

# **CCT270**

# **THE PRINCIPLES OF**

# **GAME DESIGN**

**CLASS 2 : PLAY AND HISTORY**

**PROFESSOR STEVE SZIGETI**  
**FALL 2025**

# AGENDA

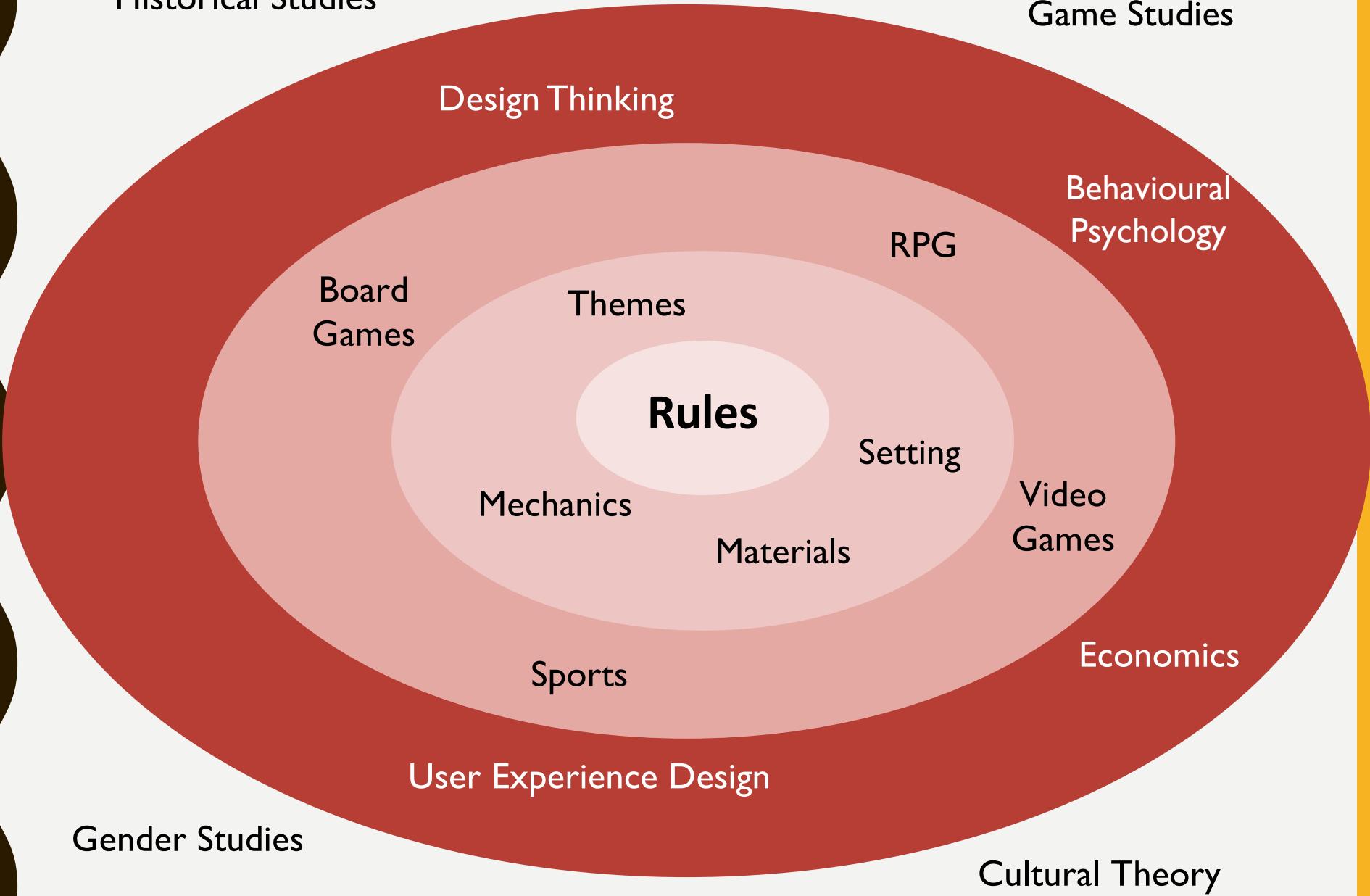
- Review
- The study of Play
- Games
- Sports
- Ancient games
- Dice
  - Exercise: Probability
- Early Board Games
  - Exercise: Snakes & Ladders
- Post WW2 Games
  - Exercise: When Did It Launch?
- Next Class

## Required Readings

- Tekinbas, K. S., & Zimmerman, E. (2004). Chapter 22: Defining Play. In Rules of play : game design fundamentals. The MIT Press. Pp 465-483.
- Williams, A. (2017). Chapter 2: Games as Experiments. In History of Digital Games: Developments in Art, Design and Interaction (1st ed.). Routledge. pp 29-50

## Recommended Readings

- Freyermuth, G. S., Czauderna, A., Pozzi, N., & Zimmerman, E. (2015). Games (1st ed.). A Short History. pp 161-164.
- Stahlke, S. & Mirza-Babaei, P. (2022). Chapter I: Caveman Arcade from The Game Designer's Playbook: An Introduction to Game Interaction Design. Oxford University Press. pp 1-16.



# EVALUATION

## **October 24: Mid Term Test.**

Format: Multiple choice and short answer

Weight: 15% (individual grade)

## **November 7: Exhibition Catalogue**

Weight: 20% (in pairs)

## **November 10 (Monday): Game Design Research**

Format: Written document submitted via Quercus

Weight: 5% (group)

## **November 28: Game Design Pitch**

Format: Oral presentation

Weight: 10% (group)

## **December 1: Game Design Document.**

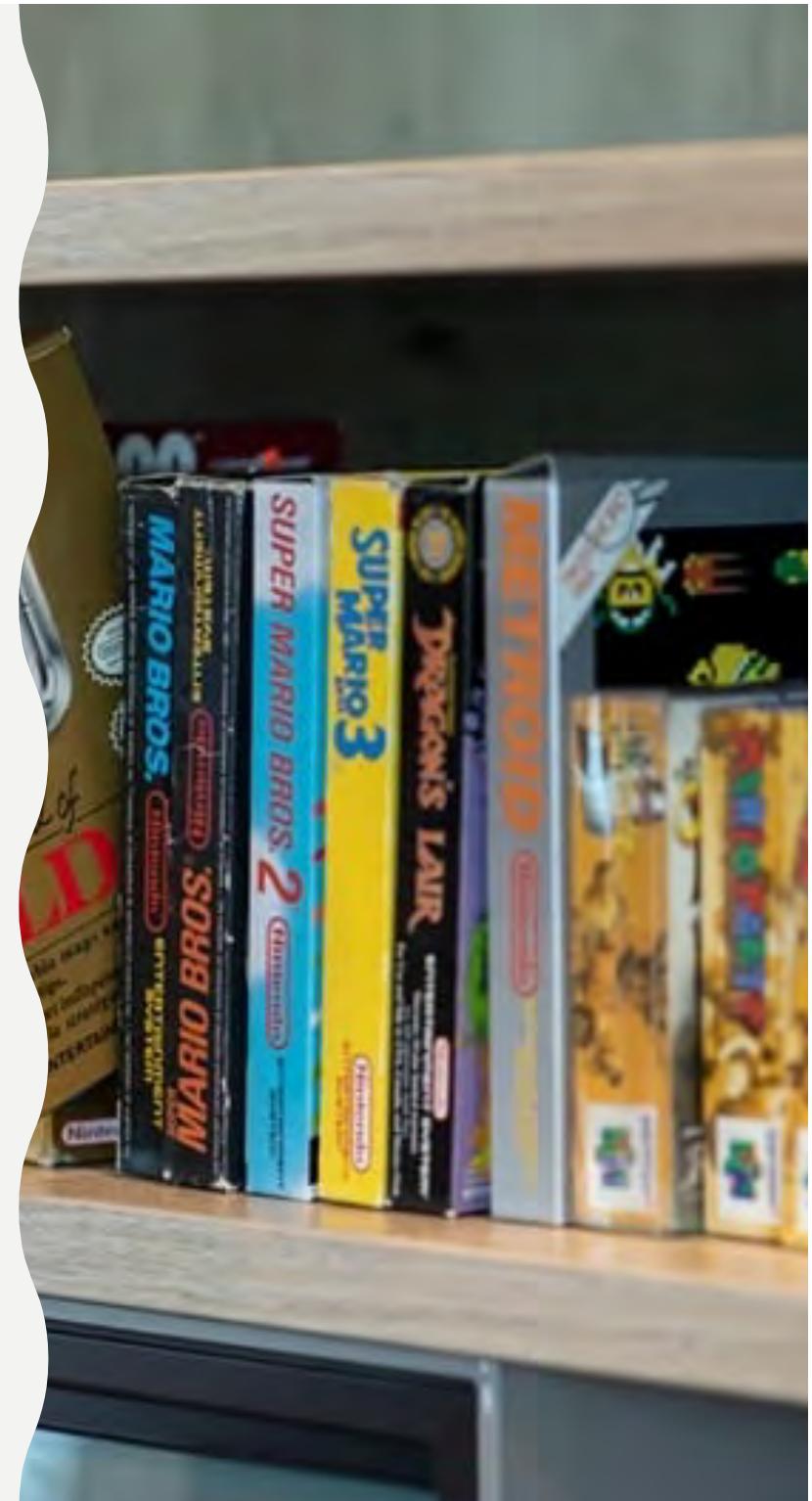
Format: Written document submitted via Quercus (by one member of the group)

Weight: 25% (group)

## **December 2: Engagement, Participation & Peer Evaluation**

Format: Form submitted via Quercus

Weight: 15% (individual grade)



# EVALUATION: LATE POLICY

- a penalty for lateness of 10% deducted per day
- work not handed in one week after due date will not be accepted

## **Special Consideration Requests - Extensions on Assignments**

- Complete a "Special Consideration Request" (SCR) form online.
- Please review the ICCIT special consideration request policy here and follow the procedures:  
<http://www.utm.utoronto.ca/iccit/students/special-consideration-request>



GOAL

NATURE  
OF  
RULES

RULES

ATTITUDE

## DEFINING GAMES

To play a game is to engage in activity directed towards **bringing about a specific state of affairs**, using only means **permitted by rules**, where the rules **prohibit more efficient in favour of less efficient means**, and where such rules are **accepted just because they make possible such activity.**

Bernard Suits.

The Grasshopper: Games, Life and Utopia.

# DEFINING GAMES

To play a game is to engage in activity directed towards bringing about a specific state of affairs, using only means permitted by rules, where the rules prohibit more efficient in favour of less efficient means, and where such rules are accepted just because they make possible such activity.

Bernard Suits.  
The Grasshopper: Games, Life and Utopia.



# PLAY

We have only to watch young dogs to see that all the essentials of human play are present in their merry gambols. They invite one another to play by a certain ceremoniousness of attitude and gesture. They keep to the rule that you shall not bite, or not bite hard, your brother's ear. They pretend to get terribly angry. And—what is most important—in all these doings they plainly experience tremendous fun and enjoyment. Such romplings of young dogs are only one of the simpler forms of animal play. There are other, much more highly developed forms: regular contests and beautiful performances before an admiring public.

“All play means something” Johann Huizinga,  
*Homo Ludens*



# PLAY

- Play is that which takes us out of ourselves: from the ordinary to the extraordinary
- Theatre, ritual, games are all cultural expressions of this impulse
- Play requires...fun. And fun is not necessarily rational.





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# A Brief Glimpse at the Long Evolutionary History of Play

Gordon M. Burghardt<sup>1\*</sup>

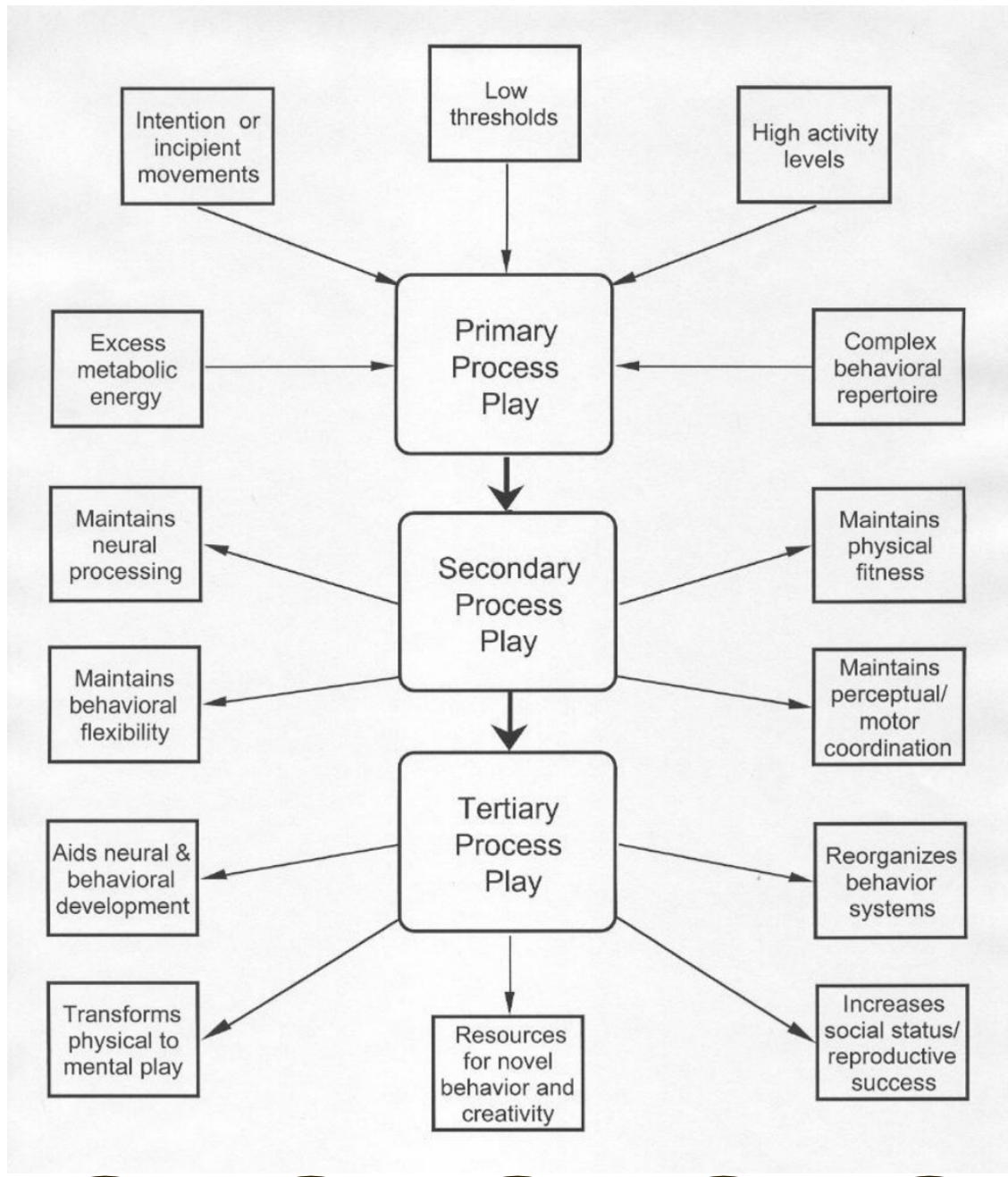
<sup>1</sup>University of Tennessee, Knoxville

\*Corresponding author (Email: gburghar@utk.edu)

Citation – Burghardt, G. M. (2014). A Brief Glimpse at the Long Evolutionary History of Play. *Animal Behavior and Cognition*, 1(2), 90-98. doi: 10.12966/abc.05.01.2014

**Abstract** - Play has long been considered an enigmatic behavior that is hard to define, but having many putative functions difficult to confirm. This situation is changing quite rapidly in recent years. This introduction to a special issue on play provides some general background, historical and contemporary, on the recognition and phylogenetic aspects of play, along with a discussion on the adaptive functions of play and some recent research findings that might facilitate or extend future research.

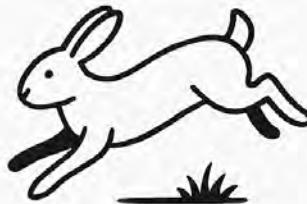
**Keywords** - Animals, Evolution, Play, Play definition, Play origins, Play functions, Surplus Resource Theory



A scenario for the evolution of play depicting three play processes. Note that all three processes can occur in the same species and individual depending on setting, context, experience, etc. (from Burghardt, 2005)

# TYPES OF PLAY

## LOCOMOTOR/ ROTATIONAL PLAY



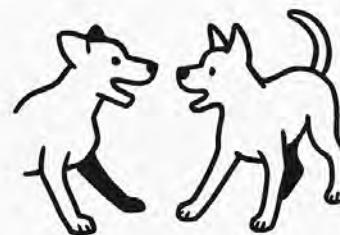
Jumping  
leaping  
twisting  
swinging  
running

## OBJECT/ PREDATORY PLAY



Carrying  
dropping  
manipulating  
mouthing or  
biting objects

## SOCIAL PLAY



Chasing  
wrestling  
tug-of-war  
role reversals

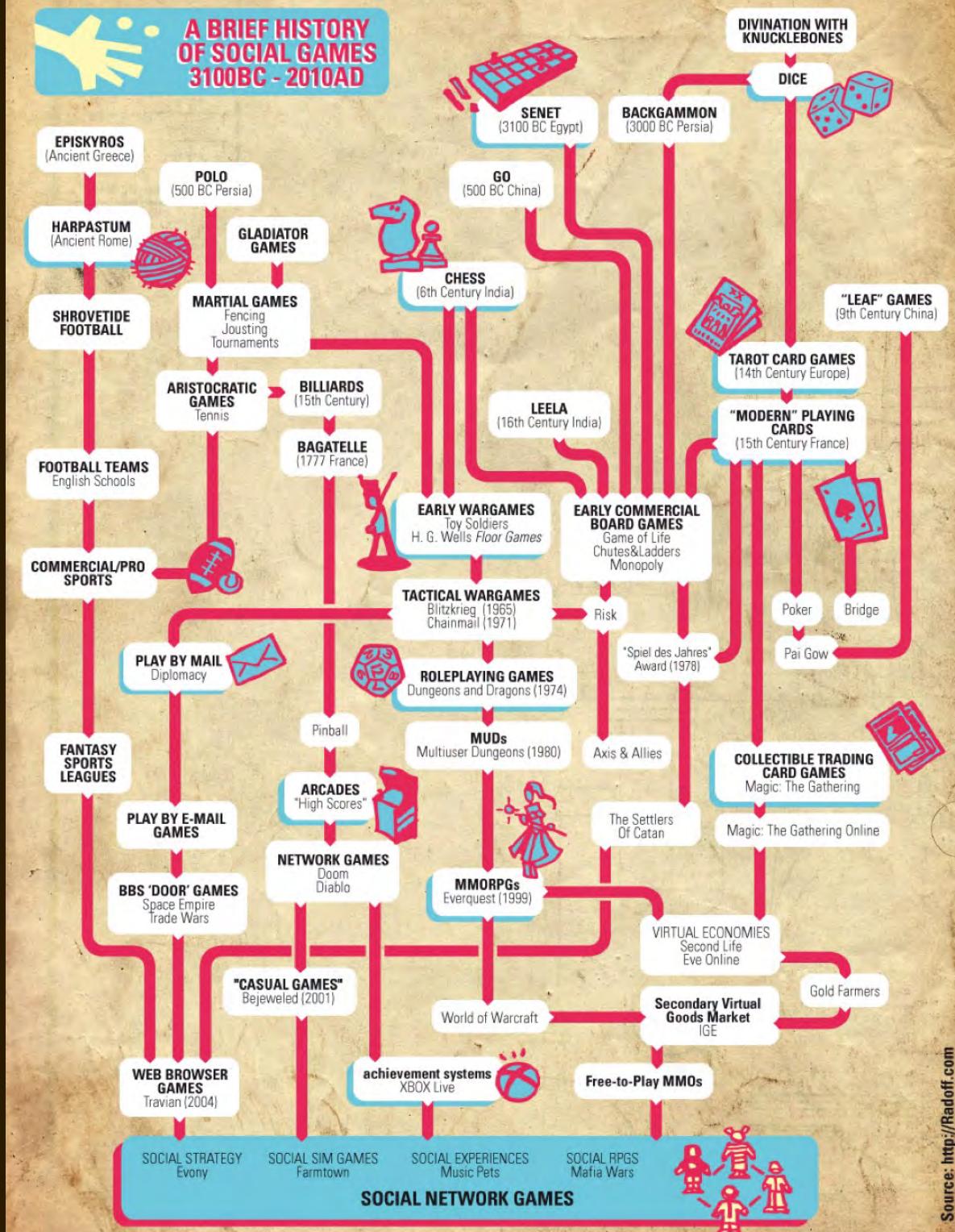
A scenario for the evolution of play depicting three play processes. Note that all three processes can occur in the same species and individual depending on setting, context, experience, etc.  
(from Burghardt, 2005)

# WHY DO HUMANS PLAY?

1. Cognitive Development
2. Physical Development
3. Emotional Regulation
4. Social Skills
5. Cultural Transmission
6. Innovation and Creativity



# The Evolution of Games



# SPORTS

## Prehistoric and Ancient Times

Sports likely began as **ritualistic or survival-based activities.**

*hunting, running, and wrestling.*



Ancient China: Cuju

# SPORTS

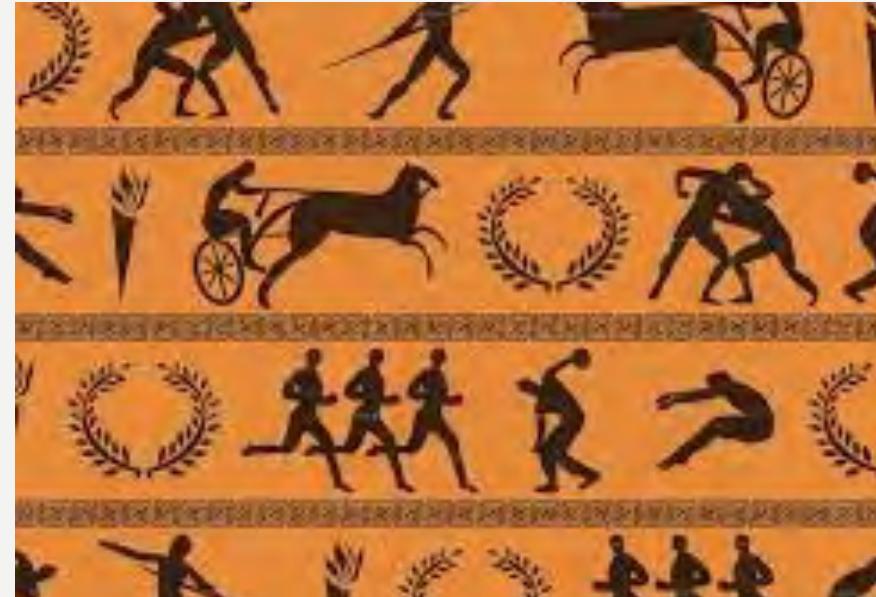
## Classical Antiquity

### Ancient Greece

Sports central to Greek culture.  
Olympic Games began in 776 BCE,  
*Events included running, discus,  
javelin, and wrestling.*

### Ancient Rome

Gladiatorial games and chariot  
races were popular, often held in  
large arenas like the Colosseum.





# SPORTS

## Medieval Period

Sports became more **localized and informal**, often tied to festivals or military training.

### North America

Stickball and lacrosse among Indigenous peoples in North America.

### Europe

Jousting and archery  
Falconry and hunting among nobility.





# SPORTS

## Early Modern Period (1500s–1800s)

Sports began to be **codified** with rules and regulations.

**Cricket**, **football (soccer)**, and **rugby** emerged in England.

The **Industrial Revolution** led to more leisure time and the rise of spectator sports.



**Olympic revival:** Pierre de Coubertin founded the **modern Olympic Games** in 1896.

# SPORTS

## Modern Era (20th–21st Century)

Sports became **globalized**, professionalized, and commercialized.

Major international events like the **FIFA World Cup**, **Olympics**, and **Super Bowl** gained large international audience.

**Women's sports** gained recognition and support.

Technology transformed training, broadcasting, and fan engagement.

**Esports** emerged as a new digital form of competitive play.





**SPORTS = GAMES**

# Senet

(3100 BC)



Image from <https://medium.com/swlh/the-full-history-of-board-games-5e622811ce89#.uszqgfawg>



# THE ROYAL GAME OF UR

IMAGE SOURCE: [HTTPS://WWW.BRITISHMUSEUM.ORG/COLLECTION/OBJECT/W\\_1928-1009-378](https://www.britishmuseum.org/collection/object/W_1928-1009-378)

# Ten

(or Passe-Dix)

Also known as Spot,  
Dicey, Roll Ten or  
Birdie.



- Players lay bets on outcome of dice.
- One of the players (usually the player to the bank's left) throws three dice.
- If they **total less than 11** then the players lose their wagers.
- If **the total is 11 or more**, then the banker loses and pays out an equal amount on the players' bet

# Jactus

Ancient Rome

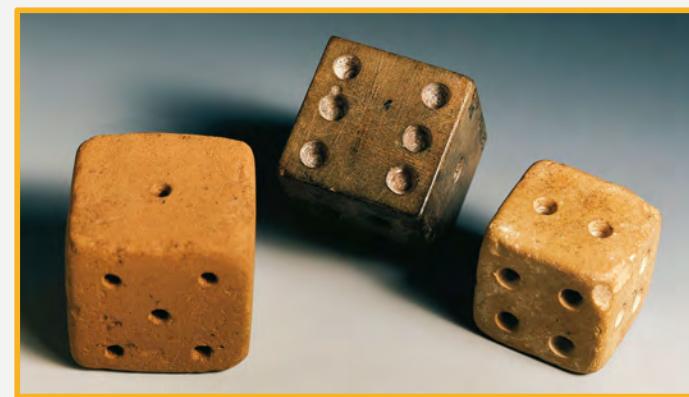
1. Players in turn roll five dice and try to get five-of-a-kind.
  - A. A player who makes 1, 1, 1, 1, 1 claims a coin
  - B. A player who makes 6, 6, 6, 6, 6 (Jactus Venereus) claims a Venus card.
  - C. A player who makes five of any other number (Jactus Canicula) claims a dog card
2. The first player to hold **a Venus card, two dog cards, and a coin**, wins the game.



# SOCIETY



# DICE





## KNUCKLE BONE DICE (5 – 3<sup>RD</sup> CENTURY BC) FROM GREECE / THRAC

IMAGE SOURCE: [HTTPS://MEDIUM.COM/@PETERATTIA/THE-FULL-HISTORY-OF-BOARD-GAMES-5E622811CE89](https://medium.com/@peterattia/the-full-history-of-board-games-5e622811ce89)

# **HARAPPAN D6 FROM INDIA**



# **SERPENTINE D20 INSCRIBED WITH GREEK LETTERS FROM THE PTOLEMAIC PERIOD**



# **PYRAMIDAL D4 FROM THE ROYAL GAME OF UR**



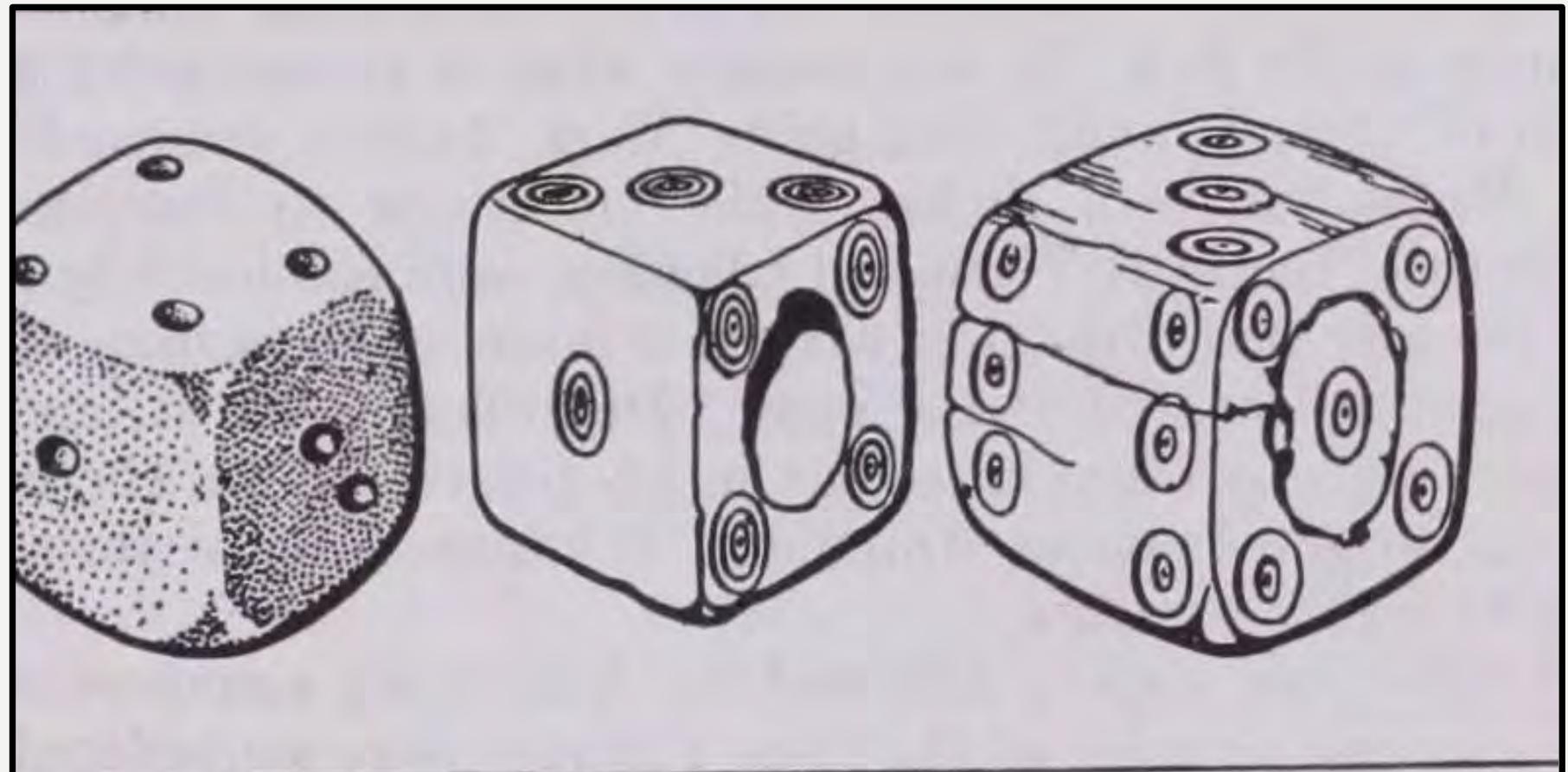
# DICE FROM CHINA AND EGYPT

IMAGE SOURCE:  
[HTTPS://MEDIUM.COM/@PETERATTIA/THE-FULL-HISTORY-OF-BOARD-GAMES-5E622811CE89](https://medium.com/@peterattia/the-full-history-of-board-games-5e622811ce89)





**ROMAN ERA DICE**



COURTESY OF SMITHSONIAN INSTITUTION

### SIX-SIDED EARLY EGYPTIAN DICE AND TWO ROMAN DICE

Similar to those used to-day have been used from the earliest times found among ancient relics in Egypt, the Mediterranean and the Far

# PROBABILITY

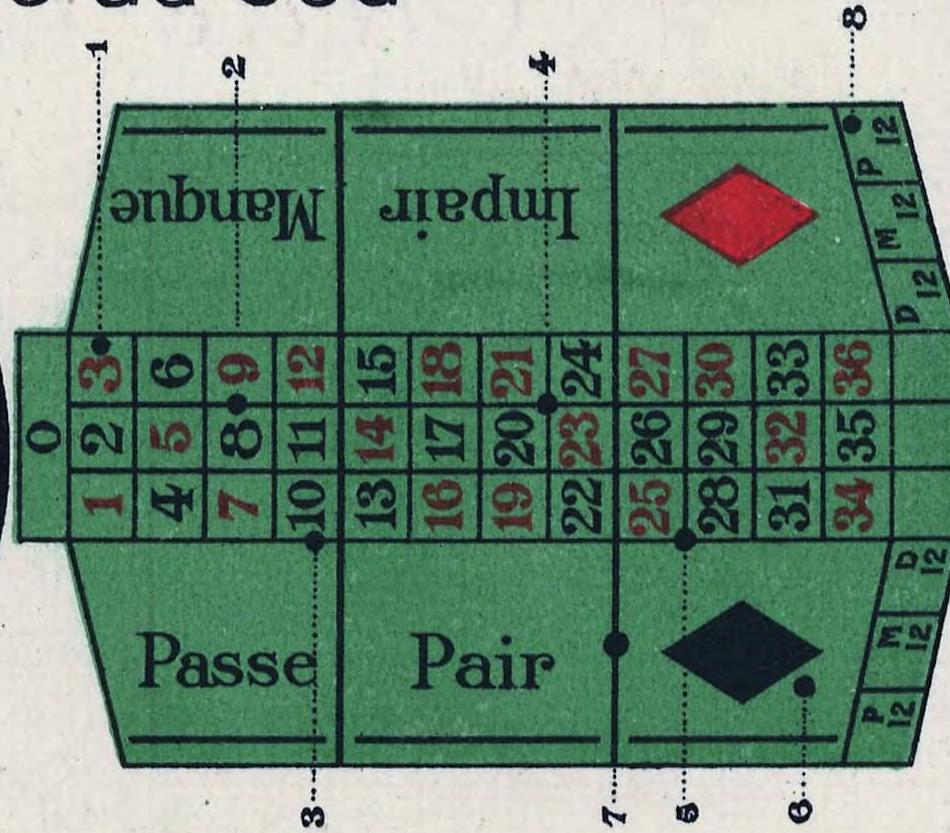
THE FIELD OF STATISTICS BEGAN WITH A STUDY OF PROBABILITY IN GAMES OF CHANCE.



# PROBABILITY (GAMBLER'S FALLACY)

## LA ROULETTE DE MONTE-CARLO

### Règle du Jeu



En plein sur le N°... 35 fois la mise  
A cheval sur 2 N°... 17 » »  
Transversale de 3 N°... 11 » »  
Un carré de 4 N°... 8 » »  
Transversale de 4 N°... 8 » »  
Transversale de 6 N°... 5 » »

Une colonne de 12, 2 fois la mise  
Sur deux colonnes 1/2 » »  
Sur une douzaine. 2 » »  
Sur 2 douzaines... 1/2 » »  
Pair, chance simple 1 » »  
Impair » » 1 » »

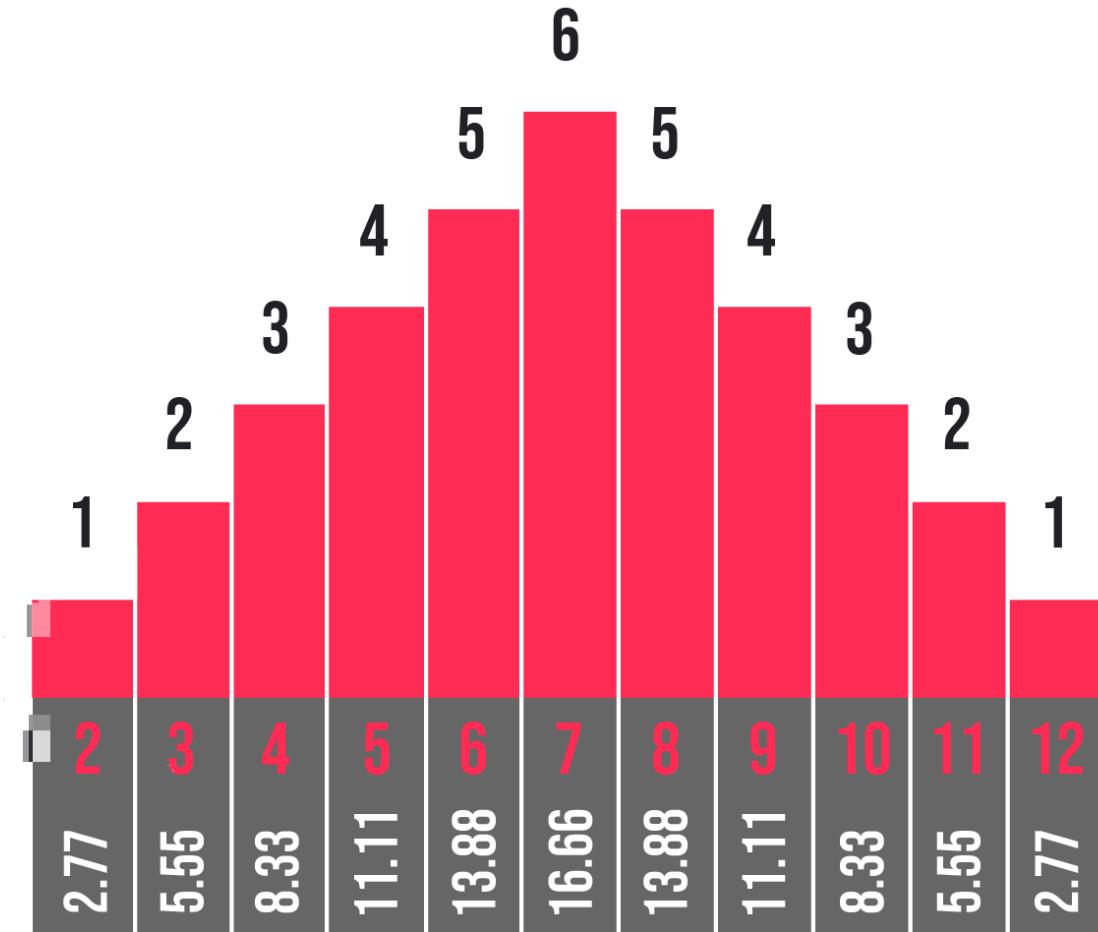
Passe chance simple... 1 fois la mise  
Manque » » - » »  
Rouge » » - » »  
Noir » » - » »  
Entre 2 chances simples 1/2 » »

*Le zéro sortant fait perdre toutes les chances, excepté les chances simples qui sont mises en prison et ne sont pas payées au coup suivant, mais rentrent en jeu, moins celles que la Banque vient à gagner de nouveau.*

- N° 1 sur un numéro (3)
- N° 5 sur une transversale de 6 n° (25, 26, 27, 28, 29, 30)
- N° 6 sur une chance simple (Noir)
- N° 7 sur deux chances simples (Noir et Pair)
- N° 8 sur une douzaine ou une colonne (1<sup>re</sup> douzaine)
- N° 2 sur deux numéros à cheval (8 et 9)
- N° 3 sur une transversale de 3 n° (10, 11, 12)
- N° 4 sur un carré de 4 n° (20, 21, 23, 24)

# PROBABILITY

THE FIELD OF STATISTICS BEGAN WITH A STUDY OF PROBABILITY IN GAMES OF CHANCE.

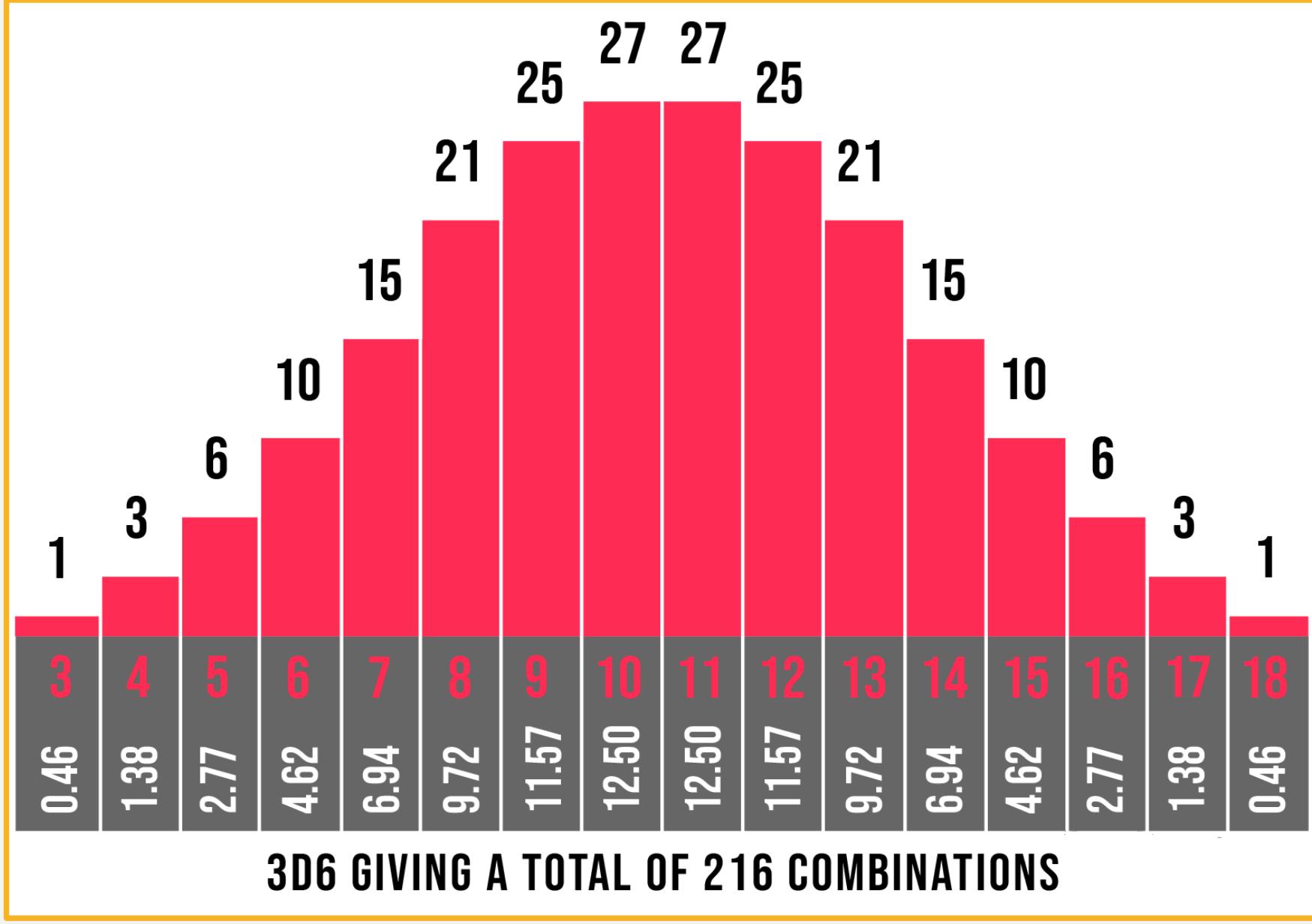


A “fair” die will result in each face having an equal probability of occurring on any given roll (Gerolamo).

The more times a die is rolled the closer the actual results will match the predicted results (Bernoulli).

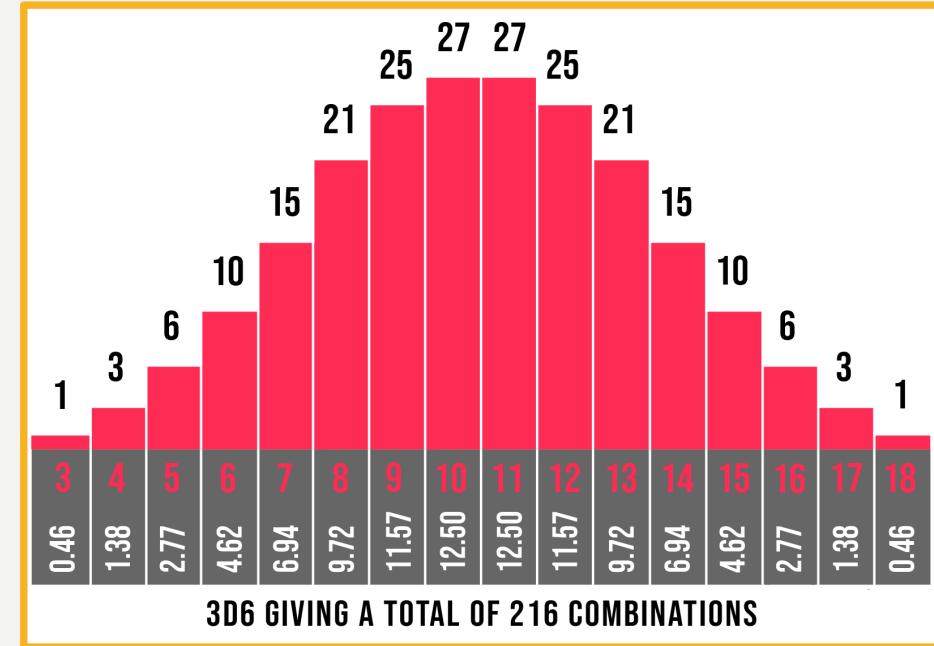
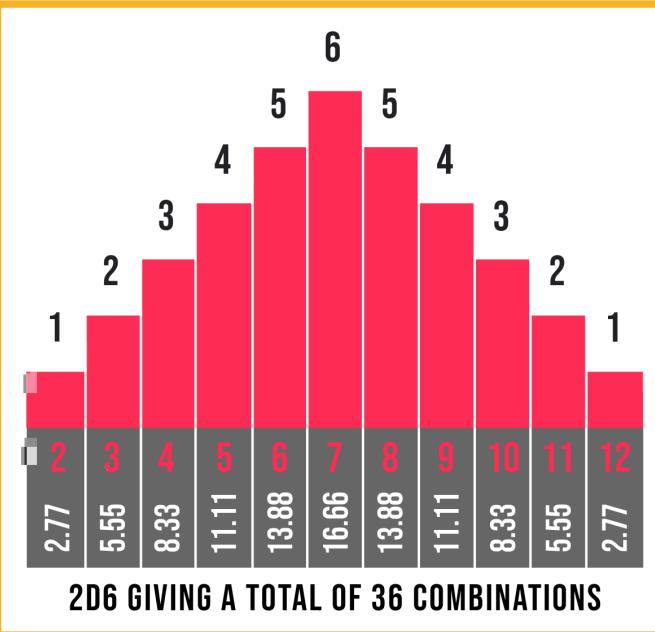
# PROBABILITY

THE FIELD OF STATISTICS BEGAN WITH A STUDY OF PROBABILITY IN GAMES OF CHANCE.



# PROBABILITY EXERCISE

THE FIELD OF STATISTICS BEGAN WITH A STUDY OF PROBABILITY IN GAMES OF CHANCE.



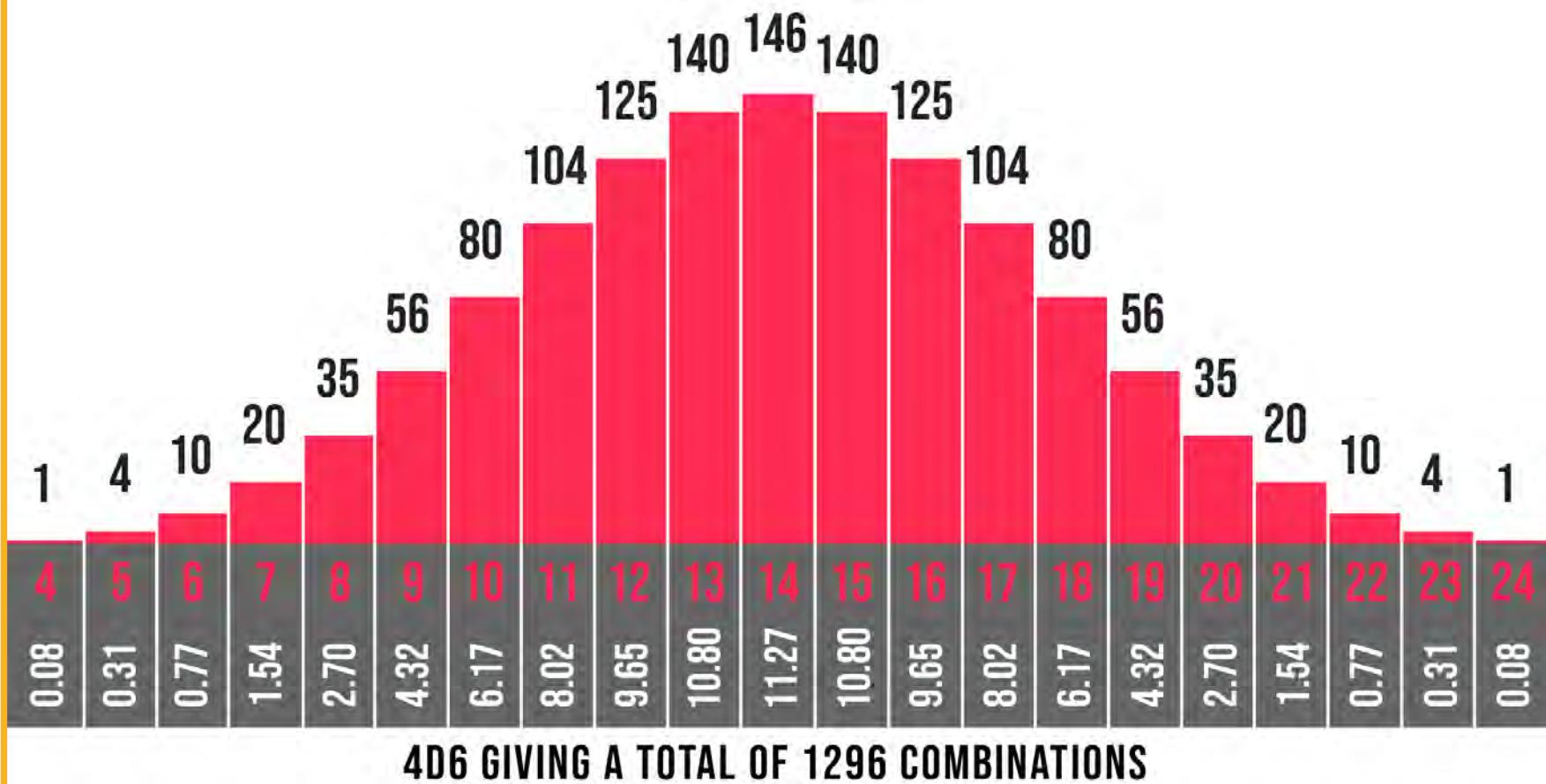
At your table,:

1. Take 2 die. Roll them and record the result (with a tick or check in the “COUNT” section on the handout sheet.)
2. After approx. 5 minutes, record the totals
3. Repeat with 3 die.

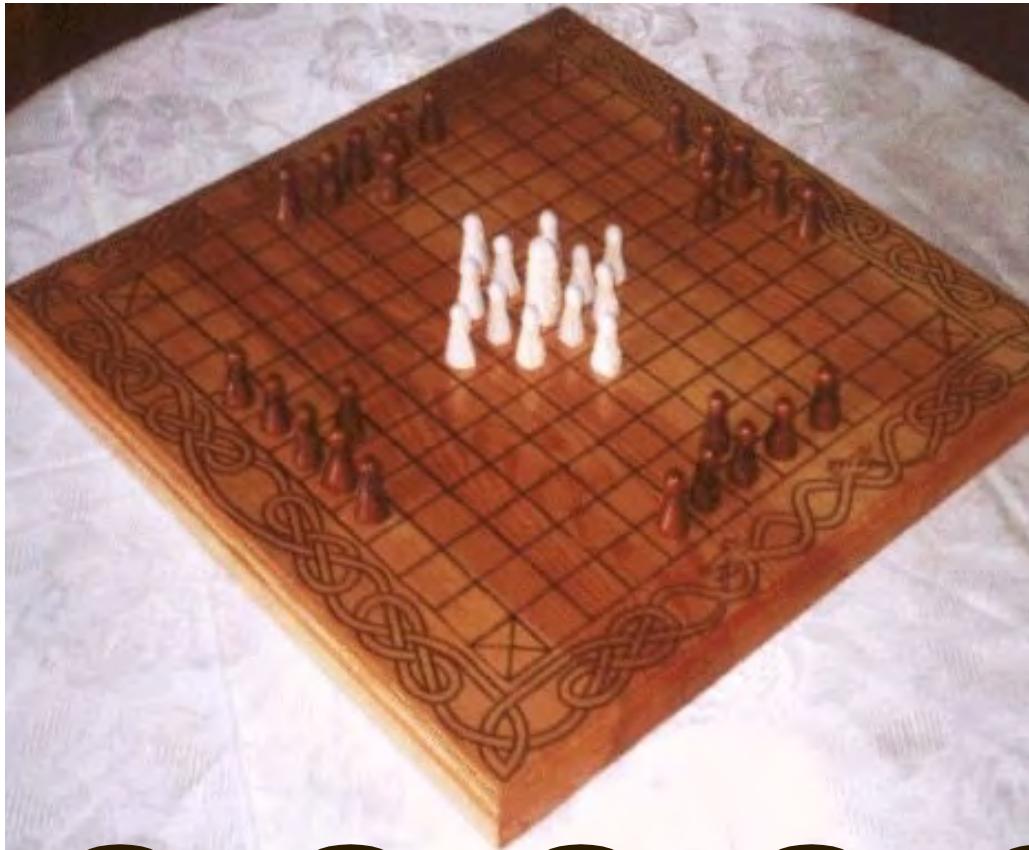
Dice Roll Result	Count	Total
2	##	5
3	###	8
4	### ###	10
5	### ### ####	14
6	### ####	12
7	### #### #### #### ####	24
8	### #### #### ####	20
9	### #### ####	17
10	### ####	11
11	##	5
12		3

# PROBABILITY

THE FIELD OF STATISTICS BEGAN WITH A STUDY OF PROBABILITY IN GAMES OF CHANCE.



# **EARLY BOARD GAMES**



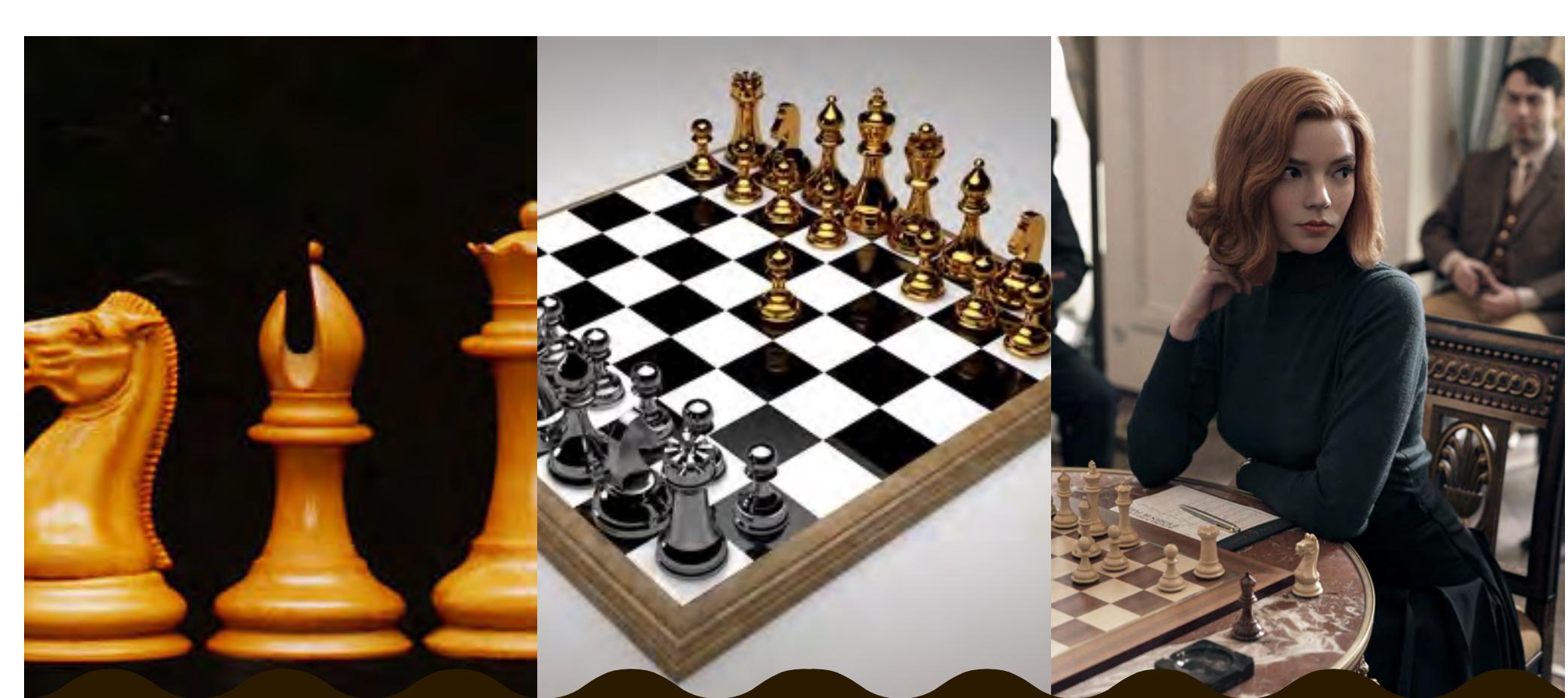
# TAFL GAMES



# CHATURANG, SHATRANJ AND BIRTH OF CHESS

# SHATRANJ

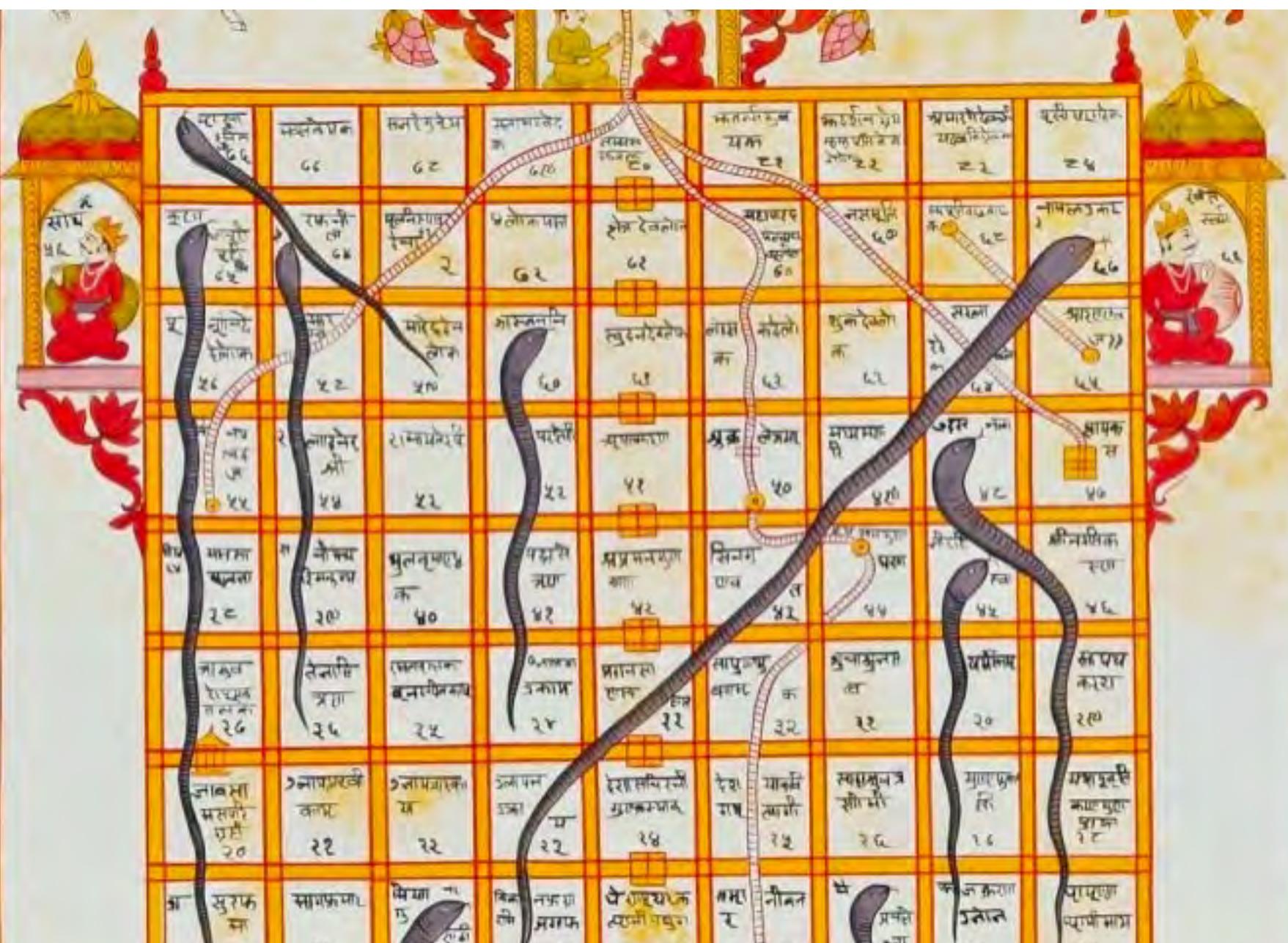




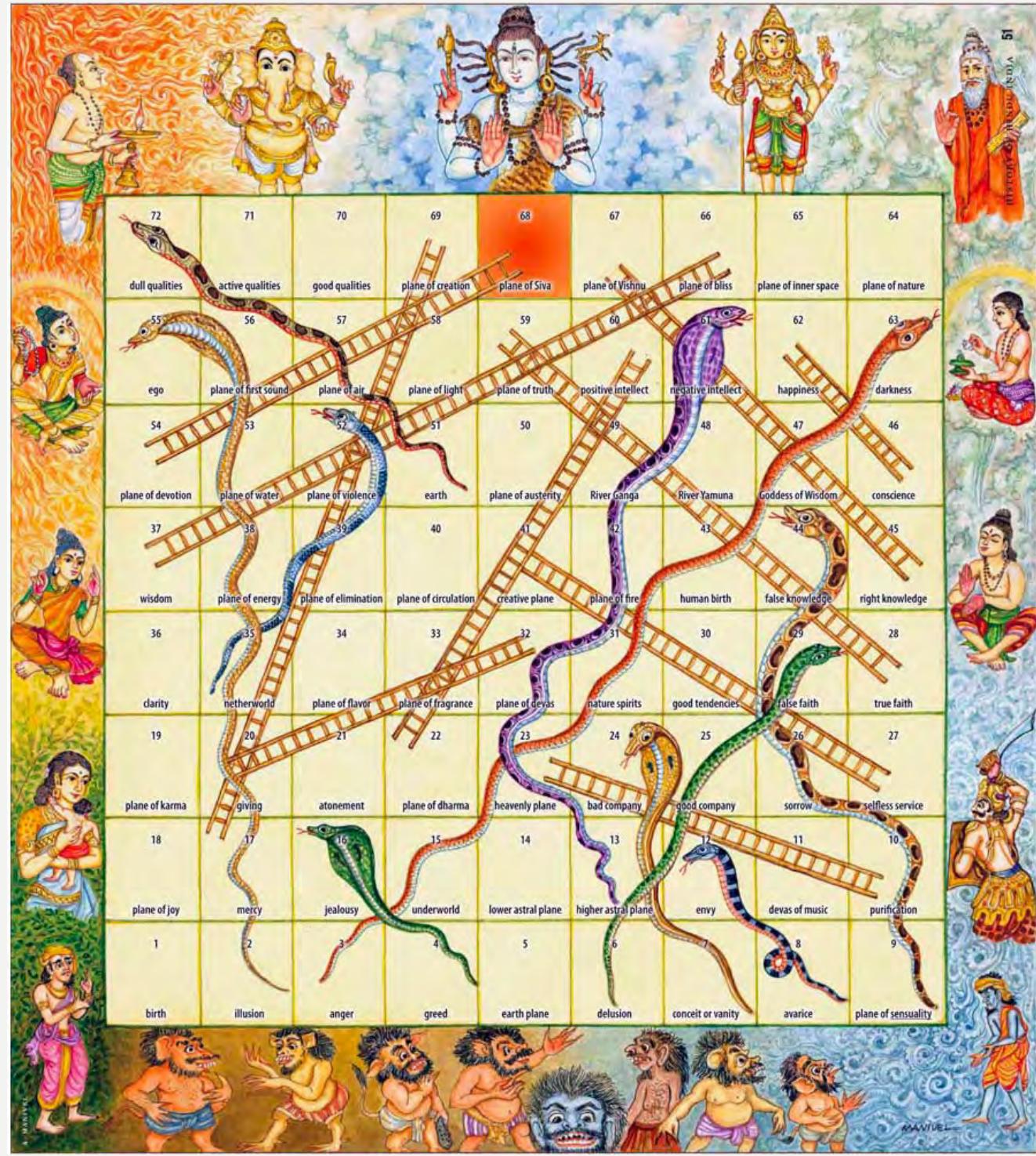
# CHESS

# EDUCATION AND MORALITY





# Education and morality







# Snakes and Ladders

## Objective:

Be the first player to reach the final square (#100).

## Setup:

1. Place paper board on table
2. Each player chooses a playing piece of a different color.
3. Players place their pieces on the starting square (bottom left)

## Gameplay:

- Players take turns rolling a single die (D6)
- After rolling, move your piece forward the exact number of spaces shown on the die.
- **Ladders:** If your piece lands on the **bottom** of a ladder, you immediately move your piece to the top of that ladder.
- **Snakes:** If your piece lands on the **head** of a snake, you must slide down to the bottom of the snake.
- **Exact roll to win:** To win, you must roll the exact number needed to land on the final space. If you roll a number that would take you past the final space, your piece remains on its current square for that turn.

## Miscellaneous:

- Players take turns in a clockwise order.
- If you land on a space occupied by another player, their piece is not sent back.
- You cannot land on a ladder or snake in the middle; you must land on the bottom of a ladder or the head of a snake.



# Mansion of Happiness

(1800-1926)

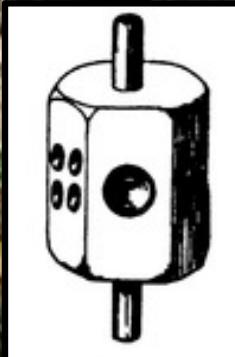
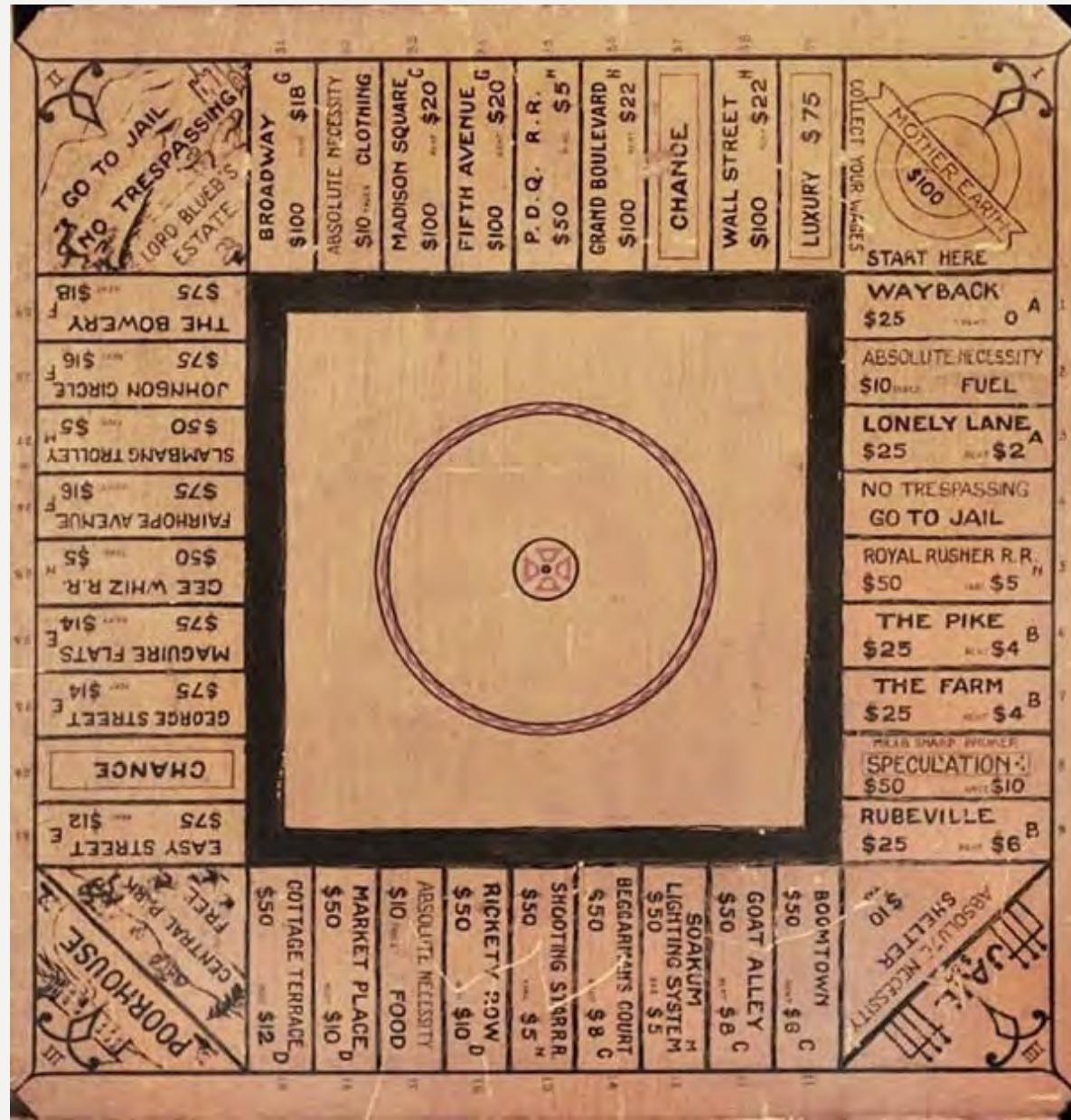


Fig. 3.  
CHINESE TEETOTUM.





# The Landlord's Game

## by Lizzie Magie (1903)

From <https://medium.com/swlh/the-full-history-of-board-games-5e622811ce89#.uszqgfawg>

# The LANDLORD'S GAME



Elizabeth Magie Phillips



Loring Battell

THE LANDLORD'S GAME

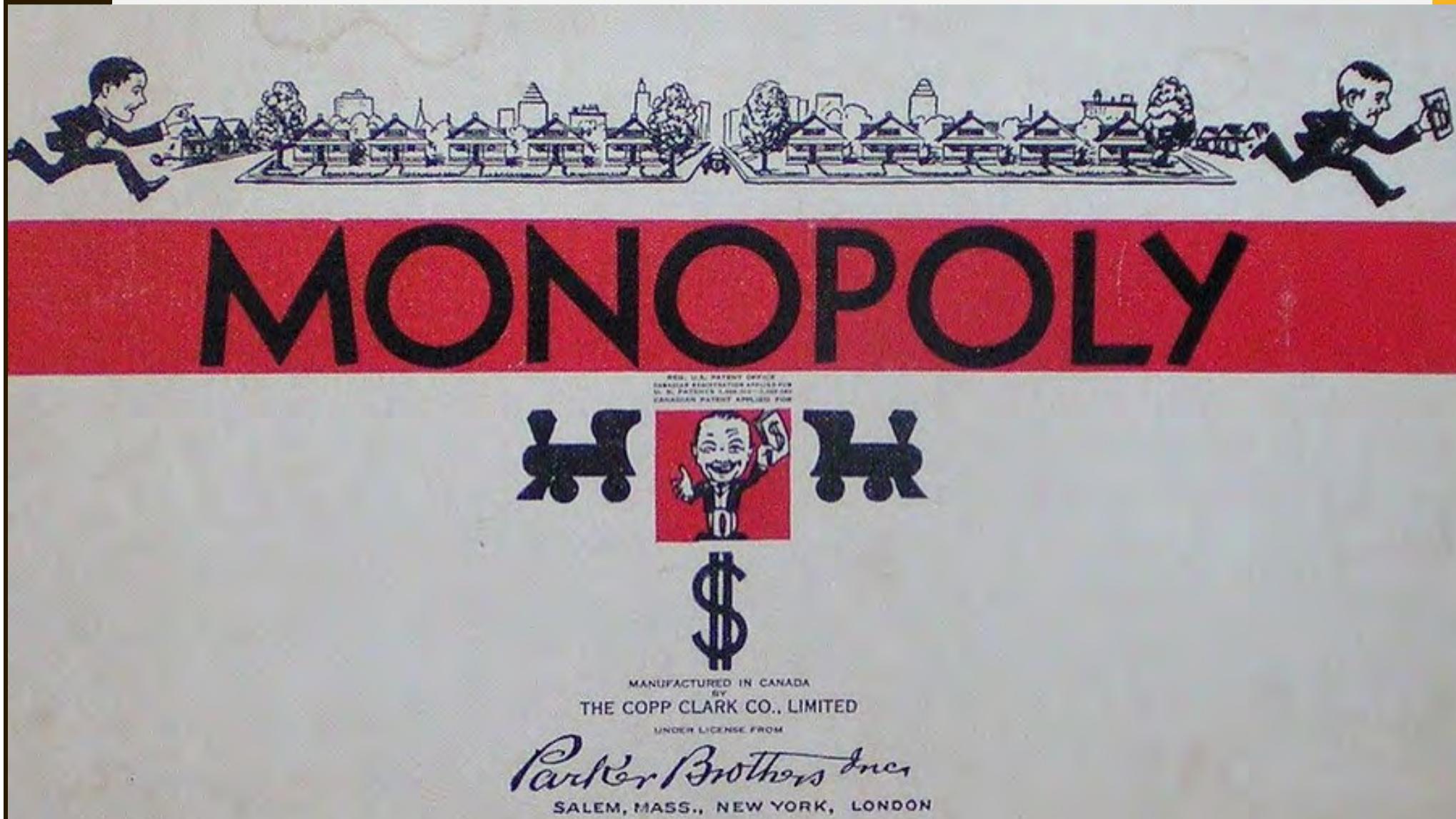
Patent Pending

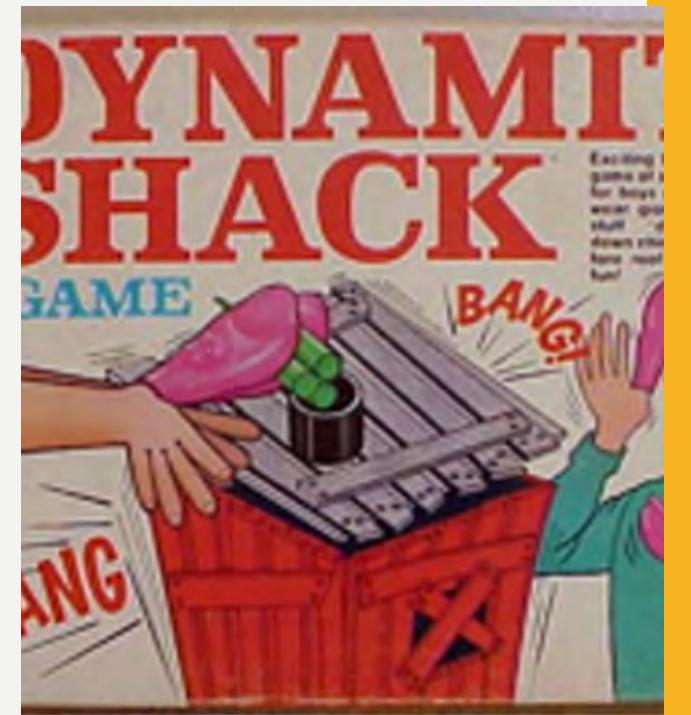
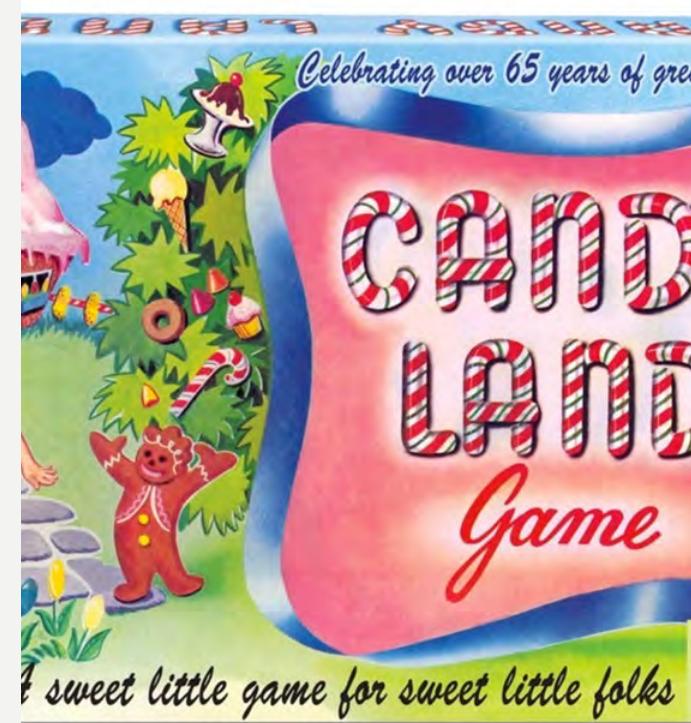
© 1904 by Elizabeth Magie Phillips

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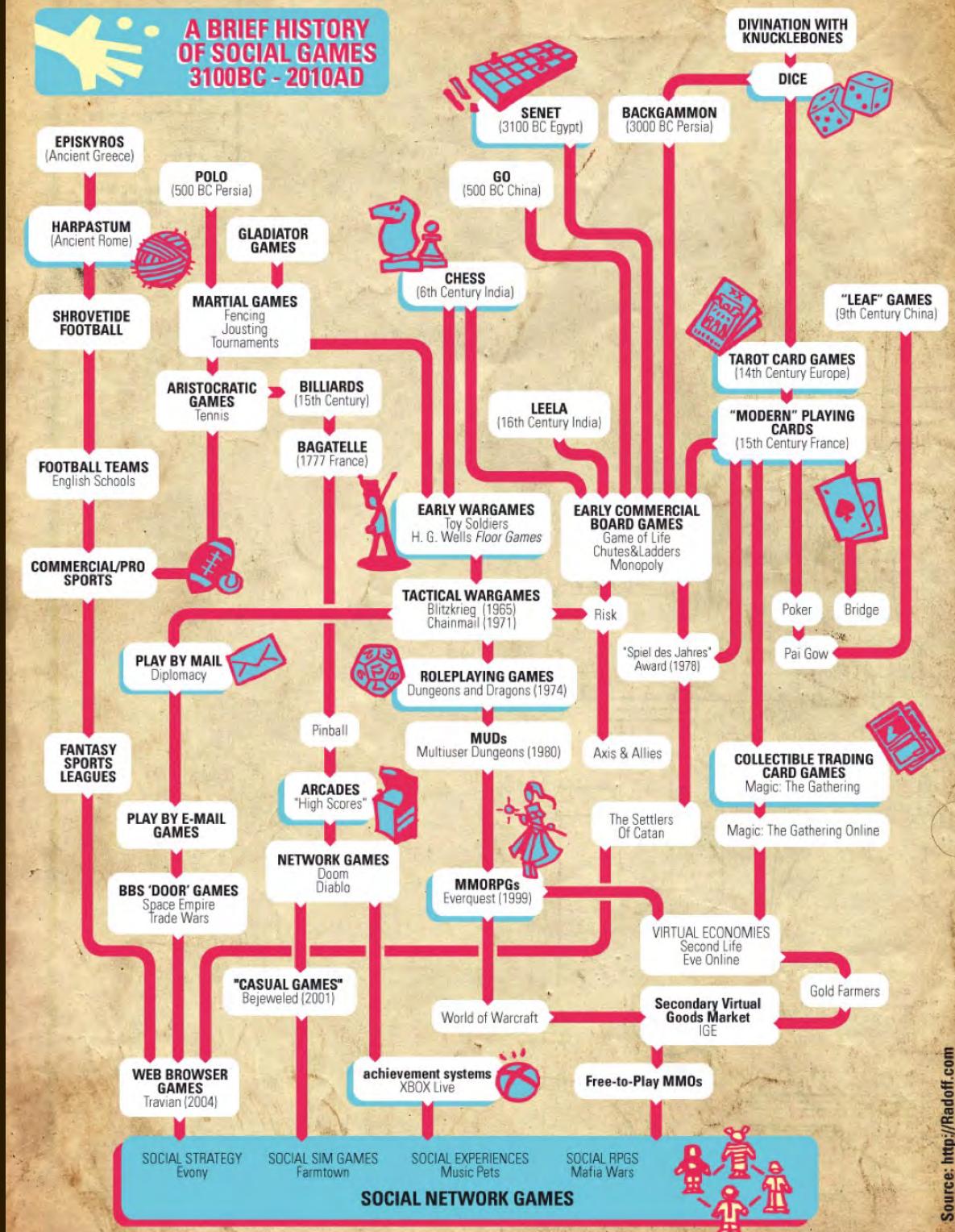
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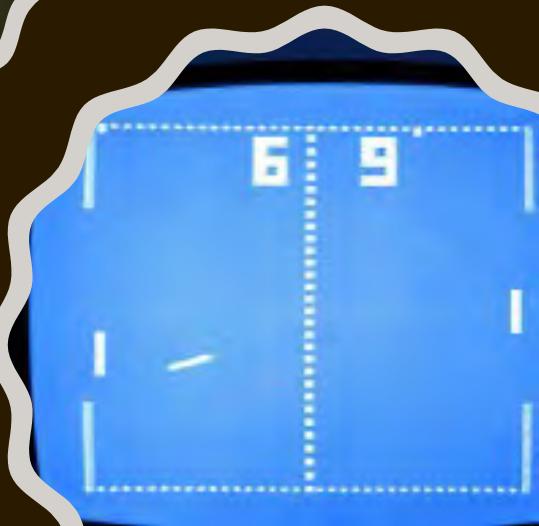




# The Evolution of Games



# Digital Games



**77%**  
of Millennials  




--Play video games--

**81%**  
of Gen Z  


Average Hours **Playing**  
**Video Games** per Week

**Gen Z gamers**

7 hours and 20 minutes

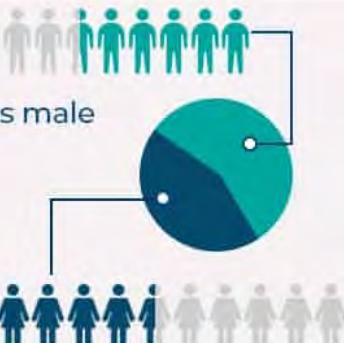
**Millennials**

6 hours 50 minutes



**55%**  
of gamers identify as male

**45%**  
identify as Female



**57%**  
of U.S. gamers  
play on smartphones

 Cloudwards

D I G I T A L   G A M E S

## Preferred Game Genres, According to Gamers



Casual

63 %

Action

39 %

Shooter

39 %

Racing

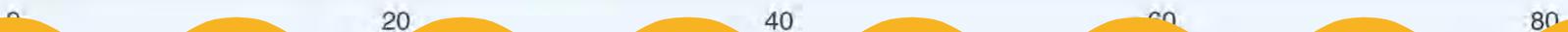
37 %

Family

33 %

Adventure

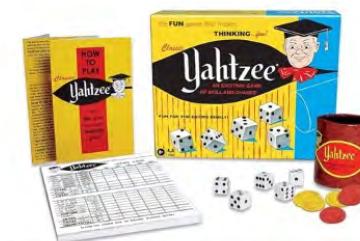
31 %



D I G I T A L   G A M E S



Professional Women's  
Hockey League



Yahtzee



Balatro



Dungeons & Dragons



Backgammon



Space Invaders



Candy Crush Saga



Sony Playstation 4



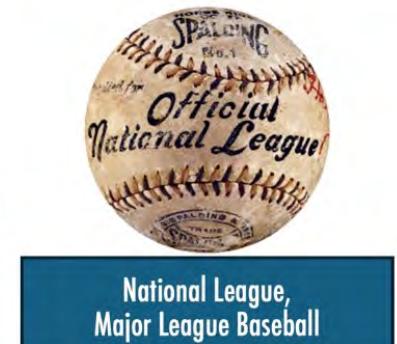
Pachisi  
(aka Ludo)



Minecraft



10-pin bowling



National League,  
Major League Baseball

# When did it launch?

## Objective:

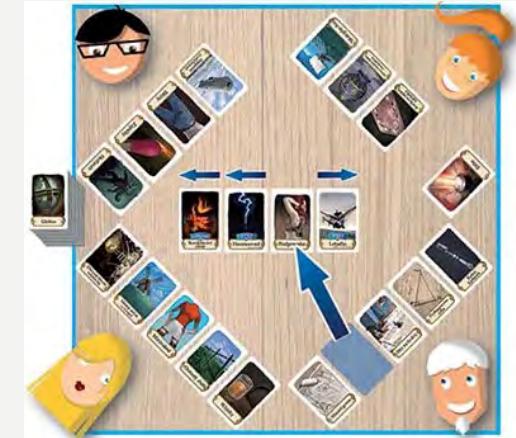
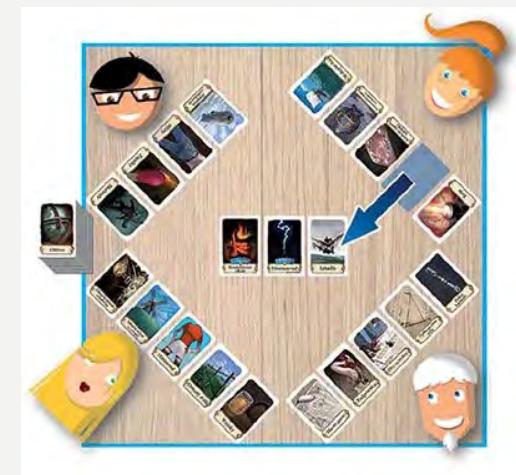
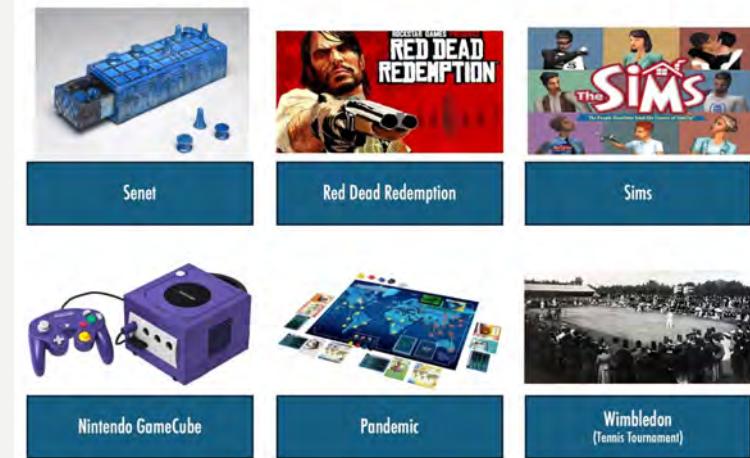
Be the only player with no cards in front of you.

## Game Setup

1. Shuffle the deck of cards. Make sure the “date” side of cards are hidden
2. Deal four cards to each player.
3. Place one card in the center of the table, with the date side face up, to start the timeline.
4. Place remaining cards face down to form draw pile.

## Gameplay

- On their turn, if player believes their card dates BEFORE a card on the table, they place their card to the left.
- On their turn, if player believes their card dates AFTER a card on the table, they place their card to the right.
- Cards can be moved to make space for a new card.
- If card was placed properly, it remains on the table with the “date” side up and players turn is over.
- If the card was NOT place properly, it is placed in a discard pile. Player must now draw the top card from the card pile and place it in front of them (“date” side down).
- Play continues until one or more players no longer have a card in front of them.



# NEXT CLASS

## Class 3 | Rules and Mechanics

**Guest Lecture: Igor Sokolov (course TA)**

### Required Readings

- Tekinbas, K. S., & Zimmerman, E. (2004). Chapter 9: The Magic Circle. In Rules of play: game design fundamentals. The MIT Press. pp 118-128
- Tekinbas, K. S., & Zimmerman, E. (2004). Chapter 11: Defining Rules. In Rules of play: game design fundamentals. The MIT Press. Pp 176-185.
- Tekinbas, K. S., & Zimmerman, E. (2004). Chapter 12: Rules on Three Levels. In Rules of play : game design fundamentals. The MIT Press. pp 187-207
- Tekinbas, K. S., & Zimmerman, E. (2004). Chapter 20: Games as Systems of Conflict. In Rules of play: game design fundamentals. The MIT Press. pp 286-304

### Recommended Readings

- Aslam, H., & Brown, J. A. (2020). Chapter 2: Affordance Theory and Game Design. In Affordance theory in game design: a guide toward understanding players. Morgan & Claypool Publishers. pp 21-30
- Tekinbas, K. S., & Zimmerman, E. (2004). Chapter 21: Breaking Rules.Rules of play: game design fundamentals. The MIT Press. Pp 416-446.

### Various Rules

- MLB 2023
- NFL 2024
- NBA 2023-2024
- NHL 2023-2024
- Tennis 2024
- Curling 2022-2026

