**Linear Review and Systems of Equations**

Total Number of Lessons: 21 days; 15 days of lessons, 3 days of review and quiz,

2 days of module review, 1 day to test

Total Time for Module: 1785 minutes

Section 1: Module Overview and Curricular Connections

* **Module overview**: In this module we will briefly review the Algebra 1 skills of solving equations and graphing lines. We will then look at the skills of solving a system of two equations and two unknowns both graphically and algebraically. We will then extend this concept to a system of 3 equations and 3 unknowns. Throughout the unit we will look at application problems that are all focused around the concept of a transistor. This module is set up for an Algebra II course that is set on a block schedule where we meet daily. It could be adapted to a traditional block schedule or another schedule by combing lessons and application problem sets.
* **Module goal**: Student will know: the process of isolating a variable, how many solutions are possible for a system of equations, how to use the three methods to solve a system, the names of the classifications of a system, and how to interpret a word problem. Students will be able to: solve a system of equations with each of the methods, Determine when a system does not have a unique solution, classify a system based upon the solution that is found, create a system of equations from a story problem, analyze their solution to determine if it is reasonable, and use technology to help with the solving of a system of equations
* **Module scope and rationale**: This module is an entire unit. The reason to use this module is it is an attempt to develop a cohesive set of application problems that students my find non-trivial.
* **Connection to standards**: Indiana Standards: AII.SE.2, AII.SE.3; ITEEA standards: 1, 2.
* **RET materials/ideas to be leveraged**: Throughout the unit we will look at transistors in our application problems. I will discuss the importance of transistors, what they look like and what some of the current limitations and problems are. We will use different expressions and equations with transistors to create a cohesive set of application problems to use throughout the entire unit.
* **Prior knowledge needed for module**: It would be helpful if teacher/students had a previous understanding of transistors and circuits but well will go over the information that we need on the first day. Through reading and a discussion.

Section 2: Overview of Module Framework

* **Real-world context**: Throughout the unit we will be using the transistor as a central theme to all application problems. This will include an array of expressions and equations that relate to the transistor. Some background information along with some reading will be presented to try and get students thinking beyond what they know.
  + **Corresponding Lesson(s)**: Lesson 1 will include the background information and the reading material. Lessons 2, 3 (day 1 and day 2), 4 (day 2 and 3), 7 (day 3 and day 4), 9 (day 3), and 11 (day 1 and 2) will contain application problems that relate to the transistor at some part of the lesson. Also Lessons 6, 8 10, and 12 are Summative Assessments (Friday Quiz or Unit 1 Test) and will contain application problems also related to the STEM topic.
* **Background STEM content**: The main content is the transistor. I will first describe to the class what I did this summer with RET and discuss how things are different from one level of education to another. The students will then read an expert of an article about the brief history of the transistor and be asked to perform a few tasks while reading. We will then go over the article, as well as discuss some information about the current state of transistors. We will then finish with how this affects them and how it could affect them throughout their lives.
  + **Corresponding Lesson(s)**: Lesson 1 – Transistors, Why Your Technology Works!
* **Final Project**: The final project is not a single artifact but the collection of all application problems we have done throughout the unit.
  + **Corresponding Lesson(s)**: Lessons 2, 3 (day 1 and day 2), 4 (day 2 and 3), 7 (day 3 and day 4), 9 (day 3), and 11 (day 1 and 2) will contain application problems that relate to the transistor at some part of the lesson. Also Lessons 6, 8 10, and 12 are Summative Assessments (Friday Quiz or Unit 1 Test) and will contain application problems also related to the STEM topic.

Section 3: Module Approaches and Additional Details

* **Description of sequenced learning objectives**: The module is the collection of application problems. The unit plan is set up so that the concepts needed for the mathematics build from day to day. The review material comes first followed but the newer material which uses the previous skills to solve problems both from a given format and application of the real world.
* **Description of formative assessment approaches**: Students will be given in-class assignments each day to work on the skills. The students will need to check their answers and get help when needed. At the end of the week there will be a quiz to test their weekly understanding, this will help me create review material for the next week.
* **Description of summative assessment approaches**: There are two summative assessments. One are weekly quizzes which cover the material for that week only. The other is the unit test which will cover the entire span of the unit.
* **Description of techniques for facilitating productive talk/student engagement**: My hope is that since the transistor is a key component in much of the technology they are addicted to that this will create a better connection to the unit’s application problems.

Section 4: Final Comments and Attached Files

* **Recommendations for implementation**: Students are always resistant to application problems but the only way for them to get better is practice. Even when you want to give up and just skip them we must keep persistent
* **List of attached files**: should include any lesson plans and handouts relevant to the Module
  + Linear Review and Systems of Equations Unit Plan
  + Transistors – Why Your Technology Works. An introduction and activity power point for the first introduction day
  + Brief History of Transistors. This is a short section of a textbook that goes over the brief history of the transistor, one of the slides in the above power point describes what to do with the article.
  + Get Your Technology Out of My Math! (Blank and Answer key with notes). This is a guided activity to some of the formulas and expressions used in transistors which is used to review many of the Algebra 1 concepts that are needed to solve equations and systems of equations.
  + Application Problems. This is a collection of application problems to use while reviewing solving linear equations. This is not an extensive list but different types and styles of problems to use throughout the unit.