Sample Lesson Plan – Algebra 2

Concept: Graphing Rational Functions, Algebra 2
Standards/Rationale: 111.40 (c) (6) (K)

Learning Target	Assessment
When provided with the defining characteristics of an equation, the student will derive the equation and produce the corresponding graph with at least 70% accuracy.	Completed Game Worksheet

Materials:

- Rationals 4-Way Group Warm-up
- Match Mine Unit 8 Rational Functions Worksheet
- Unit 8 Rational Functions Review Notes
- File Folders
- Whiteboard space

Vocabulary **(Visual Vocabulary List)**:

- Intercepts
- Vertical
- Horizontal
- Asymptote
- Co-Efficient
- Degree
- Numerator
- Denominator
- Domain
- Range
- Factor

	The teacher will:	The student will:
Focus/Mental Set	- Pass out "Rationals 4 Way" Group Warm Up (Only 1 Math Problem) - Allow Students 5 minutes past the bell to work on the warm-up - Project answers	- Work in Groups as directed on assignment - Work through the warm-up, helping and checking each other - Check Answers

Teacher Input	- 5 steps to graph: Simplify, Roots, Vertical, Horizontal, Holes
	- X intercepts (Roots)
	  - Numerator = 0
	- Vertical Asymptotes
	  - Denominator = 0
	- Horizontal Asymptotes
	  - NONE:
	    - Degree of Numerator > Degree of Denominator
	  - y = 0:
	    - Degree of Numerator < Degree of Denominator
	  - y=Co-eff N/Co-eff D:
		- Repeat as a class 3 times
		
		- Fill in Review Notes

	The teacher will:	The student will:

	- Degree of Numerator = Degree of Denominator
	- STOP!! Stand up, face the back
	  - "What are the 5 steps to graph a Rational Function?"
	- Holes
	  - "How would you make a distinction between an asymptote and a hole?"
	  - X Coordinate: CF = 0
	  - Y Coordinate: Plug in X
	ESL Strategy: Personal Dictionaries
		- Simplify, Roots, Vertical, Horizontal, Holes
		
		- Continue review notes
		
		Develop personal dictionaries and research definitions with the defined vocabulary

Guided Practice	- Introduce the Game
	  - (See Instructions in TSW Independent Practice Section)
	- Play against me
	  - "What data would you recommend asking about in order to find the equation?"
	  - Equation: $f(x) = \frac{1}{x+5} - 2$
	    - Domain: x | x ≠ −5
	    - Range: y | y ≠ −2
	    - As: $x = -5 \quad y = -2$
	- Answer questions
	
	- Guide & Prompt the answer
		- Listen to the Instructions of the game
		- Ask Questions if needed
		
		- Respond to Question
		
		- Ask questions regarding:
		  - Roots
		  - Holes
		  - Vertical Asymptote
		  - Horizontal Asymptote
		
		- Solve for the original equation in groups
		- First group completed works the problem on the board for the class

Independent Practice	- Provide 6 problems for students to "solve" in the "Match Me" Structure
	- Roam and guide where needed
		- Pair up & Set up "Offices"
		- Each pair gets 2 different <u>Match Mine Unit 8 Rational Equations Worksheets</u>.
		  - Each student gets 1 of the worksheets
		- Each student takes a moment to find:
		  - Roots, Vertical Asymptotes, Horizontal Asymptotes, and Holes
		- Students will work ONE problem at a time, beginning with the partner that is the YOUNGEST (Later referred to as A)
		- B student will then write down the problem number of the A student next to their graphing section of their worksheet
		- B student will then ask questions to the A student in order to gain the data needed to form the equation and graph the line

	The teacher will:	The student will:
		- When the B student has completed the graph and found the correct equation of the graph, the partners switch with another group and play again until completion. - Turn in Game Paper
Closure	- Listen & Observe	- Explain to your group mates: - Each of the Steps to graph a rational function

Options:

Enrichment	Reteach

- Applications of Rational Functions
  - Options:
    - Total Cost of a Refrigerator over 15 years
    - Concentration of medicine in the blood stream over time
	- Khan Academy – Graphing Rational Functions videos 1-4 Found at : https://www.khanacademy.org/math/algebra2/rational-expressions-equations-and-functions/graphs-of-rational-functions/v/horizontal-vertical-asymptotes

Modifications/Accommodations:
- 504 Disability: Bipolar
  - Break down independent practice into manageable parts
  - Give clear and simple directions for Match Mine game
    - Unexpected mood swing: have student work by themselves on a provided worksheet with 3 game problems
  - Provide extra time on classwork and assignments if needed
  - Provide positive praise and redirection
- 504 Disability: Temporary Disability (Broken Dominant Arm)
  - Record teacher input & provide outlines of notes to fill in
  - Provide Google Classroom versions of worksheets and allow for use of a computer
  - Provide a peer tutor/helper during Match Mine game time
- IDEA Disability: Traumatic Brain Injury
  - Provide a peer tutor/helper
  - Assist student with memory and organizational skills
  - Provide frequent short breaks
  - Only work 1 problem during Independent Practice's Match Mine Game that is provided by the teacher
    - Note: The student will not be required to graph the equation on the paper
    - Note: The student may leave the function in factored form