

1106-E1-2085 **sarah-marie belcastro*** (director@mathily.org). *Spanning and weighted spanning trees: a different kind of optimization.*

While some high-school students have access to discrete mathematics courses or experience introductions to graph theory, they rarely encounter explicit connections to real-world applications thereof. In this presentation, we describe an introduction to spanning trees and then weighted spanning trees (and their applications!) via structured inquiry. This topic exhibits a different kind of optimization than presented in calculus. The activity is designed to take AP Calculus students a single class period, and has been previously used with high-school students in enrichment settings and beginning college students in a classroom setting.

An AP Calculus supplemental activity should not depend on the the depth of knowledge of the teacher on the particular topic, and the delivery should be flexible enough to accommodate a variety of personal and teaching styles. We therefore provide a guide to the mathematics along with tips on likely student difficulties and a selection of presentation suggestions. Additional supporting materials are an introductory short video, a student worksheet, a concluding video that points toward further exploration, and an extra worksheet with extension questions and a short list of resources. (Received September 15, 2014)