

## SET Dice Skill Connections for Teachers

SET Dice 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 Dice inspires an intrinsic motivation and desire to “play.” The repetition of playing again and again reinforces the skills that lead to success.



### SET Dice Strengthens

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

**Ages:** 8+  
**Players:** 1-6

### About SET Dice

SET Dice is triple matching mania that anybody can play, but nobody can stop! There’s only one rule to SET: a *SET* is 3 dice that are either *all the same* OR *all different* in each individual feature. There are three features: **color** (red, green or purple), **shape** (oval, diamond or squiggle) and **number** (1, 2 or 3). SET Dice includes three ways to play with the 42 custom over-sized dice. **1) SET Cubed** is a casual strategy game that really evens out the playing field. It’s no longer a race – on your turn, the challenge is to find the best combinations with your dice and the dice already on the board. The more *SETs* you create, the higher your score! **2) Scramble SET** is fast-paced family fun, just like your favorite card game. All at once, let the 42 dice spill out of the bag and race to find the most *SETs*! **3) Crossword SET** challenges your speed and skill. Be the first to combine your dice into a crossword grid made of *SETs*! Every game is a brain booster and keeps players challenged and wanting to play again and again! Roll, Connect, WIN!

### How SET Dice Develops Skills

#### **Cognitive Development:**

- **Analytical Skills:** A tip to playing SET Dice is to use your analytical skills to systematically survey the dice two-by-two on the board or table, collecting information, then determining in your mind what the third die is that you would need to make a *SET*. Lastly, determining if that die is among the dice on the board, table or in your pile and then communicating that *SET* to other players.
- **Attention/Sustained:** There are no turns in Scramble 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, Scramble 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 Dice because players must evaluate all three features, one at a time, to create or 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 dice, two at a time to see if the third die that completes the *SET* is in front of you,
  - looking for a *SET* that is different in all three features.

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

- **Cognitive Processing Speed:** Because there are no turns in Scramble 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 Dice 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 Dice, because players will have to think in new ways when analyzing the three features of each die -- color, shape, and number -- 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 any of the versions of SET Dice. Players must continually gather information about the features of the dice in front of them and then creatively sort through the relevant information while relating the new information from dice. All the while they must apply their knowledge of the “One Rule of SET” to logically reason and draw reliable and trustworthy conclusions about if there is a *SET* on the board or table.
- **Higher Order Thinking:** Players must learn what makes a *SET*, distinguish *SETs* from non-*SETs* by analyzing and comparing the dice on the board or table, and combining them into valid *SETs*, all of which involves higher order processes of Bloom’s Taxonomy and Critical Thinking.
- **Left Brain - Right Brain Connectivity:** SET Dice 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 dice and locate the dice 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 Dice” to identify which dice combinations make a *SET*. For every two dice, there is only one die that will complete the *SET*. Players must determine what the third die is and if it is before them. Logical deduction is often used to confirm if there are any *SETs* in the options before each player.
- **Memory:** SET Dice 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, long-term memory brings up prior knowledge like colors, numbers and shapes, and then applies them to the rule.
- **Metacognition:** A mindful practice for SET Dice players is to consciously think about their thinking. After playing a version of SET Dice, 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 Dice, Scramble SET and Crossword SET require the player to use many different intelligences while playing. Players use their Visual-Spatial intelligence to recognize the shapes, colors, and numbers and then analyze the spatial array of dice. Players use their Interpersonal intelligence while observing their opponent’s behaviors, taking turns and playing in a group environment. Bodily-Kinesthetic intelligence is used when players are touching and handling the dice. Lastly, players use their Logical-Mathematical intelligence to see and explore patterns and relationships between the dice to successfully find *SETs*.
- **Organization:** As *SETs* are created and placed on the board in SET Dice, players must mentally keep track of the everchanging options before them as each player takes a turn.
- **Pattern Recognition:** Pattern recognition is the ability to recognize order in chaos. Finding a general pattern about the dice on the table helps players to quickly find a *SET*. For example, if the majority of the dice are purple, then there is greater possibility that a *SET* exists that is all purple. Same can be said for a surplus of other features, such as shape and number.

- **Problem Solving:** Players will use both analytical and creative skills while playing SET Dice. A tactic of play during SET Dice is to use the rule “for every 2 dice, there is only 1 die that will complete the *SET*.” To test the rule a player looks at any two dice from the board and reviews their individual features to determine what features the third die must have to make a *SET*. If the third die with the right features is before them, then they can play it. If not, then they must continue searching for a place to play their dice. 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 dice, there is only 1 die that will make them a *SET*.” A great strategy for play is to search the dice in play, two-by-two, reviewing their features and determining what the last die should be. Then survey the table or board to determine if the die is there or not.
- **Reflection:** This skill is central to Problem Solving and Cognitive Development. SET Dice helps players build this skill because all players peer review found *SETs* when they are played on the board or, as in SET Scramble, they are removed from the pile. Therefore, every player is constantly reviewing the Rule of SET: that ALL three dice must be either all the SAME or all DIFFERENT in each feature.
- **Visual & Spatial Processing:** Players use their ability to process dice and their features, to understand the spatial relationship between dice and to visualize the *SETs*.
  - **Form Constancy:** Players exercise this when they find *SETs*. Players learn that 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 dice on the table or board to find a *SET* without physically touching the dice.
  - **Visual Discrimination:** To find *SETs*, players must be able to detect differences in three characteristics — color, number and shape.
  - **Visual Processing:** Players must think in visual images to conceptualize a *SET*.
  - **Visual Perception:** Every time a *SET* is played or created, more dice are reviewed, creating a new array of visual information. The dice in play are always changing. Players repeatedly exercise their ability to interpret, analyze and give meaning to every new group of dice, strengthening their visual perception skills.

## Interpersonal Development (Social Skills)

- **Collaborative Learning:** Crossword 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 Dice, Scramble SET or Crossword SET in this manner can also help maintain social balance between the extroverted and introverted student.
- **Cultural Sensitivity:** Playing SET Dice allows you to put students with different backgrounds together. SET Dice has the same rules for everyone and is easy to learn for ages eight and up. SET Dice requires no prior knowledge, so it puts all players on an even playing field. SET Dice 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:** In SET Scramble, when a player finds a *SET*, they call out “*SET*” and point out the *SET* they find. Or during SET Dice, once a *SET* is made and played, all players can review the found or played *SET* and make sure it is valid. This helps players to improve their metacognitive skills as well as enhance their understanding of what a *SET* is.
- **Social Learning:** SET Dice is a social game where up to 6 players can play together. Players will learn through observing others’ behavior, attitudes, and outcomes of those behaviors. SET Dice provides a perfect situation for social learning.
- **Social Skills:** Playing any version of SET Dice 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:** Scramble SET and SET Dice require players to stay adaptable and flexible. Even though you may find a *SET*, if another player plays in your spot (SET Dice) or picks it up first (Scramble SET), their play could alter your next move. Adolescents especially need practice dealing with change. SET Dice and Scramble 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 versions of SET Dice 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 Dice 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 Dice increases players' skills and abilities, which builds their confidence and improves their overall **self-esteem**.
- **Executive Functioning Skills:** While playing any of the games of SET Dice, players will have to 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:** Scramble 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 they can use their executive skills to find *SETs*.
- **Inhibitory Control (including Self-Control):** Scramble 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 matters since the person with the highest points wins the game.
- **Intrinsic Motivation:** All the versions of SET Dice are addictive, and players want to play repeatedly because it's just fun Triple Matching Mania™.
- **Non-Cognitive skills:** While playing as a group, SET Dice 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 dice must be all the SAME or all DIFFERENT in each of the 3 features.
- **Time Management:** In Scramble SET, players must race to find a *SET* before their opponents, so focus, strategy and organization are a must to win.

### **Academic Connections:**

- **Creative Writing:** The story of how two dice found their third in order to make a *SET*. Players have to compare the three features of color, shape and number in order to find the third dice. Have players write about the adventures of those two dice looking for their third, or the sad lonely die looking for his/her two friends. Another idea is to hand a die to each player, have them roll it and then write a descriptive tale about the features on their die. There are so many opportunities for narrative storytelling and descriptive writing.
- **Cross-Curricular Approach:** SET Dice 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 Dice 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 Dice reinforces.
- **Games-Based Learning:** SET Dice facilitates learning. SET Dice can be used at any level from 3<sup>rd</sup> grade 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 Dice 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 Dice instructions to fulfill the Common Core requirement. Students can read, annotate, jigsaw, comprehend, discuss, and teach each other how to play the games of SET Dice. The assessment is built in when you see which players understand the rules and can find *SETs*.
- **Kinesthetic Learning:** SET Dice 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 Dice in a small group format or for a great challenge, give a die to each student, have them roll it, and then 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 a *SET* among their classmates that their die will work with.
- **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 Dice. Focusing on the three features and finding *SETs* from the visual array of dice, 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: 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 dice 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*.

### **Classroom Tip:**

Visit us at [www.setgame.com](http://www.setgame.com) and you can use our free online SET puzzle as a daily warm-up or an Ice Breaker activity. Either use will get your students brains warmed up for learning, plus the kids will have fun doing it!