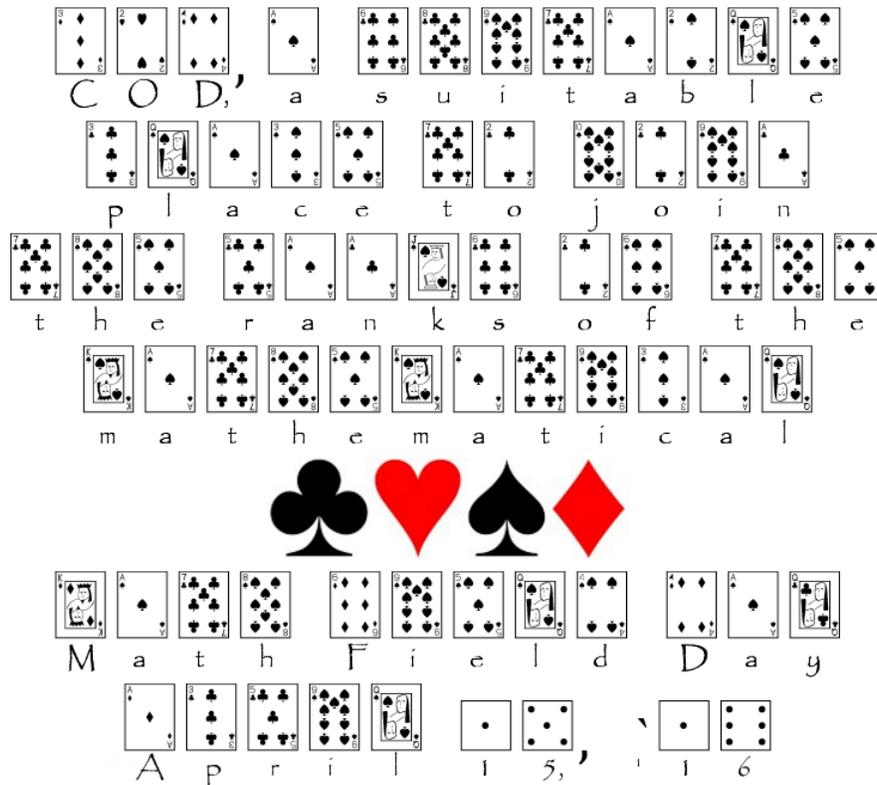


Math Field Day—at COD—April 15, 2016



1 Overview

College of the Desert welcomes schools from across the Coachella Valley to join in Math Field Day, 2016. This year’s theme is Prestidigitation and Playing Cards.

Organizing Committee

- Karen Tabor, Math & Science Dean, COD;
- Carl Farmer, COD MESA Director;
- Raul Correa, MESA President, COD;
- Jorge Perez, Prof. of Math, COD;
- Geoff Hagopian, Prof. of Math, COD;
- Melissa Flora, Prof. of Math, COD;
- Steve Dostal, Prof. of Math, COD
- John Learned, Math Dept. Chair, COD;

Participating High Schools

- Shadow Hills HS, Kate Keener;
- Desert Hot Springs HS, John Olver;
- Coachella Valley, Rommel Guerrero
- Indio HS, David Chavez
- Palm Springs HS, Richard Hunsperger
- West Shores, Roseanna Radoff
- Xavier Prep, Phil Epstein
- La Quinta HS, Daniel OGrady
- Cathedral City HS, Edward Perry

2 Schedule

Assemble in the hour before the start at 9:30 with an orientation to the day's events. Then teams will form to engage in various roughly 20-minute activities with a spirit of cooperative engagement. The plan is meant to be somewhat flexible to adapt to the circumstances at hand, but the general outline of the program will be:"

8:30am - 9:30am

Arrival time.

Assemble at the COD MESA Center in the MSTC building (see map.) Some groups will arrive earlier than others, so this is a sort of buffer zone for groups to arrive and find their way around.

9:30am - 10:00am

Orientation.

A description of the structure of the day's events and a brief description of the various activities.

10am - 12:30pm

Activities at various locations on campus.

COD MESA students and faculty will be host each of the six teams cycling through six 20-minute activities.

12:30pm - 2pm

Lunch and Awards.

The activities described below are loosely based on the theme of "playing cards" which are defined as "a piece of specially prepared heavy paper, thin cardboard, plastic-coated paper, cotton-paper blend, or thin plastic, marked with distinguishing motifs and used as one of a set for playing card games." Common examples include the traditional 52-card Bicycle decks, Set, the I-Ching and Tarot

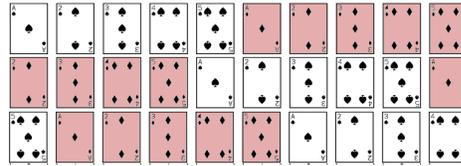


Stranger and Stranger

3 Activities

3.1 Learn Math-based Card Tricks

The 27-trick (that's a [hyperlink](#)), for instance.



Cyclic shuffling can lead to some surprising results!

3.2 The Game of Set.

You can play Set at the New York Times ([hyperlink](#)). Also, plenty of research pages available, not least of which is the page we created for the Summer Bridge back in 2011 ([hyperlink](#)).

3.3 Simplified 21

Remove all cards greater than 5 from the deck; you're left with 20 cards: Ace, 2, 3, 4, 5, in each suit. Each card is worth its face value except 5, which is worth 4. The rules are very similar to the rules for 21 ([hyperlink](#)). [Simpler hyperlink](#). What's the probability of being dealt 7 in this variation? What strategies guide optimal play?

3.4 Finding the Best Poker Hands

If you deal out 25 cards in a 5 by 5 grid, what are the five best poker hands you can make? Or other activities related to this [Martin Gardner article \(hyperlink\)](#).

3.5 The Mathematics of the I Ching

The I Ching is a base 2 system with 64 hexagrams. Read up on it here to prepare for the worst!

3.6 The Mathematics of Tarot

This is fairly amorphous at this stage. The wizards of MFD don't know much about Tarot, it turns out, so wait and see. There is a Math Tarot deck...

3.7 Create a deck of playing cards

This is a group activity. We expect there to be approximately $52 = 8 * 5 + 12$ participants. If each one draws a particular card for a deck, we can make a deck of cards and publish it for all to use.