

# GEOMETRY CONNECTIONS - T

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# General Tools



# Algebra Tiles (CPM)

This tutorial describes how to use the Algebra Tiles including additional features.

**Click on the link below to access eTool.**

[Algebra Tiles \(CPM\)](#)

## 1. The top bar has three main parts: Pen & Paper Icon, '?' Icon, and the Arrow Icon.

1. Select the Pen & Paper Icon to:

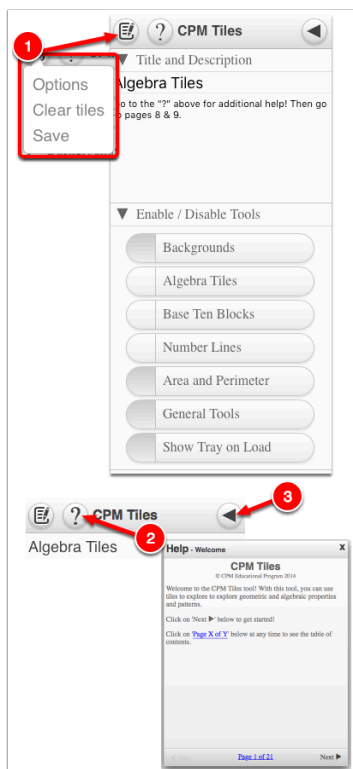
Options - Add Title and Description and Enable/Disable Tools.

Clear Tiles - This will remove all the tiles that are in the tile area.

Save - This will save all the changes made.

2. Select the '?' icon for directions.

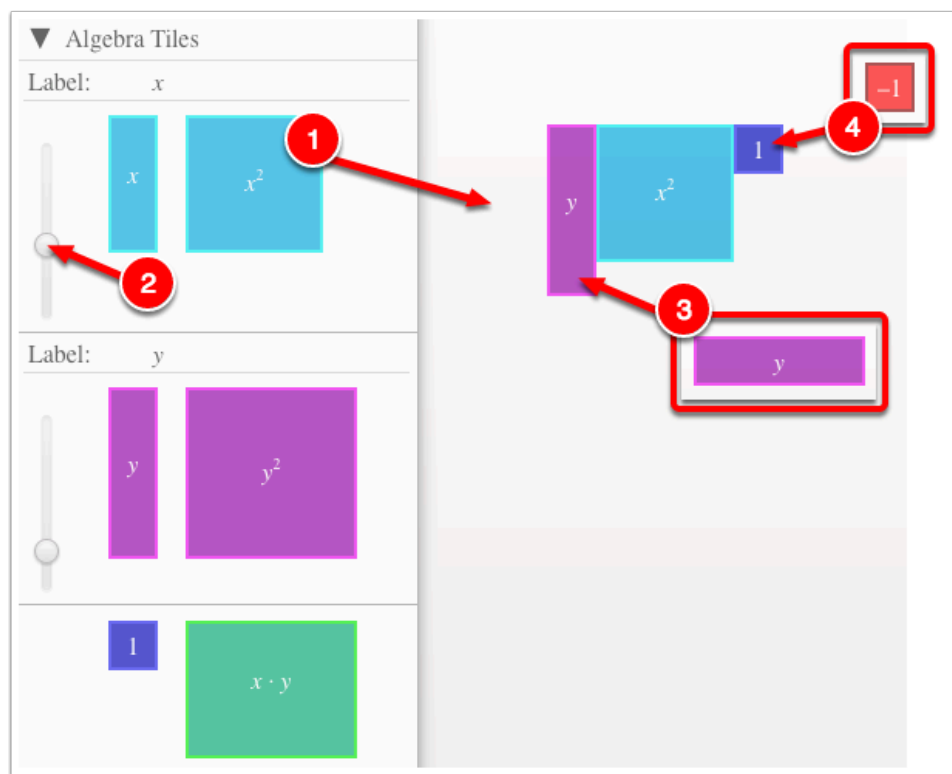
3. Select the Arrow Icon at the right to open and close the tray.



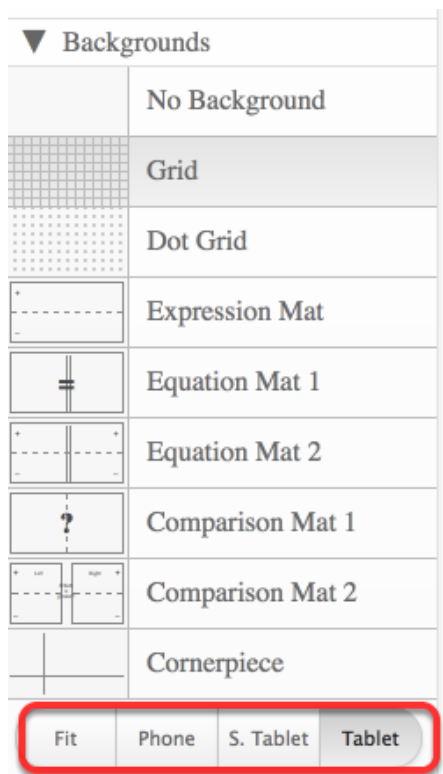
## 2. Drag tiles from the tray at the left to the display area at the right.

1. Select one of the tiles and drag it to the tile area.

2. Use the sliders in the tray to change the size of the tiles.
3. Double click tiles to change orientation (horizontal/vertical).
4. Click on a tile once to change the sign (+ -).  
Note: The color of the tile will turn to red for negative sign.

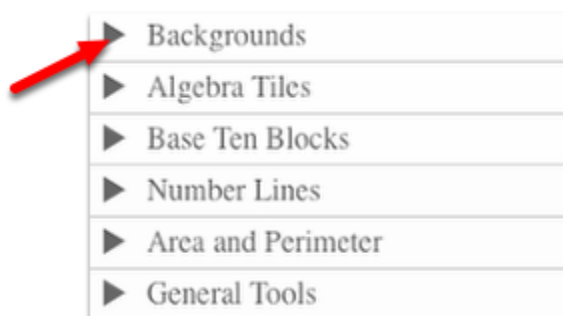


**3. Choose from a variety of different mats. Also choose from a variety of sizes to fit on various devices.**



**4. Choose from a variety of different tiles:**

- Click the arrow next to the tool to view/hide the options for each tool.



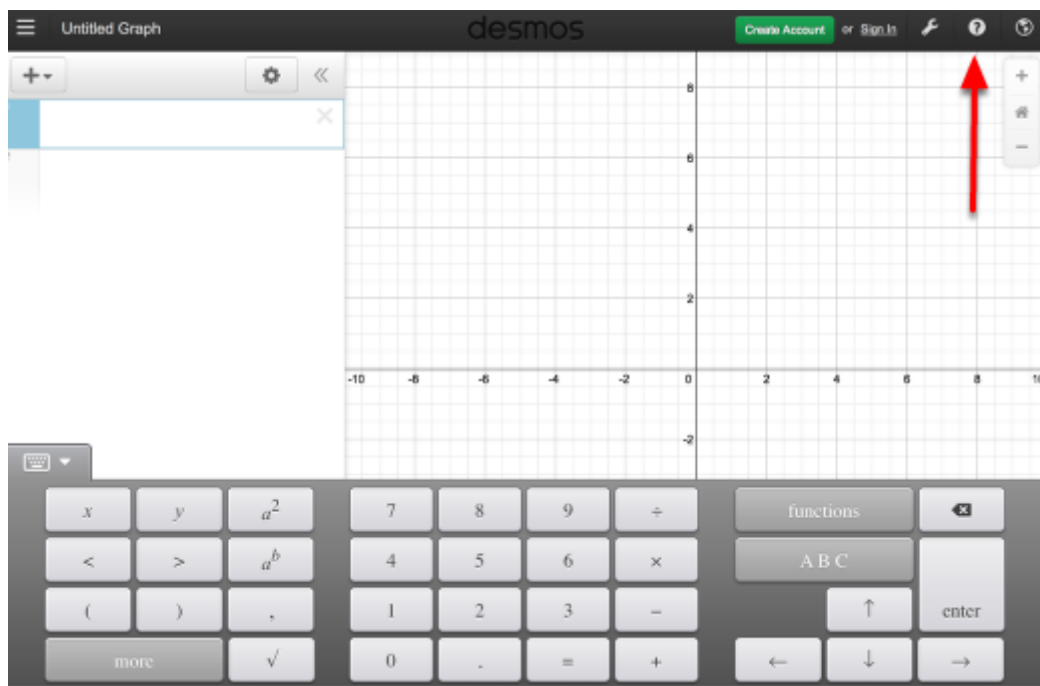
# Desmos Graphing Calculator

This free graphing calculator allows students to create a free account to save all of their graphs, animations, and projects created.

Click on the "Desmos Graphing Calculator" link below.

[Desmos Graphing Calculator](#)

1. Click on all of the buttons. Try it out! For extra help, click the "?".



2. Click on the interactive tours below for help to create:

[Sliders](#)

[Tables](#)

[Advanced Tables](#)

[Restrictions](#)

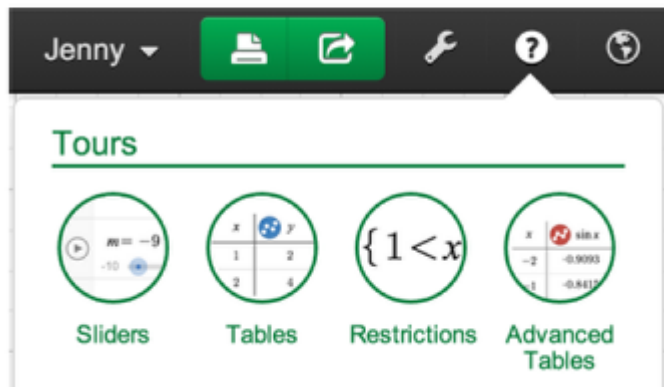
### 3. The interactive tours will NOT let you make a mistake! Try the links above!

#### Interactive Tours



Team Desmos  
posted this on December 29, 2013 22:13

Try one (or all!) of the interactive tours to learn more about sliders, tables, restrictions, and more:



### 4. Need additional help? Watch these very short excellent videos!

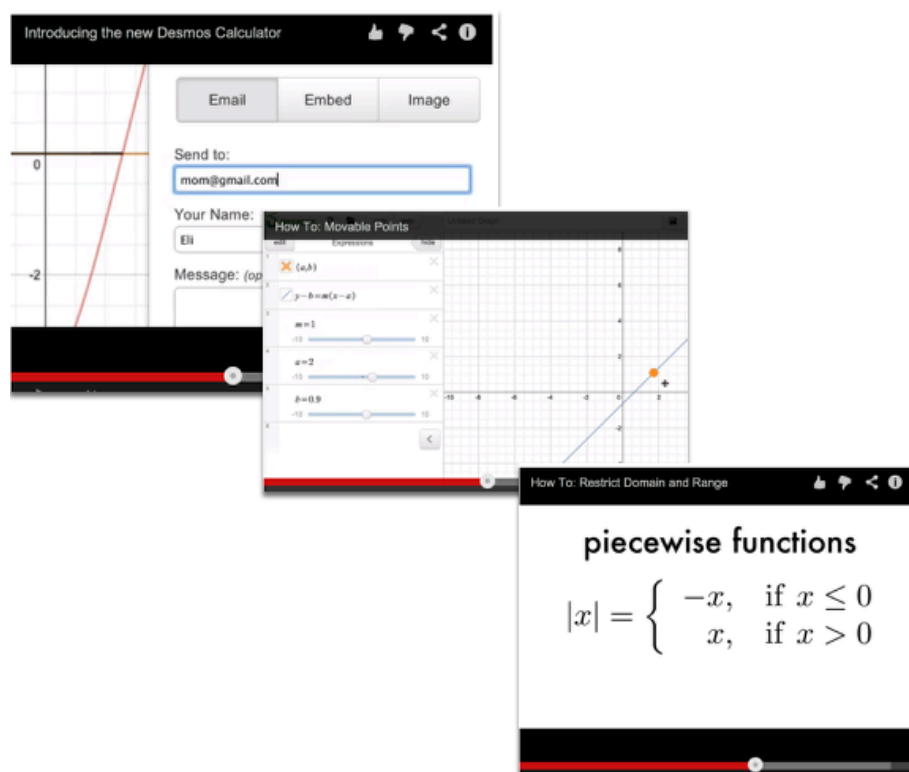
[Desmos Introduction](#)

[Moveable Points](#)

[Graph Inequalities](#)

[Piece-Wise Function](#)

## 5. The video links will help you with many of your graphing projects!



## 6. If you still need help, check out Desmos "Knowledge Base"

[Desmos Knowledge Base](#)

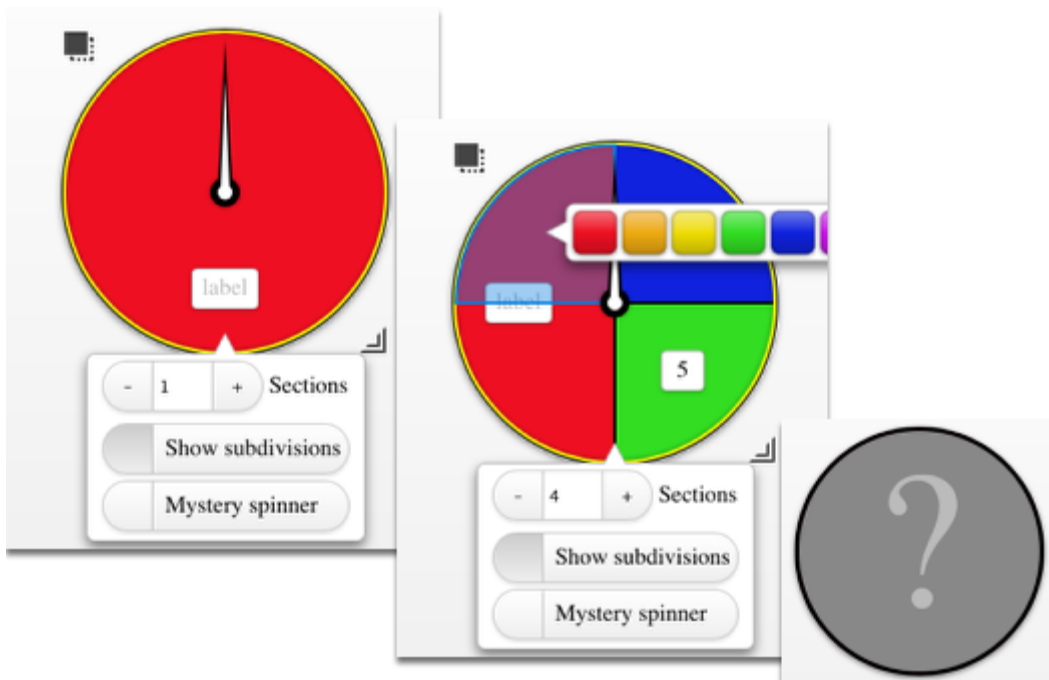
# Probability Tools (CPM)

Click on the link below.

[Probability Tools \(CPM\)](#)

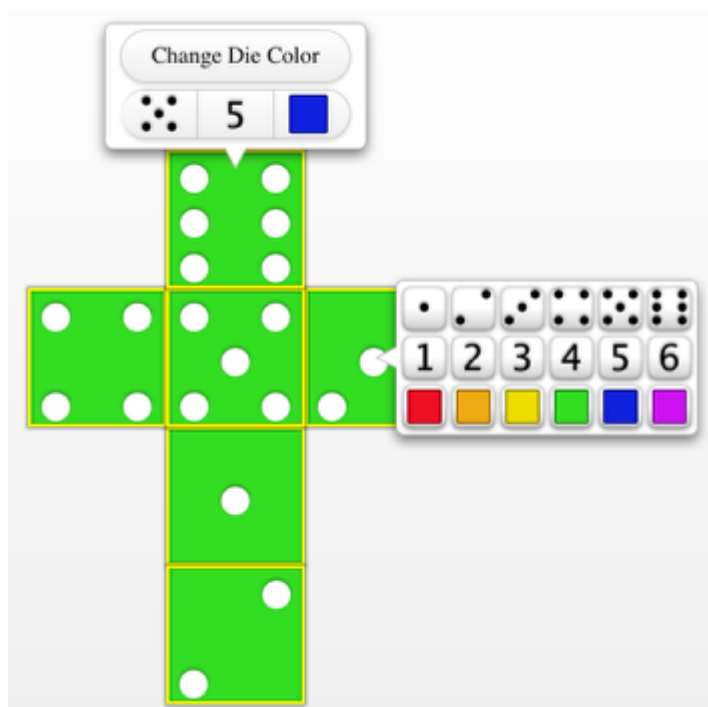
## 1. Spinners:

- Drag one or more spinners to the board.
- Resize the spinners.
- Choose color, number of sections, and labels.
- Hide subdivisions.
- Create Mystery Spinners.
- Click the spinners to spin.



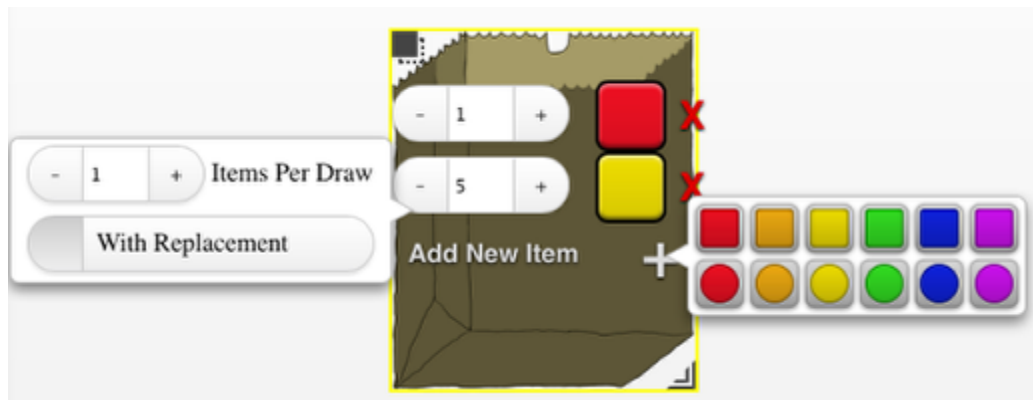
## 2. Dice:

- Drag one or more dice to the board.
- Choose dice color.
- Redesign the die with a variety of color, dot numbers, or Arabic numbers.
- Click each die to spin.



### 3. Bag:

- Drag one or more bags to the board.
- Choose the number, shape, and color of bag contents.
- Choose with or without replacement.
- Choose the number of items to draw.
- When finished, click the bag to shake and draw.



### 4. Coins:

- Coins are labelled "H" for Heads and "T" for Tails.
- Choose the color.
- Drag one or more coins to the board.
- Click each of them to spin.





## 5. Standard Deck of Cards:

- Drag one or more decks to the board.
- Choose with or without replacement and the number of cards draw at once.
- Modify the deck by eliminating specific cards or entire suits or number.
- Click the deck to draw the cards.



## 6. Random Number Generator:

- Drag the random number generator to the board.
- Indicate the number of integers to generate.
- Indicate the range for each random number.
- Click to randomize.

Generate    Integers

From

To

# Similarity Toolkit (CPM)

The similarity toolkit allows students to explore two triangles to determine congruency or similarity given SSS, SSA, SAS, AAA, etc.. Students show how two triangles are similar or congruent using rigid transformations (translation, rotation, and reflexion).

**1. Click on the "Similarity Toolkit" link below. For additional help, click on the "Similarity Toolkit Video".**

[Similarity Toolkit Video](#)

[Similarity Toolkit \(CPM\)](#)

**2. Similarity Toolkit Basic Controls:**

The screenshot shows the CPM Similarity Toolkit interface. On the left is a sidebar with various controls, and on the right are two triangles,  $\triangle ABC$  and  $\triangle DEF$ , with their respective side lengths and angles.

**CPM Similarity Sidebar Controls:**

- Notes:** A text area with the prompt "click here to type notes".
- Show/Hide Labels:**
  - Points:** A button labeled "Show Angle Measures".
  - Sides:** Three buttons: "None", "Lengths" (selected), and "Names".
  - Other:** A button labeled "Visual Effects".
- Side Lengths and Ratios:** A table comparing the side lengths of  $\triangle ABC$  and  $\triangle DEF$ .

**Triangle Data:**

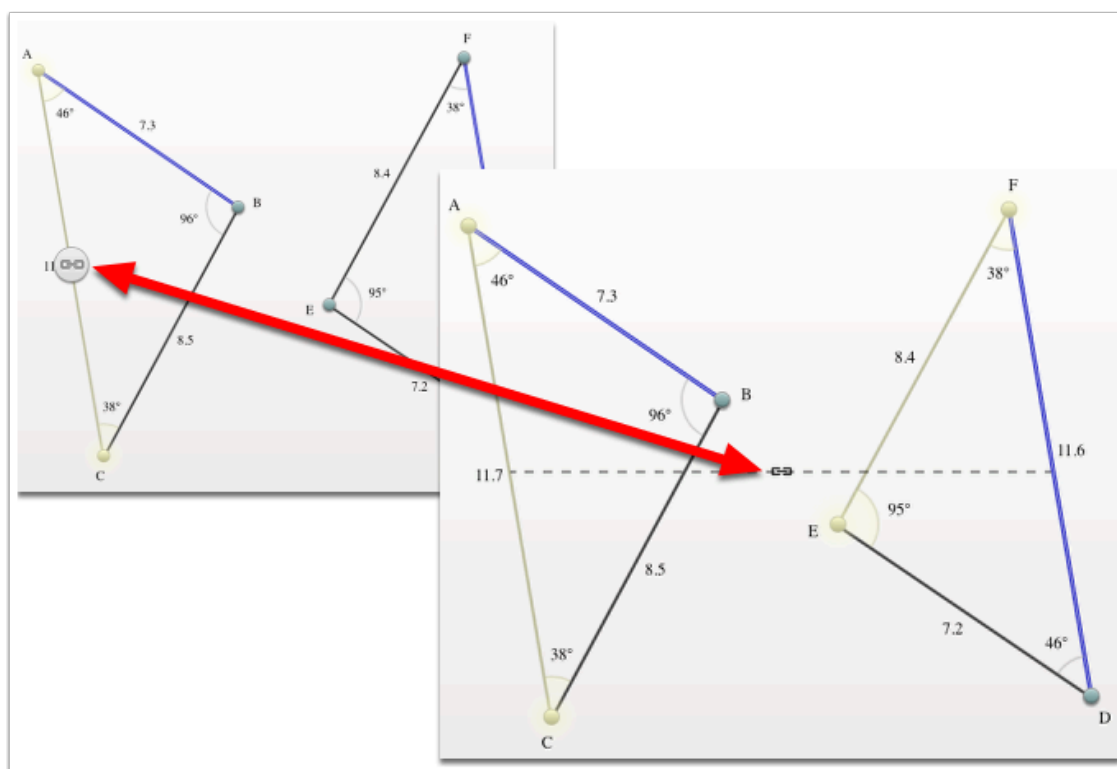
$\triangle ABC$	$\triangle DEF$
a = 8.5	d = 8.5
b = 11.7	e = 11.7
c = 7.3	f = 7.3

Link more elements to see side length ratios.

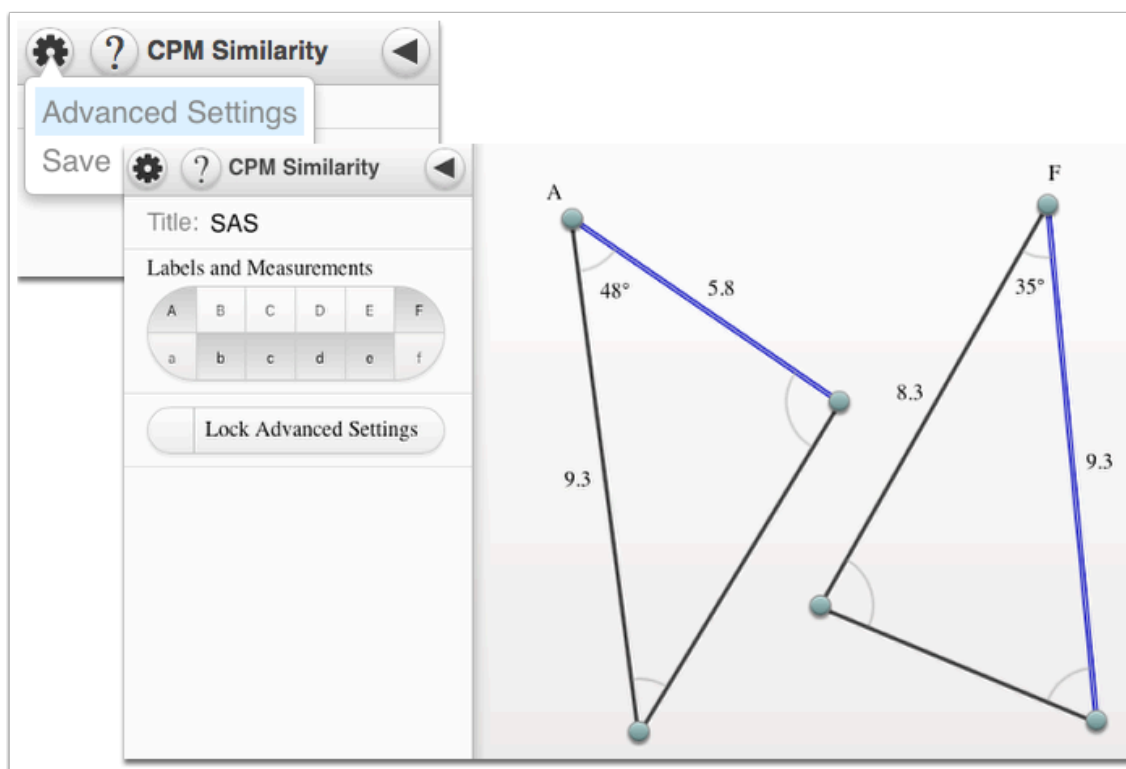
**Triangle Details:**

- $\triangle ABC$ :** Vertices A, B, C. Angles:  $\angle A = 46^\circ$ ,  $\angle B = 96^\circ$ ,  $\angle C = 38^\circ$ . Side lengths:  $AB = 7.3$ ,  $BC = 8.5$ ,  $AC = 11.7$ .
- $\triangle DEF$ :** Vertices D, E, F. Angles:  $\angle D = 46^\circ$ ,  $\angle E = 96^\circ$ ,  $\angle F = 38^\circ$ . Side lengths:  $DE = 7.3$ ,  $EF = 8.5$ ,  $DF = 11.7$ .

### 3. Indicate what sides/angles are similar/congruent.



### 4. By going to the Advanced Settings, indicate what angles and sides you want shown!



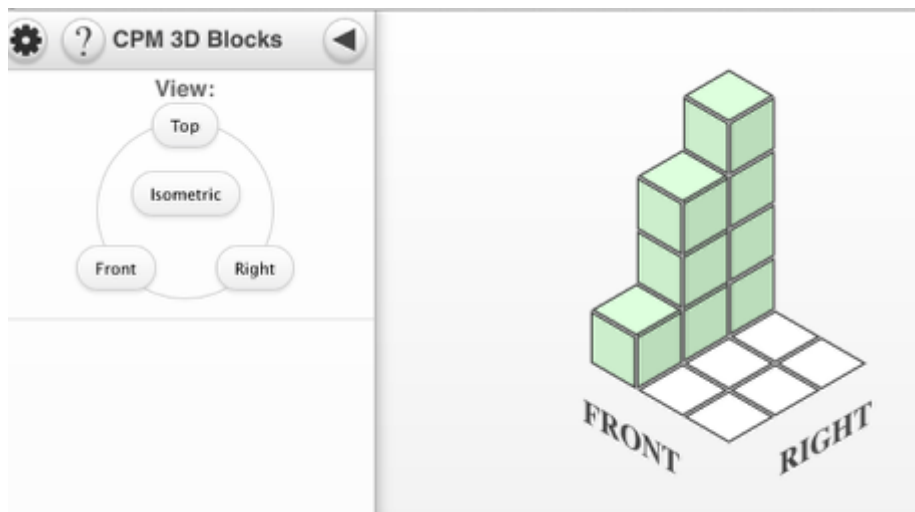
## 3D Blocks (CPM)

Click on the link below.

[3D Blocks \(CPM\)](#)

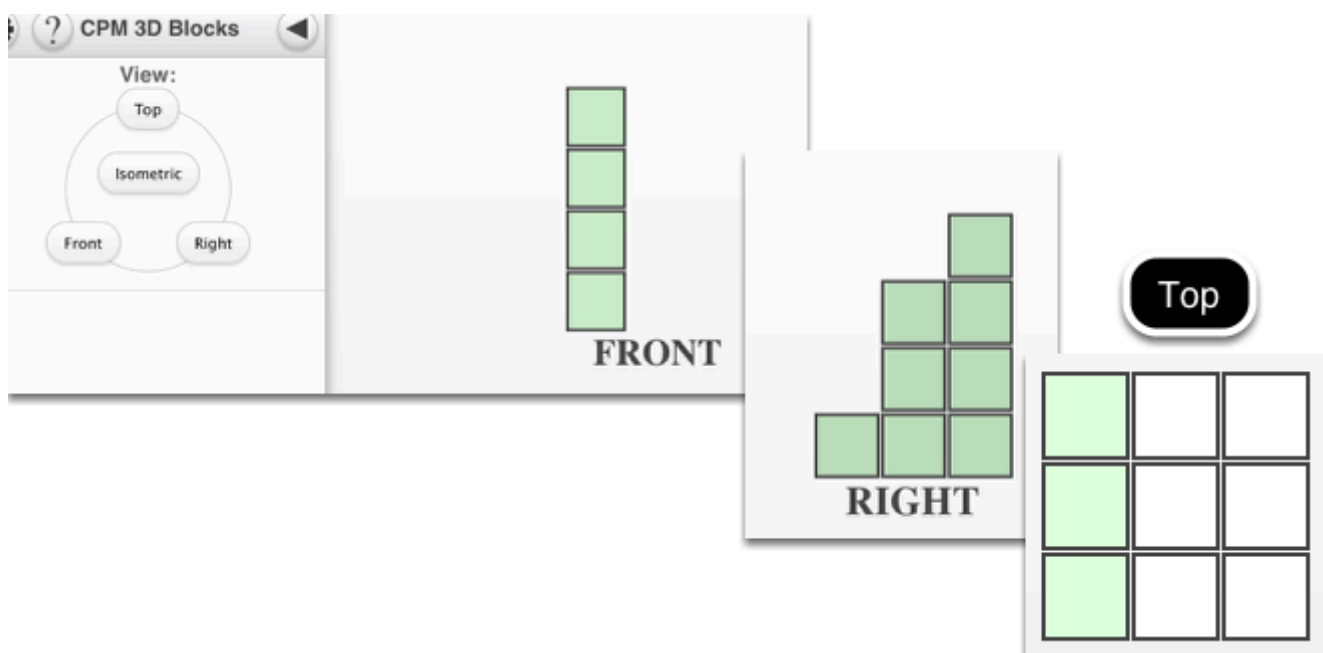
### 1. 3D Blocks (CPM)

- Build by clicking the top of blocks or the pad.
- Remove by clicking the side of blocks.



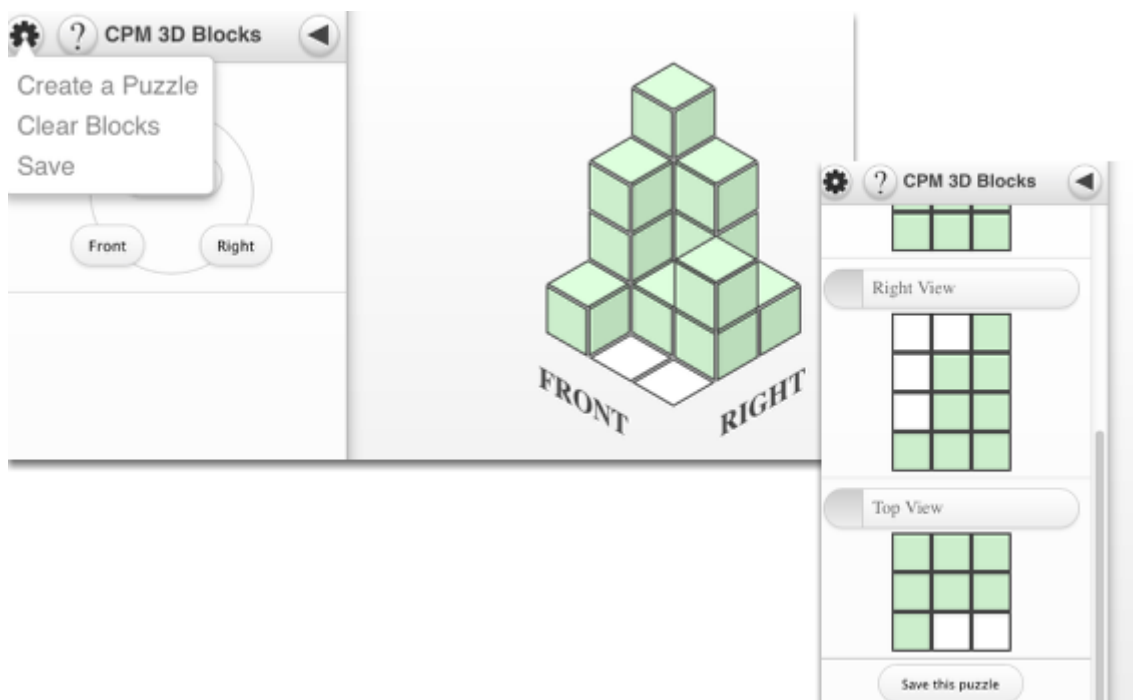
### 2. Choose the view:

- Isometric view is in step 1 above.
- Also, choose Front, Right, or Top views.



### 3. Create a Puzzle:

- Design your own puzzle by showing only the views you choose.
- Other students attempt to build your structure from the given views.

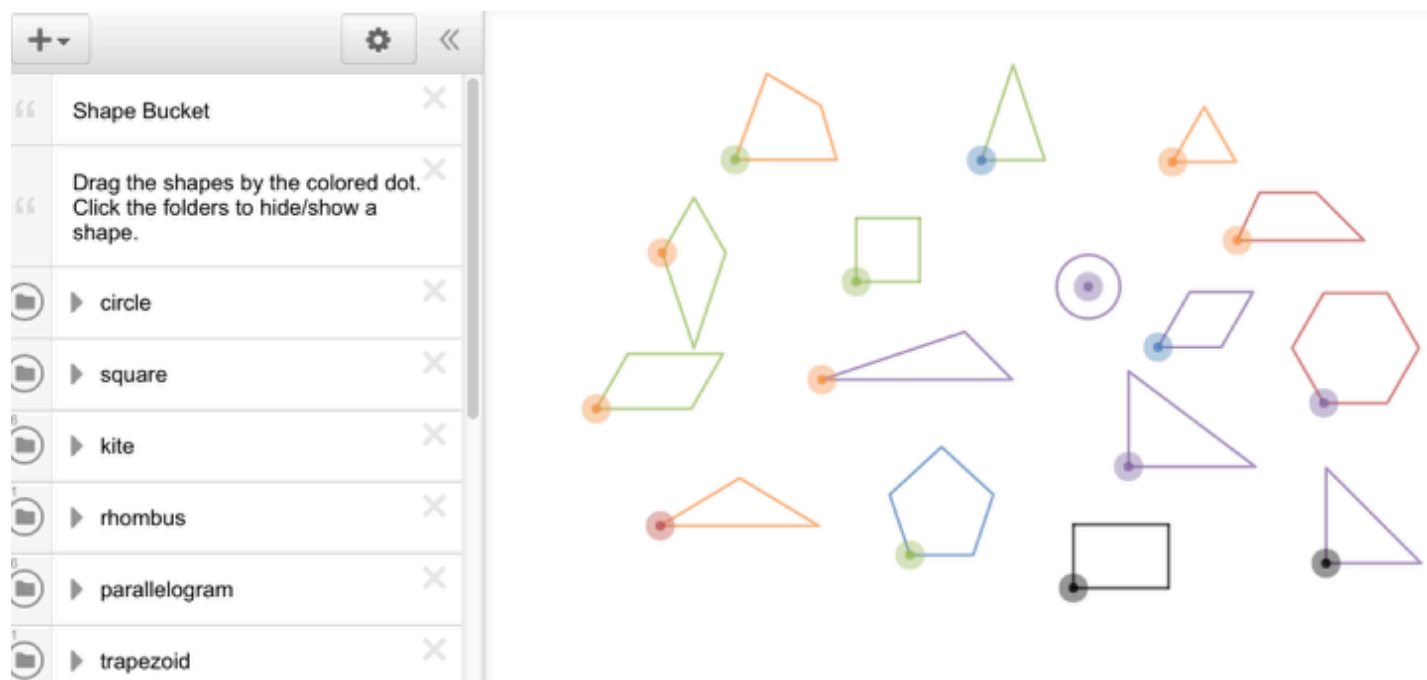


## Shape Bucket (Desmos)

Click on the link below for the "Shape Bucket"

[Shape Bucket\(Desmos\)](#)

1. Use the "Shape Bucket" to explore geometric concepts.

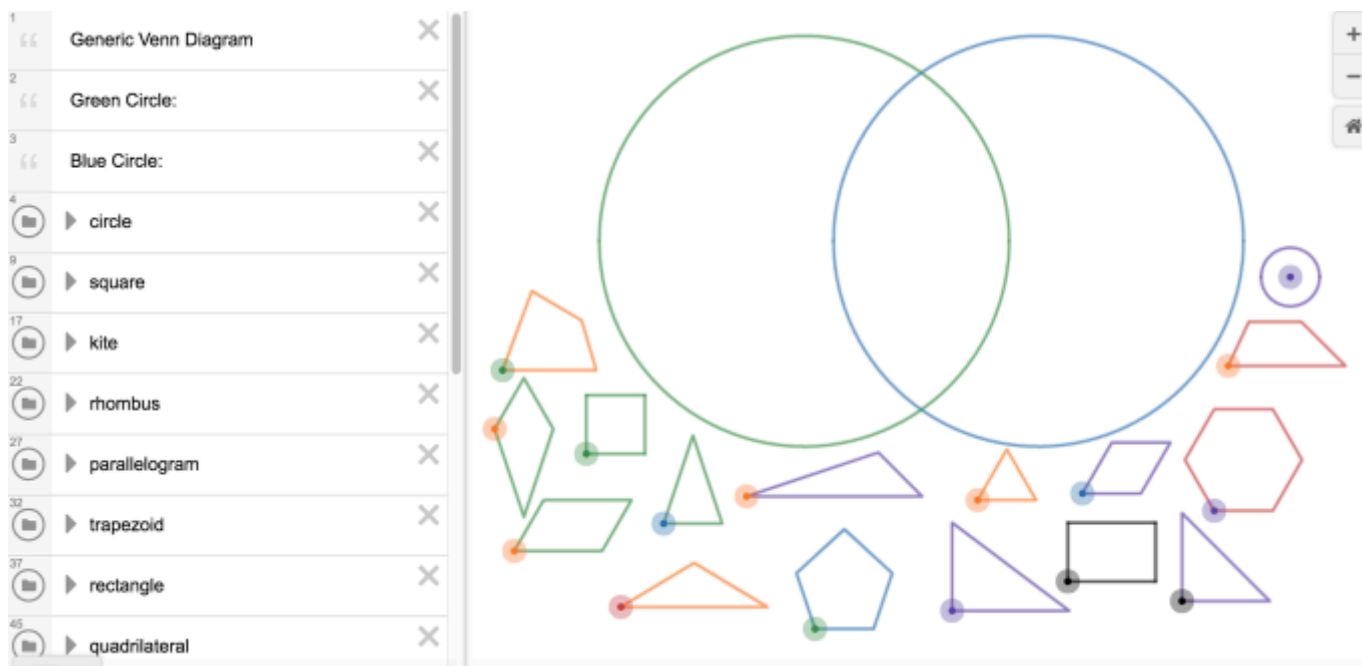


# Generic Venn Diagram (Desmos)

Click on the link below.

[Generic Venn Diagrams \(Desmos\)](#)

## 1. Create your own Venn Diagrams.








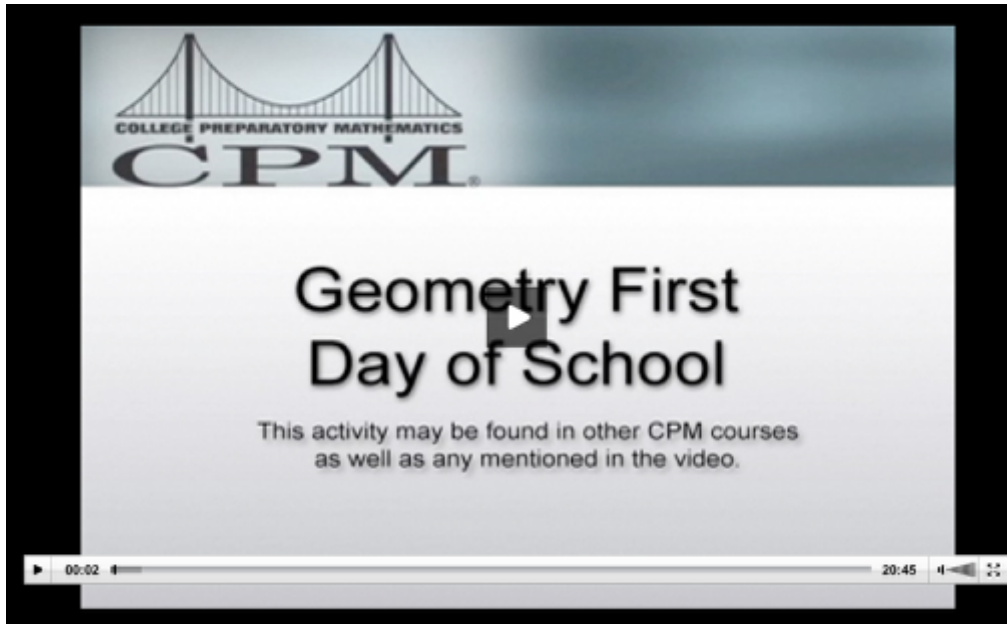
# Chapter 1

## GC 1.1.1: Geometry First Day of School Teacher Video (Vimeo)

Click on the link below.

[Geometry First Day of School \(Vimeo\)](#) 

1. This video offers suggestions for class activities for the first day of school.



## GC 1.1.1: Quilt Pictures and PowerPoint

Click on the links below.

[Quilt PowerPoint Presentation](#)

[Quilt Pictures](#)

### 1. Examples:

Quilt Pictures for Lesson 1.1.1

Quilt Pictures for Lesson 1.1.1

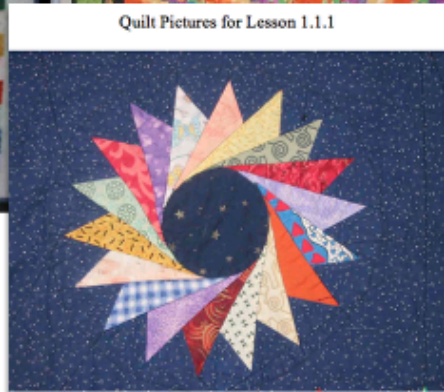


Quilt by Sue Sales



Quilt Pictures for Lesson 1.1.1

Quilt Pictures for Lesson 1.1.1




Quilt by Sue Sales





Quilt by Sue Sales

## GC 1.1.2: Teacher Mobius Strip Setup, Lesson, Closure and Intro/Summary Video

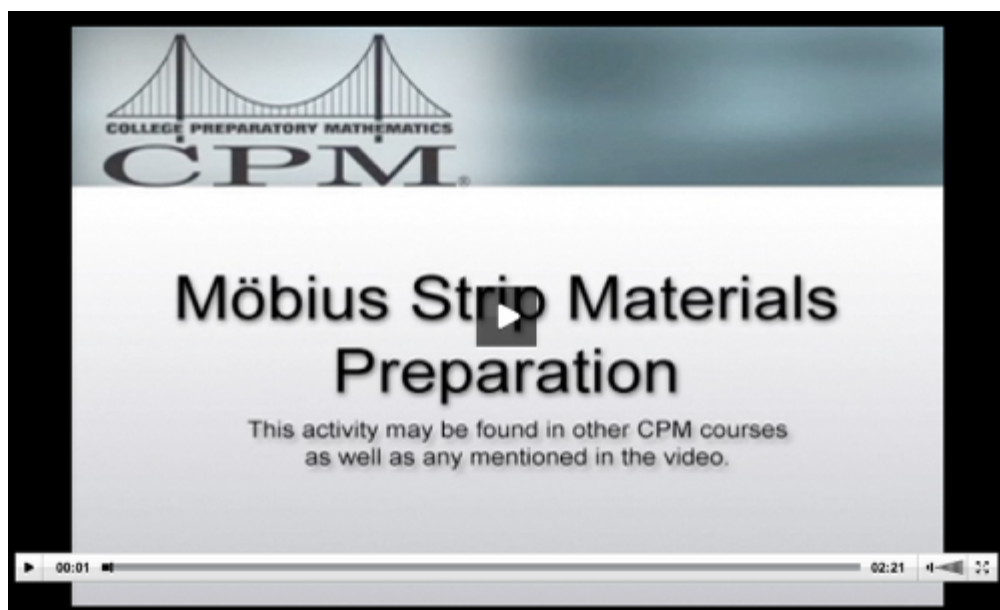
Click on the links below for the "Mobius" videos

[Möbius Strip Setup](#) 

[Möbius Strip classroom Lesson](#) 

[Möbius Strip Closure](#) 

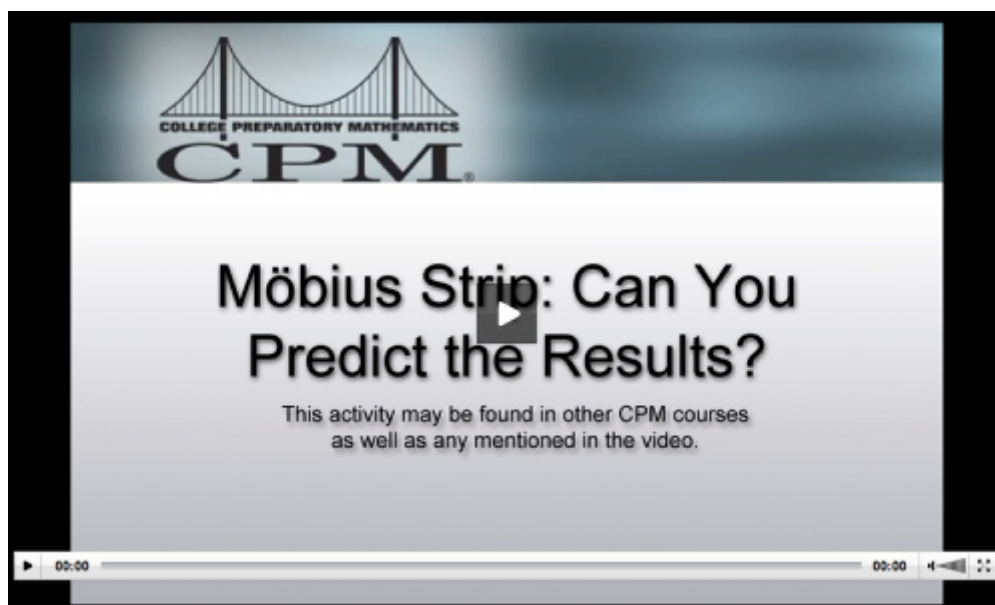
### 1. Materials Preparation:



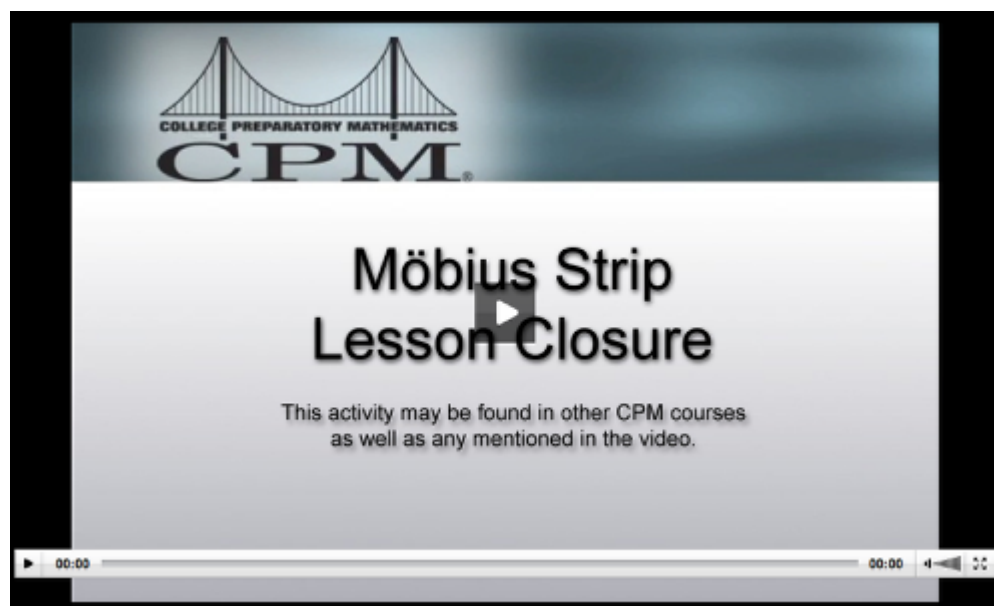
## 2. Using the strips:



## 3. Predicting results:




#### 4. Closure:



## GC 1.1.5: The Power of X Videos

Click on the link below for the "Power of X Video and Beyond the Power of X Video"

[The Power of X](#)   
[Behind the Power of X](#) 

### 1. Human kaleidoscope



TEDxSummit intro: The power of x


## 2. The making of the film:



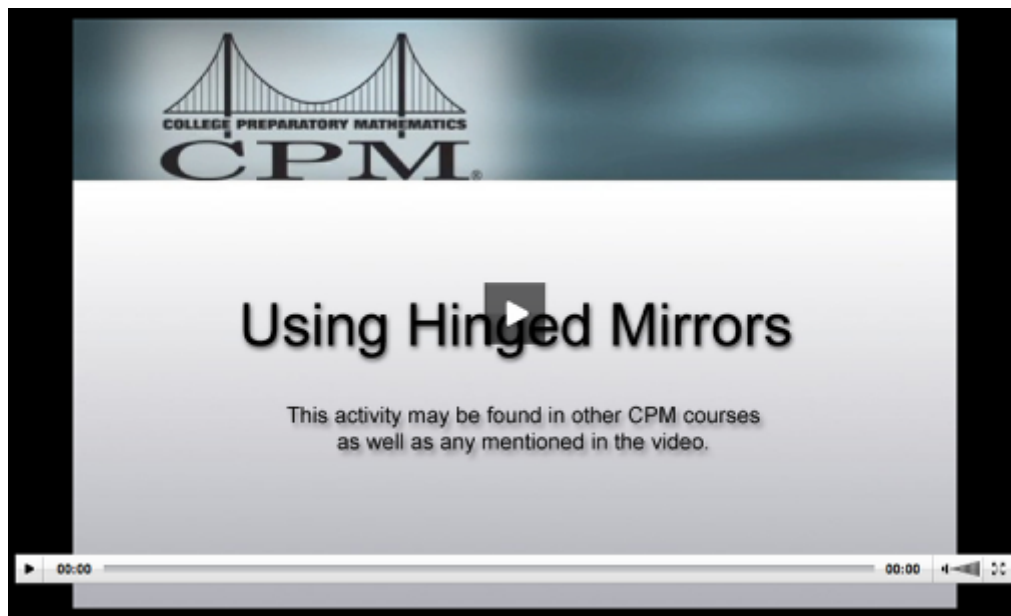


## GC 1.1.5: Using Hinged Mirrors Teacher Video

Click on the link below for the "Using Hinged Mirrors Video"

[Using Hinged Mirrors](#) 

1. Ideas for using hinged mirrors in Lesson 1.1.5 are presented in this video.



2. Students investigate the shapes they "see" as they change the opening angle of the hinged mirrors.



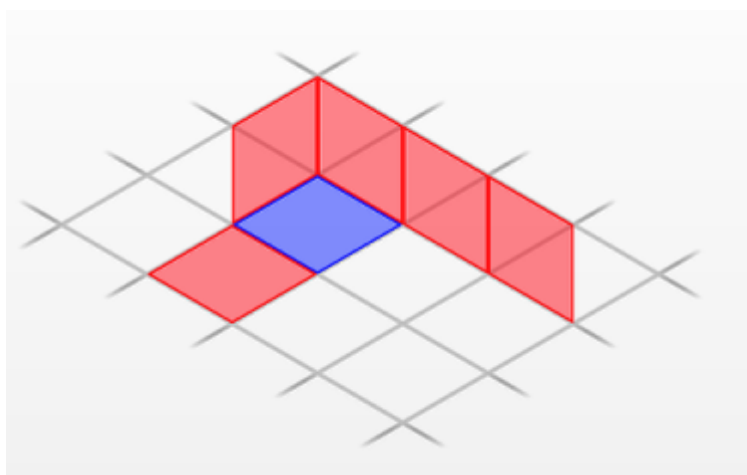
## GC 1.2.1: 1-47 3D Nets (CPM)

These nets are interactive. Click on the sides to raise or lower them. Drag in a circular motion outside of the net to rotate in space. Go to the "?" for more help!

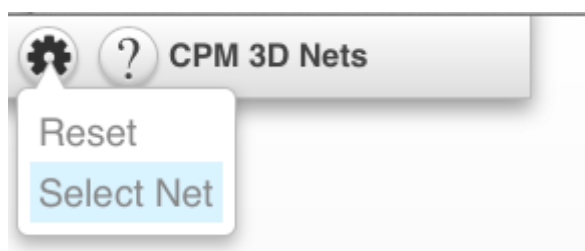
**Click on the link below.**

[GC 1-47 3D Nets \(CPM\)](#)

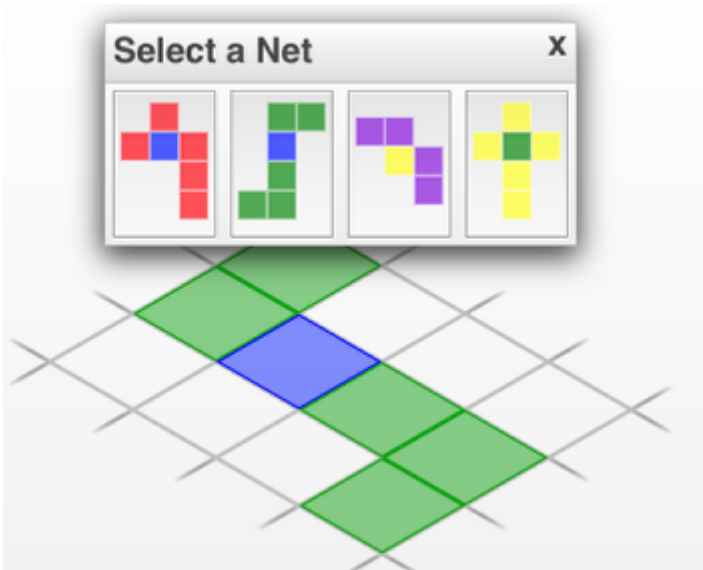
### 1. GC 47a:



### 2. Get the other nets by going to the Gear menu!



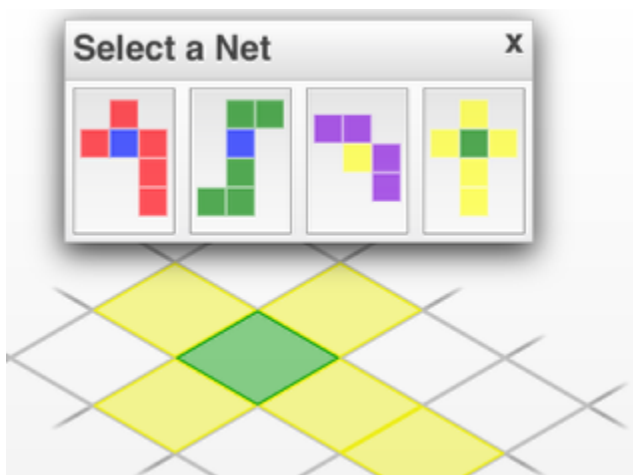
3. GC 47b:



4. GC 47c:



## 5. GC 47d:



## GC 1.2.2: Transformations with 1-59 & 1-60a, c (Desmos)

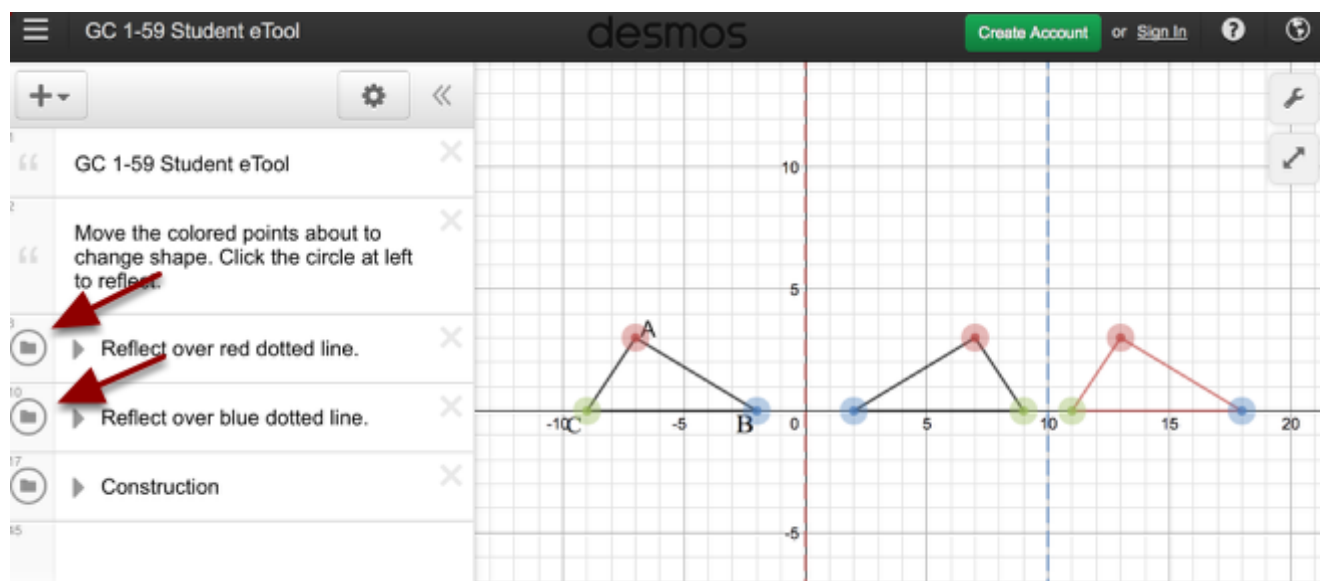
Click on the links below.

[1-59 Student eTool \(Desmos\)](#)

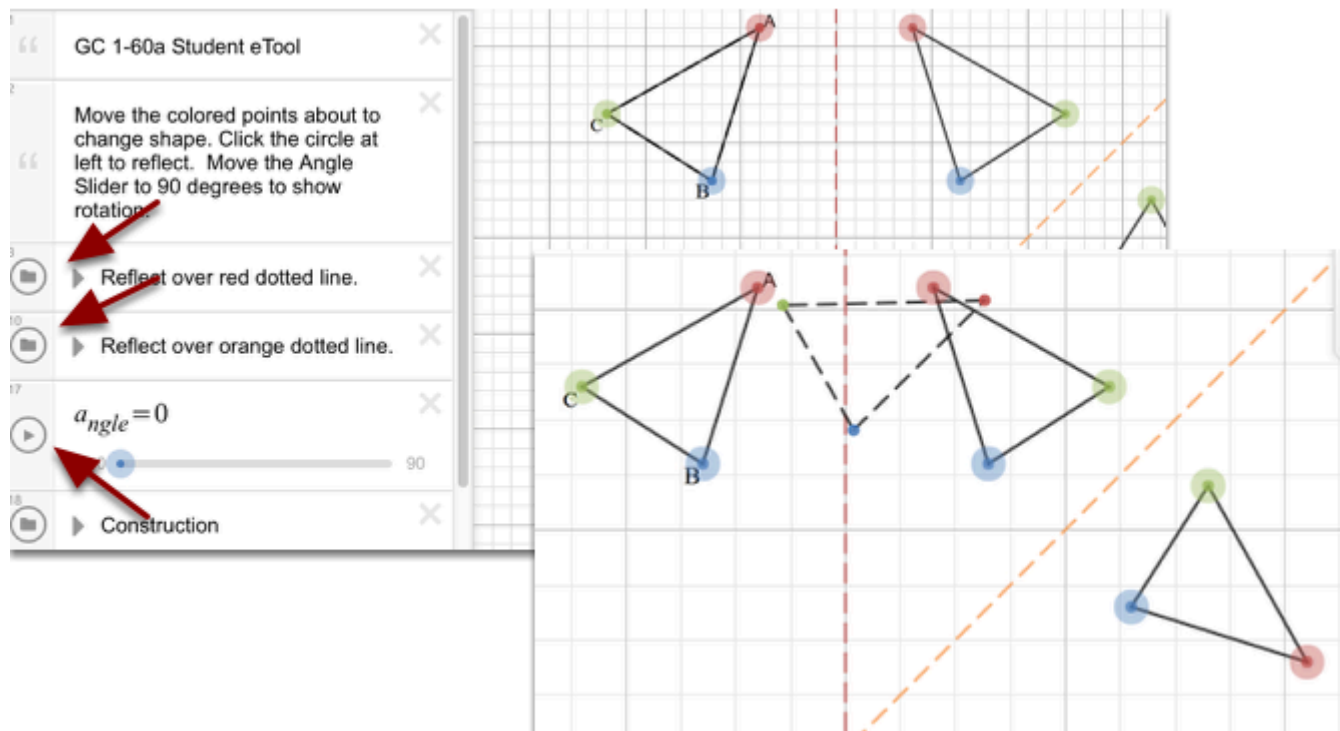
[1-60a Student eTool \(Desmos\)](#)

[1-60a Student eTool \(Desmos\)](#)

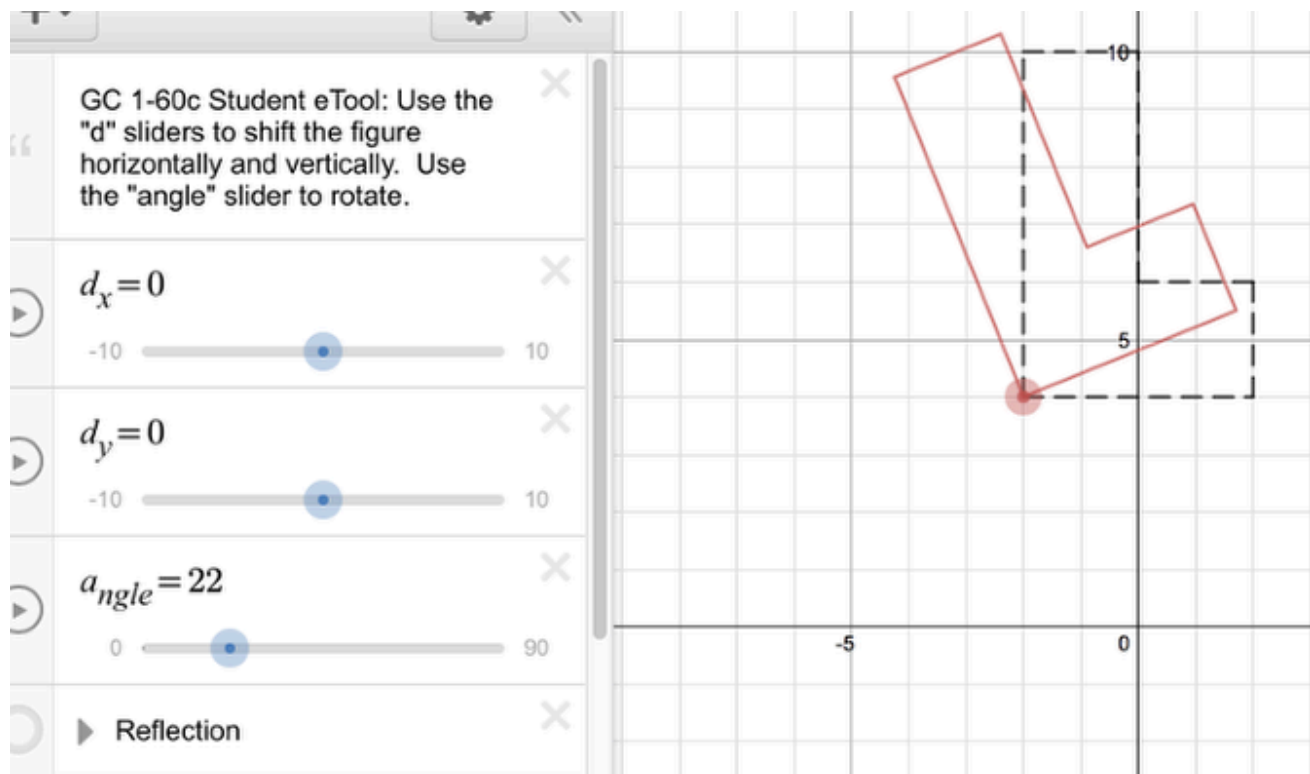
1. 1-59: Click the folder buttons to view.



**2. 1-60a: Click the folder buttons to view the reflections. Drag the slider to view the rotation.**



**3. 1-60c: Drag the Angle Slider to view the rotation.**



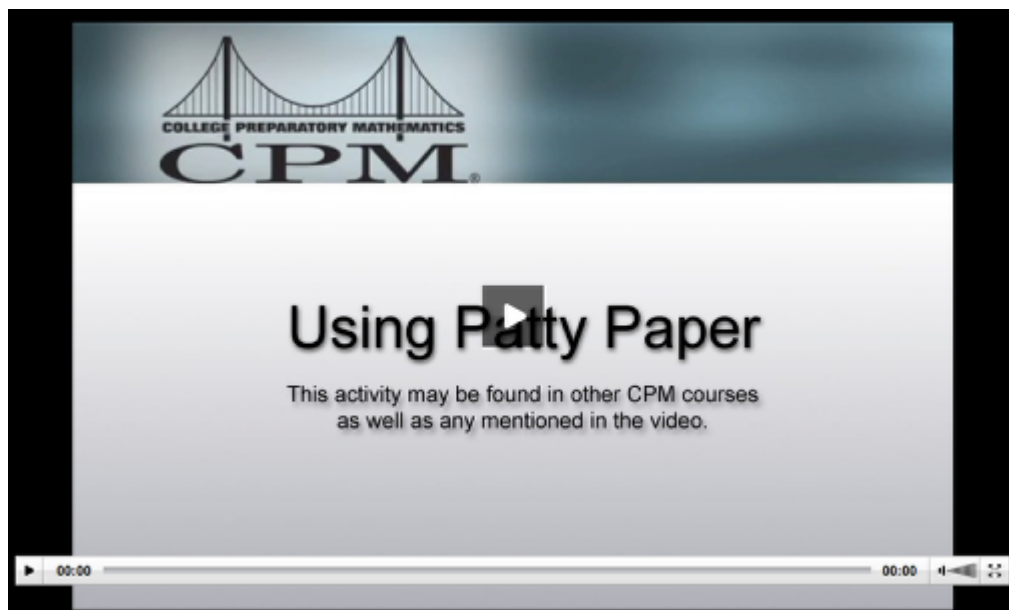
## GC 1.2.2: Using Patty Paper Teacher Video (Vimeo)

Click on the link below.

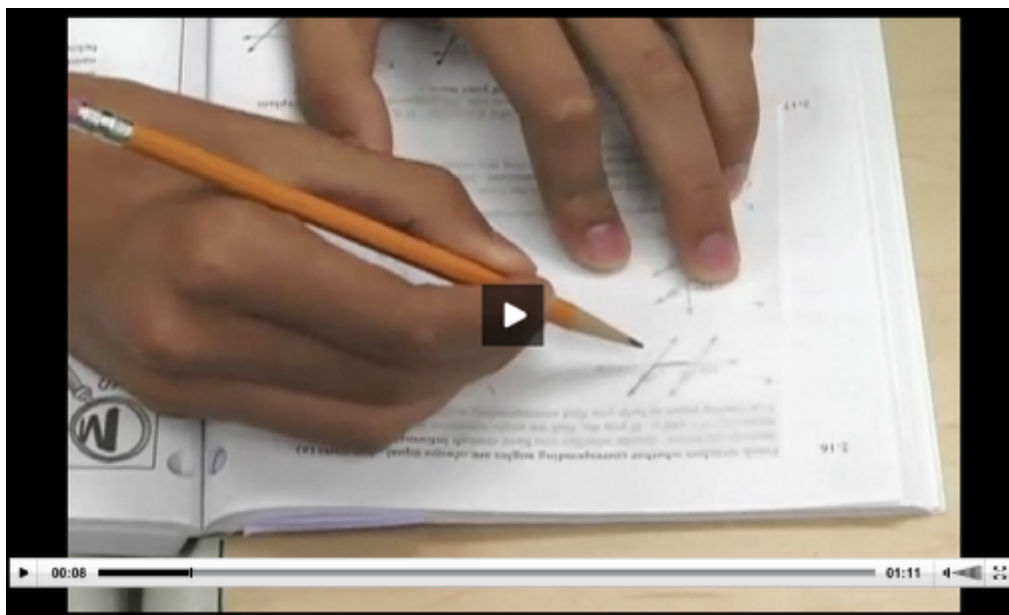
[Using Patty Paper \(Vimeo\)](#)



### 1. Screen shot:



### 2. Screen shot:

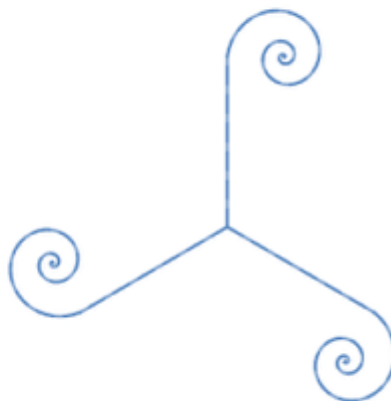
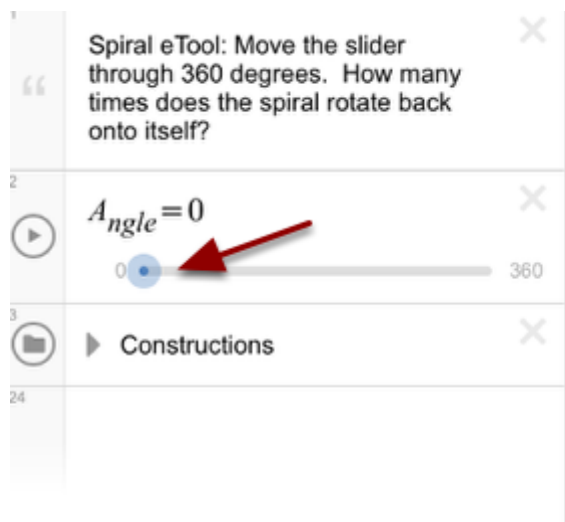


## GC 1.2.5: Spiral eTool (Desmos)

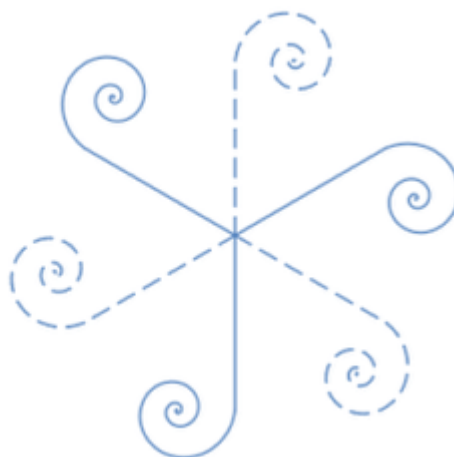
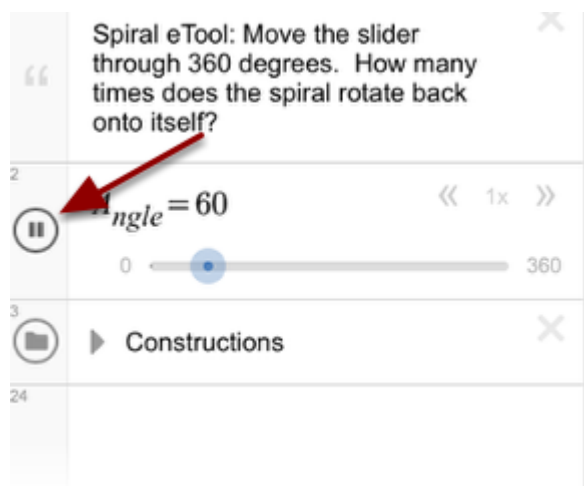
Click on the link below.

[Spiral eTool \(Desmos\)](#)

**1. Move the slider. In how many degrees does the figure rotate back to itself?**



**2. To toggle between continuous play and stop, click the play/pause button.**





## GC 1.3.1: 1-98 Venn Diagrams Shape A, B, & C eTools (Desmos)

Click on the links below.

[Shape Bucket \(Desmos\)](#)

[Generic Venn Diagram \(Desmos\)](#)

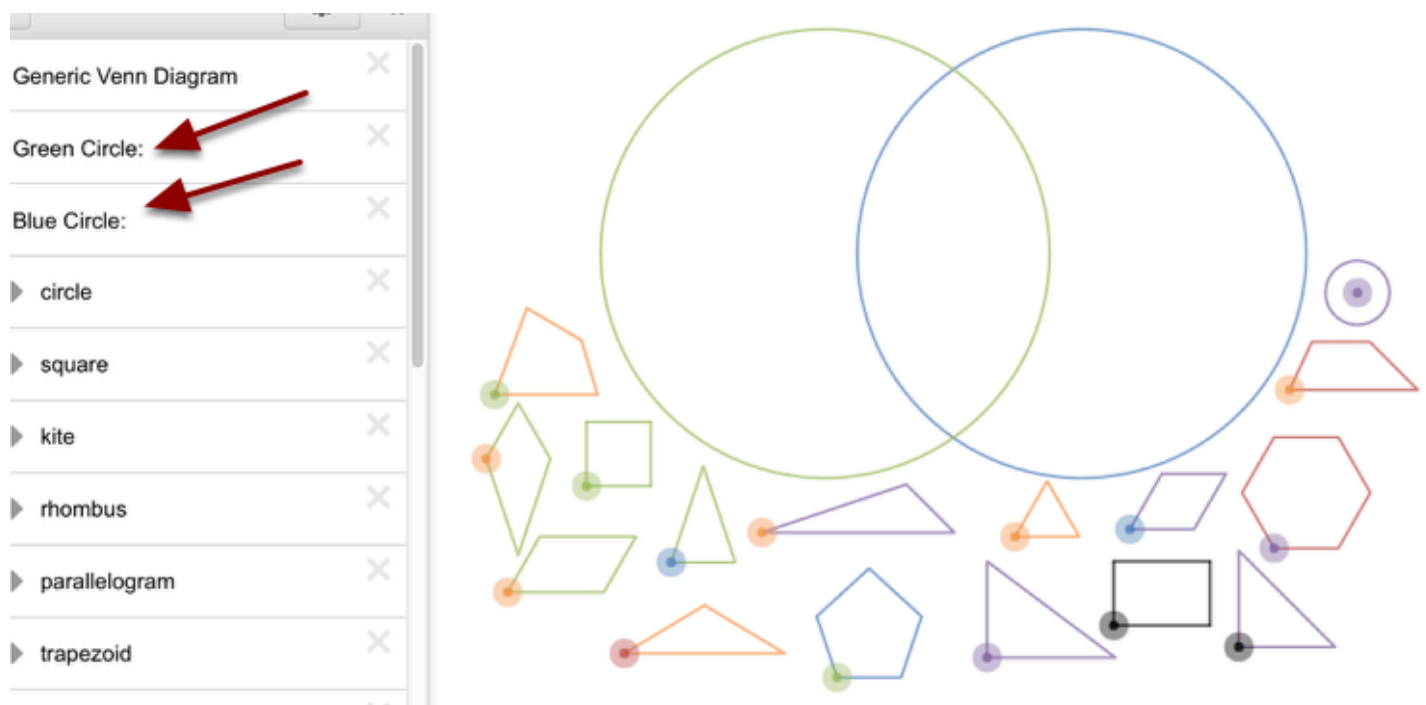
[1-111 Venn Diagram A: Student eTool \(Desmos\)](#)

[1-111 Venn Diagram B: Student eTool \(Desmos\)](#)

[1-111 Venn Diagram C: Student eTool \(Desmos\)](#)

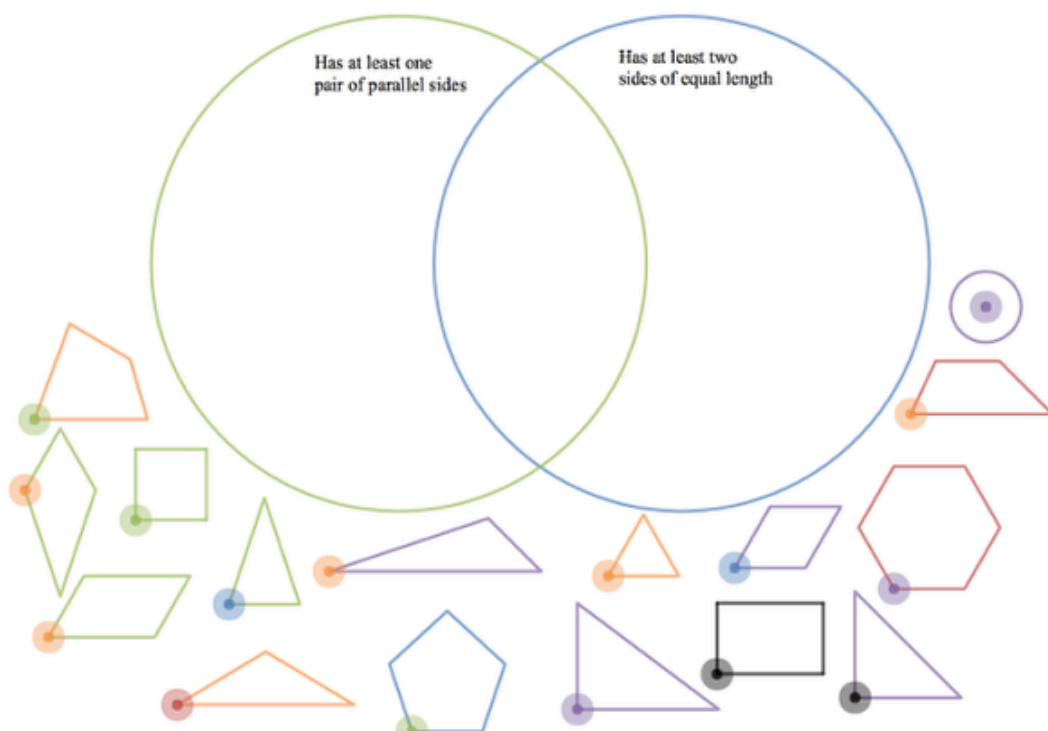
### 1. Generic Venn Diagram

- Type the attributes for each circle at the left
- Fill the circles appropriately.



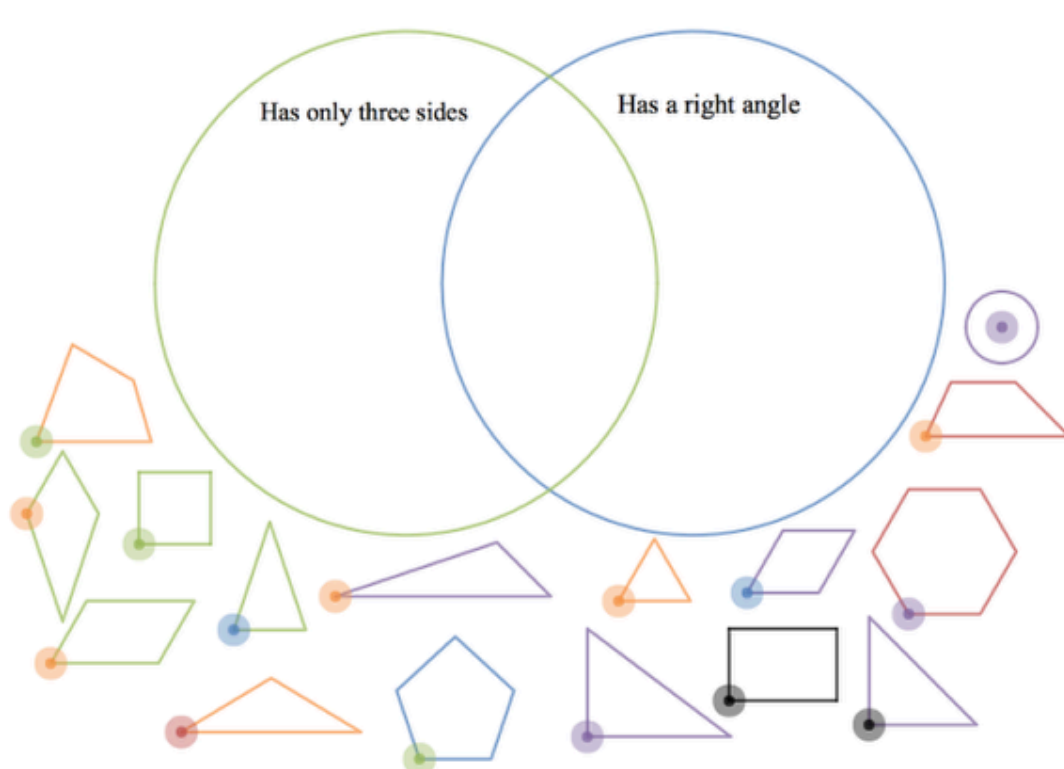
### 2. Venn Diagram A:

- Hide the tray for more room to move the shapes.
- Enlarge/shrink the shapes by using the mouse or pinching on a tablet.



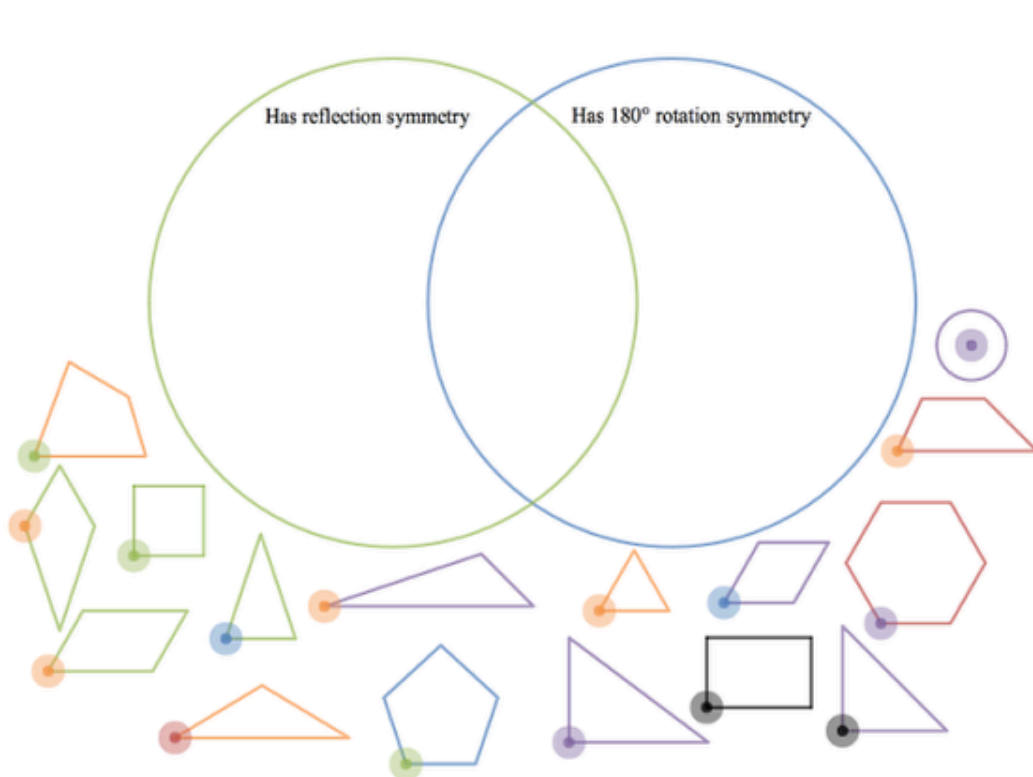
### 3. Venn Diagram B:

- Hide the tray for more room to move the shapes.
- Enlarge/shrink the shapes by using the mouse or pinching on a tablet.

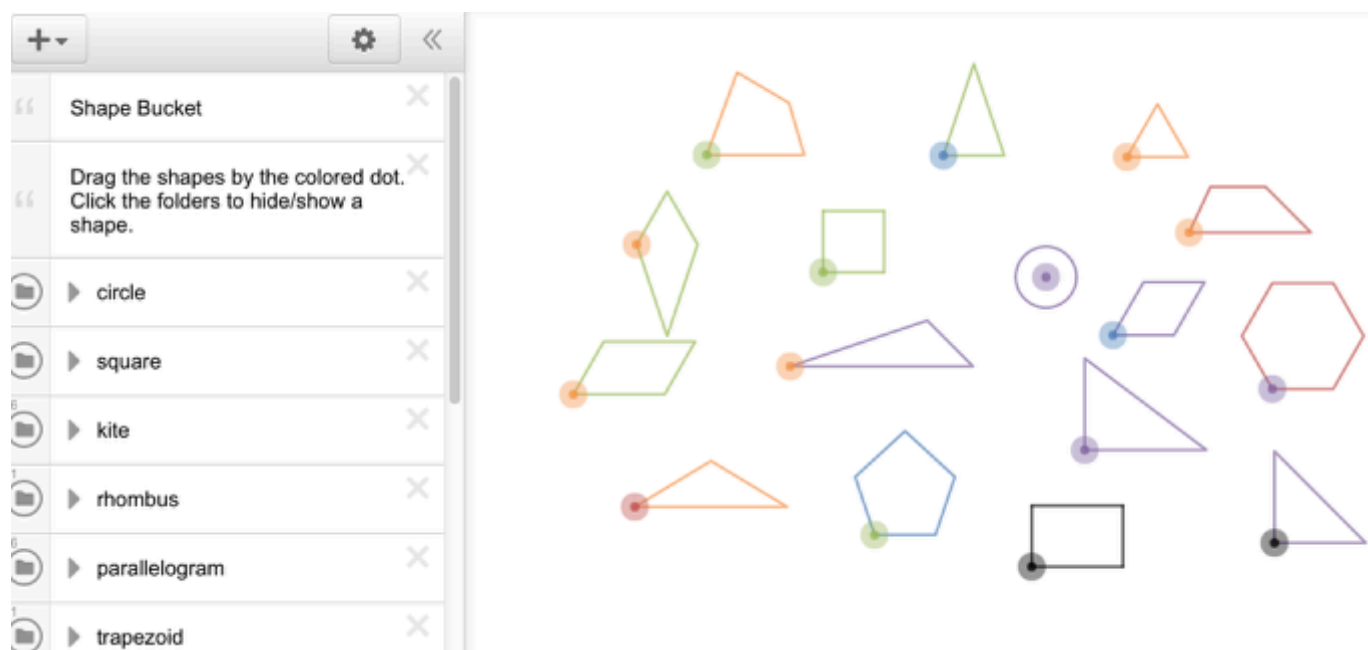


## 4. Venn Diagram C:

- Hide the tray for more room to move the shapes.
- Enlarge/shrink the shapes by using the mouse or pinching on a tablet.



## 5. Shape Bucket



## GC 1.3.1: 1-98 Venn Diagrams Shape A, B & C Answer eTools (Desmos)

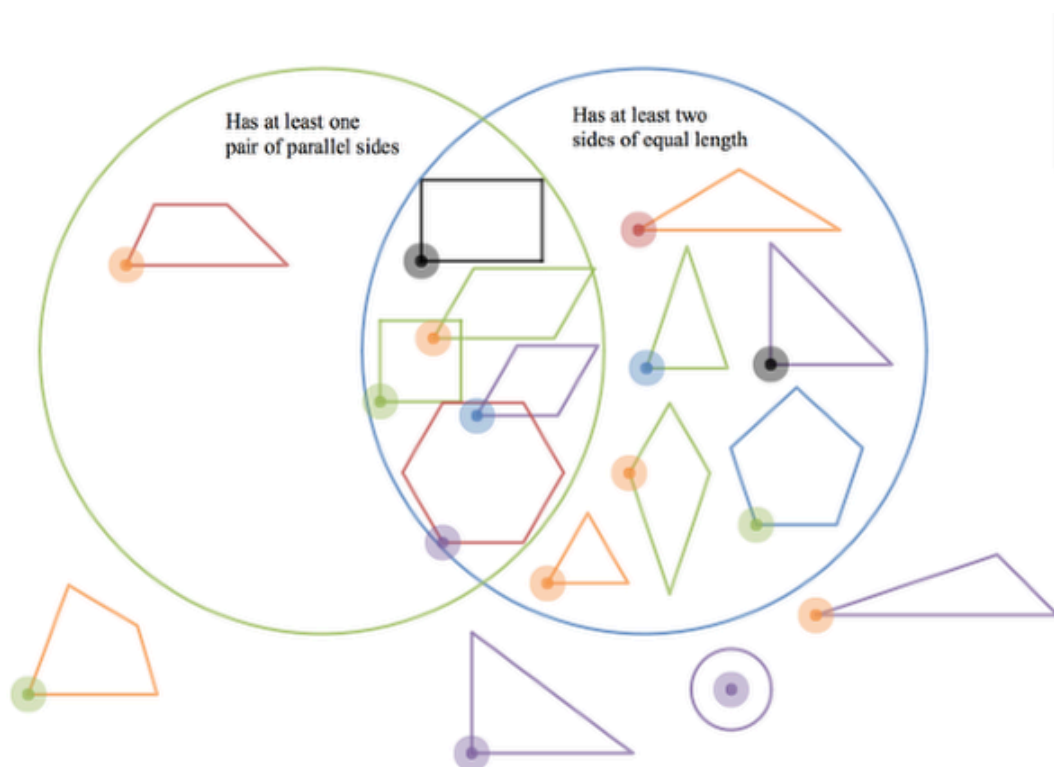
Click on the links below.

[1-111 Venn Diagram A: Answer eTool \(Desmos\)](#)

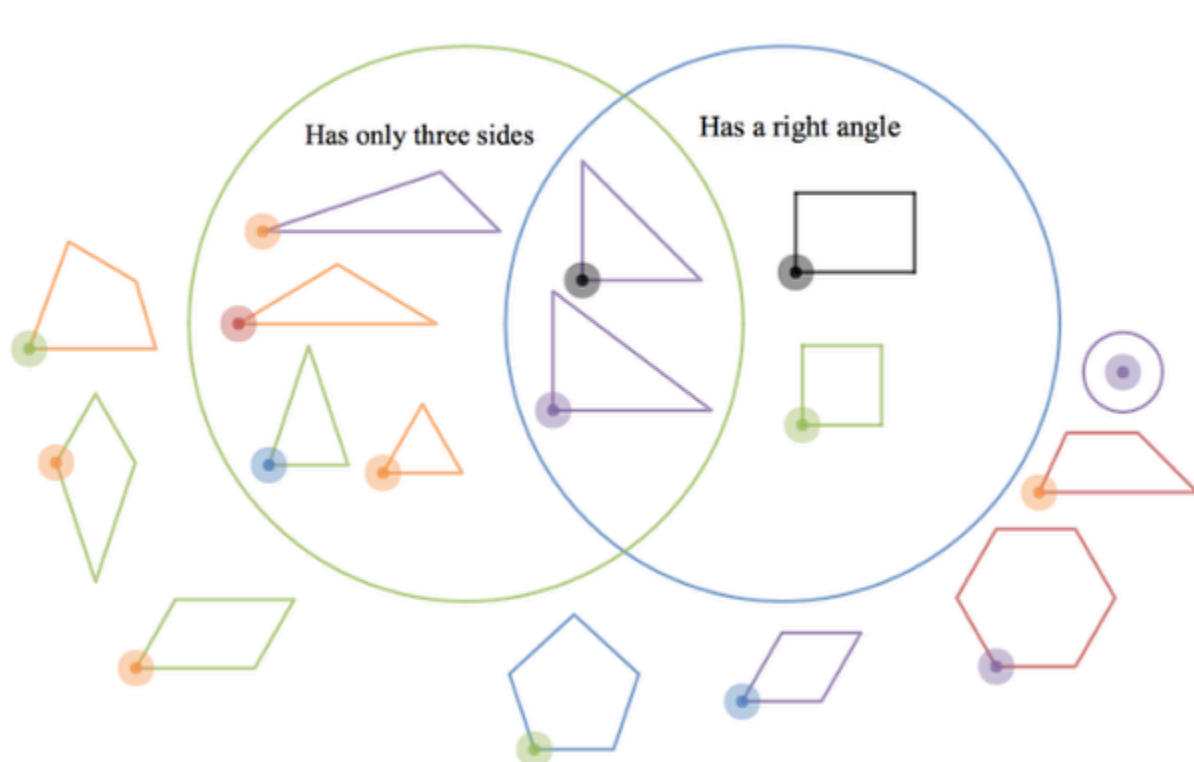
[1-111 Venn Diagram B: Answer eTool \(Desmos\)](#)

[1-111 Venn Diagram C: Answer eTool \(Desmos\)](#)

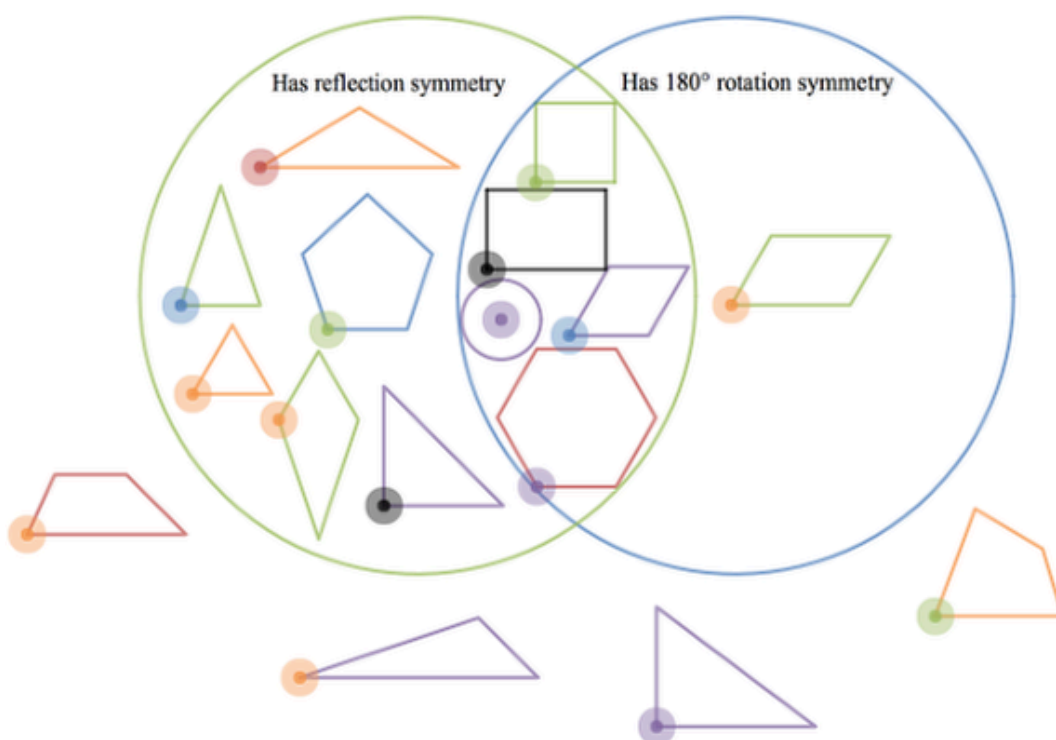
### 1. Venn Diagram Answer A: See below for the placement of shapes.



**2. Venn Diagram Answer B: See below for the placement of shapes.**



**3. Venn Diagram Answer C: See below for the placement of shapes.**



## Chapter 2

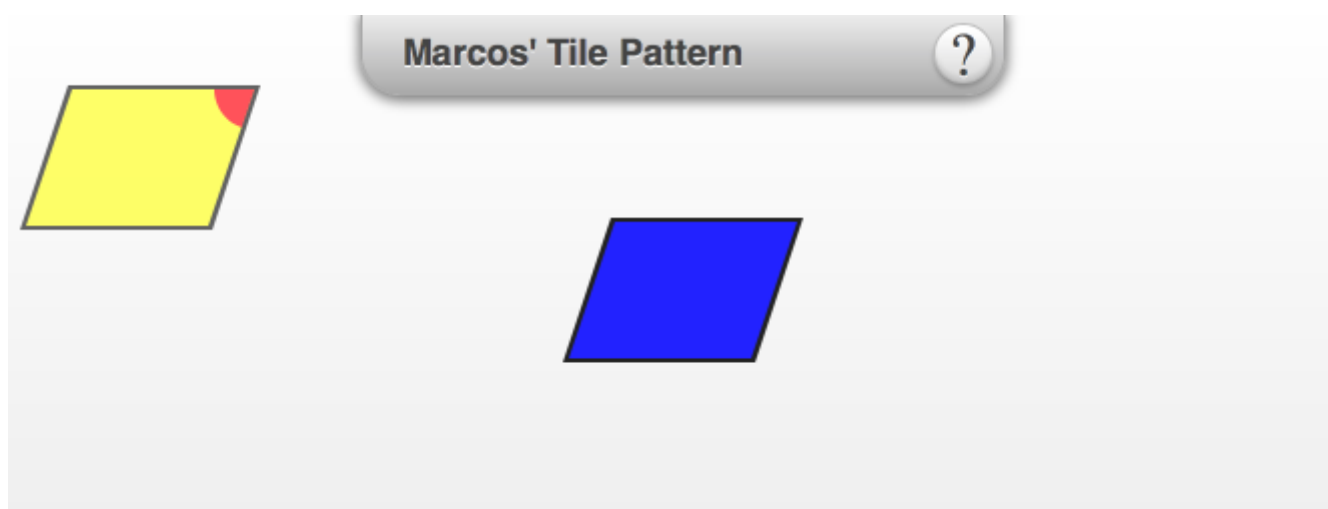
## GC 2.1.2: Marcos' Tile Pattern (CPM)

Tessellate the parallelograms by sliding them up, down, or sideways. Double click the yellow parallelogram to rotate.

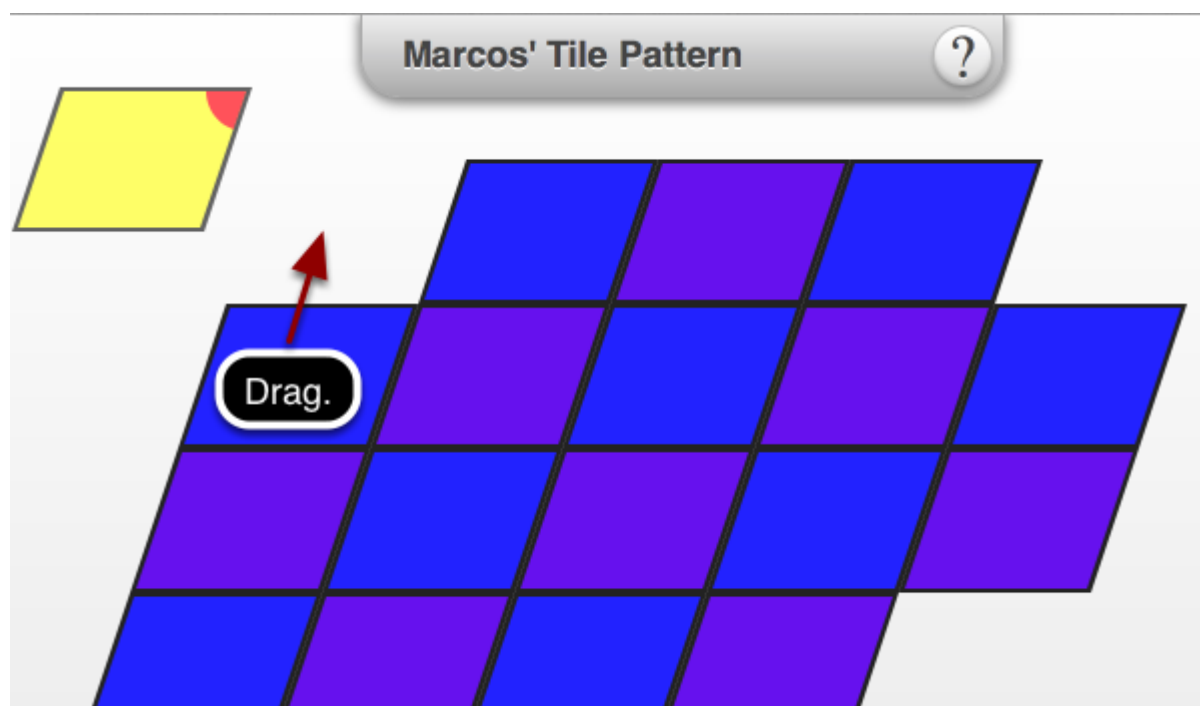
**Click the link below.**

[\*Marcos' Tile Pattern \(CPM\)\*](#)

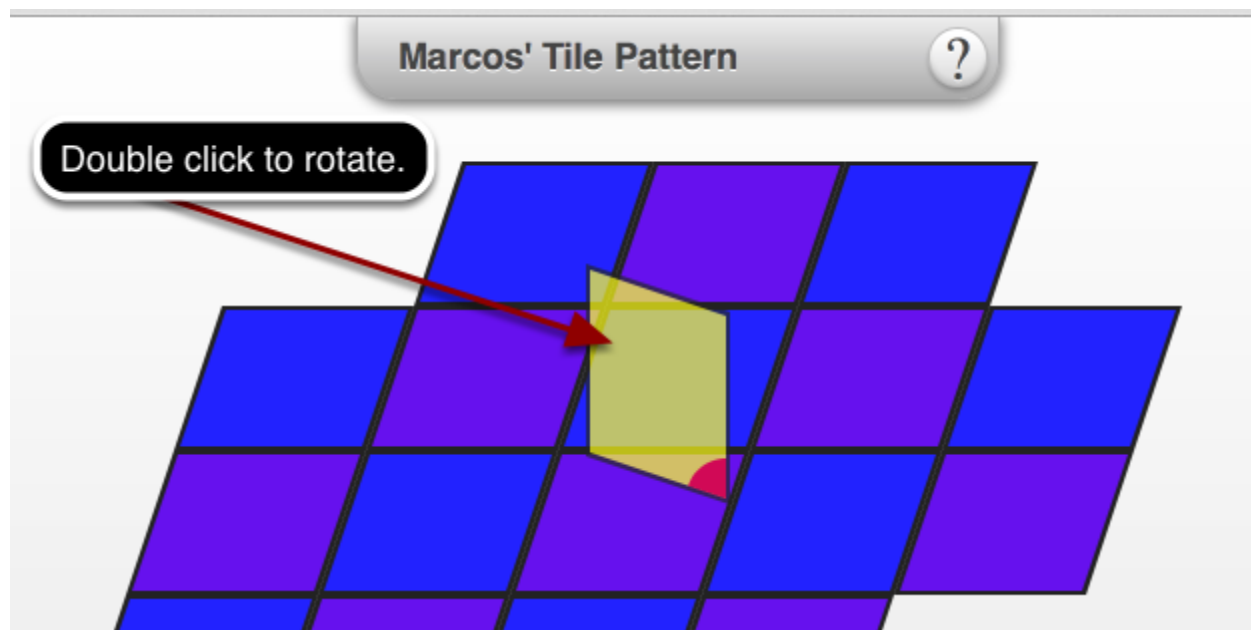
**1. This interactive eTool starts with the following parallelograms. Drag the blue tile to tessellate.**



**2. Drag until the entire space is covered.**




**3. Continue to double click to rotate at 90 degree intervals.**



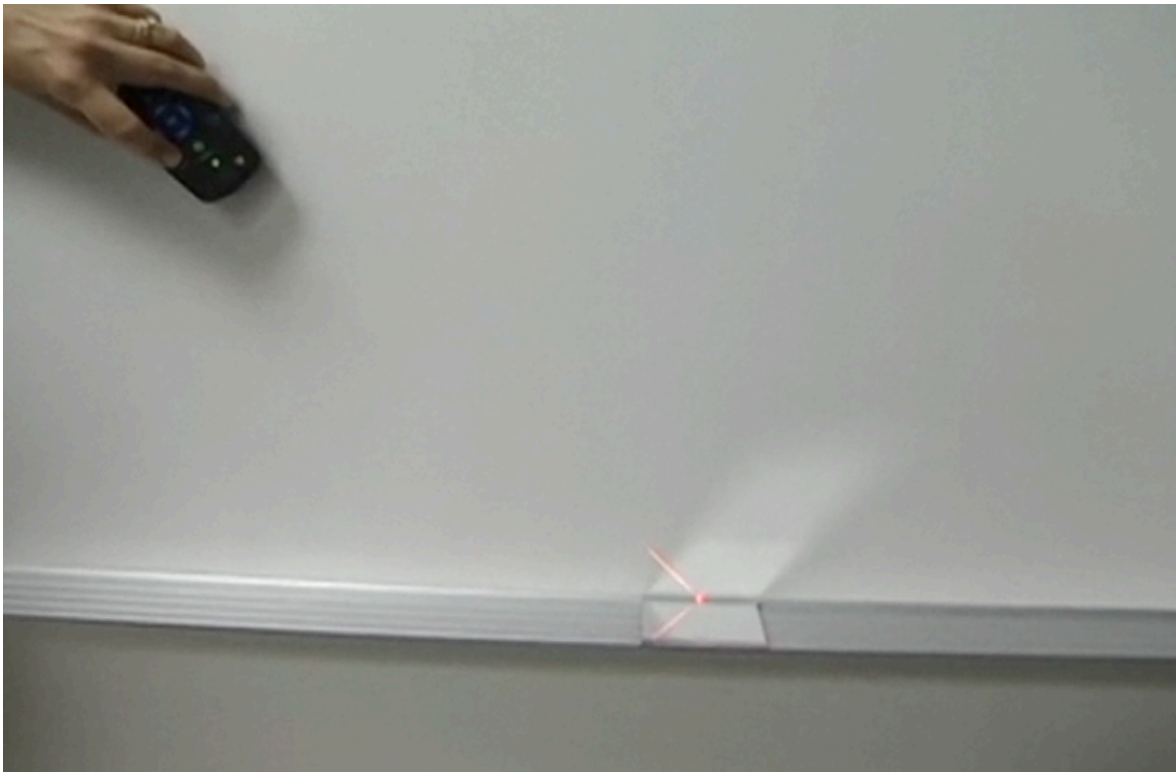


## GC 2.1.3: Reflection of Light Teacher Demonstration (Vimeo)

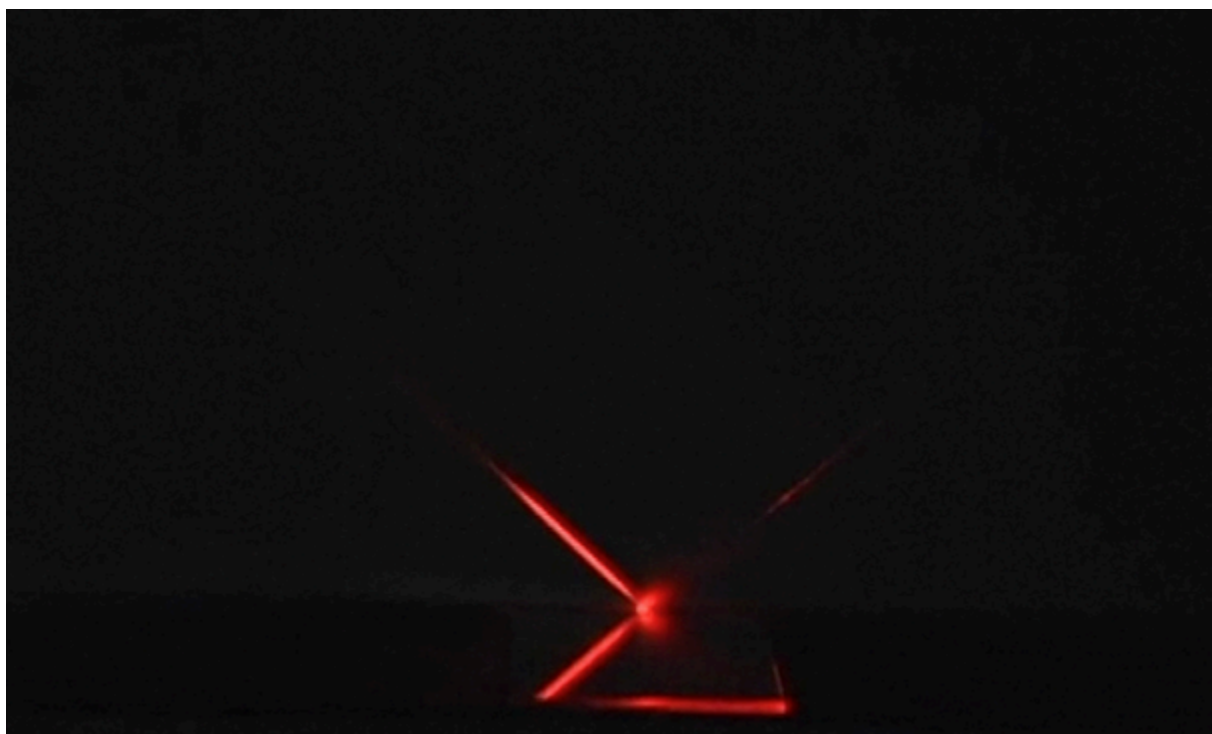
Click on the link below for the "Reflection of Light Demonstration".

[Reflection of Light Demonstration \(Vimeo\)](#) 

### 1. Reflect off a mirror.



## 2. Use chalk dust.



## GC 2.1.4: Triangle Sum Theorem (Desmos)

Click on the link below.

[Triangle Sum Theorem \(Desmos\)](#)

### 1. Triangle Sum Theorem:

Question: What is the sum of the angles of a triangle? Use this tool to investigate this question. Then prove your result.

Drag the angles to change them. Does the Sum ever change? Why?

► Show Parallel lines

$S_{um} = A + B + C$

$S_{um} = 180$

$\text{round}(A)$  = 83

$\text{round}(B)$  = 56

$\text{round}(C)$

**Triangle Sum Theorem**

## 2. How does "Show Parallel Lines" help when determining the sum of the interior angles of a triangle?

Question: What is the sum of the angles of a triangle? Use this tool to investigate this question. Then prove your result.

Drag the angles to change them. Does the Sum ever change? Why?

► Show Parallel lines

$S_{um} = A + B + C$

$S_{um} = 180$

round(A) = 77

round(B)

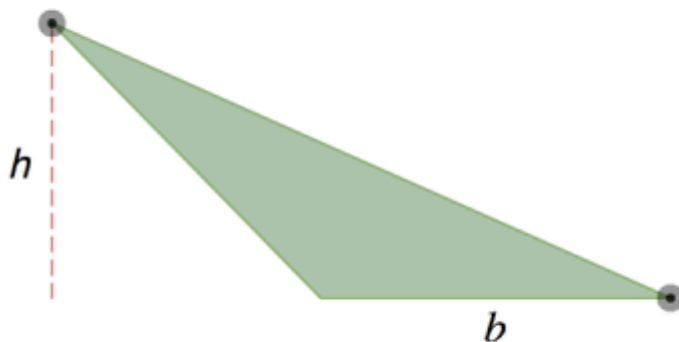
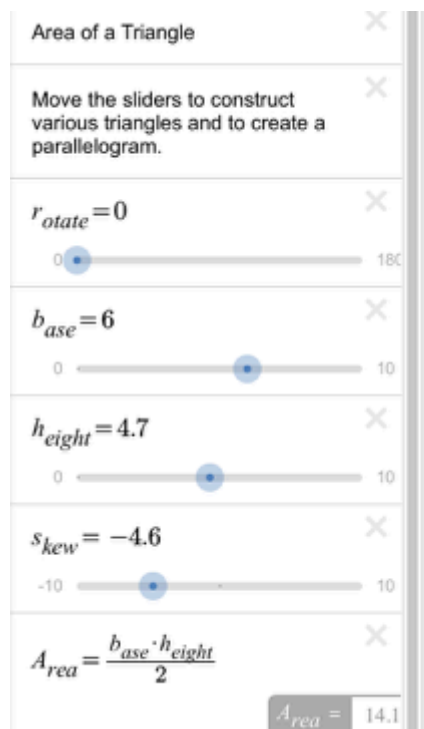
**Triangle Sum Theorem**

## GC 2.2.2: Area of a Triangle (Desmos)

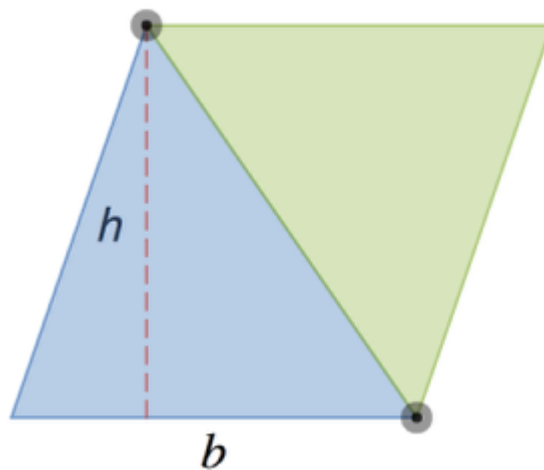
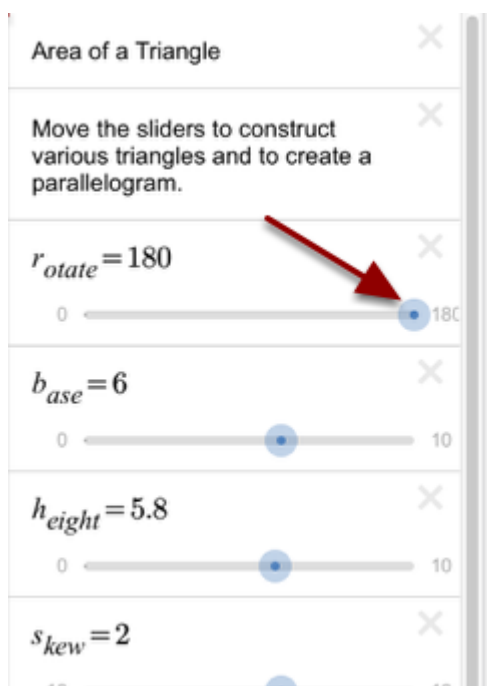
Click on the link.

[Area of a Triangle \(Desmos\)](#)

1. Move sliders to change the shape of the triangle.



## 2. Rotate a second copy of the triangle on itself to form a parallelogram.

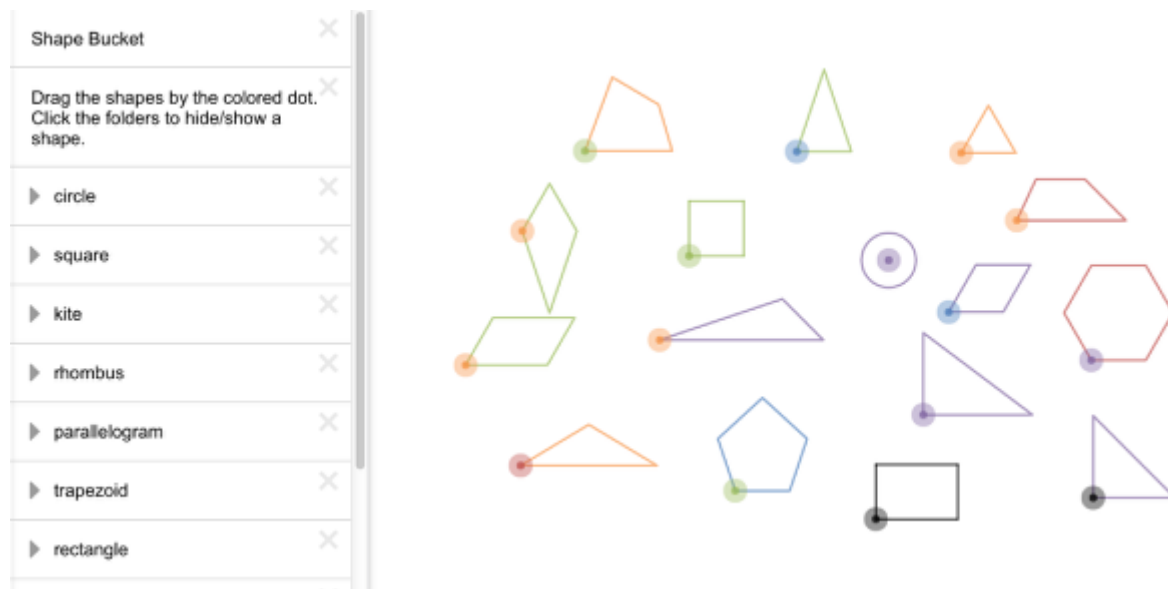


## GC 2.2.3: Shape Bucket (Desmos)

Click on the link below.

[Shape Bucket \(Desmos\)](#)

### 1. Shape Bucket:

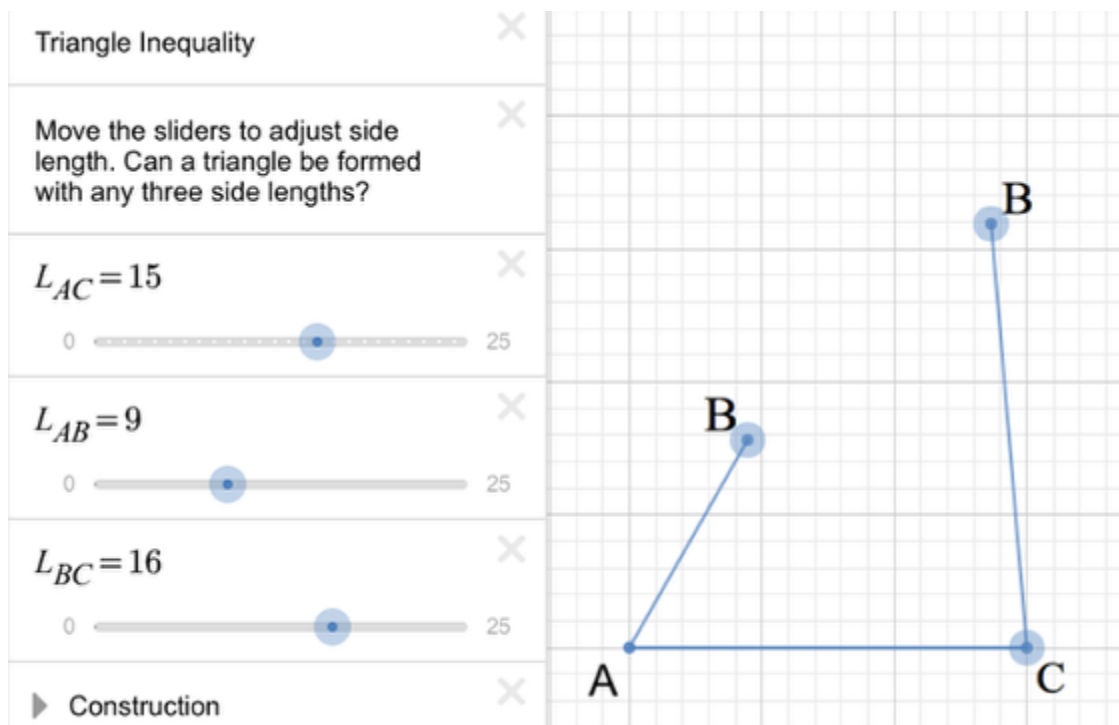


## GC 2.3.2: Triangle Inequality (Desmos)

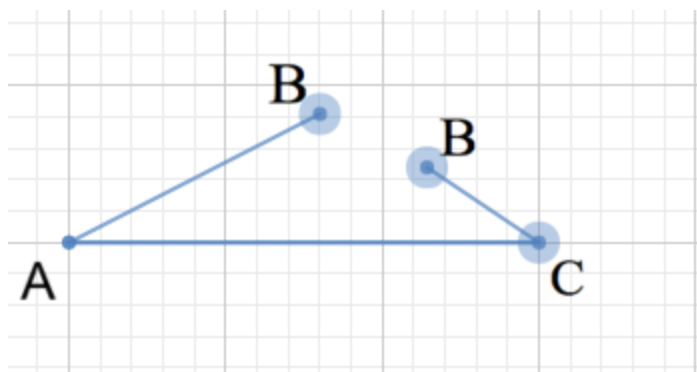
Click on the link below.

[Triangle Inequality \(Desmos\)](#)

1. Using the sliders, adjust the side lengths.



2. Drag the B handles until they form a vertex of a triangle if possible.



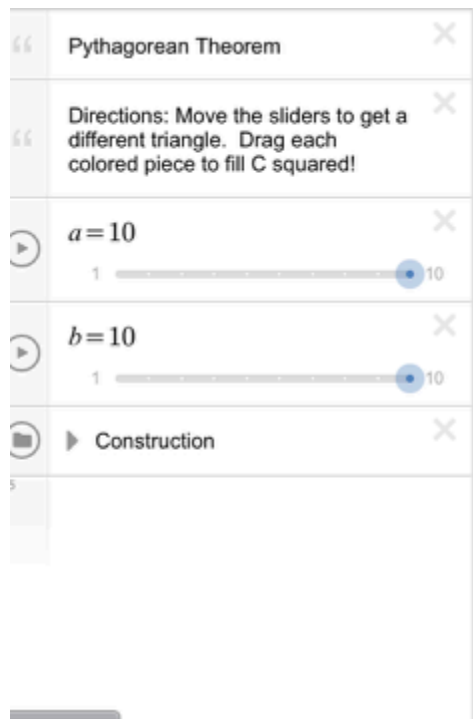


## GC 2.3.3: The Pythagorean Theorem (Desmos)

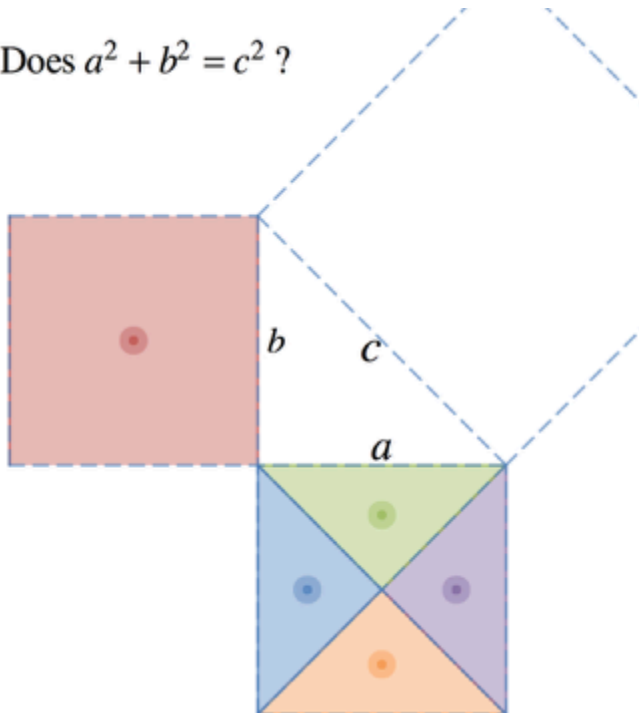
Click on the link below.

[The Pythagorean Theorem \(Desmos\)](#)

### 1. Pythagorean Theorem:

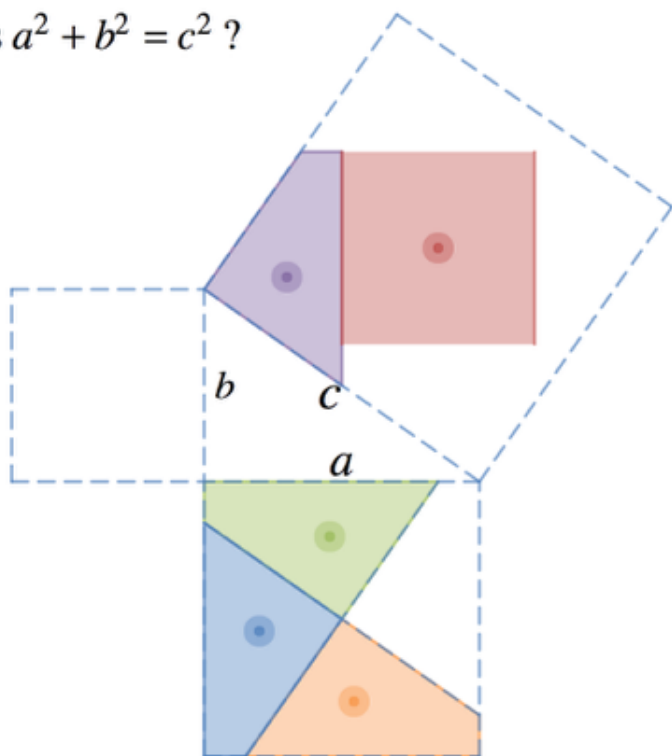


Does  $a^2 + b^2 = c^2$  ?



## 2. Drag the colored shapes to fill $c^2$ . Do they fit?

Does  $a^2 + b^2 = c^2$  ?





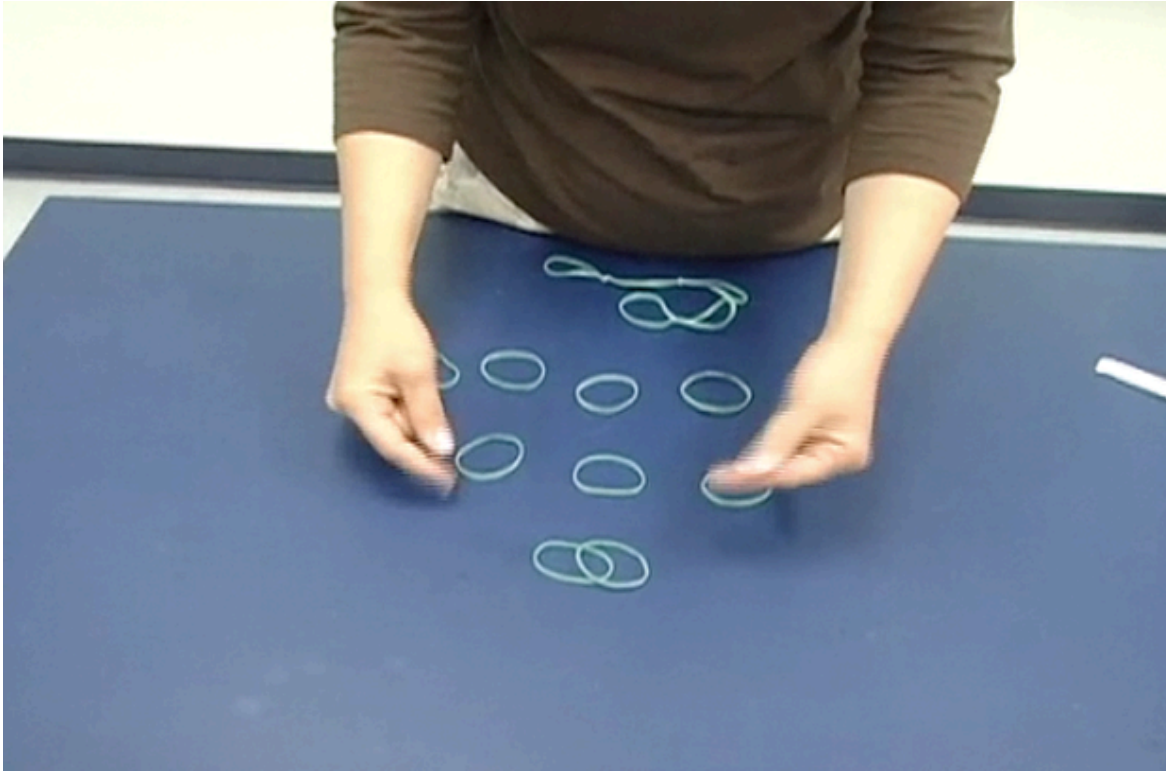
# Chapter 3

## GC 3.1.1: Pantograph Teacher Video (Vimeo)

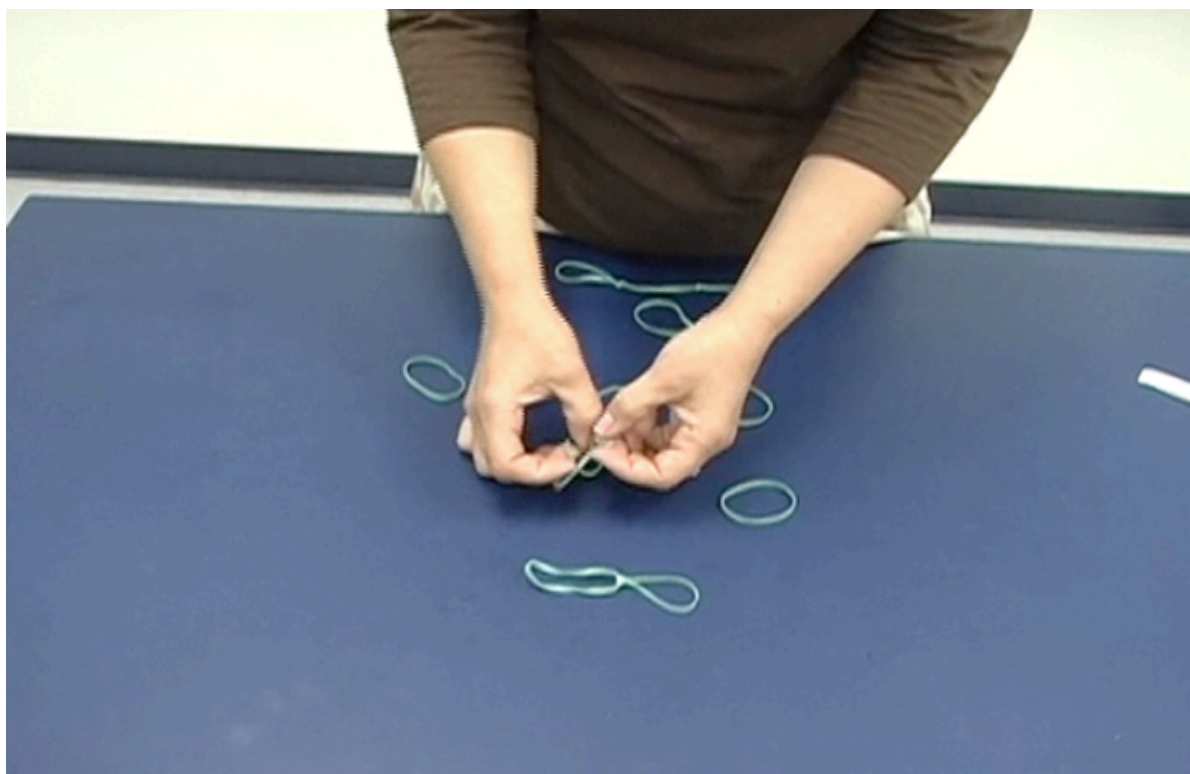
Click on the link below.

[Pantograph Teacher Video \(Vimeo\)](#) 

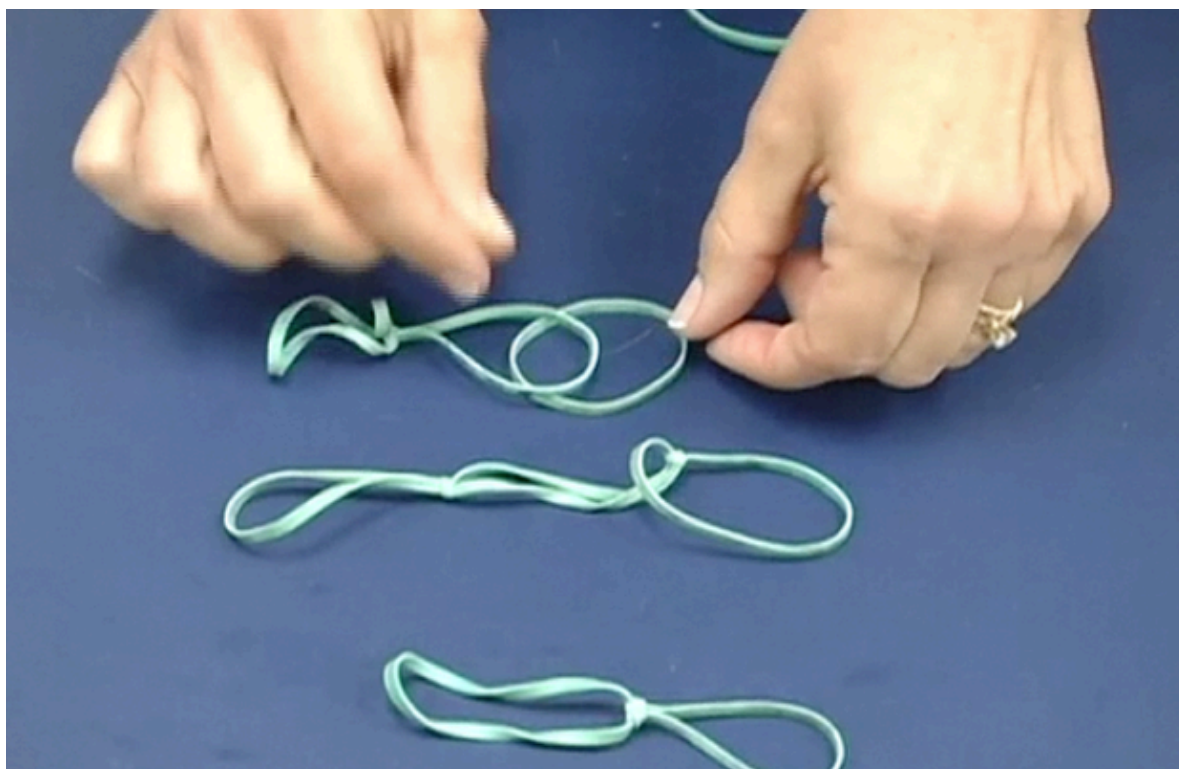
### 1. Prepare the rubber bands:



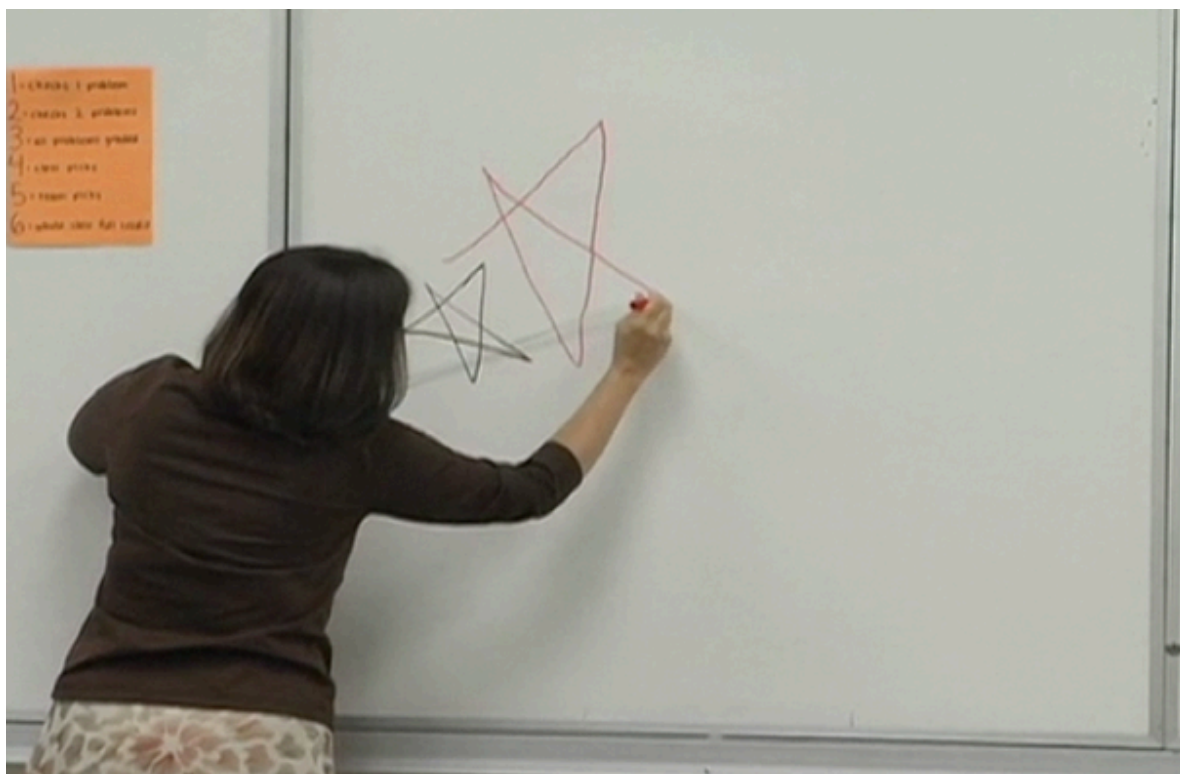
**2. Knot two rubber bands:**



**3. Several rubber bands strung together:**



#### 4. White board demonstration:



#### 5. Student demonstration:



## GC 3.1.2: Similarity Stretching Word Document

Click on the link below for the "Similarity Stretching Word Document".

[Similarity Stretching Word Document](#)

### 1. Original:

Lesson 3.2.1

#### STRETCHING EXERCISE



**Original**





## 2. Horizontal Stretch:

Lesson 3.2.1

### STRETCHING EXERCISE



**Original**



## 3. Vertical Stretch:

Lesson 3.2.1

### STRETCHING EXERCISE



**Original**





## GC 3.1.4: Mt. Rushmore Unveiling Teacher Video

Click on the link below for the "Mt. Rushmore Unveiling Video".

[Mt. Rushmore Unveiling](#) 



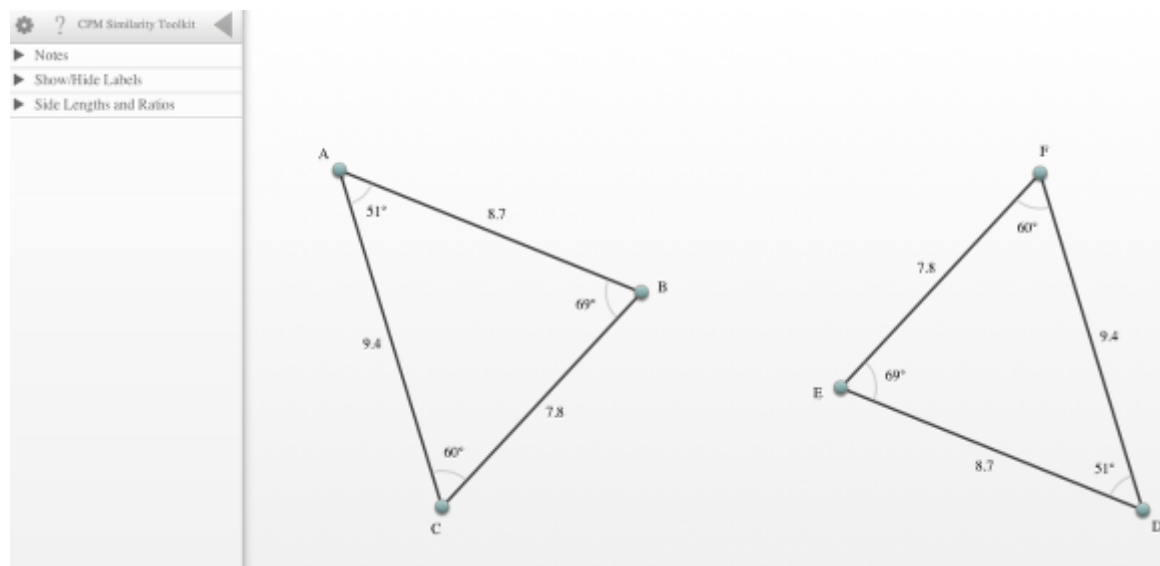
## GC 3.2.1: Similarity Toolkit and Video (CPM & Vimeo)

Click on the links below.

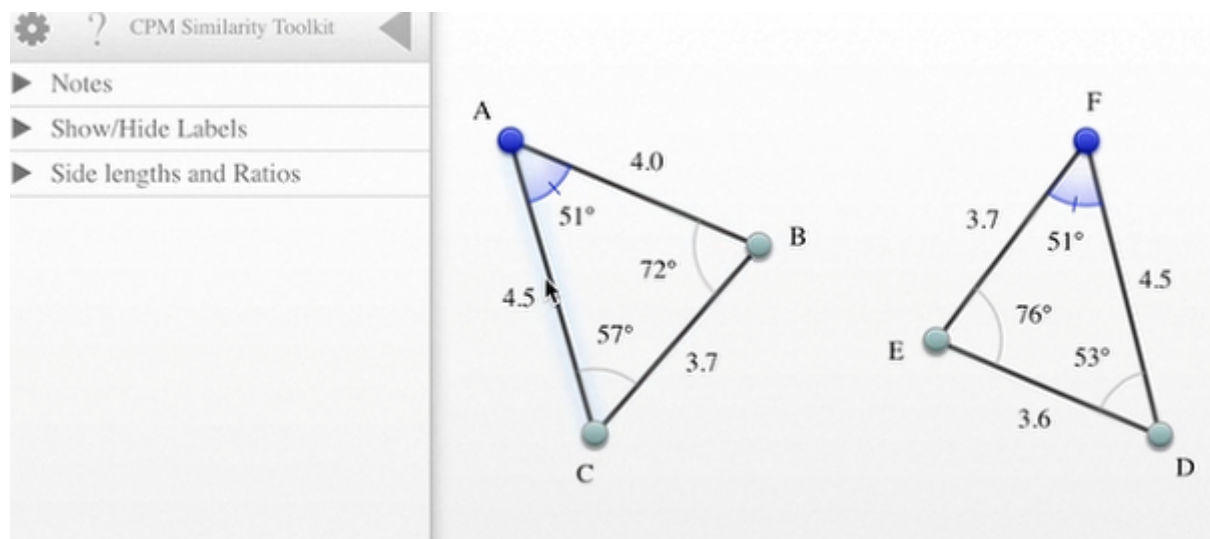
[Similarity Toolkit \(CPM\)](#)

[Similarity Toolkit Video \(Vimeo\)](#) 

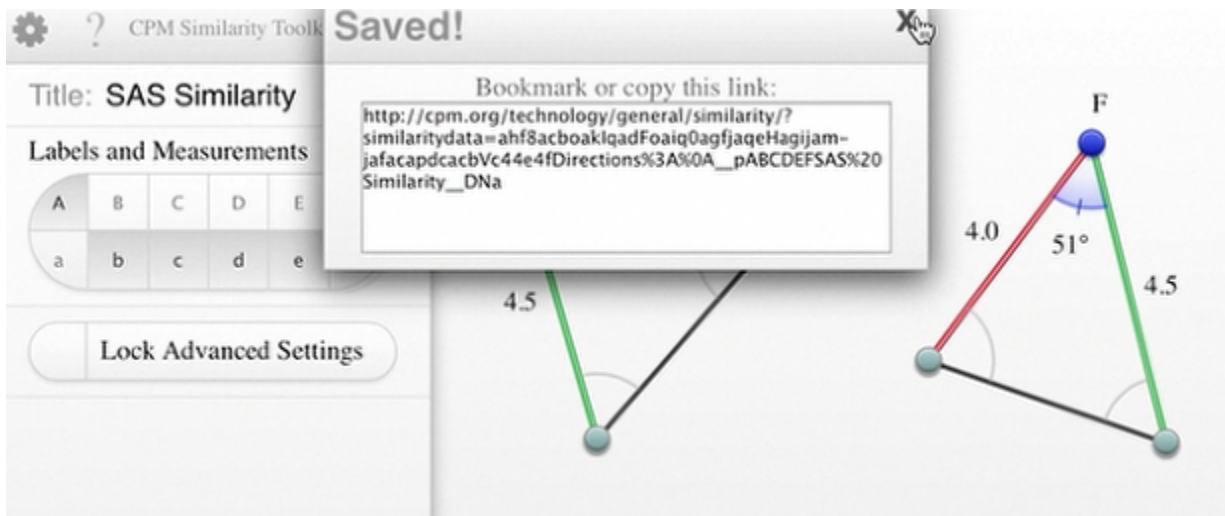
### 1. Go to "?" for HELP.



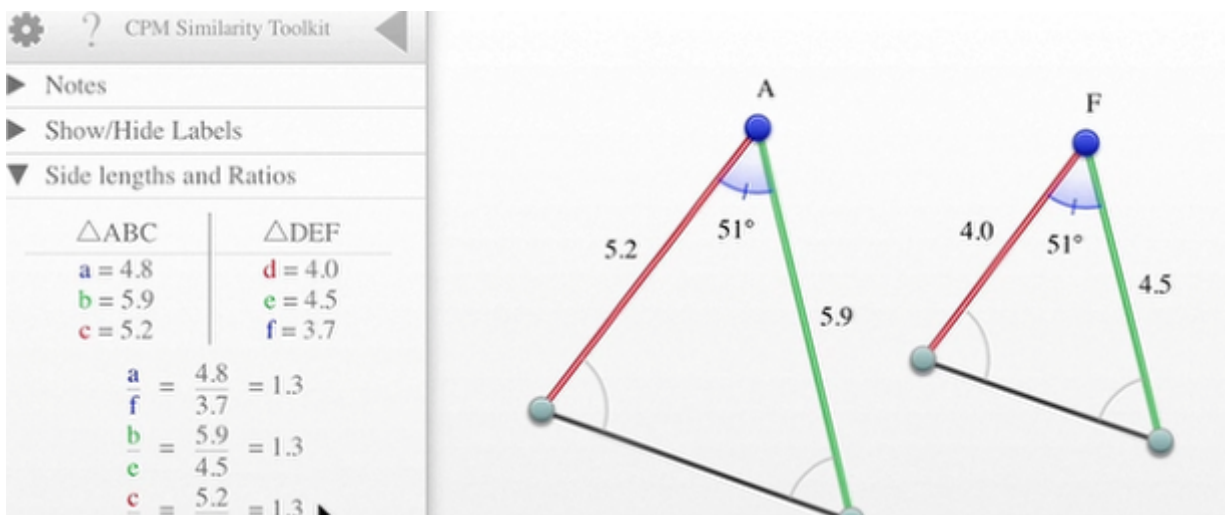
### 2. Link Two Angles:



### 3. Saved Link:




#### 4. Side Lengths and Ratios:



## GC 3.2.6: Squawk Like a Chicken Materials Setup Teacher Video (Vimeo)

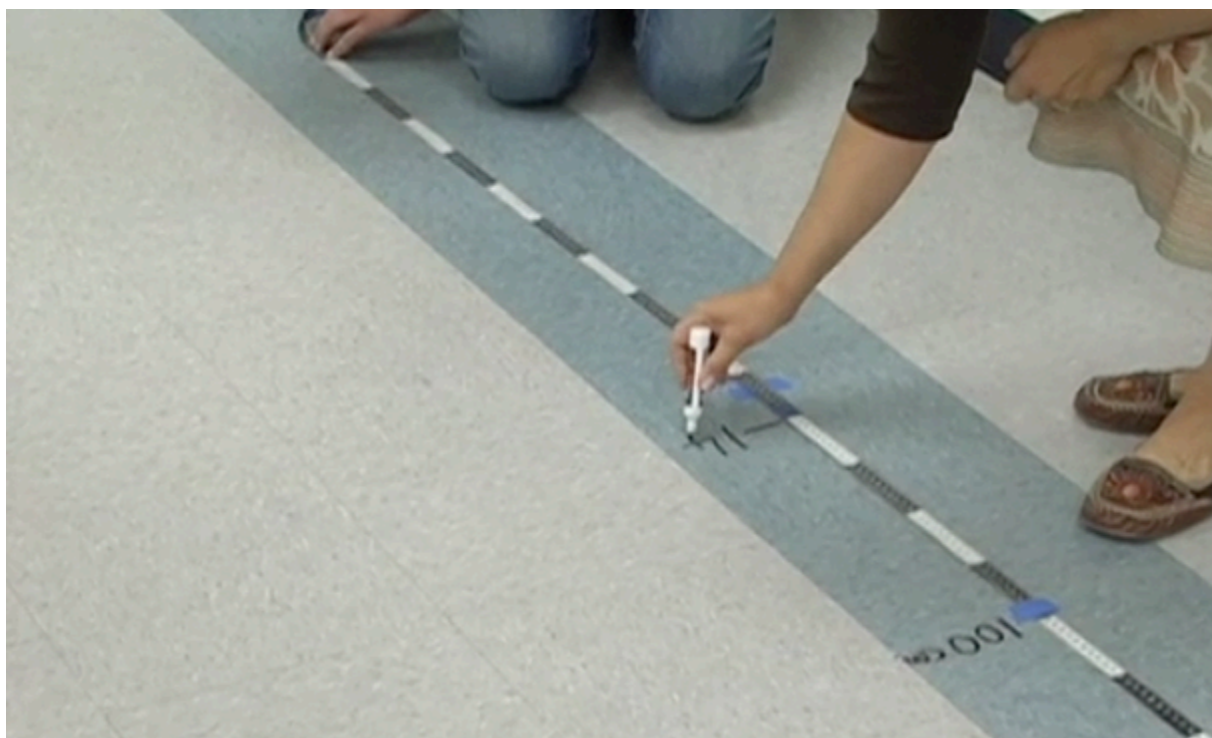
Click on the link below.

[Squawk Like a Chicken Materials Setup \(Vimeo\)](#) 

### 1. Students find their height.



## 2. Mark distances.



# Chapter 4

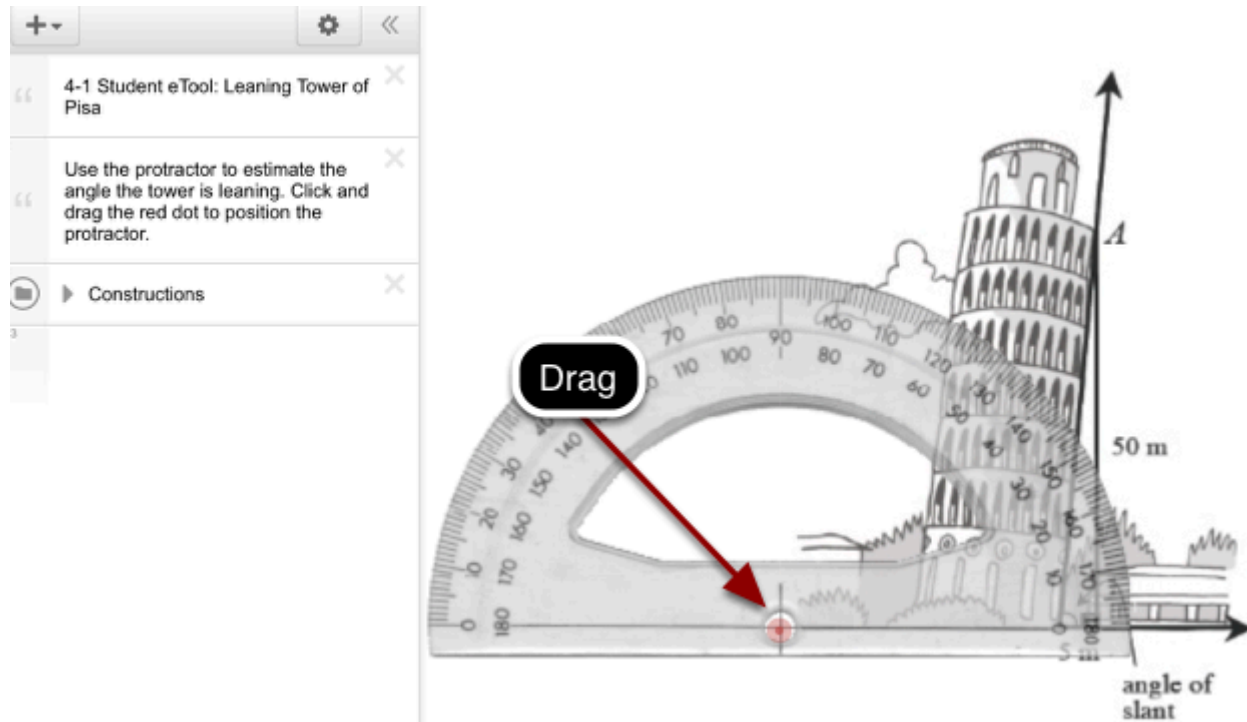
## GC 4.1.1: Leaning Tower of Pisa (Desmos) and Information Video

Click on the links below.

[4-1 Student eTool \(Desmos\)](#)

[Leaning Tower of Pisa Information Video](#)

1. Estimate the angle the tower is leaning using the protractor.



**2. This video shows the architecture of the Leaning Tower of Pisa.**





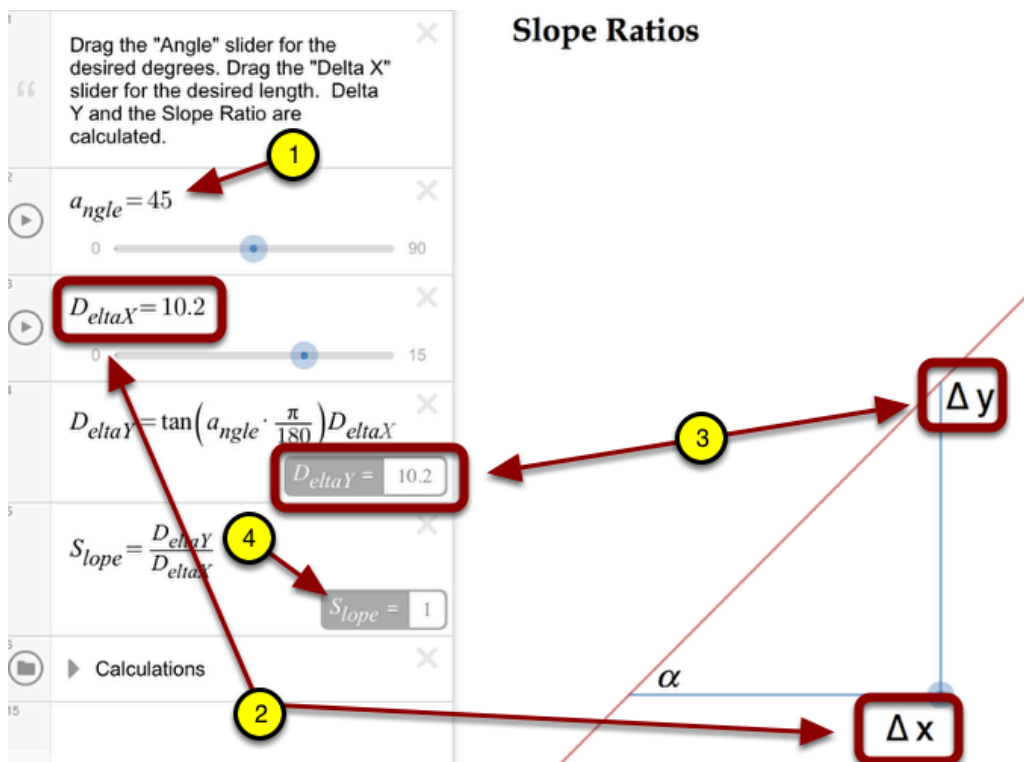
## GC 4.1.3: Slope Ratios (Desmos)

Click on the link below.

[Slope Ratios \(Desmos\)](#)


### 1. Use the sliders to to:

- Select an angle.
- Change the length of the adjacent side, delta x.
- The opposite side length, delta y, and the slope are calculated below.




## GC 4.1.5: Clinometer Teacher Videos (Vimeo)

Click on the link below for the "Clinometer"

[Clinometer Preparation \(Vimeo\)](#) 

[Clinometer Lesson \(Vimeo\)](#) 

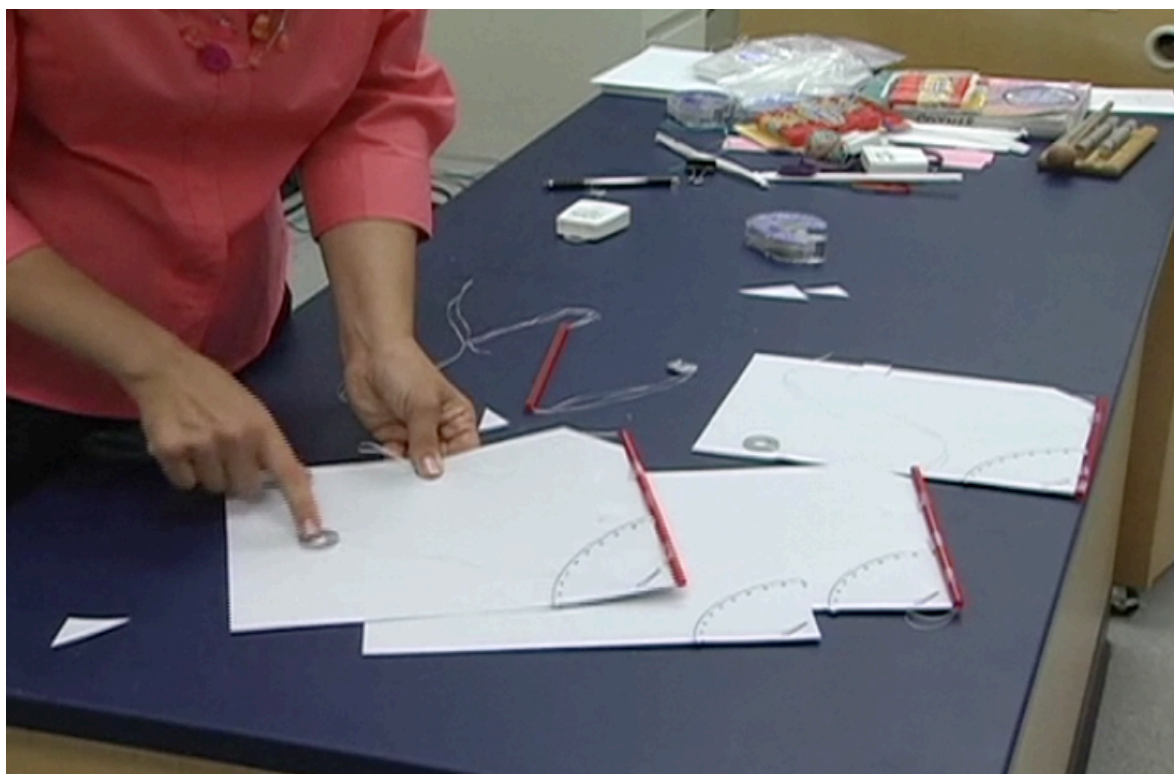
[Study Team Work \(Vimeo\)](#) 

[Closure Lesson \(Vimeo\)](#) 

1.



2.



3.



#### 4-42. HOW TALL IS IT?

How tall is Mount Everest? How tall is the White House? Often we want to know a measurement of something we cannot easily measure with a ruler or tape measure. Today you will work with your team to measure the height of something inside your classroom or on your school's campus in order to apply your new tangent tool.



4.



5.



6.



## GC 4.1.5: History of the Statue of Liberty (Teacher)

Click on the link below for the "History of the Statue of Liberty"

[History of the Statue of Liberty](#) 

1.



2.



3.



4.





## GC 4.2.2: 4-59, 4-60, & Roll and Win (CPM)




Click on the links below.

[GC 4-59 Student eTool \(CPM\)](#)

[GC 4-60 Student eTool \(CPM\)](#)

[GC Roll and Win \(Google Spreadsheet\)](#)

### 1. GC 4-59 Student eTool: Click the spinner to spin.



**CPM Probability**


**GC 4-59 Student eTool**


Luis is going to spin the spinner at right.

a. What are the possible results of his spin?

b. What do you predict Luis' result will be after one spin? Justify your prediction.

c. If Luis spun this spinner four times, what do you predict his results would be?  
A paperclip with one end extended can be spun around the center of a spinner to collect data, as shown at below. With your team, spin a paperclip four times about the spinner above and record the results. Did your experimental results match your prediction in part (c)? Why or why not?

e. What if the spinner is spun 40





## 2. GC 4-60 Student eTool: Click the spinner to spin.

**CPM Probability**


**GC 4-60 Student eTool**

You will spin two spinners to see how much money you will win. The first spinner has an equal chance of coming out \$100, \$300, or \$1500. The second spinner is equally divided between "Keep your winnings," and "Double your winnings."

a. Make a systematic list and tree diagram of all the possible outcomes.

b. What is the probability that you will take home \$200? What is the probability that you will take home more than \$500?

c. What is the probability that you will double your winnings? Does the probability that you will double your winnings depend on the result of the first spinner?



## 3. Roll and Win:

- Choose the tab.
- Type in the number of trials.

**Dice Roll Probability**

File Edit View Insert Format Data Tools Add-ons Help Last edit was yesterday at 7:17 AM

fx | Die1

	A	B	C	D	E	F	G	H	I
1	Die1	Die2	Sum		Sum	Frequency			
2	4	2	6		2	25			
3	3	3	6		3	61			
4	2	3	5		4	70			
5	5	1	6		5	107			
6	2	3	5		6	151			
7	3	1	4		7	183			
8	3	5	8		8	147			
9	5	5	10		9	89			
10	2	1	3		10	90			
11	1	6	7		11	50			
12	3	3	6		12	27			
13	4	2	6						
14	3	3	6						
15	1	2	3						
16	2	2							
17	4	4							
18	6	4							
19	1	2							
20	4	2							

Number of trials

1000

1

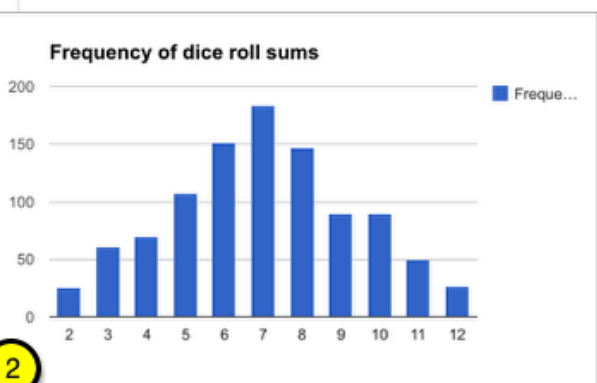
2

Directions:

1. You need a google account. Go to File --> Make a Copy...
2. Using your copy, edit the number of trials by modifying the number in the green box

Dice Roll Sums Dice Roll Products

**Frequency of dice roll sums**



## GC 4.2.4: 4-77 Student eTool (CPM)

Click on the link below.

[GC 4-77 Student eTool \(CPM\)](#)

**GC 4-77 Student eTool: Click on each spinner to spin!**

### GC 4-77 Student eTool

Your teacher challenges you to a spinner game.


You spin the two spinners with the probabilities listed below. The first letter comes from Spinner #1 and the second letter from Spinner #2.

If the letters can form a two-letter English word, you win. Otherwise, your teacher wins.


- Probability Tools
- General Tools

Click both spinners.

Spinner #1



Spinner #2





# Smart Board Chapter Files



## Smart Board Chapter Files

### Click on the links below.

These files end in .notebook and should go to your Downloads Folder. On occasion, certain browsers change the extension to something else such as .zip. Simply rename the file to end in .notebook in order to use the files correctly.

[GC: Chapter 1 - Part 1](#)

[GC: Chapter 1 - Part 2](#)

[GC: Chapter 2 - Part 1](#)

[GC: Chapter 2 - Part 2](#)

[GC: Chapter 3 - Part 1](#)

[GC: Chapter 3 - Part 2](#)

[GC: Chapter 4 - Part 1](#)

[GC: Chapter 4 - Part 2](#)

[GC: Chapter 5 - Part 1](#)

[GC: Chapter 5 - Part 2](#)

[GC: Chapter 6 - Part 1](#)

[GC: Chapter 6 - Part 2](#)

[GC: Chapter 7 - Part 1](#)

[GC: Chapter 7 - Part 2](#)

[GC: Chapter 8 - Part 1](#)

[GC: Chapter 8 - Part 2](#)

[GC: Chapter 9 - Part 1](#)

[GC: Chapter 9 - Part 2](#)

[GC: Chapter 10 - Part 1](#)

[GC: Chapter 10 - Part 2](#)

[GC: Chapter 11 - Part 1](#)

[GC: Chapter 11 - Part 2](#)

[GC: Chapter 12 - Part 1](#)

[GC: Chapter 12 - Part 2](#)