



Teaching Economics Using SimCity BuildIt Video Game

Student engagement and the application of disciplinary knowledge remain a fundamental part of the teaching and learning objectives of many academic programs and majors. Video games, such as SimCity BuildIt, offer a way to engage and connect with a generation of students who commonly interact with each other through a shared experience with video games. Additionally, incorporating assignments connected to shared video gaming allows students to absorb and apply learning outcomes, such as communication and critical thinking, which many universities are promoting to ensure graduates' employability. This paper explains how a video game can aid in the acquisition of learning outcomes, increase student engagement in online and in-person instruction, and apply disciplinary knowledge beyond the classroom in principles of economics courses.

Maryanne T. Clifford[†] Nicolas P. Simon[†]

[†]Eastern Connecticut State University

1. Introduction

Educators are always looking for an interactive and accessible way to teach economic concepts. One potential solution could be the integration of SimCity BuildIt, developed by Traktwenty and published by Electronic Arts. This game is a free mobile video game that can be downloaded onto the students' cell phones or tablets from the Google Play Store or Apple App Store. The objective of SimCity BuildIt is for players to build and manage their own city, acting as the mayor or benevolent social planner and decision-maker. This game provides an excellent opportunity to introduce students to economic concepts and their practical applications (see Appendix 1).

The selection of SimCity BuildIt and the development of corresponding assignments occurred during the pandemic for an online principles of microeconomics course. The flipped classroom methodology was employed, with students reading assigned textbook chapters and watching the instructor's prerecorded Panopto videos before the live portion of the class. Students were required to play SimCity BuildIt before synchronistic class time, where they worked in groups on assignments (see Appendix 2). However, these assignments have also been used in in-person courses. Each assignment specifies the portion to be completed as homework prior to class and the part that will be covered during the next period. Both in-person and online courses typically allocate approximately 30 minutes of class time to start playing, with additional class time at the instructor's discretion for discussing the relationship between economics, gameplay, and current events.

During class time or through online discussion boards, students interact with each other and faculty, employing written and oral communication skills to engage with the materials being taught. The SimCity BuildIt assignments can be used together or separately. After the first assignment, subsequent ones are designed to stand alone, allowing instructors to select and focus on specific topics of interest or relevance to the students. These sample assignments showcase how players utilize economics, fulfill the learning outcomes of a liberal arts university, and apply their knowledge to daily life. Many of these assignments can also be easily modified to incorporate SimCity BuildIt into more advanced economics courses, such as international economics, public economics, or environmental economics, thereby enhancing student learning and engagement. Appendix 2 contains the assignments, along with directions for students. It also includes helpful hints to guide players in understanding how the game aligns with the economics course's learning objectives. Each assignment provides information about the next class meeting and its connection to the current material covered in the course. The learning outcomes embedded in this course extend beyond teaching economics and encompass critical thinking, ethical reasoning, creativity, quantitative reasoning, and both written and oral communication. Consequently, the SimCity BuildIt assignments in Appendix 2 create assessable artifacts that can be utilized for programmatic or university-level assessment of the designated learning outcomes.

2. Literature Review

Teaching economics courses has evolved over the last couple of decades, as noted by Becker (1997) and Becker and Watts (2001, 2008). However, the pandemic and the transition back to in-person classrooms have also accelerated and shaped the nature of these changes. One aspect of the shift to virtual classrooms was the need for instructors to find new ways of engaging students and implementing active learning strategies. While van Wyk (2013) and Porter, Riley, and Ruffer (2004) emphasize the value of games in enhancing student participation and learning in economics, these activities had to be adapted to virtual formats during the pandemic. As a result, faculty began incorporating video games as instructional tools. Al-

Bahrani et al. (2018) discuss how the immensely popular mobile video game “Pokémon Go” can be utilized to teach economics, while Martinez, Gimenes, and Lambert (2022) provide a more systematic study on the use of video games in academic learning. Seyedahmad and Shute (2021) examine the impact of video games, particularly on creativity. Lawson and Lawson (2010), Youngberg (2019), and Vidal (2020) also support the value of video games in economics education.

In addition to economics, other disciplines have explored the use of video games in education. The game SimCity, which is the predecessor to SimCity BuildIt, has been in existence for a long time, and Bos (2001) and Chiaradia and A.P.C.Y (1994) discuss its academic application. Woessner (2015) and Arnold, Söbke, and Reichelt (2019) focus on the use of this game in American government and management education courses, respectively.

3. The Game Set Up and Application

In SimCity BuildIt, beginners start with a small set of resources and a factory. These initial inputs can be used as payment for consumer goods or transformed into more advanced items. However, this transformation requires either money or time, and the opportunity cost increases with the value of the item. Users are initially provided with 25,000 coins, 50 dollars, and 10 units of steel (see Appendix 3 for more details). The first task is to construct a road that connects their city to the nearby highway that goes by their vast empty land that players transform into a city (see Image 1). Before the first assignment, faculty should engage students in a discussion about the different allocation mechanisms and highlight the distinctions between a pure market economy, a mixed economy, and a command economy. In this game, initially, the players experience a command economy where they are the decision-makers, but as they progress to higher levels, elements of a mixed economy come into play.

Image 1 SimCity BuildIt Set Up



Image 1: This is a screenshot of an author's gameplay at set up as the first road and the first housing unit is built in SimCity BuildIt. Appendix 3 describes the symbols which appear in this image.

Assignment 1, as specified in the Appendix 2, launches students into the game and is given to them around Week 2 after the class covers topics such as opportunity cost, marginal benefit, marginal cost, and diminishing marginal benefit. Students have until the next period to complete the assignment. In this task, they begin to understand the trade-offs inherent in daily life as they apply these economic concepts to the game and current events, either

independently or with the instructor's assistance. After constructing the road, the player can locate the first house to start populating the city. It is important to note that basic roads can be freely installed and can follow any desired path. Each housing unit incurs a cost, with the first house costing 1 unit of steel. Once paid for, three trailers get installed on the building site. As the city grows, housing units become more elaborate and densely populated, requiring additional resources for construction and improvement. Initially, the opportunity cost is small as the housing units are quite simple in the very rural landscape, which leads to an interesting discussion on marginal benefits and marginal costs.

With the introduction of the first housing units, players suddenly find their city with a population of 52 people, having earned 880 coins and 10 stars. Stars are acquired to advance to higher levels. Initially, the residents are located in an isolated area and require goods and services. The next step is to construct the first of several commercial buildings, such as the building supply store, which costs the player 100 coins. This prompts a discussion on marginal costs and marginal benefits, allowing the instructor to discuss the role of the government in the economy as well as starting to set up the Circular Flow Diagram.

Once the first commercial building is created, two units of steel can be transformed into nails, which can be used to produce the second housing unit. These actions unlock two additional symbols: the City Storage, which displays the available resources (7 units of steel at this point), and the Smiley face, which represents the happiness index. The happier the residents, the more they contribute to the city's tax revenue. Conversely, unhappy residents result in lower taxes and population decline as people move out of the city. This also reduces the city's ability to purchase publicly provided goods and services. This is where Assignment 2 comes in. It focuses on what kind of choices each student is making, their economic implications, and where students might see this occurring in the world around them. Assignment 2 is typically given around Week 3 as it expands on Assignment 1 and covers the circular flow diagram, production possibility frontiers, specialization, and trade. Like Assignment 1, Assignment 2 instructs students to find a current event article related to the topics and explain how the article aligns with the game and the concepts discussed. This critical thinking exercise is well-received by students as it enhances their understanding of the world and its economic policies. However, students frequently require support to excel in this assignment, and allowing them to resubmit it after considering other viewpoints and reevaluating their initial response results in stronger writing assignments.

Another interesting point that is often overlooked by players is that, in the beginning of the game, land appears plentiful and it is easy to locate factories and commercial buildings away from housing units. However, as the game progresses, land becomes increasingly scarce. Players have the option to spend dollars to purchase additional vacant land. However, the trade-offs between commercial and residential use become a binding constraint, especially if the factories have not yet been upgraded to produce goods without creating pollution in their surrounding area. At this point in the game, if time allows, it is an appropriate place to discuss the location of goods with negative externalities and how poorer communities within a city or region tend to have such goods located near them. In contrast, wealthier communities do not experience the same occurrence. In the game, you can emphasize this point by asking students what happens if they move cheaper and more polluting sewage treatment plants, with greater negative externalities, near a highly developed housing area. Players will observe a decline in population near the new location of the plant, a decrease in the demand for expanding housing units, and a dramatic increase in the demand for housing in the old location.

The creation and use of factories on the production side allow players within the game to choose to create additional primary inputs like steel. As players level up, additional resources

such as wood, plastic, seeds, minerals, cloth, chemicals, spices, glass, animal food, and electrical components become available for manufacturing within factories. At higher levels, these items, which are more expensive and time-consuming, become available. Once created, these inputs can be used in combination to pay for the construction of additional housing stock or to create more complex and higher-value goods. For example, steel can be transformed into nails to build additional houses or be sold to fund the construction of a new park, a library, or to widen heavily congested roads. As items become more complex, players must wait longer for them to be created. This illustrates both the elasticity of supply in the production of goods and how production costs increase over time. Assignment 3, which aligns with Week 4, covers gains from trade, utility maximization, and preferences. It's always interesting to ask students, once they have completed the assignment, about whose utility they maximized. This assignment also provides players with time to increase the population to 8,000 residents, which will aid them in the next section on demand and supply.

A population of 8,000 residents unlocks the trade depot allowing the mayor to produce items in factories or the commercial enterprises to be sold through the trade depot for coins. Excess supply or items built specifically for export earn additional coins. It also enables players to purchase resources they did not produce to meet the demand for additional housing units. Housing units in the city center experience faster demand and more growth compared to those outside the center. Other services provided by the mayor also increase the demand for housing in certain locations while not affecting others. Assignment 4 focuses on demand, covering topics such as demand, markets, and externalities of demand. It is introduced around Week 5 after teaching the chapters on demand, supply, externalities, and price elasticity. Assignment 5 covers the supply side of the market by examining the supply of inputs and goods. It incorporates production costs, sunk costs, the elasticity of supply, and illustrates short-run versus long-run costs. By this point, players have a good understanding of what production and supply in the game are, and the challenge lies in getting them to apply this knowledge to economic reasoning.

Next, the role of government is highlighted. After two units of housing are built, a power plant is required. The longer the mayor delays the purchase of the power plant, the less happy the residents become. Assignment 6 focuses on the role of government and how tax revenues are transformed into goods and services. This transformation has opportunity costs in terms of taxes paid by residents or goods the mayor chooses not to buy. This also sets the stage for players to learn about goods with positive externalities, such as education and healthcare, as well as negative externalities like crime and pollution.

Players face an interesting choice when building the first power plant in terms of pollution. As the mayor, players can choose to purchase the more expensive and less polluting wind power plant or the cheaper and more polluting coal power plant. Just like housing units, as the player levels up and the city becomes wealthier, more elaborate choices of power plants become available, including deluxe wind power, solar power, oil, nuclear, fusion, and the futuristic Omega plant. This demonstrates the trade-offs involving expense, negative externalities, and the number of households each type of power generation can supply. As cities grow, residents start to demand additional necessary government-provided goods such as water, sewage, waste management, police and crime prevention, fire, and healthcare. The demand for healthcare and fire prevention services, as well as goods with positive externalities in general, grows alongside the population. Failure to provide such goods leads residents to move to a competing city. Moreover, the failure to address negative externalities also results in a reduction in the city population, leading to decreased demand for housing units and government-provided goods. Tax revenues also decline. These public funds can also be spent on amenities like parks, landscapes, landmarks, beach and mountain facilities, education,

transportation, entertainment (primarily sports facilities), and gambling venues. The city's amenities attract more people to housing units near the government-provided goods, as long as the increase in population does not create shortages of other essentials such as electricity or sewage. Assignment 6 focuses on the demand and supply of government-provided goods and services, but its timing is not fixed within the semester as it is typically used in case of an unanticipated change in the class schedule.

When the population reaches 10,000, the mayor can allocate resources to build a cargo dock, which facilitates the trade of various items for gold keys. These gold keys, in turn, enable special purchases that can only be made with them. Once the city's population reaches 120,000, coins can be spent on building an airport, allowing the mayor to engage in trade for imports from London, Paris, and Tokyo. These imports can then be used to construct housing in a style more typical of those parts of the world. Assignment 7 focuses on international trade and is frequently the last official assignment for students to complete. Some students continue playing the game and reference it in class throughout the rest of the semester.



Image 2: This is a screenshot of an author's gameplay in SimCity BuildIt. Appendix 3 describes the symbols that appear in this image.



Image 3: This is a screenshot of an author's gameplay in SimCity BuildIt. Appendix 3 describes the symbols that appear in this image.

4. Student Reactions

The majority of students enjoyed playing the video game as part of the course. Many found it helpful in applying economic concepts and reasoning to the video game before being expected to apply it to real-life situations. Several students mentioned they had a great time playing the game and learned a lot from it. One student even commented that the game made economics and homework enjoyable. A few students admitted that they had already played or were playing the game before the class and were pleasantly surprised by how well it aligned with the economic principles they were learning. Although the instructor suggested those students start over, it did not seem to matter whether they had prior experience with the game or not in terms of completing the assignments. Of course, the students took pleasure in playing against the instructor and leveling up faster, without knowing that the instructor had to restart at the beginning of every semester. Some students did encounter difficulties in the game, particularly when trying to find the right combination of inputs to construct intermediate or final goods. However, if they did not want to seek help from the instructor or classmates, they could find helpful videos on YouTube offering expert advice, tips, and tricks to advance more rapidly to higher levels. A couple of students even admitted to watching a preteen gamer to better understand the game's progression. Although these videos were not necessary for completing the assignments, as most could be easily accomplished at lower levels, several students became highly competitive with their classmates and sought any advantage to earn more coins and level up faster than their peers. Overall, students reported that SimCity BuildIt was an entertaining and valuable learning experience in the class.

5. Conclusion

The use of SimCity BuildIt as an educational tool for teaching economics offers a meaningful and inspiring approach to engage students in the subject matter. By immersing themselves in the game, students not only learn about economic concepts but also experience firsthand how these concepts apply in real-world scenarios. The game provides a rich environment for students to explore economic principles. Starting with a small set of resources and the task of building and managing a city, students encounter trade-offs, supply and demand dynamics, the impact of externalities, and the role of government. The progression of the game allows for the gradual introduction and exploration of more complex economic concepts. Through playing the game and completing the assignments, students develop critical thinking skills, ethical reasoning, creativity, quantitative reasoning, and written and oral communication skills. These assignments not only foster a deep understanding of economics but also contribute to the broader learning outcomes of a liberal arts education.

Assignments aligned with each stage of the game provide opportunities for students to apply their knowledge and connect it to real-world events. These assignments encourage critical thinking as students analyze current events, evaluate economic implications, and make connections between the game and the world around them. The iterative nature of some assignments allows for reflection and deeper understanding as students revise their responses based on new perspectives. This application of economics to the real world has significant value in allowing students to better understand the choices they or others make. It also allows a liberal arts education to be practically applied which is a learning objective of the authors' university.

By incorporating SimCity BuildIt into economics courses, educators provide a dynamic and interactive learning experience that resonates with students. This approach enhances student engagement, facilitates a deeper understanding of economic principles, and cultivates essential skills for the modern workforce.

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Appendix 1: Economics Concepts Taught When Playing SimCity BuildIt

Table 1:				
Topic	Level Required	Population	Unlocks with	Assignment
Opportunity Costs	Level 1	1+		1
Marginal Cost	Level 1	1+		1
Marginal Benefit	Level 1	1+		1
Diminishing Marginal Benefits	Level 1	1+		1
Production Possibility Frontier	Level 1	1+		2
Circular Flow Diagram	Level 1	1+		2
Specialization & Exchange	Level 2		Offer Bubbles	2
Gains from Trade	Level 2		Offer Bubbles	2
Exports		120,000	Airport	7
Imports		120,000	Airport	7
International Trade		120,000	Airport	7
Command Economy	Set Up			6
Market Economy	Set Up			6
Mixed Economy	Set Up			6
Markets	Level 2		Offer Bubbles	2
Utility and Preferences	Level 2			4
Demand		10,000	Global Trade HQ	4
Supply		8,000	Trade Depot	5
Equilibrium		10,000	Global Trade HQ	5
Elasticity		10,000	Global Trade HQ	5
Short Run	Level 4		Hardware Store	5
Fixed Costs	Level 1		Factories	5
Variable Cost	Level 1		Time	5
Long Run	Level 4		Hardware Store	5
Taxation	Level 5		Build City Hall	6
Government Expenditure	Level 1	1+		6
Negative Externality - Pollution	Level 1	1+	Factories and housing locations	3
Negative Externality - Crime	Level 12		Areas not covered by police stations	6
Positive Externalities – Public Art & Parks	Level 3		Parks & Public Art	

Education	Level 10		Dept. of Education	6
Pure Public Goods			City Wars and National Defense	Not Assigned
Local Amenities	Parks Art Sculptures Landscape Beach Items Casinos Entertainment and Sports		Level 3 Level 3 Level 6 Level 15 Level 25 Level 20	6
Publicly Provided Goods (roads, parks, fire, police, hospitals, waste removal, sewage)	Electric Plant Fire Station Medical/ Hospital Park Police Station Sewage Trash Removal Education Transportation Town Hall Storage Mayors Mansion		Level 1 Level 5 Level 16 Level 3 Level 12 Level 8 Level 14 Level 10 Level 10 Level 1 Level 4 Level 6	6

Appendix 2: The Assignments

Assignment 1:

Video games and economics.

SimCity BuildIt

- a. On your phone or tablet. Go to the app store (aka Google Play or the Apple app store) and download a copy of SimCity Build It for free.
- b. You are NOT to use real money to advance in the game.
- c. Play the game and get to at least level 2 and take a screenshot of your town.
- d. Economics: Using clear and concise language to briefly communicate to a general audience how the game demonstrates each of the following concepts:
 - Opportunity Cost
 - Marginal Benefits
 - Marginal Cost
 - Diminishing Marginal Benefits
- e. Provide a news article (or its link) about one of the above concepts. (Articles must be from a published source considered reputable such as a national newspaper or magazine and be less than three months old).
- f. Submit your answers to c, d, and e in Blackboard with the link titled Assignment 1.
- g. Be prepared to provide an analysis in the next class of that concept appearing in the game versus in your article. This requires the use of critical thinking skills.

Assignment 2:

Video games and economics.

SimCity BuildIt

- a. Remember, you are NOT to use real money to advance in the game.
- b. Play the game and get to at least level 4 and take a screen shot of your town.
- c. Economics: Concisely describe, in a paragraph or two, each concept and give a specific example of how this game fits in with the definitions of
 - The Production Possibilities Frontier
 - The Circular Flow Diagram
 - Specialization and Exchange
- d. Provide a news article (or its link) about one of the above concepts. (Articles must be from a published source considered reputable such as a national newspaper or magazine and be less than three months old).
- e. Provide a short analysis of the similarities and differences between your article from d and the textbook definition of the term. This requires the use of critical thinking skills.
- f. Submit your answers to b, c, d, and e on Blackboard.

Assignment 3: SimCity BuildIt

Construct detailed answers to the following questions and communicate them in a well-organized paragraph.

- a. In Levels 1 and 2 as you keep clicking on the factories to build the resources, do you then use the steel to build more homes or nails? Using critical thinking, explain your choice.
- b. Does it matter where the factories are in relation to each of the houses?
- c. Where did you put the houses relative to the factories and stores? Explain your reasoning.
- d. How does this fit with our ideas of marginal benefits, marginal costs, and maximizing people's happiness?
- e. What are the opportunity costs associated with your choice? Can you improve your selection and if so, how?
- f. In Levels 2 – 5, as you build your homes, describe them. Are the ones you build in levels 1 and 2 different than those in levels 3, 4, and 5?
- g. Do you have a hypothesis of why this might be happening?
- h. Submit the answers to a-g in Blackboard.
- i. For the next class, please be prepared to discuss if your answer is based on quantitative reasoning and why or why not.

Assignment 4:

Using SimCity BuildIt as you focus on demand and housing, construct a well-organized argument for each of the following excluding a and submit all your answers on Blackboard.

- a. Using SimCity BuildIt, move up a level or two and submit a screenshot of your city. Please make sure that your population is above 8,000 people.
- b. How does this game build demand for housing?
- c. How does the demand curve shift?
- d. Does it matter what public places are near your housing units? Is the demand for housing impacted by locational amenities?
- e. Does the location of other houses impact demand for a specific housing unit?
- f. Are there other positive or negative externalities impacting the demand for the housing unit you analyzed in d and e?
- g. Does the game explain anything about electricity demand – either yours as mayor or the residents?
- h. As the price (in terms of steel, wood, hammers, or another resource) rises does the house get bigger?
- i. Do two equally sized homes command different prices? If so, why? If not, why not?

- j. Does the location matter?
- k. What is happening in your city in terms of the resources you need to pay (i.e., the prices) for homes?
- l. How is this the same and different than in the real world?
- m. Compare your city with that of one of your classmates. Which city's design would you describe as more creative and why?

Assignment 5: Supply, Production Costs, and Elasticity of Supply

Using SimCity BuildIt, move up a level or two and as you do focus on the supply side. For each of the following, except a and h, please create a carefully written paragraph or two and submit your answers on Blackboard.

- a. Play the game, move up two levels, and take a screenshot of your town.
- b. Why the pricing of steel is 7, wood is 15 and hammers are 67?
- c. How does this describe the supply curve?
- d. What are the inputs?
- e. Does it tell us anything about elasticity?
- f. Did you figure out how to change the prices in the game and does changing the prices affect the speed at which it sells, or do you take the amounts offered by other and if so, why?
- g. Critically analyze how this may be the same or different than in the real world?
- h. Submit your answers to a-g on Blackboard and be prepared to discuss in the next class if this is or is not quantitative reasoning.

Assignment 6: SimCity BuildIt

Answer the following in a paragraph or two and submit it on Blackboard. Please play until your city has reached 10,000 residents and then create a carefully written paragraph or two to answer the following questions:

- a. As you level up, what happens to the tax revenue from your city?
- b. As mayor, are there any activities or purchases that you can make for the residents to increase their happiness? What would you choose and why? If you were running to be elected as the mayor, would you make a different choice?
- c. As you generate cash, you can use the funds to buy government-provided goods and services (like parks) or to entice factories or stores to come to your town (by buying more or upgrading them to increase production). Using economic concepts, describe your choice and explain why you chose it.
- d. Do big and small towns receive different services from the government in the real world? And if so, why?
- e. How does this fit in with what happens in this city or where you went to high school

(i.e., your hometown)?

- f. Review your answer to 6b, how does this relate to what happens in your hometown?
- g. Also, use your critical thinking skills to reflect on your city's currently available goods and services from the government and compare that to what is available in your hometown.
- h. Submit your answers to a-f on Blackboard as this week we are focusing on written communication.

Assignment 7:

Using SimCity BuildIt, move up another level or two. and as you do focus on the trade depot and the airport. Also please be aware that if you have leveled up to start a new city in a new location then you can also use that experience to answer the following. With the exception of a and h, please create a carefully written paragraph or two and submit your answers on Blackboard.

- a. Play the game, move up two levels, and take a screenshot of your town.
- b. Why is the pricing of hammers bought through the trade depot different than doing it yourself?
- c. How does the availability of foreign resources impact the supply curve?
- d. Does the availability of the trade depot and the airport change your production decisions? Why or why not?
- e. How is the building of London or Parisian buildings (or a locally specific building in the new city) in your city different than the other buildings? Is this significant?
- f. Is open land increasingly becoming scarce in your city? What can you do about it?
- g. Critically analyze how one of the above responses may be the same or different in the real world than it is in the game.
- h. Submit your answers to a-g on Blackboard and be prepared to discuss the answer to g in the next class if this is or is not quantitative reasoning.

Assignment Grading Information

- Assignment 1

a, b, f, and g do not require a submitted response.

c. Screenshot, like Image 2 or 3.

d. Provide an example of each from the game to demonstrate that they understand the concept.

- Opportunity Cost
- Marginal Benefits
- Marginal Cost

- Diminishing Marginal Benefits
 - The exact response is dependent on the player's gaming experience, reporting based on supply side or demand side observations. Encourage students to provide the number and the resources (or goods) they have observed in the game.
 - e. A linked newspaper article about one of the 4 topics above. Note, it is important that the instructor reviews submitted articles to identify which articles obviously contain one of the economic concepts versus others in which the concepts are less obvious. Professional journals should be out of bounds and students should be discouraged from dropping an economic term in a search engine.
- Assignment 2
 - a and f do not require a submitted response
 - b. A screenshot, like Images 2 or 3.
 - c. Economics: Concisely describe, in a paragraph or two, each concept and give a specific example of how this game fits in with the definitions of
 - The Production Possibilities Frontier (What the city can produce at the current game level, graphically an illustration of output choices, an application of the guns and butter example, or a demonstration of investment versus consumption all fit here)
 - The Circular Flow Diagram (An example of how resources or goods flow across the city's economy)
 - Specialization and Exchange
 - The exact response is dependent on the player's gaming experience. Students can focus on demand or supply. Encourage them to provide the number and the resources (or goods) they have observed in the game.
 - d. A linked newspaper article about one of the topics above.
 - e. Provide a short analysis of the similarities and differences between your article from d and the textbook definition of the term. This requires the use of critical thinking skills and is graded upon both the use of critical thinking skills and how well the example demonstrates the economic concept.
- Assignment 3
 - h and i do not require a submitted response
 - a. The exact response is dependent on the player's gaming experience, but the answer should provide insight into the timing of consumption by converting the basic input to a more advanced one. It increases the value of the item for sale and creates time costs for players.
 - b. Location does not matter, unless or until, the living quarters end up within an area where the pollution negative externality impacts it. The relative position of the stores to the factories does not appear to matter in the game, while in real life we rarely see bakeries that rely on sight and smell to sell their product located near factories

which would minimize these selling attributes.

- c. Here students must identify the rationale for their choice and should identify choice constraints (i.e., transportation costs, locational amenities, etc.) even if they cannot yet convey them in precise economic terms. It is often easier for them to describe this in terms of the real world and then they can see it in their game choices. Often information can be drawn out of them by asking why a home or the mall is located where it is (such as why their family selected their location to minimize a parent's commute to work).
 - d. Marginal benefits, marginal costs, and maximizing people's happiness fit with profit-maximizing decisions of businesses and utility maximization of households in multiple ways. Often, students maximize their utility before understanding how households and firms engage in the corresponding behavior.
 - e. The exact response is dependent on a player's chosen city layout and whether they focus on answering the question of supply or demand. The answer should provide insight into the tradeoffs embedded in a specific locational choice for households or businesses such as why some people or firms choose to locate within the congested city core and others choose to locate some distance away.
 - f. Again, the exact response is dependent on choices within the game and whether this question is seen about demand or supply. In general responses indicate a negative relationship between transportation costs and a firm's profits or a positive relationship between income and housing.
 - g. Many hypotheses will emerge. The instructor should guide the class towards attributes that are testable (like the correlation between price and square footage) or observable (like the height of buildings in the city center versus more rural spaces).
- Assignment 4
 - a. Does not require a submitted answer.
 - b. Good answers demonstrate the positive correlation between population and the number of housing units or between wealth and square footage.
 - c. The exact response is dependent on the player's level but should highlight locational amenities or government-provided goods and services.
 - d. The exact response is dependent on the magnitude of the population increase. It is conditional on current population density and what amenity is being provided to residents (sports stadiums create greater externalities than public art).
 - e. The player's level, the location of goods with positive or negative externalities, and the tradeoff between building additional units or upgrading existing housing stocks will impact demand for housing in a specific location.
 - f. Unless the player is creating a new neighborhood away from all previous buildings, externalities matter but the extent of the player's unique gaming experience and city design determine the magnitude.
 - g. It is easier to see price responsiveness through the mayor's perspective as players can choose to build or upgrade more or less expensive units. Price responsiveness of

demand can also be described in terms of the residents as well but depends on the player's level and unique gaming experience for the exact trade-off.

- h. The game demonstrates the positive relationship between the price and size of the housing unit but beware as the player's level can also be a source of inflation in the housing market.
 - i. Housing prices are a function of location, the player's level, size, and frequently require different resources to be built or upgraded. Yet, the time costs of the inputs frequently make the price of homogenous items more similar than they appear on the surface.
 - j. At lower levels, the value of the location is not obvious but comparing the number of residents in different housing units is partially dependent on externalities (positive and negative), local amenities, roads, and the distance to government-provided goods. The exact magnitude is contingent on gameplay.
 - k. While location matters in both, in the real-world, residents can invest in additional housing amenities that increase the value of the house when houses in the game appear more homogeneous than their real-world counterparts.
 - l. See answer to k.
 - m. Players can report on their choice of road layout, development of the beach or mountain region, housing styles, and purchases of local amenities or government-provided goods and services as a source of creativity compared to their classmates. Beware, just like almost all people report themselves to be middle-income regardless of reality, they also tend to report that they are more creative than their classmates.
- Assignment 5: Supply, Production Costs, and Elasticity of Supply
 - a. A screenshot, like Images 2 or 3.
 - b. In the game, price is a function of opportunity cost in terms of time and/or intermediate inputs. It is contingent on the time costs of all inputs used to produce the intermediate or final goods.
 - c. An answer can be about the supply for a specific good (see b) or for the whole economy. For the economy, the marginal cost is about time costs and an awareness that quantity is constrained by level by the number of factories and stores created, and if the factories and/or stores have been upgraded to produce faster. Answers will vary based on the player's level and perspective.
 - d. What is available to the player depends on level and available stores within the city. Factory produced resources are steel, and depending on the level could include wood, plastic, seeds, minerals, cloth, chemicals, spices, glass, animal food, and electrical components and require different amounts of time for the factories to create them. Intermediate goods like nails, boards, bricks, hammers, tape measures, shovels, and many more items are transformed in one or more stores into ever more expensive and more complex items depending on the player's level.
 - e. On a macroeconomic level, the player's price responsiveness for supply is limited by what is built and already stored, by the number of factories and stores, and by upgrades to factories and stores. On the microeconomic level, how responsive a

player is to relative price changes is unique to them and their current goals.

- f. In the Trade Depot it is possible to change the price of items within preset limits. Note each good is homogeneous and yet price changes do not seem to alter the speed at which the player's item sells. Yet, items that have multiple stages and thus higher time costs or are scarcer sell more rapidly.
 - g. Expect good answers to focus on differences in elasticity, homogeneous versus heterogeneous goods, and market structure depending on what chapters the course has already covered.
 - h. Does not require a submitted answer.
- Assignment 6: SimCity BuildIt
 - a. Tax revenue is conditional on population, land size, and the happiness index. The happiness index is independent of level but the other two appear to be dependent.
 - b. Responses are dependent on player preferences, current level, and the availability of coins, bills, and keys. The significant part of the answer is how economic concepts are used to support the choice.
 - c. Answers focus on investment in production, which will increase future wealth and thus future population, or on items purchased to increase the current population with little or no impact on future periods.
 - d. The answer here connects learning about the opportunity costs of tax revenue and applying this knowledge to the player's hometown. It increases student's awareness of the economic foundations of some of the disparities across cities in general, and more specifically across cities of different sizes and incomes.
 - e. Responses will vary with the student's socio-economic status and their awareness of it.
 - f. This is hard for most students to successfully complete without faculty support as it builds on good answers in b and f while also requiring an awareness of the world. Providing support before the assignment or allowing students to revise and resubmit the assignment helps especially if the instructor can take the time to compare and contrast different locations within the state (which the students are familiar with) in terms of wealth, housing stock, unemployment numbers, and other characteristics in the American Community Survey or a comparable data source.
 - g. See answer to f.
 - h. Does not require a submission of an answer.
 - Assignment 7:
 - a. A screenshot, like Images 2 or 3.
 - b. This can be an introduction to the time value of money or simply an explanation of the difference between economic costs and accounting costs.
 - c. The Autarky supply versus world supply curve is being set up here which has the expected impact on price and net exports.
 - d. Answers depend on a player's preferences and current goals. Some students embrace

these changes and some prefer their prior Autarky equilibrium. The trade depot allows specialization and exchange which allows money to function as a medium of exchange instead of a barter-based economy.

- e. These new housing unit styles have different appearances (with London and Parisian buildings being shorter while Tokyo buildings are taller than the original housing towers), slightly different population densities and building prices require payment with at least one imported good.
- f. Some players focus on building a towering city center while others focus on building horizontally instead of vertically.
- g. Topics vary. They include the gains from trade, trade barriers in some markets, the foreign exchange market, and zoning laws to name a few.
- h. Does not require a submitted response.

Appendix 3: Game symbols, what they mean, and how items can be used.

Table 2:		
Item	Meaning	Uses
Gold Coins	<ol style="list-style-type: none"> 1. Endowed with 25,000 coins, 2. Popping gift/thought bubbles, or 3. earned when selling inputs, intermediate goods, or final goods. 4. 880 are earned with the creation of the first unit of housing 	<ol style="list-style-type: none"> 1. Pay to set up or upgrade factories and commercial buildings 2. Purchase items which are used to build housing 3. Purchase or upgrade most government provided amenities (parks, public art, etc.)
Green Bills	<ol style="list-style-type: none"> 1. Start with 50 green bills. 2. Earn in contests or buy it with real money. 3. Earn it by watching video ads 	<ol style="list-style-type: none"> 1. Trade bills to speed up the time to convert inputs to outputs in factories or commercial buildings. 2. Purchase limited edition items requiring bills and not coins. 3. Trade bills to buy land to enlarge the city, add waterfront/beach, or add mountain areas to the city.
Keys	<ol style="list-style-type: none"> 1. Gold Keys are earned with cargo deliveries or from completing contests 2. Platinum Keys are earned with club wars or completing contests 	Some publicly provided specialty items which can only be purchased with gold or platinum keys
2 Blue People (Upper Left)	This identifies the current population in the players city. In Image 1 the population is 52.	<ol style="list-style-type: none"> 1. As more housing is built the population rises. 2. As the housing density increases as housing goes from trailers to skyscrapers, the population increases.
Red Star within a circle	<p>The number in the red star identifies the player's level.</p> <p>The circle identifies the city improvements a play needs to make to move up to the next level. Note as players advance in the game, it takes more.</p>	As players build their city and increase the population, they level up.

Smiley face	<p>A happiness index for city residents.</p> <ol style="list-style-type: none"> 1. Green when the index is high (80 and above) 2. Yellow when the index is in the middle range (approximately 50- 79) 3. Red when the index is below 50 	<p>Player's actions like failing to install a new electric plant or widening congested roads reduce the percentage of happy residents.</p> <p>As the happiness index falls, the population falls as residents relocate to other cities.</p>
Blue silos	<p>The numerator identifies how many items you have stored.</p> <p>The denominator identifies how many items a player can store.</p>	<p>Increased storage can be purchased as players level up. In Image 1, 9 units of steel are in storage.</p>
Road	<p>The road image can be clicked to:</p> <ol style="list-style-type: none"> 1. build roads anywhere within the city limits or 2. widen existing congested roads. 	<p>Players need to purchase and build wider roads as congestion occurs or the happiness index starts to fall.</p>
House	<p>House is the symbol for the popup menu which allows players to choose to build a new home</p>	<p>A number (1 or more) appears beside the house when additional housing units are available to be purchased and built within the city.</p>
Yellow Hard Hart	<p>This symbol appears over housing units when an upgrade to the housing unit can be purchased.</p>	<p>This symbol with a green check indicates an upgrade is available for purchase and the resources needed are available.</p> <p>This symbol alone indicates that an upgrade is available for purchase, but the resources are not currently available.</p>
Commercial Building	<p>The symbol for the pop-up menu to add one of the ten commercial buildings to the city.</p>	<p>A number appears or the building flashes to indicate that a new commercial building can be purchased and built.</p>
Factory	<p>The symbol for the pop-up menu to add or upgrade factories.</p>	
Government Building	<p>The symbol for the pop-up menu to add a government building.</p>	<p>The first government building is the Town Hall and once purchased it will list tasks and the rewards for completing the task.</p>
3 Blue People (lower left)	<p>A gateway to other players' cities where you can purchase their items, but visitors can only see items appropriate to their current level of production</p>	<p>Visiting another player's city (aka Daniel's City) and using gold coins players can purchase items from the Trade Depot in the city they are visiting until the player levels up enough to build their own Trade Depot.</p>