

SET Skill Connections for Teachers

SET is a game primarily played for fun and entertainment. The fact that it teaches, strengthens and exercises an abundance of skills makes it one of the best possible tools for your classroom. Because it is fundamentally a game people enjoy, SET inspires an intrinsic motivation and desire to “play”. The repetition of playing again and again reinforces the skills that lead to success.



SET Strengthens

- **Cognitive Skills**
- **Interpersonal Skills**
- **Intrapersonal Skills**
- **Academic Connections**

Ages: 6 to adult

Players: 1 or more

About SET

SET is a game of Triple Matching Mania™ that anybody can play, but nobody can stop! A *SET* is 3 cards that are either *all the same* OR *all different* in each individual feature. Each card has four features: **color** (red, green or purple), **shape** (oval, diamond, or squiggle), **number** (1, 2 or 3), and **shading** (solid, open or striped). The goal is to find the most *SETs*. There are no turns and no luck, the first player to see a *SET* from the 12 cards on the table says “*SET!*” and takes the *SET* from the table. The dealer replaces the 3 cards and play continues. The player with the most *SETs* at the end of the game wins!

How SET Develops Skills

Cognitive Development:

- **Analytical Skills:** A tip to playing SET is to use your analytical skills to systematically survey the cards two by two on the table, collecting information, then deducing in your mind what the third card is that you would need to make a *SET*. Lastly, determine if that card is among the cards on the table and then communicate that *SET* to other players.
- **Attention/Sustained:** There are no turns in SET. All players must stay focused on the task for an extended period. For students who have difficulty staying on task, jumping from project to project or have a lot of unfinished projects, SET is a perfect way for them to practice this skill repeatedly, which is crucial for development.
- **Cognitive Flexibility (or Flexible Thinking):** The ability to shift from one concept to another is also improved while playing SET because players must evaluate all four features, one at a time, to find *SETs*. These are just a few of the many methods of finding *SETs*:
 - looking for a *SET* that is all the same color,
 - sequencing through the 12 cards, two at a time to see if the third card that completes the *SET* is on the table,
 - looking for a *SET* that is all different in all four features.

Playing SET increases the brain’s ability to make quick shifts in thinking.

- **Cognitive Processing Speed:** Because there are no turns in SET, players must process information quickly to find a *SET* before the other players. Once they see a *SET*, they must respond appropriately by saying “*SET!*”, pointing it out and allowing everyone at the table to reflect on whether it is a proper *SET* or not before it is picked up. This process requires high mental efficiency and SET allows players to practice this over and over until the skill is automatic and performed fluently. Well-developed processing speeds contribute to proficient executive functioning skills and problem solving.

- **Creative Thinking:** Creative thinking skills are necessary when playing SET, because players will have to think in new ways when analyzing the four features of each card -color, shape, number and shading- and look at problems from a different perspective when applying the “One rule of SET.” To see these non-obvious patterns or *SETs*, players will have to think creatively.
- **Critical Thinking:** Critical thinking skills are necessary when playing SET. Once a player finds a *SET*, they say “*SET*” and remove the cards from play. The dealer then replaces those cards with 3 new ones from the deck. Players must continually gather information about the features of the cards in front of them and then creatively sort through the relevant information while relating the new information from new cards. All the while they apply their knowledge of the “One Rule of SET” to logically reason and draw reliable and trustworthy conclusions as to whether there is a *SET* on the table.
- **Higher Order Thinking:** Players must learn what makes a *SET*, distinguish *SETs* from non-*SETs* by analyzing and comparing the cards on the table, and combine them into valid *SETs* all of which involves higher order processes of Bloom’s Taxonomy and Critical Thinking.
- **Left Brain - Right Brain Connectivity:** The SET game involves learning a rule of logic, and so players must invoke “left brain” logical thinking skills. To find *SETs*, players must also examine the spatial array of cards and locate the cards that satisfy the rule – which exercises “right brain” spatial and intuitive thinking skills.
- **Logic & Reasoning:** Players practice their logical reasoning skills by applying the “Rule of SET” to identify which card combinations make a *SET*. For every two cards, there is only one card that completes the *SET*. Players must determine what the third card is and if it is on the table. Logical deduction is often used to confirm if there are any *SETs* on the table.
- **Memory:** SET requires all players to use working and long-term memory while playing. As new knowledge of the “One Rule of SET” is learned and absorbed through working memory, long-term memory brings up prior knowledge like colors, numbers, shapes and opacity, and then applies them to the rule.
- **Metacognition:** A mindful practice for SET players is to consciously think about their thinking. After playing SET, have players write out in detail their thinking process for finding *SETs* step by step. This allows players to retrace the cognitive process. Once done writing it out, pair players up and have them discuss their thought processes with each other. Players should note ideas that might help or improve their own thinking. Reflecting on one’s own thought process, allows players to take control of their own general and specific learning process.
- **Multiple Intelligences:** SET requires the player to use many different intelligences while playing. Players use their Visual-Spatial intelligence to recognize the shapes, colors and analyze the spatial array of cards. Players use their Interpersonal intelligence while observing their opponent’s behaviors and playing in a group environment. Bodily-Kinesthetic intelligence is used when players are touching and handling the cards. Lastly, players use their Logical-Mathematical intelligence to see and explore patterns and relationships between the images to successfully find *SETs*.
- **Organization:** As *SETs* are located, players remove them from the table. Mentally keeping track of what comes and goes is a good strategy as well as a key cognitive skill.
- **Pattern Recognition:** Pattern recognition is the ability to recognize order in chaos. Finding a general pattern amongst the 12 cards on the table helps players to quickly find a *SET*. For example, if most of the cards are purple, then there is greater possibility that a *SET* exists that is all purple. The same can be said for a surplus of other features, such as shape, number or shading.
- **Problem Solving:** Players will use both analytical and creative skills while playing SET. A tactic of play during SET is to use the tip “for every 2 cards, there is only 1 card that will make them a *SET*.” To test the rule, a player selects any two random cards from the face-up cards on the table and compares their individual features to determine what features the third card must have to make a *SET* of three cards. This process is repeated throughout the game.
- **Problem Finding:** Problem discovery. Players use their intelligence and insight to determine what is missing. By using the following tip: “for every 2 cards, there is only 1 card that will make them a *SET*.” A great strategy for play is to search the cards in play, two-by-two, reviewing their features and determining what the last card should be. Then survey the table to determine if the card is there or not.

- **Reflection:** This skill is central to Problem Solving and Cognitive Development. SET helps players build this skill because all players peer review found *SETs* before they are cleared from the table. Therefore, every player is constantly reviewing the Rule of SET: that ALL three cards must be either all the SAME or all DIFFERENT in each of the four features.
- **Visual & Spatial Processing:** Players use their ability to process the features of each card, to understand the spatial relationship between cards and to visualize the *SETs*.
 - **Form Constancy:** Players exercise this when they find *SETs*. They learn that even in a SET where one factor is all the same, they must still consider all of the variables. A *SET* may be:
 - all the same shape, but different in number and color or
 - all the same shape and all the same number, but different in color or
 - all the same shape and all the same color, but different in number.
 - **Spatial Reasoning:** Players practice spatial reasoning by mentally re-arranging or grouping the cards on the table to find a SET without physically touching the cards.
 - **Visual Discrimination:** To find *SETs*, players must be able to detect differences in four characteristics — color, number, shape and shading.
 - **Visual Processing:** Players must think in visual images to conceptualize a *SET*.
 - **Visual Perception:** Every time a *SET* is found, three more cards are dealt creating a new array of visual information. The 12 cards on the table are never the same. Players repeatedly exercise their ability to interpret, analyze and give meaning to every new group of cards, strengthening their visual perception skills.

Interpersonal Development (Social Skills)

- **Collaborative Learning:** SET can be played as a class-wide challenge. Players can work collaboratively, as a group, competing against other groups to find the most *SETs*.
- **Cooperative Learning:** Players are divided by ability into mixed teams, where they teach, support and guide each other as they master finding *SETs*. Playing SET in this manner can also help maintain social balance between the extroverted and introverted student.
- **Cultural Sensitivity:** Playing SET allows you to put students with different backgrounds together. SET has the same rules for everyone and is easy to learn for ages six and up. SET requires no prior knowledge, so it puts all players on an even playing field. SET is religiously, politically and culturally neutral, making this an ideal situation for interaction between people of different age, race, sex, religion, politics and culture.
- **Peer Assessment:** When a player finds a *SET*, they call out “*SET*” and point out the *SET* they find. At that time all players can review the found *SET* and make sure it is valid. This helps players to improve their metacognitive skills as well as enhance their understanding of what is a *SET*.
- **Social Learning:** SET is a social game where as many people as can fit around a table comfortably may play together. Players will learn through observing others’ behavior, attitudes, and outcomes about those behaviors providing a perfect situation for social learning.
- **Social Skills:** Playing SET provides multiple opportunities for learning and exercising proper social skills such as: *verbal and non-verbal communication; following rules; listening; using appropriate vocal volumes, words and touch; and coping with losing and proper behavior when winning.*
- **Teamwork:** Divide players into small groups that will work together to find as many *SETs* as possible before other groups in the class.

Intrapersonal Development (Emotional Growth)

- **Adaptability:** SET requires players to stay adaptable and flexible. For example, you may find a *SET*, but another player says “*SET*” first, and when they pick up their *SET* they end up taking one of the cards you needed to make your *SET*. Since this card is no longer available, you must start again and look for a different *SET*. Adolescents especially need practice in facing change. SET provides a safe situation for players to remain adaptable throughout play.

- **Emotional Skills:** Each time a player finds a *SET*, his or her **self-confidence** grows. As players repeatedly play *SET* their cognitive, physical, social and emotional skills continually develop which increases their overall self-confidence. Over time each player's ability to find *SETs* increases dramatically. Excelling at something that was once difficult reinforces a **growth mindset**. Playing *SET* is fun so players are **intrinsically motivated** to play again and again; this repetition is key to developing skills. Each time a player finds a *SET*, he or she feels a sense of accomplishment, which creates an urge to find more. The enjoyment of playing and the feeling of success every time a *SET* is discovered, is found to naturally **enhance moods**. It's purposeful play that impacts each player's environment and **mindset** in a very positive way. Playing *SET* increases a player's skills and abilities, which builds their confidence and improves their overall **self-esteem**.
- **Executive Functioning Skills:** While playing *SET*, players take part in the decision-making process that includes planning, organizing, sequencing, strategizing, response inhibition, sustained attention, time management, flexible thinking and working memory.
- **"Hot" Executive Function:** *SET* is an exciting game that becomes competitive and fast paced making it a situation that isn't emotionally "neutral". Players will have to manage their emotional reactions, so that they can use their executive skills to find *SETs*.
- **Inhibitory Control (including Self-Control):** *SET* is a great game for introverts and extroverts to play head to head. Players will have to ignore distractions and resist the temptation to blurt out "*SET*" when they really haven't found one. False cries of *SET*, will cause them to lose points which matter since the person with the highest points wins the game.
- **Intrinsic Motivation:** *SET* is an addictive game that players want to play repeatedly because it's just fun Triple Matching Mania™.
- **Non-cognitive skills:** While playing as a group, *SET* players will work on their personality traits, such as agreeableness, conscientiousness, emotional stability, extraversion, and autonomy.
- **Self-assessment:** As a player finds a *SET* they can review their *SET* and determine if the information they surveyed reflects their understanding of the Rule of *SET*: that to make a *SET* the cards must be all the SAME or all DIFFERENT in each of the 4 features.
- **Time Management:** Players must race to find a *SET* before their opponents, so focus, strategy and organization are a must to win.

Academic Connections:

- **Creative Writing:** Ask your students to write the story of how two cards found their third in order to make a *SET*. Players must compare the four features of color, shape, number and shading to find the third card. Have players write about the adventures of those two cards looking for their third, or the sad lonely card looking for his/her two friends. Another idea is to assign a card to each player and have them write a descriptive tale about the attributes on their card. There are so many opportunities for narrative storytelling and descriptive writing.
- **Cross-Curricular Approach:** *SET* can be used in any classroom. The skills and competencies it develops can be used in many subject areas across the curriculum. It has been used to teach both low and high-level math concepts including probabilities and set theory, narrative storytelling or descriptive writing in English, ELA or Foreign Language classes, patterning and descriptions in science, teamwork in physical education classes, and many other tried and true best practices.
- **Differentiated Instruction:** *SET* can be utilized as a choice in differentiated content for students to practice skills they are learning. Read above to find out what cognitive, interpersonal, and intrapersonal skills *SET* reinforces.
- **Games-Based Learning:** *SET* facilitates learning. *SET* can be used at any level -- from six years of age through adulthood -- in a variety of learning situations. It can be used to help with behavior modification or to support learning in complex domains such as evaluation or creativity.
- **Hidden Curriculum:** Players will be having so much fun, they won't even realize the variety of skills they are mastering. *SET* requires players to use many social and self-regulatory skills that they won't even know they are practicing while playing the game.

- **Informational Text:** Use our SET instructions to fulfill the Common Core requirement with lower age groups. Students can read, annotate, jigsaw, comprehend, discuss, and teach each other how to play SET. The assessment is built in when you see which players understand the rules and can find SETs.
- **Kinesthetic Learning:** SET is a great change of pace for players. It's a great brain activity, that gives teachers and students a break from direct instruction time. Use SET in a small group format or for a great challenge, give a card to each student and have them go and find their SET among their classmates. Don't worry about those who don't find a SET, have the class work together to find them a SET among their classmates that their card will work with. This challenge is very similar to how our game SET Dice plays.
- **Math Skills:** SET's strategic and unique design opens connections to a plethora of mathematical disciplines, including geometry, modular arithmetic, discrete mathematics, combinatorics, probability, linear algebra, and set theory. Visit our website to read our Math Workbook created from the best practices of educators like you. Learn more by reading *The Joy of SET*, published 2016.
- **Science:** A student's ability to see and describe unique features becomes better after playing SET. Focusing on the four features and finding SETs from the visual array of cards, increases awareness of similarities and differences. For example, teachers have seen this improvement when students must draw and describe bacteria they are looking at under a microscope. The initial description of a blob turns into a tan, solid edge, clear center, oval shaped organism with specks inside.
- **SETs in Real Life:** Developing skills in comparing and contrasting or drawing analogies between items based on their similarities or differences is critical. Have students find real life SETs based on a set of features, like color, shape, number and shading. For example, an apple, a tomato and a pomegranate. They are all red, all round, all singular and all opaque. These would make a SET. You could also change what makes a SET by changing the features. In biology or anatomy, SETs are a great way to study the interactions of different systems of the body. For example, senses, body parts, the face. A student would write eyes, mouth and nose. These are all senses, different body parts, and all located on the face. In culinary classes students could use the Food Pyramid to write healthy meals based on SETs. For example, sautéed apples, baked chicken, and rice pilaf. These are three DIFFERENT food groups, three DIFFERENT cooking methods and three DIFFERENT colors. There is only one rule to make a SET, a SET is three items that are either all the SAME or all DIFFERENT in each feature.
- **Writing Across the Curriculum:** Writing is a key competency skill. SET can be used in all subjects. In science class have players write about a SET they found, comparing and contrasting features, they can then compare this to recessive and dominant gene studies or cell formation. When studying concepts like probability or set theory in math class, have students use the cards to explain in their own words these concepts. Have players write about teamwork after using our Kinesthetic Learning, Collaborative or Cooperative learning activities in physical education classes. In ELA or Foreign Language classes, students can use any SET to write a simple descriptive narrative that practices adjective-noun and verb placement and vocabulary. In English classes, give students cards that contain a SET and have them write a creative story personifying the features of that SET.