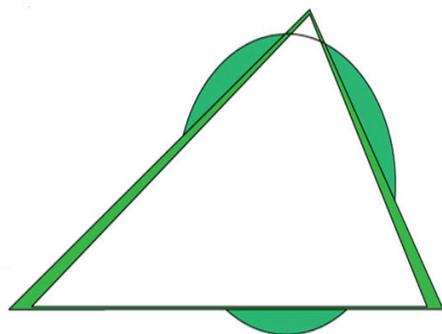


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September
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2017

PROMOTING CAREER & TECHNICAL EDUCATION AND THE WORLD OF WORK

IN THIS ISSUE

Math and The CTE Classroom

by Dwayne Mentgen

The great thing about CTE courses is that they are designed to answer that age old question of "Where am I ever going to use this stuff?" In this issue we will look at the answer to that question by connecting the CTE and mathematics classroom.

The foundation of high school mathematics rests in the Algebra classroom. Not only is Algebra a state requirement for graduation, but its content permeates almost every occupation available. So, where is the connection?

Consider the concept of the variable. Within Algebra, students will focus on solving for x . However, x is not just a number it is a representation of a thing. So, instead of having a student understand a **variable** abstractly as in pure Algebra, a CTE teacher can reinforce this important concept starting with simple vocabulary lessons. Having the CTE teacher use proper terminology for both their content area, and the mathematics content area is key to giving the student a true "depth of understanding".

Consider these usages of the **variable** in CTE content areas:

Computer Applications: Consider the Spreadsheet. A key concept in spreadsheets are cell addresses. Using a cell address (**B1** for example) is the same as using a variable in Algebra). Reinforce the term variable and use it interchangeably with Cell Address (at appropriate times of entering formula's, etc.)

Automotive: When turning brake rotors students will have to reference the minimum thickness allowed for safe operation. Additionally, when they measure the current thickness of the rotor, that difference between safe operation and current thickness is a **variable**. Having a student calculate that measurement is simple math, but reminding them they just solved for a **variable** reinforces the concept, and the connection.

Building Trades: A project requires three lengths of 2×4 , each of $2 \frac{1}{2}$ foot length. When the student chooses from the wood supply, he or she should choose the length of wood that will have the least waste. If they are choosing from a length of board that is $92 \frac{5}{8}$ inches, what will be left if the kerf has a $\frac{1}{8}$ inch bite? The remainder is the **variable**, and also gets the students thinking in multi steps for their problem solving.

More Electrical Power Equations (P)

Using $P = IV$ and Ohms Law: $R = \frac{V}{I}$

We can find the Power DISSIPATED (converted to heat) by a resistor.

By substituting from Ohms Law: $V=RI$ OR $I=V/R$

$P = I^2R$ $P = \frac{V^2}{R}$

Electrical

The field of electronics/electrical wiring cannot exist without proper calculations. The variable example here can be figuring how many Ohms are produced. This would be based upon the thickness of the wire (**the variable**) that the current travels through.



Welding

Welding operates on the principles of the gas laws. One law says that the pressure times the volume equals the temperature times a constant. A master welder will look at this formula and instantly tell you what happens to the temperature(**variable**) if the pressure(**variable**) goes down and the volume stays the same.

All CTE courses will have elements of mathematical application. A basic starting point is for the CTE teacher to be bi-lingual. That is to speak the language of mathematics, while at the same time speaking the vernacular of their particular trade or content area. So below is a list of common mathematical terms and examples of where they are used in the trades.

Slope—Construction (pitch of a roof).

Parabola—Engineering (Suspension bridge)

Ratio—Automotive (Gear Ratios)

Sine Wave—Automotive (Oscilloscope)

Proportion—Culinary Arts (Recipes)

Starting with vocabulary is an easy way to bridge the gap and make the connection between math and the CTE course.

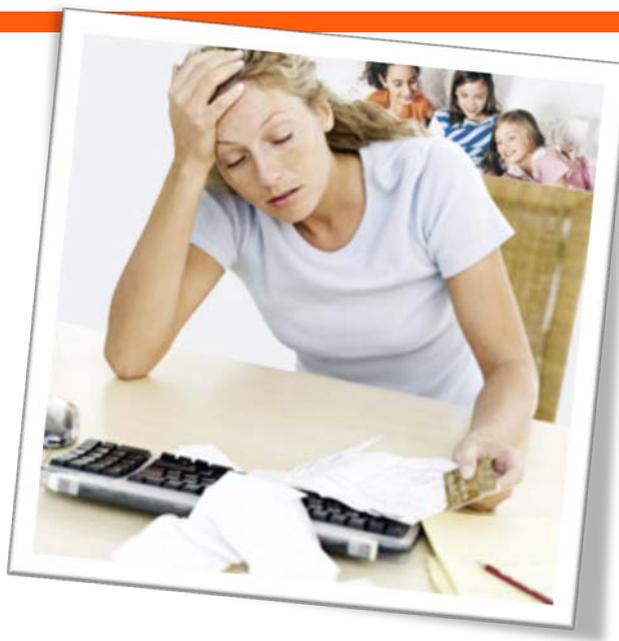
However, it doesn't end there. Looking for solid examples of how the math is used in the content area is vital.

If students are to overcome apprehension to doing math, they need to be made aware that they are already practicing the math that they fear, and on a daily basis. In future issues we will look at specific applications of math within specific content areas. As an example, how are the elements of a line used in construction, engineering, nursing, etc.? When students are made aware that they already successfully use upper-level mathematical concepts, they should become more receptive to the idea that the courses they enjoy (CTE) depend heavily upon courses they fear, or mistakenly believe they don't understand. The CTE teacher can serve as a key stepping stone in overcoming misunderstanding regarding mathematical concepts.

Helpful Websites:

Philips Exeter Academy: This website publishes a full problem set of varying types of mathematics. Almost all are word problems that lead to real life applications. It's free, and well worth a look: [Click Here](#)

Mathematical Thinking: [Click Here](#) for a good website to get you thinking about the uses of mathematics in everyday life.



Single Parent Help

by Aurora Medina

As the Single Parent Coordinator for SRAVTE I serve as an Advocate and Mentor for Single Parents, Displaced Homemakers, Single Pregnant Women, and Teen Parents. My mission is to empower these populations to reach personal and career success through career exploration, educational opportunities, job skills training, and mentoring. I meet with participants 1-2 times a month in their home or in their school, and discuss a variety of topics including career planning, occupational skills, parenting information, and educational assistance as part of my individual services. Throughout the year I also provide school services, where I am invited to schools and present "Today's Choices...Tomorrows Reality". This is a 3 day workshop designed to help students learn more about life on their own after high school, and to discourage teen pregnancy.

To better serve my participants I will be coordinating Single Parent Workshops and Teen Parent Support Group. The goal of the Single Parent Workshops is to connect Single Parent families with resources to be successful. These workshops promote education, career development, provide education on nutrition and healthy living, and family planning. Teen Parent group will be offered to young parents and

parents-to-be 14-21 years old. This support group will help encourage positive parenting, promote healthy life styles, and strengthen relationships. It will also be focused on education and career development. My main goal is to provide services and resources to help Single Parents gain employment which provides a wage sufficient to meet their needs and those of their children.

As a Program Coordinator I am assigned to participant in the Hispanic Council Committee. My responsibilities are to reach out to the Latino students in my surrounding communities and invite them to participate in campus visits. I coordinate two campus visit throughout the school year, IVCC visit in the Fall and University visit in Spring. The following are upcoming workshops/activities offered to those I serve:

1. Single Parent Conference- September 14
2. Career and Life Transitions Workshop-October 19
3. IVCC Latino visit day- November 14
4. Health and Wealth Workshop- February
5. Single Parent Resource Fair- March
6. Teen Parent Conference-April
7. Latino University campus visit- April

To learn more about my services, or if you have a referral, please feel free to contact me at 815-224-0347 or email me at aurora_medina@ivcc.edu.

SRAVTE Career Resource

If career preparation and exploration is part of your school culture, then taking advantage of what Career Cruising has to offer should be a part of each student's experience. IVCC provides enrollment and subscription to the Career Cruising Software Platform for all schools in its region. The SRAVTE office is specifically charged with helping the Middle Schools get up and running with the platform. That being said, when you receive your freshman class, each student will already have a Career Cruising account. This account is set up and ready to go, and already populated with information from their sessions with the SRAVTE Perkins Coordinator Mrs. Jeanette Maurice.



Career Cruising:

The SRAVTE Office provides a variety of career resources. One of those resources is the Career Cruising website. This site provides students with a career interest survey and targets some of their career interests. Our office provides a career cruising presentation to 8th graders. The students develop an electronic portfolio and their career interests are stored in that portfolio. The students who have an interest in Career and Tech Ed are shared with the counseling department at the students' targeted high school.

Once the students complete a career interest survey they are then guided to do some career research of the job description, earnings and education needed for one particular career. All of the students' work is stored in their electronic portfolio which can be accessed at any time and also once they reach their high school.

The Career Cruising site also offers further assessments for Learning Styles and Ability Profiles.

Teachers are left with several lessons for more career development. One of those lessons is to explore the Inspire section of Career Cruising where over 294 local

companies are listed and teachers and students can explore what a company does/manufactures and have access to 1396 Career Activities and 325 Career Coaches. This site makes it easy for teachers to locate companies who will do field trips, career fairs and provide guest speakers.

One of the schools visited this year sent a letter home to the parents which stated:

This powerful program will help students explore careers within their interest areas. The goal of the training is to help students focus their schooling toward specific jobs and careers.

Students will first establish an electronic portfolio to track their explorations. Students will then complete an interest survey which will allow the program to generate a list of 40 possible careers for exploration. Students will be able to see job descriptions, training recommendations, and entry level salaries. The goal is to encourage students to begin thinking about careers of interest and find out what training is needed to compete for employment in a given career.

This will provide students with a first look at a powerful tool which will be available to them through their high school years.

On the next two pages is an example of an assignment one teacher designed to have her students use the information they garnered from Career Cruising.



Contact The SRAVTE Office

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Visit our Website at:

www.sravte.org

Student Engagement

Is your school looking to increase student engagement in a manner that promotes collegiality and honest discussion amongst the faculty?

If the answer to that question is YES, then perhaps your school should look into the IPI process. IPI is a system to track student classroom engagement. It is teacher led, and driven. It also provides hard data for charting your schools level of student engagement with its classrooms. You can learn more about this process by visiting the website listed below:

[IPI Student Engagement](#)

As a teacher/administrator who has seen this process in action I can attest to its ability to build collegiality, and to promote honest reflection on increasing student engagement. Its simplicity and attention to building faculty buy in make it a powerful tool in promoting honest reflection that is done in a non-threatening manner.

ACTE Statistics

The following statistics were garnered from the ACTE organization and their publication found [here](#)

- Students can attend public community and technical colleges for a fraction of the cost of tuition at other institutions: \$3,520, on average, in 2016-2017
- According to research in Texas, Colorado and Virginia, graduates with technical or applied science associate degrees out-earn bachelor's degree holders by \$2,000 to \$11,000.
- 27 percent of people with less than an associate degree, including licenses and certificates, earn more than the average bachelor's degree recipient.

If these statistics sound surprising, they should not be. Careers that are found through CTE courses are as strong as they have ever been. They provide students with a very valuable alternative to pursuing a four year degree right out of High School.

1st CAREER CHOICE

Job Title: Middle School Teacher

Description: Instruct junior high students.

Core Tasks: Teach one or 2 subjects; usedifferentmethods to interest and motivate students; prepare/grade assignments and tests.

Attributes & Abilities: Passionate about subject; good communications skills; patient and understanding; good with people.

Working Conditions: Classroom/offices; 40+ hours a week with extended holidays and summers off; demanding yet fulfilling career.

Earnings Range: \$36K-\$82K

Req. Education/Training:

4-year Bachelor's Degree

Possible College Choices:

Illinois College-Jacksonville-
\$38K

University of IL- Champaign-

2nd CAREER CHOICE

Job Title: Addictions Counselor

Description: Help people overcome addictions with alcohol, drug, gambling, etc.

Core Tasks: Meet with clients; develop treatment plans, counsel, support, and encourage clients; monitor client progress, write reports, and educate the public.

Attributes & Abilities: Patient, understanding, and non--judgmental; good communication and listening skills

Working Conditions: Offices; 30-40 hours a week; stressful; high bum -out rate

Earnings Range: \$25K-\$70K

Required Education/Training: Formal training in addictions counseling-college degrees preferable

Possible College Choices
IL Valley Comm. College- Ogelsby-
\$3K

University of St. Francis-Joliet-\$37K

Related Careers:
Abuse/Crisis Counselor
Bereavement Counselor
Family Therapist
Psychiatrist/Psychologist

DREAMJOB

Job Title: Obstetrician-Gynecologist

Description: Care for pregnant women, deliver babies, and specialize in care of female reproductive system.

Core Tasks: Provide medical care before, during, and after pregnancy; deliver babies; monitor overall patient health; perform tests and procedures.

Attributes & Abilities: Caring and compassionate; emotionally mature; strong communication skills; good with people.

Working Conditions: Hospitals/clinics; 60+ hours per week plus on-call duties; mentally demanding

Earnings Range: \$100K-\$400K

Required Education/Training: 4-year Bachelor's Degree Pass MCAT
4-year Medical Degree
Complete 4-year residency program

Possible College Choices
Loyola University -Chicago- \$52K
Northwestern University-Chicago-
\$61K

Related Careers:
Midwife
Family Physician
Pediatrician

Career Cruising

2016

Careers in my Family

Teacher

Office/ Clerical

Worker

Accountant

Executives

Nurse

Beautician

My Career Cluster Results

Artistic

Social

Conventional

My Lifestyle Goals

Own a nice home

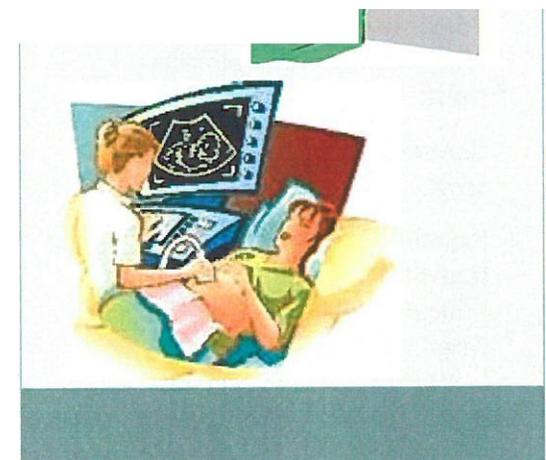
Drive a nice car

Eat out once or twice a week

Take vacations

Save for retirement

Portfolio



Choose a job you love, and you will never
have to work a day in your life.

—Confucius—