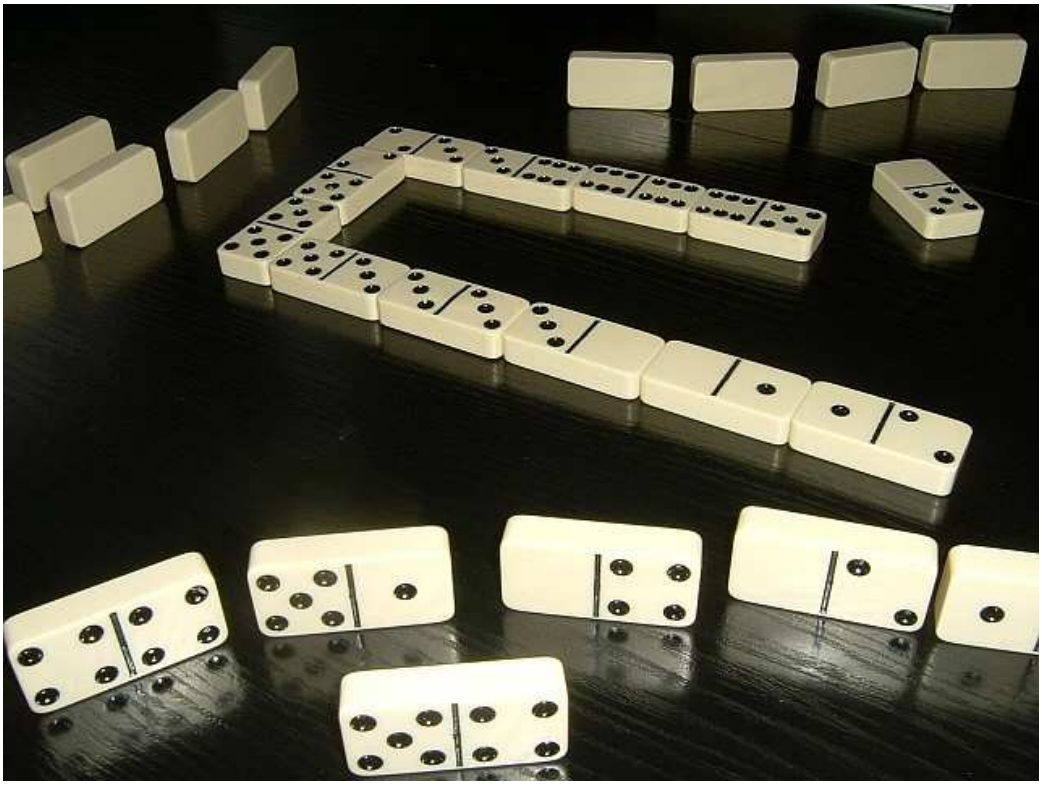
Dominos
For Schools



by Steve McCrea
Edited by Mario J. Llorente Leyva
Rules and Glossary by Mario
Learn more (and find the link to the free ebook) on Abcdominos.com

How would Mario organize these tiles? Find out inside.
(page 33)

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Learn more:
Visit the Youtube Channel
Youtube.com/ABCDominos

Introduction

Dear Teacher

This is a short book. It's one of the quickest books you have ever read. If you are a visual or audio learner, click on the videos (on the website ABCDominos.com). In fact, you can get the main idea after reading this page. Then tell your colleagues about it.

1. The game that many people in the USA call **"Dominoes" is just a game**.
2. The game of dominoes that many US kids learned to play has rules that promote individual competition -- **it is "every player for himself."**
3. The rules used by most players of dominos around the world create partners -- it's still competitive, but the game also teaches **collaboration and teamwork.**
4. Collaborative skills that are gained by **playing bridge** (recommended by Bill Gates and Warren Buffett) are **more quickly taught with dominos.**

5. **The game is spelled "dominoes"** in the USA and is often associated with individual players (similar to the card games Hearts and Rummy). Dominoes are used to create "knock them down" demonstrations of "the domino theory." I would like you to join me in writing **"dominos" to indicate the team game** that uses collaboration versus "dominoes," which are used to create "knock 'em down" displays.
6. Even the way that children in the USA **count the points** is mixed up -- you'll learn more in "Myths about Dominos" (chapter B).

There you have it -- the entire book on one page. If you grew up in the USA, you probably learned dominoes the way I did: every person for himself. Your world just got bigger (the way my world changed when my friend and collaborator Mario Llorente described the International Rules of Dominos).

THIS BOOK is FREE on the Internet: You can take your time looking through this book or you can download it free from scribd.com "**free book about dominos** dominoes for teachers McCrea Llorente" is the search phrase. It's also available at ABCDominos.com

Let's get right into this book. You are a teacher, so you don't have time to spend on elaborate descriptions of history and theories about why dominos is excellent for mental development (you can learn those pieces in Mario's other books). Let's get through the table of contents and then **explore the myths of this mental activity.** In chapter C I

describe **the math behind dominos** and, by then, you will want to know the "real rules" of the collaborative game. Mario will give those rules and glossary of terms, followed by a general description of the game (which you can skip if you are in a hurry). The important **strategy of "the block"** and how to gracefully **communicate with your partner** are described in Chapter F (from a transcription of a series of videos that we encourage you to watch on Youtube). The book ends with an "end note" that gives you the directions for **spreading this fascinating activity** through your school and school district.

So, from one teacher to another, thank you for taking time with me today.

Steve McCrea, teacher SteveMathTeacher@gmail.com
Call me and let's talk about how to get dominos in your school
+1 954 646 8246
Skype SteveEnglishTeacher

Building International Bridges

*I founded Building International Bridges, Inc., a non-profit that aims to remove obstacles to communication. Learn more at **BuildingInternationalBridges.org***

*I teach teachers and parents about innovative teaching strategies at **GuideontheSide.com** and **VisualandActive.com** -- invite me to your school so I can learn by observing your innovative teachers.*

***BIB Penpals** connect your students with my students of English (who want to learn the U.S. accent). Learn more by visiting the Youtube.com channel BIBPenpals.*

If you have ideas about how to teach the global skills needed by students in the next century, let's talk.

Table of contents

B. Seven Myths about Dominos

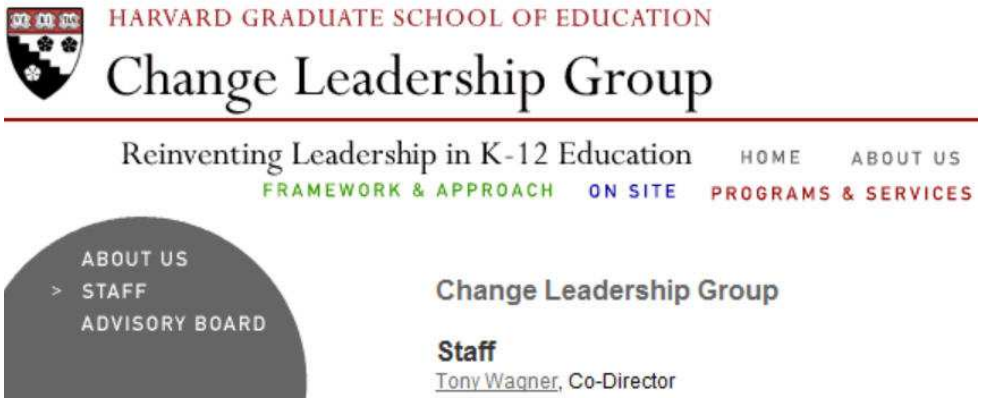
Myth 1. "I could never introduce dominos in my classroom -- the kids will lose the tiles or start throwing them at each other."
Reply: If this is a concern, print out the dominos on paper. There are several websites that give photocopiable sheets with the tiles distributed on them.
Photocopiable sheet: http://www.first-school.ws/theme/printables/dominoes-math.htm

Myth 2. "Chess is a better game for teaching thinking."

Reply: Chess is an individual sport. It is excellent for encouraging persistence and critical thinking, but what does it do for collaboration?

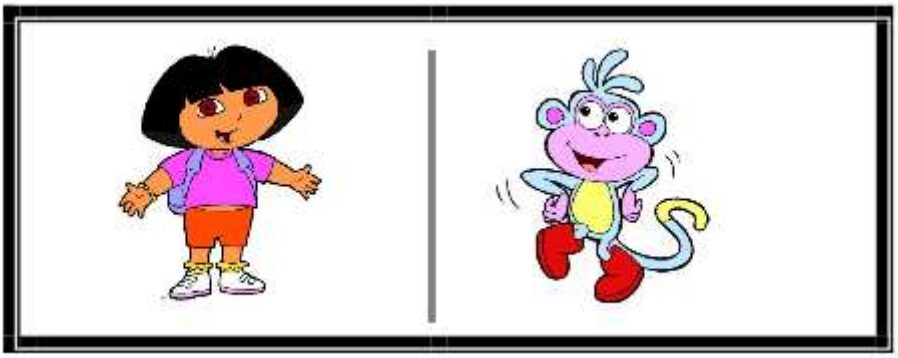
Myth 3. "Dominoes is *every man for himself.* You can't teach collaboration with dominoes."

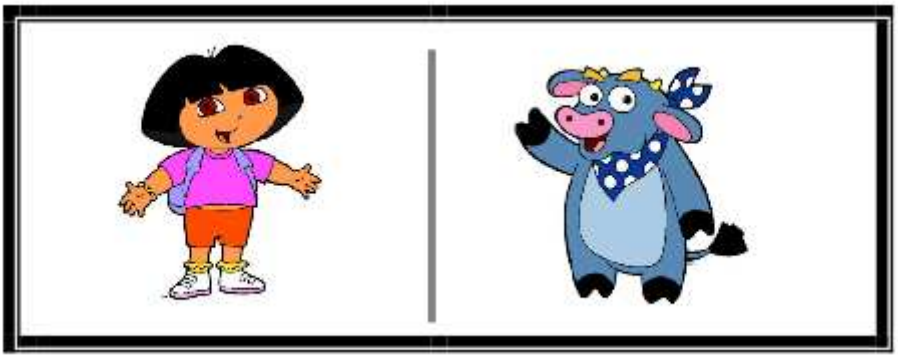
Reply: Ah! The rules of "team dominos" are set up so that you play with a partner. It's you and your partner against a second team of two.
Why is collaboration so highly valued? Look at the list of Seven Global Skills (compiled by Tony Wagner, a Harvard professor):
Collaboration
Critical thinking
Creativity and imagination
Communication skills
Initiative and entrepreneuring
Adaptability and agility
Accessing and analyzing information
CCCC I AA These are the seven skills of dominos.



Myth 4. "We can't play dominos without numbers."

Reply: Oh? There are free printouts that you can get on the Internet that have seven images to replace the numbers. The downside of this game is that the relative differences between tiles are removed. The strategies of blocking and ending the game in a variety of ways (either reducing your exposure or claiming as many points as possible) are reduced or eliminated when numbers are removed from the game.





Here is a website that offers a free printout without numbers (a fun game, but it lacks the level of sophistication that dominos provides).
http://**www.gameideasforkids.com**/dominos%20pdf/dominos%20dora%20p1.pdf

NOTE: Dominos without numbers is a clever way to introduce one part of dominos to children. Children can recognize patterns before they develop a deep understanding about numbers, so it makes sense first to allow students to learn the matching aspects of dominos without numbers, then to ask them to use tiles that have numbers. (For more about the stages of development related to numbers, see the work of child development psychologist Jean Piaget.) The danger of using dominos without numbers is that the activity can easily degenerate into an "every person for herself" sport. We want to make sure students have a complete exposure to the brain activities associated with the international rules of dominos. We have given you this electronic book because we want students to have the experience of playing team dominos.

Myth 5. "We use the tiles to demonstrate the principles of physics, to develop patience when setting up

the tiles and to develop creativity with new arrangements. The traditional game is not useful for academics."
Reply: Yes, "knock 'em down" is a delightful activity and many intricate and imaginative ways of setting up the tiles for collapse.

See Videos of "knock 'em down": Search key words like
"Over FOUR Million Dominoes - It's A New World Record"

Mario has identified the world's record for the number of tiles involved in a "knock 'em down" display.

2:40
*Over FOUR Million **Dominoes** - It's A New **World Record***
*The **record** is 4,079,381 **Dominos**. But yes, this IS the **record**, but what I'm saying is that there is MUCH more **dominos** than a million involved here **...***
*by royaltyclub | 4 years ago | **2,533,174 views***
3:47

Domino** Day 2008 The New **World Record**: 4,345,027 **dominos
*by gabopictures | 2 years ago | **1,903,922 views***
3:49
*Guinness **World Record** - Longest / Biggest **Domino** Line Ever*
*This is the longest **domino** line ever*
*by ShanesDominoez | 1 year ago | **378,074 views***

These accomplishments are amazing, but they fall short of the mental gymnastics that dominos can deliver when it is played as "team dominos."

Myth 6. "Bridge is an excellent way to prepare students for team building. After all, Bill Gates and Warren Buffett advocate bridge in schools."

Reply: True, there are aspects of the bidding when the game of bridge begins that depend on collaboration. However, while the hand is being played, what happens to the partner of the winning bid? That bridge partner sits back.

Teachers need to build a culture of cooperation in many of their classes. The buddy system is important for students to learn to develop trust in another person. Communication with the partner is ongoing during dominos and the rules are learned more quickly than the rules of bridge.

Go ahead and **introduce bridge** in middle school, as suggested by numerous bridge advocates. But **start with dominos** in elementary school.

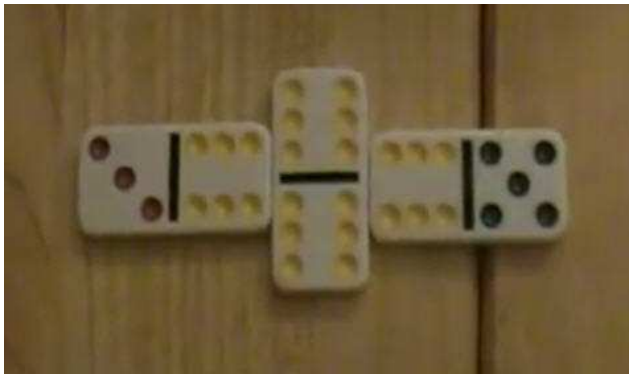
In an article in the New York Times, *"To see seventh and eighth graders sitting and **concentrating for three hours**, it never happens **except in bridge**," said Bud Brewer, whose nonprofit group, Reno Youth Bridge, held a tournament in April after teaching the game to 160 students in 14 public middle schools and three private schools in Reno and Sparks, Nev.*

Reply: Oh? If educators took time to go to South America and watch **kids playing dominos**, they might be surprised how long children sit together.

This photo (above) comes from a youtube video showing Gates and Buffett playing bridge. Why not also play dominos, the team sport?

Myth 7. "Dominoes is child's play."

Reply: The way the tiles are played by children in the USA -- yes, that game has elements of many children's games. Individual, every man for himself, and scoring is done differently from the "team dominos" way. When you teach students the team dominos, you give them a lifetime of working with a partner.



In short, there are many reasons to introduce dominos into schools. Here's a point that Mario often tells me: "If your mind is trained for more things, you will be better equipped for life. If I only have to remember information for quizzes and tests, I will not be ready to memorize other important things. Dominos trains retention."

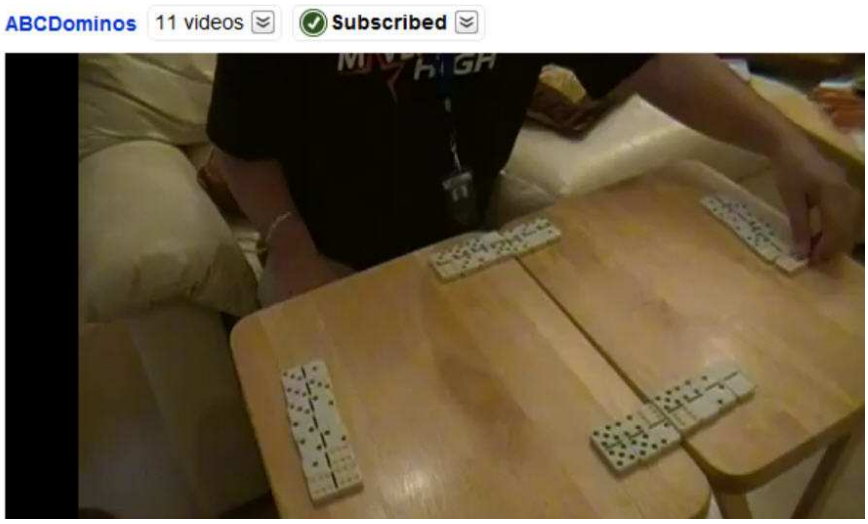
C. A Math Teacher Looks at Dominos

I have taught math since 1972 when a teacher asked me to coach a classmate through the complexities of algebra. I hold a teaching certificate in the State of Florida for Math levels 6-12 and I teach an SAT course at Broward College in Fort Lauderdale. My website **SATVideos.com** is used by hundreds of students. I'd like to tell you about **the mathematics behind dominos.**

(If you want to start playing, you should skip this chapter and go directly to Mario's description of the rules…)

There are three ideas that we can convey to students:
a) probability, b) combinations and c) collaboration.

a) probability
Ask your students: If you hold the 5/5 and you see 5/4 and 5/6 on the table, how many other tiles are in the hands of the other players? There, you've got your students thinking about probability.



b) combinations
How many combinations are in the dominos set? Why are there **34 dominos** in the typical set of tiles? You can get the students to discover the answer by asking them to arrange the tiles in a pattern -- and let them create their own patterns.

ANSWER at the end of RESOURCES (Chapter G)

c) collaboration.
Is math about collaboration? Yes. You and I grew up doing math with friends, with parents, with neighbors... and then we went to school. We sat in chairs and we were told to "**keep your eyes on your paper** and **don't look** at the work of other students."

There are fabulous books about collaborative or creative games and activities with math. A textbook that I learned with, Heutinck and Kramer, claimed that U.S. schools typically cover **a lot of material** at **a shallow level**. A typical 45-minute class might do **15-20 problems**. In **Japan**, according to the textbook, a typical class tackles at most **three exercises** in a session. (Notice the difference in language: USA has problems and Japan has exercises.) Many teachers in Japan give time for elaboration and teamwork to let students find several ways of solving problems.

Have you read "A Mathematician's Lament"? It's a 30-page essay by Paul Lockhart.

Here are some extracts:

Discussions between "Simplicio" (the simple one) and "Salviati" (the saved one):

SIMPLICIO: But isn't one of the purposes of mathematics education to help students think in a more precise and logical way, and to develop their "quantitative reasoning skills?" Don't all of these definitions and formulas sharpen the minds of our students?
SALVIATI: No they don't. If anything, ***the current system*** *has the opposite effect of* ***dulling the mind.*** *Mental acuity of any kind comes from solving problems yourself, not from being told how to solve them.*

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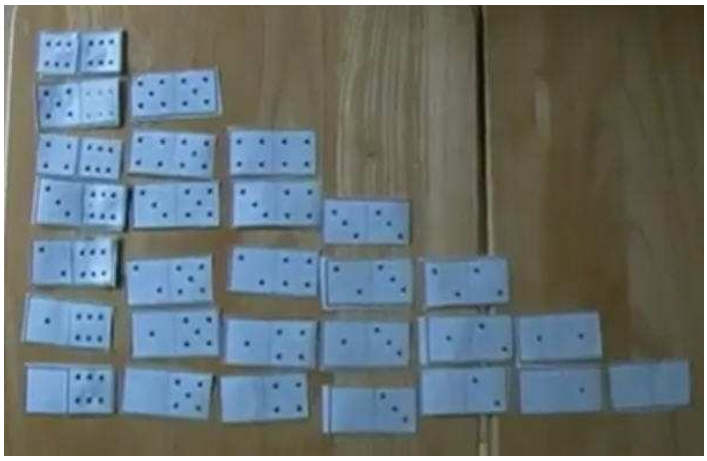
SIMPLICIO: But surely there is some body of mathematical facts of which an educated person should be cognizant.
SALVIATI: Yes, the most important of which is that ***mathematics is an art form*** *done by human beings for pleasure! Alright, yes, it would be nice if people knew a few basic things about numbers and shapes, for instance. But this will never come from rote memorization, drills, lectures, and exercises.* ***You learn things by doing them*** *and you remember what matters to you. We have millions of adults wandering around with "negative b plus or minus the square root of b squared minus 4ac all over 2a" in their heads, and absolutely no idea whatsoever what it means. And the reason is that they were never given the chance to discover or invent such things for themselves. They never had an engaging problem to think about, to be frustrated by, and to create in them the desire for technique or method. They were never told the history of mankind's relationship with numbers.*
More importantly, no chance for them to even get curious about a question; it was answered before they could ask it.



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A good teacher can guide the discussion and the flow of problems so as to allow the students to discover and invent mathematics for themselves. The real problem is that the bureaucracy does not allow an individual teacher to do that. With a set curriculum to follow, a teacher cannot lead. There should be no standards, and no curriculum. Just ***individuals doing what they think best for their students.***

I made this extended quotation from Lockhart's essay in the hope of driving you to look up his materials. Please search "Mathematician's Lament." See this interpretation https://sites.google.com/site/theguideontheside/home/math-teachers-lament

I told you all of these things to get you in the mindset to receive the following information:
Dominos when played as a team **("team dominos") is an engaging activity.** Team Dominos promotes mental math at the end of the game (when adding up the points). The students see how their blocking strategy might or might not pay off with the scoring system used in international (team) dominos. There are strategies that Mario taught me that are not rewarded by the rules of individual dominoes.

Dominos or Dominoes?

As a math teacher, I must stand up. Too often U.S. students are given the idea that it's okay to learn metric system, but it's only when you go traveling or if you work in certain industries. Excuse me? Look at the list of items that U.S. students are told "oh, you don't need to know how to convert that...":

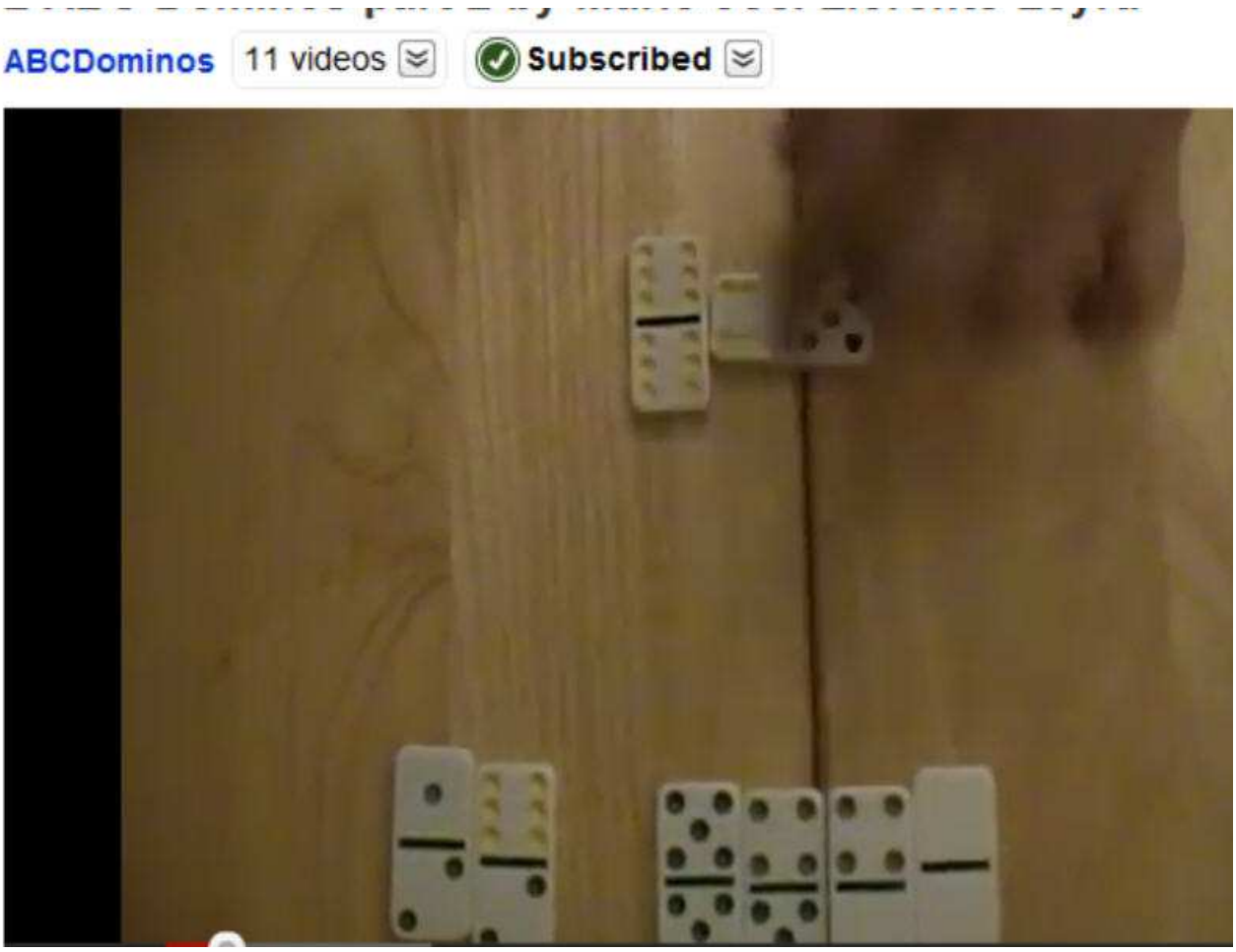
Be strong: try to **convert these measurements** (answers in Chapter G):

gallons or quarts to liters
F to C
miles to km
yards to meters
inches to cm
pounds to kg

100 miles = ?
100 km = ?
10 liters =?
25 degrees F = ?
10 gallons = ?
10 pounds = ?
10 kg = ?

... and now "dominoes" and dominos.
Billions of people call the activity **"dominos"** and several hundred million English speakers insist on using the plural like tomatoes, potatoes and mosquitoes. Stand firm, teachers. Use the word "dominoes" to describe the "knock them down" displays of physics and to refer to the individual domino games. When you refer to the **team** version of **dominos**, please drop the "e" in the plural.

As a math teacher, I encourage my students to speak flexibly. They can move from 320 kilometers to 200 miles, from 372 liters to 100 gallons, from 100 kilograms to 220 pounds, from 30 degrees C to 86 degrees F.

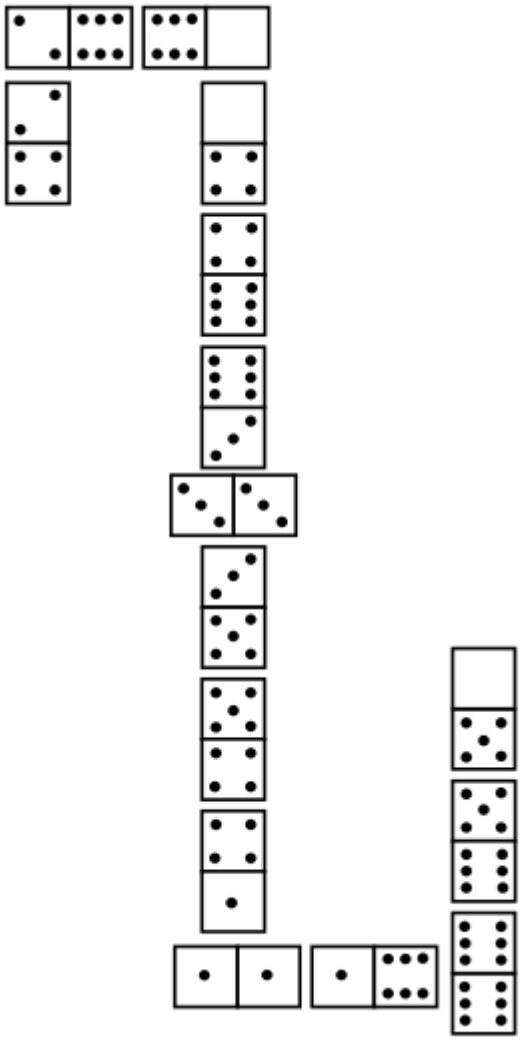


Find this video on Youtube.com/ABCDominos

We will go into deeper game theory in a larger book. In fact, search on the Internet for "Mario Llorente dominos" and see what a prolific author my collaborator is. After this short book, you will have plenty of things to look at to deepen your awareness of this remarkable mental activity.

D. The Rules

by Mario Joel Llorente Leyva



Material: a 28-tiles set (up to double six only)
The game: Dominos is a pair games **(team game)**. Partners on the same team sit across from each other. They never talk across. The communication between partners has to be strictly by **"pausing"** (the amount of time a player takes to execute his turn to play)
The game is played in a simple way.
Numbers that are the same connect together:
a 5 with a 5, a 3 with a 3.
In the diagram below, you see how each tile's end matches the end of the tile that touches the first tile. When a double tile is played (5/5 or 3/3, for example), you twist the tile (like 3/3, 1/1 and 6/6 in the diagram).

In the diagram, you can see that the HEAD and the TAIL are the only places where the next player can add a tile (or you can say, "The two heads"). If I have a tile with a 4 or a blank, I can play (in this situation).
If a player cannot play a tile, it is defined as a **"pass,"** and the player will verbally say, "Pass." A **pass** is the best form of information of dominos, since it says unequivocally that the player does not have one or more suits in his hand. Example: if both heads are 3's and a player passes, we all know that the player does not have a tile with a 3. If one head is 3, and the other head is 5, and a player passes, it means the player does not have 3's or 5's.

Rules

1. To start the game, put all the tiles face-down and shuffle them (slide them around the table, making a motion like a swirling whirlpool).
2. The lead player will be chosen by any agreed method. A common way is by a member of each team drawing one tile from the pack before you distribute the tiles. The player with the highest tile wins. **What if a player draws 5/3, which adds up 8 points, and another player draws 6/2, which also makes 8?** Then the player with 6/2 will win, since 6 is a higher number than 5. The four tiles are put back in the pile and shuffled to prepare for distribution.
3. Each player will draw 7 tiles. If a player accidentally draws more than 7 tiles and has not yet seen them, then the player missing the tile will draw it from the player with too many tiles. If the tile has already been seen by the player, then a re-shuffle will be asked.
4. The game will be played **COUNTERCLOCKWISE.** After the lead player has played, the player on the lead player's RIGHT will play next.
5. The player who plays his seventh (last) tile will grant victory to the **team.** When that happens, **all the points in all remaining tiles are counted** and added up to that team's scoreboard.

EXAMPLE: If you and I are partners and you end the game. I hold the 6/1, the other team holds 5/2 and 4/2, then the winning team gets 6 + 1 + 5 + 2 + 4 + 2 = 20 points.

6. The games will be played up to **200 points**.
7. In certain occasions, the game will be '**blocked**' or '**jammed**' meaning that no more tiles can be played. Both members of each team will put their tiles together and count the points; the team with fewer points will win the hand.

Example: You and I are partners and the game is blocked. You hold 3/3, I hold the 6/1, the other team holds 5/2 and 4/2, then our team is 3 + 3 + 6 + 1 = 13 and the other team is 5 + 2 + 4 + 2 = 13. Oh, no! A tie? Not in dominos. The team with the lowest numbers will win. You and I have a tile with a 6, but the other team wins because their highest number is 5.

8. If a player plays **a tile that does not fit** in either head, the opposing team will be awarded with 30 game points. (*Look carefully before you make a play.)*
9. If a stone (also called a "tile") is uncovered or exposed by whatever reason, the opposing team gets 30 game points awarded. *(Don't drop your tiles!)*
10. **If a player talks** in any manner that exposes his/her game to the other players, the opposing team is awarded 30 points. *Example:* You cannot say, "I have two 5s and two 6s."

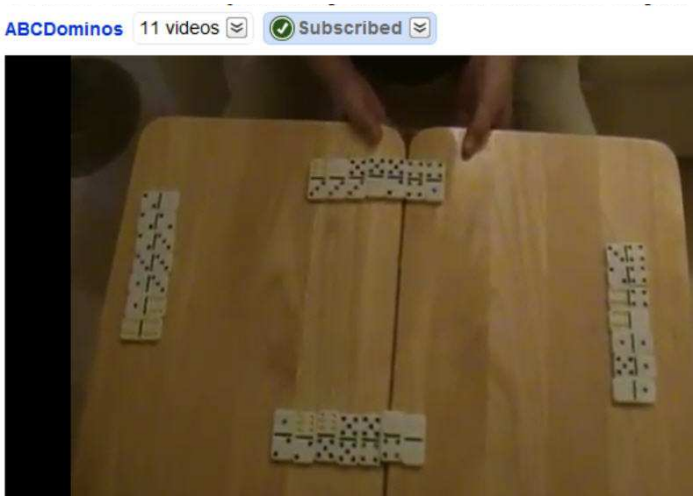
*You can find the "North American" rules at "Anglo" websites like **domino-games.com/domino-rules/domino-basics.html.** Mario has evaluated these "standard" rules (for North American players) and found some differences with the international rules (which are used in Cuba and throughout Europe, South America, Africa and Asia). The team dominos uses the rules that Mario has described above.*

Tip: Until you learn how to play double-number tiles effectively, make it a rule to **"get rid of them"** quickly. If you are the lead player and you have 6/6, 5/5 or 4/4, lead with them. Use a high numbered tile to lead (since you are generally trying to reduce the number of points that can be scored against your team).

Tip: When you first introduce dominos to your class, turn up the tiles in the four hands so that all students can watch the play. The students can even recommend the next move and analyze what might have been a better move.

Glossary

Ace
The end of a domino with one dot.
Back
The "back" of a domino is the side opposite the numbers. The back is often free of any adornment, but may also contain a design, logo, or other pattern. All dominoes must have identical backs, so that players cannot tell what dominoes they are drawing.
Bar
The "bar" is the line separating the two ends of a domino. Also called the "center" or "divide."
Blank
A "blank" is an end of a domino that contains no dots. If both ends are blank, then it's called a "double blank." A blank is also sometimes called a "zero" or "white" (from *blanco* in Spanish).
Block
A "block" or "blocked game" is a game in



which no player is able to place a domino on the table. This typically signals the end of a game. The situation is also called a "jam."
Bone
Domino pieces are sometimes called "bones," because they were originally made of animal bones or ivory. Today they are often made of plastic, ceramic, or wood. The tiles are sometimes called "stones," "tiles" or a "domino."
Boneyard
At the beginning of a game, when all the dominoes have been turned face-down and shuffled, the collection of mixed-up tiles is called the "boneyard." Players draw tiles from the boneyard to form their hands.
Deuce
The end of a domino with two dots.
Domino
A tile used in a game of dominos is commonly called a "domino." To "domino" also means to play the last tile in your hand, which typically ends a game or hand.
Dominoes
The word "dominoes" can refer to both the game of dominoes, and the domino tiles that are used to play the game. In this book, dominoes refers to the individual “every person for himself” game.
Dominos
The correct way of spelling the game in Spanish. In this book, dominos refers to the international team game.
Dot
Each domino contains some number of "dots", usually from 0 to 6, but up to 18 in some sets. A dot is also called a "pip" or a "spot."

Double
A domino with both ends having the same value. For example, two sixes is called "double-six", and two ones is called "double-one."

Draw
When you transfer a domino from the boneyard into your hand, this is called a "draw."

End
A domino tile has two ends with a center dividing line. Each end has a number. A domino is referred to by its numbers, so a domino with a 2 on one end and a 5 on the other is called a 2/5 (or a 5/2). A domino with both ends having the same value is called a "double."

Hand
A "hand" is the set of dominos that each player holds. Contrary to the name, the dominos are usually not held in the hands, but are placed edge-wise (vertically) on the table in front of the player, so that the player can see their values, but the opponents cannot. When playing a game that consists of multiple rounds, each individual round in the game is called a hand.

Layout
The dominos that have been played. Also called the "table", "tableau", or "board." We often say, “The table doesn’t lie” and we ask, “What is the table saying now?”

Open End
An "open end" is an end that is not connected to any other tile. Tiles may be played only on an open end. There are always two ends in basic dominos.

Pip
Each domino contains some number of "pips", usually from 0 to 6, but up to 18 in some sets. A pip is also called a "dot" or a "spot."

Set
"To set" is to put a tile on the table. It is also used to denote the first tile played.

Shuffle
At the beginning of a game, all the dominoes are turned face-down and "shuffled" in order to randomize the tiles so that no player knows where to find any particular domino.

Spinner
The first double that is played during a game is called the "spinner." In many games, dominoes can be played off all four edges of the spinner - both ends and both sides.

Spot
Each tile contains a number of "spots," usually from 0 to 6, but as many as 18 in some sets. A spot is also called a "dot" or a "pip."

Stone
Each domino or tile can be called a "stone" or "bone."

Suit
A "suit" is the collection of tiles all having the same number of dots on at least one end. Each suit has seven tiles. For example, the "sixes" suit consists of 6-0, 6-1, 6-2, 6-3, 6-4, 6-5, and 6-6.

Tile
Another name for a domino or a "bone."

Trey
The end of a domino with three dots.

This list is adapted from domino-games.com/glossary-of-domino-terms.html