| Year | Development | Grade | Overview |
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| 2005 | **A Balancing Act II** | **Grades 9-12, Geometry, Honors Geometry** | In this lesson students will learn the definition of "median" and will investigate the characteristic of the centroid as the center of gravity. It is assumed that students can name and classify triangles by sides and angles, and will know basic terms, such as vertices and midpoint. The lesson will culminate with students constructing a mobile using the properties of the centroid. |
| 2005 | **Understanding Models of Exponential Growth and Decay** | **Advanced Algebra I, Algebra II** | This unit provides students with a conceptual introduction to the exponential function that can preface the traditional treatment that focuses on fluency of algebraic manipulation and translations of the graph. The Lessons contain a sequenced series of questions that, step by step, lead students to construct a conceptual mastery of the exponential function. Specific emphasis is placed upon the defining characteristic of the function. Exponentials model situations where a measured quantity changes by a certain percentage each unit interval. This concept is also constructed in terms of a common ratio. Students get to discover exponential relationships by using numerical methods, through physical data taking, and by interpreting graphs.<br><br>Students will work in cooperative groups of 3-5 with the teacher monitoring each group's progress. The teacher plays the role of a guide or facilitator by asking questions or proposing avenues of exploration to the groups as needed. The Teacher's Reference sheets not only include sample answers, but also key concepts that should be emphasized at that moment. These concepts reappear throughout the series and students should be reminded of the connections. The sheets also address some common student errors and misconceptions. Bold-faced words may be new vocabulary for some students.<br>The Follow-up Explorations provide additional concept development by exposure to further applications and by analyzing the exponential function in contrast to the |
| 2005 | **Searching For The Center** | **Created as a linking/ remembering device** | This is a three-lesson unit that discovers and applies points of concurrency of a triangle. The lessons are labs used to introduce the topics of incenter, circumcenter, centroid, circumscribed circles, and inscribed circles. The lesson is intended to provide practice and verification that the incenter must be constructed in order to find a point equidistant from the sides of any triangle, a circumcenter must be constructed in order to find a point equidistant from the vertices of a triangle, and a centroid must be constructed in order to distribute mass evenly. The labs provide a way to link this knowledge so that the students will be able to recall this information a month from now, 3 months from now, and so on. An application is included in each of the three labs in order to demonstrate why, in a real life situation, a person would want to create an incenter, a circumcenter and a centroid. |

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| **2005** | **Staggered Starts - An Application of Arc Length** | **Lessons 1 and 2: Geometry and above,**<br><br>**Lesson 3: Algebra 2 and above** | This is a series of three lessons. In the first lesson, students will be given track designs with varying dimensions and asked to determine starting positions for each lane using their knowledge of arc measure, circumference, arc length and the measurement of a central angle. They will be asked to write a brief report explaining their calculations. The second lesson builds on the concepts of lesson 1 and includes using both radian and degree measure. Using these ideas, students will design a track using their own dimensions, again determining the starting positions for each lane. The third lesson involves extending the concepts to elliptical shaped tracks and reviews the definition and properties of ellipses.<br><br>Lesson 3 should only be taught after a unit on conic sessions including ellipses has been taught. |