

EDUCATIONAL NOTE

Ten Economic Lessons Learned from *Animal Crossing* During the Lockdown

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Abstract

Animal Crossing: New Horizons was the breakout video game of the 2020 coronavirus pandemic, selling over twenty million copies. Making use of the game’s popularity, this paper offers a novel way of learning about markets by examining the forces that drive game play in *Animal Crossing*. We use ten scenarios to illustrate that markets are instrumental in the game, providing opportunities to teach students of all levels about the importance of markets.

JEL Codes: A13, A2, P1

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I. Introduction: “Real” World Economics

The movement to make economics education more interactive has received a lot of support over the years. The warnings of Serva and Fuller (2004) that economic education has not kept up with innovation, along with the encouragement of Becker, Becker, and Watts (2006) to drop “chalk and talk,” have motivated economics educators to seek alternative ways to present material. More recently, Picault (2019) notes that nontraditional ways of engaging students can act as transversals that promote greater learning.

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One heretofore limited area of exploration has been the use of video games. After a thorough search, we found only that Ferrarini (2012) mentions the potential for using video games as a teaching tool. However, her analysis is limited mainly to suggesting that instructors ask students to provide examples of video games where economic concepts appear. There simply is not much written about the use of commercially produced video games to teach economics.

It would be hard to imagine the multibillion-dollar gaming industry spending time developing a heroic economist who must battle her way through a legion of monopoly zombies, or a central banker whose riveting exploits include deciding on the next monetary policy moves while avoiding sword-wielding ninjas.

Fortunately, there is already an incredibly popular video game that incorporates many economic concepts as part of its normal course of play. In fact, the better you are at navigating the game’s economics, the more successful you will be. Already in its fifth iteration, Nintendo’s *Animal Crossing* rewards players who understand economic principles in a world of their creation.

Through ten examples, we explore how markets impact in-game decisions. We also provide two lesson plans to help instructors incorporate *Animal Crossing* into the classroom. The paper proceeds as follows: section 2 discusses what makes *Animal Crossing* a particularly appealing tool for teaching about markets. Section 3 provides a literature review. Section 4 describes the game, while section 5 highlights the game’s market-based concepts. Section 6 presents two lesson plans, and section 7 concludes.

II. Pandemic Play

According to gaming reporter Imad Khan (2020), *Animal Crossing: New Horizons* emerged early on as the video game of the pandemic. The sales of Nintendo’s megahit are staggering when compared to the brand’s other flagship video games. From its release on March 20, 2020, through June 30, 2020, *Animal Crossing: New Horizons* sold over 22 million copies (Nintendo 2020, p. 3), making it the second-most-popular Nintendo Switch game ever,¹ behind *Mario Kart 8*. *Animal Crossing* had outsold *Super Smash Bros. Ultimate* (19.9 million copies), *The Legend of Zelda: Breath of the Wild* (18.6 million), *Pokémon Sword* and

¹ The Nintendo Switch is a hybrid game console that premiered in 2017. The Switch can be used as an at-home console or as a portable unit.

Pokémon Shield (18.2 million), and *Super Mario Odyssey* (18.1 million) (McFerran 2020)—all games that had been out for a year or more.

Prior to 2020, any one of the Switch games on this list would have been considered more mainstream than *Animal Crossing*, but COVID-19 changed everything. Nintendo reported that among all the new Switch consoles purchased from April through June, more than half were used to play *Animal Crossing: New Horizons* on the day they were purchased (McFerran 2020).

Animal Crossing is now a household name, and it seems like only a matter of time before it becomes the Switch’s best-selling game ever. While many industries suffered during the coronavirus pandemic, video games did spectacularly well. Nintendo’s net profit for 1Q 2021 was up by 541.3 percent over 1Q 2020 (Nintendo 2020, p. 1).

III. Literature Review

While there are many excellent papers on using activities in the classroom, we focus on efforts by economics educators to use video games as a teaching tool. For instance, economics-games.com has several simulations that can be played individually or in multiplayer settings. Some of these games are versions of activities presented in academic journals. *Trading in a Pit Market* is based on Smith (1962) and Holt (1996), while the Bubble Game is based on Moinas and Pouget (2016).

Economists have also developed personal webpages with their own versions of games, descriptions of which have been published in various journals. White’s (1997) article explores a method of learning public policy through an interactive system of team building, inter-team cooperation, negotiation, and a computer simulation whereby students make decisions on prices and outputs with the goal of maximizing profits and policy goals.

Santos (2002) developed a game that allows students to interact with each other in the role of monetary policy maker. Students play as central bankers whose decisions directly impact outcomes in the virtual world. The results are interdependent and update as decisions are made. Cloutier, Kaufman, and Kaufman (2008) created an interactive tool that allowed students to visualize how changes in demand lead to changes in total revenue in the context of professional sports salaries.

While not really a game, Mitchell (2009) built a webpage that allows students to manipulate cost curves to explore the relationship between short-run and long-run curves. Gold and Gold (2010)

developed simulations where students compete against each other by making decisions in activities that involve different topics in a variety of market structures. Reiman (2014) created a website that allows users to interact with an otherwise complex model constructed by Brander and Taylor (1998), which uses Ricardian and Malthusian principles to examine the use of renewable resources. Mayer (2015) built a website that allows buyers and sellers to interact in different ways to visualize changes in consumer and producer surplus. Ng (2019) discusses a game designed for a hybrid principles of microeconomics course. Youngberg (2019) created a game, *Merchants of the Sea*, to help students understand the workings of the market.

Beyond the games built by individuals, Econoclass, MobLab, and Veconlab are a sample of sites that have options for setting up interactive games. Additionally, a set of virtual reality modules to learn about markets are set up on the website Second Life. Some of these third-party platforms require payments, and some have more tech support than others, but clearly, online gaming in the economics world is moving forward.

The closest analog for our discussion of *Animal Crossing* is Al-Bahrani et al. (2018), which examines the economic lessons to be learned from the *Pokémon-Go!* craze of 2016. The authors use the popular mobile app game as a launching pad to explain economics as opposed to building a game around an economic idea the instructor intends to teach. As we will see, *Animal Crossing* provides for a world in which economics guides the play and the use of markets is pronounced, making it an exceptional tool for teaching.

IV. What Is *Animal Crossing: New Horizons*?

Animal Crossing is a life simulation game now in its fifth iteration. In the current version, *Animal Crossing: New Horizons*, players buy an island, move there, and begin building a community. Through exploration, production, and trade on a grand scale, players develop their islands in unique and customized ways.

To improve the status of an island, *Animal Crossing* allows players to participate in a variety of markets where basic economic concepts are demonstrated, as we discuss below. Not only do players engage in market-based transactions; there are also myriad opportunities to contribute to public goods. Players' contributions to the social good are purely voluntary, and while such philanthropy may mean lower incomes, positive benefits arise from their contributions. Additionally, utility is maximized by investing in sustainability, as it

increases not only the beauty and variety on the island, but also the productivity of the island’s resources. An island’s overall success is found in a mix of economic and social goals, none of which is obviously at odds with the other. For more information on *Animal Crossing*, Polygon (n.d.) provides details about the game, and IGN (2020) offers new players a beginner’s guide.

Despite its benefits, *Animal Crossing* has been accused of being a dystopia where players are beholden to an evil capitalist called Tom Nook (Tait 2020). Nook controls all financing in the game, and without access to funds, you cannot start building on your island. To build anything, you need to take out a loan, so players start in hock to Nook. But this simplistic view of Nook belies the necessary role he plays in the economic lessons the game teaches. Players have a world of market-based moves to make, financed by Nook’s largesse—he never runs out of bells, the currency in *Animal Crossing*, to loan.

V. Ten Economic Lessons from *Animal Crossing*

In this section, we examine some of the prominent market-based features that make *Animal Crossing* such a powerful learning tool.

A. Trading Creates Value

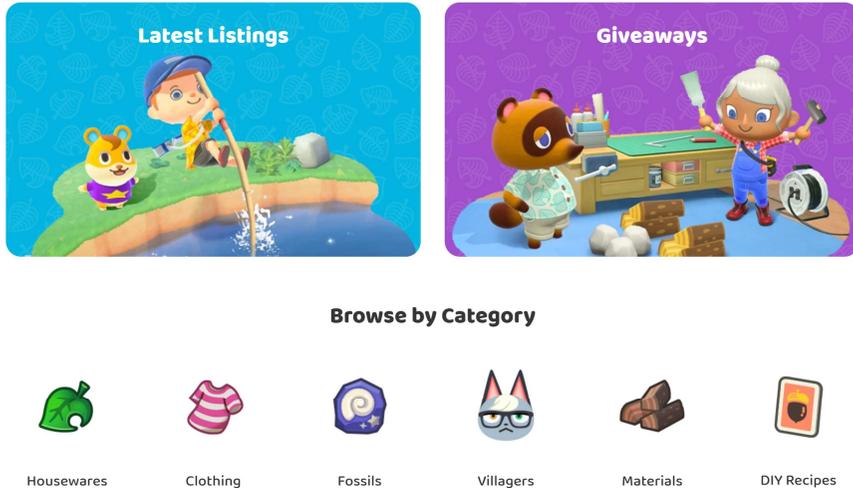
Animal Crossing emphasizes the basic economic idea that trade creates value. You can trade almost anything you find in the game to the digital characters you meet, as well as using bells as a medium of exchange. You can trade material goods with the villagers who inhabit your island, and you can hire in-game characters to do menial tasks on your island.

To move beyond autarky, it behooves players to trade resources with people they know from other islands using friend codes. Trading on these margins moves you from relying on your island’s resources, where limited trading exists, to trading on a much wider scale. This activity raises your standard of living. Numerous online sites, such as Nookazon, Nook Exchange, and Animal Crossing Exchange lower the transaction costs of trading with unknown players. These sites effectively transform your relatively isolated island existence to one where global exchange is at your fingertips.

One of the signatures of the trading community in *Animal Crossing* is that many trades occur out of the goodness of traders’ hearts. In these online trading communities, players provide items and resources to each other at no charge. Utility for these players is based on generosity. It is, after all, only a game (Tait 2020).

Teaching Tip: Use the various ways that trade can happen in *Animal Crossing* to illustrate that trade, particularly voluntary trade, creates value.

Figure 1. At Nookazon.com (pictured below) and other sites, players can trade for, or buy, every item in *Animal Crossing*.



B. Rare Items: Price Is a Function of Demand and Supply

There are many ways to earn bells in *Animal Crossing*, but the most common way is to collect items as you explore the game. Once you collect an item (such as gold nuggets, star fragments, metals, wood, fish, bugs, shells and sea creatures, flowers and fruits, and much more), it is easy to sell. Among all these potential riches, though, some things are more valuable than others. For instance, a great white shark will fetch fifteen times more bells than a cherry salmon, so searching for hard-to-find items is a good time-value-of-money proposition. Items that appear infrequently typically secure more bells, which provides a way of discussing demand and supply. When normal goods are low in supply and high in demand, the price will be higher. That is the case with the great white shark. Cherry salmon are common and therefore fetch a lower price.

Interestingly, some in-game characters are willing to pay more than the going market rate. Flick is a bug specialist and CJ is a fish expert. Because of their special interest in particular fauna, they will pay a premium. In other words, their demand is more inelastic. They are not around all the time, though, so a player who needs bells

immediately will have to sell the same items for less at Nook’s Cranny, the general store (see figure 4, below).

Teaching Tip: Searching for more valuable items can be a good way to illustrate marginal benefit and marginal cost (see Lesson Plan 1 at the end of this paper).

Figure 2. A great white shark is worth 10,000 bells.



C. The Turnip Market: Arbitrage

The turnip market offers a lesson in speculation. You can buy turnips on Sunday and have the rest of the week to sell them. Since turnip prices change twice a day, at noon and midnight, you must be strategic about when to sell—and where, because prices vary by island. Sometimes the market price is in your favor and large profits can be earned. Other times, turnip prices are low. Unlike real turnips, though, *Animal Crossing* turnips spoil quickly. If players have any left on the following Sunday, they spoil and are worthless.

The conundrum is when to sell. On Sunday, you can buy turnips for between 90 and 110 bells. During the week, turnip prices can rise to over 600 bells or fall under 30 bells. This variability makes investing in turnips risky. As a rule, turnip prices tend to fall early in the week and then the prices may continue to sink thereafter or, if you are patient, you might benefit from a price spike before the market crashes back down. Since you can sell too soon or too late, the turnip market offers a simple lesson in volatility and risk tolerance.

The riskiness of the turnip market can be dramatically reduced if players crowdsource by sharing turnip prices with their online friends. When one person reports a positive price spike on their island, their friends can visit and bring their turnips to exchange at the higher price. There’s no cost to travel to another island when you’re invited by a friend.

Teaching Tip: Arbitrage opportunities exist if you can transport turnips to an island where the price is higher. Discuss what should happen in the market for turnips if a whole bunch of players bring their turnips to sell on the same island. The supply would rise, and the price should fall.

Figure 3. Players can check the price of turnips twice a day.



D. Nook's Cranny: Elasticity

Nook's Cranny is the general store in *Animal Crossing*. Here, you can buy and sell items, making it more like an old-fashioned trading post than a convenience store. The number of items available isn't extensive, but it is enough to furnish a house and equip yourself with useful tools such as fishing rods, shovels, sling shots, and nets. You can use these tools to acquire resources that you can then sell for bells.

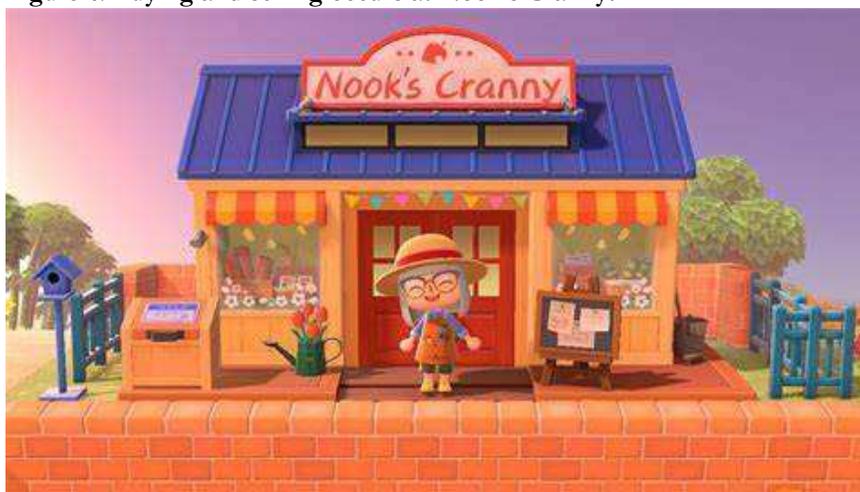
Nook's Cranny only operates during set hours, so if you want to sell an item after hours, you can use a drop box located outside the store—if you don't mind selling for a 20 percent discount. In exchange for the goods you deposit into the box, your account will be credited with bells the next day. Additionally, there are periodic

“hot items” for sale at Nook’s Cranny. The proprietors, Timmy and Tommy, will offer a premium of 50 percent for the daily “hot” item.

These scenarios offer interesting applications of elasticity of supply. Your willingness to supply must be quite elastic to accept a 20 percent price reduction when you could just wait a few hours for the store to reopen. And, in the case of the hot items, the higher price must be enough to encourage you to sell.

Teaching Tip: The elasticity of supply is affected by the price offered. In some cases, the price rises significantly, while in others, the price offered is lower. How you respond to these prices indicates whether supply is elastic or inelastic.

Figure 4. Buying and selling occurs at Nook’s Cranny.



E. Borrowing from Tom Nook: Monopoly and the Market for Loanable Funds
 The financial instigator in *Animal Crossing* is the character Tom Nook. Nook owns pretty much everything in the *Animal Crossing* universe. The game begins when Nook offers you an island getaway package. When you buy an island from Nook’s seemingly endless supply, he provides you with a bill, which you must pay off, to move forward during the game. When you begin to develop your island, Nook also issues the permits required to build infrastructure and houses. Furthermore, you must go to Nook to borrow funds to build your own house.

You only have one option to borrow money: go to Nook. As a monopolist, Nook is quite benevolent, extending loans at zero percent interest. While he does not badger you about repayment, you

cannot upgrade your property until you repay him. Once you do, he will happily extend you another loan to update the exterior appearance of your house. Of course, Nook offers renovation services as well.

Interestingly, Nook will accept deposits and pays interest that compounds monthly on savings. Because there is only one place to deposit money (and because players could earn exorbitant sums over time in previous iterations of the game), the interest rate is exceptionally low: 0.05 percent.

Some people view Nook as the archetypal capitalist villain. While he appears happy to help, he is also in the enviable position of being the monopolist who will reap the financial windfall of whatever you build in the game and without whom you will be unable to build up your island. However, our take is that Nook is not a villain, but a facilitator who encourages transactions that benefit all parties.

Teaching Tip: Explore how a monopoly in the market for loanable funds should lead to higher interest rates. Then ask why Tom Nook does not charge any interest.

Figure 5. Tom Nook gives out no-interest loans.



F. The Museum Is a Pure Public Good

At some point, an owl named Blathers shows up on your island and informs you that he is opening a museum there and needs your help to collect bugs, marine life, and fossils. A little later, he opens a separate wing to collect art, too. The museum is both nonexcludable (the entrance is always open, and no admission fee is required) and

nonrival (an unlimited number of players can enjoy it at the same time).

There is no reason to expect such an elaborate museum on a small tropical island. Most players in *Animal Crossing* enjoy donating to Blathers and seeing their museum collections become complete—despite economic rhetoric about free-riding. Friends who visit your island can also enjoy the museum, and players are keenly interested in seeing what others have collected.

The social nature of *Animal Crossing* encourages activities that benefit the community. The museum is a particularly vivid example of players becoming so invested in game life that they willingly give up their time and resources to complete this task, foregoing earning hundreds of thousands of bells in the process.

More broadly, *Animal Crossing* expects players to behave “nicely.” Being nice and helping other characters is part of the game’s social contract. Three characters represent this aspect of game: Gulliver, a pirate who needs your help finding the parts to his communicator so his ship can come and rescue him; Wisp the Ghost, who scares easily and needs you to collect his lost spirit; and players returning lost items found on the ground to their owners. In each case, once you have done the socially responsible thing, the game gives you a reward such as bells, an item, or a DIY recipe for your efforts. These rewards reinforce the social contract that is part of the game experience.

Teaching Tip: Contributing to a public good often leads to the free-rider problem. What motivates someone to contribute to a public good? In society’s utility function, there is clearly room for nonmonetary compensation.

Figure 6. Blathers accepts a donation.



G. Cousin Redd: Asymmetric Information

“Buyer beware” sums up the character of Cousin Redd, whose ship docks at your island occasionally to sell artwork. When you first meet Redd, he asks if you are interested in buying a painting. When you inquire about the price, he quotes 500,000 bells—an absurdly high price. When you pass on the offer, Redd immediately pivots and drops the price to 5,000 bells—an entirely reasonable amount. Redd is using 500,000 as a reference point, knowing that consumers are more likely to buy when they think they are securing a deal.

But there is more to Redd than simply a foray into behavioral economics. There is a catch: many of Redd’s pieces are fake. It is up to you to spot the difference between the real paintings (which you can donate to Blathers’ museum to complete your art gallery) and the fakes (which the museum will not accept). Due diligence requires looking up the real work of art online (outside the game universe) and comparing the image to the art Redd is selling to determine which of his pieces are real. Most of the art Redd sells is fake.

In real-world markets where there is asymmetric information, adverse selection can cause people to pay less and lead markets to collapse. This does not happen in the game, because Redd’s prices are constant. Still, the cost of dishonesty takes two forms. First is the amount that the purchaser is cheated: 5,000 bells, in this case. Second, the existence of lemons would ordinarily drive peaches from the marketplace (Akerlof 1970). However, Redd continues to offer both real and fake paintings as if the law of lemons does not apply.

Teaching Tip: While Redd asks for a ridiculously high price, he quickly drops it when you refuse. This is what the invisible hand predicts should happen in a market. Also, asymmetric information can lead to fewer trades. If you bought a fake painting from Redd, would you deal with him again? What can be done to eliminate this information problem?

Figure 7. The museum curator, Blathers, breaks the bad news to a player that the art they purchased is fake.



H. Designing Your Own Island: Budget Constraints

In *Animal Crossing*, you have control over the game’s appearance. You can craft items and terraform the island, which means you can sculpt the terrain of the island itself and build a world that fits your preferences.

Every island also receives a computer-generated score (one to five stars) for its aesthetics. The game offers advice on how to make your island more beautiful (for example, the island is too cluttered, it has too many trees, or it has not enough paths). You are encouraged to plant flowers, terraform the island, and install structures.

Your virtual neighbors want to live in a world with amenities. The more the island appeals to them, the higher they rank it. This ranking is important because to begin terraforming, you need to achieve at least a three-star ranking. You can decorate your island to increase your ranking by adding furniture, flowers, pathways, and fences, among other things. Some items you can buy from Nook, while others require that you spend time crafting recipes and collecting ingredients from around the island to build them. These

features allow players to exhibit their preferences for what their world looks like.

The budget constraint is how much time players want to spend on the game. Subject to this constraint, players seek to maximize their utility functions.

Teaching Tip: What limits how fast you build your island? Any optimization model in economics is limited by a constraint. In this case, you have a budget constraint. You need more bells to build a better island, and it takes time to acquire bells. Further, the infinite variety of island designs is a clear illustration that utility is a personal preference.

Figure 8. *Animal Crossing* has an island rating system. Only the best islands earn five stars.



I. Planting Trees: Property Rights and Incentives for Preservation

One element that *Animal Crossing* emphasizes is sustainable income. You can regularly collect the items found on your island, and the other islands you visit, and sell them to Nook’s Cranny to earn bells. Some of the items that are available at zero marginal cost and regularly replenish include seashells, insects, fruits, fish, wood, and minerals. Collecting and selling these items provides the basic income players need to improve their island.

Animal Crossing also gives you the opportunity to design your island by planting bushes and trees, building bridges and homes, and terraforming your land to your heart’s content. But one element, planting trees and harvesting the fruit, is particularly suited for

providing long-run sustainable income. You can plant a tree by simply planting some of its fruit in the ground. If you plant fruit that is native to your island, you earn a sizable income. However, if you collect non-native fruit from the other islands you visit and plant it on your island, you can earn even more, as the fruit from non-native trees pays double.

Picking fruit from the fruit-bearing trees every three days when they ripen provides a simple lesson in creating a sustainable revenue stream. In other words, taking care of your property and not overharvesting the fruit leads to greater income over time—an important market lesson that is woven into the game-play fabric.

Teaching Tip: Property rights are a key facet of sustainability. In the commons, anyone can pick the fruit, so trees are over harvested. By limiting how many people visit your island, you can keep a close eye on your trees to make sure they produce the largest harvest.

Figure 9. Planting a forest of non-native trees produces a sustainable income stream for the player.



J. Triple Bottom Line: Profit Maximization

The phrase “triple bottom line” (TBL) was first introduced in 1994 by John Elkington, a self-described authority on corporate responsibility and sustainable development. The triple bottom line measures a company’s performance with three metrics: profits, people, and the planet. TBL theory holds that a firm that only maximizes profits is not accounting for the full cost of doing business. By explicitly considering the people it employs and the

environmental impact of its actions, the firm is fully internalizing all costs of production, which leads to a more sustainable enterprise than one that only maximizes shareholder value (*Economist* 2009).

One of the challenges for firms is the difficulty in measuring their social and environmental bottom lines. Earnings matter in the TBL, but not at the expense of social and environmental concerns. *Animal Crossing* has this concept perfectly covered. Yes, economic rewards matter tremendously. But the player is also incentivized by the in-game features to be socially responsible. For instance, characters will sometimes give you a gift when you talk to them. And, when you give gifts to others, they often reciprocate with a gift or pay you in bells, if they do not have anything to offer in return.

Players are encouraged to invite in-game characters to their island to create a social scene. The characters who visit, or decide to live on your island, enjoy the environment you have created, just like you do. They fish, sing, exercise, attend concerts, and get value from the landscape you have created. When those characters get bored because you are not interacting with them, they leave. From a social standpoint, you are building a small community where you, and the in-game characters, all enjoy one another’s company.

Equally important is the environment. Residents are encouraged to plant flowers, terraform the island, and install structures. Players receive rewards in the form of Nook Miles for doing this and enjoy the social benefit of being able to invite guests (other online players) to their islands.² A pleasing environment goes together with increased enjoyment from sharing your island with others.

Teaching Tip: The triple bottom line illustrates that money isn’t the only thing that goes into someone’s utility function.

² Nook Miles are like airline miles, although they can also be traded as currency and converted at a rate of one mile for six bells. You earn miles by traveling or completing certain tasks. For instance, after you have collected 100 weeds, you get a Nook Miles bonus.

Figure 10. The island has a recycling bin where players can deposit and claim items.



VI. Sample Lesson Plans

We have created two lesson plans for instructors to use in their courses. The instructor can play the game in front of the class (or on Zoom). It should not cost anything; due to the game’s popularity, it is likely that the instructor (or one of the students) can bring the console and game in to be played.¹

A. Hunting for Sharks (or other valuable things)

In *Animal Crossing*, you can find items and sell them for bells. Not every item has the same value, though. Some things, like great white sharks, are worth more than others, like the common sea bass. As you wander around your island looking for items to sell, you can determine if it is in your interest to collect more common items or wait for the big catch. In other words, you are weighing up the costs and benefits of collecting the common items.

To better understand these trade-offs, it would help to know how much each of the things you collect are worth. This should be easy to do.

Based on your wanderings, complete the table below. Total benefit is how many bells you have collected (or will collect when you trade for them) during the time you are playing. The cost of your

¹ At the time of writing, the game costs \$60 and the Nintendo Switch console costs \$300.

collecting is the time you spend. When computing the time spent looking for an item, keep a running total of the time.

For instance, if you spend one hour playing the game and you find the first sea bass in five minutes, the time in the first row would be five minutes. The time for the second sea bass would be how much total time it has taken you to find the second one. If you find the second sea bass at 12 minutes into your search, then the time spent looking would be 12 minutes in total. The marginal cost would then be the difference in the time spent looking, which in this case would be 7 minutes.

ITEM 1: _____

Quantity	Time spent looking	Total benefit	Marginal benefit	Marginal cost

ITEM 2: _____

Quantity	Time spent looking	Total benefit	Marginal benefit	Marginal cost

Discussion questions:

1. How would you explain the marginal benefit of the two goods you have collected?

Answer: The marginal benefit of the rarer good is much higher.

2. What is the difference in the marginal costs of the two goods you have picked up?

Answer: A common good should have a much lower marginal cost.

3. Does it make sense to search for the harder-to-find good?

Answer: This will depend on what the two goods are and the relative costs and benefits. Answering this question requires students to understand this difference. Also, it would be good to point out that each student is likely to answer differently based on their experience.

4. Is it possible to change either the marginal benefit or the marginal cost?

Answer: Again, depending on the goods the student is searching for, there may be some items that can be traded for more bells to some characters, although these would be relatively rare. Marginal costs can be reduced by being very lucky, or perhaps by trading with people who already have them.

5. Does it make more sense to donate the rare items you have collected or to sell them? Why?

Answer: This depends on how much utility you receive from contributing to the public good.

For advanced students: Have students find the optimal level of bass and sharks (or whatever two items they are collecting). Students should identify where the marginal utility of bass divided by the price of bass equals the marginal utility of sharks divided by the price of sharks. Already having found the marginal utility, the only missing variable is the price. In this case, the price is the amount of time spent fishing, which is the number in the second column of the table.

B. Investing in the Turnip Market

In *Animal Crossing*, you will meet Daisy Mae on Sunday. She will try to sell you turnips. You can buy as many as you can afford, but any turnips you do not sell within a week will spoil.

To better understand how the turnip market works, we invite instructors to play a simulated version of *Animal Crossing* with their classes for four weeks. Each student will start with one million imaginary bells.

Each Friday, you will collect the following from every student:

Do you wish to buy this Sunday (circle one)? YES/ NO

If YES, how many turnips do you wish to buy? _____

Collect all the student submissions, so you can keep track of each student’s earnings. Each student should also be given the following tabulation sheet, so they can calculate their earnings for themselves.

Week	Number of turnips bought	Paid price	Sold price	Profit/Loss
1				
2				
3				
4				

During the next four weeks, ask your students to keep track of price changes in the turnip market from Monday to Friday. Turnip prices change twice a day, so you will want to share with everyone the morning turnip price at the start of class each day. Give students the chance to sell their turnips at the morning price, at the afternoon price, or on a later day. (Note: The game does not require you to sell all your turnips at once; you can choose how many to sell.) Repeat this process throughout the week for four weeks. Think of a suitable award/prize for the student who earns the most bells over the course of play.²

This activity can work in any environment, whether teachers see their students in person or on Zoom, daily or less often, as long as prices are posted in a place where all students can see them and respond promptly. We do not allow students to trade on Saturday, which falls outside the bounds of the usual school week.

² Also, the way *Animal Crossing* is scripted, the potential rewards to the turnip market are greater than the potential losses. See Donnellan (2020) for details.

Discussion questions:

1. Describe how you felt when the price jumped after you sold in a particular week.

Answer: Your students will feel regret, one of the most powerful emotions, and one that may affect them in real life if they play the stock market. Stock markets are driven by a herd mentality. By going along with the herd, instead of doing market-based research and forming their own conclusions, individuals are more likely to feel regret after a loss and potentially take on more risk in the hope of “making back” what they have previously lost. In *Animal Crossing*, players often wait for a “big win” instead of cutting their losses by selling at a modest loss.

2. The turnip market rewards players who take on risk. Are you likely to win if you “play it safe” by selling early in the week to avoid a big loss when prices are falling?

Answer: No, conservative play will not “win” the simulation, but neither will it cause you to finish last. Differences in risk tolerances are normal. A conservative allocation will protect the wealth you already have.

3. How do you feel when the price you can sell at is below what you paid?

Answer: Students often use the purchase price as an anchoring point, meaning they wait until the selling price rises above it. Anchoring can cause investors to stay in the market longer than they should, waiting for a turnaround.

4. What are some differences between the turnip market and real stock markets?

Answer: The turnip market does not allow you to buy in with any knowledge other than the purchase price, which is in the range of 90 to 110 bells to start each week. Also, *Animal Crossing’s* turnip market always follows one of four patterns: (1) a huge price spike, (2) a small price spike, (3) high prices to start then decreasing prices, with an increase at the end of the week, and (4) decreasing throughout. The

actual stock market is statistically independent and there is no easily discernable pattern other than that the market has historically risen over time.

For advanced students: Have your strongest math students research the turnip market and serve as “turnip brokers” who recommend to the class when to sell. You can assign this role to a different student each week, so multiple students get to participate. Students will learn about volatility, risk taking, and the potential rewards and costs of entering the marketplace.

VII. Conclusion

Video games, like other media, can be a useful tool to illustrate the relevance of economic ideas. *Animal Crossing: New Horizons* provides economics instructors with a mainstream opportunity to teach about markets through a medium which, up to now, has been underused. The game provides a familiar setting for students to see the relevance of economic concepts in shaping the choices that players make when building their islands.

Animal Crossing is a particularly powerful platform from which to discuss the value of markets. In addition, the two lesson plans provided reduce the time cost of game development for the instructor and allow us to do what we do best: teach.

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