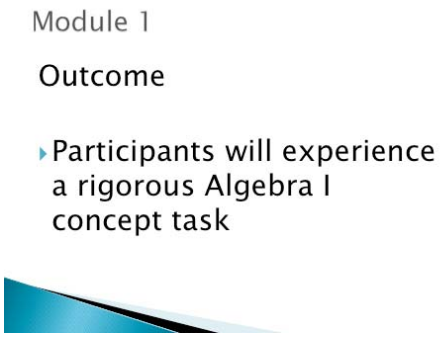
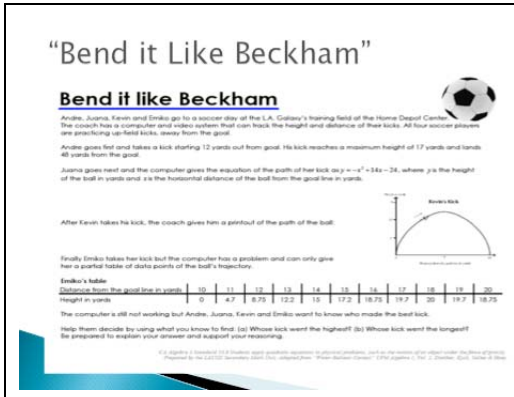
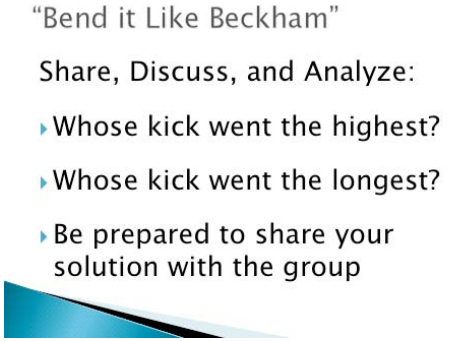
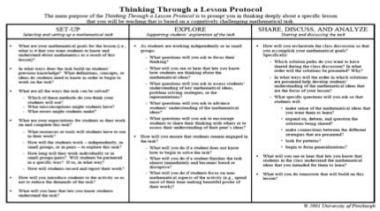
Algebra 1 - Quadratics

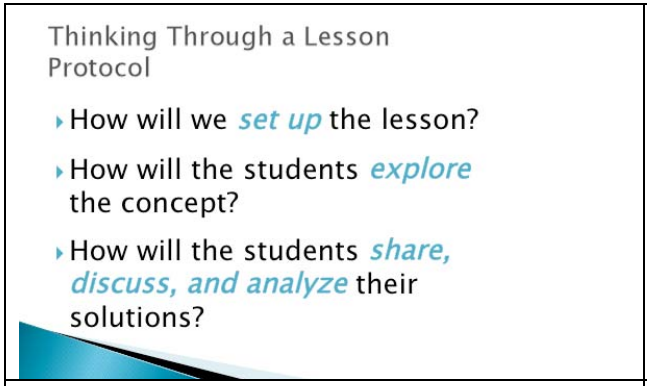
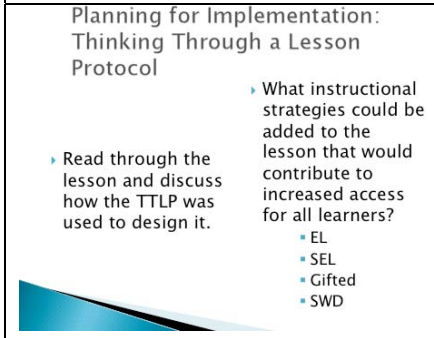
Professional Development

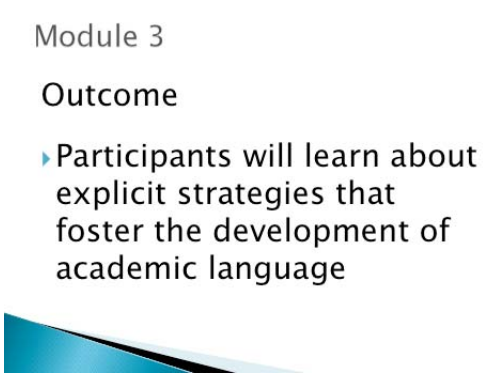
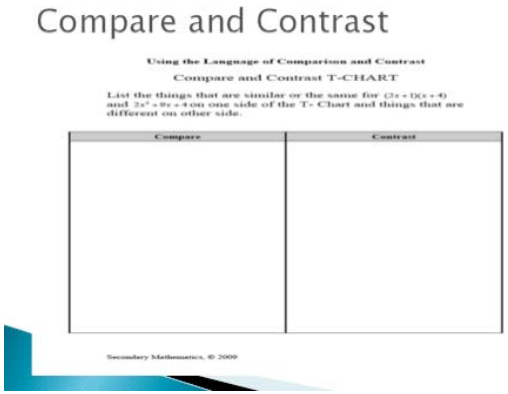
Facilitators Notes

	<u>Algebra 1 Professional Development Quadratics</u> Welcome!	The Algebra 1 PD for Quadratics is divided into 6 modules that can be introduces in a 6-hour period or in six 1-hour sections. The purpose of this set up is for flexible use at schools and LD professional development opportunities.
Module 1 Outcomes 	Outcomes: *Participants will experience a rigorous Algebra 1 concept task*	You can remind participants that all concept tasks and lessons can be found on the Math website. Lausd.net/math
Task	<u>Bend it like Beckham</u> – every participant gets a copy of the task Ask participants to:	Make copies for all participants Chart paper for keeping track of discussion

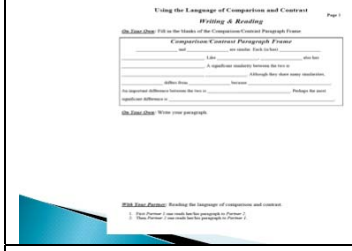
	Read for context, (2 min) Discuss and chart answers Read for vocabulary, (2 min) Discuss and chart answers Analyze for math content and non-math content vocabulary (2 min) Discuss and chart answers Ask participants: *How does this process of reading with different purpose help the students understand the task and have access to the mathematics?* Give participants time to work through the problem.	Participants experience all the steps students need to take to make the task accessible for all students.
	After working through the problem (as a whole group) Share/discuss/analyze Ask participants the following questions: *Whose kick went the highest?* *Whose kick went the longest?* *Be prepared to explain your solution with the group* Chart responses	

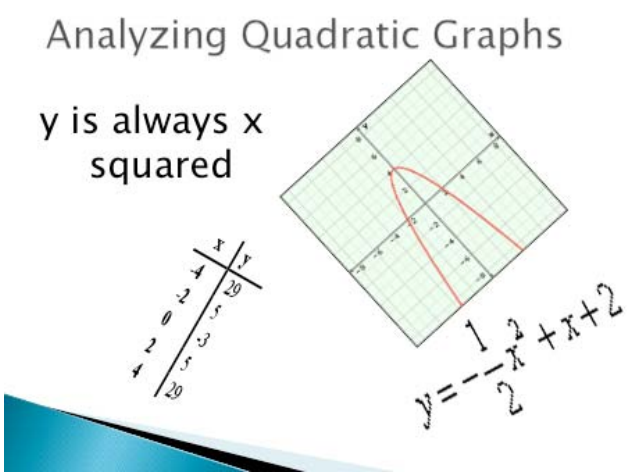
"Bend it Like Beckham" Group discussion: How do we make the mathematics accessible to all students? How can the four access strategies: ▪ graphic organizers ▪ cooperative groups ▪ academic language development ▪ instructional conversations be more explicitly embedded in the lesson?	Group Discussion: *How to make mathematics accessible to all students?* *How can the four access strategies:* • *graphic organizers* • *cooperative groups* • *academic language development* • *instructional conversations* *be more explicitly embedded in lesson?*	4 access Strategies: Graphic Organizers Cooperative Groups Academic Language Development Instructional Conversations
Module 2 Outcomes Module 2 Outcome ▸ Participants will work with the Thinking Through a Lesson Protocol (TTLP) to plan the implementation of the task in the classroom	*"Participants will work through the Thinking Through a Lesson Protocol to plan implementation in their classrooms."* Give participants some time to read through the TTLP	Make sure all participants have a copy of the TTLP.
Thinking Through a Lesson Protocol 	Share copies of the TTLP Have a short discussion about findings- How can they use the TTLP when planning to deliver task/lesson	
	Ask participants: *How will they set up the lesson?*	Video is available on math website

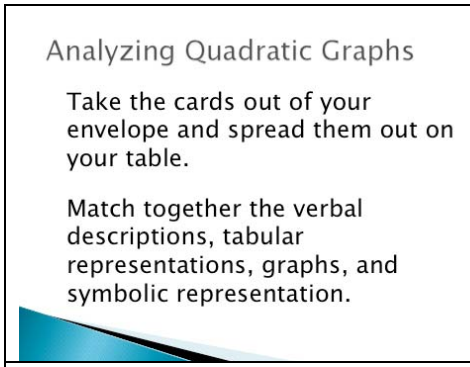
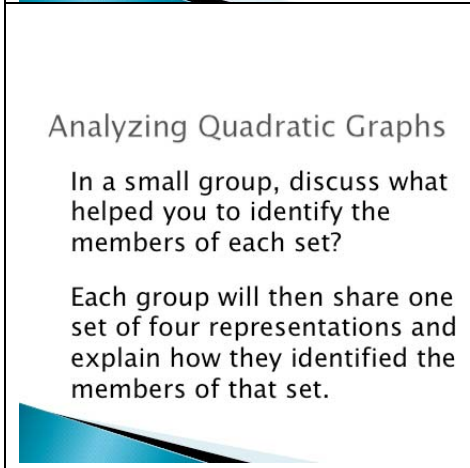
	*How will the students explore the concept?* *How will the students share, discuss and analyze their solution?*	
	When is the best time to use the Concept Task - Participants should know that the tasks might be used at the introductory, middle of end of a concept. - There are other concept task available on the math website	
	Share the concept lesson with the participants. Give them some time to read through it. Remind them to look at it through the lens of the TTLP. (10 min) *Read through the lesson and discuss how the TTLP was used to design it.* *What instructional strategies could be added to the lesson that would contribute to increase access to mathematics for all learners:* *SEL, EL, Gifted, Sp. Ed., and SWD*	

Module 3 Outcomes  	Outcomes: *Learn explicit strategies that foster the development of academic language*	
 	Compare and Contrast T-Chart Ask participants to do activity	Need copies of Compare and Contrast T-chart for all participants

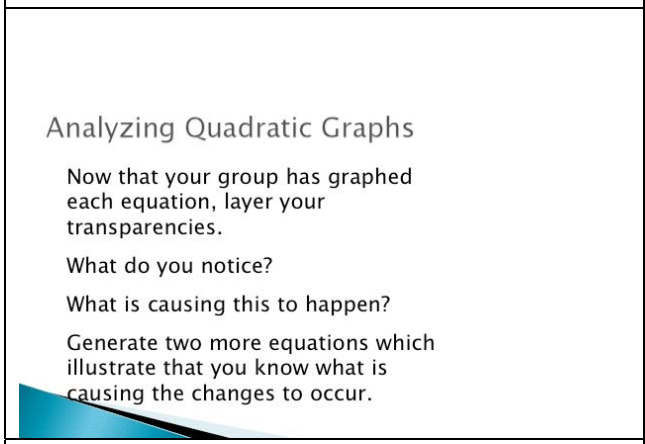
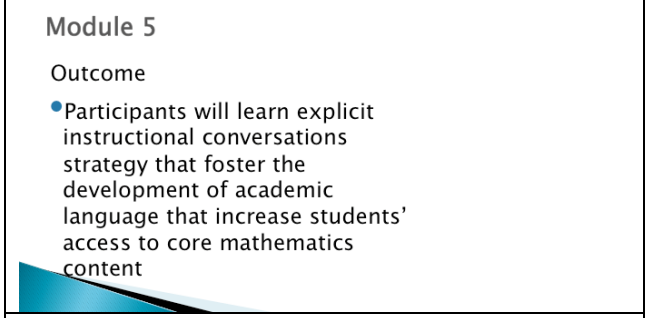
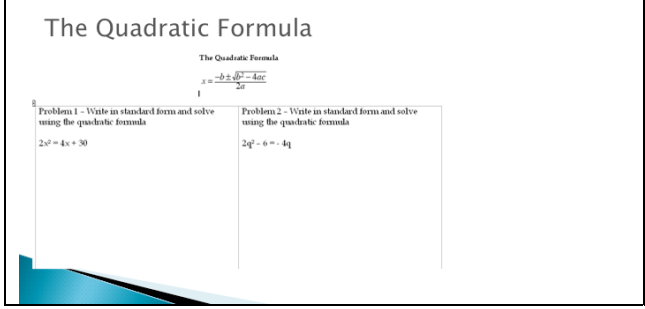
Compare and Contrast How will this activity support the academic language development for your students? What questions can you ask to engage students with this activity?	Ask participants: *How will this activity support the academic language development of your students?* *What questions can you ask to get kids engaged in the activity?*	
Using the Language of Compare and Contrast 	Comparison Listening and Speaking Activity Give some time for the participants to read through the handout Make sure that every one chooses a partner for the activity. Discuss their findings: How will you use with your students? What do you need to modify or add? Why is this activity important? When can you use this activity with future lesson?	Pass out the handout: "Listening & Speaking" Remind participants that the level of scaffold depends on the need of their students. Some students will not need all the sentence starters because they have better language skills. It is important to be aware of the EL level of the students if they have them in their class.
	Contrast Listening and Speaking Activity Give some time for the participants to	

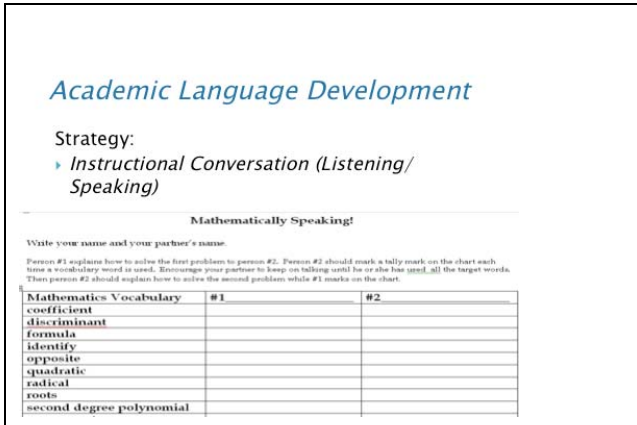
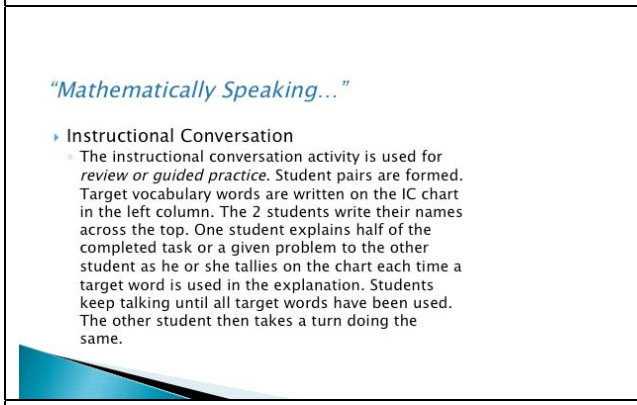
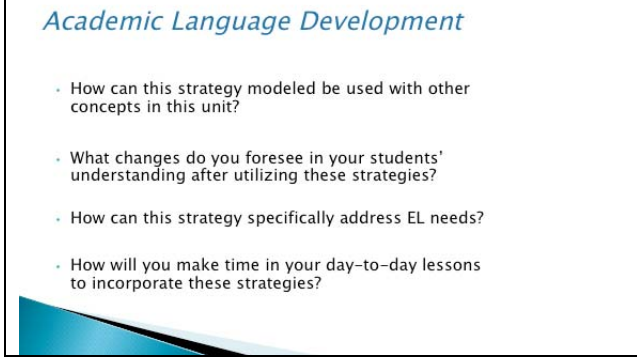
Using the Language of Compare and Contrast 	read through the handout Make sure that every one chooses a partner for the activity. Discuss their findings: How will you use with your students? What do you need to modify or add? Why is this activity important? When can you use this activity with future lesson?	
Using the Language of Compare and Contrast 	Writing and Reading Give some time for the participants to read through the handout Make sure that every one chooses a partner for the activity.	
Using the Language of Compare and Contrast How will you use this with your students? What do you need to modify or add? Why is this activity important? When else can you use this activity with future lessons?	Discuss their findings: *How will you use with your students?* *What do you need to modify or add?* *Why is this activity important?* *When can you use this activity with future lesson?*	

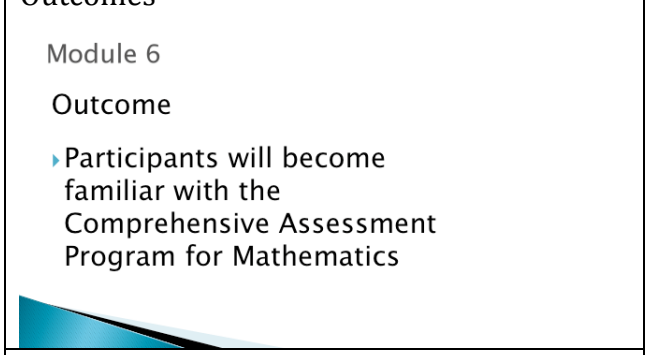
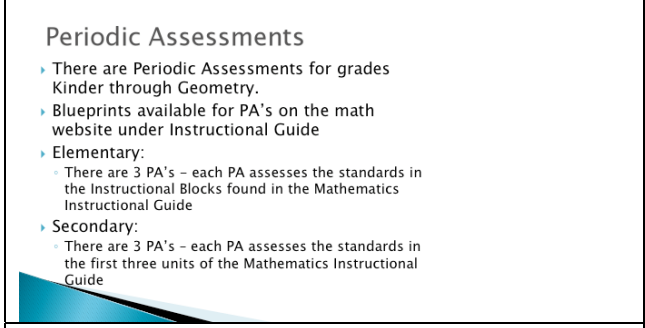
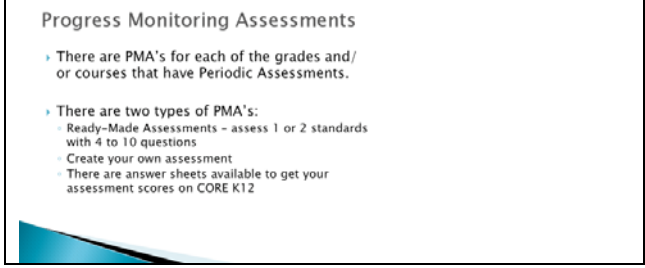
Module 4 Outcomes Module 4 Outcome ▸ Participants will gain an increased understanding of strategies that increase students' access to core mathematics content	Outcomes: *Gain an increase understanding of strategies that increase students access to core mathematics content.*	
	Quadratic Functions Graph Match Activity	Need copies of Quadratic Functions Graph Match Activity for all participants Make sure to copy and cut the two activity sheets. Cut apart the graphs, tables, descriptions and symbolic representations. Give each group an envelope with the pieces, copy of blank answer grid and glue/tape.
	Take the cards out of your envelope and spread them out on your table. *Match together the verbal*	

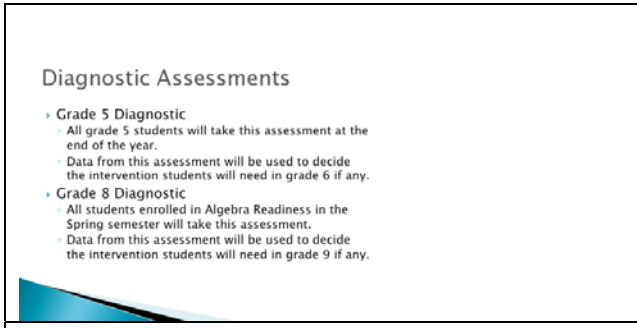
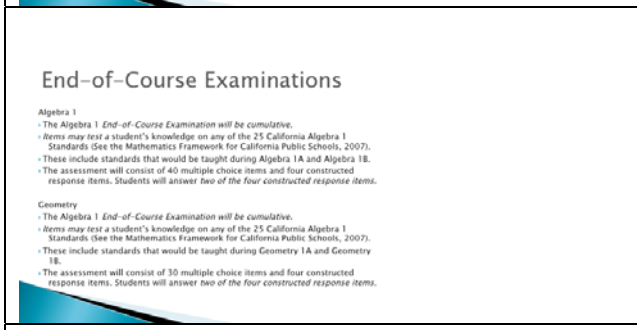
	*representations, tabular representations, graph and symbolic representations.*	
	*In a small group, discuss what helped you identify the members of each set?* *Each group will then share one set of four representations and explain how they identify the members of that set.* Ask participants: What questions can you ask students to expand their explanations and thinking?	
	How does this activity enrich the students' understanding of different quadratic representations? *How might you use a similar type of activity in a different unit of study?*	

Analyzing Quadratic Graphs How does this activity enrich the students' understanding of different quadratic representations? How might you use a similar type activity in a different unit of study?		
Analyzing Quadratic Graphs **COMPARING GRAPHS 1** Tables Set 1 $y = x^2$ $y = 2x^2$ $y = 3x^2$ $y = 4x^2$ $y = 5x^2$ x | y $y = x^2$ $y = 2x^2$ $y = 3x^2$ $y = 4x^2$ $y = 5x^2$	Analyze Quadratic Graphs	Make copies of the Comparison Graph sheets to give one to each group Pass transparencies, markers, and graph paper.
Analyzing Quadratic Graphs Each group will receive one of the comparing graphs sheet. Each member of the group will be receiving a blank transparency, a different colored marker, and a piece of graph paper. Each person in the group will graph one of the equations on a transparency—your group will have a total of five different graphs.	Directions: *Each group will receive one of the Comparing Graphs sheet.* *Each member of the group will be receiving a transparency, a different color marker, and a piece of graph paper.* *Each person in the group will graph one of the equations on a transparency – your group will have a total of five*	

	different graphs.	
	Now that you group has graphed each equation, layer your transparencies. What do you notice? What is causing this to happen? Generate two more equations that illustrate the same effect.	
Module 5 Outcomes 	Outcomes: *Participants will learn explicit instructional conversations strategy that foster the development of academic language that increase students' access to core mathematics content.*	
	The Quadratic Formula	Make sure every participant has a copy of the Quadratic Formula activity

	Academic Language Development - Instructional Conversations	
	Mathematically Speaking	
	Academic Language Development Discussion Questions: •*How can this strategy modeled be used with other concepts in this unit?* •*What changes do you foresee in your students' understanding after utilizing these strategies?* •*How can this strategy specifically address EL needs?* •*How will you make time in your day-*	

	to-day lessons to incorporate these strategies?	
Module 6 Outcomes 	Outcomes: *Participants will become familiar with the Comprehensive Assessment Program for Mathematics.*	Need: Internet access Computers for participants Introduce all the assessments for mathematics that are available to monitor student progress and assess their level of proficiency in the course/grade level.
	Periodic Assessments	
	Progress Monitoring Assessments	

	Diagnostic Assessments	
	End-of-Course Examinations	
	Assessment Information and Data - visit the different sites to show participants what is available and how to access the materials and/or data. - If possible: computers should be accessible for participants to access their own data. This is the WHAT, now we need to talk about the SO WHAT? And NOW WHAT? -What is the data telling us about our students' progress?	Take participants through the different sites that have information on Periodic Assessments, Progress Monitoring Assessments, Diagnostic Assessments, and End-of-Course. Chart answers

	- How do we use this information to plan for intervention and enrichment? -What does the data tell us about our teaching? - How are our EL, SEL, SWD and Gifted students doing? - What are you already using to inform your instruction and how are you using it?	