Name_____

Berkeley Math Circle- Upper
Exponentials in Biology: Part 1

NOTES

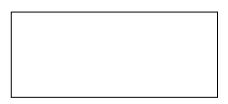What is a bacterial cell?

Generation   Number of Bacteria

Is there a pattern?

Can we write create an equation?

PROBLEM SOLVING

1. Starting with one bacterial cell, how many cells will there be in the third generation?

    a. Fifth generation?

    b. Tenth generation?

2. We now start with three bacterial cells. How many cells will there be in the third generation?

    a. Fifth generation?

For problems 6-8, we know that a species of bacteria clones itself every five minutes.

3. If we start with one bacterial cell, how many cells will there be after five minutes?

    a. Ten minutes?

    b. Twenty minutes?

CHALLENGE:

4. Tommy shakes Billy's hands, transferring one *e. tommy* cell onto his friend's palm. How many cells are on Billy's hands after nine minutes? (*e. tommy* cells replicate every three minutes)

     a. Ten minutes?

5. Billy, having not showered, transfers twenty *e. billy* cells onto Tommy's hand. How many cells are on Tommy's hand after six minutes? (*e. billy* cells replicate every two minutes.)

     a. Seven minutes?