At Zygomatic, we are committed to reducing the environmental impact of our products. We work hand in hand with our supplier partners* to improve our production methods and physical resources. Thus, we prioritize the use of recyclable materials, the reduction of packaging and the minimization of transportation between the point of production and the point of sale. 95% less plastic By eliminating the plastic insert and the plastic film around the box in favor of a cardboard insert and a simple sticker, we have reduced the amount of plastic used by 95%. Each Dobble game box contains less than one gram of plastic, compared to 23 grams previously. 100% FSC-certified paper and cardboard In a Dobble box, all the paper and cardboard used is FSC certified: the box, the cardboard insert, the game cards and the rule book. FSC is a label guaranteeing that the wood used comes from sustainably managed forests. 33% less empty space In the box. To reduce the empty space in the box, we have reduced the depth of our cardboard boxes from 75mm to 50mm. The tin box and game cards retain the same high quality for an unchanged game experience. The Dobble game box has changed a lot! The new version (on the right) is thinner and has been redesigned! But its whats inside that matters most Find out everything that has changed* Change takes time! However, we intend for all of our Dobble games to be packaged in this new packaging by 2024, worldwide. One year of production of these new Dobble game boxes in place of the old boxes would save an estimated 94 tons of plastic, paper and cardboard the weight of 16 African bush elephants! We are pleased to be able to introduce this new Dobble game box. However, we want to continue reducing the environmental impact of our Dobble games and other Zygomatic studio games: limiting packaging, reducing plastic and increasing the use of recycled materials. Eco-design is a process of continuous improvement, and we hope to go further and offer products that are ever more respectful of the planet. Any additional questions? We will gladly answer any questions you may have about our eco-design approach. Feel free to send us your questions at contact.zygomatic@asmodee.com. *The contents of the Dobble game boxes and the data are subject to variation depending on the selected supplier. All data is obtained from a life cycle analysis of the Dobble game boxes from a single supplier. Card gameFor the Ghanian music duo, see Dobble (music duo).DobbleAlternative namesSpot It!TypeMatchingPlayers2-8Age range8+Cards55DeckProprietary cardsPlaying time15 minutesDobble is a game in which players have to find symbols in common between two cards. It was the UKs best-selling game in 2018 and 2019.[1][2][3]The game is sold as Dobble in Europe and Spot It! in the US.[4] The name is a play on the word 'double'.[5]The game uses a deck of 55 cards, each printed with eight different symbols. Any two cards will always share one, and only one, matching symbol. The objective of the game is to be the first player to announce the common symbol between given cards.[4]In 1976, inspired by Kirkman's schoolgirl problem, French mathematics enthusiast Jacques Cottereau devised a game consisting of a set of 31 cards each with six images of insects, with exactly one image shared between each pair of them. In 2008, journalist and game designer Denis Blanchot found a few of the cards from the "game of insects" and developed the idea to create Dobble.[5]Dobble was released in France in 2009, and in the UK and North America in 2011 under Blue Orange Games. In 2015, the French board game company Asmodee acquired the rights to Dobble and Spot It![5][6][7]2 points on each line, 2 lines on each pointThe special way that symbols are arranged on Dobble cards can be understood using geometry. If each card is represented by a line, and each symbol by a point where two lines intersect, then the properties of Dobble are that:any two lines intersect at exactly one point, andany two points are joined by exactly one line.[8] This geometric structure is an example of a finite projective plane.[8]The Fano PlaneIf there are 3 points in each line this creates a structure known as the Fano plane. This represents a simpler version of Dobble with 3 symbols on each card, 7 cards and 7 symbols.[8]In general, a finite projective plane of order n has n+1 points on each line, and n2+n+1 points and lines.[8] This implies that a finite projective plane of order n1 has n points on each line, and n2n+1 points and lines.Graph of the projective plane of order 7, having 57 points, 57 lines, 8 points on each line and 8 lines passing through each point, where each point is denoted by a rounded rectangle and each line by a combination of letter and number. Only lines with letter A and H are drawn. In the Dobble or Spot It! game, two points are removed. In the SVG file, hover over a line to highlight it.The game of Dobble with 8 symbols on each card corresponds to the finite projective plane of order 7, where each line joins 8 points. This results in a structure with 57 lines and 57 points (72+7+1=828+1=57),[8] corresponding to a maximum of 57 cards and 57 symbols. Dobble uses 55 cards rather than 57 to allow the cards to be printed on standard card-making machines that are designed to produce decks of standard playing cards (52 plus 2 jokers and 1 advertising card).[5][9] A junior version of Dobble features 6 symbols per card, 30 cards, and 31 different symbols (626+1=31).Puzzlewocky: Finite Projective Planes and the Math of Spot It!Mathematical Association of America: The Intersection GamePeter Collingridge - The Mathematics of DobbleHow does Dobble (Spot It) work?^ "Asmodee named UK's No.1 Games Manufacturer of 2019". Asmodee United Kingdom. Archived from the original on 2020-03-01. Retrieved 2020-03-01.^ Smithers, Rebecca (2019-12-15). "Families get on board with fast, easy games for Christmas". The Observer. ISSN0029-7712. Retrieved 2020-03-01.^ "Dobble named UK's biggest-selling card game as one millionth unit sold". ToyNews. Archived from the original on 2020-08-01. Retrieved 2020-03-01.^ a b "Dobble | Card Game". Rules of Play. Retrieved 2020-03-01.^ a b c d McRobbie, Linda Rodriguez. "The Mind-Bending Math Behind Spot It!, the Beloved Family Card Game". Smithsonian Magazine. Retrieved 2020-03-01.^ "Asmodee (2015-07-02). "Asmodee Acquires the Rights to Spot It! Game". www.businesswire.com. 2015-07-02. Retrieved 2020-03-04.^ a b c d "Finite Projective Planes and the Math of Spot It!". puzzlewocky. 2016-02-18. Retrieved 2020-03-03.^ Polster, Burkard (2015-04-01). "Blue Intersection Game" (PDF). Math Horizons. 22 (4): 811. doi:10.4169/mathhorizons.22.4.8. ISSN1072-4117. S2CID125989030. Archived from the original (PDF) on 2020-02-07.Retrieved from " IF YOU LIKE DOBBLE, YOU WILL ALSO LIKE: Find the answer to this question and thousands of others with Timeline, where you can combine your intuition and your knowledge with history. Discover Do you want to write us a love letter, or ask us a question? Write to us Dobbleis a card-based game that will help your child increase their observation skills and their working memory (which will, in turn, help with self-control and concentration). The basis of the game is a set of fifty-five cards, each ofwhich has eight symbols on it of varying sizes. Each card is designed so that theres only one matching symbol between each and every possible pair of cards, and its up to the players to find these matching symbols. It sounds simple, but when youtry to do this at speed, it becomes surprisingly difficult. Dobble can be played with between two and eight players. Be warned, its incredibly addictive, and if your child really likes it, you can use it as the basis for exploring the mathematical principles which were used to create the game.How Long Does It Take To Play? Dobble consists of a series of mini-games, each of which will take between three and five minutes to play, and typically youll play a number of mini-games in a row. This means that a typical game of Dobble may last between fifteen minutes (for three to five mini-games) and half an hour (six to ten mini-games).Ages: Six and older, although some younger children may enjoy it too.Each Dobble card has eight symbols on it (out of a choice of fifty different ones), and each card has one, and only one, matching symbol with every other card in the deck (in this case, the anchor symbol).Core Life Skills It Will Help Develop: Critical Thinking Skills Observation; Workingmemory;Pattern recognition; Intrapersonal Skills Self-control; Concentration; Physical Skills Hand-eye coordination.What Do You Need To Play It? In order to be able to play this game, you need to have a set of Dobble cards. UK-based parents can purchase a set from here, while USA-based parents can purchase a set from here.Preparation: Once you have a set of Dobble cards, youll need to read the rules carefully so that you understand exactly how its played. Its also an idea to have a practice round to ensure that everyone has understood the rules before you play in earnest for the first time.How Do You Play It? There are five basic mini-games you can play with your Dobble cards. You can select an individual game to play and play it a number of times (or you can work through each of them once) each time, or in a random order. No matter how you play it, the winner is the person who has won the highest number of mini-games by the time you decide to stop playing. So what are the mini-games? They are:The starting position for The Towering Inferno mini-game for four players.The Towering Inferno: To play this game, first shuffle the cards and then place one card face down in front of each player. The remaining cards are placed face up in the middle of the table and form the draw pile. The object of the game is to win the highest number of cards from the draw pile before the cards run out. Cards are won from the draw pile by being the fastest person to find a match between the card the player is holding and the one at the top of the draw pile. The first person to call out a match with the top card in the draw pile wins it. This card then becomes their matching card. The game ends when the draw pile is empty, and each player then counts up how many cards they have to find out who has won.The Well: To play the game, deal all the cards out to all the players, then place the last card face up in the middle of the table. Each player then shuffles their own cards and places them in adraw pile in front of them. The objective of this game is to get rid of all your cards as quickly as possible. The game starts when someone calls out Go! At this point, each player turns over the top card on their draw pile and tries to match it to the face-up card in the middle of the table. The first person to call out a match places their card on top of the existing card to become the new match card. They then turn over the next card from their draw pile. The first person toget rid of all their cards wins, and the game ends when only one person is left holding any cards.The Hot Potato: Each player is given a single card that is then kept hidden in their hand without looking at it. The remaining cards are set aside to be used in later rounds. The aim of the game is to get rid of your card faster than any other player. To play the game, someone says go, and all the players reveal their cards (making sure that all the symbols on them are fully visible). As soon as cards are turned over, each player must search for a match between their card and their opponents. When someone spots a match, they shout it out and place their card on top of the opponents card they are matching it to. Their opponent now has two cards and they must find a match between their uppermost card and their opponents. If a player who has more than one card finds a match, they pass all their cards on to their opponent. This carries on until one player is lefthholding all the cards. This is the end of the round and they set the cards down in a pile in front of them. At this point, each player is dealt a second card and a second round begins following the same rules. This is repeated for as many rounds as the players wish to play, and the loser is the person with the most cards after the final round is played.Gotta Catch Them All: To play this game, a card is placed face-up in the middle of the table, and then each player is dealt a face-down card. The rest of the cards are set aside for later use. The aim of the game is to get as many cards as possible. On someones signal, all players flip their card over at once and try to find a match between any of the revealed cards (whether theirs or someone elses)and the central one. Whenever someone calls out a match between any of these cards and the central one, they get to claim that card. This continues until all the revealed cards have been claimed (and remember that each person can claim as many cards as they are the fastest to find a match to the central card in each round). At the end of the round, the middle card is replaced with a new face-up one, and each player is dealt a new face-down card. The game ends when there are no more cards to be dealt out, and the winner is the person with the most cards.The Poisoned Gift: To start this game, place one card face-down in front of each player and then turn the remaining cards face-up in a pile in the middle of the table, creating a draw pile. The aim of the game is to gain the fewest cards possible. To play the game, someone shouts go and each player flips their card over. At this point, each person must try to find a match between the card at the top of the draw pile and any of their opponents cards. When they spot a match, they call it out, and then place this card on top of their opponents. This reveals a new card in the draw pile, and the players must continue to try to find a match between it and their opponents upper-most cards. The game ends when there are no more cards left in the draw pile, and the winner is the player with the fewest cards.A set of Dobble cards comes in a handy metal storage tin (on the left), making them easy to carry around. It can be played anywhere there is enough room to lay the cards out.When And Where Can You Play It?Dobblecan be played anywhere where you have the room to set out the cards in the required pattern, and you may find if you dont have room for one of the mini-games, you do have room to play a different one.The Maths Behind Dobble: One of the most interesting features of Dobble is the fact that there is one, and only one, matching pair of symbolsbetween each and every pair of cards in a set. You might think that this would be difficult to do, and it would be were it not for a set of mathematical principles. The main one of these is the principle of interactions, which states that two lines always have single point in common, and this principle can be used to work out how to order items so that they always have one single item in common.This is a mathematical problem that has interested mathematicians for centuries, and it has been approached in different ways to accommodate specific properties. The most widely known example of this is called Kirkmans Schoolgirl Problem. In this problem, fifteen schoolgirls must go out for a walk in rows of three for seven successivedays, but on each day, they must arrange themselves in such a way that no two of them will walk in the same row twice. In 1976, the technique used to solve this problem was generalised by Jaques Cottereau and used to create a game that waseventually (in 2009) developed into Dobble.The basic mathematical principles behind Dobble are used to create error-correcting code which allow digital information to be transmitted over unreliable communication channels. This is because if any information is missing, you can work out what it is based on the data that was accurately received. For example, if you lost one of your Dobble cards, you could re-create it by examining the remaining cards to see what symbols it must have had on it so that it would have only one matching symbol with every other card. This is the same principle behind Sudoku, where you can work out the arrangement ofthe digits one to nine in a grid given a specific rule (the same digit cannot appear twice in any row or column within the grid) and a few initial digits, and its remarkable how much missing information can be inferred from just the few bits and pieces that get through, as long as they are structured in such a way as to follow a set of rules similar to the cards used to play Dobble. If your child likes playing Dobble, and shows an interest in learning more about the mathematics behind it, then this is something which they may enjoy exploring (but dont try to push them into it if they are not!).Links To Useful Products For This Game You can purchase a set of the original Dobble cards by clicking hereor on theimage below. Share copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Si vous aimez Dobble, vous aimerez aussi : Trouvez la rponse cette question et des milliers d'autres avec Timeline, en confrontant votre intuition et vos connaissances l'Histoire. Dcouvrir Vous souhaitez nous laisser un mot doux ou nous poser une question ? Nous crire The award winning game Dobble is over a decade old. You might know it by its pseudonym Spot it! or you might have seen it wearing Star Wars or Harry Potter disguises. Published by Asmodee this games closest relative is snap.So how does a simple game of finding pairs win awards and last over a decade with unwavering popularity? Is it hype and marketing or is it a good game? Read on to find out.GameplayDobble is easy to grasp. Most people who have played snap will understand the simplest objective of matching an image on two cards. This original version contains 55 cards, each with eight illustrations on them. When comparing two cards only one image will ever match. Dobble however, mixes it up and messes with your brain! It does this by varying the sizes of the symbols from card to card. When you stop to think about this, it is really, really clever. The illustrations dont change colour, the creators went that twisted, but they did decide on a palette of colours that frequently get used and help camouflage one another.Dobble offers a handful of different ways to play The Towering Inferno, The Well, Hot Potato, Gotta Catch Them All!, and The Poisoned Gift.However they try to market it with these different mini-games, Dobble is still ultimately the same matching game. You have to match to either gain or get rid of your cards. That doesnt really matter though, because this is still very clever in its tricky simplicity.My favourite mini-game is Towering Inferno. Where each player has a card in front of them and there is a central draw deck. Turning over the top card of the draw pile players work out which of their symbols match to win that card. The player with the most cards at the end wins. This is the one I play with my kids the most. It doesnt need to be more complicated than this and you can still have fun without the vindictiveness of some of the other options. Each of the 2-8 players are constantly involved trying to find their pair. It is also quick and inclusive. I have played it with my youngest son when he was 4. Granted, we created a house rule for older players that we had to count to 3 in our head before making a match to give him a fighting chance. For me, this is a much better option than splashing out on the Dobble Kids version. From 8+ no handicap is needed, although sometimes I wish they would count to 3 in their heads for me to win a couple!You can go on a roll and suddenly every card has a particular symbol on and you just get in the zone, but equally other players have these spurts as well so it balances out in the end.Below are two cards, how quickly can you find the matching symbol?The cards are colourful and good quality. Strong enough to withstand the odd snatch or grab without creasing or tearing. The symbols are colourful and good what you would want for a child to recognise and be able to identify. The small tin protects the cards and means that the card game is easily transportable.Dobble doesnt necessarily take up that much table space so it is also a perfect on the go game.Final thoughts on DobbleWith the house rule discussed above in play no one has an advantage. This means we can all play together, including our youngest player, and it will still be competitive and fun. That is rare in all but the best family games, to level the playing field and still enjoy the game as a so-called grown-up. It is also a quick game to play, with 5 minutes being a long game. The small tin lends itself to being transportable so it can be taken anywhere. It fits in your handbag if you are off to the pub and need something to amuse the youngsters. It has travelled to the coast and we even play it on the top of the fold down trays on a coach, train or plane. It would probably even fit in a hand bag (fanny pack for American readers) if those things still exist. There is even a waterproof version for playing outdoors in the great British summer.As I mentioned Dobble is also available in different themes such as Harry Potter and Star Wars. These have a good look and appeal to the fan bases. For me though, you cant beat this original version for the whole family to enjoy.In short, Dobble delivers. Summary Dobble is a lightweight game in more ways than one. The small tin certainly packs a punch bigger than its size suggests. With an RRP of 12.99 this really is a game that every family should own and play. Artwork and Components Complexity Instructions Interaction Value for Money Pros Great family game for all agesEasy to learnQuick play timeTransportable Cons The variety of ways to play arent that different Your kids can actually beat you! If you already own Dobble and enjoy it, or are looking for other inspiration, you might also like these similar games:Anomia Jungle SpeedCobra PawHappy Salmon If you want to buy Dobble after reading our review click on one of our affiliate links below:(note there has been no affiliate links until this point) For clarity. We dont get paid for our reviews. We purchased this game with our own money, this has not affected our review in any way. We may however earn a tiny commission if you buy after having clicked one of our affiliate links which does hopefully give us a bit of pocket money towards hosting costs and new games to review!As an Amazon Associate I earn from qualifying purchases.Board Game Review is a brand ambassador forOut of Town Games.We also are an affiliate of Board Game Prices, a price comparison website for Board Games.These affiliate advertising programs are designed to provide a means for sites to earn advertising fees by advertising and linking to their websites.Read my disclosure policy by clicking here. Share copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Following birthday and Christmas presents, families often have a glut of new games to learn and play. Many of these games involve computers or games consoles, but with concerns about childrens screen time there has been a recent increase in the popularity of traditional board and card games. One non-electronic card game that has made its way into our homes is Dobble. Its a game of observation, articulation and speed that was first released in France in 2009. While the children are learning the workings of this game it is interesting, as cognitive psychologists we were also fascinated by the underlying cognitive processes that make this simple game so absorbing and challenging to play. How does Dobble work mathematically? The aim of the game is to be the first player to get rid of all their cards by discarding them one at a time into a central pile. Players do this as soon as they can identify, and announce, the single common symbol between the card in their hand and the one on the top of the pile. The top card will change every time someone gets rid of a card. There are 55 cards, each containing eight symbols out of a possible 57. And in any pair of cards, only one symbol matches. The first task in the game is to visually search the symbols on both the card in your hand and that on the top of the central pile to find the single match. Colour, size and location are typical cues we use when searching. But this task is more difficult than it seems due to the number and variety of symbols. Their shared features sometimes give rise to false alarms when scanning quickly. For example, the lips, heart, maple leaf and fire symbols are all red in colour. The fact the target items will likely be of a different size and orientation on each card also means that we perceive the same symbol slightly differently. So a match is more difficult to identify. Unlike, for example, Wheres Wally?, where the object of the search is clearly defined, with Dobble we do not know on any round which item we are searching for. Indeed, this will be different on each card. We may switch between different strategies such as scanning the symbols on both cards in the hope that the match will just pop out. Or we may adopt a more structured approach where we peruse each symbol in turn. When demands on attention are high, we are more likely to suffer inattentional blindness. Thats the phenomenon of looking but not seeing, whereby the item we are fixating on does not receive enough attention for us to actually notice it. Say the name Once you have found the matching symbol you must quickly announce what it is before placing your card down on the pile. This again sounds simple, but just like producing the correct word in everyday speech, it requires the processes of linking the desired concept the symbol on the card with the name that represents it. Also, we may be able to select the appropriate word, for example saying tortoise rather than turtle. Plus you must select the correct sounds to utter that word, before finally saying it out loud. In the urgency of the game, you may find these processes dont happen as quickly as you want them to. Dobble - not as easy as saying what you see. Claire Adams/Shutterstock Once you have correctly articulated the matching symbol and played your card, the whole process starts again. Given the low chance of that previous symbol being the next correct match, you must inhibit (stop yourself thinking about) this and search again. As a result, you may find you remember its name, its location, even its colour so that you can be open to a new search. However, you must not inhibit it completely as there is still a chance it could appear on the next pair. Even if you were about to articulate a match, you must stop yourself if your opponent calls out a symbol on their card first. Even if you were about to articulate a match, you must stop yourself if your opponent calls out the match first. You will need to inhibit this vocalisation and instead restart the search for a new pairing since the reference card in the centre has now changed. This ability to switch between searches and inhibit unwanted information is one of a number of executive organisational cognitive processes that help us in the planning and coordination of activities. Under stress And of course, all of this occurs under time pressure. Stress can increase when it seems your opponent is discarding their cards quicker. We know that increased stress levels impair our word-finding ability, attention to information, inhibition of responses and ability to adapt to changing circumstances. All of these are vital to performing well in Dobble. The bad news for parents is that many of the processes we have described decline as we get older, meaning that children may have the competitive edge at Dobble. If youre looking for a quick, fun game that can be enjoyed by all ages, Dobble is the perfect choice. This fast-paced card game is all about observation, speed, and matching symbols.Whether youre new to Dobble or just looking to brush up on the rules and strategies, Im here to guide you through everything you need to knowfrom setting up the game to mastering the art of spotting those elusive matches. Lets dive into how to play Dobble, explore its various game modes, and discover some winning strategies.What is Dobble?Dobble is a popular card game known for its simplicity and quick gameplay. The game consists of a deck of 55 circular cards, each adorned with eight different symbols.What makes Dobble unique is that any two cards will always have exactly one symbol in common, though the symbols might differ in size or orientation. The objective of the game is straightforward: be the first to spot the matching symbol between two cards and call it out.Dobble is incredibly versatile and can be played with 2 to 8 players, making it a great option for family game nights, parties, or even casual get-togethers. The games fast pace and simple rules make it accessible to children and adults alike, ensuring that everyone can join in on the fun.Dobble Game SetupSetting up Dobble is as easy as it gets. Heres a quick guide to getting started:Shuffle the Cards: Begin by shuffling the deck thoroughly. This ensures that the game is fair and random.Decide on the Game Mode: Dobble offers five different mini-games, each with its own set of rules (which Ill cover shortly). Decide which one you want to play, or mix things up by playing multiple modes in one session.Distribute the Cards: Depending on the game mode, youll either deal a specific number of cards to each player or place a certain number in the centre of the table. Ill explain the specifics of each mode in the next section.And thats it! Youre ready to start playing Dobble.Dobble Rules: How to Play Dobble?Basic RulesThe basic premise of Dobble is simple: players compete to spot the matching symbol between two cards. The first player to correctly identify and call out the matching symbol wins the round. The winner of the round either collects the card, places it in the centre, or discards it, depending on the game mode.Game VariationsDobble isnt just a one-trick pony. There are five different mini-games, each offering a unique twist on the standard gameplay:1. The TowerSetup: Deal one card face down to each player, and place the remaining cards face up in a stack in the centre.Objective: Players simultaneously flip their card and try to spot the symbol that matches the top card of the stack. The first to do so takes the centre card and places it on top of their pile. The game continues until all the centre cards are taken. The player with the most cards at the end wins.2. The WellSetup: Place one card face up in the centre, and deal the remaining cards equally among all players.Objective: Players race to get rid of their cards by matching the symbol on their top card with the one in the centre. The first to discard all their cards wins.3. Hot PotatoSetup: Each player starts with one card in hand.Objective: Players must quickly find the matching symbol between their card and the card of another player. When they do, they pass their card to that player. The game continues until one player is left holding all the cards. The player with the fewest cards at the end wins.4. The Poisoned GiftSetup: Deal one card face up to each player and place the remaining cards in a draw pile.Objective: Players race to match the symbol on the top card of the draw pile with a card held by another player. When they find a match, they give the draw pile card to that player. The goal is to avoid collecting cards, and the player with the fewest cards at the end wins.5. TripletSetup: Lay nine cards face up in a 33 grid on the table.Objective: Players race to find a matching symbol between any three cards. The first to spot a match calls it out, takes the three cards, and replaces them with new ones from the deck. The player with the most cards at the end wins.Each of these variations adds a fresh challenge to the game, keeping it exciting and engaging for all players.How to Win Dobble?: Strategies and TipsWhile Dobble is a game of speed, there are a few strategies that can help you improve your chances of winning:Observation SkillsDobble is all about quickly spotting the matching symbol, so honing your observation skills is key. Focus on the symbols and practice identifying them as quickly as possible. It can help to familiarise yourself with the symbols on the cards before the game starts.Mind GamesSometimes, getting into your opponents head can give you the edge. For example, you can try to distract them or feign uncertainty to slow them down. Just be careful not to lose focus yourself!Speed vs AccuracyWhile speed is crucial in Dobble, its important not to rush too much. If you call out the wrong symbol, youll lose valuable time. Find a balance between being quick and making sure youre correct before you shout.Practice TipsAs with most games, practice makes perfect. The more you play Dobble, the better youll become at spotting matches quickly. You can even practice on your own by going through the deck and trying to spot matches between random pairs of cards.Common Mistakes to Avoid When Playing DobbleEven seasoned players can make mistakes when playing Dobble. Here are a few common pitfalls to watch out for:RushingIts easy to get caught up in the excitement and rush to call out a match. However, rushing can lead to mistakes, like calling out the wrong symbol or missing a match altogether. Take a moment to confirm before you shout.OverthinkingDobble is designed to be a quick game, so try not to overthink your moves. Trust your instincts and go with your first impression. Overanalyzing can slow you down and cost you the round.Ignoring VariationsSticking to one game mode can get repetitive, so dont forget to try out the different variations. They each offer a new way to play, and you might find one that you enjoy even more than the standard game.ConclusionDobble is a brilliantly simple yet challenging game that keeps players on their toes. Whether youre setting up for the first time or honing your winning strategies, I hope this guide has helped you get the most out of your Dobble experience. Dont forget to try out the different game variations and practice regularly to sharpen your skills. Now that you know how to play Dobble, its time to gather your friends or family and enjoy some fast-paced matching fun!FAQs About DobbleWhat age group is Dobble suitable for?Dobble is designed for players aged 6 and up, making it a great choice for family game nights.How many players can play Dobble?Dobble can be played with 2 to 8 players, making it versatile enough for both small and large groups.Can Dobble be played online?While there isnt an official online version of Dobble, there are apps and digital versions available that mimic the gameplay. Spot It! is a fun game that has some interesting math behind it. I first took notice of Spot It! because its packaging is similar to a game called Name That! that I co-designed, though the games are quite different. To play Spot It!, you turn over two cards and find the matching symbols. Any two cards will have one and only one matching symbol in common. According to the game documentation, there are 55 cards with 8 symbols on each card and 50 different symbols used in the deck.When my brother and I sat down to play this game, we immediately started thinking about the math behind it and wondering about the different combinations that one could use to create simpler or more complex versions of this game, and how many cards and symbols would be necessary in the various configurations.One way to understand the math of Spot It! is to look at the game as a physical expression of a finite projective plane, which is a set of points and lines such that any two points have only one line that passes through them, and any two lines have only one point in common. This describes the math of Spot It! Besides the fact that any two cards have exactly one symbol in common, it is also true that for any two symbols, there is only one card that contains those two symbols. To understand this, its best to start with a simplified version of the game.A matching game with 7 cardsThis game has seven cards. Any two cards will have exactly one symbol in common. The finite projective plane shown below is an illustration of how the symbols are organized on the cards. It is the Fano Plane: the projective plane of order 2. In this plane, there are seven points and seven lines, one of which is circular. As you can see, it meets the requirements discussed: any two lines intersect at exactly one point, and any two points are connected by exactly one line.Also, there are three lines through every point, and three points on every line.Fano Plane with FruitMaxime Bourrigan made a game like this, which he calls Mini Dobble. (Dobble appears to be a French version of Spot It!) So this is the smallest playable version of Spot It! possible: seven cards and seven symbols, with three symbols on each card. (Actually, by some definitions, a finite projective plane of order 1 is a simple triangle. Based on that, you could have a game of Micro Spot It! with only three cards, three symbols, and two symbols on each card, but it would be a very short game!) From here, we can create more complex versions of the game based on finite projective planes of greater orders.Symmetrical finite projective plane order 3For a projective plane of order n there will be n2 + n + 1 points and lines, with n+1 points on each line, and n+1 lines through each point. Above is a projective plane of order 3, with 13 points and 13 lines. There are four points on each line and four lines on each point. I am indebted to Petr Vojtchovsk for the idea of arranging the diagram in this way. Below is the same projective plane arranged in a different way. This diagram would likely be more useful to create a game, as the lines are easier to follow. Switching from Maxims system, we could say that each point represents a symbol, and each different color line represents a card that would contain the symbols the line intersects with.Finite projective plane order 3This shape is related to one of the principles of projective geometry. The grey line represents the horizon, or line at infinity. Just as parallel train tracks appear to meet at the horizon line, so each set of parallel lines the 3 rows, the 3 columns, and each of the 2 sets of 3 curvy diagonals meets at an infinity point on the grey horizon line.Finite Projective Plane Order 4Here is an illustration of a projective plane of order 4, provided by Ed Pegg, Jr. (who also created another game based on the Fano Plane). This plane has 21 points and 21 lines, with five points on each line and five lines on each point. The small grey circles are the points and each different color squiggle is a line. By following an individual colored line, you can see that it intersects with exactly five points. Each point has exactly five different color lines passing through it. So from this model, we could create a 21-card game with 21 symbols and five symbols on each card. But we would probably want to rearrange it into a diagram that includes a square grid. We will actually do this for a projective plane of order 7, below.The actual game of Spot It! turns out to be based on a projective plane of order 7. That would give us 57 cards and 57 symbols, with eight symbols on each card. (Apparently, the makers of Spot It! decided to only use 55 cards, though the game could have had 57.) Here is an illustration of a projective plane of order 7, courtesy of Wolfram Alpha.To turn this into a diagram that would be easier to follow for actually creating a game, we can rearrange it into a shape that includes a square grid, as we did for the projective plane of order 3 above. This will be a 77 grid. When we transformed the projective plane of order 3 using a 33 grid, we only had two diagonals at 45 degree angles. With a larger grid, we will have more diagonals at different angles. To understand this, it may help to start with a Graeco-Latin square. Below is a hyper-Graeco-Latin square of order 7 with 6 dimensions the concentric squares within each of the 49 units of the grid. This is a complete set of mutually orthogonal latin squares.Complete set of mutually orthogonal Latin squares.To understand the Graeco-Latin squares, for each dimension, the same color appears only once in each row and each column. For our purposes, take note of the diagonals. If you follow a color along a dimension, you will see that it follows a certain angle. For example, if you start with the upper right blue square, and follow the blue color along the outermost dimension, it follows a 45 degree angle to the lower left. If you follow the same color from the same starting square along the second dimension in from the outermost, you see that the line two squares left for each square down, and when it gets to the left edge it must wrap around and continue on the other side. For the next dimension in from the outermost, the line goes three squares left for each square down, and so on. Each of these diagonals is a line in the finite projective plane that arises from this set of latin squares. To start making cards for a game, we can place 49 symbols in a 77 grid. Just as with the projective plane of order 3, we will also need the points at infinity, one for where the rows meet, one for where the columns meet, and one for the meeting point of each of the 6 sets of 7 parallel diagonal lines, defined by the 6 dimensions of the Graeco-Latin square.Now we can easily see which symbols should appear on each card. Each line represents a single card, and each point represents a symbol. In the example below, the red line and green line follow the second-from-outermost dimension in the Graeco-Latin square. Because they are parallel within the grid, they have no symbol in common until they reach the point at infinity. The blue line crosses the red line and the green line so the blue card will have exactly one symbol in common with the red card and with the green card. The blue card also needs the infinity point for the columns, which is the circle. There are 8 sets of 7 parallel lines, which accounts for 56 cards. The 57th card (purple line below) is made up of the 8 infinity points.For more help in creating your own game based on a finite projective plane, you may want to check out this thread or this one on Stack Overflow.For more on the relationship betweenGraeco-Latin squaresand finite projective planes, see this explanation of the equivalence. A hyper-Graeco-Latin square of ordern can have n-1 dimensions if and only if there is a finite projective plane of ordern. One can be constructed from the other.A complete set of orthogonal Latin squares of order 3 exists if and only if a projective plane of order 3 exists.Many of the designs on this website are available as prints or on other products at Redbubble. The original with its 5 mini-games Discover Celebrate 10 years of Dobble! Discover A brand new way to play Dobble that will make your head spin! Discover For a safari feel... Discover Dobble and the Wizarding World! Discover! Two Dobble games on the themes of "Fantasia" and "Food." Discover To learn shapes and numbers. Discover Discovering animals! Discover December 21, 2022 Dobble is a well-loved card game among many UK households. If youre new to the game you may be wondering how to play it - thats why weve created our easy-to-understand instructions for you to follow. We have many Dobble versions available, these rules are for the Dobble classic game, but can be followed for most versions of the game.Whats in the box?There are 55 cards in Dobble, with each card containing 8 symbols (out of 50 available in total). From card to card, there will always be one symbol that is identical in shape and colour, but may be different in size. The main focus of the game is to find the matching symbol between cards as fast as possible.With the Dobble game, there are five possible games to play with your cards:The Towering InfernoThe WellThe Hot PotatoGotta Catch Them AllThe Poisoned GiftNo matter the game, every player will always be searching for the matching symbol between cards to say out loud in the quickest time. Dobble RulesWe will go through the instructions of each of the five mini games to play with your Dobble cards.Mini Game 1. The Towering InfernoGoal:Be the player who has gathered the most cards when the draw pile runs out.Shuffle all of the cards and then place one card down in front of each player, with the remaining cards placed face up in a pile accessible to all players(example shown is for 4 players).All players flip over their cards at the same time and must rush to identify the matching symbol on their card with the card which is face up in the central pile.The first player to notice this match will shout the symbol name aloud then take this card from the pile to place on top of their own card.Once this card is taken, a new card is revealed on the central pile. Players will continue to find the matching symbols between their top card and the top pile card as quickly as possible.Mini Game 2. The WellGoal:The winner of this mini game is the person who gets rid of all of their cards first, whereas the person who takes the longest is the loser.Opposite to the Towering Inferno game, this time all shuffled cards will be distributed evenly between all players. Each player should have a pile of their own cards face down. The final card is placed face up in the middle of all players.All players will flip their piles at the same time, revealing a top card with symbols. The aim is to find a symbol on your own card which matches the central card.This time when the symbol is identified, you will shout out the symbol name but discard your card on the central pile. The middle card will change when a player puts their card on top, so players will continue to find a match with this new card.Repeat until a player has placed down all of their cards. They are the winner!Mini Game 3. The Hot PotatoGoal:Get rid of your cards faster than the other players!The Hot Potato is the quickest game which can be played over multiple rounds, best played with 6 players. All players will be handed a random card which they will hold face down. All players will turn their hand over at the same time so that everyone can visibly see each others cards.Players can choose to look at any card of their opponents, but you will race to find the matching symbol between your card and one of the other players. As soon as a player notices a matching symbol, they will say it aloud then place their card on top of the opponent's card they matched with.This opponent will then use the new card on their pile, so if they find a match with another player they will place all of their cards on top of the players card. The game will continue until one player is left with all of the cards. Therefore, the aim of the game is to get rid of your cards as soon as possible.Considering this happens so quickly, it is recommended that you play this minigame over at least 5 rounds to determine an overall winner.You could choose to continue playing until there are no more cards to hand out. The loser will be the person who has gained the most cards out of all of the rounds.4. Gotta Catch Them All!Goal: Collect as many cards as possible before the other players!Similarly, Gotta Catch Them All! is best played over multiple rounds. Start by placing one card face down in front of players, then place one card face down in the middle of the table.On go, players will turn their card over and flip the central card. All players will race to find matching symbols between all of the outside cards with the middle card. Once you have found an identical symbol, shout this aloud then take the card. You could take your own card or someone elses, but you must never take the middle card as this must remain the same throughout the round.When all cards have been taken, a new round can be started by placing the original middle card to the bottom of the main pile of cards and drawing a new one. Gained cards are kept across different rounds.You could play until there are no longer any cards to be drawn. The winner will be the player who has gained the most cards.Mini Game 5. The Poisoned GiftGoal: Collect as few cards as possible from the deck.Arguably the minigame that likely to cause the most arguments, this time players could feel sabotaged.Place one card face down in front of each player, with the draw pile face up in the middle.All players will reveal their cards at the same time, but this time you are looking at everybody elses cards rather than your own. You must spot the identical symbol between the card in the central pile with any opponent's card.Once you have identified a match, say the symbol aloud, then take the card from the central pile and place it on top of your opponent's card. This will then reveal a new card in the central pile, continuing the game. The round will continue until all cards from the middle pile have been distributed. The winner of this minigame is the person who has the least amount of cards.Bonus mini-game: 6. The Tower Extra RulesIf players say the symbol at the same time, it is the player who placed his/her card on top first who wins it.If players tie, you can play a duel game to determine the winner. Draw one card each and the person who finds the matching symbol first, wins.How to get better at DobbleIf you take Dobble seriously and youre looking impress your friends and family with your talent at playing the game, there are three key skills that could help you win!Improve your reaction speedConcentrate as hard as you canHand positioning could influence your speedSuccess at Dobble comes down speed. This card game is easier once you familiarise yourself with the symbols, if youre serious about winning at Dobble, practising on your own could help.If youre the competitive one in the family, get yourself in the zone and dont be distracted by your opponents as they could disrupt your flow.If youre sat far away from the centre pile, youre less likely to beat someone who is sat close to it. Make sure you get yourself in a good position to reach the pile.Popular Dobble versionsFollowing the popularity of the original Dobble game, there is now a fantastic range of Dobble versions, including, but not limited to:These games follow the same rules as described above, but with different funsymbols related to your favourite tv show or movie.You can explore the whole range of Dobble games on the Asmodee website. The Mathematics of Toys and Games Dobble (also called Spot It!), is a card game that uses special circular cards, each with a number (8 in the standard pack, 6 in the kids pack) of symbols or image. There are various ways to play, but they all the games involve finding which symbol is common to two cards. The cards are designed so that any two cards will always have one symbol in common.This got us wondering: how you could design a deck that way? More formally:Given n different symbols, how many cards can you make, and how many symbols should be on each card?Given s symbols per card, how many cards can you make and how many different symbols do you need?If you want to make k cards, how many symbols do you need on each card, and how many in total?The requirements for the cards are: Requirement 1: every card has exactly one symbol in common with every other card. Requirement 2: each card has the same number of symbols. Requirement 3: no symbol appears more than once on a given card. After playing around for a while, I realised that, contrary to my expectation, there's probably no simple formula for the number of symbols and cards. Instead, there is quite a lot of room for exploration. A couple of weeks later, someone asked one of these exact questions on a Facebook group called Actually good math problems (it's a closed group, so you have to join to see the posts).No answer was given on the group, but someone posted links (included at the end of this post) to articles on pairwise balanced design and incidence geometry, so it seems there is real mathematical value in some of these concepts. This article however, is about my more empirical exploration. To get a handle on the problem, I started playing about, starting with the simplest situation and gradually building up. I found it easiest to vary the total number of symbols, which I'll call n. I recommend trying to create some decks with small values of n.With one symbol, e.g. $\{A\}$, you can have one card: a card with the symbol A. Technically, given the requirements above, you could have infinite cards, each with just an A on it, so we'll add a requirement.Requirement 4: each card must be unique.With two symbols, $\{A, B\}$, you can still only have one card: one with the symbols A and B on it (which I'll write as AB). Technically we could instead have just a card with an A or just a card with a B, but we'll add another requirement.Requirement 5: given n symbols, each symbol must appear on at least one card. With three symbols, $\{A, B, C\}$, we have something more interesting: three cards, each with two symbols: AB, AC and BC. You can even arrange them a bit like dominos, joined by their common symbols.Is there something special about the number three? With four symbols, you could have three cards: AB, AC and AD. However, since Dobble involve spotting the common symbols between cards, this would make the game trivial (because the common symbol would always be the same). It also makes the problem less interesting, because we can always create $n - 1$ cards this way. So we'll add final(ish) requirement.Requirement 6: there should not be one symbol common to all cards. I worded the requirement so we can still have decks of one card. With this requirement our only solution is a deck of one card: $ABCD$. We need more than two symbols per card because with two symbols per card, three cards most you can have. I'll explain this later, but if you play about with the symbols for a while this should soon become clear. It relates to the fact that with three cards, each card has two symbols and each symbol appears on two cards.The pigeonhole principle For $n = 4$, we need to have at least three symbols per card. But with three symbols per card there are six positions in which to put four symbols, so we can't avoid an overlap of two symbols . This is an example of the pigeonhole principle, which is an obvious-sounding idea that is surprisingly useful in many contexts. It states that: If n items are put into m containers, with $n > m$, then at least one container must contain more than one item. With five symbols we now have "space" for three symbols per card with an overlap of one, for example: ABC and CDE. Technically, this fails to meet requirement 6, since C is common to all two cards, so I decided to alter requirement 6 slightly. This isn't really necessary, but I think it makes the graphs slightly nicer later. Requirement 6 (amended): there should not be one symbol common to all cards if $n > 2$. With five symbols, three symbols per card works because the first card provides three symbols, whilst the second provides two additional symbols and one to overlap. More generally, if we have s symbols per card, then we can make two cards when the number of symbols is:$\qquad k = 2, n = s + (s - 1) = 2s - 1$ With six symbols, we can go one better. The first card gives us three symbols, the second adds two more, and the third add another. In general, if we have s symbols per card, then we will be able to make three cards when the number of symbols is:$\qquad k = 3, n = s + (s - 1) + (s - 2) = 3s - 3$ We can generalise further to get a value for any k. Every time we add a card, we add s symbols minus one symbol to match each existing card, which gives us:$\qquad n = sk - (1 + 2 + \text{...} + (k - 1))$ The sum of the numbers $1 + 2 + \text{...} + k$ are the triangular numbers, so called because they are the number of items required to build triangles of different sizes. They are generated by the formula:$\qquad T(k) = \dfrac{k(k + 1)}{2}$ Substituting in the equation for triangular numbers, we get: $ \qquad\begin{align} n &= sk - T(\color{blue}{k - 1}) \\ n &= sk - \frac{\color{blue}{(k - 1)}(\color{blue}{(k - 1)} + 1)}{2} \\ n &= sk - \frac{k(k - 1)}{2} \end{align} $ We might expect that if n is the triangular number $T(s)$, then we could have s cards, e.g. three cards with three symbols each. In fact, we can go one better. When we have s cards, $s - 1$ symbols are matched on each card. In other words, each card has exactly one unmatched symbol. We can therefore create a new card using these s unmatched symbols (CEF in the diagram). If we sum the new symbols added by each card, we get $3 + 2 + 1 + 0 = 6$. We can verify the number of cards algebraically by rearranging the above formula to find an equation for k when n is a triangular number. $ \qquad\begin{align} T(s) &= sk - T(k - 1) \\ \frac{s(s + 1)}{2} &= sk - \frac{k(k - 1)}{2} \\ s^2 + s &= 2sk - k^2 + k \\ k^2 + k(-2s - 1) + s^2 +s &= 0 \\ \end{align} $ Which is a quadratic with solutions with coefficients $a = 1$, $b = -2s - 1$, $c = s^2 +s$. If you solve for k, you get $k = \dfrac{2s + 1 \pm 1}{2}$. In other words $k = s$ and $k = s + 1$. So when n is a triangular number you can have s cards, but you can also have $s + 1$ cards. Conclusion: With s symbols per card we can create $s + 1$ cards using $\dfrac{s(s+1)}{2}$ symbols in total. Note that this does require that $s > 1$ because whilst one card does have one unmatched symbol, we can't add a second card with that unmatched symbol because we'd end up with two cards the same. It does work with $s = 2$ giving $k = 3$ and $n = 3$, which was the previous best deck. Another way to understand why triangular numbers work well is to make a matrix of cards, showing which symbols they share. We can line up each card in rows and columns, then for each cell in the table, we write the one symbol that is common to the cards for that row and that column. The diagonal is blocked out since we don't compare cards to themselves. This table forms two triangles of symbols, one above and one below the diagonal. We only need to look at one triangle since comparing, say, card ABC to card ADE is the same as comparing card ADE to card ABC. ABC ADE BDF CEF ABC ADE BDF CEF A B C D E F A B C D E F With this arrangement each row and each column spells out the symbols on that card. In addition, each triangle above or below the diagonal, contains each symbols once. This gives us a method to create n cards: Create an $n \times n$ table.Block out the diagonal.Fill in the lower triangle of the table with different symbols.Read along the columns and rows to get the symbols for each card. The problem with this method is that requires a lot of symbols. The real Dobble deck has 55 cards, which would require having 54 symbols on each card and a total of 1485 different symbols. Because we put each symbol in the table once each symbol is only used twice. Can we be more efficient by having symbols appear on more than two cards? So far, when creating cards we have chosen to match symbols that have not yet been matched. But what if we make the first three cards all share the same symbol. The first thing to notice is that with $s = 3$, when now need n to be at least seven symbols: one repeated symbol and three lots of two symbols. Can we add a fourth card matching the same symbol? This would require $n = 9$. But, in order to meet requirement 5 we need at least one card that doesn't have an A. And that means that for the fifth card we need to match symbols on four cards, where those cards have no symbol in common with each other except A, and we can only pick three symbols. In other words, with $s = 3$, each symbol can only be repeated three times. A B C A D E A F G A H I B D F H Conclusion: If each card has s symbols, then each symbol can occur at most s times. So instead of repeating A again, we create two more cards with a B and two more cards with a C to give a total of seven cards. In doing so, we also end up repeating the remain symbols, so each one occurs exactly three times. This also gets us our biggest deck yet - almost double what we got with six symbols. If we use the triangular number method to get seven cards, we need 21 symbols, each appearing on two cards. This new arrangement uses a third of the number of symbols by having each symbol appear on three cards. Seven symbols is the sweet spot for $s = 3$ because it allows each symbol to appear the maximum three times. You view this as splitting the symbols into the first one, A, and then three groups of two, $\{BC\}, \{DE\}, \{FG\}$. Alternatively you can view this as the first card, followed by three groups of two cards in which the symbols on the first card (A, B and C) are repeated twice each.The image shows the seven cards in rows, with the seven symbols in columns. If you move your mouse over a card, all its symbols are highlighted on all cards (so exactly one symbol should be highlighted on each other card). A A A B B B C C C D D D E E E F F F G G G In general, with s symbols per card, the most symbols, n, and also the most number of cards we can have, k, is one plus s lots of $s - 1$.$n = k = 1 + s(s - 1) = s^2 - s + 1$I call these Dobble numbers, $D(s)$. The first few Dobble numbers are 1, 3, 7, 13, and 21. They are all odd, since $s(s - 1)$ is always even.Here's the example with 13 symbols, leading to 13 cards with four symbols per card. The lines show how I split the cards and symbols into groups ($ABCD$, EFG, HIJ and KLM). A A A A B B B B C C C C D D D D E E E E F F F F G G G G H H H H I I I I J J J J K K K K L L L L M M M M Conclusion: If each card has s symbols, then we can make $k = s^2 - s + 1$ cards. Each symbol will appear s times and the number of different symbols will equal k. I'm not 100% sure that you can always build a deck of this size, but pretty sure you can't build one larger. Either way, we can get an equation for s in terms of k, using the quadratic formula, with $a = 1$, $b = -1$ and $c = 1 - k$. Conclusion: For k cards, the minimum number of symbols per card is $s = \left\lfloor \dfrac{1 + \sqrt{4k - 3}}{2} \right\rfloor$. Where $\lfloor n \rfloor$ means "round n down to the nearest whole number. What I call the Dobble numbers are called sequence A002061 in the Online Encyclopedia of Integer Sequences. The page gives a long list of properties for this sequence. One interesting property which appears completely unrelated, is that this sequence of numbers occurs along the diagonal if you write the positive integer in a grid, starting in the middle and spiralling out. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 So far, with the possible except of the spiral above, this has been a problem of combinatorics which seems logical given the nature of the problem. However, the discussion on Facebook suggested a geometric interpretation. The terminology is a little intimidating, but it's basically describing the same problem using points and lines.Incidence geometry and linear spacesWe can represent each symbol as a point and each card as a line. Points that lie on a line then represent symbols on a card. Now the problem is one of incidence geometry: the study of which points lie on which lines. A linear space is an incidence structure where:Every pair of distinct points determines exactly one line.Every line contains at least two distinct points.Rule 1 corresponds to the requirement that no two cards are the same. Rule 2 corresponds to the fact that we want cards to have at least two symbols. The requirements for Dobble are more stringent, but this is enough for now. The simplest non-trivial linear space consists of three points and corresponds nicely to how we arranged the three cards like dominos. If you mouse over a point, the two lines it's connected to are highlighted; if you mouse over a line, the two points that lie on it are highlighted. You can build similar diagrams with four, five and six points. The fact that line BDF is a circle in the diagram with six points is a side-effect of drawing the diagram in 2D. In terms of the geometry, there is no difference between any of the lines. A B C D A B C D E A B C D E F We can make the rules more stringent by considering projective planes. These are linear spaces where:Every pair of distinct lines meet in exactly one point.There exist four points, no three of which lie on the same line.The first rule corresponds to the key rule for Dobble, namely every card should share at least one symbol with every other card. The second rule is there to rule out situations where all the points lie on the same line. The most famous projective plane is called the Fano plane, which is famous enough that I'd seen before (in Professor Stewart's incredible numbers). The plane consists of seven lines and seven points. Every line goes through three points and every point lies on three lines. It has all sorts of interesting properties and symmetries. Projective planes all consists of $n^2 + n + 1$ points where n is the number of points (s) on a line minus 1. If you plug $s - 1$ into this you get the number of points is $s^2 - s + 1$, just like the rule I discovered. On the Wikipedia page on projective planes there is a matrix representing a projective plane with 13 points which looks just like to the diagram I made for 13 cards of four symbols. Unfortunately, I don't think there is a nice diagram for arranging 13 points and 13 lines. Getting back to the empirical approach, we can continue to increase the number of symbols to see if any more patterns emerge. With eight symbols, we have a similar situations as with four symbols. We need more than three symbols per card because three symbols are maxed out by seven cards. But with four symbols, two cards don't cover all the symbols (requirement 5), and with three cards, there's not enough symbols. With five or more symbols, the overlap between two cards is too great. With nine symbols we do now have space for three cards of four symbols. With ten symbols we have the fifth triangular number, and so can get five cards of four symbols. Since this is a triangular number each symbol appears on exactly two cards. ABCD AEFG BEHI CFHJ DGIJ ABCD AEFG BEHI CFHJ DGIJ A B C D E F G H I J A B C D E F G H I J We can keep going, plotting the results on a graph. Notice the series of peaks at the Dobble numbers, each one having $k = n$. Total symbols (n) Maximum number of cards (k) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 1 5 9 13 17 21 Following each Dobble number, when $n = D(s) + 1$, the value of k crashes. For the first three "Dobble plus one" numbers (2, 4 and 8), the deck size is one. With 14 symbols we finally have enough symbols to scrape four cards together.The numbers 2, 4 and 8 are also powers of two. With 16 symbols, we have the first power of two, which is not a "Dobble plus one" number. With 16 symbols we can make six cards, which is a lot better than one. However we can also make six cards with with 15 symbols (a triangular number). This is the only example so far where increasing n doesn't increase k other than the "Dobble plus one" numbers. So it seems that it's hard to make decks when n is a power of two. Another interesting parameter to look at is the mean number of times each symbol appears in a deck, r. For example with nine symbols, we had the cards $ABCD$, $AEFG$ and $BEHI$. So A, B and E appear twice, while the remaining six symbols appear once. Therefore $r = \frac{3 \times 2 + 6 \times 1}{9} = \frac{4}{3}$. Total symbols (n) Mean symbol repeats (r) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 1 2 3 4 5 Perhaps unsurprisingly, this graph has a similar shape to before since the more cards in a deck, the more each symbol is repeated. One small difference is that now there is a dip at $n = 16$ rather than a flat line. A more interesting trend becomes apparent when we look at values for which r is an integer.We already know when n is a triangular number, $r = 2$, and when n is the Dobble number, $D(s)$, $r = s$ (21 is both a triangular number and a Dobble number, but the Dobble number wins out since we want the largest deck). The first four powers of two, 1, 2, 4 and 8, all have one card, so $r = 1$.Dobble minus one There is one other type of number that has an integer value for r: the "Dobble minus one" numbers. When n one less than a Dobble number, the number of repeats is one less than for that Dobble number, i.e if $n = D(s) - 1$, then $r = s - 1$. With $n = D(2) - 1 = 2$, $r = 1$With $n = D(3) - 1 = 6$, $r = 2$With $n = D(4) - 1 = 12$, $r = 3$With $n = D(5) - 1 = 20$, $r = 4$ This is just an empirical observation, based on these four (five if you include $D(1) - 1 = 0$) values. I don't have yet have any proof or any sense of the logic for why this might be the case (assuming the pattern holds).The total number of symbols in a deck is equal to the number of symbols multiplied by the average number of repeats. So if this pattern does hold, the total number of symbols in these decks, N, is: $\qquad \begin{align} N &= (D(s) - 1) \cdot (s - 1) \\ N &= (s^2 - s) \cdot (s - 1) \\ N &= s^3 - 2s^2 + s \end{align}$ The number of cards in a deck, k, is equal to the total number of symbols divided by the number of symbols per card: $\qquad \begin{align} k &=\dfrac{N}{s} \\ k &=\dfrac{s^3 - 2s^2 + s}{s} \\ k &= s^2 - 2s + 1 \\ k &= (s - 1)^2 \end{align}$ Conjecture: If the number of symbols, n, is in the form $s(s - 1)$, then $k = (s - 1)^2$. e.g $n = 12 = 4 \times 3$, so $k = 3^2 = 9$ Once the deck size gets into the teens, it becomes hard to be sure that you've found the best solution using pen and paper. So I built a tool to help me. It keeps track of which cards you've matched and stops you from adding symbols found on matched cards. This means a lot of the works is done for you and often only have to worry about picking the correct first symbol for each card. To find even larger decks I tried to write a program to find decks by brute force, trying all valid solutions. Sadly, I think it worked in $O(n!)$ time or worse, so by the time I reached $n = 12$ it was taking too long to run. There's probably a lot I could do to improve its efficiency, but I think I need a more clever strategy to get anything useful. I think that looking at the number of times each symbol is repeated as the deck is built might yield something, but I haven't worked out the specifics. The real game of Dobble has 55 cards with eight symbols on each card. The eighth Dobble number is $D(8) = 8^2 - 8 + 1 = 57$ so they could have had two more cards. I guess they decided 57 didn't seem like such a nice number. Presumably there are then 15 ($8 + 7$) symbols that appear only seven times. The Dobble Kids version has six symbols per card and "30 cards with more than 30 paper animals". More than 30 paper animals must refer to the fact that there are 31 ($D(6)$) different symbols. The Mathematics of Toys and Games

What type of game is dobble. Is dobble a good game. How does the game dobble work. Dobble kaartspel. What is dobble card game. Dobble spelregels. Dobble uitleg. What are the 5 dobble games. Dobble speluitleg.