



Know the Score: Credit Score Modeling and Impacts

LESSON DESCRIPTION (Background for the Instructor)

In this lesson, students will learn what credit scores are and how predictive modeling techniques determine credit scores. Included in this discussion will be the five key factors that are used in the algorithms (i.e., rules followed by computers to make a calculation) that determine credit scores and math calculations that show how varying credit scores affect the interest rate, and total interest paid, for borrowed money.

The lesson includes five activities that instructors can select from. In these activities, students will:

- ♦ View and debrief the YouTube video *Understanding How a FICO Credit Score is Determined*
- ♦ Use the *Class Grading Activity* with an Excel® template containing weights for a class grade to simulate how credit scores weight key factors related to creditworthiness
- Conduct a Web Quest by searching online for "how to increase your credit score"
- ♦ Complete an activity to calculate the cost of credit (interest) for borrowers with different credit scores
- ◆ Take an online or print *Credit Score Quiz* to assess credit score knowledge (as a pre- and/or post-test)

The lesson also contains 10 assessment questions (5 multiple choice and 5 True-False), learning extensions (i.e., suggested learning activities beyond the scope of the lesson plan), and references and resources.

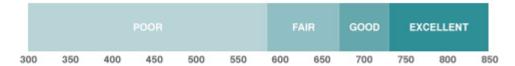
INTRODUCTION (Background for the Instructor)

Credit reports are like a "report card" in school. Credit scores are similar to a grade point average (GPA). They are a three-digit number, ranging from 300 (lowest) to 850 (highest), used to measure the risk that borrowers will become delinquent or default on debt obligations. Credit scores are based upon information contained within credit reports. Thus, consumers will likely have different credit scores from each of the three major credit bureaus (Equifax, Experian, and TransUnion), just like they have different credit reports. This is because information upon which credit reports and scores are based may vary among credit bureaus. Some creditors may elect to provide information to only one or two credit bureaus instead of all three.

Credit scores are not required by law to be provided to consumers annually free of charge, upon request, the way that free credit reports are. However, an increasing number of creditors are now providing credit scores free of charge anyway, as a way to attract and retain customers. Otherwise, consumers generally must pay a fee to get their credit score. There are also some Web sites that provide free credit reports (e.g., Credit Karma, Credit Sesame, Quizzle). These sites provide a rough estimate of credit status but are not the FICO score that most lenders see. Average FICO credit scores fall between 670 and 680 (median of 710).

Credit scores are determined by statistical "risk models" based on algorithms (i.e., rules followed by computers to make a calculation) and are often referred to as FICO scores. FICO is an abbreviation for Fair, Isaac, and Company, a company that develops the credit scoring models used by a large majority of U.S. banks and mortgage lenders. Negative events, such as late payments or charged-off debts, will cause credit scores to drop. Conversely, a sustained record of on-time debt payment will raise a credit score.

The higher the credit score number, the better, because it helps borrowers qualify for credit and obtain the most favorable terms. Conversely, "subprime" borrowers with low credit scores pay higher interest rates to borrow money, if they are approved at all. The exact threshold for the best credit terms varies among lenders but is generally somewhere in the low- to mid-700s (e.g., 720 to 760). A high credit score can save thousands of dollars in interest payments, particularly on long-term loans such as a home equity loan or mortgage. An approximate breakdown of credit score categories is as follows:



Below are the five most important factors affecting FICO scores and their weighs as a percentage of the total score. Note that almost two-thirds of a credit score comes from the first two factors alone.

- Previous Payment History (35%) This is most important factor in determining credit scores. On-time payments enhance a person's score while late payments subtract points. The more credit accounts that have late payments (e.g., three creditors versus one), the later the payments (e.g., 90 days late versus 30 days), and the more recent the negative information in a credit report (e.g., a year ago versus five years ago), the more negative the impact on a consumer's credit score.
- Amounts Owed Relative to Credit Limits (30%) -Often referred to as a "credit utilization ratio," this is the percentage of a consumer's credit line that is borrowed against. For example, \$3,000 of debt on a credit card with a \$10,000 maximum limit results in a credit utilization ratio of 30%. To raise a credit score, the lower the credit utilization ratio percentage (e.g. 20% versus 50%), the better. Many credit experts recommend keeping it below 20% and 10% is better still. To boost a credit score and/or keep it high, keep credit card balances low. If the ratio occasionally rises above 20%, pay off debt as quickly as possible.
- Length of Credit History (15%) Credit scoring models give more weight to people who have successfully used credit for long periods of time.
- Types of Credit Used (10%) -Credit scores increase when consumers have a mix of different types of credit (e.g., mortgage, home equity loan, car loan, and credit cards) instead of just one.
- New Credit (10%) -Credit scoring models take points away from people who have applied for a number of new credit lines within a short time period (e.g., six months to a year). However, promotional" inquiries made by creditors in advance of a pre-approved offer, and multiple inquiries made within a two-week time period when "shopping around" for a lender, are ignored and do not impact credit scores negatively.

Credit scores are not just for credit cards and loans. In all but a few states (CA, HI, MA, where the practice has been banned), insurance companies can use a specially formulated credit score to issue policies (or not) and set premium rates. They claim that policyholders' bill-paying history can predict their future risk of filing an insurance claim.

If students think that their report card days will be over once they graduate, they need to think again. A credit score is a "snapshot" of a person's credit history at a particular point in time and consumers are constantly being "graded." Paying bills on time and not becoming overextended are the two best ways to raise a credit score and earn an "A."

OBJECTIVES

Students will be able to:

- Describe what a credit score is and how it is used by potential lenders and others (e.g., auto insurance).
- Identify the five key components of a credit score and ways to improve a credit score.
- Understand how a weighted average is used to calculate a credit score.
- Calculate and compare the cost of credit for borrowers with different levels of credit scores.

NEW JERSEY PERSONAL FINANCIAL LITERACY STANDARD

◆ Standard 9.1.12.C6: Explain how predictive modeling determines credit scores. See http://www.state.nj.us/education/cccs/2014/career/91.pdf for information about Standard 9.1

TIME REQUIRED

45 to 180 minutes (depending upon student progress and content depth and number of activities used)

MATERIALS

- ◆ YouTube Video: *Understanding How a FICO Credit Score is Determined*: https://www.youtube.com/watch?v=Hf4BgvN5f E
- ♦ Class Grading Activity (weighted average score) handout
- ♦ Web Quest handout
- ♦ Loan Calculation Activity handout
- ♦ Credit Score Quiz: http://www.creditscorequiz.org/
- ◆ Credit Score Quiz (ASSESSMENT)

Teachers are encouraged to use as many of the student learning activities as time permits to provide a fuller understanding of credit scores. The activities can also be used for extra credit assignments, homework, or after-school activities.

PROCEDURE

1. As an introductory activity to provide an analogy with which to explain about credit scores, ask students to explain how their grade point average (GPA) is calculated. Then ask them how their GPA relates to information contained within a report card.

Answers will vary but the key point is that students realize that a grade point average is based upon the same information that is contained in a report card. In other words, if students do well in a class by completing assignments and passing exams, both their report card and GPA will be positively impacted.

Then ask students to explain what a credit score is. Provide a hint by indicating that credit reports have been compared to a report card and credit scores to a GPA. Like the relationship between a report card and GPA, both are impacted-positively or negatively- by how someone uses credit.

Answers will vary, but the two key points for students to realize is that that credit scores are derived from information contained in credit reports and that they used to predict a borrower's future creditworthiness.

2. **Activity 1:** Show the video *Understanding How a FICO Credit Score is Determined* and ask students to explain key take-aways: https://www.youtube.com/watch?v=Hf4BgvN5f E

Answers will vary and may include the fact that FICO credit scores are the most commonly used credit scores, that credit scores are three digit numbers, that statistics about a person's past credit use are used to assess future creditworthiness, the five key factors contained within credit scores, and the fact that good credit scores will save borrowers money because interest rates are generally lower.

- 3. Share the information in the *Introduction* pertaining to the range of FICO credit scores (i.e., 300 to 850), sources of free credit scores, the five key factors that comprise credit scores, how statistical risk models work, and the use of credit scores for auto insurance as well as consumer lending.
- 4. **Activity 2:** Distribute the *Class Grading Activity* (weighted average score) handout and ask students to go to the web site http://rci.rutgers.edu/~boneill/ and download the Excel spreadsheet to calculate the weighted average score for ten different components of the class grade for three students. The correct answers for the class grades are as follows:

Student #1: 82.75 (B) **Student #2**: 92.75 (A) **Student #3**: 72.50 (C)

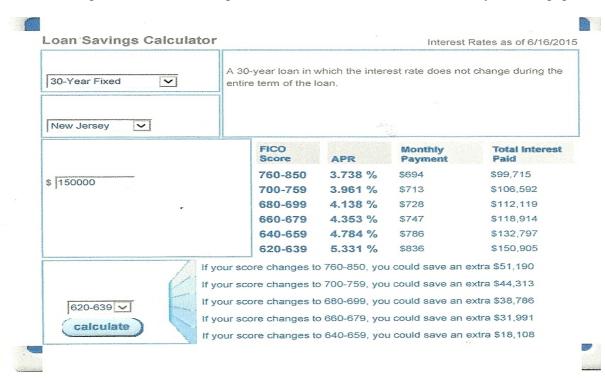
	Student Num8	0.05 Fin Article 100 50	0.1 TWB or TAM 100 100	0.1 Group Proj. 100 100	0.05 Credit Calc 100 50	0.05 cc Comp 100 50	0.05 PowerPay 100 50	0,05 Retint Calc 100 50	0.05 MF Comp 100 50	0.25 MidY Exam 100 75	0.25 Final Exam 100 75	1.00 Average 100 72.5
#	1	82	90	75	85	90	80	85	78	80	85	82.75
#		90	95	85	90	100	90	95	90	90	98	92.75
Ħ		68	60	85	75	62	80	75	75	70	75	72.5

Note that weights for various components of the student's final grade vary from 5% or 10% for different assignments to 25% each for the mid-term and final exams. Thus, students should put their maximum effort toward studying for the two exams because they count the most in their weighted average score. Student #3 was able to able to earn a final passing C grade (72.5), even with failing grades on three assignments, because they had lower weights. Likewise, it is important to pay attention to credit score components with the highest weights: previous payment history (35%) and amounts owed relative to credit limits (30%).

5. **Activity 3:** *Web Quest* Activity: Distribute the handout and ask students to use an online search engine (e.g., Google, Bing) and search for "how to increase your credit score" Give them about 15 minutes to find, read, and summarize articles from reliable sources that are not selling financial products. Call the entire class back together and debrief the activity and what they learned.

The information that students find will vary. Most answers should relate to the five key factors used in the FICO credit scoring model (e.g., paying bills on time, keeping balances low on credit cards, applying for credit only a needed, reducing the amount of debt owed, shopping around for credit within a short period of time, and avoiding serious credit infractions such as charged off accounts, collections, and bankruptcy).

6. **Activity 4:** *Loan Calculation Activity:* Distribute the handout and ask the students to log in to http://www.myfico.com/myfico/creditcentral/loanrates.aspx and complete the activity by entering the following data: a 30-year fixed mortgage (Step 1) in New Jersey (Step 2) with a loan principal amount of \$150,000 (Step 3), and a FICO score range of 620-639 (Step 4). Then press "calculate." Debrief the results shown below, noting how the annual percentage rate (APR) and total cost of loan interest decreases as the credit score range improves. In the example, the cost savings between the lowest and highest credit score ranges is over \$50,000 over the life of a 30-year mortgage.



Students' discussion will vary but the key take-away is the significant impact that credit scores have on the cost of interest paid on loans, particularly long loans like mortgages. If time permits, encourage student to continue testing out the calculator with different types of mortgages, principal amounts, and credit scores.

7. **Activity 5:** *Credit Score Quiz* Activity: Direct students to http://www.creditscorequiz.org/ and have them take the 12-question quiz developed by the Consumer Federation of America. Instructors should take the quiz, themselves, first and review the print version of the quiz with the answer key posted at http://www.creditscorequiz.org/CreditScoreQuiz AnswerKey Eng.pdf. Debrief the quiz and discuss the rationale for the correct answers and reasons why incorrect answers are wrong.

CLOSURE

Ask students if they have any remaining questions about credit scores. Close the lesson by reiterating the fact that credit scoring systems are used to evaluate the creditworthiness of millions of people. Like political polls, they are based on large samples to assure accuracy. Credit scores are a "moving target" and change frequently as new information is added about consumers' credit lines and debt repayment history.

GLOSSARY

Algorithm- Rules followed by computers to make a calculation. In the case of credit scores, algorithms use formulas that convert the information contained within a consumer's credit report into three-digit numerical scores. Companies that provide credit scores typically have proprietary formulas to create their algorithms.

Credit Bureau- Also known as a credit reporting agency, a credit bureau is a company that collects, maintains, and sells information about the credit history of individuals. The information is sold to creditors, consumers, and other entities with a "permissible purpose" (e.g., insurance companies, landlords, employers) in the form of a credit report. The three major credit bureaus are Equifax, Experian, and TransUnion. Credit bureaus, themselves, do not decide whether consumers qualify for credit or not. Rather, they provide information to banks, mortgage lenders, credit card issuers, etc. that make credit decisions.

Credit Report- A detailed report prepared by a credit bureau that is used by creditors to make lending decisions. Included in an individual's credit report are personal information (name, address, employer), detailed credit account information (e.g., bill payment history, credit line, current balance), information from public records (e.g., liens, wage garnishments, bankruptcy), and a list of credit account inquiries. Negative information generally remains in a credit report for seven years (10 years for bankruptcy filings). Under the Fair and Accurate Credit Transactions Act (FACTA), consumers are entitled to request one free credit report annually from each of the "big three" credit bureaus via www.annualcreditreport.com.

Credit Score- A three digit number that is derived from information contained within a credit report. Ranging from 300 to 850 (FICO scores), lenders use credit scores as a measure of a person's creditworthiness and to determine the interest rates charged for a loan or credit card. The higher the credit score number (e.g., 760 versus 550), the better a loan risk an individual is judged to be. Credit scores incorporate a number of key factors that have been shown to be associated with debt repayment. Auto insurance companies may also use credit scores to determine the premiums charged for insurance coverage.

Credit Utilization Ratio- The amount of debt owed by someone compared to the amount of credit that they have available (e.g., credit card limits). It can be calculated for individual credit cards or by dividing total credit card balances for all credit cards by total credit card limits (e.g., $$2,000 \div $10,000 = 20\%$). The credit utilization ratio comprises 30% of FICO credit scores. The lower a credit utilization ratio (e.g., 20% versus 60%), the better a person's score. A ratio less than 20% to 30% is advised by many credit experts.

Excluded Information- Personal information that is not considered in the determination of a credit score. Examples include a potential borrower's age, race, national origin, color, religion, gender, marital status, occupation, and geographic location of residence. "Promotional inquiry" requests for information about borrowers in advance of making pre-approved offers and "account review requests" by creditors to periodically review existing customers' accounts are also not counted in credit scores.

FICO Score- FICO is an acronym for Fair Isaac Corporation, the company that is most frequent source of consumer credit scores. FICO credit scores are used by more than 90% of lenders. Therefore, free non-FICO credit scores are likely not the most accurate assessment of a person's creditworthiness.

Subprime Loans- The term used to describe loans that are made to borrowers with low credit scores and other related characteristics (e.g., delinquent payments, repossession of secured property, bankruptcy, high debt-to-income ratios). Borrowers with low credit scores who receive subprime loans pay higher interest rates to borrow money than prime loan borrowers due to their higher risk of default (credit risk).

LEARNING EXTENSIONS

If time permits, the following activities can be used to extend the depth of this lesson:

- ♦ Invite a representative from a credit counseling agency as a guest speaker to provide "real world" stories about how people can damage their credit scores through poor financial management practices and improve their credit scores by handling money wisely.
- Invite a "reformed over-spender/debtor" (e.g., a previous student in his or her 20s) to discuss how they damaged their credit and later improved their credit score.
- ♦ Show and discuss the whiteboard video (1:38): What is a "Good" Credit Score?: https://www.youtube.com/watch?v=DsKvlEuzYqw
- ♦ Have students review and discuss information about credit scores on the MyFICO web site: http://www.myfico.com/CreditEducation/articles/
- ◆ Have students write an article about credit scores for the school newspaper or a class blog. Suggest the FTC *Credit Scores* web site: http://www.consumer.ftc.gov/articles/0152-credit-scores and the *Credit Score Student Organizer*: http://www.thirteen.org/finance/educators/p-lesson3_org5.html and the *Credit Score Quiz*: http://www.creditscorequiz.org/CreditScoreQuiz_AnswerKey_Eng.pdf as sources for background information.
- Review and teach material from the A Lesson Plan to Understanding Credit Scores lesson plan developed by VantageScore: http://your.vantagescore.com/images/resources/VantageScore_LessonPlan.pdf
- Review and teach material from the *Money Math for Teens: Credit Score* lesson plan developed by the FINRA Investor Education Foundation:
 http://www.saveandinvest.org/web/groups/sai/@sai/documents/sai_original_content/p503144.pdf
- View or participate in #creditchat, a Twitter chat sponsored by the credit bureau Experian (Wednesdays at 3 pm Eastern Time). For a list of upcoming #creditchat topics, see http://www.experian.com/blogs/news/about/creditchat/

ASSESSMENT: Credit Score Quiz

Instructors are encouraged to use the questions below for content review or as a pre-and/or post-test to determine gains in student knowledge about credit scores after teaching this lesson.

Correct answers to the multiple choice and True-False questions are shown in boldface type.

Multiple Choice Questions

- 1. FICO credit scores generally range from
 - a. 100 to 990
 - b. 250 to 800
 - c. 300 to 850
 - d. 450 to 900
- 2. Which of the following companies is the leading provider of credit scores?
 - a. TransUnion
 - b. Fair Isaac
 - c. Equifax
 - d. Experian
- 3. Which factor counts the *most* in the calculation of a person's credit score?
 - a. Types of credit used
 - b. Length of credit history
 - c. Credit utilization ratio
 - d. Previous payment history
- 4. Which factor counts the *least* in the calculation of a person's credit score?
 - a. Types of credit used
 - b. Length of credit history
 - c. Credit utilization ratio
 - d. Previous payment history
- 5. The credit utilization ratio for someone with \$1,000 charged on three credit cards that have a total available credit limit of \$5,000 is
 - a. 10%
 - b. 20%
 - c. 35%
 - d. 50%

True-False Questions

1. An 800 credit score is better than a 650 credit score (TRUE: The higher the credit score number (ranging from 300 to 850), the better a person's creditworthiness is presumed to be. A 650 score is considered "fair" by potential creditors and an 800 score is considered "excellent")

- 2. A 30% credit utilization ratio is better than a 50% ratio. (TRUE: The amount owed on credit accounts relative to the amount of credit available is a key factor in credit score modeling. Low credit utilization ratios have a positive impact on credit scores. Conversely, if someone is close to "maxing out" their credit limit and has a high credit utilization ratio (e.g., \$900 owed with a \$1,000 limit or 90%), this will have a negative impact on their credit score)
- 3. Consumers can have more than one credit score. (TRUE: Consumers generally have different credit scores for several reasons. First, creditors that report their personal information may not report to every "big three" credit bureau. Therefore, their credit reports with each credit bureau may be different and so will the credit scores that are derived from them. Second, the credit scores that are created by Fair Isaac Corporation (FICO score) and other providers such as Credit Karma and Quizzle use different proprietary algorithms, which will result in different credit scores)
- 4. A bankruptcy is generally listed in a credit report and, thus, affects a person's credit score for five years. (FALSE: Bankruptcies are generally listed in a person's credit report for ten years)
- 5. Credit scores can be used to determine the premium that you pay for health insurance. (FALSE: Credit checks are not a part of the health insurance application process. Thus, credit scores do not affect individual health insurance premiums. Credit scores can, however, be used to set premiums for property (auto and homeowners) insurance, except in states that ban this practice)

REFERENCES AND RESOURCES

A Lesson Plan to Understanding Credit Scores (Vantage Score): http://your.vantagescore.com/images/resources/VantageScore_LessonPlan.pdf

Credit Reports and Scores (Consumer Financial Protection Bureau): http://www.consumerfinance.gov/askcfpb/search/?selected_facets=category_exact:credit-reporting

Credit Score Student Calculator (Educational Broadcasting Corporation): http://www.thirteen.org/finance/educators/p-lesson3 org5.html

Credit Scores (Consumer Financial Protection Bureau):

http://www.consumerfinance.gov/blog/category/credit-scores/

Credit Scores (Federal Trade Commission): http://www.consumer.ftc.gov/articles/0152-credit-scores

Credit Scores (Practical Money Skills for Life):

 $\underline{http://www.practicalmoneyskills.com/personalfinance/creditdebt/history/scores.php}$

Loan Savings Calculator (MyFICO): http://www.myfico.com/myfico/creditcentral/loanrates.aspx

Money Math for Teens: Credit Score (FINRA Investor Education Foundation):

http://www.saveandinvest.org/web/groups/sai/@sai/documents/sai_original_content/p503144.pdf

The Credit Score Quiz (Consumer Federation of America): http://www.creditscorequiz.org/

The Credit Score Quiz PDF File with Answer Key (Consumer Federation of America): http://www.creditscorequiz.org/CreditScoreQuiz_AnswerKey_Eng.pdf

Wise Credit Management Quiz (Rutgers University): http://njaes.rutgers.edu/money/wise-credit/

Class Grading Activity

Credit scores use computer models to predict a borrower's future creditworthiness. The predictive models that are used are very similar to gradebooks that teachers set up in Microsoft Excel® to assign grades to their students.

Just like different class activities (e.g., homework, assignments, exams) have different weights toward a student's grade, so do the different factors that comprise a credit score (e.g., bill payment history and length of credit history).

Follow the steps below to calculate a weighted average grade for three students so you can better understand how credit scores are developed.

Step 1: Go to http://rci.rutgers.edu/~boneill/ and click on "Class Gradebook."					
Step 2: Click on "Save" and download and then open the file.					
Step 3: Enter the following data in the rows for three students by spreadsheet column letter:					
◆ Student #1: B: 82; C: 90; D: 75; E: 85; F: 90; G: 80; H: 85; I: 78; J: 80, and K: 85					
◆ Student #2: B: 90; C: 95; D: 85; E: 90; F: 100; G: 90; H: 95; I: 90; J: 90; and K: 98					
◆ Student #3: B: 68; C: 60; D: 85; E: 75; F: 62; G: 80; H: 75; I: 75; J: 70; and K: 75					
Step 4: Record the weighted average scores for the three students below: • Student #1: • Student #2: • Student #3:					
Step 5: Write a one-sentence summary describing what you learned from this activity:					

Web Quest: How to Increase Your Credit Score

Credit scores are affected by five key factors and these factors are affected by the way that people manage money and handle credit. In this activity, you will conduct an online search to identify specific actions that people can take to raise their credit their credit scores, thereby qualifying for the lowest interest rates.

Instructions:

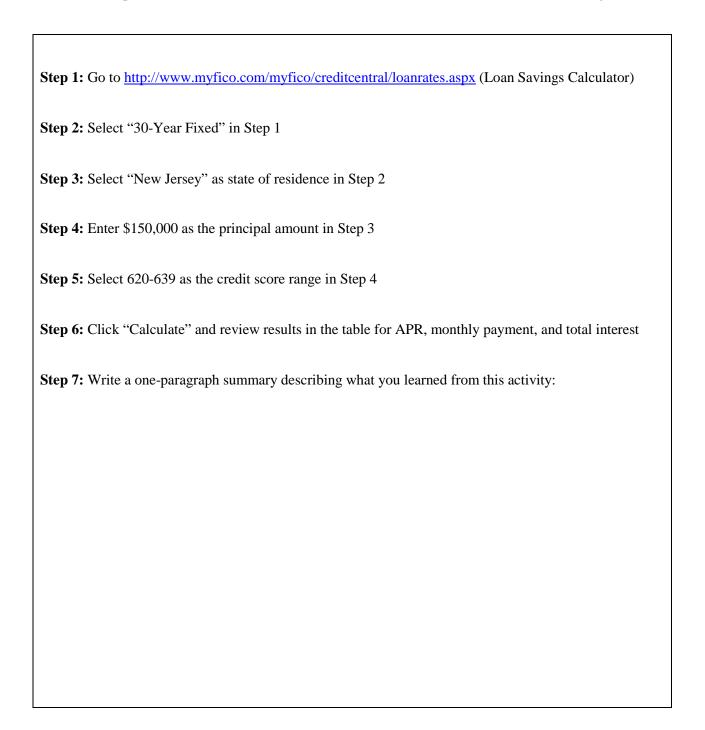
- 1. Go to an online search engine (e.g., Google, Bing) and search for "how to increase your credit score."
- 2. Read three articles (not paid advertisements) that describe actions that people can take to increase their credit score.
- 3. When you are done reading, complete the table below by listing three key pieces of information that you found.
- 4. Be prepared to discuss the information that you found with the entire class.

Information Source	Advice About Increasing Your Credit Score

Loan Calculation Activity

Credit scores play an important role in determining whether or not consumers are approved for a loan. If borrowers are approved, credit scores affect the interest rate that they will pay. Generally speaking, the higher a borrower's credit score, the lower the interest rate that is charged. Over the course of a loan, a high credit score can save borrowers thousands of dollars in interest that people with a low credit score have to pay.

Follow the steps below to calculate the cost of a loan for borrowers in different credit score ranges.



Credit Score Quiz

Multiple Choice Questions:

Circle the correct answer from among the four answers provided.

1.	FICO scores generally range from					
	a. 100 to 990	b. 250 to 800				
	c. 300 to 850	d. 450 to 900				
2.	Which of the following companies is the leading provider of credit scores?					
	a. TransUnion	b. Fair Isaac				
	c. Equifax	d. Experian				
3.	Which factor counts the <i>most</i> in the calculation of a person's credit score?					
	a. Types of credit used	b. Length of credit history				
	c. Credit utilization ratio	d. Previous payment history				
4.	Which factor counts the <i>least</i> in the calculation of a person's credit score?					
	a. Types of credit used	b. Length of credit history				
	c. Credit utilization ratio	d. Previous payment history				
5.	The credit utilization ratio for so available credit limit of \$5,000	omeone with \$1,000 charged on three credit cards that have a total is				
	a. 10%	b. 20%				
	c. 35%	d. 50%				
	rue-False Questions: ark "T" for True or "F' for Fal1. An 800 credit score is bette	se in the space before each question.				
	2. A 30% credit utilization ra					
	3. Consumers can have more	than one credit score.				
	4. A bankruptcy is generally years.	listed in a credit report and, thus, affects a person's credit score for five				
	5 Credit scores can be used t	o determine the premium that you pay for health insurance				





The *Know the Score: Credit Score Modeling and Impacts* lesson plan was written by Dr. Barbara O'Neill, CFP®, Extension Specialist in Financial Resource Management for Rutgers Cooperative Extension (oneill@aesop.rutgers.edu).

Publication Date: June 2015

This publication was supported with funding provided via August 2011 legislation, (N.J.S.A. 17:9-43.2.D) that authorizes New Jersey credit unions to serve as public depositories for the purpose of promoting personal financial literacy education.