

## Zangle™ Skill Connections for Teachers

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

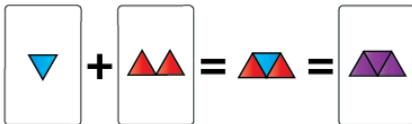
### Zangle Strengthens

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

**Ages:** 6 to adult  
**Players:** 1 to 6



### About Zangle



Zangle is a game of brain-twisting shape-building fun! A Zangle is two or more cards that make the shape on another card. The goal is to get rid of all your cards by making Zangles. Players earn one point for every card they have remaining at the end of each round. The player with the lowest score at the end of the game wins! With three ways to play, you can choose to take your

time in **Turn-Style**, boost your adrenaline by racing your opponents in **Speedster**, or play **Solitaire** to keep your brain kicking and heart ticking.

### How Zangle Develops Skills

#### **Cognitive Development:**

- **Analytical Skills:** A tip to playing Zangle is to choose a card with a shape that contains four to five triangles and then the player uses their creative analytical skills to systematically survey the center cards and their own cards, collecting information, then deducing in their mind what cards they can use to make a Zangle. Lastly, they must decide if that Zangle is their best option from the choices on the table or the only option. A way for teachers to check for understanding is to ask players to explain how Zangles they found qualify as a Zangle.
- **Attention - Selective:** There are no turns in Zangle's Speedster game mode. It is a race for each player to get rid of their cards before any of their opponents. All players must stay focused on the cards and not allow what other players are doing to distract them from continuously surveying the cards to find Zangles. Students who are easily distracted or jump from task to task find Speedster game mode perfect for practicing this skill repeatedly, which is crucial for development of their executive functioning skills.
- **Cognitive Flexibility (or Flexible Thinking):** Players practice the ability to think about something in more than one way as they adjust their thinking in response to the ever-changing cards in front of them. A Zangle must be made using at least one card from the center cards and at least one card from the player's cards. As Zangles are made, center cards are taken and replaced with new cards from the center draw pile; and the player's faceup cards are replaced with cards from the player's draw pile. With each Zangle found, the cards are constantly changing requiring players to shift from one possible Zangle to another.
  - looking for a shape from the center cards that uses many of the player's cards to make a Zangle.
  - sequencing through center cards and the player's cards to determine which possible Zangle will strategically use the most of their cards.
  - adjusting thinking when a center card necessary for a Zangle a player has spotted is removed from the table by another player and the options for Zangles change.
  - adjusting tactics if a player cannot make a Zangle and having to take a hit, by taking a card from the center draw pile and adding it to their faceup cards.

Playing Zangle increases the brain's ability to make quick shifts in thinking.

- **Cognitive Processing Speed:** Players must process information quickly to find a Zangle before their opponents in Zangle's Speedster game mode because there are no turns. Once they see a Zangle, they must respond appropriately to freeze the game by saying "Zangle", pick up the Zangle and quickly replace the center faceup cards from the center draw pile so that play can resume. Then they must replace their own faceup cards from their own draw pile. In Speedster game mode, Zangles are only checked for accuracy when a person goes out by being the first to get rid of all their cards. They then will reveal all their Zangles and everyone at the table will have an opportunity to inspect them. If their Zangles are not correct, then they receive five points and everyone else at the table receives zero points for that round. The lowest score after five rounds wins! This process of speed and accuracy requires high mental efficiency. Zangle 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:** Zangle challenges players to solve problems creatively by looking for Zangles from different perspectives and being able to see non-obvious patterns. A Zangle is two or more cards that make the shape on another card. A player must use a minimum of three cards in a Zangle. As players visually survey the shapes on the faceup cards in the center and the faceup cards in front of them, they must mentally organize the cards to create the shape on one other card. To see these non-obvious patterns or Zangles, players will have to think creatively by putting different shapes together to form the shape on one card.
- **Critical Thinking:** Higher-order thinking is necessary when playing any Zangle game mode. Players must continually gather information about the shapes on the cards in front of them and then creatively sort through the relevant information (the available shapes on the faceup cards) while relating new information (constantly changing cards that are replaced in the center faceup cards and in the player's faceup cards). All the while, players must apply their knowledge of what a Zangle is to logically reason and draw reliable and trustworthy conclusions as to whether there is a Zangle they can make and if it is strategically the best move toward the goal of being the first to get rid of all their cards.
- **Higher Order Thinking:** Players must learn what makes a Zangle and distinguish Zangles from non-Zangles by analyzing and comparing the cards on the table in order to combine them into valid Zangles. All of which involves higher order processes of Bloom's Taxonomy and Critical Thinking.
- **Left Brain - Right Brain Connectivity:** Zangle is the perfect game for Left and Right Brain Connectivity. **The left-brain** uses visual sequencing to recognize non-obvious patterns. Additionally, the left-brain may rely on the number of triangles on each card or categorize the cards by color to determine if a Zangle is even possible. Cards have either one (blue), two (red), three (purple), four (yellow) or five (green) triangles in various shapes on them. If a player chooses a card with three triangles on it, they will need one of the following to make a Zangle: A) a card with one triangle on it and a card with two triangles on it ( $1 + 2 = 3$ ); or B) three cards with one triangle each ( $1 + 1 + 1 = 3$ ); C) a card with three triangles and a Z-card, which equals zero ( $3 + 0 = 3$ ). But players must be careful, not all cards with two triangles fit into cards with three triangles, and so on: not all threes fit into fours, nor fours fit into fives. This can also be said of cards with the same number of triangles. For example, players will notice not all cards with 2 triangles are the same shape. **The right-brain** comes into play at this point as it holistically looks at the problem in front of it, picturing the shapes fitting together. It comprehends the visual imagery and uses its spatial abilities to find a Zangle. You will find as students play, they will lean toward the left or right brain to try to find Zangles. Many will use their mathematical reasoning and only look at the number of triangles, colors and patterns. While others will only use their spatial abilities and look at the shapes in their entirety as they compare them. But Zangle requires both sides of the brain, and with repeated practice cognitive processes will speed up.
  - In Zangle's Speedster game mode, winners receive an equalizer to continually provide an even playing field. For example, have the winner play all the consecutive rounds with only their non-dominant hand, or while covering their dominant eye. Equalizers can be whatever the group or teacher decides they are before the game starts. This is an opportunity to add more cross-communication between the Left and Right Hemispheres of the brain.

- **Logic & Reasoning:** In Zangle's Turn-Style game mode, players can practice their logical reasoning skills by determining what faceup cards on the table will make a Zangle. A Zangle must be made from a minimum of three cards. There are cards in two locations, center cards and the player's cards. Cards must be used from both locations to make a Zangle. Players will need to use logical deduction to confirm if there is a Zangle between all the faceup cards and/or which Zangle is to their best advantage so that they can be the first to get rid of all their cards.
- **Memory:** Zangle requires all players to use working and long-term memory while playing. As new knowledge of how to make a Zangle is learned and absorbed through working memory, long-term memory brings up prior knowledge like simple pattern recognition and/or simple mathematics, and then applies them to make a Zangle. Working memory is continually challenged as it works to encode ever-changing faceup cards for processing, so that the long-term memory can take the knowledge of how to make a Zangle and attach it to the working memory. This process of learning will continue as Zangle is played over and over. Different aspects of the game will become part of long-term memory, like for example, the shapes and colors on the cards and specific combinations that can be made.
- **Metacognition:** A mindful practice for Zangle players is to consciously think about their thinking. After playing Zangle, have players write out in detail their thinking process for finding Zangles, step by step. Did they initially look at the whole images or did they look at it as a math problem? This allows players to retrace their cognition in order to understand how they process information and what styles of learning would suit their brain the best. 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.
- **Multiple Intelligences:** Zangle allows the player to use many different intelligences while playing. **Visual-Spatial** players will enjoy processing the shapes on the cards in order to see a Zangle. **Bodily-kinesthetic** players will like that they are making something and can touch the cards to show and pick up their Zangle. The **Interpersonal** player will enjoy observing their opponent's behaviors, learning strategies as they see them played out and playing in a group environment. Lastly, the **Logical-Mathematical** player will get to see and explore the patterns and relationships between the shapes to successfully find Zangles.
- **Organization:** As Zangles are made and taken from the table, players must keep track of the faceup cards. There must always be four center faceup cards and the last player to make a Zangle must immediately replace them with cards from the center draw pile. The player's faceup cards must also equal four - unless the player has chosen to take a hit on their cards, in which case they could have more than four faceup cards. These cards are replaced from the player's draw pile and can only be replaced after the center faceup cards are replaced.
- **Pattern Recognition:** Pattern recognition is the ability to recognize order in chaos. Finding a Zangle requires players to repeatedly use the stimulus of the shapes on faceup cards and match it to the memory of what a Zangle is. A Zangle is two or more cards that make the shape on another card and must be a minimum of three cards. The stimulus or shapes are always changing as Zangles are made and faceup cards are removed from the center and the player's faceup cards. They are then replaced from the draw piles, first the center and then the player's as play continues.
- **Problem Solving:** Players challenge their creative and analytical skills while playing Zangle. The goal of Zangle is for a player to get rid of all their cards before your opponents do. Players must evaluate all center faceup cards and their own faceup cards in order to find a Zangle. A Zangle requires players to think about how shapes can fit together creatively while using a minimum of three cards.
- **Problem Finding - Problem discovery:** Players use their intelligence and insight to determine if what they need to make a Zangle is on the table. A tip to finding Zangles is to count how many triangles are on a card. If there are four triangles in the shape on a card, then any of the following card combinations will create a Zangle: A) 1 blue triangle card and 1 purple three triangle card ( $1 + 3 = 4$ ); B) 2 red two triangle cards ( $2 + 2 = 4$ ); C) or 2 blue triangle cards and 1 red two triangle card ( $1 + 1 + 2 = 4$ ). But be careful, not all cards with two triangles fit into cards with three triangles, and not all three triangle cards fit into four triangle cards, and so on. Analyzing the possibilities on the table for a Zangle allows a player to determine if there are Zangles in the allotted cards and/or which Zangle would be to their greatest advantage and help them get rid of their cards before their opponents do.

- **Reflection:** This skill is central to Problem Solving and Cognitive Development. Zangle can help support this skill. First-time players should start with Zangle's Turn-Style game mode. As players take turns making Zangles, make a rule that players must explain what process step-by-step they used to find the Zangle and then have them explain why it's a Zangle. This form of Reflective learning is a way of allowing players to step back from the game and help them to develop critical thinking skills and improve upon future performance by analyzing their experience.
- **Strategy:** In Zangle, all players have four cards faceup in front of them. Other players can see these cards. A possible strategy, is to look at those cards in front of other players, and when it is a player's turn, they may opt to make a Zangle out of a card they know the next player could use, thereby making their opponent's turn more difficult. This may seem like an unfair advantage because players can see each other's cards, but once a player picks up their Zangle and replaces all the center cards, this gives the next player a fresh opportunity to play and make a Zangle from the new cards. Another strategy is to decide if large and unusual shapes should be used early or to hang on to them. Players can decide which strategy they prefer or use them both.
- **Visual & Spatial Processing:** Players will process the incoming visual stimuli of the shapes on the cards in order to understand the spatial relationship between the objects and make a Zangle.
  - **Form Constancy:** Players exercise form constancy when they find a Zangle. They learn to recognize the different shapes regardless of their change in orientation, color or context. As players find Zangles they will learn how to sort the different shapes, identify shapes within another shape and match shapes.
  - **Spatial Reasoning:** Players practice spatial reasoning by mentally re-arranging or grouping the cards on the table in order to find a Zangle, all without physically touching the cards.
  - **Visual Discrimination:** To find Zangles, players must be able to detect differences in variables such as the number of triangles, the shape the triangles make, the color of the triangles.
  - **Visual Processing:** Players must think in visual images to conceptualize a Zangle. A player must be able to mentally rotate or use the mirror image of a shape to find Zangles. There is a limit though, players are not allowed to rearrange the shape on the card and make a new shape.
  - **Visual Perception:** Every time a Zangle is found it is cleared from the table. Since a Zangle must come from both the player's cards and the center cards, the cards removed from the table must then be replaced from their respective draw piles. As a result, players are repeatedly using visual discrimination and processing in order to make sense of what the eyes see thus strengthening their visual & spatial processing skills.

## Interpersonal Development (Social Skills)

- **Collaborative Learning:** Zangle is a great activity for small groups. One Zangle game can have up to six players. Zangle is played open where all players can see each other's faceup cards. In Zangle's Turn-Style game mode, players can help each other find the best Zangles in order to get rid of their cards. This allows players with strong skills to help those who are still developing their skills. Zangle is an excellent platform for a learner-centered activity like Collaborative Learning.
- **Cooperative Learning:** Players are divided by ability into mixed teams, where they teach, support and guide each other as they master finding Zangles in Turn-Style game mode. Playing Zangle in this manner can also help maintain social balance between the extroverted and introverted student.
- **Cultural Sensitivity:** Playing Zangle allows you to put players with different backgrounds together. Zangle's Turn-Style game mode has the same rules for everyone and is easy to learn for ages six and up. Zangle requires very low-level prior knowledge like colors and numbers, so it puts all players on an even playing field. Zangle 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 Zangle in Turn-Style game mode, all players can review the found Zangle and make sure it is correct. In Zangle's Speedster game mode, the first person to get rid of their cards must reveal all their Zangles at the end of the round and allow other players the opportunity to check that they are accurate. This helps players to improve their metacognitive skills as well as enhance their understanding of what is a Zangle is.
- **Social Learning:** Zangle is a social game for up to six players. Players will learn through observing others' behavior, attitudes, and outcomes from those behaviors, providing a perfect situation for social learning.

- **Social Skills:** Playing Zangle 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 Zangles as possible before other groups in the class.

## Intrapersonal Development (Emotional Growth)

- **Adaptability:** Zangle requires players to stay adaptable and flexible. For example, in Zangle's Speedster game mode a player may find a Zangle, but if a second player says "Zangle" first, they get to pick up the cards for their Zangle and may end up taking one of the cards the first player needed to complete their Zangle. After each Zangle is found, center cards are replaced, and you must start again to look for a different Zangle. Adolescents especially need practice at facing change. Zangle provides a safe situation for players to remain adaptable throughout the game.
- **Emotional Skills:** Each time a player finds a Zangle, his or her **self-confidence** grows. As players repeatedly play Zangle their cognitive, physical, social and emotional skills continually develop which increases their overall self-confidence. Over time each player's ability to find Zangles increases dramatically. Excelling at something that was once difficult reinforces a **growth mindset**. Playing Zangle 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 Zangle, 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 Zangle 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 Zangle increases a player's skills and abilities, which builds their confidence and improves their overall **self-esteem**.
- **Executive Functioning Skills:** While playing Zangle, 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:** Zangle's Speedster game mode is exciting and 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 Zangles and get rid of their cards before their opponents.
- **Inhibitory Control (including Self-Control):** Zangle's Speedster game mode 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 "Zangle" when they really haven't found one. False cries of "Zangle" result in players receiving a penalty card from the center draw pile, which they must then add facedown to their own draw pile. Players must try to avoid this penalty since the goal of the game is to get rid of their own cards first with correct Zangles.
- **Intrinsic Motivation:** Zangle is a game of brain-twisting shape-building fun that players want to play repeatedly because they just can't stop.
- **Non-cognitive skills:** While playing Zangle, players work on their non-cognitive skills like personality traits such as, agreeableness, conscientiousness, emotional stability, extraversion, and autonomy.
- **Self-assessment:** As a player finds a Zangle they can review their Zangle and determine if the information they surveyed reflects their understanding of what a Zangle is: Two or more cards that make the shape on another card, using a minimum of three cards.
- **Time Management:** In Zangle's Speedster game mode, players must race to find Zangles and get rid of their own cards before their opponents. Focus, strategy and organization are a must to win.

## Academic Connections:

- **Creative Writing:** Creative writing displays imagination or invention. After playing a game of Zangle, ask players to write the story of how their Zangle was made. Players will need to compare numbers, colors and shapes and explain how these cards became a Zangle. Players can write about the adventures of these cards as they looked for each other. Or the sad lonely card looking for his/her 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:** Zangle can be used in any classroom. The skills and competencies it develops can be used in many subject areas across the curriculum. It can be used to teach both low and high-level math concepts, 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:** Zangle 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 Zangle reinforces.
- **Games-Based Learning:** It takes over 400 repetitions to create a synapse in the brain without playful engagement OR about 12 repetitions to create a synapse when you use play to teach (Purvis,2012). Zangle facilitates learning. Zangle 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:** Zangle requires players to use many social and self-regulatory skills. They will be having so much fun, they won't even realize the variety of skills they are mastering.
- **Informational Text:** Use our Zangle 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 Zangle. The assessment is built in when you see which players understand the rules and can find Zangles.
- **Kinesthetic Learning:** Zangle 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 Zangle in a small group format. Or for a great challenge, give a card to each student and have them go and find a Zangle among their classmates. Give points for the largest Zangle made with the most people.
- **Math Skills:** Zangle opens connections to a plethora of mathematical disciplines, including absolute zero and modular arithmetic. Or geometry topics such as: vertices, congruencies, and calculating the area of different shapes. Zangle strengthens visual-spatial skills needed for many professions, like programming in robotics and even air traffic controllers.
- **Science:** A student's ability to see and describe unique features becomes better after playing Zangle. Focusing on the features and finding Zangles from the faceup cards in the center and in front of the player, 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 edged, clear centered, oval shaped organism with specks inside.
- **Writing Across the Curriculum:** Writing is a key competency skill. Zangle can be used in all subjects. In science class have players write about a Zangle they found, comparing and contrasting features. When studying different math concepts have students use the shapes on 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 Zangle to write a simple descriptive narrative that practices adjective-noun and verb placement and vocabulary. In English classes, give students a Zangle and have them write a creative story personifying the features of that Zangle.

### **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!

### **Sharing is Caring:**

Check out the Teachers' Corner at [setgame.com](http://setgame.com) for more ideas of how to use our games in your classroom. Have an idea you would like to share? Please email us your ideas, worksheets, and ways to play and we will add them to the Teachers' Corner.