Counting Leaves and Sticks

Level	3 (Age group 11-14)
Resources Required	Paper and pencil 2-3 twigs from different trees, trees with leaves
Alternate Options for the Resources	if no trees/bushes are available, players can draw a tree or a bush with clear illustration of the different parts - twigs, leaves etc.
Strand Covered	Number and Operations
Targeted Skills	Estimation and Ratio
Inspired by	Third Space Learning
Time Required	10 minutes for preparation 15 minutes for game
Previous Learning Required	Multiplication with 2- and 3-digit numbers
Support Required	Low support

Rules of the Game:

Goal	The team that proves their estimation first, wins
Rules	A team can only win if (1) they come up with an estimation first AND (2) the estimation is backed up by a calculation involving ratios Each team can have between 2-3 learners If an incorrect ratio calculation is presented first as an answer, this team can only present a new estimation if all the other groups have already presented an answer at least once Recommended for 2 or more players
Steps	Step 1: The adult cuts twigs from different trees or bushes. If there are 2 groups, the twigs need to be from 2 different types of trees or bushes Step 2: Each team of 2 or 3 is presented with a unique twig Step 3: Their task is to figure out which tree or bush their twig belongs to, and estimate the number of leaves on their entire tree or bush by providing a total number and a calculation. they should use the number of leaves on the twig to estimate the total number of leaves. For example, if the number of leaves on a twig is 12, the number of twigs on the branch is 22, and the number of branches on the tree is 16, there should therefore be 4224 leaves on the tree (12 leaves x 22 twigs x 16 branches =

	4224 leaves on a tree). Have the players write down their ratios and show their multiplication work Step 4: The final answer is rounded to the nearest 10 step 5: groups should then write the ratio of the leaves on the twig to that of the total number of leaves on the tree/bush. In the example above, this would be 12:4224 step 6: groups simplify the ratio and share it with the rest of the class as the final answer
Variations of the Game	This game can be played as a hunt for different estimations instead of just one. For example, a list such as: 1. Number of players in the school (number of players in a class, number of classes in a school) 2. Total number of pages in all players' notebooks in class (number of pages in a book, number of books per players, number of players) 3. Distance from the classroom to the gate using stride length
Enrichment	This game can be played so that different skills are tested. For example, instead of an estimation of numbers, the hunt can be based on different estimations of measurements. The prompts can be: 1. An object length of 1 meter 2. An object of 5cm
Simplification	1) Smaller numbers 2) Remove the estimation and multiplication components so that players can focus on making ratios