

Slope, Distance, and Midpoint



Standards-Focused Classroom Series

The *Standards-Focused Classroom* series was created to provide educators with actual classroom examples of lessons that target 21st century learning standards.

Pre-viewing Discussion Prompt

1. How do you prepare your students to collaborate with each other on graphing activities?

Lesson Evaluation

Rate the lesson's effectiveness (1 = not effective; 5 = very effective), and use your results to facilitate discussion and reflection.

1. Student learning targets were clearly communicated.
1 2 3 4 5
2. Instructional activities led students toward meeting the objectives.
1 2 3 4 5
3. Students were actively engaged.
1 2 3 4 5
4. Teacher differentiated instruction.
1 2 3 4 5
5. Assessments effectively monitored student progress.
1 2 3 4 5

About this Segment

In Ms. Kathy August's honors geometry class at South Salem High School in Salem, Oregon, students review how the Pythagorean Theorem applies to the slope, distance, and midpoint of two points on a coordinate plane.

Post-viewing Discussion Prompts

1. If you were the instructional coach observing this classroom, what 2-3 strengths in this lesson could you help the teacher identify?
2. What evidence of critical thinking and problem solving did the students demonstrate?
3. What constructive feedback could you give this teacher?

Reflection Questions

After watching the video, participants can answer the following questions to reflect on new learning:

1. How do you communicate the learning objectives, and measure students' progress towards them, during your lessons?
2. What are the features of your most successful rubrics?
3. What activities do you use to engage students to reflect on their prior knowledge about a specific skill or content piece?

Teacher Lesson Plan

Teacher: Kathy August	School Name: South Salem High School	Location: Salem, OR
Grade Level: 8-9	Content Area: Honors Geometry	Lesson Duration: 50 min., part 1 of 1
		Lesson Date: Jan. 28, 2014

Summary/ Overview	Students begin class with a warm-up activity, a colored slip of paper that contains a number between one and four, and a question. Upon completing the warm up, students will organize themselves into groups of four, which consist of four different colors and four different numbers. The groups are then given a graphic organizer to help in identifying slope, distance, and midpoint. Once the equations for slope, distance, and midpoint are identified, students will then apply them to an example. After reviewing the graphic organizer, students will apply the equations to authentic problems involving the school's map.
Skill-Based Objectives & Deliverables	<ul style="list-style-type: none"> • Students will be able to identify the slope, distance, and midpoint of a line segment on a coordinate grid. • Students will be able to successfully complete a graphic organizer.
Standard(s) Addressed	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
Materials & Resources	Colored slips of paper, graphic organizer worksheet, grid transparency, dry erase markers, map of first and second floor of South Salem High School, group work sample question handout
Scaffolding the Learning	Students will work in groups, allowing those who have a better understanding of the material to help the others. Teacher will give assistance where needed.
Procedures	<ol style="list-style-type: none"> 1. As students enter class, pass out colored slips of paper with a number between one and four and a question. Instruct students to sit wherever they want and to answer the question on their paper. 2. Ask students to get into groups of four, with each group containing a person with a slip of paper representing each number (1-4) and each of the four colors. 3. Pass out the graphic organizer. The groups will have five minutes to best complete their organizer. The student with the "#1" will share their paper with the class. "#2" can use outside resources. "#3" can ask the teacher questions. "#4" is the timekeeper. 4. Review the graphic organizer with the class. 5. Students will retrieve school map, grid transparency, dry erase marker, and a work sample write-up. 6. Establish the point of origin for the map. 7. Students will work on the sample until the end of the period and hand in their graphic organizers.

Resources from School Improvement Network

Finding the volume of cylinders, cones, and spheres. *Edivate*. <http://www.pd360.com/index.cfm?ContentId=5416>

Triangulation using the Pythagorean Theorem. *Edivate*. <http://www.pd360.com/index.cfm?ContentId=7122>

Resource for Classroom Practice

Carey, R. (n.d.). Pythagorean theorem – inquiry based unit plan. Retrieved June 13, 2014, from Buffalo State University, Department of Mathematics website: <http://math.buffalostate.edu/~it/projects/Carey.pdf>