

Unit: Coordinates and Transformations

The unit focuses on coordinate methods in geometry. It connects concepts in algebra to geometry. The representations of shapes and transformations in a plane are explored systematically using coordinates.

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| Evaluation | <p>Reasoning with slopes: What shape is it?</p> <ul style="list-style-type: none"> Students predict the shape, then provide mathematical proof using the shapes mathematical properties <p>Representing and Reasoning with Circles</p> <ul style="list-style-type: none"> Students use the Pythagorean theorem to develop the equation for any circle on the coordinate plane <p>Walk and Turn: Composition of transformations</p> <ul style="list-style-type: none"> Students combine transformations, investigate the individual properties of the transformations and compare and contrast to the composite transformations. Students create multiple representations for each composition | <p>Animate This!</p> <p>This is a student project in which they create a new animation using mathematical transformations and simple programming command. Students must be able to represent their animations through coordinates, matrices and programming.</p> |
| Synthesis | | |
| Analysis | | |
| Application | <p>Calculating distance, slope and midpoint</p> <ul style="list-style-type: none"> Develop and use algorithms for distance, slope and midpoint. <p>The Circle</p> <ul style="list-style-type: none"> Use the equation of a circle to solve problems. <p>Rigid Transformations</p> <ul style="list-style-type: none"> Use representations of transformations in a variety of coordinate problems | <p>Movement on Screen: Rigid Transformations</p> <ul style="list-style-type: none"> Students create miniprograms to have an object rotate, reflect, and translate (mini-animations) Study transformations in artwork <p>Modeling Size Transformations</p> <ul style="list-style-type: none"> Students investigate a size transformation (dilation) on a computer animation and artwork and discover the properties of dilation. |
| Comprehension | | |
| Knowledge/Awareness | | |

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| Knowledge in one discipline | Apply in one discipline | Apply across disciplines | Apply in real world predictable situations | Apply in real world unpredictable situations |
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Are you satisfied with where the lessons/activities lie on the framework? Explain.

Mostly, yes. I am thinking about using a different context for transformations than animation. Reasoning with slopes could be moved to Quadrant D by creating a deeper context for the study of shape. I do not want to move this task at the present time since students have encountered slope in many different situations. Primarily they have worked with slope in “real world” situations, and I want to discuss it general properties that apply within geometry. They may choose to use these properties in their project Animate This.