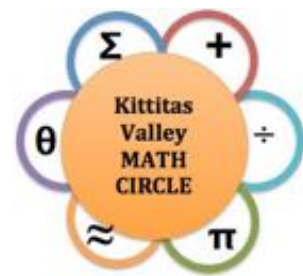


# Kittitas Valley Math Circle

a Circle for students  
& their parents



Sponsored by:

B. Wieggers, D. Klyve, A Rogan-Klyve, and J. Shiver  
Central Washington University



## Where is Kittitas County?

**Population:** 40,915 (in 2010).  
7,484 children under 18

**Total Area:** 2,315 square miles



Image from [https://en.wikipedia.org/wiki/Kittitas\\_County,\\_Washington](https://en.wikipedia.org/wiki/Kittitas_County,_Washington)  
Data from: <https://www.co.kittitas.wa.us/about/default.aspx>

## Creating KVMC- Using Resources Wisely

### University Town

- Undergraduate Mentors
- Quarters (10 weeks)
- Existing outreach (CESME)

### Rural Small Town

- Sports
- Bible Study
- Other outreach projects
- Driving distance

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### Elementary Math Circle:

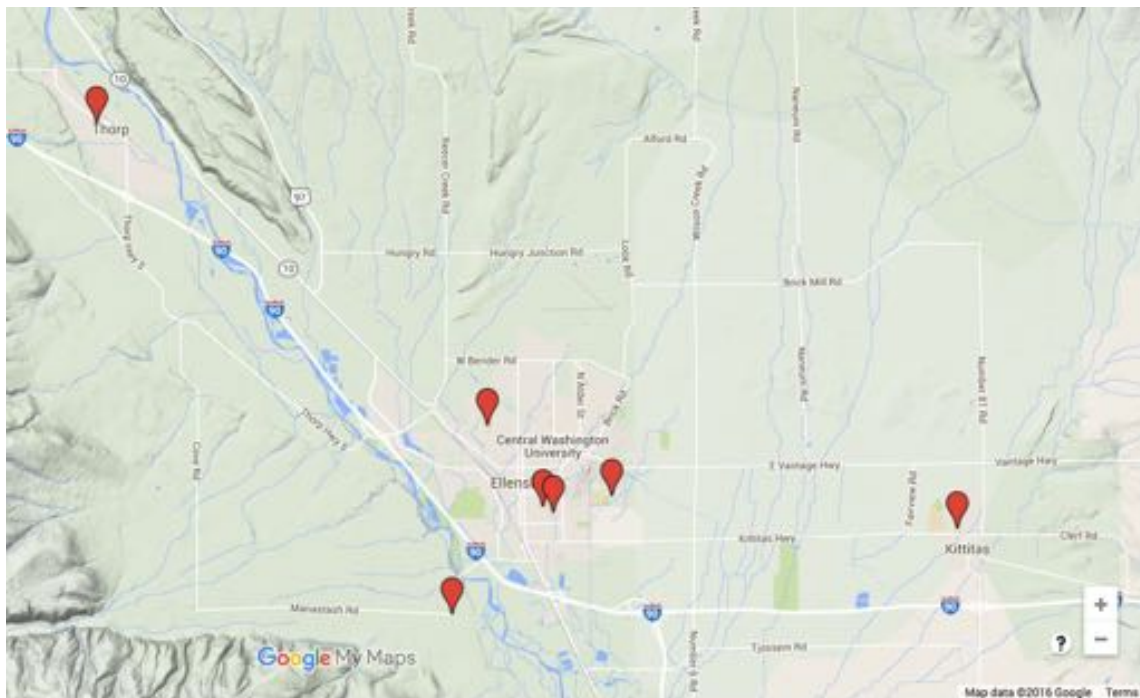
4th, 5th, 6th grade students

### Topic blocks

(5 weeks, 1 per quarter)

### Parents/ guardians are

invited to attend a parent specific session for the 1st 2 weeks of a topic block



- Fun Topics
  - Problem Solving
  - Math Patterns
  - Cryptology
- Parent/ Guardian Program
- Undergraduate Mentors

## Creating Success



## Block 1: Mathematical Problem Solving





## Block 2: Mathematical Patterns



## Working with Parents

*"I have colleagues at Central who have trouble understanding their children's math homework."*

*It doesn't look like the math they learned themselves."*



Dominic Klyve  
Math

Janet Shiver  
Math Education

Allyson Rogan-Klyve  
Science Education

# What happens at parent meetings?

## Discussing Their Students' Math Experiences

- Discussion of Shifting Classroom Experience
- Common Core State Standards
- Introduction to mathematical/ education approaches

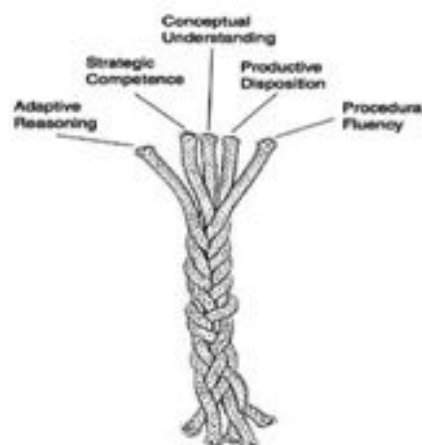
## Discussing Mathematics

- Introduction to the games their students are playing with
- Math at Home: Challenge opportunities

## Providing Resources for more fun at home

# Shifting Classroom Experience

- Classes become mathematical communities rather than collections of individuals
- Logic and use of mathematical evidence are given priority rather than viewing the teacher as the only authority
- Students work on use mathematical reasoning rather than memorizing procedures
- Increased focus on conjecturing, inventing, and problem solving
- Creation of close connections between mathematics and its applications



NCTM (2000)

## **Common Core State Standards**

Effort by 26 states to develop standards that are meant to support this vision of math and math learning (and English Language Arts)

- Set of Standards
- Not a curriculum
- Not an assessment

## **Introduction to mathematical/ education approaches**

- Concrete-Pictorial-Abstract Approach
- Productive Disposition
- Patterns
- Mathematical Thinking and Games
- Meaning of Fraction



# Introduction to mathematical/ education approaches

- Concrete-Pictorial-Abstract Approach
- Productive Disposition
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- Mathematical Thinking and Games
- Meaning of Fraction

## Meaning of Fraction

- Interpreting fractions
- Part-whole interpretation
- Measurement interpretation
- Division interpretation

## Undergraduate Mentors





4 Year public university

Enrollment: 10,650 students

- ~9800 undergraduates
- ~500 graduate students
- 166 declared majors
- 50+/- graduates a year

Math degrees offered

- Pure
- Actuarial
- Teaching (secondary, middle)
- Applied - it's coming :)

From <http://www.cwu.edu/about/quick-facts>

## Changing Undergraduate Experience

- Kittitas Valley Math Circle
- Re-energized Math Club
- Math Honors Program
- New Degree Requirements including Math 299s - Introduction to Problem Solving
- New Math Festival Events



# **DO NO HARM**

## **Math Circle Training...**



## **I don't know, let's figure it out together**



## **Math 4 Love Tips for Asking Questions**

- What happens if we make it smaller/easier/ shorter / lazier?
- Can we organize the data?  
Picture. Table. List.
- What does your partner think?
- Can you explain your thinking to me?
- Can you give a hint without giving away the answer?
- Tell me why you think it is right.
- Can you break this into parts?
- What would you do if you did know what to do?
- How sure are you?
- What would make you more sure? What can you test?
- Can you break your pattern?
- What have you done so far that has helped you? What got you more stuck?

**Thank you to SIGMAA-MCST,  
this awesome audience,  
and our sponsors...**



**<http://www.cwu.edu/math/kittitas-valley-math-circle>**

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