CEMC at Home

Grade 7/8 - Wednesday, April 8, 2020

Car Transportation

Question 1: A car manufacturer produces cars in solid colours as well as patterns. A new striped car comes from a manufacturing line every 7 minutes. A new solid yellow car comes from another manufacturing line every 4 minutes. Both manufacturing lines start working at the same time. A driver parks the cars on the back of a large transport truck in the order the cars leave their respective manufacturing lines. The top floor of the transport truck is loaded first.

Which of the cars in the loaded transport truck below are striped and which are yellow?

\[
\begin{array}{ccccccc}
7 & 14 & 21 & 28 & 35 & 42 \\
4 & 8 & 12 & 16 & 20 & 24 \\
\end{array}
\]

Need help getting started?

Try using objects like coins, paper clips, or pieces of paper to represent the cars leaving their respective manufacturing lines. This is called a simulation. Create a model or a table to summarize what the loading truck looks like at various time intervals.

Question 2: A new solid black car comes from a third manufacturing line every \( n \) minutes, where \( n \) is an integer between 5 and 10, inclusive. A second transport truck is loaded with only black cars and striped cars using the same method as in Question 1. After the truck is fully loaded it looks like the truck below. What is the value of \( n \)?

More Info:

Check out the CEMC at Home webpage on Thursday, April 9 for a solution to Car Transportation.

A variation of this problem appeared on a past Beaver Computing Challenge (BCC). The BCC is a problem solving contest with a focus on computational and logical thinking.

Many industries, including car manufacturing, are highly automated, and this automation relies on computers to control and coordinate production. As such, the production needs to be carefully planned and synchronized so that various demands (availability of transport trucks, the need for particularly designed items to go on a particular truck, etc.) can be managed. The need to understand, create, manage, and improve automated systems is a real-world example of computer science being applied.