80 GAMES WITH 20 STUDENTS: A REVIEW AND CASE STUDY

Keith Jones

Abstract

The book *Around the World in 80 Games*, by Marcus Du Sautoy, is a collection of essays about board, card, and other games based on Du Sautoy's experiences traveling the world as a research mathematician. This article is a review of the book and a retrospective on its use as a foundation for a first-year general education seminar course on topics in gaming, targeting competency in critical thinking, information literacy, and global literacy.

Keywords

book review, education, pedagogy, popular ludology, mathematics, teaching with games, TTRPG, board games

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Du Sautoy, Marcus. *Around the World in Eighty Games.* New York: Hachette Book Group, 2023. 369 pages, Paperback w/ color illustrations. ISBN 978-1-66-863312-0.

Around the World in Eighty Games (hereafter *Eighty Games*), published in October 2023, is the latest popular mathematics book by Marcus Du Sautoy, who is the Simonyi Professor for the Public Understanding of Science at the University of Oxford, a fellow of New College, Oxford, and a Fellow of the Royal Society. As the title suggests, the book consists of 80 essays focusing on games and topics in gaming. Du Sautoy is an award-winning mathematician and a communicator of science, having earned honors from the Royal Society both for original research in theoretical mathematics and for popular communication of mathematics and science. This contribution to popular ludology continues his efforts in popular math and science communication and maintains the standard of quality that has led Du Sautoy to prominence beyond mathematical research. As much memoir as exposition, it shines a light on the deeply interdisciplinary nature of the study and development of games while being accessible to the interested casual reader, weaving fascinating historical details

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and approachable math among tales of Du Sautoy's travels as mathematician and boardgame afficionado.

The publication of *Eighty Games* coincided with my development of a new first-year seminar on games at the State University of New York (SUNY) Oneonta. SUNY Oneonta had just revised its General Education program to include a first-year interdisciplinary seminar on special topics as a "cornerstone of its General Education program."[1] Founded in active learning principles, discussion, and problem solving, these seminars introduce college-level work and reading expectations and the competencies of *Critical Thinking and Reasoning, Information Literacy,* and *Global Literacy*.[2] Notably, neither the book nor the course are targeted at math students.

This article first provides a brief overview of *Eighty Games* and then an examination of its use for two semesters as a primary text for that course, titled "Game On! An Exploration of Games from the Ancient to the Modern." We mention most, but not all, games by name, using italics to reference both games and essay titles from *Eighty Games*.

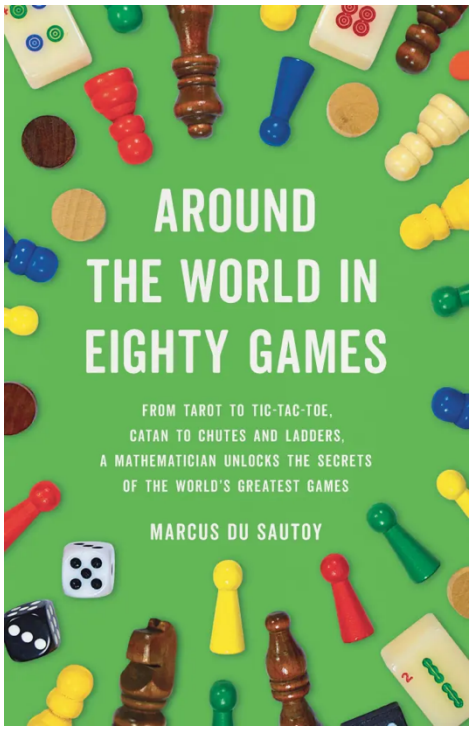

Figure 1: The book cover for Around the World in Eighty Games.

An Overview of Eighty Games

Du Sautoy's writing in *Eighty Games*, starting with his choice to model the book as an homage to Jules Verne's *Around the World in Eighty Days*, is rife with theme. He references Phileas Fogg's journey as an analog to his own travels, which allowed him to explore many cultures and the games they have brought into the world. Du Sautoy's passions for board gaming, travel, and mathematics are evident,[3] and he invites readers to relive his travels with him, learning about games and the people who play them. The book's journey weaves together a variety of topics in ludology: narrative and the human experience, culture and anthropology, mathematics and decision-making, as well as philosophy as psychology of games.

Eighty Games occupies the space between casual and academic reading, including an index and bibliography, but not in-text citations. Du Sautoy regales the reader with tales of his many encounters with people and games from around the world, which brim with historical details and tantalizing glimpses of related academic themes. It is not encyclopedic — the selection of games and topics was personal and intended to discuss "the philosophy, culture, mathematics, and sociology of the games we play,"[4] and it is clear that many of these games have marked destinations for him along his own journey.

Du Sautoy nods to the fact that each reader will take their own journey through the book by offering an optional gamification of the book itself, suggesting the reader roll dice to determine the reading order for the eighty essays. If we apply the ideas he espouses about *what makes a game great* to

[1] "Red Dragon Seminars," *SUNY Oneonta*, retrieved January 14, 2025, https://suny.oneonta.edu/academics/dragon-academy-general-education-program/red-dragon-seminars.
[2] "Dragon Academy General Education Program," *SUNY Oneonta*, retrieved January 14, 2025, https://suny.oneonta.edu/academics/dragon-academy-general-education-program.
[3] Marcus Du Sautoy, *Around the World in Eighty Games* (New York: Hachette Book Group, 2023), 3.
[4] Du Sautoy, 6

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this "game," we are forced to conclude that it is not a great game. However, some readers may enjoy that approach, and it does not need to be a great game to be a great book. When read by a class or other group, it is worth discussing whether to let the dice determine the order, read it straight through, or choose some other ordering. But the order it was written was chosen carefully, giving the feel of a journey to fit the theme, and also with a trend from the early history to the modern hobby and an interleaving of games and related topics. It is bookended by philosophical topics, including essays on scholarly attempts to define game and musings on games and life. About half the chapters cover games originating in a specific region, country, or continent, while the rest, named after seas, explore related gaming topics.

The focus of *Eighty Games* is analog games. The Mesoamerican game Pitz is the only sport highlighted, and one chapter is dedicated to video games. Unsurprisingly, *Dungeons & Dragons* is the only role-playing game mentioned. The collection is at times eclectic, but each essay adds value to what amounts to a well-rounded survey, and the essays are tied together with the thread of Du Sautoy's personal narrative. He does not shy away from the mathematics in these games; indeed, the book is in large part an effort to place fascinating and accessible mathematics in front of curious readers. In a fashion not uncommon in modern popular math (see, e.g., *Mathematics for Human Flourishing*, by Francis Su),[5] mathematical discussions are set apart in boxed text. Du Sautoy offers, "If these mathematical dives leave you feeling out of your depth, feel free to return to the surface."[6]

Eighty Games in the Classroom

The Class at a Glance

While Du Sautoy is a world-renowned mathematics researcher, the interdisciplinary nature of ludology takes him many places where he is not an expert, and he acknowledges this. As an academic creating a new interdisciplinary course not housed within my discipline, I found this forthrightness helpful both in developing the course and in communicating with students about how we can contribute to a discussion while acknowledging that we still have much to learn. In class, we discuss both Du Sautoy's and my own relevant credentials, and lack thereof, and the benefits we can still gain by exploring together. This has proved to be a good launching pad for the themes of rhetorical ethos and the scholarly conversation. It also clarifies the expectation that students will critically consider the perspectives of the author and their instructor alongside their own and voice disagreement with reasoned arguments when they feel it is appropriate.

Overall, the book is well-received by most students, who tend to be willing to engage with and comment on the readings. Du Sautoy's conversational style is approachable to new college students and provides many opportunities to connect with and build upon the themes of the book, which we develop together in discussions that consist of an initial online post, followed by in-person discussions, followed by "concluding" online responses. This structure both "primes" the in-class discussion and provides students options for expressing themselves. Students routinely bring up salient points from the book, often acknowledging that they have gained new perspective. In part, this is because the wide-ranging conversation touches on so many topics that are meaningful in their lives. For example, the quote "a novel may move you to tears, but a game can make you feel guilty for your actions" has evoked student reflections ranging from family *Monopoly* sessions to difficult choices made while playing *Red Dead Redemption.*

[5] Francis E. Su, *Mathematics for Human Flourishing* (New Haven, CT: Yale University Press, 2021).
[6] Du Sautoy, 5.

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One goal for this seminar was to provide first-year students with a sense of opportunity. This class is part of an introduction to the college experience, intended to be filled with doors that might be opened — and new paths followed — when interests are piqued. So, title of the introduction to *Eighty Games*, "Opening Moves" is suitable: we intertwine the ideas of starting a new game, introducing a new book, and beginning a new phase in life. Just as the opening moves in a game set the stage, the academic experiences a student has in their first year of college can have a powerful impact on the direction that journey takes. Throughout the course, I looked for "door openers" to call out, potential paths that students might step down in further exploration. One "opening move" I have used has been to play *Wits & Wagers* — a rare game that works well in very large groups — as a class in the first week, since it has characteristics that make for a good ice-breaker, giving students something to talk about, but also surprising them. They assume at first that it is a trivia game, but it is also about taking risks and hedging, which makes it a nice segue from the familiar to the new.

Eighty Games provided inspiration for the framing the course in terms of four broad themes:

- **The Landscape of Gaming** – *What is a game? Who plays games? Types of gaming discourse.*
- **Games and Social Discourse** – *Information literacy and socio-cultural issues.*
- **Games, Reasoning, and Decision-Making** – *Problem solving and decision-making, game theory.*
- **Games as Tools for Learning, Therapy, and Creativity** – *Games in the arts or as art, gamification, games and research or therapy tools.*

Even for a survey course, there is far too much here to cover. In practice, I have incorporated ideas from the final part into first three, and I am restructuring the course to reflect this. The reading order for *Eighty Games* was selected to pair with these themes. While we play some games in class, it was built around discussion and activities. After a debrief with my students during the second semester, I have resolved to fit more gameplay that serves the learning objectives into future iterations of the course.

Assignments consist of online and in-class discussion from *Eighty Games* and paired readings, class activities, reflections, and the following three major assignments:

- **Exploring the World of Gaming.** Introduced early in the semester, this aims to help students get more comfortable speaking to large groups. There is a two-minute oral game recommendation, with one or two "share-outs" per meeting, spread throughout the semester, and a five-minute slide show presentation on "Games I'd Like to Try," which also asks students to practice crediting sources.
- **Review of the Review.** This involves a rhetorical analysis of a board or video game review along with creating a "review" of how well the selected game review accomplished its goals.
- **Gaming UnEssay Project.** This project is scaffolded over the final month of the semester, culminating in a final presentation and statement. The freedom of an UnEssay (a project where the specific topic, medium, and format are up to the student) is intimidating to first year students, but scaffolding and early discussions help set them on track. The second time I ran the course, I invited a student from the previous semester to present their work, which

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helped smooth the initial steps. Throughout the semester, I encourage students to consider potential project ideas, and I make it clear that this is an opportunity to either leverage a skill they already have or to try something new, since they are not being graded on their ability with the chosen medium or on research methodology, but on their engagement with the process and their reflection in on what
they learned through the experience.

The Landscape of Gaming

On Gaming Discourse

We begin the class by trying to get a sense for the world of gaming and the many types of related discourse. Three short assignments at the beginning of the semester get students thinking about the landscape of gaming. First, I ask them to use the table of contents for *Eighty Games* to select three essays they feel most interested in reading, based only on their titles, and provide brief explanations for their choices. I also ask them to reflect on their experiences with gaming and provide a personal narrative. Finally, I ask them to find three sources online that explicitly or implicitly claim to speak authoritatively about games, gaming, or play, and provide a little bit of information about them, including what kind of media they are (for example, scholarly, corporate, industry blog, governmental regulation, etc.) We discuss these together and try to "lay out the map" of gaming discourse on the board as an exercise in examining the landscape of gaming and to set the stage for interrogating sources of information.

Eighty Games itself is a major part of the discourse that we dissect, and Du Sautoy's early comments on gaming fit into this landscape. His criteria for a "great" game[7] have been a focal point for class discussion and provide an opportunity for students to take in the author's perspective critically and ask questions like: *Do I agree? On what authority is the author speaking? Is this a matter of fact or opinion?* This could be taken a step further by asking the students to critique his ideas and develop their own list of what makes a game great.

Students tend to be intrigued by the discussion of attempts to define games and play introduced in *Homo Ludens* with the ludology scholars Johan Huizinga and Roger Caillois. We explore this further with Wittgenstein's *Language Games*, examining the broader use of the word "game," as well as the difficulty of defining words and how we understand them through use. Bernard Suits' *The Grasshopper* shares the satisfyingly punchy "playing a game is a voluntary attempt to overcome unnecessary obstacles." This bit of philosophy early in the semester tends to be eye-opening. Some students latch on to the discussion that when money or other gain is involved, "play" might turn into work, and the concept of "grinding" in video games is brought up. One might ask students to dig deeper into defining games with an article such as Thomas S. Henricks' piece,[8] which explores the distinctions between Huizinga's and Caillois' perspectives.

Games and Social Discourse

Information literacy by its nature is scattered throughout the course, but we try to focus on it explicitly here, along with issues of global and social awareness.

[7] Du Sautoy, 7.
[8] Thomas S. Henricks, "Caillois's *Man, Play, and Games:* An Appreciation and Evaluation," *American Journal of Play* 3, No. 2 (2010): 157-185.

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On Games and Spirituality

Beginning our "journey" with the earliest recorded games in the Middle East, including *Senet* and *The Royal Game of Ur*, we highlight the significance of spiritual life, divination, and fascination with the afterlife in early gaming. This theme recurs throughout the book, appearing in *Snakes and Ladders* and Pick-up Sticks. In *Games and Riddles*, about spirituality and the Norse game *Hnefatafl*, Du Sautoy notes that riddles about this game are thought to have influenced J.R.R. Tolkien in writing *The Hobbit*. However, *The Buddha's Banned Games* provides a counter-thread on religious attempts to control play, continued in *The Mansion of Happiness*, which eschews dice in favor of a dowel to discourage gambling. Du Sautoy points out the irony that spinning tops have also long been a tool for gambling. These discussions open the door to explore similar, more recent, issues in gaming, such as the "satanic panic" with *Dungeons & Dragons* or moral panic over video games.

On Cultural Interactions, Colonization, and Appropriation

In India and China, we explore the early history of card games (*Ganjifa Cards* and *Zi Pai*, *Khanoo*, and the Origins of Playing Cards) and tile games (*Dominos* and *Mah-jong*), and cards are revisited with *Whist*, *Bridge*, and the essay "Spades, Hearts, Diamonds, and Clubs." Du Sautoy's assertion that a pack of cards is "one of humanity's most extraordinary inventions"[9] is backed up by his brief vignette on the math of the perfect deal; but also cards games tend to have a certain universality, enabling most students to find the topic relatable. Card collecting in *Lady Charlotte and the Game of Parliament* segues into a fascinating glimpse into the origins of Tarot, examining the writings of Michael Dummett and Olivia Mann.[10] Most students will not be aware that Tarot originated as a game and has only recently been adopted by believers in the occult. We also learn here that trump (*trionfi*, "triumph") cards first appeared in Tarot. In Japan, Du Sautoy was introduced to *Hanafuda*, linking analog and digital gaming through Nintendo, which was founded in the late 1800s to sell hanafuda cards. His choice to focus on Pokémon for collectible card games is in large part due to his personal experience with it, but there is substantive consideration given to *Magic: The Gathering* as the originator of the genre, as well.

Appropriation is a critical topic in modern gaming, and *Eighty Games* has multiple passages on this topic. Some of Du Sautoy's earliest and most impactful personal brushes with historical board games occurred during his childhood visits to the British National Museum. In *The Royal Game of Ur* he acknowledges that collections like those at the British Museum often come from artifact theft:

> My nine-year-old self didn't question why a museum in London should be home to a game from Mesopotamia. But returning to gaze on the game as an adult, I am acutely aware that the fascination of earlier generations with collecting artifacts from around the world robbed those cultures of their heritage. It is a valuable reminder as I make my own journey around the world: there is a fine line between celebrating a culture through exploration of its games and plundering those games disrespectfully for my own amusement. Even if a physical game isn't stolen, an idea can be.[11]

In class, this has generated lively discussion, ranging from distinguishing between inspiration and outright plunder to how different cultures may conceptualize sharing and ownership. Examples that

[9] Du Sautoy, 127.
[10] Michael Dummet and Olivia Mann, *The Game of Tarot: From Ferrara to Salt Lake City* (Duckworth, 1980).
[11] Du Sautoy, 16.

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arose in these discussions include the how *Dread* and *Star Crossed* utilize the mechanism from *Jenga*, *Mysterium*'s application of *Dixit*-style art, and *Monopoly* copying *The Landlord's Game*.

Many students are eager to discuss *Monopoly*, as it remains perhaps the most popular mainstream board game. The fact that it was based without attribution on the very similar *Landlord's Game* by Lizzie J. Magie is interesting news to many students, but perhaps of more interest is that the *Landlord's Game* itself is thought to have been inspired by the indigenous American game *Zohn Ahl*, offering an opportunity to contrast evolution in game design versus copying.

Du Sautoy is also explicit about his effort to be inclusive of cultures affected by colonization in his chapters on South and Central America, Africa, and Australasia. While discussing the Māori game *Mu Torere*, which offers an opportunity to study ethnomathematics,[12] he laments "it was a familiar story: the Europeans who came to the region in the eighteenth and nineteenth centuries brought the games they loved playing, and those familiar games ended up defining the gaming culture up to the present."[13]

Games from South and Central America illustrate the play of indigenous games alongside the adoption of non-indigenous games into a culture. Among *Mexican Bingo* (*Loteria*), *Sapo, Jogo do Bicho, Adugo and Komikan, Truco, Perudo (Liar's Dice)*, and *Pitz*, there is much opportunity to explore cultural interactions as well as potentially parallel evolution. In class, when students have spoken about their experiences playing *Loteria* and *Truco* with family, this has led to greater engagement on the cultural significance of these games.

The games from Africa also provide plenty to talk about. Among U.S. students, *Mancala* is certainly the most famous African game; and this and other games from Africa, such as *Achi* and *Bolotoudou*, which are more interesting alternatives to *Tic-Tac-Toe*, offer opportunities to explore strategies and decision making in games. The Nigerian card game *Agram*, known throughout Africa by numerous other names, opens discussion of the slave trade and Brenda Romero's game *New World*, an educational game about the horrors of the Middle Passage. *Gulugufe* and *Fanorona* give examples of cultural cross-pollination with India as well as possibly parallel evolution of the "jump over to capture" game mechanic seen in checkers, *Adugo* and *Komikan*, and *Fox and Geese*.

On Inclusivity, Representation and Community-Building

L'Attaque and Women in the Gaming Industry covers the issue of gender imbalance among game designers and introduces Hermance Edan, designer of the Stratego predecessor *L'Attaque*, and *Wingspan* designer Elizabeth Hargrave, as well as Gemma Newton (*Plotalot*) and Brenda Romero (*Train*). I pair this with a reading of Hargrave's guest blog post[14] on the *Stonemaier Games* blog, which presents a personal perspective from an industry insider and also cites the work of Pobuda[15] on representation. I also share Pobuda & Jones' work on gender inclusivity in board game

[12] M. Ascher, "*Mu Torere*: An Analysis of a Maori Game." *Mathematics Magazine* 60, no. 2 (April 1987): 90-100.
[13] Du Sautoy, 169.
[14] Elizabeth Hargrave, "Inclusion, Diversity, and Representation in Board Games and Beyond (guest post by Elizabeth Hargrave)," *Stonemaier Games Blog*, July 23, 2020, https://stonemaiergames.com/inclusion-diversity-and-representation-in-board-games-and-beyond-guest-post-by-elizabeth-hargrave/.
[15] Tanya Pobuda, "Assessing Gender and Racial Representation in the Board Game Industry," *Analog Game Studies* 5, no. 4 (December 2018), https://analoggamestudies.org/2018/12/assessing-gender-and-racial-representation-in-top-rated-boardgamegeek-games/.

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rulebooks[16] along with industry reports such as The Geena Davis' Institute's *Changing the Narrative*.[17] From an information literacy perspective, it is useful to compare and contrast books such as *Eighty Games*, industry insider posts such as Hargrave's, interest group documents, and scholarly works. I also asked students to watch a brief documentary on the creation and marketing of *Jenga*, designed by Leslie Scott, on the YouTube channel *Seize the Play*.[18]

It is clear that Du Sautoy's limited experience playing *Dungeons & Dragons* was impactful; the "games can make us regret our actions" observation made earlier resonates as he reflects upon how easily his family fell into the "murder-hobo" pattern, in which player-characters disconnected from consequences choose to solve all of their in-game problems with violence. *D&D* is a highly anticipated topic among students, and he covers much ground in few pages, offering lessons on the value of diversity in building teams, creating safe spaces to explore identity, how games can bring people together, as well as hinting at therapeutic value in games. He contrasts how *D&D* taps into "the very human need to sit around the campfire and tell stories"[19] with the performative nature of social media. There are many possible paired readings, but Blakinger on *Dungeons & Dragons* in prison[20] and Abramson on roleplaying-games as therapy[21] are good options. It could be beneficial to include a role-playing game as a class activity, though I haven't found the right game yet. In addition to his pitch for *D&D*'s ability to promote diversity in team building, the Equilateral Triangle game, an improv icebreaker game,[22] can be used with the class to illustrate self-organization and collaboration.

On Information and Media Literacy

Students tend to have a fair amount to say about gamification, sharing experiences with sites like *Kahoot!* and *Sumdog*, so Du Sautoy's introduction to his own *MangaHigh.com* is more a launching point for this topic than a focus. I ask the students to play the web game *Bad News*,[23] which utilizes inoculation theory to educate its players to better resist online misinformation strategies, allowing me to serve two goals by using gamification to explore information literacy. Student reflections show this to be a very popular activity, and they happily to discuss their ideas about misinformation gleaned from the game.

The Game of Life introduces John Conway's pioneering cellular automaton, which Du Sautoy uses to discuss the idea of Turing-completeness (also noted in discussing *Magic: the Gathering*), but in this class I find it more relevant to introduce simulations as a way to learn about social issues. I share

[16] Tanya Pobuda and Shelly Jones, "An Analysis of Gender-Inclusive Language and Imagery in Top-Ranked Board Game Rulebooks," *Analog Game Studies* 7, no. 2 (December 2020), https://analoggamestudies.org/2020/12/an-analysis-of-gender-inclusive-language-and-imagery-in-top-ranked-board-game-rulebooks/.
[17] "Changing the Narrative: Why Representation in Video Games Matters," *Geena Davis Institute* (2023), https://geenadavisinstitute.org/research/changing-the-narrative-why-representation-in-video-games-matters/.
[18] "Leslie Scott Shares How She Invented Jenga," *Seize the Play*, November 26, 2020, video, https://www.youtube.com/watch?v=eu0ROfLWiz4.
[19] Du Sautoy, 161.
[20] T. Blakinger, "The *Dungeons & Dragons* Players of Death Row," *The New York Times* (August 31, 2023), https://www.nytimes.com/2023/08/31/magazine/dungeons-dragons-death-row.html.
[21] A. Abramson, "Improving Treatment with Role-Playing Games," *Monitor on Psychology* 56, no. 3 (April 1, 2025): 58, https://www.apa.org/monitor/2025/04-05/role-playing-games-therapy.
[22] "Improv Comedy Icebreakers: Equilateral Triangle," *ExpertVillage Leaf Group*, December 11, 2002, video, https://www.youtube.com/watch?v=4OKPEgUpYq4.
[23] *Bad News – Play the Fake News Game,* Cambridge Social Decision-Making Lab, Cambridge University, May 21, 2025, https://www.getbadnews.com/en.

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the article "Seeing Around Corners" by Jonathan Rauch on the legacy of Conway's *Game of Life*[24] to scientific research, such as the work of Thomas Schelling, as well as the opportunity to "play" *Life* on websites. Much more could be explored about the relationships between games and simulations, but we focus on the connections between gamification, simulations, and issues of media consumption and implicit bias by exploring *The Parable of the Polygons*,[25] an interactive exploration of emergent segregation inspired by Thomas Schelling's work, and *We Become What We Behold*,[26] "a game about news cycles, vicious cycles, infinite cycles," the latter of which I added upon the recommendation of a student.

On Games, the Arts and Human Experience

The theme of Games in the Arts get its own eclectic chapter exploring "the interesting dialogue that games have not had with mathematics, but with the creative arts."[27] We explore the murder-mystery genre with *Cluedo* (*Clue* in the US), focusing mostly on Agatha Christie. This and "*Azad* and *The Player of Games*" continue the theme of games and literature that begins with "The Master of *Go*" and is wrapped up with Hermann Hesse's *The Glass Bead Game*. We touch on music theory and randomness with *Mozart's Dice Game.* Musically inclined students have enjoyed exploring the relationship between music and video games; in both semesters, students have chosen to create scores or arrangements for either existing or hypothetical video games as their UnEssay projects.

While Du Sautoy sets other fictional games like *A Game of Thrones's Cyvasse* and *Harry Potter's Wizard's Chess* aside as a mere "distraction for the book's characters,"[28] some students find these to be relevant entry points into the discussion, for example arguing for the significant role that *Wizard's Chess* played in the character-developing climax of *Harry Potter and the Philosopher's Stone*. This connection between games, play, and literature offers yet another enticing doorway. While work has been done — see e.g. Detweiler,[29] which offers a broad survey of games, play, and playfulness in literature or Gualeni[30] which targets imaginary games such as *Azad* or *The Hunger Games* — it seems there is ample room for continued examination.

While almost all students can speak to some analog gameplay, most students' experiences come from video games, including both solo and communal experiences, and so much classroom discussion will cite experiences with video games. In *Prince of Persia*, we get the sense of deep immersion that video games can create as well as the ability of even single-player games to bring people together. However, Du Sautoy's lamentation about the "rather antisocial nature of playing on your own"[31] seems poorly considered, given that even single-player games can provide a foundation for deep social connections and community-building. Many of the great conversations in class are about common experiences with single-player games.

[24] Jonathan Rauch, "Seeing Around Corners," *The Atlantic* (April, 2022), https://www.theatlantic.com/magazine/archive/2002/04/seeing-around-corners/302471/.
[25] V. Hart & N. Case, *The Parable of the Polygons*, 2014, https://ncase.me/polygons/.
[26] Nicky Case, *We Become What We Behold by Nicky Case!*, 2016, https://ncase.itch.io/wbwwb.
[27] Du Sautoy, 173.
[28] Du Sautoy, 179.
[29] R. Detweiler, "Games and Play in Modern American Fiction," *Contemporary Literature* 17, no. 1 (1976): 44-62.
[30] Stefano Gualeni, *Fictional Games: A Philosophy of Worldbuilding and Imaginary Play* (London: Bloomsbury Publishing, 2023).
[31] Du Sautoy, 248.

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Games, Reasoning, and Decision-Making

On Winning Games

There are many vignettes in *Eighty Games* that allow a class to explore reasoning and quantitative decision making. The early essays on Backgammon, Rolling Bones, Polyhedral Dice, and The Doubling Cube introduce the first of Du Sautoy's mathematical sidebars on the Platonic solids (recognizable to any *D&D* player) and strategic probabilities in *Backgammon*. His discussion of a famous allegory about grains of rice on a Chess board makes the significance of exponential growth — a concept with which informed adults must be familiar — concrete. Similarly, the logical deduction puzzle provided with *Cluedo* can engage students in logical argumentation. Activities and discussions along these lines are sprinkled throughout the course.

We explore reasoning about winning games as a segue to game theory. A typical introductory game theory question is: *In a given game, does the first or second player have an advantage?* In *Chocolate Chili Roulette*, there is a pile of chocolates on a table and a single hot chili pepper, and two players take turns removing chocolates, either one or two at a time, until none are left. The losing player is the one who cannot take chocolates on their turn, and they must eat the pepper. I ask the students: Do you want to be the first player or the second? *Nim*, a similar but deeper game whose historical predecessor is the Chinese game *Tsyan-shizi*, follows the same principle. Du Sautoy tells of beating elementary students at *Chocolate Chili Roulette*, so the reader can feel comforted knowing they are receiving a gentler lesson than those students did! But the topic is also gentle in that the math to analyze this game is simple and intuitive, among the most accessible math in *Eighty Games*. Both hygiene concerns and a desire to avoid punishing my students by making them eat hot peppers led me to use an alternative game in the classroom, called *21 Count-Up*. In the version we played, beginning from 0, players take turns adding 1 or 2 until someone can say "21". That person wins the game. It is quick to learn and play, so we can explore multiple rounds in class, tracking wins and losses, and asking students to consider what strategies work as they try to build a theory of how to win.

There are a number of other simple and either familiar or easy-to-learn games that can work to similar effect, but I appreciate *21 Count-Up* for its reliable and elegant efficiency in allowing students to discover and vocalize strategy. Another example that may be worth exploring as a class is the "pen and paper" game *Pipopipette [Dots and Boxes]*, invented by the number theorist Eduard Lucas (also famous for inventing *The Towers of Hanoi*), which has a strategy that is more interesting than, say, *Tic-Tac-Toe*. Games, like the classroom and the sports field, are (or should be) a safe context for building skills that can translate to the real world. By understanding that we can think logically and quantitatively to obtain better outcomes in games, and by practicing decision-making skills, we are practicing the skills that can lead to better outcomes in other contexts. Transfer in learning, the application of knowledge or skills from one context to another, is notoriously difficult to achieve, but we can be explicit about its value to students.

On Shifting Perspective

In *Nim*, the reader who sticks with the discussion is shown a new counting trick, but this time counting in binary. While more challenging, this discussion is remarkable for showing how shifting one's perspective a on problem can lead to unexpected solutions. Binary comes up earlier in the book with *Pick-up Sticks*, wherein Du Sautoy connects the ancient *I Ching*, a Chinese philosophical and divination text, to modern computing through binary. This connection can be further explored

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with a paired reading from the Guardian.[32] Using binary with *Nim* illustrates the value of alternative perspectives and is perhaps an apt piece of math for a class on games, since it makes students play by different rules.

In a similar vein, one of the history's most famous examples of "playing by different rules" is the emergence of non-Euclidean geometry, an extended story of humanity's grappling with the reality that our perceptions are not definitive, and that finding avenues to perceive differently can offer great value. Du Sautoy covers this in *Spacewar!*, but I like to begin by asking my students "*what is the shape of Pac-Man's world?*" to explore the torus and challenge our notions of space. We watch a video exploring non-Euclidean space and talk about games featuring non-Euclidean geometry, and I ask them to create a short sales pitch and sell-sheet, either for a new game or a modification to a game, featuring non-Euclidean geometry. From a survey at the end of class, I was surprised to find that among a small, but vocal, group, this was seen as least helpful assignment; some enjoyed the "sales pitch" and "sell sheet" but saw less value in exploring non-Euclidean games.

On Game Theory

With *The Ultimatum Game*, Du Sautoy discusses his encounter with, and the work of, Nobel-prize winning Israeli-American game theorist Robert Aumann. Despite, or perhaps because of, the heaviness of this topic, students have not seemed inclined to discuss it. I have tended to focus on allowing student interests to direct conversation, saving my own contributions to highlight connections to the learning objectives or between the ideas we have seen. The game theory theme continues with one of its most famous topics, *The Prisoner's Dilemma*, including its origins and its relevance to the history of computer science, going into detail on Robert Axelrod's famous algorithmic competition with winning strategy "Tit for Tat," which is as relevant to sociology as computing. This highlights that sometimes the better question is about what happens over multiple iterations of a game, rather than in a single instance. This is a premise in studying games of chance, but *The Prisoner's Dilemma* shows that inherent randomness is not a requirement for a game to be best analyzed this way.

The relevance of psychology to these questions, traditionally ignored by game theory's assumption of rational actors, speaks to an ample opportunity to explore connections between game theory and social deduction games. One approachable scholarly article connecting these is by Wiseman & Lewis,[33] which analyzes the game *Betrayer's Banquet*, evocatively reviewed by Quintin Smith[34] and discussed in a GameTek segment of the *Ludology* podcast.[35] Betrayer's Banquet is a social dining game (players attend an actual banquet) which brings the iterated prisoner's dilemma to life.

On Large Numbers, Probability & Randomness

Games are extraordinarily fertile ground for exploring counting and probability, which offers many mind-bending learning moments. In class we discuss the beautiful and mind-blowing mathematics of

[32] D. Walter, "The Ancient Book of Wisdom at the Heart of Every Computer," *The Guardian,* March 21, 2014, https://www.theguardian.com/books/2014/mar/21/ancient-book-wisdom-i-ching-computer-binary-code.
[33] S. Wiseman & K. Lewis, "What Data do Players Rely on in Social Deduction Games?," *CHI PLAY '19 Extended Abstracts* (October 2019): 781-787.
[34] Quintin Smith, "Review: Betrayer's Banquet," *Shut Up & Sit Down*, October 23, 2013, https://www.shutupandsitdown.com/review-betrayers-banquet/.
[35] "GameTek 70 – Betrayer's Banquet," *The Ludology Podcast*, December 8, 2013, podcast, https://ludology.libsyn.com/webpage/game-tek-70-betrayer-s-banquet.

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"the perfect deal," and the astronomically large number of possible arrangements in the shuffling of a deck: "To get a sense of the size of this number: if everyone on earth had dealt cards at one deal per second for the lifetime of the current universe, we still wouldn't have dealt that many hands."[36] It is satisfying that something as common as a pack of cards provides an ideal example of how readily numbers arising from counting possibilities tend to outpace numbers arising in the physical world. Other discussions of numerical analysis in gaming are found in *Catan*'s modular board, as well as examinations of game balance in *Risk* and *Ticket to Ride*.

If a pack of cards can show us that the world is perhaps larger than we imagined, then a class might also explore the "birthday paradox", a similarly unintuitive result that shows the world is often smaller than we expect: in any group of 23 people, there is a slightly better than 50% chance that two people share the same birthday. One might begin by asking students, "given that there are 365 days in a year, how many people do you think would need to be in the room before the likelihood of at least two of them sharing a birthday is greater than 50%?"

We also try to build some intuition for probability with *The Casino*, which tends to entice some students for whom gambling holds a kind of glamor. The applied probability of understanding how casinos work an opportunity to practice some critical thinking and information literacy that can have a very real impact. It is not difficult to fit in a mini-lesson on expected value with an activity to simulate rounds of gambling, observing the typical result when the house sets the odds.

Rock-Paper-Scissors provides a remarkable example for studying the unintuitive nature of randomness and the difficult we have in simulating it. Du Sautoy shows how pattern-defying transcendental numbers such as π can be useful. In class, we do an activity in which some students flip 100 coins while others fake 100 flips, keeping secret which is which. The results are put on the board and students guess which were truly random and which were fake. The inspiration for this activity came from an episode of the podcast Radiolab in which they talked through a similar activity facilitated by Professor Deborah Nolan, of University of California, Berkeley.[37] I cannot help but think of the meme *RNGesus*,[38] where people apply a divine will to the randomness so common in gaming. I use a roll-and-write "proto-*Catan*" with a given board configuration and focused only on die rolling, akin to *Machi Koro* or *Space Base*, to effectively explore probability as a class and help students move away from the commonly expressed misconception that randomness means your choices do not matter and toward understanding that because some outcomes are more likely, decisions based on understanding of probability can lead to better long-term results. Finally, from a game design perspective, I cannot resist asking students to reflect on input randomness versus output randomness and the role they play in creating a gaming experience.

On Technology, Artificial Intelligence, and Information Theory

Scrabble and *Wordle* introduce frequency analysis, cryptography, and information theory. Du Sautoy quotes former US National Scrabble Association Director John Williams, noting that competitive Scrabble "is a math game. It's like poker. It's all about probabilities," and he provides an example on the problem of choosing the best starting word in *Wordle*, which is very accessible and shows the power of taking time to find a reason approach to solving the puzzle. The applied logic of word games and information theory feel strongly connected to social deduction games, and I found it

[36] Du Sautoy, 133.
[37] J. Abumrad, "Stochasticity," *Radiolab.org*, June 15, 2009, podcast, https://radiolab.org/podcast/91684-stochasticity/transcript.
[38] "RNGesus," *Wiktionary*, May 16, 2025, https://en.wiktionary.org/wiki/RNGesus.

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useful to make this explicit in my class by having my students read Nancy Foasberg[39] on using *Spyfall* to teach about the scholarly conversation. In class, we play a round or two of *Werewolf* to similar effect. It would also be easy include a cryptogram activity explicitly focused on frequency analysis, perhaps leading deeper into cryptology by investigating simple rotation cyphers such as the Caesar cypher. There are also many word games that might work well for exploring information theory and critical thinking in the classroom, from quick rounds of *Just One* or *Codenames* to perhaps the more involved or mind-bending *Letter Jam*, *Decrypto*, or *That's So Clover*.

Gaming has historically been one of the most common applications of applied artificial intelligence and a proving-ground for AI research. In *Tic-Tac-Toe*, Du Sautoy finds an excuse to investigate an early example of "game AI," and in both *Chess* and *Go*, we see milestones of artificial intelligence in gaming. Given the increasing prevalence of large language models and generative AI, the topic of machine learning is ever more relevant to both information literacy and ethics.

Concluding Our Journey

Having begun with ancient games in the Middle East, Du Sautoy comes full circle to modern analog gaming back home in Europe. Germany's culture and history of board-gaming are noted in *Spiel Des Jahres*, and *Pandemic* provides a case study for collaborative games. In "The Best Board Game Ever," Du Sautoy makes his case for *Catan*, whose modular design was an eye-opening innovation that lured many of us to (or back to) board games. Two other games that may be familiar to hobbyists are *Dobble* (*Spot It!* in the US) and Set, which both involve real-time "searching" among cards and have rich connections to the fascinating mathematics of finite geometries. He notes that *Set*, which may also be familiar as a puzzle offered by the *New York Times*, was originally invented by population geneticist Marsha Jean Falco as a result of her studying epilepsy in German shepherds, illustrating the undefinable value of playful exploration.

He closes another loop by ending on philosophical notes with "*Mornington Crescent* and Nongames", "Infinite Games and *The Glass Bead Game*." *Mornington Crescent* appeared as part of the BBC radio show *I'm Sorry I Haven't a Clue*. Like the gameshow *Numberwang!*[40] from *That Mitchell and Webb Look*, *Mornington Crescent* is a nongame[41]—a "game" (perhaps fictional) which does not have clear rules, often for absurdist humor. He dutifully brings up a similar phenomenon, *The Game*, which you just lost. In "Infinite Games," Du Sautoy discusses the 1986 book by religious scholar James P. Carse, whose "whoever must play cannot play" provides an example of a meaningful paradox revisiting the nature of play. Finally, we arrive at what he professes to be his favorite game, *The Glass Bead Game*, a fictional game in the book of the same name by Hermann Hesse, which feels like an intellectual home for Du Sautoy. He notes: "…when I read the book, I became obsessed with trying to play this game, and I think everything I've done since that moment has been an attempt to become a master of it," going on to explain that "players of the game are expected to synthesize themes from music, mathematics, history, linguistics, philosophy, and art, woven together almost like a story as the game proceeds."[42]

[39] Nancy Foasberg, "*Spyfall*: Information Games and Scholarly Conversation," *College & Research Libraries News* 78, no. 4 (2017), https://crln.acrl.org/index.php/crlnews/article/view/9653/11094.
[40] *JAAM Studios*, "Numberwang! Episode 1," December 20, 2014, video, https://www.youtube.com/watch?v=0obMRztklqU.
[41] DiceSully, "*Mornington Crescent* (Original Modern Rules)," August 1, 2014, video, https://www.youtube.com/watch?v=OjOsOB4erZI.
[42] Du Sautoy, 334.

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While Du Sautoy remarks, "this book can be regarded as an attempt to play Wittgenstein's *Language Game*,"[43] it is as suitable to call it an admirable attempt to play a round of *The Glass Bead Game* – a playful contribution to the deeply interdisciplinary world of ludology. He writes of mathematicians, "we love doing math for the sheer playing of the game,"[44] a sentiment which can be broadened to all academics, as the appeals of academic pursuits are as broad as the types and themes of games that people play. My appreciation for *Eighty Games* has improved upon revisiting it, just as Du Sautoy's did with *The Glass Bead Game*, and just as players can expect from a great game. However, Du Sautoy also took away the lesson that "putting the game back in the box and moving on is as important as that exciting moment when you first throw the dice or move a pawn or play a card at the beginning of the next game,"[45] which we should keep in mind.

The pages of *Eighty Games* provide far more fodder for classroom discussion and discovery than can fit in a single semester, and they offer many opportunities to explore critical thinking, understanding global relationships, and information literacy. As an academic and educator, it is my mission to reach out to my students and serve as a kind of guide to the academic paths that lay waiting before them, inviting them to adventure, if they so desire. *Eighty Games*, a celebration of games and life and passionate pursuit of understanding, offers an engaging toolkit to begin that journey.

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[43] Du Sautoy, 4.
[44] Du Sautoy, 335.
[45] Du Sautoy, 336.

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