



# Prairie State Achievement Examination (PSAE)

## Mathematics Presentation

ISBE Student Assessment Division

217.782.4823

[www.isbe.net/assessment/psae.htm](http://www.isbe.net/assessment/psae.htm)



# Prairie State Achievement Examination (PSAE)

## **PSAE Contractor**

ACT is ISBE's primary contractor for the PSAE.

Pearson is ACT's subcontractor for Day 2 PSAE test materials.



# Prairie State Achievement Examination (PSAE)

## Purpose

The major purpose of the PSAE is to measure the **Illinois Learning Standards** in four learning areas: **Reading, Mathematics, Science, and Writing.**

Scores for and participation of grade 11 students contribute to school, district, and state Adequate Yearly Progress (AYP).

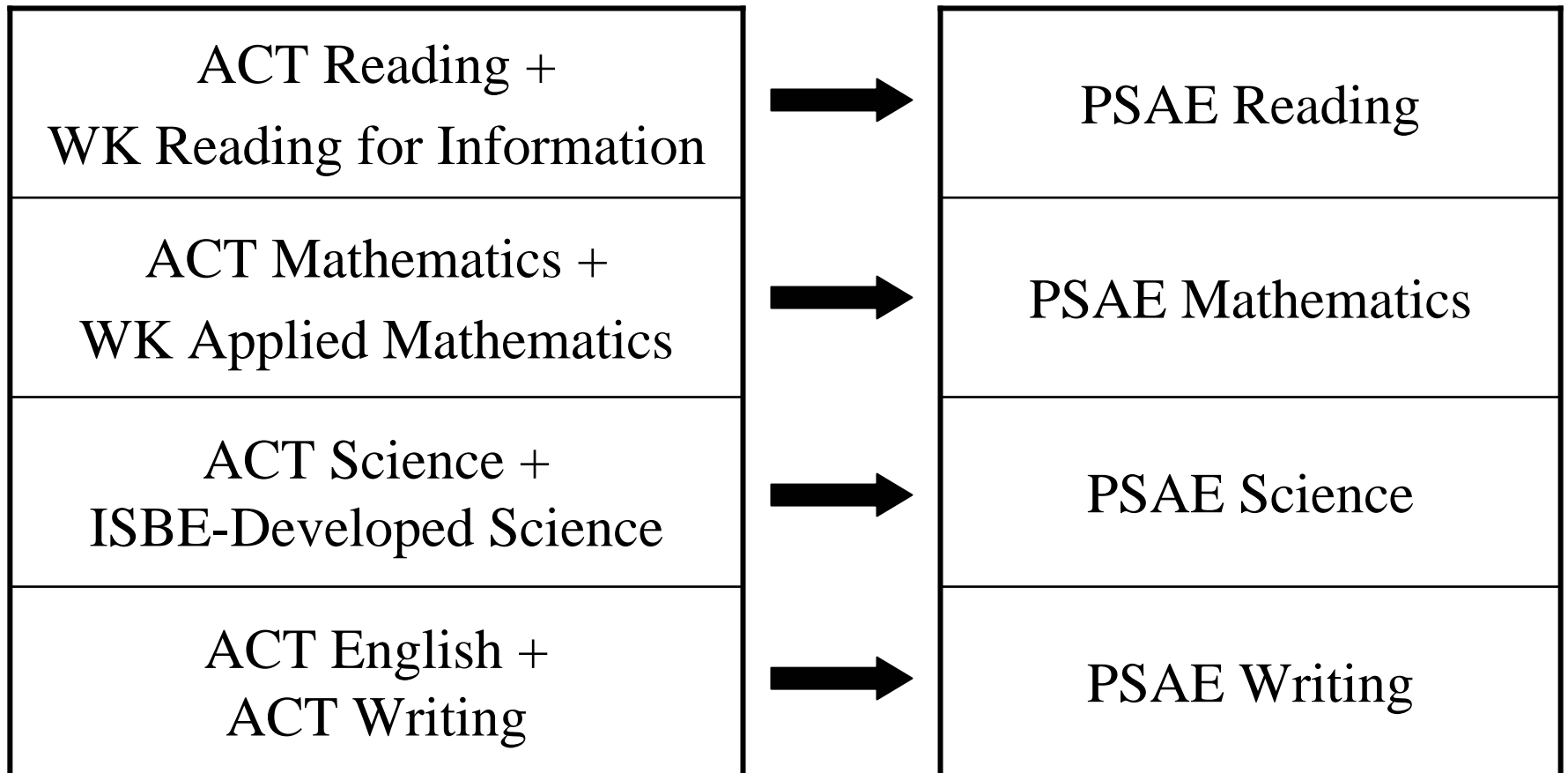
The PSAE provides these bonuses:

1. ACT Scores
2. WorkKeys Scores



# Prairie State Achievement Examination (PSAE)

## Test Components





# Prairie State Achievement Examination (PSAE)

## Day 1 Standard Time Test Administration Schedule

### Day 1: Wednesday, April 28, 2010

- ACT English Test – 45 minutes (75 questions)
- ACT Mathematics Test – 60 minutes (60 questions)  
*[required 15-minute break]*
- ACT Reading Test – 35 minutes (40 questions)
- ACT Science Test – 35 minutes (40 questions)  
*[required 5-minute break]*
- ACT Writing Test – 30 minutes (1 prompt)

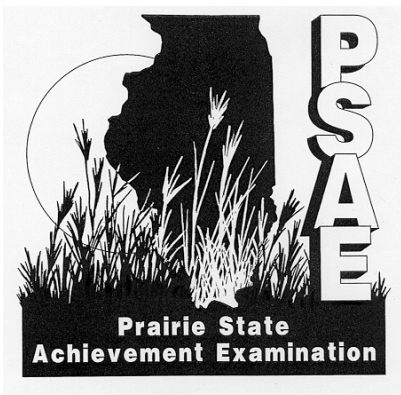


**Prairie State Achievement  
Examination (PSAE)**

**Day 2 Standard Time  
Test Administration Schedule**

**Day 2: Thursday, April 29, 2010**

- ISBE-Developed Science Test – 40 minutes (45 questions)
- WorkKeys *Applied Mathematics* Test – 45 minutes (33 questions)  
*[required 15-minute break]*
- WorkKeys *Reading for Information* Test – 45 minutes (33 questions)



# Prairie State Achievement Examination (PSAE)

**Day 1 and Day 2**

**Standard Time Makeup**

**Test Administration Schedule**

- Standard time makeup testing –  
May 12 and 13, 2010 (Day 1 and/or Day 2)
- Different (but equivalent) forms used for makeup testing
- Same test administration schedule as initial standard time testing in April



# **Prairie State Achievement Examination (PSAE)**

## **Accommodations Test Administration Schedule**

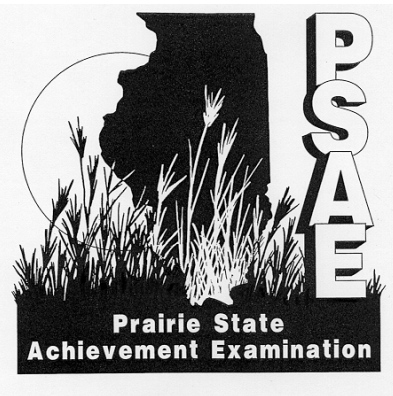
- Day 1 accommodations testing window –  
(as early as) April 28, 2010 until (as late as) May 12, 2010
- Day 2 accommodations testing window –  
(as early as) April 29, 2010 until (as late as) May 13, 2010
- Different (but equivalent) forms used for accommodations testing



**Prairie State Achievement  
Examination (PSAE)**  
**Illinois Mathematics Assessment  
Framework for PSAE**

The Illinois Mathematics Assessment Framework for PSAE connects the content assessed on PSAE to the Illinois Learning Standards.

[www.isbe.net/assessment/IAFindex.htm](http://www.isbe.net/assessment/IAFindex.htm)



# Prairie State Achievement Examination (PSAE)

## PSAE Day 1

### ACT Mathematics

- 60 multiple-choice items in 60 minutes
- Problem solving in six areas: pre-algebra, elementary algebra, intermediate algebra, coordinate geometry, plane geometry and trigonometry
- Certain types of calculators may be used  
To obtain the latest list of prohibited calculators, check the ACT Web site ([www.act.org](http://www.act.org)) or call 1.800.498.6481.

The ACT for mathematics contains questions that require the use of reasoning skills to solve practical problems in the following six areas:

- Pre-Algebra ( $\approx 23\%$ )
- Elementary Algebra ( $\approx 17\%$ )
- Intermediate Algebra ( $\approx 15\%$ )
- Coordinate Geometry ( $\approx 15\%$ )
- Plane Geometry ( $\approx 23\%$ )
- Trigonometry ( $\approx 7\%$ )

## ACT: Pre-Algebra ( $\approx 23\%$ )

Questions in this content area are based on basic operations using whole numbers, decimals, fractions, and integers; place value; square roots and approximations; the concept of exponents; scientific notation; factors; ratio, proportion, and percent; linear equations in one variable; absolute value and ordering numbers by value; elementary counting techniques and simple probability; data collection, representation, and interpretation; and understanding simple descriptive statistics.

## ACT: Elementary Algebra ( $\approx 17\%$ )

Questions in this content area are based on properties of exponents and square roots, evaluation of algebraic expressions through substitution, using variables to express functional relationships, understanding algebraic operations, and the solution of quadratic equations by factoring.

## ACT: Intermediate Algebra ( $\approx 15\%$ )

Questions in this content area are based on an understanding of the quadratic formula, rational and radical expressions, absolute value equations and inequalities, sequences and patterns, systems of equations, quadratic inequalities, functions, modeling, matrices, roots of polynomials, and complex numbers.

## ACT: Coordinate Geometry ( $\approx 15\%$ )

Questions in this content area are based on graphing and the relations between equations and graphs, including points, lines, polynomials, circles, and other curves; graphing inequalities; slope; parallel and perpendicular lines; distance; midpoints; and conics.

## ACT: Plane Geometry ( $\approx 23\%$ )

Questions in this content area are based on the properties and relations of plane figures, including angles and relations among perpendicular and parallel lines; properties of circles, triangles, rectangles, parallelograms, and trapezoids; transformations; the concept of proof and proof techniques; volume; and applications of geometry to three dimensions.

## ACT: Trigonometry ( $\approx 7\%$ )

Questions in this content area are based on understanding trigonometric relations in right triangles; values and properties of trigonometric functions; graphing trigonometric functions; modeling using trigonometric identities; and solving trigonometric equations.

## Sample ACT Mathematics Item

In any parallelogram  $ABCD$ , it is always true that the measures of  $\angle ABC$  and  $\angle BCD$ :

F. add up to  $180^\circ$ .\*

G. add up to  $90^\circ$ .

H. are each greater than  $90^\circ$ .

I. are each  $90^\circ$ .

J. are each less than  $90^\circ$ .

*ACT Subscore: GT (Plane Geometry/Trigonometry)*

*Illinois Mathematics Assessment Framework: 9.11.05*



# Prairie State Achievement Examination (PSAE)

## PSAE Day 2

### *WorkKeys Applied Mathematics*

- 33 multiple-choice items in 45 minutes
- Work-related problems
- Five levels of difficulty (Levels 3, 4, 5, 6, and 7)
- Certain types of calculators may be used  
To obtain the latest list of prohibited calculators, check the ACT Web site ([www.act.org](http://www.act.org)) or call 1.800.498.6481.
- A formula sheet is provided

The Work Keys *Applied Mathematics* Assessment contains questions that require the use of reasoning skills and problem-solving strategies to solve practical problems found in the workplace.

- A formula sheet is provided
- A calculator may be used
- Five levels of difficulty (Levels 3-7)

Most of the problems in the *WorkKeys Applied Mathematics* Assessment will involve one or more of the following applications:

- **Quantity** - determining the number of items sold, produced, or purchased, or figuring totals on a per unit basis tasks involving monetary units include figuring sales, costs, wages, and expenses
- **Money** - tasks involving monetary units include figuring sales, costs, wages, and expenses
- **Time** - some tasks involve figuring elapsed time, converting time units
- **Measurement** - calculating distance, area, weight, and volume; conversions
- **Proportions and Percentages** - tasks that require making predictions, calculating commissions, discounts, taxes, price increases, changes in sales, and wage changes
- **Averages** - records may be expressed in terms of averages (sales records, wages, costs, hours worked)

The WorkKeys *Applied Mathematics* Assessment Level 3:  
(IMAF: 6.11.17)

*Individuals with Level 3 skills can set up and solve problems with single-step mathematical operations (addition, subtraction, multiplication, or division) on whole numbers, fractions, decimals, or percentages.*

**Example:** It took you 1 hour to unpack, price, and shelve 3 boxes of jeans at work. On the average, how many minutes did it take to unpack, price, and shelve 1 box of jeans?

- A. 15
- B. 20 \*
- C. 30
- D. 40
- E. 60

The WorkKeys *Applied Mathematics* Assessment Level 4:  
(IMAF: 6.11.18)

*Individuals with Level 4 skills can set up and solve problems with 2 or more different mathematical operations (addition, subtraction, multiplication, or division) on whole numbers, fractions, decimals, or percentages.*

**Example:** The discount store where you work is selling a video game for 15% off the regular price of \$21.00. What is the sale price of the game?

- A. \$ 3.15
- B. \$16.80
- C. \$17.85 \*
- D. \$18.90
- E. \$24.15

# The WorkKeys *Applied Mathematics* Assessment Level 5:

(IMAF: 6.11.17)

*Individuals with Level 5 skills can set up and solve problems with multiple-step calculations on a mixture of whole numbers, fractions, decimals, or percentages, when the information is presented in a logical order.*

**Example:** You groom dogs. It takes you 1 hour 15 minutes to groom an average-sized dog. Large dogs, however, take 1 hour 45 minutes to groom. Today you have to groom 3 average-sized dogs and 2 large dogs. How much time should it take you to groom all 5 dogs?

- A. 3 hours
- B. 3 hours 45 minutes
- C. 6 hours 15 minutes
- D. 7 hours 15 minutes \*
- E. 7 hours 45 minutes

## The WorkKeys *Applied Mathematics* Assessment Level 6:

(IMAF: 7.11.03, 6.11.17)

*Individuals with Level 6 skills can set up and solve problems containing unnecessary information or information presented out of logical order and involving multiple-step calculations on a mixture of whole numbers, fractions, decimals, or percentages.*

**Example:** You are preparing to tile the floor of a rectangular room that is  $15\frac{1}{2}$  feet by  $18\frac{1}{2}$  feet in size. The tiles you plan to use are square, measure 12 inches on each side, and are sold in boxes that contain enough tiles to cover 25 square feet.

How many boxes of tiles should you order?

- A. 11
- B. 12\*
- C. 34
- D. 59
- E. 287

# The WorkKeys *Applied Mathematics* Assessment Level 7: (IMAF: 7.11.03)

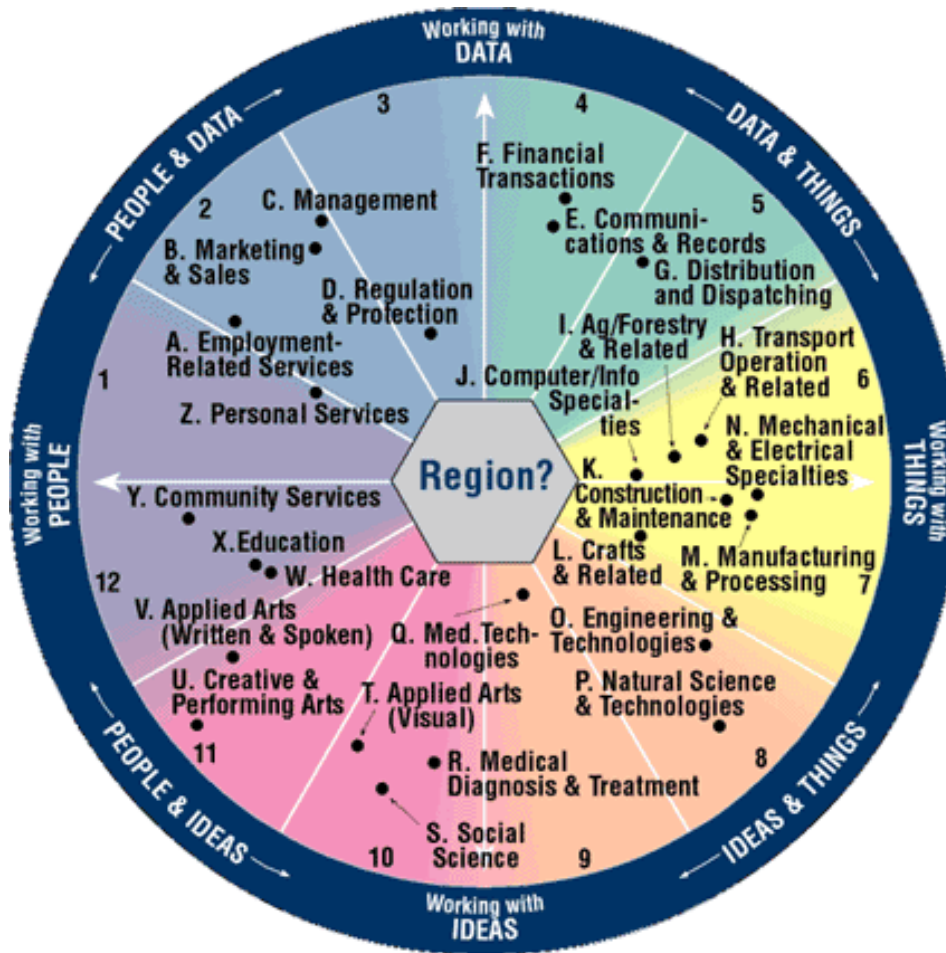
*Individuals with Level 7 skills can set up and solve problems requiring extensive calculations and several conversions between systems of measurement. They can calculate percent change, set up & manipulate complex ratios and proportions, find multiple areas or volumes of 2- and 3-dimensional shapes, find the best economic value of several alternatives, and locate errors in multiple-step calculations.*

**Example:** The farm where you just started working has a vertical cylindrical oil tank that is 2.5 feet across on the inside. The depth of the oil in the tank is 2 feet. If 1 cubic foot of space holds 7.48 gallons, about how many gallons of oil are left in the tank?

- A. 37
- B. 59
- C. 73 \*
- D. 230
- E. 294

# World of Work Map: Applies WorkKeys Scores to Careers

[www.act.org/wwm](http://www.act.org/wwm)



- **Career Area X: Education**

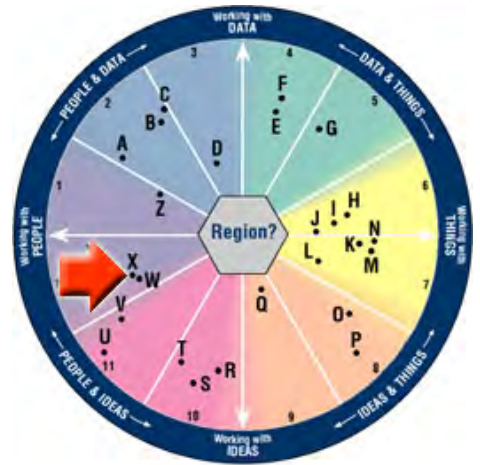
- **Examples of Occupations:**

Athletic Coach; Educational Administrator; Elementary/Secondary Teacher; Corporate Trainer.

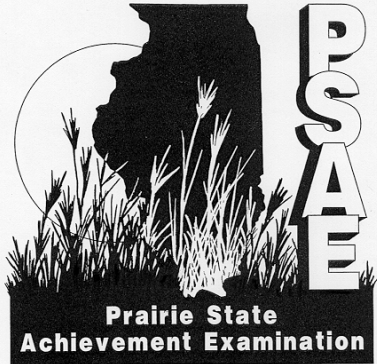
- **Examples of majors/programs of study**

(years of study past high school):

Individual/Family Development Studies (2), General/Elementary/Secondary Teacher Education, Specialized fields (e.g., Music, Science) related to education (4). While it's important to know what kind of career you're interested in, it's also important to consider the **skill level** needed. **Education Profile**



- Brian Vanderveer is a teacher in a middle school. He is responsible for teaching youth that have a variety of learning disabilities. He designs and modifies instruction to meet a student's special needs. He works closely with parents to inform them of their child's progress and suggest techniques to promote learning at home. He loves the challenge of working with his students and the freedom he has to find the best method to help students to learn. He dislikes not having enough time to dedicate to each student. He worries that he will eventually burn out because of the stress of teaching students with so many different needs.



# Prairie State Achievement Examination (PSAE)

**Contact**

ISBE Student Assessment Division

Megan Forness, PSAE Consultant

217.782.4823

[mforness@isbe.net](mailto:mforness@isbe.net)

[www.isbe.net/assessment/psae.htm](http://www.isbe.net/assessment/psae.htm)