

(A) Lesson Context

BIG PICTURE of this UNIT:	<ul style="list-style-type: none"> • What is meant by the term FUNCTIONS and how do we work with them? • mastery with working with basics & applications of linear functions • mastery with working with basics & applications of linear systems • understanding basics of function concepts and apply them to lines & linear systems 		
CONTEXT of this LESSON:	Where we've been Grade 8 math & working with problem solving skills	Where we are Graphs & algebra of linear functions	Where we are heading Mastery of working with multiple representations of $f(x) = mx + b$

(B) Lesson Objectives

- Work with multiple methods for solving unfamiliar problems
- Work with documenting & showing evidence for the assorted problem solving strategies

(C) Grains of Rice Challenge

There is a well-known story of the man who invented chess. The local ruler was so pleased with the invention that he offered the inventor a great reward in gold. The inventor suggested an alternative reward: he would get one grain of rice on the first square of the chess board, two grains on the second square, four on the third, eight on the fourth, etc., doubling the number of grains each time. The ruler saw that this must be a much better deal for him, and accepted. The board has 64 squares.

- How many total grains of rice did the ruler have to pay the inventor? Show your work.
- EXTENSION QUESTION #1: If these grains of rice were lines up end to end, how far would the line go? Show your work and internet data/information you needed to come up with an estimate.
- EXTENSION QUESTION #2: If these grains of rice were used to cover up the land in India, how deep would the pile be? Show your work and internet data/information you needed to come up with an estimate.

The Legend of the Ambalappuzha Paal Payasam is an alternate version of the same story. Check it out!

(D) The Banana Problem



Please work in your groups to solve this problem. Show your work with pictures, charts, tables, algebra, equations, etc ...

The Problem...

There is a Camel on the edge of a desert that is **1000 km** wide. Beside the camel is a pile of **3000 bananas**. The camel can carry **at most** 1000 bananas at a time. For **every km** it walks it has to **eat one banana**.

What is **the largest amount of bananas** the camel can end up with on **the other side of the desert**?

Important hints!!

- The camel can walk **back and forth** as many times as needed.
- The camel can **drop bananas off** at any point along the way, to get later.

Solution

- Please present your solution as clearly as possible on a separate sheet of paper. Again, pictures, charts, and tables are the key. I should not only see your numerical answer, but also the visual representation of your thinking and process.

Extension Questions to Ponder

- How do you know if your solution is the “correct” answer?
- Are there other ways to find a solution to this?
- How does the problem change if you have 6000 bananas and the desert is 2000 km wide?

(E) The How Far? Problem

Mr S. is training to run in a half marathon around Christmas time and wants to keep track of his distances that he ran during his training runs. So one area where Mr. S. runs is on our “track” here on the CAC campus (see diagram below). When he runs around this 6 lane track, he runs his first lap in Lane 1, his second lap in Lane 2, and his sixth lap in Lane 6. Each lane is 1 meter wide. He does this “set” three times (running a total of 18 laps).

(a) How far does he run?

(b) If he runs at an average speed of 10 km/hr, how long would it take him to run 50 laps?

(c) EXTENSION QUESTION: Let’s assume that our track has 100 lanes and Mr. S runs each lane once as he completes 100 laps. What total distance has he run?

**(F) Homework**

- a. Complete the [Linear Relations Unit PRETEST](#) (linked here as a pdf file and here as a WORD doc