TI-Nspire - Geometry: Circles - Angles and Arcs

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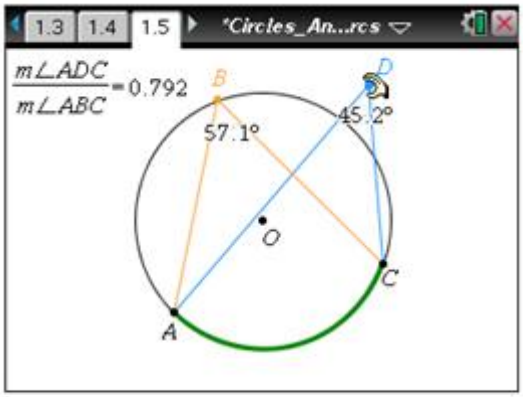

This lesson involves manipulating endpoints of an arc, manipulating an inscribed angle, and manipulating the vertex of an angle intercepting an arc. As a result students will:

- Use visualization to understand the definitions of central angle, intercepted arc, and minor and major arcs.
- Infer that the sum of the measures of minor and major arcs is 360°, that two inscribed angles intercepting the same arc have the same measure, and that the inscribed angle has half the measure of the central angle that intercepts the same arc.
- Deduce that the opposite angles of a quadrilateral inscribed in a circle are supplementary. *(taken from TI website)*

Grade Level: Grades 9-12
PSSM Content Standard: Geometry
CCSSM Content Standard: Geometry
Math Content: Central angle, Inscribed angle, Major arc, Minor arc, and Intercepted arc

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Evaluation

What is being learned? What mathematics is the focus of the activity/technology? Is relational or instrumental understanding emphasized?

- Students will know the definitions of and identify central angles, major and minor arcs, intercepted arcs, and inscribed angles of a circle.

- Students will determine and apply the following relationships: · Two inscribed angles intercepting the same arc have the same measure. · An inscribed angle measure of 90° results in the endpoints of the intercepted arc lying on a diameter. · The measure of an angle inscribed in a circle is half the measure of the central angle that intercepts the same arc.

- Students will construct viable arguments and critique the reasoning of others (CCSS Mathematical Practice).

- Students will look for and express regularity in repeated reasoning (CCSS Mathematical Practice). (*all taken from TI Website)*

A relational understanding is being emphasized.

How does learning take place? What are the underlying assumptions (explicit or implicit) about the nature of learning?

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Explicit learning is taking place. Students are not being told about relationships they are able to manipulate the angles to make discoveries.

What role does technology play? What advantages or disadvantages does the technology hold for this role? What unique contribution does the technology make in facilitating learning?

Technology allows the students to see the angles' sizes change right in front of their eyes. I do a similar activity where students are drawing, but they can't see multiple ways of

representing different facts about circles. For example my students highlight a major arc in one color and the minor arc in another color. Their notes then show one major arc and one minor arc. If they look at their neighbors arcs, they see two major and two minor. Using this technology they can see hundreds of major and hundreds of minor arcs in a matter of seconds.

How does it fit within existing school curriculum? (e.g., is it intended to supplement or supplant existing curriculum? Is it intended to enhance the learning of something already central to the curriculum or some new set of understandings or competencies?)

I would use this to enhance my existing curriculum. The applet highlights and brings to life 5 geometry concepts that I already teach. I will be able to use it next year in place of my notes that I used this year.

How does the technology fit or interact with the social context of learning? (e.g., Are computers used by individuals or groups? Does the technology/activity support collaboration or individual work? What sorts of interaction does the technology facilitate or hinder?)

I need to get the i-pads with the TI-Nspire app. The applet supports individual work, it would be best for each student to have their own calculator or i-pad to work with. After students make discoveries on their own, they can then discuss with a partner their results.

How are important differences among learners taken into account?

The applet itself gives more students an easier chance to understand the content. However, within the technology itself there are not modifications.

What do teachers and learners need to know? What demands are placed on teachers and other "users"? What knowledge is needed? What knowledge supports does the innovation provide (e.g., skills in using particular kinds of technology)?

The only thing that teachers and learners need to know how to do is grab and drag a point. From there all of the information is displayed on the screen and students can then start making discoveries. Students will learn more about math using this then any particular kinds of new technology.