

## Unit Plan

**Title:** Dream Home

**Description:** Quaint cottage or stately mansion? Suburban ranch house or urban loft? When teenagers almost old enough to move out on their own imagine their dream houses, anything seems possible.

But will they be able to afford the home of their dreams? In this consumer math project, students learn how to calculate the real cost of real estate, and use Seeing Reason to consider the myriad factors that influence home buying decisions.

### At a Glance

**Grade Level:** 9-12

**Subject sort (for Web site index):** Math

**Subject(s):** Math

**Topics:** Consumer math

**Higher-Order Thinking Skills:** Analysis, Decision Making, Argumentation

**Key Learnings:** Personal finance, problem solving, data collection and analysis

**Time Needed:** 15 – 1 hour class periods

### Unit Summary

In this consumer math unit, students test their real estate and financial aptitude as they calculate the real costs of owning a home.

To get started, they consider the factors that influence home desirability and price using the *Seeing Reason Tool*. They calculate home affordability, monthly mortgage payments, and loan amortization using online calculators and spreadsheet software and analyze the data collected to determine their best financing options.

Once their calculations are complete including the total payoff of the home, students present the results to their classmates in the form of a short persuasive oral presentation. They develop multimedia slide shows to illustrate their main points and support their purchase choice.

### Curriculum-Framing Questions

#### Essential Questions

How are our lives affected by the choices we make?

#### Unit Questions

How do I select the right home for me?

How can I maximize my purchasing power?

#### Content Questions

What is amortization?

What criteria does a lending institution use to determine loan qualification?

## Assessment Processes

View how a variety of student-centered [assessments](#) are used in the Dream Home Unit Plan. These assessments help students and teachers set goals; monitor student progress; provide feedback; assess thinking, processes, performances, products; and reflect on learning throughout the learning cycle.

## Instructional Procedures

### Prior to Instruction

This unit of study makes use of the *Seeing Reason Tool*. Examine this [brief guide](#) as you plan instruction and introduce mapping to your students.

Discuss the project with a local real estate agency. Ask a realtor and in-house loan officer to come to class to discuss home real estate and financing. Make plans for your guests to visit the second day of the project.

### Set the Stage

Introduce the project by presenting this scenario:

*Imagine you have just inherited \$250,000 USD from your great aunt. However, her will stipulates that you must spend the entire amount on the purchase or down payment of a house, and that you must prove to her executors that you have chosen a home that lets you live within your means.*

Discuss student's reactions to such "news," and ask questions to spur conversation and debate, such as: "Is \$250,000 a little or a lot of money?"

Introduce the Essential and Unit Questions: *How are our lives affected by the choices we make?* and *How do I select the right home for me?*

Go over the [inheritance scenario handout](#) and discuss the details of the upcoming assignment. In brief, students will examine the factors that influence home purchasing as they choose a home that will suit their persona's budget and lifestyle.

### Take on a persona

Distribute a [persona card](#) to each student.

You may want to make strategic assignments or distribute the personas through a random drawing. Each persona has a "twin," a duplicate in every way except for region and income. Give students a few minutes to voice their excitement or disappointment over their persona. To tap prior knowledge, instruct students to describe, in the form of a quick write, the dream home they believe their persona will be able to purchase based on the information on their assigned card.

Next, have each student write a quick list of factors they think would be important in a dream home from their persona's point of view. Afterward, have students partner with their twin persona to compare and debate lists.

### Learn from an Expert

Tell students a real estate agent and loan officer will be visiting to discuss home real estate and financing. Together brainstorm a set of questions you would like the guests to address.

Sample real estate agent questions might include:

- *What do I need to know before buying a home?*
- *What factors influence home price?*
- *How do I know if I am getting a good deal?*

Sample loan officer questions might include:

- *How do I go about getting a loan?*
- *How can I find out the maximum loan amount I qualify for?*
- *How do I know if I am getting the best rate?*

Have students take notes during the discussion with experts.

### **Use *Seeing Reason* to Study Factors That Influence Home Price**

After the presentation by the local real estate agent or loan officer, make a *Seeing Reason* map with your class that represents students' understanding of the factors related to home price. Use a presentation computer and project the *Seeing Reason* map view for all to see. Have students respond to the question: *What factors influence home price?* See the [brief guide](#) for instructions on how to set up and introduce the project to your class.

Have students refer to their notes taken during their discussion with the guest real estate agent or loan officer as they contribute factors such as those shown in the following map.

### **Examine the *Seeing Reason* Activity**

The *Seeing Reason* tool space below represents a sample class map. The map you see is functional. You can roll over the arrows to read relationships between factors, and double-click on factors and arrows to read the descriptions.

**Project Name:** Dream Home – Price

**Question:** *What factors influence home price?*

### **Map from the Perspective of One House Hunter**

After working on the class map, have students pair with their "twin," persona. Instruct teams to recreate the class map, and then adjust it to show how the factors from the class-created map relate to them. As they build maps, have pairs determine which factors are important from the point of view of their persona, and which have no effect or decrease desirability. Encourage them to use the description feature of the tool to explain their thinking, and create new factors they believe would be important to their persona which might not appear on the class map.

### **Keep Priorities in Mind**

Mapping helps students identify desirable and undesirable features for their persona to keep in mind as they look for houses on the Web. For example, a single adult may see a home with two bedrooms as desirable, where most home-seekers would see this as a limitation. In this case, a small number of bedrooms is a factor that may help keep the cost of their dream home down. See a map for a single, 30-something software engineer below.

### **Examine the *Seeing Reason* Activity**

The *Seeing Reason* tool space below represents one team's investigation in this project. The map you see is functional. You can roll over the arrows to read relationships between factors, and double-click on factors and arrows to read the team's descriptions.

**Project Name:** Dream Home - Desirability

**Question:** How do I select the right home for me? [Consider how the factors that affect home price relate to your persona.](#)

### **Affordability and Loan Terms**

After students have established a tentative list of home features that suit their persona through mapping, set each student to work calculating the real costs of real estate. Pose the Content Questions: *What is amortization?* and *What criteria does a lending institution use to determine loan qualification?*

Start by having students determine affordability. Instruct students to use [mortgage calculators](#)\* to find the maximum loan they qualify for based on their persona profile and standard lender guidelines.

Next, have them calculate the maximum they can pay in principal and interest, property taxes, and homeowners insurance (PITI) a month. This may not exceed 34 percent of their gross monthly income. Parts of PITI, such as property tax, are based on regional factors. Students need to research their persona's location to establish these rates. Remind them to factor in a down payment amount of \$250,000.

Have students enter data into an [affordability spreadsheet and pie chart](#), and then partner with "twin" to compare calculations. Have pairs compare their work and reconcile any inconsistencies by refiguring their calculations. Note: To check student home affordability calculations, see yellow shaded areas (for teacher only) on this [persona spreadsheet](#).

Follow with a class discussion where students share their persona's occupation, salary, minimum debt, and how debt affects their buying power. This will demonstrate that debt-to-income ratio can be even more important than income in determining how much home one can afford.

Next, using the maximum loan amount they qualify for, have students compare loan terms using a [payment/amortization mortgage calculator](#)\*. Ask them to determine the ratio of principal to interest in payments over loan terms of 10, 15, and 30 years, using interest rates from three different lenders and record this information in a spreadsheet. This activity will demonstrate that loan term affects the total payout much more than interest rate, and that monthly payments decrease considerably as loan term increases.

Important Note: At this point, some students will not qualify for a loan based on standard lender guidelines. Explain that an obscure lending institution has agreed to grant them a loan of up to \$50,000, but it will cost them three percentage points more than the current loan rates available from traditional lenders. They should use the loan amount of \$50,000 and add three more percentage points to the current loan rates for this activity. For example: If the current rate is 5.75 percent, they will need to calculate using 8.75 percent instead.

Follow up with a class discussion. Have students share what they learned about financing.

### **House Hunting**

After students have determined dream home features through mapping, calculated how much of a home loan they can qualify for, and evaluated their loan options, they are equipped with all the information they need to make home purchasing decisions.

Have students start house hunting. Because they "live" in different regions of the country, Web research is their best option. Suggest that students select homes that come as close as possible to meeting their dream home desires while remaining within budget. Have students settle on 5-10 homes, and enter basic data into a spreadsheet. From the spreadsheet they will be able to compare the benefits and drawbacks of the various homes under consideration. This [home comparison spreadsheet](#) shows the information one student used to analyze properties that fit his criteria.

After classifying and analyzing the list of homes based on their criteria, students select their "dream home," or at least the closest to it that they can afford.

### Determine Dream Home Loan Options

Once students select a "dream home," have them evaluate total costs over different loan periods. Have students:

1. Compare loans of 10, 15, 20, and 30 years. This time, have students use a single current loan rate to make comparisons easier. The [spreadsheet example](#) shows the factors they should consider relating to loans.
2. Write a [real estate research summary](#) that describes the decisions they made about home purchases based on research.

### Persuade the Executor

Students' final task is to deliver a short, persuasive oral presentation. Their goal is to convince their late aunt's executor (the class) that the home they have selected to purchase, if they receive the \$250,000 from her estate, truly is their dream home, and that they have made the right decision by selecting this particular property. Distribute the [inheritance scenario handout](#) and read through the project instructions together.

Have students create [multimedia slides](#) to support their presentations.

Slides should include:

- Description of persona and budget
- List of dream home criteria and copy of student map
- Spreadsheets, graphs, and charts to support key points

### Explaining the Oral Presentation Evaluation Process

Pass out a copy of the [presentation rubric](#) before students begin working on their presentations. Discuss requirements and demonstrate how the project checklist can be used to guide students through the creation and final review process. Make sure that students have a clear understanding of what is expected before beginning this project.

### Drafting and Preparing for the Oral Presentations

After discussing the assessment process for the oral presentations, have students draft or outline their key arguments for their persuasive speeches in a simple storyboard. They should focus on key points and the presentation order. Remind students that they need to practice their oral presentations. The slides are meant to support their speech by reinforcing and illustrating key points.

Once students have completed their storyboards, have them meet with you to discuss their draft and get approval before moving on to creating the actual slides and begin practicing their presentations.

### Delivering the Presentations

Set aside time for students to deliver their oral presentations to the entire class. Have audience members ask questions and assess each presentation on its thoroughness and persuasive quality. (See the [presentation rubric](#) for specific criteria.)

### Wrapping Up

After students complete their final map and save it to their portfolio, hold a class discussion. Encourage student to share what they learned about the importance of decision-making as it applies to their role as consumers.

Afterwards, pass out the short [essay questions](#) and ask students to summarize what they have learned during the unit. Grade the essay test based on quality of content and supporting details. Essay questions include the Essential Question: *How are our lives affected by the choices we make?* and the Unit Question: *How can I maximize my purchasing power?*

### **Prerequisite Skills**

- familiarity with the *Seeing Reason Tool*
- familiarity with multimedia presentation software
- familiarity with spreadsheets

### **Differentiated Instruction**

Describe changes in content, process, products, or learning environment for different learners:

#### **Resource Student**

- Modifications as dictated in the student's IEP
- Written and oral instructions presented in a variety of ways
- Checkpoints and positive reinforcement throughout the unit and assigned projects
- Select class partner (twin persona) that is best suited to work with this student and address his/her needs
- Extra time to complete assignments

#### **Gifted Student**

- Calculate loans based on variable interest rate as well as fixed
- Determine interest rate savings if they paid points, etc.
- Calculate average moving costs and monthly budget related to owning a home
- Calculate average cost to furnish the home they purchased.
- Interview local realtor or loan officer. Find out more about their occupation and write a short paper about what they have learned.
- Compare/contrast local real estate prices, interest rate, property taxes, etc with that of their personas region.
- Collate pertinent class persona data in a spreadsheet and create charts and graphs to show interesting correlations

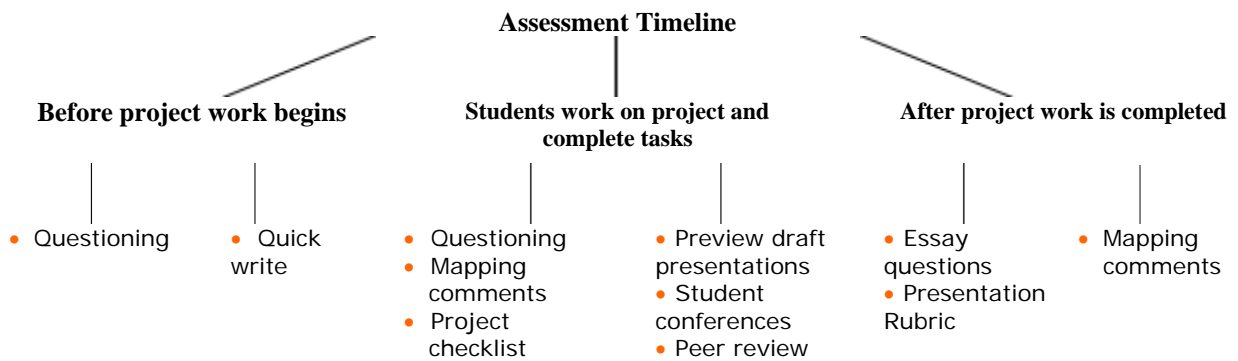
#### **English Language Learner**

- Provide more templates and graphic organizers for students
- Select class partner (twin persona) that is best suited to work with this student and address his/her language needs
- Find a bilingual realtor or loan officer that can provide information and answer questions in the student's native language

## THINGS YOU NEED

The following [sections](#) are listed in the Things You Need highlight box (Assessment, Standards, Resources, PDF) and are linked to leaf pages that contain that section's content.

### Assessment Plan



Students use a [project checklist](#) and [presentation rubric](#) to help guide their learning, stay on track, and self-assess their progress. Quality of causal map comments in *Seeing Reason* projects, and accuracy of spreadsheet calculations, help both teacher and students to monitor progress and understanding of content. Questioning is used throughout the unit to help students develop their higher-order thinking skills and process content. Individual and peer conferences are used to help monitor progress and answer any questions.

### Targeted Content Standards and Benchmarks

#### Michigan Curriculum Frameworks: Mathematics Data Analysis

- Organize data using tables, charts, graphs, spreadsheets and data bases.
- Use the data and their characteristics to draw and support conclusions.
- Formulate and communicate arguments and conclusions based on data and evaluate their arguments and those of others.

#### The National Standards for Business Education Economics & Personal Finance

- Uses a rational decision-making process as it applies to the role of consumers.
- Apply a decision-making model to maximize consumer satisfaction when buying goods and services.
- Analyze factors that affect the choice and the cost of credit.

### Student Objectives

Student will be able to:

- Collect data and use real estate calculation tools to analyze budgets and home financing
- Make personal decisions based on analysis of economic factors

## Materials and Resources

### Internet Resources

#### House Hunting

- Realtor.com  
[www.realtor.com](http://www.realtor.com)\*  
A database of homes for sale and the official site of the National Association of REALTORS. Find real estate listings, realtors, mortgage rates, and home buying help, and more.

#### How much home can you afford to buy

- LocalLender.info  
<http://locallender.info/mortgage/affordcalculator.asp>\*  
A network of lenders helping people with their financial needs. Used for teacher number checks on persona spreadsheet- high lending estimates.
- Realtor.com  
<http://finance.realtor.com/HomeFinance/Calculators/mortgagequalifier.asp?gate=realtor&poe=realtor>\*  
Home Affordability Calculator provided by Realtor.com. Used for low lending estimates.
- Quicken Loans  
[www.quickenloans.com/mortgage\\_calculator/home\\_buying\\_calculators/home\\_afford\\_calculator.html?lid=3131](http://www.quickenloans.com/mortgage_calculator/home_buying_calculators/home_afford_calculator.html?lid=3131)\*  
Home Purchase calculator provided by quicken loans

#### Payment/Amortization Calculator

- LocalLender.info  
[www.locallender.info/consumer-banking/mortgage/amortization-schedule.asp](http://www.locallender.info/consumer-banking/mortgage/amortization-schedule.asp)\*  
Amortization schedule calculator provided by LocalLender.com.

#### Crime Rate Check

- Sperling's Best Places  
[www.bestplaces.net/html/crime.html](http://www.bestplaces.net/html/crime.html)\*  
Complete crime rate statistics for over 2,500 U.S. cities.

### Other Resources

#### Technology – Hardware

- Computer to conduct research, create spreadsheets and multimedia presentations, perform calculations and create maps using online tools
- Printer to publish student products
- Projector for creating class map and showing student presentation slides
- Internet connectivity to conduct research and access *Seeing Reason Tool* and online calculators

#### Technology – Software

- Spreadsheets to record, sort, and analyze data as well as perform calculations and create graphs and charts
- Multimedia software to create slides to support oral presentation



**Credits:** Bonnie Ott, from Ovid-Elsie High School, Michigan developed the idea for this unit plan. Her class project was featured in *An Innovation Odyssey*, a collection of stories of technology in the classroom, Story 125: [Dream Houses](#). A team of teachers expanded the plan into the example you see here.