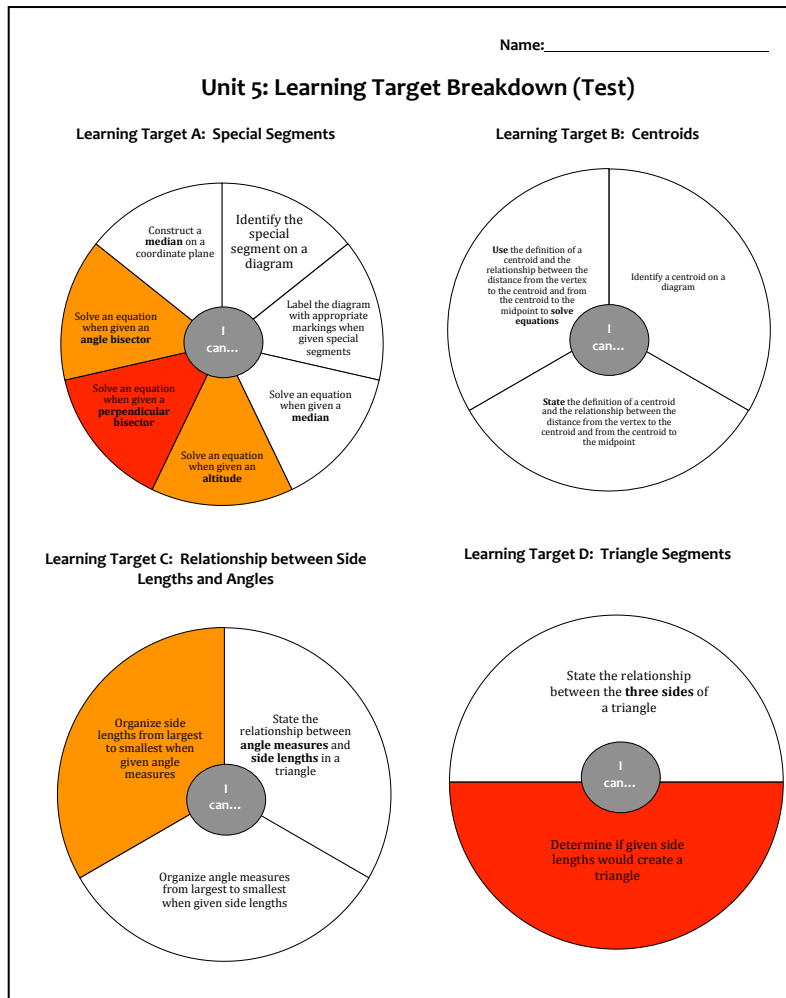
Post-Assessment

- Teacher compiled error-analysis tool

- Communication with students regarding areas of remediation

- Orange shaded areas show areas of partial understanding and red areas show no understanding

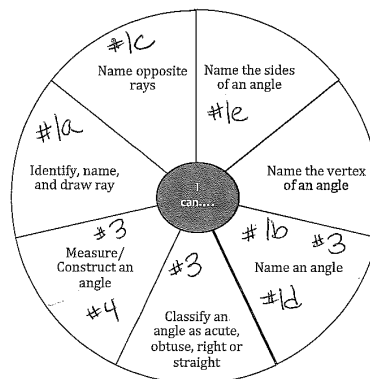*A way for teachers "clarifying, sharing, and understanding learning intentions and criteria for success."*
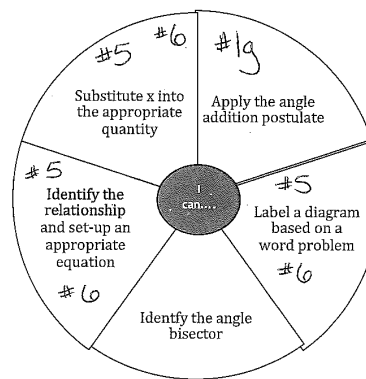
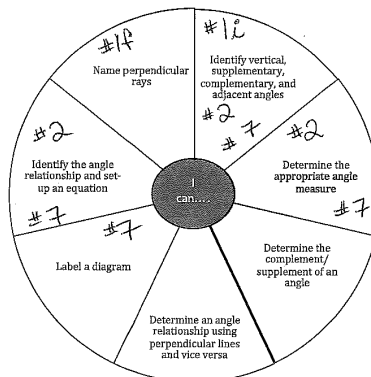*-Dylan Wiliams*

LEARNING WHEELS
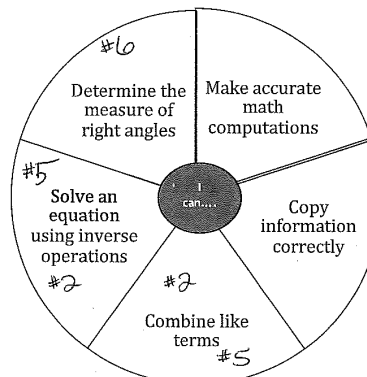
Name:_____

Unit 2: Angles Quiz

Learning Target A: Angles

Learning Target B: Angle Addition/Bisectors

#1c — Name opposite rays
#1e — Name the sides of an angle
#1a — Identify, name, and draw ray
#1e — Name the vertex of an angle
#3 — Measure/Construct an angle
#3 — Name an angle
#1b —
#3 —
#1d —
#4 — Classify an angle as acute, obtuse, right or straight
I can....

#5 —
#6 — Substitute x into the appropriate quantity
#1g — Apply the angle addition postulate
#5 — Identify the relationship and set-up an appropriate equation
#5 — Label a diagram based on a word problem
#6 —
#6 — Identify the angle bisector
I can....

Learning Target C: Angle Relationship

Pre-Requisite

#1f — Name perpendicular rays
#1i — Identify vertical, supplementary, complementary, and adjacent angles
#2 —
#7 —
#2 —
#2 — Identify the angle relationship and set-up an equation
#2 — Determine the appropriate angle measure
#7 —
#7 —
#7 — Label a diagram
#7 — Determine the complement/supplement of an angle
Determine an angle relationship using perpendicular lines and vice versa
I can....

#6 — Determine the measure of right angles
Make accurate math computations
#5 — Solve an equation using inverse operations
Copy information correctly
#2 —
#2 — Combine like terms
#5 —
I can....

REMEDIATION OF LEARNING TARGETS

Ask students to analyze their hmwk , quiz wheels and decide which target they are going to work on today

On center of board write and discuss expectation for today

1. Choose a target to remediate today

2. Once you complete that Target, you get a CHOICE:

choose another target to work on today   OR   Work on Review Sheet

Work on Redo/Late work

If all above are done, ask me
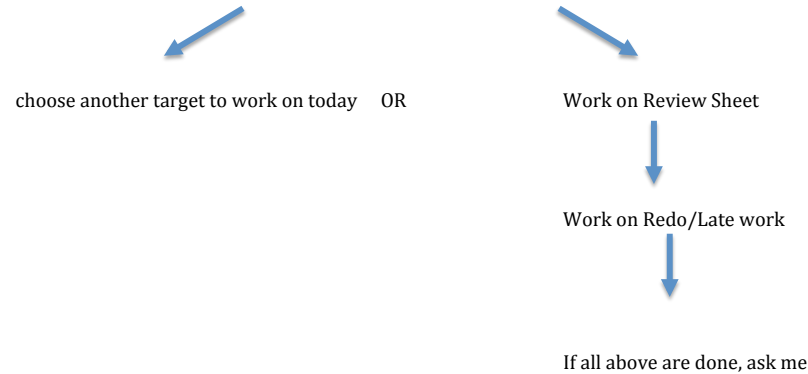
1. Quickly take a vote of who is working on which target FIRST (description of each is on learning wheel). I do this by saying "all students who are going to begin with Target (Letter), which is (description) raise your hand", etc

2. Then tell "all target(Letter) sit over here and all target(Letter) sit over here" .
Best to see how many of each you have so you can place them better.

3. At this point, they have each other to help them, they have answers on the back and they have you walking around in circles offering to help them.

4. Again, when they finish their initial target they can either get another target (and sit with original group) or work on review sheet/redo/etc for the remainder of the period.

5. With 3 minutes left, get their attention as a class. Tell them they are more than welcome to come and take ANY of the target sheets home to practice.

TARGET REVIEW
DIRECTIONS

LEARNING TARGET REVIEW

Unit 5: Special Segments
Target A

☐ A. I can use and apply the perpendicular bisector theorem

1. Given $\overleftrightarrow{BD}$ is the perpendicular bisector of $\overline{AC}$, determine which of the following statements **MUST** be true.

   i. $\overline{AP} \cong \overline{PC}$

   ii. $\overline{BP} \cong \overline{PD}$

   iii. $\overline{AB} \cong \overline{BC}$

   iv. $\overline{AB} \cong \overline{AD}$
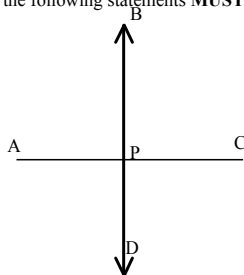
True Statements:_____

2. Given $\overleftrightarrow{BD}$ is the perpendicular bisector of $\overline{AC}$,
$AB = 5x + 2$, $AM = 2x + 2y$, $BC = 7x - 4$, $MC = 8x - 7y$, determine x and y.
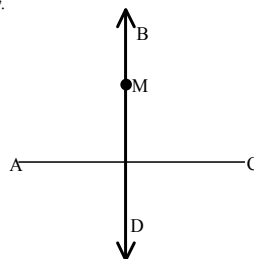
3. Given $\overleftrightarrow{WM}$ is the perpendicular bisector of $\overline{XZ}$, $WZ = 4x - 15$, $WX = x + 12$, determine WX. (Draw a labeled diagram first).

4. Given $\overleftrightarrow{AB}$ is the perpendicular bisector of $\overline{DC}$, $BC = 5y - 6$, $DB = 18 + 2y$, determine CD.
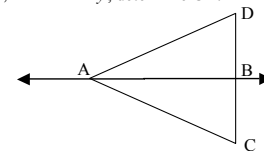
5. Given $\overleftrightarrow{DB}$ is the perpendicular bisector of $\overline{AC}$ at D, AC = 18 and BD = 12, determine AB.
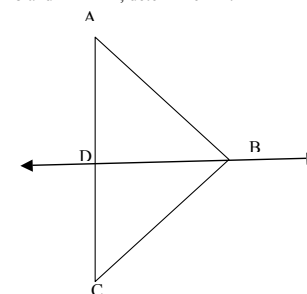
Answers: 1. i and iii   2. x=3, y=2   3. WX=21   4. CD=68   5. AB=15

INSTRUCTION TO ACHIEVE SUCCESS FOR ALL STUDENTS

FOR A FAIR SELECTION EVERYBODY HAS TO TAKE THE SAME EXAM: PLEASE CLIMB THAT TREE
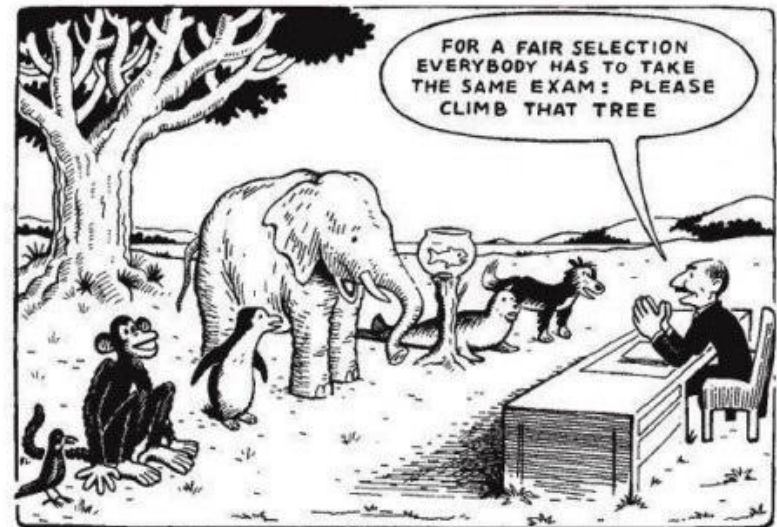
FOLDABLES

- **Geometry "Google"**

- **LD students need to see/hear something 66 times in order to remember it.**

- **Definitions on notes**

- **Discovery activity**

- **Accommodations for students**
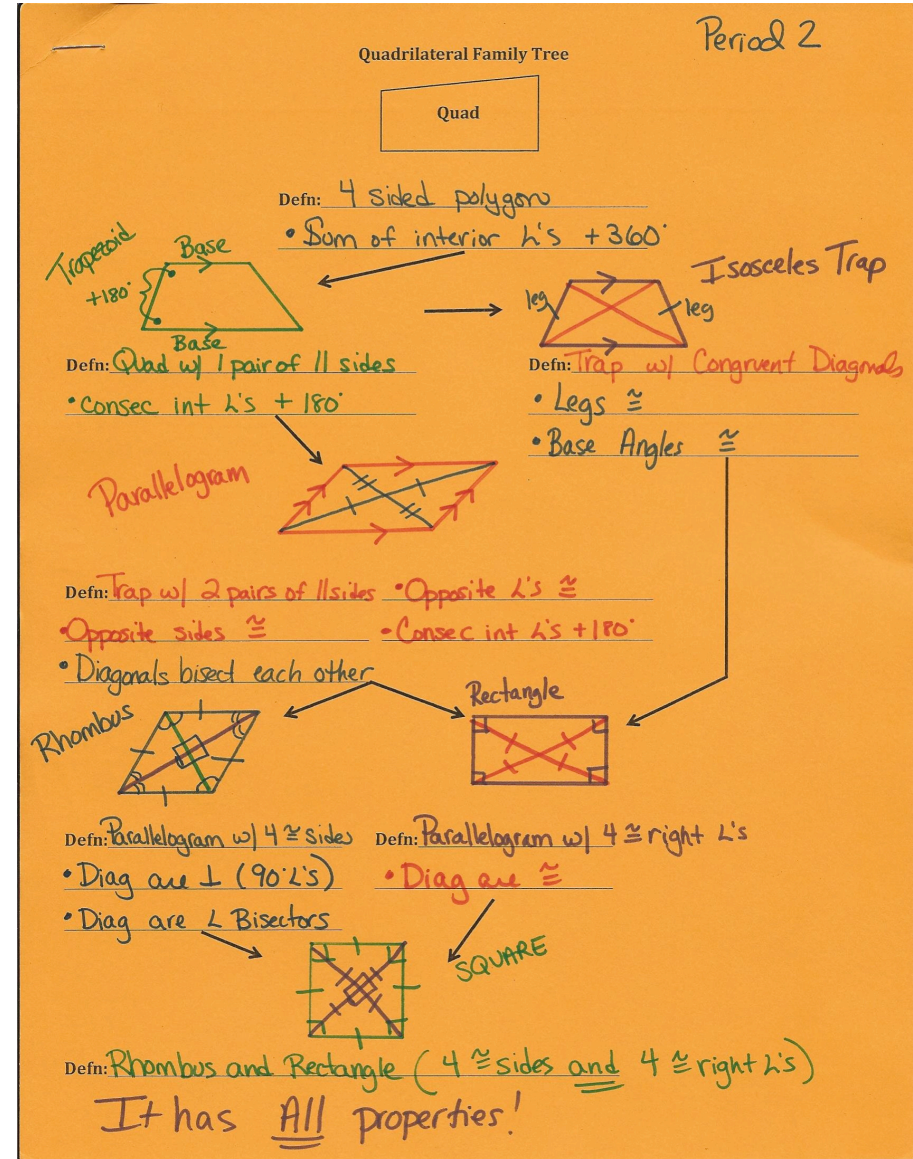
FOLDABLES

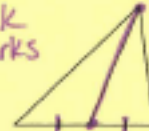Right Triangle Relationships foldable with tabs: Pythagorean Theorem, Altitude to Hypotenuse, * Hide in SQUARES!, Special Right Triangles (30-60-90 / 45-45-90), Trigonometry Angles, Trigonometry Sides, Angle of Elevation and Depression

only Right △

$leg^2 + leg^2 = hyp^2$

* Given Right △ with 2 sides!

3,4,(5); 7,24,(25); 8,15,(17)
5,12,(13)

Pythagorean Theorem

△CAB ~ △DAC ~ △DCB by AA~

Altitude to Hypotenuse

all 30-60-90 △'s are ~ to the Base △!

Hide: Equilateral △

Isosceles Right △'s

All 45-45-90° △'s are ~ to the Base △!

* Hide in SQUARES!

Special Right Triangles
(30-60-90 / 45-45-90)

S$\frac{O}{H}$ C$\frac{A}{H}$ T$\frac{O}{A}$

① Label the diagram
② Use your reference Angle & decide which trig ratio to use
③ Set up an equation (NO Proportion!!)
④ Solve using inverse trig (2nd button)

Trigonometry Angles

S$\frac{O}{H}$ C$\frac{A}{H}$ T$\frac{O}{A}$

① Label the diagram
② Use your reference Angle and decide which trig ratio to use.
③ Set up a proportion!
④ Solve

Trigonometry Sides

Angle of Depression

Angle of Elevation ≌ 11
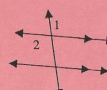
(0° clinometer)

(0° clinometer)

Angle of elevation

Angle of Elevation and Depression

FOLDABLES

Alternate Interior Angles

Alternate Exterior Angles

Corresponding Angles

Consecutive Interior Angles

Vertical Angles

	Equation	Conditional Statement
Alternate Interior Angles	$m\angle 1 = m\angle 2$	if lines are parallel, then alt. int. $\angle$'s are $\cong$.
Alternate Exterior Angles	$m\angle 1 = m\angle 2$	if lines are parallel, then alt. ext. $\angle$'s are $\cong$.
Corresponding Angles	$m\angle 1 = m\angle 2$	if lines are parallel, then corresponding $\angle$'s are $\cong$.
Consecutive Interior Angles	$m\angle 1 + m\angle 2 = 180°$	if lines are parallel, then consecutive int $\angle$'s are supplementary (+180°)
Vertical Angles	$m\angle 1 = m\angle 2$	Vertical $\angle$'s are Always $\cong$!

FOLDABLES

Altitude : height
* Right ∠

Median
* tick marks

Perpendicular Bisector
* tick marks & 90° ∠.

Angle Bisector
* loopies

Circumcenter
outside
center of ⊙

Centroid

Segment that starts @ a vertex and is perpendicular to the opposite side. (Height) * 90 angle	slope: Find the slope of the line it's ⊥ too + take opposite reciprocal y-int: Sub in Vertex	slope: midpt & vertex Used to find slope y-int: Substitute in Vertex or midpt.	Segment that starts @ a vertex & goes to the midpt of the opposite side * tick marks
Line that passes thru a midpt and is perpendicular to a side * tickmarks and 90° ∠. (No vertex unless it's an isoceles △)	slope: Find the slope of the side it's ⊥ too + take opposite reciprocal y-int: Sub in midpt		Segment that starts @ a vertex & cuts an ∠ into 2 = parts. * loopies
The distance from the Circumcenter to the Vertices are EQUAL (Radii)	The point where the 3 perpendicular bisectors intersect. The location of Circumcenter: Acute △: inside Right △: on a side Obtuse △: outside	The point where the 3 medians intersect The Centroid is the center of gravity (Balance pt)	The distance from the midpt to Centroid is HALF the distance from the vertex to Centroid.

FOLDABLES

Unit 9B

Name: Parisi

Key Features of Quadratics	Increasing/Decreasing
Use symmetry to get another pt. Vertex Form – Graphing $a(x-h)^2 + k$	Vertex Form – Writing $a(x-h)^2 + k$
Factored Form – Graphing $a(x-p)(x-q)$	Factored Form – Writing $a(x-p)(x-q)$

Standard Form – Graphing $ax^2 + bx + c$

---

x-intercept: $(\#, 0)$ $(\#, 0)$
$y = 0$ (opposite p, 0) (opposite q, 0)

y-intercept: $(0, \#)$
$x = 0$
$(0, c)$

Vertex: Balance pt ; Symmetry
(opposite h, k)

Axis of Symmetry: Vertical line through Vertex
$x = \_\_$

Key Features of Quadratics

Increasing/Decreasing

I D D I

Relationship Quad I
$x > \_\_$

$+a \Rightarrow$ Open Up — Vertex min
$-a \Rightarrow$ Open Down — Vertex max

Vertex: (opposite h, k)

Another pt: ① sub in $x = 0$ $(0, \_)$
② Type in calc
③ Use symmetry to get another pt.

Vertex Form – Graphing $a(x-h)^2 + k$

Sub in Vertex
$y = a(x - \_)^2 + \_$

Pick another point (x, y)
• Sub in pt for (x, y)
• Solve for a

Rewrite equation

Vertex Form – Writing $a(x-h)^2 + k$

$+a \Rightarrow$ Open Up — Vertex min
$-a \Rightarrow$ Open Down — Vertex max

x-intercept: (opposite p, 0)
(opposite q, 0)

Find Vertex by finding middle pt.
• Use the x-coordinate of axis of symmetry to sub into equation to find y-coord.

Factored Form – Graphing $a(x-p)(x-q)$

Sub in x-intercepts
$y = a(x - \_)(x - \_)$

• Pick another point (x, y)
• Sub point in (x, y)
• Solve for a

Rewrite equation

Factored Form – Writing $a(x-p)(x-q)$

$+a \Rightarrow$ Open Up — Vertex min
$-a \Rightarrow$ Open Down — Vertex max

y-intercept: $(0, c)$

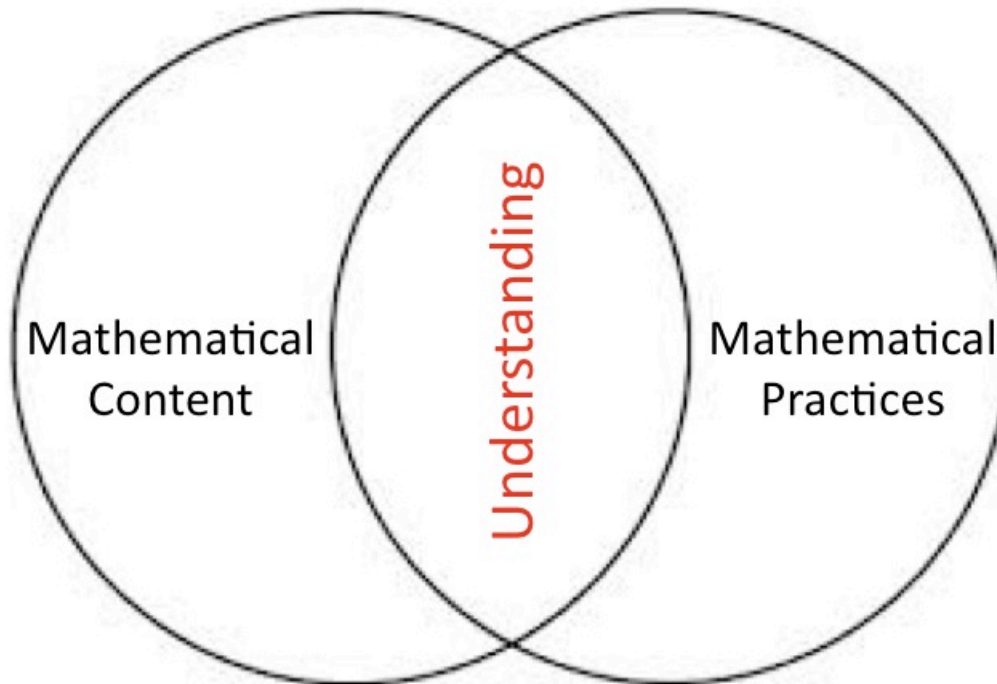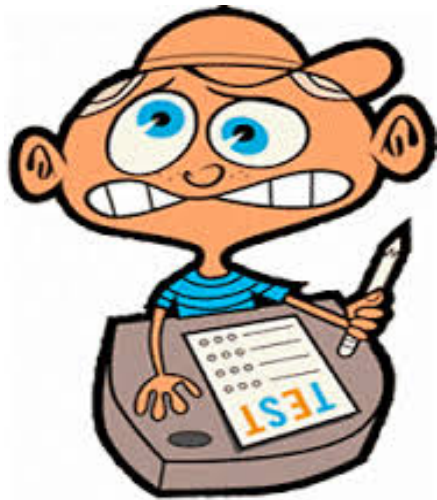Find x-intercepts by Factoring (or GCF)

Factored Form (x)

Find Vertex by finding middle pt.
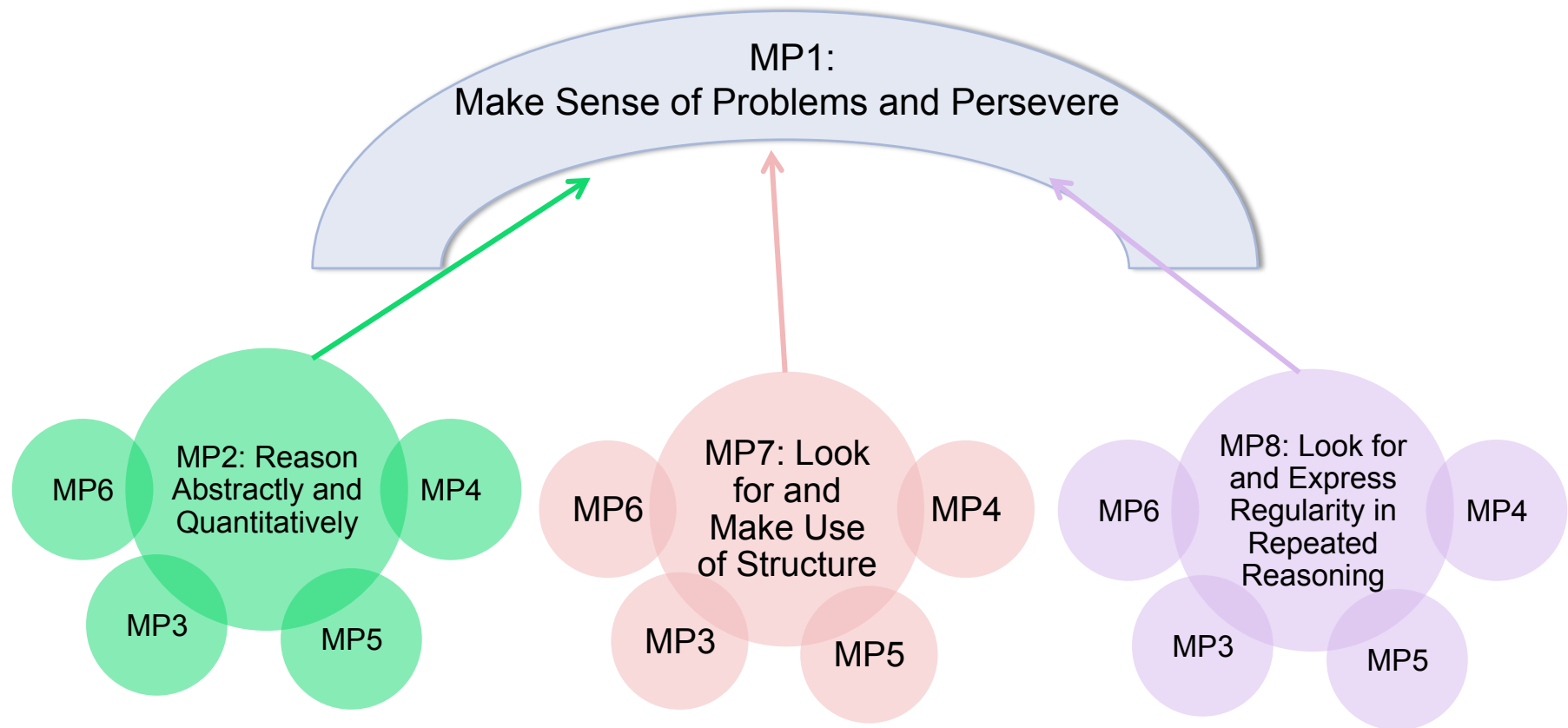• Use the x-coordinate of the axis of symmetry to sub into equation to find y-coord.

Standard Form – Graphing $ax^2 + bx + c$

THE MATHEMATICAL PRACTICES

Mathematical Content

Understanding

Mathematical Practices

COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

Learning *how* and *why* is now part of the guaranteed and viable curriculum!

USING MATHEMATICAL PRACTICES

MP1:
Make Sense of Problems and Persevere

MP2: Reason Abstractly and Quantitatively
- MP6
- MP4
- MP3
- MP5

MP7: Look for and Make Use of Structure
- MP6
- MP4
- MP3
- MP5

MP8: Look for and Express Regularity in Repeated Reasoning
- MP6
- MP4
- MP3
- MP5

"Fostering Mathematical Practices in All Students," Creighton, Lucenta and Kelemanik

MP2: REASON ABSTRACTLY AND QUANTITATIVELY

- What are my **Quantities?**
- What are my **Relationships?**

MP6

MP2: Reason Abstractly and Quantitatively

MP4

MP3

MP5
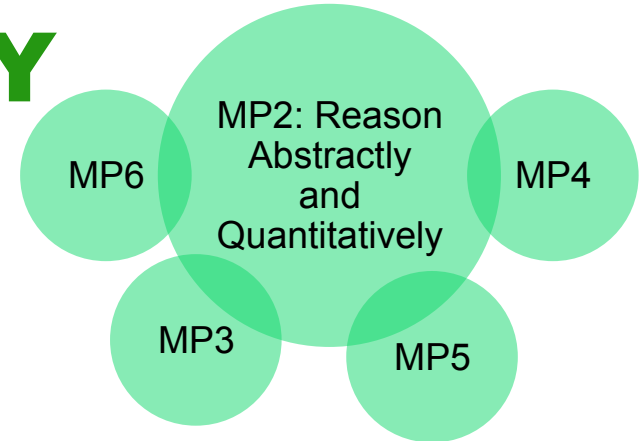
QUANTITIES

- Anything that has a measurement
- Anything that you can count
- Unknown quantities

RELATIONSHIPS

- How the quantities relate to one another

"Fostering Mathematical Practices in All Students," Creighton, Lucenta and Kelemanik

MP2: REASON ABSTRACTLY AND QUANTITATIVELY

MP7: LOOK FOR AND MAKE USE OF STRUCTURE

MP7: Look for and Make Use of Structure

MP6

MP4

MP3

MP5

- Can I use prior knowledge here?
- Can I represent the information differently?
- How can I break up the problem into a familiar relationship?

Strategies to Think Structurally:

Connect   Change   Chunk

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MP7: STRUCTURE

3. Janet and Kate are in a friendly competition on who reads the most books. Janet, who has only read one book since the start of the school year, wants to read more books than Kate. Kate has already read 18 books and plans to read an additional 3 books every month. Janet decides to read 4 books every month to try and win the competition. Define variable(s) **and** write an **inequality** to represent the situation. You do **not** need to solve. (3 pts)
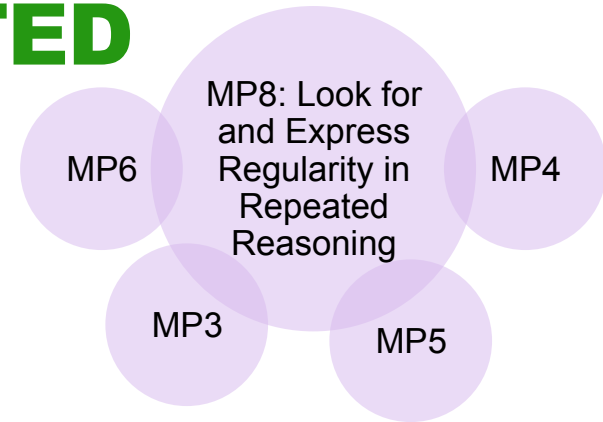
Let x represent number of months

Inequality: $4x + 1 > 3x + 18$

Janet

# of month	total of book
0	1 > +4

Kate

# of month	total of books
0	18 > +3

MP8: LOOK FOR AND EXPRESS REGULARITY IN REPEATED REASONING

MP6

MP8: Look for and Express Regularity in Repeated Reasoning

MP4

MP3

MP5

- **What patterns do you see?**

- **How can you generalize the problem?**

Students should use inductive reasoning...moving from specific to general

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