

Teacher:

Exponential

Lesson Summary:

This lesson went much smoother than the Poisson in that I used the same recording of the highway and the students were much more prepared. This time Mrs. Chay gathered stop watches and the students recorded the time interval between arrivals in a single lane. Mrs. Chay and I did a few practice runs to demonstrate. The students were told to get thirty samples and then to construct another histogram. The equation was shown and explained as well as some sample histograms but unfortunately the schedule listed was wrong from the timing of the bell and as such, believing I had five more minutes than I really did, ran out of time. As such, a few students' histograms were not finished but for the large part they completed the activity. More time needs to be allotted in the future for demonstrations and examples on how to complete whatever activity I am having them engage in.

GK-12 Lesson Plan

Teacher:

Period:

Class:

Date(s):

SETTING THE STAGE	
<u>Essential Question</u>	How can we use our knowledge of exponential functions to better understand some common real life situations where randomness occurs?
<u>Content Objective(s)</u> (Student-friendly)	To gain an understanding of how the rate at which cars appear on a highway can be classified using exponential functions.
<u>Connection to previous or future lessons</u>	This lesson expands upon the lesson involving the Poisson distribution.
<u>Critical Thinking Questions</u>	
<u>Key Vocabulary</u>	Exponential distribution
<u>Materials Needed/Safety</u>	Stream of highway, stop watches
ACTIVE INSTRUCTION	
<ul style="list-style-type: none"> ● Launch (Engage) 	A live stream of the highway with acceptable conditions is shown to the students. I will ask the students what they believe the average inter-arrival time of cars arriving on the highway is, and what the probability that it is less than one. What is the probability that it is more than ten? Can we find this? How?
<ul style="list-style-type: none"> ● Investigation (Explore) 	<p>They are asked to work alone in this case. They are given stop watches and record for two-three minutes. They start the stop watch as soon as a car arrives on the highway and stop it as soon as the next one arrives. They keep track of their times.</p> <p>After this is performed the students are asked to construct a histogram. This is essential in my case as the students need all the graphing help they can get. They will break it up into intervals, such as 0-0.5, 0.5-1, and so on, and the histogram is constructed that way.</p>

GK-12 Lesson Plan

Teacher:

TIME FOR REFLECTION	
<ul style="list-style-type: none">Summarization (Explain & Extend)	<p>What does this histogram represent? Can you now tell me the probability of having an inter-arrival time of less than one second?</p> <p>To further summarize I show them the equation for the exponential distribution and explain what the variables mean and how it can be used to find the probability of inter-arrival times.</p> <p>I also show them a set of exponentially distributed plots and ask if theirs is similar. If not, how come?</p> <p>I will conclude this and the past lesson by explaining how the Poisson and the exponential distributions can be used to construct a system that represents a whole host of real life situations.</p>
<ul style="list-style-type: none">Assessment (Evaluate)	<p>This is performed along the way.</p>
<ul style="list-style-type: none">Homework	<p>None.</p>