active learning – a few examples

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My experience

- Online
- Hybrid, mastery based course
- Flipped large lecture
- Active Learning in a med to large class
- Problem based small course with reflective journaling

Toolset:

- Flipped
- Inquiry based
- Problem based
- Active learning
- Technology

considerations

- class size/demographic
- content/learning outcomes
- student strengths

Courses

- Active Learning in a med to large class
- Problem based small course with reflective journaling

Active Learning
Math for Elementary Ed

- Elementary education majors
- Predominantly women, almost like a cohort
- Lots of resistance to mathematics

- Lots of really great problems with ability to get your hands on things

Active Learning
Math for Elementary Ed

- Began in ALT room - 72 students
- Used publisher created activities and our own
- Structure, structure, structure
- Assigned groups that change 3x during semester
- Early accountability and formative feedback
- Lots of help

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Daily List
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AGEMENT

Unit 1 Daily List

Build Content | Assessments | Tools | Partner Content

Week 1: Jan 20

For Wednesday:

Class Objectives:

- Learn to implement legal manipulations in algebraic expressions
- Use manipulatives to solve algebraic equations and inequalities
- Use algebraic manipulations to solve algebraic equations and inequalities

To Class Wednesday, please

1. Read Section 1.3 and take notes.
2. Bring Blue base blocks.
3. Bring three copies of these Balance Scales

Homework (due Monday):

1. Section 1.3: 5, 7 (with balance scale pictures), 9, 11d (with balance scale pictures), 17b (with balance scale pics), 20, 22, 23

Active Learning – Mid-size (20-36) Math for Elementary Ed

- First semester - setup
  - Structure
  - Assigned groups
  - Clear expectations
  - Early accountability and feedback
- Second semester - setup
  - More flexibility – students know the routine
  - Assigned groups – changed once during the semester
  - Clear expectations known by students
  - Less accountability, less feedback

Active Learning – Mid-size (20-36)
Math for Elementary Ed

- First semester – content
  - Highly non-linear problems early
  - Time to acclimate to exploration
  - Introduce structured work and guided assignments later

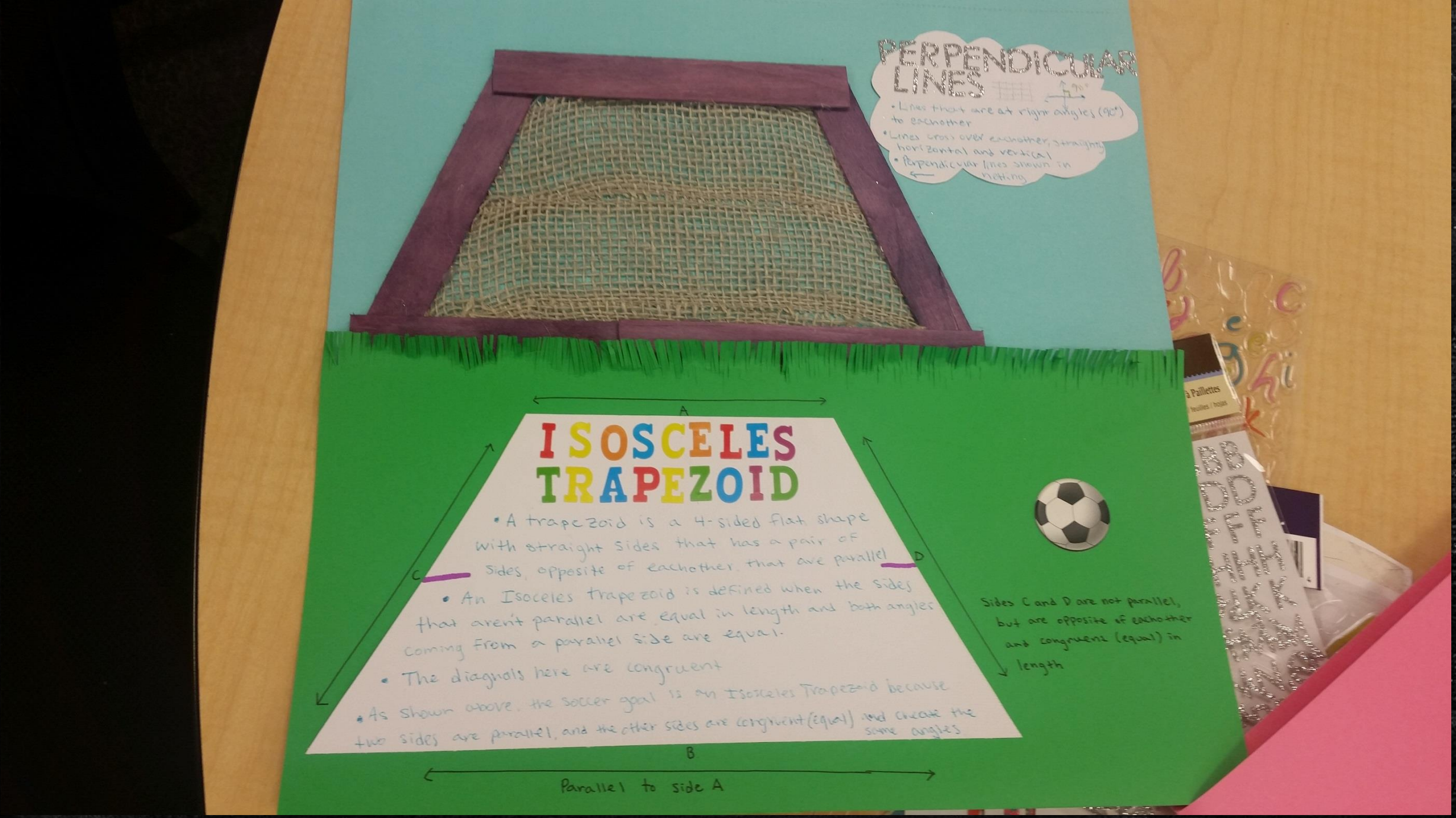
- Second semester – content
  - Larger projects, time to breathe.
  - Explorations

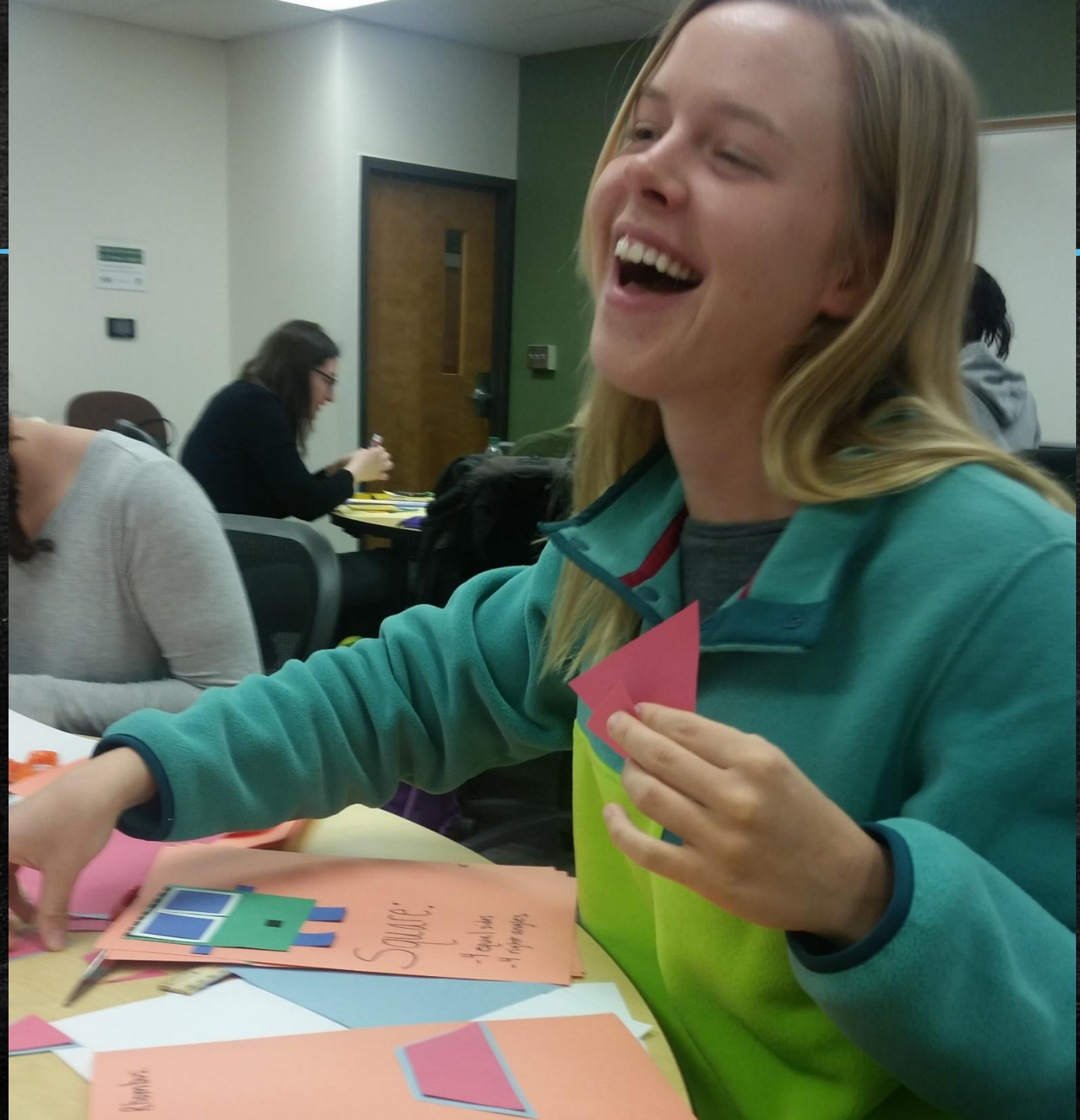
Geometry Project

Build a portfolio/booklet/scrapbook/project of your choice which demonstrates all important geometry vocabulary and formulas.

Geometry Project

- Creativity (we're trying to move away from book-like pictures). Think of something a kid would enjoy looking at or enjoy creating.
- Your project should bring meaning and life to the detailed vocabulary. You, I and your classmates should find your approach interesting and engaging.
- Your work should have a consistency to it, and at the end of the semester be a finished product.
- The project should contain well-labeled diagrams with precise vocabulary that will be outlined in class. You may use written definitions as needed for clarity.


PERPENDICULAR LINES
• Lines that are at right angles (90°) to eachother
• Lines cross over eachother, straight horizontal and vertical
• Perpendicular lines shown in Knitting
ISOSCELES TRAPEZOID
• A trapezoid is a 4-sided flat shape with straight sides that has a pair of sides opposite of eachother that are parallel
• An Isoceles trapezoid is defined when the sides that aren't parallel are equal in length and both angles coming from a parallel side are equal.
• The diagnols here are congruent
• As shown above, the soccer goal is an Isosceles Trapezoid because two sides are parallel, and the other sides are congruent (equal) and create the same angles
A
B
C
D
Parallel to side A
Sides C and D are not parallel, but are opposite of eachother and congruent (equal) in length


Square
- 4 equal sides
- 4 right angles

Problem Based Learning – small class Quantitative Reasoning

- Non-majors
- Required course
- Really don't like math

- Student strengths – hardworking, love projects

Problem Based Learning – small class Quantitative Reasoning

Setup

- Super flexible
- No assigned groups, used groups and individual assignments on the fly

Problem Based Learning – small class Quantitative Reasoning

- Mixture of lecture, projects, presentations and reflection
  - Mini-lecture:
    informal introduction. I have a set list of important topics to cover
  - In-class work
    open ended problems, or larger explorations
  - Homework:
    writeup what we did in class and reflect on the important points.
  - 5 Mini-exams:
    mastery based

Problem Based Learning – small class
Sample assignments

Sets

Let $U = \{t,u,v,w,x,y,z\}$, $D = \{w,y\}$, $A = \{w,v\}$, $B = \{v,t,x\}$, $C = \{z,t,v,x,w\}$.

Is $B \subset C$?

Problem Based Learning – small class
Sample assignments


MAKE IT COUNT.
Curate - Structure - Connect