

Pancakes, Music, and Games in MTC Dubuque

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Overview

- 1 General Setting
- 2 Common Core Practice Standards
- 3 Pancakes
- 4 Music
- 5 Games

General Setting

- Email Notification and Online Sign Up Form
- Common Core Math Practice Standards
- Dinner and Math Games (Thanks, MTC and AIM seed grant!)
- Mini Presentation or Information (Provided by us or a guest)
- Discussion
- Post-Survey Online
- AEA Recertification Credit

MP1: Make Sense of Problems and Persevere in Solving Them

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. . . Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

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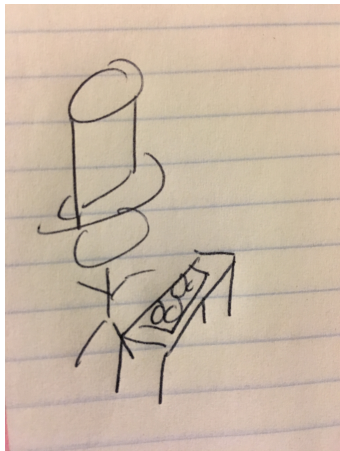
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Pancake Sorting Problem

MTCircular

https://issuu.com/mathteacherscircle/docs/mtcircular_winter_spring_2016/16

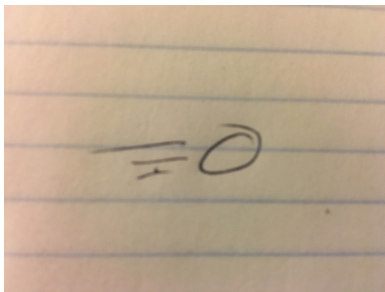


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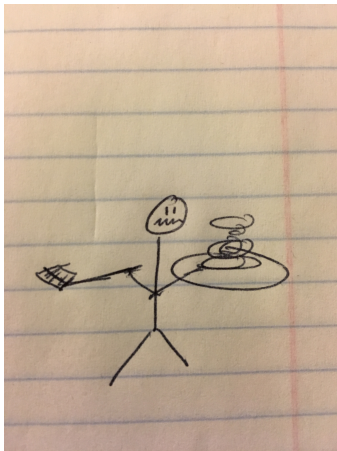
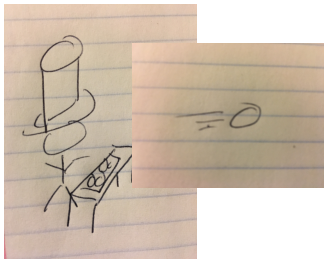
Stick figures:



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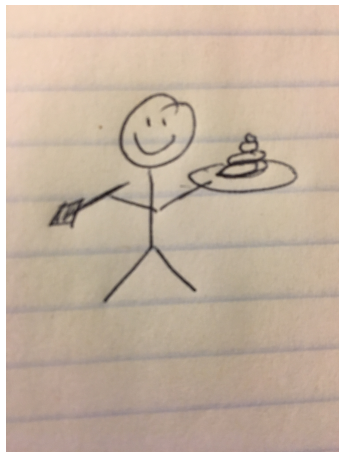
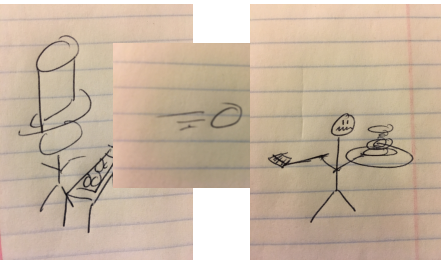
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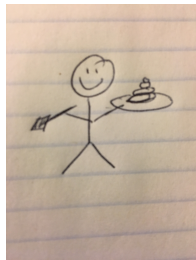
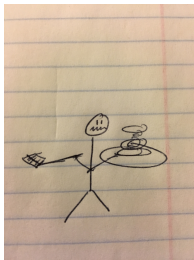
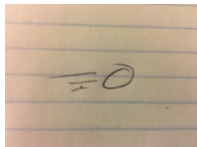
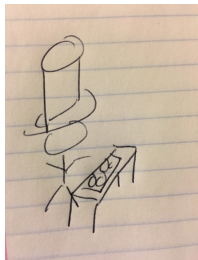
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How do we get the pancakes in order? How long does it take? Is there a more efficient way? What's the worst case scenario? What's the optimal scenario? Does the number of pancakes in a stack matter? How do we keep track of this nicely? Our pancake sketches are blurring together, is there another way to represent a stack of pancakes?

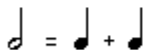
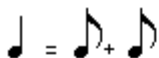
Music and Rhythm

Guest: Angela Kohlhaas (Loras College) based on material developed for a class, Math of Art & Music

Regular notes



Dotted notes



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- Count rhythms in a measure n beats long using at most half notes and quarter notes.
- What changes if you allow whole notes? rests?
- What changes if you allow for two tones? k tones?
- Can you find an expression for the number of rhythm options with n beats and k tones?

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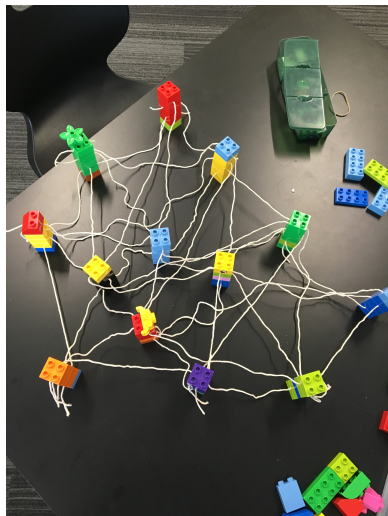
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- Open problems (research): E.g., using $\frac{1}{4}$ and $\frac{3}{8}$ notes?

- Spot it! (picture from 2016 summer workshop)
- SET
- Swish (ThinkFun)
- On the Dot (Brainwright)
- Prime Climb
- Sumoku (Blue & Orange)
- Qwirkle



Thank You

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