

## Living and Working in a Mathematical World—Career Connections

We live in a mathematical world. Whether we are buying a car, choosing an apartment, or filing a tax return, we rely on our understanding of mathematics.

The level of mathematical thinking and problem solving needed in the workplace has increased dramatically. Those who understand and can do mathematics will have opportunities that others do not. Mathematical competence opens doors to productive futures. Here are a few examples of people at work and how they use mathematics in their everyday lives:



Paul Zandt, Meteorologist

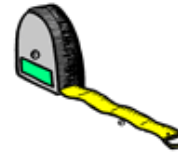
Believe it or not, the weather surrounding you is mathematics in motion! Every cloud, monsoon storm or hot, dry day can be summed up by a series of mathematical equations. Paul Zandt learned these mathematical equations by taking college courses in advanced mathematics. The equations Paul learned help explain which way the wind will blow and whether the temperature will rise or fall. These equations are programmed into giant computers. Meteorologists like Paul rely on these computers to help them make the forecasts you hear on the radio or TV. Paul could not do his job without a good understanding of mathematics. So, if you think your child might want to be a meteorologist, encourage her to excel in mathematics!



Tina DiFelicianantonio, Filmmaker

Have you ever heard the phrase “time is money?” It turns out that the more filmmakers know about mathematics, the better they are at getting a film produced on budget and on

schedule! As a producer, Tina uses mathematics to decide how many people can be hired, how much they will be paid and how much time she can spend editing the film. The cameraman uses mathematics to design the look of the film and to calculate the depth of field using “f stops” and focal lengths. The sound team calculates sound patterns and recording levels using mathematics. As you can see, once Tina starts to put a film together, there is no end to the use of mathematics! If your child shows promise as a creative filmmaker, remind him that studying mathematics will help him achieve his dream!



Bill Whitmire, House Builder

Bill likes pounding nails, sawing wood and trying to figure out the best way to solve a problem. That’s what building is: a lot of mathematical thinking to go along with the physical work. Bill uses mathematics to figure out how much cement, lumber, nails, roofing and insulation he will need. He uses mathematics to read blueprints and figure out where to pour the foundation and put the doors. He uses geometry to figure the angles of the building, slope of the land and incline of the stairs. Building strong houses comes from building strong mathematics skills!

### **PBS MATHLINE: Career Connections**

To explore profiles of other people who tell about their careers and how they use mathematics in their everyday lives, go to: [www.pbs.org/teachersource/mathline/career](http://www.pbs.org/teachersource/mathline/career)

## **Osborn School District**

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**Osborn School District**  
An Osborn Education

*Performance  
Objectives  
Overview*

*Grade 5*

*Osborn School District*  
*Grade 5 Targets*

**Mathematics**

**Number and Operations**

**Number Sense:**

- Students extend their work with equivalency among fractions, decimals, and percents to include ordering and comparing;
- Work with factors, multiples, prime and composite numbers, and integers to prepare for number concepts in Grades 6 and 7.

**Numerical Operations:**

- Students expand their understanding of equality, adding and subtracting fractions to include unlike denominators;
- Develop fluency with the operations and standard algorithms for adding and subtracting fractions and decimals and multiplying and dividing whole numbers;
- Extend their work with order of operations to numerical expressions.

**Estimation:**

- Students use estimation skills to verify the reasonableness of their solutions;
- Make reasonable estimates with whole numbers for sums, differences, products and quotients.
- Make reasonable estimates for sums and differences of fractions and decimals.

**Data Analysis, Probability and Discrete Mathematics**

**Data Analysis (Statistics):**

- Students apply their understanding of whole numbers, fractions, and decimals as they construct, analyze, and describe data;
- Apply this understanding of data in other core content areas and in their lives.

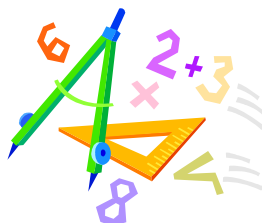
**Probability:**

- Students extend their knowledge of fractions to be able to state the theoretical probability of an event as a fraction, decimal, or percent;
- Predict, record, and compare results in actual experiments;
- Begin to understand how probability is determined and make predictions related to probability.

**Systematic Listing and Counting:**

- Students extend their understanding of counting problems and their relation to probability;
- Analyze different representations and make connections to the multiplication principle of counting.

**Vertex-Edge Graphs:** Students continue to develop their understanding of vertex-edge graphs by investigating and solving problems involving Euler paths and circuits.



**Patterns, Algebra, and Functions**

**Patterns:**

- Students extend their work with numerical sequences to include fractions and decimals;
- Improve their communication of algebraic reasoning as they analyze sequences.

**Algebraic Representations:**

- Students use variables to write algebraic equations;
- Apply properties to solve those equations.

**Analysis of Change:** Students build on their knowledge of change over time and extend this to include describing patterns of change as constant, increasing, or decreasing.

**Geometry and Measurement**

**Geometric Properties:**

- Students analyze and categorize polygons by their properties;
- Build upon their knowledge of polygons to relate and compare two and three-dimensional figures.

**Measurement:**

- Students extend their thinking about measurement to include measuring angles and determining the appropriate unit and degree of accuracy for measurements made in context;
- Solve problems involving time, area, and perimeter.

**Structure and Logic**

**Algorithms and Algorithmic Thinking:**

- Students extend their work analyzing common algorithms for calculation with fractions and decimals;
- Explain why the procedures work on the basis of properties of operations and place value;
- Use their understanding of geometric properties to develop algorithms for calculating area and perimeter of polygons.

**Logic, Reasoning, Problem Solving and Proof:**

- Students select and use efficient strategies to solve problems;
- Evaluate their method and solution;
- Develop arguments to defend their choices in problems that integrate the content of strands one through four.