Name_____

Counting the Number of Trees on Earth

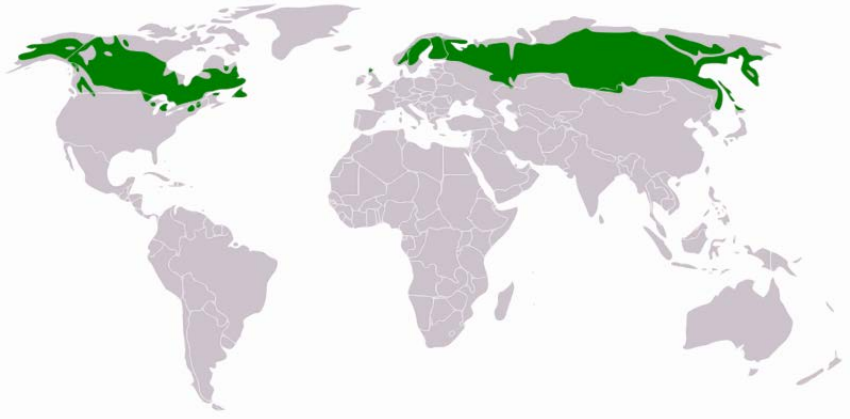
Knowing how many trees there are on Earth is important because it helps us understand the size of habitats for different species. It helps to estimate the amounts of natural resources that are available, like timber. Know the number of trees can also aid scientist in creating global climate and ecological models. That's just to name a few! However, it is really difficult for scientists to count all the tree because there are so many and the Earth is so big! Therefore, scientists have to estimate this number.

1. How might you estimate the number of trees, say on your playground, if you could not count them all?

Scientists know that different types of forests have different densities of trees – remember… the density of trees is the number of trees growing in a certain area. Below are descriptions of three different types of forests on Earth.

Boreal Forests

<u>Boreal forests</u> consist mainly of coniferous trees. Coniferous trees, like pine trees and spruce trees, have seed-bearing cones (pinecones). Boreal forests are found almost exclusively in Arctic regions in Canada, Alaska, Finland, Sweden, Norway, and Russia (see map below).



Temperate Forests

Temperate forests are forests that exist between the warmer tropics and the colder polar regions. They change with the seasons. There are several types of temperate forests. You should be familiar with temperate forests because these are the forests we have in Pennsylvania!

Tropical Forests

Tropical forests have once major thing in common – they are hot! When you think of tropical places, you probably think about rainforests, which are very wet like the picture on the left. But, tropical forest can be dry like the picture on the right. Think about which type of tropical forest has more trees. Below is a map showing where you can find tropical rainforests.

Now that you have learned a little bit about 3 different forest types, let's estimate the number of trees on Earth.

2. Make a hypothesis! How many trees do you think are on the planet Earth right now? How did you come up with this number?

The table below shows the area that each forest covers on the planet Earth and the density of trees for each forest type.

A	B	C	D	E
Forest Type	Area on Earth covered by each forest (km^2)	Area in terms of the United States	Tree Density (trees/km^2)	Total # of trees estimated
Tropical	45,465,000	4.5 times the size of the US!	28,506	
Temperate	30,648,000	3 times the size of the US!	23,326	
Boreal	15,390,000	1.5 times the size of the US!	48,690	
Total estimated number of trees in forests on Earth =				

3. Which type of forest has the highest tree density?

4. To figure out how many trees there are on Earth for each forest type, multiply the <u>area covered by the forest</u> (column B) by the <u>tree density (column D)</u>.

Tropical Forests	Temperate Forests	Boreal Forests
45,465,000 km^2 <u>x 28,506 trees/km^2</u> = trees	30,648,000 km^2 <u>x 23,326 trees/km^2</u> = trees	_____ km^2 <u>x _____ trees/km^2</u> = trees

5. Now, fill in the table above with you answers, and add them all up to find the total number of trees in forests on Earth.

6. The number of trees in the world is approximately 3,040,000,000,000. Why might the number of trees on Earth in forests be LOWER than this number? Think about other places that you find trees that are not in forests…

EXTRA!!!

7. The number of trees on Earth has decreased by 46% since humans began cutting them down. Therefore, the 3,040,000,000,000 trees estimated to be on Earth represent only 54% of the number of trees it originally had.

   How many trees did our planet have before we started cutting them down? (Hint #1: this number should be BIGGER than 3,040,000,000,000. (Hint #2: Solve for 'x'.)

$$\frac{3{,}040{,}000{,}000{,}000}{x} = \frac{54}{100}$$