Connecting Math to Our Lives and Communities

Estimating Tewa'lutewei

Introduction

All the snow has melted, the buds are growing on the trees, and the fields are turning that bright, summer-time green. What else can you picture about this time of the year? Do hundreds of dandelions spread over lawns and fields come to mind? Dandelions, or tewa'lutewei, are flowers belonging to the Aster family, and although they are often regarded as a weed, these flowers are beneficial to not only humans, but also our friends the honeybees!

Honeybees, or Mijipjamuej, can be found going from tewa'lutewei to tewa'lutewei collecting pollen to bring back to their hives. Just like humans, Mijipjamuej need certain nutrients to survive. Just like we need a variety of healthy foods, Mijipjamuej need a variety of different nectars and pollen that they collect from plants! While tewa'lutewei pollen is short on certain proteins for the mijipjamuej, the fact that tewa'lutewei are so abundant make them very important.

Tewa'lutewei are also rich in nutrients that are good for humans too. The leaves and flowers are rich in vitamin A and C and they contain more calcium and iron than spinach! These flowers and plants have been harvested by humans across many cultures to make a variety of different drinks, salads, and dishes. Mi'kmaq people have used tewa'lutewei to prepare fresh root teas for liver, gallbladder, kidney, and bladder ailments. The collection and brewing of medicinal drinks such as these are sacred and require teachings from knowledge keepers within the community.

Math Connections

- Calculations
- Measurement
- Surface Area

Materials

- 5m measuring tape
- Pencil

Activity

Now that we know how important dandelions are to ourselves and the honeybees, we will use this activity to explore how many dandelions we are really seeing spread across our yards. In this activity we will

estimate the area of our yard/lawns and then estimate how many dandelions are across this area. We will be estimating lengths during this activity, so the first thing that we will do is determine our pacing factor! Your pacing factor is the number of steps (or paces) it takes you to walk a certain distance. (In this case we will figure out how many steps it takes you to walk 5m).

1. Using the measuring tape included in your kit measure out a 5m straight line.
2. Mark both the beginning and end of the 5m distance (you can use a pile of rocks, a stick, or any toys that you have lying around).
3. Next practice walking the 5m distance with a consistent sized step (this means that every step you take should be roughly the same distance).
4. Once you feel comfortable with your walking, count how many steps it takes you to walk the 5m distance. Enter this number into the equation below.

$$\textbf{Avg. steps per 5m} = \frac{\textbf{steps} + \textbf{steps} + \textbf{steps}}{\textbf{3}} = \textbf{steps}$$

5. Now enter your average step number per 5m into the equation below to determine your pacing factor:

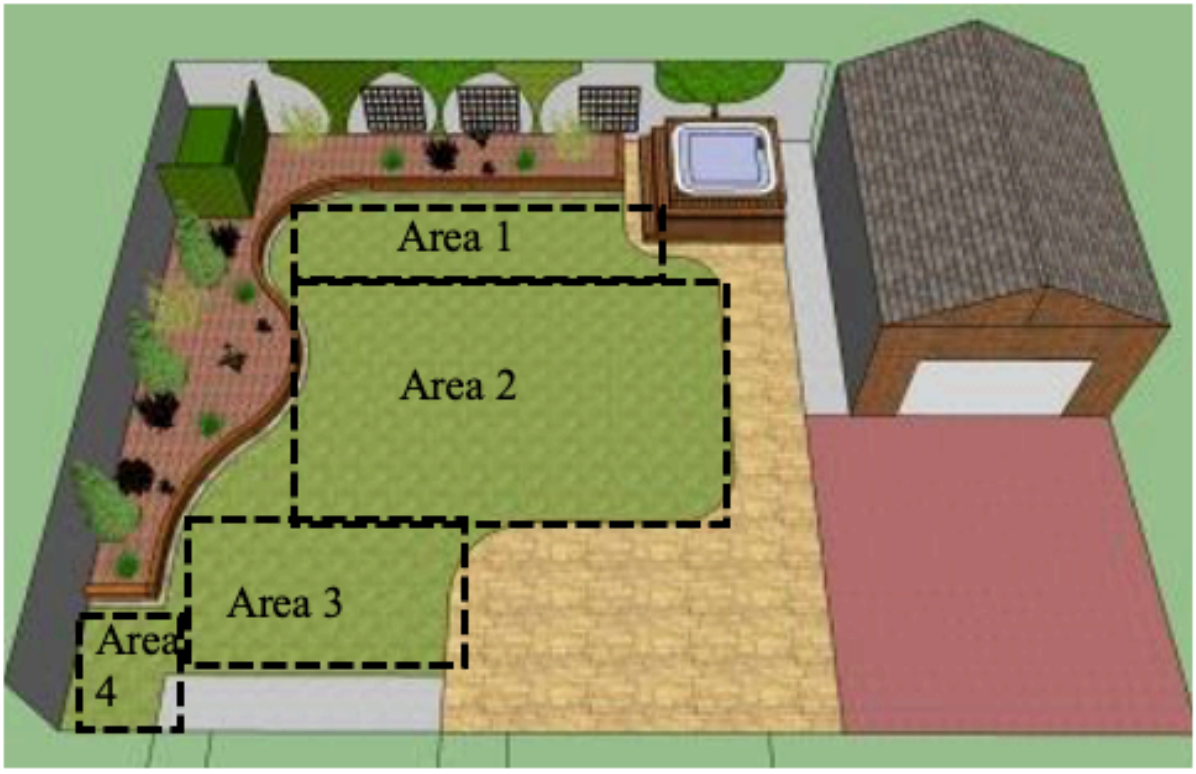
$$\textbf{Pacing Factor} = \frac{\textbf{5m}}{\textbf{Avg. steps per 5m}}$$

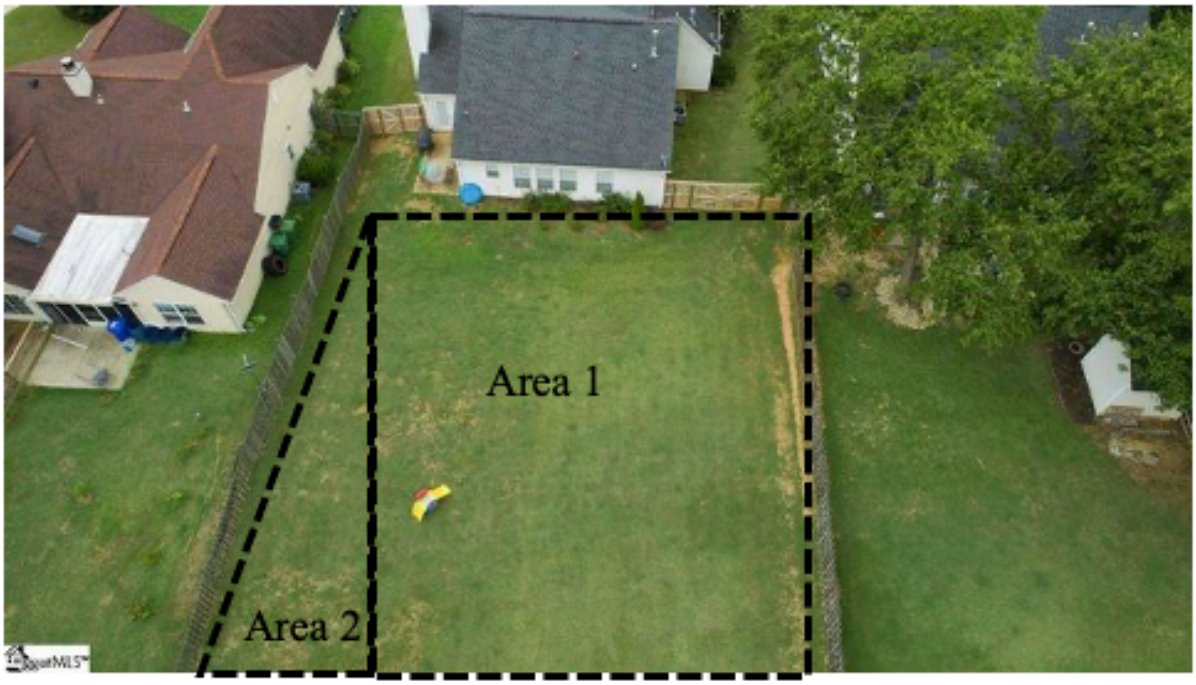
$$\textbf{Pacing Factor} = \frac{\textbf{5m}}{\textbf{Steps}} = \textbf{m/step}$$

Awesome! Now that we have our pacing factor, we can use this to determine roughly the area of our yards.

To begin the next steps in this activity we will have to think about the shape of our lawns, sometimes lawns can be a perfect rectangle. Often though, lawns are a mix of different shapes! Sketch a birds-eye view perspective of your lawn in the box below and then just like the examples look for how you can break your lawn into rectangles and triangles (this is just an estimation and does not have to be perfect!)

Examples:

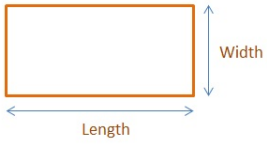




Your Turn!

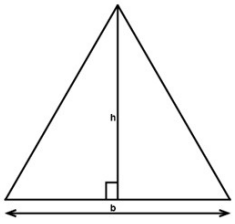
Now that you have your sketch drawn, we can figure out which areas and distances we will need to measure! To figure this out let's start by looking at the area equations for rectangles and triangles.

The area of a rectangle is the length multiplied by the width.

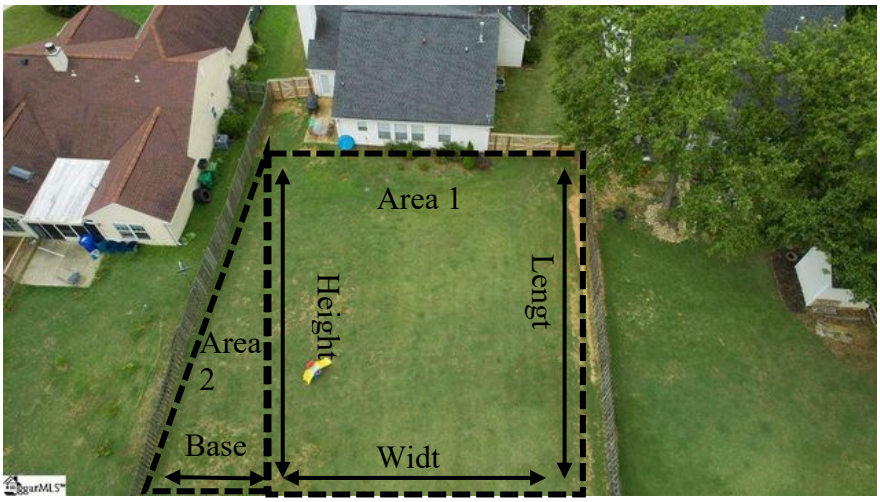


Area of a rectangle (m^2) = l x w

The area of a triangle is the base of the triangle multiplied by the height of the triangle divided by two.



Area of a triangle (m^2) = $\frac{b \; x \; h}{2}$



As you see in the example above, to calculate the area, you will need to calculate the height and base of the triangle and the length and width of the rectangle. You may also notice that the height of the triangle and the length of the rectangle are the same distance!

The total area of the lawn = Area 1 + Area 2 = (Length x Width) + (Base x height)/2
We will calculate these distances using our pacing factor! Start by counting how many steps it takes you to travel each distance. To calculate how far this distance is in meters you will multiply the # of steps it took for you to travel the distance by your pacing factor!

Distance= (# steps to travel distance) x (pacing factor)

Distance	**=**	**steps**	**x**	**m/steps**	**=**	**m**

Now that you have all your distances measured use the area of the triangle and rectangle equations to calculate the different areas in your yard. If you had more than one shape to estimate add all your areas together to determine the area of your entire lawn!

Now how many Dandelions can your lawn grow?
Let's say that your lawn can grow 40 dandelions per $1m^2$, since we know the area of your yard, we can use this number to calculate how many dandelions your lawn could support!

# of dandelions = 40 dandelions/m^2 x Area of your yard m^2

# of Dandelions	**=**	**40 dandelions/m^2**	**x**	**m^2**	**=**

Send us a photo of your birds-eye view and calculations at Connecting Math to Our Lives and Communities email (*cmtolcstfx@gmail.com*)! ☺