KCM

KENTUCKY CENTER FOR MATHEMATICS

# Let's Do Math with KCM
# High School Geometry

## Rich Mathematics Tasks

# Welcome!

Your host


## Leah Dix White

Regional Consultant

Kentucky Center for Mathematics

leah.dix@louisville.edu


KCM
KENTUCKY CENTER FOR MATHEMATICS

# Kentucky Center for Mathematics

- KCM seeks to advance the knowledge and practice of effective mathematics teaching and learning, encompassing early childhood through adult education.
- KCM provides and develops statewide leadership, facilitate professional learning experiences, and cultivate innovation with the aim of improving mathematics education, practice and policy.

## KCM Yearly Numbers

29 math courses taught

73 cohorts of teachers

Over 1000 KY teachers attending

Over 182 days of math professional learning

Over $150,000 of math materials directly in the hands of teachers

109 school districts

300 KY schools

100 principals trained

>5000 students impacted

KCM Annual Math Conference national prominence

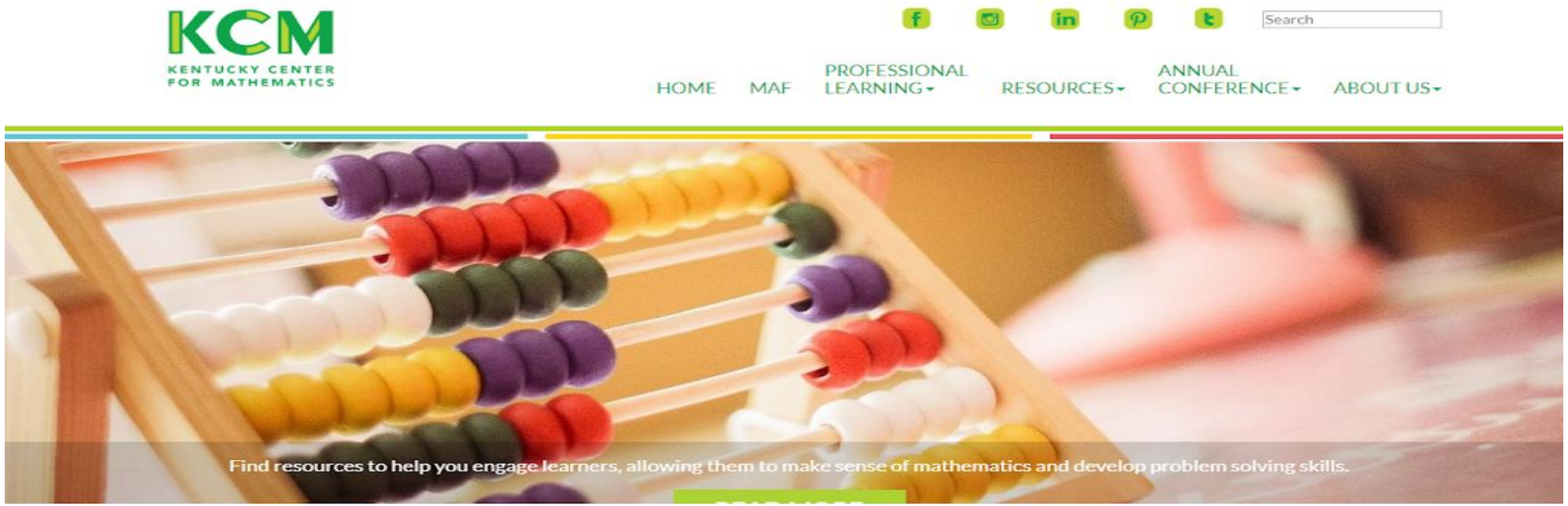
Closing the achievement gap for our KY math students.

Math Achievement Fund intervention students (3000) had an average of 10 percentile points gained as a direct result of KCM trained math interventionists.

KCM
KENTUCKY CENTER FOR MATHEMATICS

# Visit Our Website

www.kentuckymathematics.org




KCM
KENTUCKY CENTER FOR MATHEMATICS

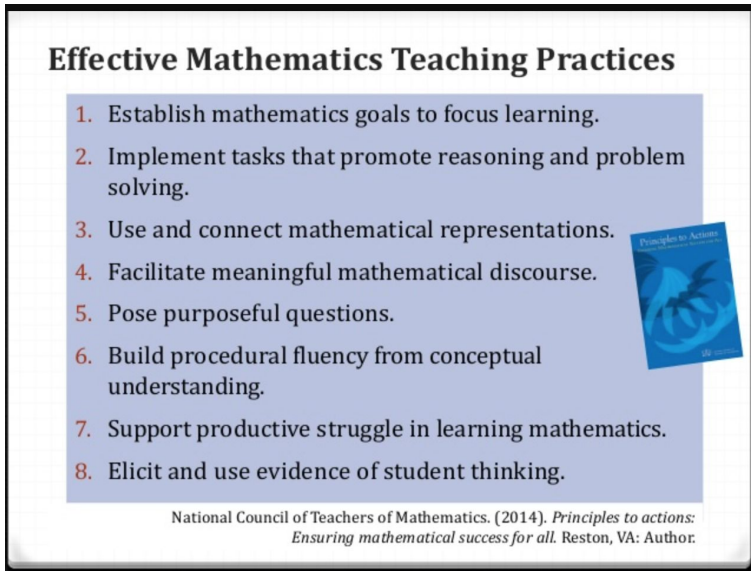
# Today's Session

- Research
- Standard
- Let's Do the Math: Similar Triangles & Circles

  Visual Proof in Geogebra
- Virtual Manipulatives
- Upcoming Sessions

KCM
KENTUCKY CENTER FOR MATHEMATICS

# Research




Basing the concept of similarity on dilations instead of taking the axiomatic approach allows students to construct *visual knowledge* and *operations* to discover and fully comprehend properties of dilations"

Battista, M. T., & Clements, D. H. (1995). Geometry and proof. *Mathematics Teacher*, *88*(1), 48-54.

KCM
KENTUCKY CENTER FOR MATHEMATICS

# Standards

KY.HS.G.15 Verify using dilations that all circles are similar. MP.5, MP.8

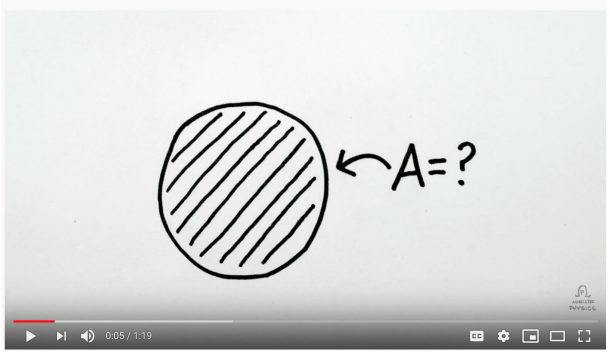
KY.HS.G.9 Understand properties of dilations.

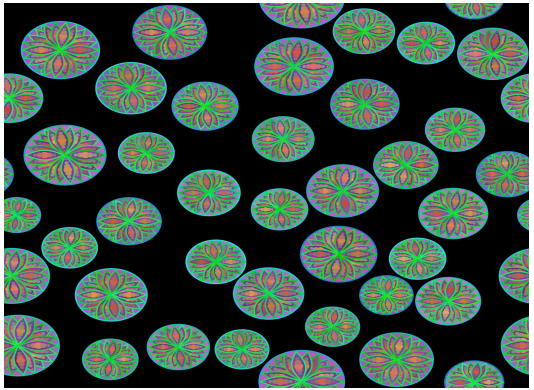
a. Verify the properties that result from that dilations given by a center and a scale factor.

b. Verify that a dilation produces an image that is similar to the pre-image. MP.5, MP.7

KCM
KENTUCKY CENTER FOR MATHEMATICS

# Visual Proofs



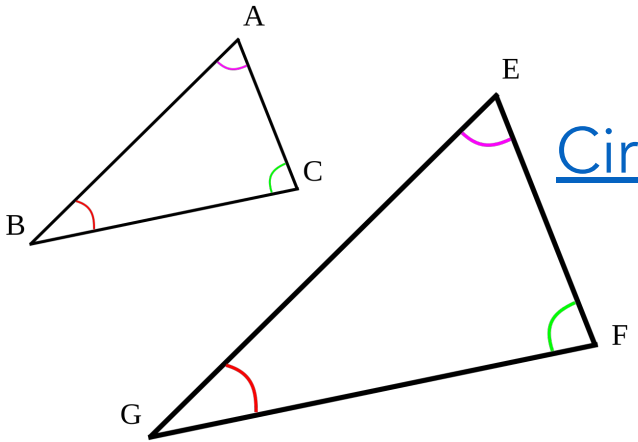



KCM
KENTUCKY CENTER FOR MATHEMATICS

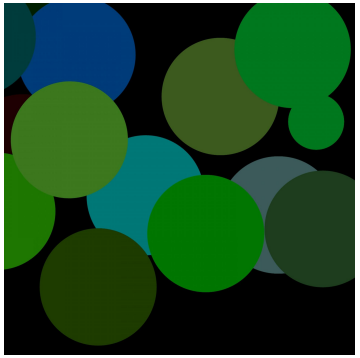
# Let's Do the Math...

Verify in Geogebra pairs of similar triangles and circles.

Triangles




Circles



When would students need to look for and or notice repeated reasoning?

KCM
KENTUCKY CENTER FOR MATHEMATICS

# Task: Dynamic Similar Circles Proof

Similar Circles Applet


For any pair of circles you can translate one circle, apply the scale factor, then dilate to superimpose that circle onto the other.

KCM
KENTUCKY CENTER FOR MATHEMATICS

# What repeated reasoning in similarity did you notice from these visual proofs?

Triangles have proportional corresponding side lengths.

Circles have proportional corresponding radii, circumferences, and diameters.

Solids have proportional corresponding heights and radii.

A dilation is a single or sequence of similar transformations that map one figure onto the other.

KCM
KENTUCKY CENTER FOR MATHEMATICS

# Extensions

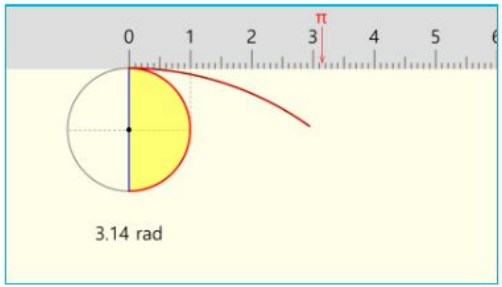
## Are all cylinders with the same of height similar?

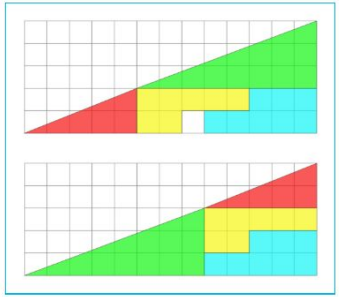
## Why or why not?

# Need more mathematics?

NCTM NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

Middle and High School Resources

[JavaLab Mathematics Simulations]

KCM KENTUCKY CENTER FOR MATHEMATICS

# Virtual Manipulatives

[Geogebra](#)

[Phet Interactive Simulations](#)

[Desmos](#)

[Didax Math Virtual Manipulatives](#)




KCM
KENTUCKY CENTER FOR MATHEMATICS

# KCM Support for Educators

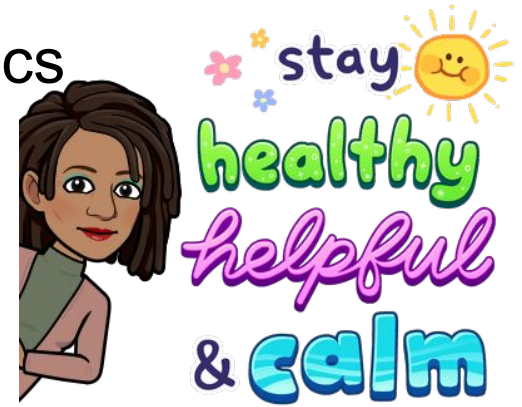
Your host


## Leah Dix White

Regional Consultant

Kentucky Center for Mathematics

leah.dix@louisville.edu


KCM
KENTUCKY CENTER FOR MATHEMATICS

# Upcoming Professional Learning

KCM
KENTUCKY CENTER FOR MATHEMATICS

Search

HOME MAF PROFESSIONAL LEARNING RESOURCES ANNUAL CONFERENCE ABOUT US

**Apr 2**
1:00-1:30 p.m. EDT

**Geometry - Similarity with Geogebra**
**Facilitated by:** Leah Dix
**Downloads:** TBD
Join Live Session

**Apr 9**
1:00-1:30 p.m. EDT

**Algebra 2 - Function Simulations with Colorado Phet**
**Facilitated by:** Leah Dix
**Downloads:** TBD
Join Live Session

**Apr 16**
1:00-1:30 p.m. EDT

**TBD**
**Facilitated by:** Leah Dix
**Downloads:** TBD


KCM
KENTUCKY CENTER FOR MATHEMATICS