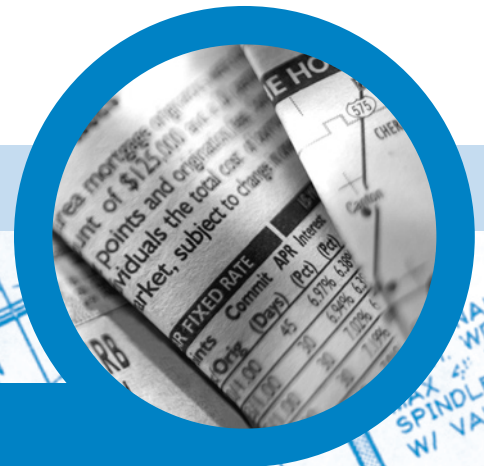


Build a HOME

Build a CAREER



MATH

Home Building by the Numbers



The Workforce Development Arm of the National Association of Home Builders
1201 15th Street, NW, Washington, DC 20005 (800) 795-7955 Ext. 8927

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OF HOME BUILDERS

The Lesson Booklet series:

- Career Exploration
- English/Communications
- Math
- Science
- Social Studies

Lessons are built around steps in the HOME BUILDING PROCESS

PLANNING AND DESIGN PHASE

- Development/Construction Management
- Financial Management
- House Design
- Site Selection
- Determine Materials/Costs
- Zoning/Permits
- Site Preparation

CONSTRUCTION PHASE

- Purchase Materials
- Laying Foundation
- Framing
- Electrical/Plumbing/HVAC Installation
- Insulation
- Flooring
- Roofing
- Window Installation
- Drywalling/Finishing and Tapers
- Select plumbing, electrical, cabinet fixtures and floor coverings
- Finishing—carpentry, painting, tiling
- Flooring installation
- External finishing

THE HOME INTERIOR

- Smart House Enhancements
- Interior Design

LANDSCAPING

HOME BUYING

- Financing/Closing

HOME SELLING (ongoing throughout process)

- Public Relations/Advertising
- Marketing and Sales

MATH

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MATH

Algebra
Consumer Math
Geometry
Personal Math

Introduction

Math is one of those valuable life skills that people only begin to appreciate some years after they have left the classroom. Students can be intimidated by math, especially when they can't see how it applies to their lives. The same students who calculate sports statistics on the spot, or amaze parents with unexpected financial savvy, stare blankly at math problems or concepts they think have no connection to their world.

No doubt some of your most successful classes are those in which your students are able to make the magical connection between formulas or equations and an event or activity that is central to their lives—or at the very least, of interest to them.

The lesson suggestions and activities in this booklet are built around two different math-focused themes. They are intended to provide you with relevant, reality-based learning experiences that will engage your students and reinforce important life skills.

Unit 1: Math in Construction

Students see Algebra in action as they learn how formulas, equations, and ratio and proportion are vital to building a house (at least, if they want it to remain standing).

Unit 2: Home Buying

Students go through the home buying process and discover how they will use math and decision-making skills every step of the way to successful homeownership.

For additional activities that will engage your students, see the Science Lessons book, *Unit 1: the Science of Building*. Each of the five lessons under that unit (electricity, flooring, framing, HVAC, plumbing) includes a worksheet with construction-related math problems.

UNIT 1

Math in Construction – Algebra



LESSON 1: Express Yourself Math Magically (Expressions)

LESSON 2: Picture This! (Formulas and Equations)

LESSON 3: To Scale (Ratio and Proportion)

LESSON 4: How Much Is It Worth? (Statistics and Central Tendency)

The following activities and lessons are correlated to Algebra curricula. Each lesson, where applicable, provides time for speakers from the construction industry to reinforce the math curriculum in relation to their profession.

Students can keep a portfolio of construction careers introduced and the construction vocabulary presented. At the end of the term, the students are responsible for further research on one of the careers and an oral presentation to the class about that career with a focus on how mathematical concepts are used. Students can also keep a journal where they record reactions to speakers and observations about the professions they are discovering.

Students are given word problems dealing with construction that require the use of critical thinking skills. This involves both cooperative learning and individual practice.

As a final group project, students can apply the mathematics learned and work with an industrial arts/building or science class to design and build a model house. See the *Build and Wire a Mini-house* lesson in Unit 2 of the Science Lesson book.

Construction Vocabulary for Unit 1– Tools and Terms

Building Tools

- 30 -60 -90 triangle
- 45 -45 -90 triangle
- backsaw
- carpenters square
- chalkline
- combination square
- folding wooden rule
- miter box
- plumb bob
- protractor
- rafter square
- ruler
- scribe
- T-bevel
- tape measure
- T-square

Building Terms

- asphalt shingles
- apprentices
- attic louver
- ceiling
- cripple
- dormer
- drip edge
- eavesdrip
- excavating
- fascia
- felt paper
- footers
- gable stud
- grading
- gusset
- gutter
- header
- hoisting
- hurricane clip
- overhang or eave
- pitch
- plywood
- plywood clip
- pre-fab
- rafters
- ridge board
- sill
- sky light
- steeple
- stud
- top & bottom chord
- top & bottom plate
- trusses
- web member

LESSON 1

Express Yourself Math Magically (Expressions)

Students will be given problems that deal with home construction. They will translate verbal expressions into mathematical expressions. This lesson will also introduce students to some of the terms that are part of the construction vocabulary.

Preparation

- Make copies of vocabulary lists and worksheets.
- Develop examples, quizzes, and/or tests, which continue to reinforce the construction vocabulary.
- Arrange visit to a subdivision where homes are in various stages of construction.

Procedure

- Tell students they are going to learn how math skills translate into careers in home building.
- Copy and distribute vocabulary list.
- Take students to a subdivision where several homes are in various stages of construction.
- Ask a contractor to give students a tour, explaining how math and precision in measuring is key to his/her job. As your guide talks about construction terms and tools, students should add any words not on their list.
- In the classroom, have students work in teams to review the terms. If possible, invite building construction students, instructors or professionals to your class to help reinforce the new vocabulary.

- Distribute Worksheet A and have students write expressions for practice. Then ask them to use construction terminology to create problems for each other.
- Distribute Worksheet B and have students complete the problems. In addition to writing the expressions, ask them to write a brief explanation of why the expression is written as it is.

Team Teaching/Blended Instruction Opportunities

Art and Communications, Consumer Economics, Industrial Arts.

Support Materials/Resources

- Vocabulary list of tools and terms (for use in all lessons)
- Worksheets – Scenarios and Problems
- Local contractor to provide site tours

Worksheet A – Home Building Problems

Name: _____

Directions: Write a mathematical expression for each verbal expression.

1. The length of a room whose length is three feet more than twice the width.
2. Building Delights Construction Company has four less roofers than painters. Write an expression for the number of painters.
3. The amount of wallpaper in 3.5 rolls.
4. The number of bricks left from 5 pallets after using 1150 bricks to build a chimney.
5. The number of gallons of paint needed to paint the interior walls of a house if each gallon covers about 600 square feet and each wall needs two coats of paint.
6. The number of nails used by a roofer to put on the shingles, if each shingle needs three nails.
7. The width of a tub where the width is six inches more than one-fourth of the length.
8. The number of light switch plates needed for a new house if you need four more than the number of rooms in the house.
9. The number of square yards of linoleum required if the two bathrooms need three square yards less than one-fourth the amount needed for the kitchen.
10. The amount of cement needed for a sidewalk that is to be four inches deep if the length of the sidewalk is six inches more than twice the width.

Worksheet A – Home Building Problems *continued*

11. The length of a patio where the length is three times the width.
12. The amount of fence needed for a square dog pen.
13. The number of tiles left from 12 cases if you applied it in both bathrooms and used 1080 tiles.
14. The height of the bedroom door, if the height is twice the width of the door.
15. The cost of a house if the builder charges \$75 per square foot.
16. The length of a room in feet if 20 square yards of carpet covered the room. (9 square feet = 1 square yard)
17. The number of smoke detectors needed for a house if the law requires one smoke detector for every 500 square feet.
18. The number of ceiling fans in Jon's house if there are three less than the number of rooms in his house.
19. The length of the kitchen that is four feet longer than it is wide.
20. The length of the mantle that is one inch less than ten times the width.
21. The number of square feet in a \$105,000 house if the builder charges x dollars per square foot.

Worksheet B – Home Building Scenarios

Name: _____

1. The electrician wired fixtures for a house and told the builder that he needed 30 40-watt light bulbs. Write an expression for the number of boxes of light bulbs the builder should purchase if there are n light bulbs in each box.
2. An interior designer wants to replace the wallpaper in Dave's guest bathroom. She will need 12 square feet less than the amount that four rolls of wallpaper will cover. Write an expression for the amount of wallpaper that she will use if each roll will cover x square feet.
3. Johnson's bricklayer used 3.5 pallets of bricks for the fireplace and chimney. Write an expression for the number of bricks used if each pallet contains x bricks.
4. Dan wants to have a painter come in and repaint the interior walls of his house off white. He plans to purchase 2.5 gallons of paint per room. Write an expression for the number of gallons Dan should purchase if he has n rooms that need to be painted.
5. A carpenter needs to cut the baseboards for a master bedroom. The master bedroom is 18 ft by 25 ft. One of the short walls has 2 doors; the other short wall has 1 door; all doors are 3.5 ft wide. The carpenter starts with 5 boards each x ft long. Write an expression for the amount of wood left after he cuts the baseboards.

LESSON 2

Picture This! (Formulas and Equations)

This lesson shows students how to interpret blueprints so that mathematical formulas can be used to determine specific construction needs. Students will work in groups to determine a specific area, volume and/or perimeter for given areas of the house.

Preparation

- Make copies of worksheets.
- Learn how to interpret blueprints.
- Obtain several sets of blueprints with scales.
- Make arrangements for guest speaker(s): roofer, painter, concrete mason, and/or carpenter.
- Have conversion charts available (linear, area and volume) for a group assignment.

Procedure

- Introduce your lesson on formulas and equations as you normally would.
- Distribute Using Formulas worksheet; have students complete it individually.
- Invite a panel of construction professionals to discuss how they use formulas in their jobs.
- Take students on a trip to a site or construction company to see firsthand how and where formulas are used in the building industry.
- In the classroom, have students work in groups to determine a specific area, volume, and/or perimeter for given areas of a house. Distribute blueprints and copies of the Concrete Slab, Living Room and Roof worksheets.

Activity Extensions

- Calculation errors in building can cause huge headaches because one wrong number sets off a chain of errors. Have students interview building industry professionals about the problems of calculation errors in the building industry that most frequently result in re-doing work, re-planning a project, or coming to some other resolution. During a sharing session, ask students to share their interview findings/report with others in a small group. Tell students they should cite the sources of their interviews, explain the problems attributed to miscalculations, and state how the individual solved the problem.
- Give students the following problem to solve, then ask them to work in small groups to create an original problem based on a calculation error to share with the class.

Your client, a contractor, is having a dispute with a property owner for whom the contractor installed a water tank. The owner does not believe that the tank holds the 500 gallons he was promised. The tank is in the shape of a cylinder. It has a radius of one yard and a height of 2 feet 4 inches. Given that there are about 7.5 gallons in a cubic foot, determine the number of gallons the tank holds. Source: *When Are We Ever Gonna Have to Use This?*, Hal Sanders, Dale Seymour Publications, 3rd edition, 1988.

Support Materials/Resources

- Worksheets: A – Using Formulas, B – Concrete Slab, C – Living Room, D – Roof
- Guest panelists from the building industry
- *Algebra 1 Integration Applications Connections*, Glencoe/McGraw-Hill, Copyright 1997

Worksheet A – Using Formulas

Name: _____

$$A = lw$$

area of rectangle

$$A = \pi r^2$$

area of circle

$$P = 2(l + w)$$

perimeter of rectangle

$$P = 4s$$

perimeter of square

$$P = \text{sum of sides}$$

perimeter of any
2-dimensional object

$$C = 2\pi r$$

circumference of circle

$$V = lwh$$

volume of rectangle

$$V = \pi r^2 h$$

volume of sphere

$$V = s^3$$

volume of cube

$$R = d/2$$

equation

Choose the appropriate formula for each problem and solve. Make sure to use the appropriate label.

- Find the volume of a cube with 6-inch edges.
- Find the area of a rectangle with length 5 feet and width 8 feet.
- Find the area of a circle with a diameter of 3 yards.
- Find the volume of a rectangular prism with a length of 40 feet, a width of 30 feet and a height of 4 inches.
- Find the circumference of a circle whose radius is 8 feet.
- Find the perimeter of a pentagon with sides of 6 feet, 8 feet, 3 feet, 3 feet, and 6 feet.
- Find the perimeter of a rectangle with length 12.5 feet and width of 16.3 feet.
- How many square yards of carpet are needed to cover a floor that measures 12 X 14 feet?
- A football field is 120 yards long and $53 \frac{1}{3}$ yards wide. How many square yards of artificial turf are needed to cover the field?
- Find the perimeter and area of a floor whose length is twice its width, if the width is 15 feet.
- Suppose your school is building a new computer center. Four hundred square feet of the center will be available for computer stations. Each station requires 20 square feet. How many computer stations can be placed in the center?

Worksheet B – Concrete Slab

Name: _____

Formulas and Equations

1. Use the blueprint to sketch the layout of the slab and label all measurements.

2. Determine the square footage of the slab.

- A. Determine the amount of moisture barrier needed under the concrete.

- B. Determine the amount of wire mesh needed under the concrete.

- 3. Using the formula for volume, determine how many cubic yards of concrete will be needed to pour the slab. (The concrete needs to be four inches thick.)

Worksheet C – Living Room

Name: _____

Formulas and Equations

1. Determine the length and width of your room using the blueprint.

Length _____ Width _____

2. Determine the height of the walls, using the blueprint.

Height _____

3. Using the formula for area, find the area of each wall.
4. Use the information from 1-3 to determine the amount of paint needed if one gallon of paint covers between 350 and 400 square feet. Make sure to include amount needed for primer and finish coat.
5. Find the perimeter of the ceiling to determine how many feet of crown molding are needed.

Worksheet D – Roof

Name: _____

Formulas and Equations

1. Determine the length and width of the roof using the blueprint.

Length _____ Width _____

2. Using the formula for area, find the area of the roof.

A. Determine the number of sheets of plywood needed to cover the roof. Do not forget the overhang. (Plywood comes in 4' X 8' sheets.)

B. Determine the number of rolls of 30-pound felt needed to cover the plywood. (Felt comes in rolls that cover about 216 square feet at \$9.40 per roll.)

C. Determine the number of bundles of shingles needed to cover the felt. (Shingles come in bundles that cover about 33 square feet.)

3. Determine the amount of eavesdrip needed. (Eavesdrip comes in 10-foot lengths.)

LESSON 3

To Scale (Ratio & Proportion)

This lesson is intended to complement student knowledge of ratio and proportion. A guest speaker will help students understand scale drawings as applied to the building industry.

Preparation

- Make sure students are familiar with ratio and proportion.
- Make arrangements for an architect speaker.
- Obtain several sets of drawings with a given scale.
- Make copies of Ratio & Proportion worksheet and have plain paper available.
- Make copies of the Ratio & Proportion task sheet and have a set of rulers available

Procedure

- Review ratio and proportion with class as necessary. Tell students they are going to learn how these lessons apply to designing and building homes.
- Invite an architect to show scale drawings, explain their value and teach students how actual sizes are derived from scale drawings. The architect can distribute sample plans and help students practice determining actual sizes of rooms and total buildings using scale.
- Give students a scale and room size and ask students to draw an actual room to scale.
- Distribute Ratio & Proportion worksheet and task sheet; ask students to work individually to complete them.

Activity Extension

Watch Your Step! (Slope)

- Add to your students' understanding of the concept of slope, using home building as an example. Invite a roofer, plumber or architect to talk about use of slope in his/her profession; ask the speaker to bring blueprints or plans. Have a set of rulers on hand.
- Ask students to work in groups, using a set of plans to determine the slope of the roof or grade of plan, under the direction of your guest speaker. The speaker should explain that some roofs may have more than one slope.

Support Materials/Resources

- Ratio & Proportion Worksheet and Ratio & Proportion Task sheet
- Scale drawings
- Architect

Ratio & Proportion Worksheet

Name: _____

Use the scale and room size given to determine the scale size of each room. Using the scale dimensions, draw the room (each room should be drawn on a separate sheet of paper). Show all work! Set up each proportion, then solve.

1. Scale: $\frac{3}{4}'' = 1'$

Actual room size: 10' by 12'

Scale size:

2. Scale: $\frac{1}{2}'' = 1'$

Actual room size: 12' by 15'

Scale size:

3. Scale: $\frac{3}{8}'' = 1'$

Actual room size: 14' by 28'

Scale size:

4. Scale: $\underline{\hspace{1cm}}'' = 1'$

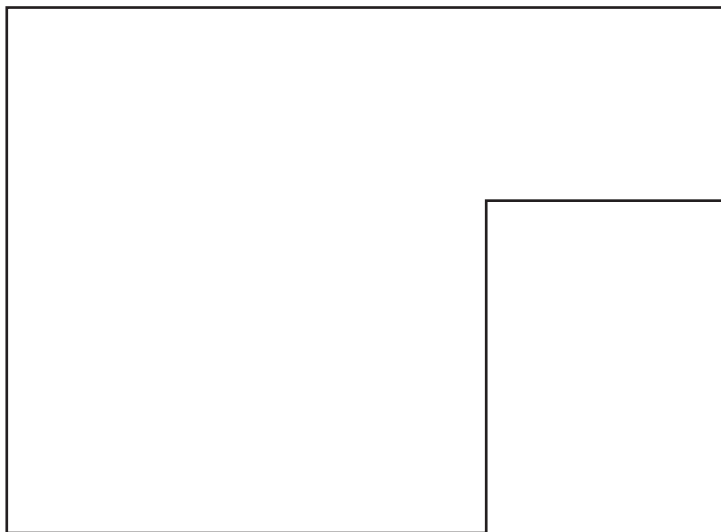
Actual room size: 14'6" by 16'4"

Scale size:

Ratio & Proportion Task

You will need a ruler for this task.
Show all work.

$$1/4" = 1'$$



**Use the scale above to determine the dimensions of the given room.
Label all necessary parts.**

LESSON 4

How Much Is It Worth? (Statistics and Central Tendency)

This lesson should be a follow-up to a lesson on statistics, including all measures of central tendency as it ties these math skills to building industry tasks.

Preparation

- Arrange for real estate professionals to present to the class; ask them to bring data on selling prices of houses in several subdivisions, which are close to each other.
- Have a supply of graph paper available.
- Copy Central Tendency Problems worksheet.

Procedure

- As part of your scheduled lessons on statistics and central tendencies, have students complete the Central Tendency Problems Worksheet.
- Tell students you are going to apply lessons on statistics and central tendencies to calculations of local housing prices, and discuss how they think that would apply.
- Invite a real estate agent to talk about the selling prices of houses in a given subdivision and ask students to record the prices. Have the speaker repeat the process with information about selling prices in a separate subdivision that is near the first one.
- Have students find the measures of central tendency for each and compare the information by graphing.

Support Materials/Resources

- Real Estate professional
- Central Tendency Problems Worksheet

Central Tendency Problems Worksheet

Find the mean, median, mode, and range for each of the following.

1. 231, 236, 239, 227, 239, 232
2. 3940, 2389, 3197, 5487, 3940
3. -89, -98, -12, -56, -75, -63, -12, -89
4. 9, 15, 26, 7, 12, 35, 9, 5, 23, 14, 5, 7, 7, 14, 16
5. -56, -85, 56, 51, -32, -89, 59, 59
6. Your test scores for six weeks are: 105, 78, 95, 95, 85, 101.
7. The temperatures in Florida for one week in August were: 101° , 99° , 102° , 97° , 89° , 94° , 100° .
8. The number of households in the following states are: Georgia – 2314, Florida – 4922, North Carolina – 2444, West Virginia – 708, and South Carolina – 1225.
9. You practiced your speech every day for 5 days. The times are: 10.00 min., 9.75 min., 9.60 min., 9.00 min., and 8.00 min.
10. The temperatures in Wisconsin for one week in January were: -3° , 16° , -5° , -2° , 10° , -8° , -4° .
11. While practicing for the marathon, you ran: 15 miles the first week, 24 miles the second week, 23 miles the third week, 29 miles the fourth week, 27 miles the fifth week, 29 miles the sixth week, 35 miles the seventh week and 28 miles the eighth week.

UNIT 2

Home Buying – Consumer/Personal Math



LESSON 5: On Your Way to Homeownership

LESSON 6: What You Can Afford

LESSON 7: Anatomy of a Mortgage Loan

LESSON 8: Getting Loan Approval

LESSON 9: Closing Day

LESSON 10: Build It. Buy It. Insure It.

This unit covers the home buying process from loan shopping through insuring the purchased property. Students sharpen math skills as they learn the steps involved in home ownership and the importance of upfront planning and sound decision-making.

The lessons were developed to be done as a unit, sequentially. Each lesson builds on the knowledge gained in the previous lessons.

In the first lesson, *On Your Way to Homeownership*, students are organized into groups and given a family identity that they maintain throughout the unit.

The Mortgage Loan Closing Terms beginning on the next page can be used with all the lessons. Have students add additional terms to the list as they encounter them.

Team Teaching/Blended Instruction Opportunities

This entire Unit or any of the lessons can be tied in with Consumer Economics/Finance, Urban Studies or Pre-Law courses.

Mortgage Loan and Closing Terms

As defined by Ameriquest Mortgage Consumer Smarts Mortgage Dictionary

3 Cs

Lenders consider three factors, credit, capacity and collateral when considering a credit application. Credit is the borrower's proven willingness to repay a debt. Capacity is the borrower's financial ability to repay a debt. Collateral refers to the property used to secure a loan transaction.

1099

A document that reports to the Federal government gross and net income earned by individuals who receive pension, social security or miscellaneous income, such as income from contract work. 1099s must be mailed to recipients by January 31 of each year for the previous year.

ABSTRACT OF TITLE

A history of a property's title record used in some states to prepare the Preliminary or Title Commitment report. An Abstract of Title lists anyone who has ever had a claim to the property, past and present. Some states require mortgage lenders to obtain a complete Abstract of Title. However, most states condense the abstract into a document called either the Preliminary or Title Commitment, which lists only current claims to the property.

APPRAISAL

Opinion as to the monetary value of the property. An appraisal of property provides an idea of how much money the property is worth in the housing market at a given time.

APPRECIATION

An increase in value. Example: An increased value of property due to either a positive improvement of the area or the elimination of negative factors.

ATTORNEY CLOSINGS

This practice is prevalent in states where attorneys' opinions are used in place of title reports. Closings by attorneys follow much the same procedures as escrow closings. The lender delivers to the attorney the settlement statement and the net loan proceeds, as well as instructions for their use.

BACK-END DEBT RATIO

This refers to the borrower's debt ratio and is calculated using a borrower's total of monthly payments due on credit obligations divided by the borrower's gross monthly income. It's expressed as a percentage. See also [Debt Ratio](#).

CASH-OUT EXPLANATION LETTER

A handwritten, signed and dated letter provided by customers who are receiving cash from the loan to explain how they intend to use that cash. Generally used to verify that borrowers aren't planning to use the cash to incur additional debt that will add to their monthly obligations and decrease disposable monthly income.

CHAPTER 13 BK

Chapter 13 is a debt reorganization in which debts are repaid under a court-supervised repayment plan. Debtors submit part of their income for distribution among creditors. Also known as the wage-earner plan.

CHAPTER 7 BK

A Chapter 7 BK is a straight liquidation bankruptcy where the debtor submits all of their non-exempt assets to the trustee for liquidation; proceeds are disbursed to creditors.

CLOSING

A meeting between a lender and borrower or a buyer, seller and lender or their agents when the loan documents are signed and the funds legally change hands. Also known as settlement.

CLOSING AGENT

The party designated to conduct the loan closing, and to ensure the mortgage or deed is recorded and the funds disbursed on time.

CLOSING COSTS

Money paid by the borrower to effect the closing of a mortgage loan, including such costs as title insurance premiums, appraisal fees, lender fees, closing agent fees, recording fees, etc.

CLOSING STATEMENT

A statement required by Federal law (the Real Estate Settlement Procedures Act) that itemizes all changes imposed on the borrower and seller (if any) in connection with a mortgage secured loan transaction. Also known as a settlement statement, HUD-1 or HUD-1A.

CONVENTIONAL LOAN

A loan that was not underwritten by HUD, the SBA, VA or the FHA.

CREDIT SCORE

A numerical assessment assigned to the customer by credit bureaus that represents a measurement of the customer's overall credit rating. The scores are weighted and range from approximately 365 to 840. Low scores reflect a "high risk," while higher scores reflect a "lower risk." Each credit bureau has its own credit score system.

DEBT RATIO (DR)

The percentage of the customer's gross monthly income allocated to pay the monthly installments on their debt owing.

DEFAULT

Failure to meet legal obligations of a contract such as the failure to make the monthly mortgage payment or the failure to pay property taxes when due or maintain hazard insurance on the property.

DEPRECIATION

A decrease in value to real property improvements caused by age, deterioration or functional obsolescence.

EARNEST MONEY

The cash deposit paid by the prospective buyer of real property, as evidence of good faith intentions, to complete the purchase transaction.

ESCROW

Delivery of something of value by a grantor to a 3rd party for delivery to the grantee upon the happening of a contingent event. In some states, all instruments necessary to the sale are delivered to a 3rd party, with instructions as to their use.

FAIR HOUSING ACT (FHA)

A Federal act that prohibits discrimination in any aspect related to the sale, rental or financing of dwellings on the basis of race, color, religion, national origin, sex, handicap or familial status.

FANNIE MAE

The nation's largest mortgage investor created in 1968 by an amendment to Title III of the National Housing Act. This stockholder-owner corporation, a portion of whose board of directors is appointed by the President of the United States, supports the secondary market in mortgages on residential property.

GIFT LETTER

A letter to the lender from the donor stating a gift of money has been made to the buyer in order to purchase specific property. The relationship of the donor and donee is stated, as well as the amount of the gift.

INTEREST

Money charged over time for the use of money.

LIQUID ASSETS

Cash or assets, such as checking/savings accounts, stocks/bonds, that are immediately convertible to cash.

LOAN RISK

The risk category assigned to a loan, which estimates the probable risk of delinquency and loss in the future.

LOAN TERM

The loan term is the period of time over which the loan will be paid. First mortgage loans typically have terms of 30, 20 or 15 years.

MARKET VALUE

The highest price a buyer would pay and the lowest price a seller would accept on a property. Market value may be different from the price a property could actually be sold for at a given time.

MARKETABILITY

The probability of selling property at a specific time, price and terms.

MORTGAGE

A written instrument that creates a lien upon real estate as collateral for the payment of a specified debt. The borrower retains possession and use of the property.

MORTGAGE BANKER

A non-depository financial institution that specializes in originating and servicing loans. They generally sell their loans to investors, but may continue to service them.

MORTGAGE BROKER

A mortgage broker is one who arranges financing for a borrower by placing loans with lenders. Mortgage brokers are paid a fee by the borrower or the lender when the loan closes.

NEGATIVE AMORTIZATION

Amortization means that monthly payments are large enough to pay the interest and reduce the principal on a mortgage loan by its maturity date. Negative amortization occurs when the monthly payments do not cover all of the interest cost. The interest cost that isn't covered is added to the unpaid principal balance. This means that, even after making many payments, a borrower may owe more than was owed at the beginning of the loan.

ORIGINATION FEE

A 1-time setup fee charged by the lender. One of the lender's charges to a borrower for handling a loan transaction.

POINTS

Each point is an amount equal to 1% of the principal amount of an investment or note.

PRELIMINARY TITLE REPORT (PRELIM)

A report showing all current claims against a property before the sale or loan transaction and identifying those items that must be removed to obtain a 1st lien position. After completion of the transaction, a title insurance policy is issued. Same as TITLE COMMITMENT.

PREPAID INTEREST CHARGE

The portion of interest, added on at loan closing, which covers the time period between funding and the beginning of the first 30-day period covered by the first payment. For example, if the loan closed on 2/15, the first payment due on 4/1 retroactively pays interest from 3/1 to 4/1. The prepaid interest would cover the period from 2/15 to 2/28.

PRIVATE MORTGAGE INSURANCE (PMI)

Insurance against a loss by a lender normally required in the event the lender has lent more than 80% of the value of the property securing the loan. The premium is paid by the borrower and is included in the mortgage payment.

PRIME RATE INDEX

A rate index which is the prevailing rate that banks charge to lend money to corporations.

SURVEY

A document prepared by a licensed surveyor that verifies the accuracy of a property's legal description, plat maps, easements or other information found in a title search.

TITLE CLOSING

The process in which the title company oversees the closing or document signing of the loan in close conjunction with the entity performing the escrow function on the loan. Once the loan documents are signed and all contingencies are satisfied, the title company records the security instrument and releases the proceeds of the loan.

TITLE INSURANCE

Insurance against certain loss resulting from undisclosed defects of title to a specifically described parcel of real property.

TITLE SEARCH

A review of all recorded documents affecting a specific piece of property to determine the present condition of claims against the property.

UNDERWRITING

The analysis of a customer's credit capacity and the loan's collateral upon which a risk is given.

Credit Related Terms

CREDIT REPORT

A report provided by a credit reporting bureau that provides a detailed account of the applicant's credit history.

DEROG LETTER

A letter written by the borrower that explains any derogatory information or reporting on the credit report.

INQUIRIES

An indication of credit investigations made by companies that are considering granting credit to a person who appears on the credit report.

TRADELINE

Credit items reported on a credit report.

LESSON 5

On Your Way to Homeownership

One of the first steps to home ownership is pre-applying for a loan and finding out about how much you can afford to spend. In this lesson, the students form “family units” and begin the application process, using the “2 1/2 times” rule to estimate what they can afford. They will become familiar with the terminology and abbreviations used in home sale ads by reading through real estate ads and watching a real estate video.

Preparation

- Divide students into groups and create different family identities for each group so the class will experience home buying from different perspectives. The identities should include household income, credit status, number of children/dependents and ages, approximate monthly bills, etc.
- Review the first page of a standard residential loan application and make enough copies for each student “family group.”
- Obtain newspaper real estate sections, identify appropriate home web sites and obtain a video, if possible.

Procedure

- Organize the class into groups that represent different family identities. Tell students the groups will maintain their identity throughout the home buying module. Each group will fill out any paper work using the personal and financial information that has been provided for the family.

- Distribute Terminology and Concepts Worksheets. Tell students they will be completing the sheet as they go through the lesson.
- Distribute list of Mortgage Loan and Closing Terms as reference.
- Show a real estate video if possible.
- As a preparatory step to home shopping, select a small group of students to research home ads and come up with definitions for the abbreviations used. A local real estate agent may be able to help them compile a list.
- Ask groups to research the different types of loans and interest rates available, then select the best one for them.
- Have groups begin the pre-application process for a home loan by filling out the first 4 sections of the application. This transaction is assumed to be a purchase of a home for primary residence. Some information may need to be left blank since this is a pre-application.
- Distribute home abbreviation definitions list the class has developed, and ask groups to “shop” for homes using newspaper real estate sections, and the internet.
- Have the class select the criteria they will use to select homes (proximity to schools, number of rooms, size of lot, etc.)
- Tell family groups to select 10 homes that meet the requirement of the “2 1/2 times” rule (defined on the worksheet). They will compile a list of ten homes selling for approximately that amount and meeting their family’s needs. The groups will be required to report on the basic type of house they can afford and need.

Extension Activities

- Students can learn about the actual costs of items purchased with loans by researching and comparing loan interest rates and calculating the cost of a loan with different payment schedules. Copy and distribute the Loan Financing Worksheet. Have students select items they want to purchase, then find loans to finance those items, using newspaper ads. As they complete the sheets and calculate the real amount they will be paying with different loans, ask them to write a brief report that draws conclusions about the pluses and minuses of time purchases.
- Invite loan officers to talk to students about banking and finance. The speakers should speak from the perspective of what students need to know as consumers and what they may want to know about a career in banking. Take students to a bank to observe the process of applying for a loan. Ask the banker to help the class develop a financial plan for purchasing a home.

Support Materials/Resources

- *Business Mathematics* by Glencoe
- Loan applications
- A local mortgage finance company or bank
- Real estate video or TV show
- Real estate ads in local newspapers; real estate web sites
- Terminology and Concepts Worksheet
- Loan Financing Worksheet

Terminology and Concepts Worksheet

Fill in the answers as you complete the lesson.

1. Different types of loans: VA, FHA, Conventional (the most common). Research the definitions and history of each loan type.
2. Prime interest rate: Where do you find this? What is it based on?
3. What is amortization? Define the types: fixed rate, GPM, ARM.
4. Interesting fact: When building your own home, it is better to buy the land and let it sit for a year or more as "seasoned property" so that you can use the equity in the land to help finance the home to be built. Why would this be good advice? Refer to the line in an application that says Complete this line if construction or construction-permanent loan.
5. Interesting fact: You should consider re-financing your home only if you can get an interest rate that is at least 1 point lower than your current one or you could lose money in the transaction. Why? Also, shop carefully, because mortgage companies are different in their fees. Refer to the line in the loan application that says, "Complete this line if this is a refinance loan."
6. Source of down payment: Lenders want to know which account it is coming from, if it is a gift, or money from tax returns etc. The applicant must be specific. Why?
7. The loan officer needs to know residential and job status for the last two years.
8. The "2 1/2 times" rule. In general, a person should not purchase a home that is priced for more than 2 1/2 times his/her annual gross salary. A mortgage company will more than likely pre-approve a buyer for somewhere between 2 1/2 to 3 1/2 times the annual salary. The buyer should be very careful about staying close to the 2 1/2 value because a person should still be able to live life after buying a house.

Loan Financing Worksheet

Type of Loan	Purchase Price	Interest Rate	Time Financed	Total Cost
Automobile #1				
Automobile #2				
Truck #1				
Truck #2				
Boat #1				
Boat #2				
Furniture Loan				
Personal Loan				
Credit Card #1				
Credit Card #2				
Home				

Summary of information obtained:

LESSON 6

What You Can Afford

After students have completed a loan application and started home shopping (*On Your Way to Homeownership*), the groups will take the shopping process to the next step. They will factor in closing costs, determine what they have for a down payment, and how much they will have to finance through a mortgage loan.

Preparation

- Familiarize yourself with the basic formulas for figuring down payment, mortgage loan amount, and monthly payment. (Resources for this include the textbook, *Mathematics with Business Applications* by Glencoe, internet sites for home buyers that have payment calculations, and the TVM Solver on the TI-83 calculator.)
- Arrange trips for student to view the exteriors of homes they select.

Procedure

- Copy, cut and distribute a Payment Formulas sheet to each student.
- Tell groups to set aside \$2,500 of their savings for closing costs, and determine what they have left as a down payment on their potential house. Using this amount, tell them to figure what percentage of each house in their portfolio that they can pay for upfront and what amount will be financed through a mortgage loan.
- Ask the groups to figure the amount of monthly payment required for each of their 10 homes using a formula and a chart, an internet site, or a graphing calculator.
- Finally, ask students to gather more information on their 10 homes by calling realtors, checking out web sites if they are available, and going to see the exterior of the houses.

Activity Extension

Arrange with a real estate agent to visit the interior of at least one of the homes students selected.

Support Materials/Resources

- *Mathematics with Business Applications* by Glencoe
- TI-83 Owner's manual
- Internet sites for home buyers
- Real estate agent
- Payment Formulas handout

Payment Formulas

1. Down payment = selling price * % of down payment
2. Percent of down payment = amount set aside for down payment / selling price
3. Mortgage loan amount = selling price – down payment amount
4. Monthly payment = mortgage loan amount/1000 * monthly payment for \$1000 loan
(Use with a chart that shows the monthly payment on a \$1000 loan, given the terms of the loan.)

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Payment Formulas

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LESSON 7

Anatomy of a Mortgage Loan

Students begin to focus on the monthly payment involved in a mortgage as they calculate the amount paid to interest, to principal, and the remaining loan balance. They will also learn how to prepare an amortization schedule.

Preparation

- Locate and review formulas for figuring interest, principal, and remaining balance of a home mortgage after each monthly payment.
- Find a method for creating an amortization table, either by TI-83 calculator or computer spreadsheet.
- Copy Sample Mortgage Problem sheet.
- Mortgage banker or broker to discuss loan payments.

Procedure

- Ask students to figure the monthly payment of a home they have chosen, using a chart in their textbook, and the TVM Solver on the TI-83 calculator. Distribute Sample Mortgage Problem sheets as a reference.
- Have students break down the monthly payment into the amount paid to principal and the amount paid to interest for at least the first three payments, using the interest formula ($I = PRT$).

- Ask students to program the TI-83 calculator or computer spreadsheet to make an amortization schedule for a mortgage loan. Have them create a schedule for at least three of the homes in their portfolio.
- Invite a mortgage banker/broker to discuss the mechanics of mortgage loans and answer students' questions.

Support Materials/Resources

- *Mathematics with Business Applications* by Glencoe
- *Time, Value, and Money Workbook*: Applications on the TI-83
- Microsoft Works® spreadsheet
- Sample Mortgage Problem sheet

Sample Mortgage Problem Sheet

Formulas:

1. Payment to Interest = Principal * Rate * Time
2. Payment to Principal = Monthly Payment – Payment to Interest
Remaining Principal = Previous Balance – Payment to Principal

Sample Problem:

\$100,000 mortgage
7.5% interest rate for 30 years
Monthly payment is \$699.21

1st payment:

$$\begin{aligned} I &= 100,000 * .075 * 1/12 \\ &= 625 \\ P &= 699.21 - 625 \\ &= 74.21 \\ B &= 100,000 - 74.21 \\ &= 99,925.79 \end{aligned}$$

3rd payment:

$$\begin{aligned} I &= 99,851.12 * .075 * 1/12 \\ &= 624.07 \\ P &= 699.21 - 624.07 \\ &= 75.14 \\ B &= 99,851.12 - 75.14 \\ &= 99,775.98 \end{aligned}$$

2nd payment:

$$\begin{aligned} I &= 99,925.79 * .075 * 1/12 \\ &= 624.54 \\ P &= 699.21 - 624.54 \\ &= 74.67 \\ B &= 99,925.79 - 74.67 \\ &= 99,851.12 \end{aligned}$$

4th payment:

$$\begin{aligned} I &= 99,775.98 * .075 * 1/12 \\ &= 623.60 \\ P &= 699.21 - 623.60 \\ &= 75.61 \\ B &= 99,775.98 - 75.61 \\ &= 99,700.37 \end{aligned}$$

Amortization table: 1st four payments only

Payment #	Monthly Pymt	Interest	Principal	Balance
1	699.21	625.00	74.21	99,925.79
2	699.21	624.54	74.67	99,851.12
3	699.21	624.07	75.14	99,775.98
4	699.21	623.60	75.61	99,700.37

LESSON 8

Getting Loan Approval

Once a loan application is completed, it is evaluated by a loan officer and sent to an underwriter. This lesson takes students through the decision-making process that determines whether an applicant is approved. A real estate agent can show students what happens after approval.

Preparation

- Meet with a mortgage loan officer and an underwriter to get the details of the approval process for a mortgage loan application.
- Understand how to record liabilities and assets on the application.
- Learn how to figure front and back end ratios and prepare an activity for students that will enable them to practice this skill.

Procedure

- Have student family groups complete the mortgage loan application, started in On Your Way to Homeownership, page 32, by filling out sections 5, 6, and 7.
- Distribute the Front and Back End Ratio Reference Sheet as a practice tool; have students do practice problems relating to front and back end ratios, and calculate the amount of loan an applicant can afford.
- Ask students to look up the interest rate for the day, figure the front and back end ratios, and determine the amounts they would be approved for. Then students can check the houses in their portfolios to see which ones they could purchase with the loan amounts they will receive.

Support Materials/Resources

- *Business Mathematics* by Glencoe
- Internet housing sites
- Front and Back End Ratio Reference Sheet

Front and Back End Ratio Reference Sheet

Formulas:

- (front end ratio)
Monthly payment that can be afforded = 28% of gross monthly income or less
- (back end ratio)
Total debts including house payment should be between 38-42% of gross monthly income or less
- Amount of loan that applicant can be approved for is found by using the chart from the Glencoe text or a loan application calculator or the TVM Solver on the TI-83.
- Monthly payment/# in chart * 1000 = loan amount

Sample Problem:

Mr. & Mrs. John Smith

Combined gross monthly income: \$4,000

Debts: car loans \$525 per month, credit cards minimum payment \$80 per month, student loan \$100 per month

Terms for loan: 7.5% for 30 years

Step 1: 28% of 4000 = 1120
House payment cannot exceed \$1120

Step 2: Other debts total: 525 + 80 + 100 = 705
Total: 1120 + 705 = 1825
 1825/4000 = 45.6%
This is too high so the potential house payment must be lowered.

$$(X + 705) / 4000 = .42$$

$$x = .42 * 4000 - 705$$

$$x = 975$$

The house payment for this applicant can be no higher than \$975.

Step 3: loan amount = 975 / 7.0 * 1000 (7.0 comes from the chart)
 = 139,285

The Smiths will be approved for \$139,285 loan as long as their credit score is within an acceptable range.

LESSON 9

Closing Day

Students use math and decision-making skills as they learn about and calculate closing costs, the established fees involved in the purchase of a house in addition to the down payment and monthly payments.

Preparation

- Compile a list of the definitions associated with mortgage loans and closing costs. Practice the problems calculating closing costs.
- Contact a professional from a mortgage or title company who can help introduce the lesson and serve as a resource.

Procedure

- Discuss various closing costs a buyer will encounter and invite a mortgage professional or closing lawyer to explain what the items are and why the buyer pays for them.
- Have students figure the closing costs for varying mortgage loan amounts and mortgage companies. Distribute the Closing Costs Calculation Problems Worksheet and encourage students or student groups to create additional problems for the class.
- Invite mortgage professionals to class to help you conduct a simulation of a closing showing how money is distributed and what kinds of payments are required. For example, a buyer must have enough money in a checking account to cover closing costs, pre-payment on insurance, taxes, a down payment, and any other up-front costs. Also, the buyer must show that he or she has two months of living expenses in a savings account.

Activity Extensions – Simulations

These simulations can help students understand the legal processes involved in home buying by studying contracts and contract negotiations from building through closing.

This activity is time-intensive, but can provide a valuable hands-on experience in areas that students will encounter as consumers. It is not necessary to conduct all the simulations to present a worthwhile lesson.

You will need the following experts:

- An attorney who often represents builders
- An attorney who often represents home buyers
- A guest to act as a potential home buyer
- A closing agent
- A qualified home inspector

And, the following documents:

- A sample builder contract
- A sample set of plans and builder specifications
- A change order
- Photos of home building quality issues
- An outline of appropriate building industry standards
- A set of documents necessary for closing
- A home warranty

Simulation 1: Contract Negotiations Process (Two 90-minute periods)

- Students read through the contract, view the plans, and correlate the list of builder specifications to the plan.
- Divide students into two groups. One group will concentrate on the concerns of the potential home buyer. The other group will focus on the concerns of the builder.
- Instruct the first group to prepare a list of contract questions, concerns, and possible additions or revisions.
- Two attorneys (one to represent the home buyer and one to represent the builder) will meet with the class. They will begin by addressing the list prepared by the students representing the purchasers. Students representing the builder will counter the list.

- The attorneys will simulate a contract negotiation using the concerns of the students as a starting point. (This interaction can be videotaped for use in subsequent settings.)
- Changes negotiated through the above process are inserted in the contract.

Simulation 2: Contract Implementation Process (Three 90-minute periods)

- A guest (in the role of purchaser) presents quality issues in the construction of the home.
- If possible, conduct a mock “walkthrough” of a home currently under construction.
- Have students take and submit photos to represent the quality issues.
- Ask students to locate the relevant clauses in the contract and specifications sheet which address the quality issues.
- Depending on the severity of quality issues, the services of a qualified home inspector and/or structural engineer may be requested.
- Ask students to locate the relevant sections of the local standards.
- Students representing the purchaser and the builder negotiate the construction repairs/ changes needed to address the quality issues.

Simulation 3: Closing Process (One 90-minute period)

- A closing agent instructs the class on the objectives of the closing process.
- Distribute documents necessary for closing to the students.
- Have students calculate the financial transactions necessary for the final payment to the builder.

Simulation 4: Warranty Implementation Process (One 90-minute period)

- Introduce homeowner-identified concerns as they might be at the one-year and five-year marks.
- Ask students to research the applicable warranty provisions that will affect the homeowner’s right to repairs or reimbursement.

Support Materials/Resources

- *Business Mathematics* by Glencoe
- <http://www.ameriquestmortgage.com> (consumer’s dictionary)
- Local mortgage professional
- Legal professionals (for simulations)
- Closing Cost Calculation Problems Worksheet

Closing Cost Calculation Problems Worksheet

A sample of common closing costs for Premium Mortgage Inc.

Credit report:	\$40.00
Loan Origination Fee:	2% of mortgage loan
Title Search:	\$315
Processing Fee:	1.10% of mortgage loan
Appraisal Fee:	\$250

Problem #1

Use the typical closing costs above to figure the closing costs on a \$100,000 mortgage loan for Mr. & Mrs. Kyle Smyth.

Problem # 2

The Franklins are purchasing a \$150,000 home. They have agreed to make an 8% down payment and finance the remaining balance through Premium Mortgage Inc. They will also owe 1 month of pre-paid insurance and taxes totaling \$189. How much will the total check be to cover all these costs?

Create your own problem to share with the class:

LESSON 10

Build It. Buy It. Insure It.

This lesson introduces students to the types of insurance that builders must carry while constructing a home and the types of coverage a homebuyer/homeowner should have.

Preparation

- Obtain videos on home and builder insurance to introduce the subject.
- Acquire a list of insurance terms from a local agent or internet source.
- Contact insurance professionals who can explain different types of home insurance and the claims process.
- Locate web sites students can use to compare rates among various insurance agencies and companies on the cost of general liability, worker's compensation, builder's risk and homeowner's insurance.
- Arrange a trip to an insurance agency where students can observe the process and complete a sample application for commercial lines of insurance and/or homeowner's insurance.

Procedure

Lead a discussion about the kinds of insurance that might be involved in building and buying a home.

Insurance for Home Developers/Builders/Contractors

- Start by asking students to think about what a builder would want to insure or protect against (the site, unforeseen circumstances that delay or stop a project such as weather, accident/injury claims by workers, visitors and non-employees).
- Distribute materials that describe the different types of insurance a builder would have (general liability, workers' compensation, etc.). Work with students to build a vocabulary of commercial (business) insurance terms and ask students to lead informal class quizzes on the definitions.
- Invite a builder and an insurance professional to talk to the class about the issues and challenges involved in risk management in home building.
- Ask students or teams to focus on a particular type of insurance a builder would have (liability, workers' compensation, etc.), and prepare a report that is based on interviews with builders and insurers. Interviews can be written, audio taped or videotaped, and used as a part of a "news-style" report. The finished product should define the type of insurance and clearly explain why it is needed. Ask interviewees to give a brief real-world example of how the insurance helped a builder protect against loss.
- Have students work in groups to "shop" for rates on various types of insurance on-line, then compile comparison charts.

Insurance for Home Buyers/Homeowners

- Start a discussion by asking students if they know what kinds of coverage their parents/family might have to protect their home and list them on a board or flipchart. (Answers might include fire, theft, property and casualty, liability/accident.)
- Distribute materials that describe the different types of homeowners insurance. Work with students to build a vocabulary of terms.
- Invite an insurance professional to conduct a simulation of a homeowner's needs assessment with a selected student "family" to illustrate the process, the types of insurance required/recommended and the rationale behind risk management.

Insurance Careers Related to Home Building

- Ask students to name careers in insurance. Most will probably say agent, but may not think of others involved in the process. Brainstorm to come up with other key jobs such as underwriter, claims adjuster, actuary. Bring in materials that will explain these jobs and show how they fit in the context of an insurance career. (You can obtain information from web sites, local colleges, your own media center or local insurance agencies. This information gathering can also be a research assignment for student teams.)
- Arrange a visit to an insurance office or company that includes a tour to provide students with an overview of the process and an introduction to the different jobs.
- Assign teams of students to research a particular insurance career they have learned about. Using web sites and other resources, teams will compile a report, give an oral presentation, or create a PowerPoint® presentation that will explain the job to other students. Ask them to include the following: Description of the job and how it fits in the insurance process, training/education required, salary potential, description of a typical day.

Support Materials/Resources

- Videos/printed materials explaining commercial and personal lines of insurance related to home building
- Professionals to talk about builder's insurance, homeowner's insurance, and claims
- Internet insurance rate comparisons and career information
- Sample insurance applications and contracts for builder's and homeowner's insurance
- http://www.iii.org/individuals/home/how_to_insure_home.html
- <http://www.iii.org/individuals/home/inventory.html>
- <http://www.usik.murrystate.edu/~tohilpot/http/Insurac.htm>
- <http://www.insure.com/business/smallbizbasics.html>

Content Standards

Mathematics

Students will:

- Solve real world problems involving length, height, perimeter, area, capacity/volume, time, temperature, and angle. (Formulas & Equations)
- Using a rectangular coordinate system (graph), apply and algebraically verify properties of 2- and 3-dimensional figures, including distance, midpoint, slope, parallelism and perpendicularity. (Ratio & Proportion)
- Select and use direct (measured) and indirect (not-measured) methods of measurement as appropriate. (Ratio & Proportion)
- Select and use appropriate instruments, technology and techniques to measure quantities in order to achieve specific degrees of accuracy in a problem situation. (Ratio & Proportion)
- Present and apply geometric properties and relationships to solve real world and mathematical problems including ratio, proportion and properties of right triangle trigonometry. (Ratio & Proportion)
- Describe, analyze, and generalize relationships, patterns and functions using words, symbols, variables, tables, and graphs. (Expressions)
- Calculate measures of central tendency (mean, median, mode) and dispersion (range, standard deviation and variance) for complex sets of data and determine the most meaningful measure to describe the data. (Statistics and Central Tendency)
- Collect, organize and display data in a variety of forms including tables, line graphs, charts, and bar graphs to determine how different ways of presenting data can lead to different interpretations. (Statistics and Central Tendency)
- Understand the different ways numbers are represented and used in the real world.

- Understand the effects of operations on numbers and the relationships among these operations; select appropriate operations; and compute for problem solving.
- Estimate measurements in real-world situations.
- Acquire a solid foundation, which includes knowledge of addition, subtraction, multiplication and division; other number sense, including numeration and estimation; and the application of these operations and concepts in the workplace and other situations.

Business Technology

Students will:

- Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace in order to accomplish job objectives and enhance workplace performance.
- Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

Process/SCANS/NCDS

- Acquire information from a variety of sources to make decisions.
- Use basic skills of reading, writing, speaking and mathematics to solve problems.
- Demonstrate the ability to think in order to learn, reason, make decisions, and solve problems.
- Use resources of time, money and materials.
- Work in teams, teach others, lead, negotiate, and work well with diversity.
- Demonstrate responsibility and be self-managed.
- Demonstrate interpersonal skills of teamwork, teaching others, serving customers, leading, and negotiating.
- Acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.

Home Building Industry Careers

The Department of Labor has identified more than 100 occupations and careers associated with the residential construction industry, in eight major categories.

Here are just a few that might be of particular interest to students who enjoy math working with numbers and precise measurements:

EXECUTIVE, ADMINISTRATIVE & MANAGERIAL

- Purchasing Manager
- Accountants & Auditors
- Cost Estimators
- Wholesale & Retail Buyers
- Special Agents, Insurance Assessors
- Purchasing Agents

PRECISION, PRODUCTION, CRAFT & REPAIR

- Carpenter
- Tile, Floor Layer
- Painter & Paper Hanger

PROFESSIONAL SPECIALTY

- Civil, Electrical & Electronic, Industrial & Mechanical Engineers
- Systems Analysts

ADMINISTRATIVE SUPPORT

- Adjusters, Investigators & Collectors
- Bookkeeping, Accounting, Auditing Clerks
- Credit Authorizers, Credit Checkers; Loan & Credit Clerks

TECHNICIANS & RELATED SUPPORT

- Engineering Technicians
- Drafters

ADDITIONAL, HOUSING-RELATED FINANCIAL AREAS

- Bank Loan Officers
- Mortgage Bankers/Brokers

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