AMAZON MISSION OVERVIEW: STORY LINE AND LEARNING OBJECTIVES

	Design Challenge Overview	Students will:
DESIGN CHALLENGE 1: MALARIA MELTDOWN!	Students are responding to the needs of the Yanomami people in the Amazon. In their first challenge, they are to design a medicine carrier that can successfully transport malaria medicine. The carrier should keep the medicine within certain temperature constraints to protect it from heat, be rugged enough to prevent an egg from breaking when dropped, and be as low in cost as possible.	• calculate and interpret the slope of a line • graph a compound inequality • conduct two controlled experiments • collect experimental data in a table • produce and analyze a line graph that relates two variables • distinguish between independent and dependent variables • determine when it's appropriate to use a line graph to represent data • list combinations of up to five layers of two different kinds of materials • draw a three-dimensional object and its net • find the surface area of a three-dimensional object • apply the engineering design process to solve a problem
DESIGN CHALLENGE 2: MERCURY RISING!	As students arrive at the village, the Yanomami meet them with a new challenge—to design a water filter that can filter out at least 75% of the mercury in the freshwater near the mining operation. To do so, students research different sizes of Mercatrons, mercury-absorbing spheres. Students find which ones would meet the criteria of being low in cost and still effective at removing at least 75% of mercury from water. Students also calculate minimum and maximum flow rates for water and experiment with different factors that influence the flow rate.	• calculate the surface area of a sphere using a formula • solve a multistep problem • convert measurement units (within the same system) • use proportional reasoning • write a compound inequality statement • graph and analyze the relationship between two variables • determine when it's appropriate to use a line graph to represent data • design and conduct a controlled experiment • apply the engineering design process to solve a problem
DESIGN CHALLENGE 3: OUTBREAK!	The Yanomami are vulnerable to infectious diseases brought by outsiders. Students are challenged to select from a list of interventions to form a virus containment plan. Students conduct simulations of virus spread under different conditions, calculate percentage rate of infection with different combinations of interventions, and use their results to design a virus containment plan that would keep the percentage of infected villagers to no more than 25% for 30 days and be as low in cost as possible.	• identify and extend exponential patterns • generalize and represent a pattern using symbols • graph simulation data and describe trends • calculate compound probabilities • use a computer model • apply the engineering design process to solve a problem