Game Theory for Elementary School

BRAVE games, including JAMs, are a Game Theory application called "repeated games" that explore the role trust plays in conflict and cooperation.

JAMs use human connection to spark skilled reading so players can layer viewpoints, detect bias, diagnose and transform working dilemmas. Groups of 4 can use these 30-minute activities as prequels or sequels to BRAVE board game learning, or as stand-alone fun.

Each booklet in this series presents a unique schema designed to help students frame and organize content. Explore one schema, or try them all:

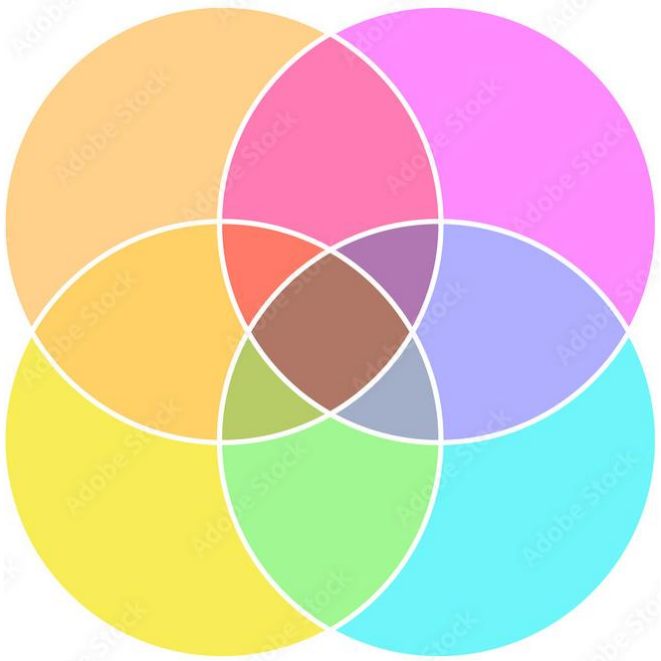
Game Theory
context
perspective
change
conflict
rights
cooperation
connection
trust
creativity

Taken together, tools needed to navigate any social studies class with discerning minds.

BRAVE COURSE
Gamifying U.S. History

Game Theory

Games, Game Theory & Real-World Applications



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For parents & teachers: Welcome!

BRAVE games, including JAMs, are consistent with Science of Reading instructional guidelines. Tightly-scoped, this inquiry-led method puts knowledge in the foreground to cut across a range of K4-5 standards, meeting all learners where they are to get everyone in the game!

We take learning seriously. *And for fun.*

JAMs break from typical programming insofar as they're consistent with cognitive science. First, human connection sparks intrinsic motivation, incentivizing skilled reading. The beauty of this method is that players *want* to grapple with embedded vocabulary, engage in healthy discussion, and solve group problems. It's fun. This means students embrace the thrill of collaborating, reasoning with facts, sequencing, and testing truths.

Writing extensions provide explicit instructions to support students as they process, integrate, and store new knowledge. This last step is key because, according to Cognitive Load Theory, it effectively clears one's working memory, laying a foundation of knowledge to excel in equivalent classes at higher grades.

Messy? R&D revealed students thrive with this inquiry-led approach because it's intriguing. At that rate, they're positioned to soar beyond our wildest dreams.

VOCABULARY

capacity the ability to receive or contain

challenge call or summons to engage in any contest, as of skill, strength; a call to fight, as a battle, a duel

elaborate (adj) marked by intricate and often excessive detail

elaborate (verb) to add details to

empathy understanding what/why others are thinking

iterate to develop (ideas, products) by building upon previous versions or iterations, using each version as the point of departure for refinements and tweaks

interdependent depending on each other

meta-cognition watching one-self think; higher-order thinking that enables understanding, analysis, and control of one's cognitive processes esp. when learning

model a representation, generally in miniature, to show the construction or appearance of something

rejuvenate restore to a former state; refresh; make fresh or new again

strength mental, physical or moral force to resist

resilient springing back; rebounding; recovering

4. SUMMARY

In the 1950s, economists began a shift from Zero-Sum gaming to Game Theory by studying how players make choices in non-cooperative games as they began to ask how all players could benefit if they worked together. For instance, could players coordinate actions so that everyone wins, *even if just a little?*

Over time, scholars, diplomats, military strategists, businesses and lawyers have followed suit in recognition of Game Theory's capacity to guide rational players to overcome dilemmas and optimize all kinds of situations.

Then, in 2005, two mathematicians who'd been using Game Theory to study how trust affects conflict and cooperation received the Nobel Prize in Economic Sciences for their work on "repeated games." Today their legacy is invitation for us to consider if trust could be deployed to improve social studies class. *Are you in?*

Do you believe you have room to grow? Do you believe we could incorporate a playful mindset into rigorous coursework? Do you have the peace of mind to breathe your way through discomfort? Do you think you have the wits to work your way out of a JAM? And the willingness to assess your effort through written assignments? If so, game ON.

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VOCABULARY

What are you waiting for?! Dig in!

Games are a FANTASTIC way to relax, to be with others, and to learn. At that rate, why don't we play games all day, every day? *Mmmm.* Maybe we should...

1. WHY GAMES?

GAMES ARE ENGAGING. They pull us into another world where we can take a break from worrying about our chores and responsibilities so can simply focus on doing our best and playing to win. When a game ends, we're inspired and **rejuvenated**, ready to tackle any **challenge** or problem.

GAMES BUILD COMMUNITY. Board games, card games, and yard games provide a safe space to be together since joining a game means everyone implicitly agrees to play by a set of rules. This sets the tone, a mutual sense of accountability that allows players to anticipate behavior and/or consequences for breaking the rules. In sum, rules provide players with freedom to maneuver, given a set constraints, without worrying someone might go rogue.

GAMES TEACH US ABOUT OURSELVES BY REVEALING HOW WE THINK. Wise players process learning by judging how different strengths and weaknesses affect outcomes. If so, they have the feedback they need to **iterate**, or refine their skills. For example, are you the kind of player who has a typical opening, second, and third move? If so, you might rely on an **elaborate** or complex foundation to secure victory. Yet if your strategy is too rigid, it might prevent you from making an unexpected move if the chance to score a victory arises unexpectedly.

REPEATED GAMES

GUIDING QUESTIONS CLASS DISCUSSION

1. RE-TELL What's the difference between sympathy and empathy?

2. REVIEW We combine meta-cognition with empathy to ask questions such as WHO, WHAT, WHEN, WHERE. Yet the answers to these questions don't explain WHY, which may be the most important piece of the puzzle. For example,

    a) WHY do teachers want students to learn how to read?
    b) WHY do parents typically set bedtimes?
    c) WHY do some companies add artificials colors, flavors & excessive salt and sugar into their products?

3. REASON Have you heard of the expression, "Thank Goodness for Second Chances"? Based on that idea, infer the benefit of "repeated games."

3. REPEATED GAMES, A GAME THEORY APPLICATION

Game Theory is not about games, not necessarily. Game Theory is a branch of mathematics that uses **models** to explore how **interdependent** players make strategic decisions based on a set of constraints and a number of variables. In a sense, Game Theory is the opposite of Zero-Sum gaming since it's goal is to find a way to increase everyone's odds of winning.

Repeated games are designed to study how rational players behave in competitive situations. Players "repeat" a game play so they can explore how others behave and determine if they were to play the game again if they could increase the number of positive outcomes.

The ability to change **iterate** strategies in repeated games rests on **meta-cognition**, thinking about your own thoughts; plus, **empathy**, understanding OTHERS thoughts. By combining meta-cognition with empathy we're positioned to win without losing sight of others' desire to achieve their goals, too. Just don't confuse empathy with sympathy! Sympathy connects us to each other through feelings, or emotions. By contrast, empathy focuses on answering WHO, WHERE, WHAT, and WHEN. Taken together, we're poised to answer WHY. This reveals our motivation, a key step toward co-creating win-win outcomes.

WHY GAMES?

GUIDING QUESTIONS CLASS DISCUSSION

1. RE-TELL According to this reading, what are three main reasons people play games?

2. REVIEW **How do games prepare people to live in community?**

3. REASON The author believes two-person games that could be played on a device against an algorithm (ex., online chess or backgammon) should be played in real time with another person when possible. *Why do you think the author believes that?*

2. DIFFERENT KINDS OF GAMES

One-person games such as brain-benders are silly fun that support vocabulary, memory, logic, or sequencing. For example, crossword puzzles, Wordle, Sudoku, or solitaire. What are your favorite one-person games?

Two-person games such as checkers, card games, or tennis are different. These games are **Zero-Sum** games, whereby my win is your loss.

Team sports and group games are technically Zero-Sum games, however, they're slightly different because despite winning or losing, the level of teamwork needed to work toward a common goal is its own reward. This suggests we're willing to work harder when we trust others are doing the same on our behalf. *But can we work smarter?*

Exactly what kind of skills are needed to ensure a team's success? What does it take to leverage everyone's **strengths** given the depth of talent on any team? Imagine a time you felt frustrated, overwhelmed and frazzled. What skills did you need to spring back? Game or not, it's likely the skills needed depend more on behavior than technique. The ability to slow your breath, regain focus, and cultivate a positivity are skills that foster **resilience**, increasing our ability to recover from any setback to score a win!

DIFFERENT KINDS OF GAMES
GUIDING QUESTIONS CLASS DISCUSSION

1. **RE-TELL** According to this reading, what are the three main types of games?

2. **REVIEW** How do group activities and team sports make group members/players more resilient and therefore poised for growth (win or lose)?

3. **REASON** If you're an introvert, meaning you re-charge your batteries through alone-time, you might enjoy one-person games more than team games. If you're an extrovert, the opposite might be true. In both instances, infer why it might be wise to participate in all kinds of games, not just your favorite ones?