FREEZE FRAME:
Snapshots of Mathematical Meaning in Everyday Life

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1. Polygon Picassos
- This lesson was intended to provide an introduction to the sum of the interior angles of polygons conjecture.

2. Where on Earth?
- This lesson was used to assess student understanding of special triangle centers in our unit on constructions in Geometry.

3. Angry Birds: "Hit Me With Your Best Shot!"
- This lesson was used to review different forms of quadratic equations: vertex, factored and general, in Algebra II.

4. Modeling Functions in Context
- Depending on the concepts being covered, there are many digital pictures that can be used as a backdrop for modeling functions in a variety of classes.

5. Geometric Art
- There are many places (such as Google Images) where digital pictures of works of art can be uploaded and used for many different applications in a math class.

6. Flying Fish
- Several frames of a video are captured and viewed in progression to simulate fluid movement. At each instant, a point can be plotted to trace the path of the object.

7. The Slow Mo Guys (YouTube)
- Short videos of common events unfolding in super slow-motion; great to spark interest and/or to model behaviors of functions.

All of the activities demonstrated can be downloaded from the NCTM conferences website.
Contact me at lorie.mcfee@bcsemail.org if you would like more information.

Polygon Picassos

- Select one digital picture from the Polygon Pics folder in J:/Student Share/McFee/Geometry/Chapter 5. Copy it using Ctrl-C or right-click Copy.

- Open Geometer's Sketchpad and paste the picture using right-click Paste Picture or Edit/Paste Picture.

- Use segments to outline various polygons. Be sure to include <u>at least one</u> of the following:

Polygon	Interior Angle sum	Color	Convex/Concave?
quadrilateral			
pentagon			
hexagon			
octagon			
nonagon			
___ -gon			

- Construct the interiors of each polygon and use different colors to emphasize the difference.

- Copy and paste one representative polygon to each of the pre-labeled, tabbed pages.

- Measure all of the interior angles of each of the polygons selected in steps 1 – 6. Use the calculator in the Measure menu to find the sum of the interior angles.

- Do your results verify your initial conjecture on the angle sums? Why or why not?
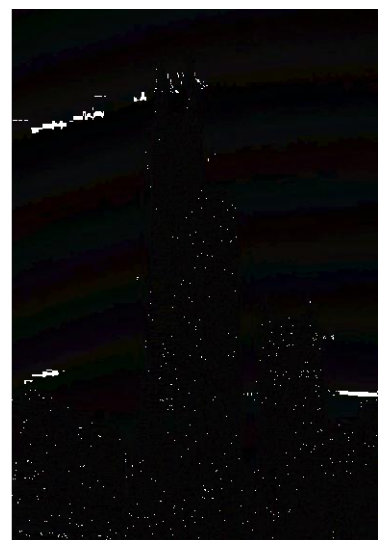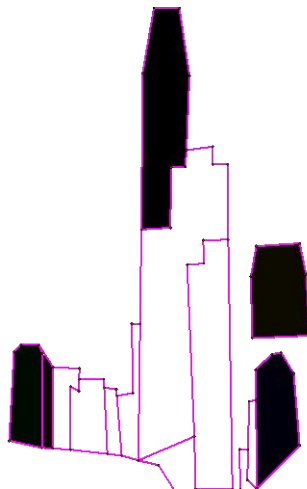
In order to make Second Chance Breakfast more convenient for students, your task is to identify the ideal location on campus to make it equally accessible to all students.

Your decision should be: mathematically based, logical and feasible.

- Work with your group to decide on three specific points to represent areas of the school. Describe the reasoning behind your selections.

- Use your preferred method of construction to identify the ideal location and give reasons supporting your answer. Make sure that an outside observer will be able to follow your logic.

- List any advantages/disadvantages to your final location.

Your group will present their findings to a Mr. Evans on Friday [think Donald Trump's role on The Apprentice]. Be prepared to answer follow-up questions. Mr. Evans will judge which group has the best overall plan.

Each student is responsible for submitting in writing their own mathematical argument in support of the proposed location.

greenhouse

vocational

office

cafeteria

theater

band

chorus

gym

North Buncombe High School

media

english

ROTC

social studies

computer labs

business

science

math

math

Google e

Imagery Date: 10/20/2010 · 35°44'21.78"N 82°33'26.4"W · elev 2213 ft · Eye alt 3

Hit Me with your Best Shot!

- Using the game of Angry Birds, take an initial screenshot of one level by selecting CTRL:PrintScreen. Make sure to capture the slingshot and the target in the screenshot.

- Open Geometer's Sketchpad and paste the screenshot using a right-click command.

- On the Graph menu, choose "Define Coordinate System". Move the coordinate system so that the origin is placed as the base of the slingshot.

- Create three new parameters by using the "New Parameter" command from the Graph menu. Label the parameters a, h, and k.

- From the Graph menu, select "Plot New Function". Enter the generic vertex form of a quadratic, $a(x-h)^2 + k$, by clicking on the parameters to insert them in the function.

- Double-click on the parameter boxes to change the parameters in order to find the best fit for the function.

  VERTEX FORM: _____

- Once you have determined the best fit quadratic function, plot the vertex and the roots on the graph by using "Plot Points" from the Graph menu.
  VERTEX _____ ROOTS _____

- Convert the vertex form to general and factored forms. Verify the equations by using "Plot New Function" from the Graph menu.

  GENERAL FORM: _____

  FACTORED FORM:_____

- Go back to the game and use your work with the quadratic function to guide your next shot. Were you successful? _____

Part II:

- Take a screenshot from a different level. Develop three mathematically-based questions to ask about the scene.

Q1:

Q2:

Q3:

- Answer the questions for yourself and then trade places with a partner. Identify your partner and record your answers to their questions in the space below.

Part III:

- Using the given screenshot, find the three different quadratic functions that would model the path directly from the slingshot to the projected landing places of each path.