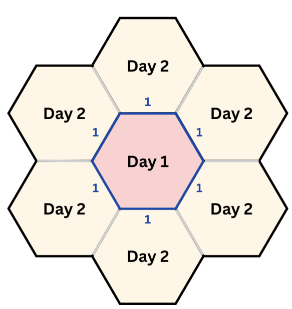
**Problem 1.1:** Barbie the Bee is collecting honey from 100 distinct flowers labeled from 1 to 100. She visits a given flower if and only if all the digits of the flower are distinct and the flower is not even-numbered. How many flowers does she visit?

**Problem 1.2:** Let $T =$ TNYWR. All bees in a certain colony have body patterns made up of $n$ stripes, where $n$ is the remainder when $T$ is divided by 10. Each stripe is black or yellow, and every bee's stripe pattern is not equal to its reverse. What's the maximum number of unique stripe patterns in such a bee colony?

*(e.g. (BYBY) is a good stripe pattern as (YBYB) is its reverse, but (YBBY) is not, as (YBBY) is its reverse)*

**Problem 1.3:** Let $T =$ TNYWR. Barbie the Bee is building a honeycomb structure. On day 1, she builds a hexagonal honeycomb with side length 1. On each subsequent day, she covers the entire perimeter of the existing honeycomb with hexagons of side length 1. The resulting structure after day 2 is shown below. What's the perimeter of Barbie's honeycomb after $T$ days (the perimeter is just the length of the exterior of the entire honeycomb)?

*(i.e. after Day 1, the honeycomb will have a perimeter of 6 while after Day 2, the honeycomb will have a perimeter of 18)*




Barbie's honeycomb after 2 days

**Problem 2.1:** In triangle $DEF$, there is a point $U$ on $\overline{DF}$ and a point $K$ on $\overline{EF}$ such that $K$ is the midpoint of $\overline{EF}$. If the area of quadrilateral $DUKE$ is 12 and the area of triangle $KUF$ is 2, the ratio $\frac{DF}{DU}$ can be expressed as $\frac{m}{n}$, where $m$ and $n$ are relatively prime positive integers. Find $m+n$.

**Problem 2.2:** Let $T = \text{TNYWR}$, and $p = \frac{T-2}{T+2}$. Duke is in a close basketball game with their rival UNC. The current score is 67-66 in Duke's favor, and there are 3 minutes left in the game. After each minute, Duke outscores UNC by 1 point with probability $p$ and UNC outscores Duke by 1 point with probability $1-p$. Given that each scoring update is independent of all previous scoring updates, the probability that Duke is winning when the game is over can be expressed as $\frac{m}{n}$, where $m$ and $n$ are relatively prime positive integers. Find $1000m+n$

**Problem 2.3:** Let $T = \text{TNYWR}$. Let $K$ be the units digit of $T$. The Duke Blue Devil mascot loves to stack donuts on the three prongs of his trident. If he receives $K$ distinct donuts, how many ways can he arrange them on his trident? Note that the order in which he places the donuts on each prong matters.