



# HALLSVILLE HIGH SCHOOL EMBEDDED MATH GUIDELINES

\*\*\*RESPECT\*\*\*RESPONSIBILITY\*\*\*INTEGRITY\*\*\*COOPERATION\*\*\*



## Description:

Hallsville High School has identified math concepts covered through the ACT WorkKeys to be equivalent to competency of a math credit. By embedding lessons and the completion of the ACT WorkKeys into the Career and Technical Education Department, students will have the opportunity to earn embedded credit while enrolled in a sequence of Agricultural Courses.

## Rationale:

Hallsville High School continues to become increasingly diverse. As a result we have students who make a variety of post-secondary plans. Embedded credit allows for another option and opportunity for students to earn a mathematics credit towards graduation requirements. As a result, this can lead to greater flexibility and choice by a student's senior year. In addition, embedded mathematics allows students to earn simultaneous credit. This helps students to see the direct correlation between agricultural concepts and mathematics concepts thus giving them a sense of relevance in their coursework.

## Prerequisites:

- Students must be a junior enrolled in an Agricultural sequence for embedded math credit.
- Students must have successfully completed 2 high school mathematics courses that satisfy the graduation requirements, including Algebra I\*.
  - \*Algebra I is an EOC course required for graduation
  - For students who took 8th grade Algebra I - While Algebra I is a high school credit, it does not count towards the graduation requirement per the 8th grade Algebra contract. These students will need to successfully complete Geometry and Algebra II in order to be eligible for an embedded math credit.

## Implementation:

1. Through research and collaboration with area technical education centers, Hallsville's CTE and math departments determined that the ACT WorkKeys assessment and curriculum best fits the needs of Hallsville students to earn an embedded math credit.
2. Teacher Responsibilities:
  - a. Hallsville's CTE department will incorporate embedded math credit into their course sequencing documents and the course description book to inform students about embedded math and the requirements to receive credit.
  - b. During class the Agriculture instructor will introduce and review the math concepts required for the week's work.
    - i. This instruction will review procedural and conceptual math concepts as well as the practical application of those concepts to the specific tasks and learning objectives for the week.
  - c. The Agriculture instructor will collaborate with the Mathematics instructor to ensure best practices and correct mathematical processes are used.

3. Pre-test & Completion of four levels of ACT WorkKeys Lessons
  - a. Students will be pre-tested to determine their starting Level on the WorkKeys lessons. Students will start at a minimum of Level 3.
  - b. Students will be required to progress through and complete Level 7 to be deemed ready to take the WorkKeys Applied Mathematics Assessment (see below).
  
4. Testing
  - a. Upon completion of Level 7 of the ACT WorkKeys lessons, students will schedule a time to take the exam.
  - b. The exam takes 55 minutes and will be proctored online by a Hallsville instructor.
  - c. Students who do not score at a mastery of Level 4 or higher, will have the opportunity to retake the assessment following additional remediation.
  
5. Grading and Credit
  - a. Credit will be awarded on a pass-fail basis for students who have met all of the requirements.
    - i. Maintaining a 70% average in their chosen Ag program
    - ii. Passing the WorkKeys Applied Math assessment at a Level 4 or higher
  - b. Credit will be transcribed as Embedded Math at the completion of their Agricultural program sequence.
    - i. This is not considered “college preparatory” so students planning to pursue post secondary education should work closely with their counselors to assure they are taking the necessary courses to help them gain acceptance into their college or technical school programs.
    - ii. This is not NCAA approved. Students who plan to pursue college athletics should work with their counselors to assure that they meet the athletic requirements.

**Cost:**

Implementation of embedded math credit at Hallsville High School will be at a minimal cost to the district. After school support will be provided by Hallsville educators. Career ladder and after school support funds will be used for compensation. Additional costs include ACT WorkKeys lessons and exams. District technology budgets will be used for these costs.

**Student Expectations for Earning Credit:**

- Students will be expected to maintain a 70% average in their chosen Agriculture program.
- Students will be expected to work through the WorkKeys curriculum independently for a minimum of 1 hour each week during their study hall period. Students may continue to work through lessons independently outside of school.
  - Progress will be monitored by an Agricultural Instructor and a Mathematics Instructor.

**Progress Benchmarks:**

- Students will be given a target completion date. This date will be used to set benchmarks for students to achieve.
- Students who fail to reach benchmarks may be assigned extra support time before/after school by the Agricultural and/or Mathematics Instructor.
- Students who have not successfully passed the WorkKeys Applied Math Assessment at a Level 4 or higher by the end of their Junior year
  - May be advised to attend summer school to complete credit requirements
  - May be enrolled in a math course their senior year to ensure graduation requirements are met.
- Students will be awarded 1 Embedded Math credit after successfully completing their Agricultural sequence of courses and passing the ACT WorkKeys Applied Math Assessment at a Level 4 or higher.

**ACT WorkKeys Applied Math Assessment**

Number of items: 34

Method of delivery: Online and Paper

Test length: 55 minutes

**What it Measures**

There are five levels of difficulty. Level 3 is the least complex, and Level 7 is the most complex. The levels build on each other, each incorporating the skills assessed at the previous levels. For example, at Level 5, individuals need the skills from Levels 3, 4, and 5. Examples are included with each level description. Hallsville high school students in the embedded program will start at a minimum Level 3.

**Level 4****Characteristics of Items**

- Information may be presented out of order
- May include extra, unnecessary information
- May include a simple chart, diagram, or graph

**Skills**

- Solve problems that require one or two mathematical operations. They can add, subtract, or multiply using positive or negative numbers (such as 10 or -2), and they can divide positive numbers (such as 10).
- Calculate the average or mean of a set of numbers (such as  $(10+11+12) / 3$  ). For this, they may use whole numbers and decimals.

- Figure out simple ratios (such as  $\frac{3}{4}$ ), simple proportions (such as 10/100 cases), or rates (such as 10 mph).
- Add commonly known fractions, decimals, or percentages (such as  $\frac{1}{2}$ , 0.75, or 25%).
- Add or subtract fractions with a common denominator (such as  $\frac{1}{4} + \frac{3}{4} + \frac{1}{4}$ ).
- Multiply a mixed number (such as  $12 \frac{1}{8}$ ) by a whole number or a decimal.
- Put information in the right order before performing calculations.

## Level 5

### Characteristics of Items

- Problems require several steps of logic and calculation (e.g., problem may involve completing an order form by totaling the order and then computing tax)

### Skills

- Decide what information, calculations, or unit conversions to use to find the answer to a problem.
- Add and subtract fractions with unlike denominators (such as  $\frac{1}{2} - \frac{1}{4}$ ).
- Convert units within or between systems of measurement (e.g., time, measurement, quantity) where the conversion factor is given either in the problem or in the formula sheet.
- Solve problems that require mathematical operations using mixed units (such as adding 6 feet and 4 inches to 3 feet and 10 inches, or subtracting 4 hours and 30 minutes from 3.5 hours).
- Identify the best deal using one or two step calculations that meet the stated conditions.
- Calculate the perimeter or circumference of a basic shape, or calculate the area of a basic shape.
- Calculate a given percentage of a given number and then use that percentage to find the solution to a problem (e.g., find the percentage and then use it to find the discount, markup, or tax).
- Identify where a mistake occurred in a calculation (such as identifying the row in a spreadsheet where a problem occurred).

## Level 6

### Characteristics of Items

- May require considerable translation from verbal form to mathematical expression
- Generally require considerable setup and involve multiple-step calculations

### Skills

- Use fractions with unlike denominators and calculate reverse percentages.

- Convert units within or between systems of measurement (e.g., time, measurement, and quantity) where multiple-step conversions are required and the formulas are provided such as converting from kilometers to meters to feet.
- Identify why a mistake occurred in a solution.
- Find the best deal from a group of solutions and then use the result for another calculation.
- Find the area of basic shapes when it may be necessary to rearrange a formula, convert units of measurement in the calculations, or use the result in further calculations.
- Calculate the volume of rectangular solids (e.g., cubes).
- Calculate rates, production rates, rate by time (such as, production rate is 59 cups produced per hour, how many will be produced in an 8 hour shift).
- Identify the correct equation for solving a problem.

#### Level 7

##### Characteristics of Items

- Content or format may be unusual
- Information may be incomplete or implicit
- Problems often involve multiple steps of logic and calculation

##### Skills

- Solve problems that include ratios, rates, or proportions with at least one of the quantities is a fraction.
- Identify the reason for a mistake.
- Convert between units of measurement using fractions, mixed numbers, decimals, and percentages.
- Calculate volumes of spheres, cylinders, or cones.
- Calculate the volume when it may be necessary to rearrange the formula, convert units of measurement in calculations, or use the result in further calculations.
- Set up and manipulate ratios, rates, or proportions where at least one of the quantities is a fraction.
- Determine the better economic value of several alternatives by using graphics, or determining the percentage difference, or by determining unit cost.
- Apply basic statistical concepts for example calculate the weighted mean, interpret measures of central tendency, or interpret measure of spread and tolerance

#### **WorkKeys Resource Links:**

<https://www.act.org/content/act/en/products-and-services/act-workkeys.html>