



# BIODIVERSITY

## BASELINE AUDIT, GRADES K-2

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Consider contacting local, regional or state non-profits, natural history museums, tribal leaders and master naturalists for assistance conducting your audit. Their involvement is a great way to connect to the community, inspire students and demonstrate career possibilities while sharing resource expertise.

Invite parents and community members to participate in the auditing process. Students can take on the role of educator by working with volunteers on citizen science projects. This experience is a great way to build community.

**Before starting the Biodiversity audit or going further, survey your students. Record the average response.**

1. I can define biodiversity. \_\_\_\_\_ Yes \_\_\_\_\_ No
2. Can students help increase biodiversity? \_\_\_\_\_ Yes \_\_\_\_\_ Maybe \_\_\_\_\_ No

### GETTING READY TO ASSESS BIODIVERSITY

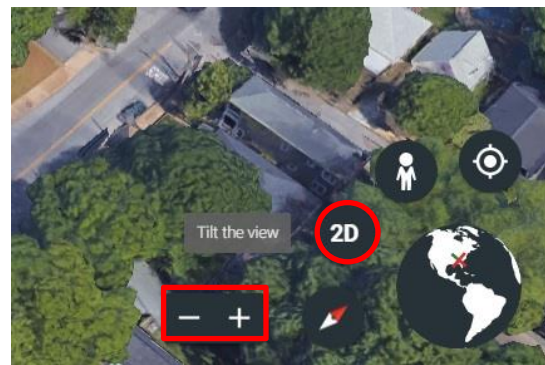
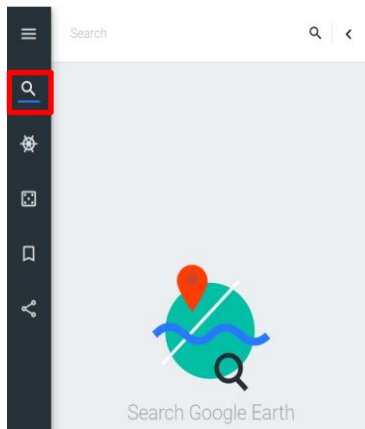
As schools are as diverse as they are numerous across the United States, it is hard to prescribe space dimensions that will universally work nationwide. That said, our National Wildlife Federation biologists suggest calculating a **minimum inventory site** based on the overall size of the school's footprint. The advantage of doing so will demonstrate the scale dependencies of assessing biodiversity. Small school areas will have small inventory sites and large school areas will have large inventory sites.

While students in grades K-2 will be able to help with some aspects related to defining the inventory site and observations areas, this task will be mostly left to the adult members of the Eco-Action team. We suggest going through the identification process on your own first to determine how best to structure the learning experience for your students and to determine if support from volunteers is required.

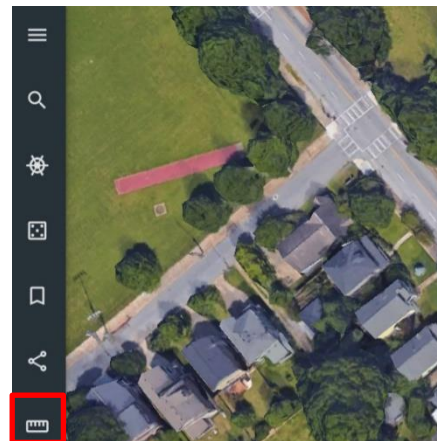


To calculate your school's area (buildings, parking lots, grounds), teams will use [Google Earth](http://www.google.com/earth), [www.google.com/earth](http://www.google.com/earth).

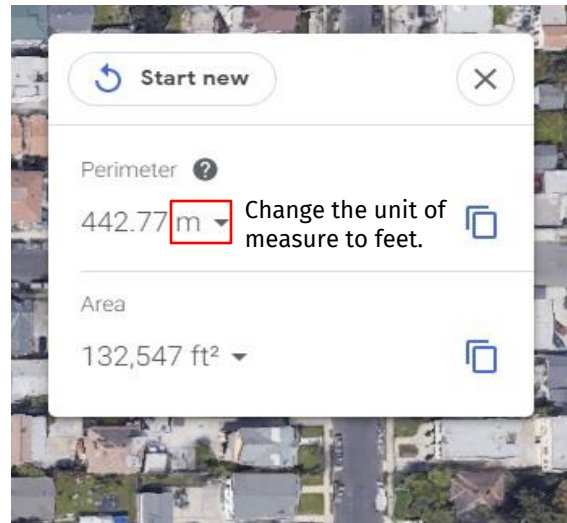
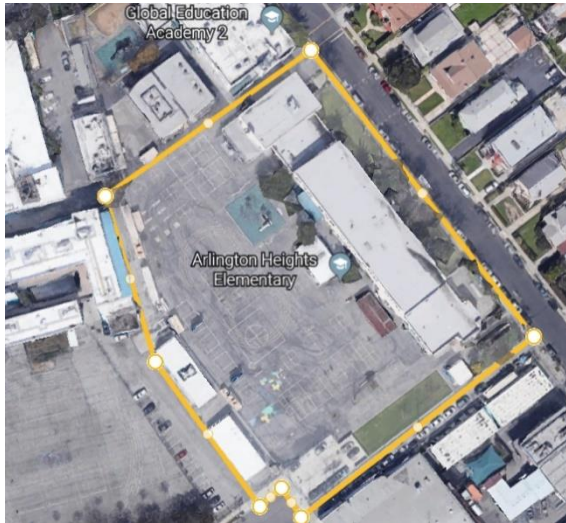
1. Launch Google Earth in Chrome.
2. In the search area, type your school's name or address and click enter. Use the plus sign to zoom in a little closer to your school. Next click, in the bottom right hand corner, 2D.



3. In this view, you will see your school from a "birds-eye" or top-down view. Next click on the ruler icon, found in the left-side navigation.



4. Click to drop the yellow marker on the start of the perimeter or irregular perimeter you are measuring. Click at each corner or turn that's needed, until you end where you started. Once complete a yellow box will outline the perimeter. Once the perimeter is closed, Google has calculated the perimeter and area in meters. If required, change the unit of measure to feet/square feet.



5. Calculate your inventory site. [What is .1% of your school's area?](#) The area of the school above is 132,547 ft<sup>2</sup>. Round this number to the nearest thousand, 133,000 ft<sup>2</sup>. The formula is, .1% of 133,000 (1/1000 x 133,000 is 133 ft<sup>2</sup>).

$$\frac{1}{1000} \cdot \frac{133,000}{1} = \frac{133}{1} = 133$$

Want to check your math? <https://percentagecalculator.net/>). Once you have the square footage you can derive the perimeter; the inventory site for this school is approximately 33 feet by 33 feet (133 ÷ 4 = 33.25). **If .1% of the school's area is less than 25 ft<sup>2</sup>, then use 25ft<sup>2</sup> to identify and mark the inventory site.** Once the perimeter is marked, have students create a minimum of 3, 3 foot (1 meter) by 3 foot (1 meter) observation areas within the larger inventory site to use while assessing plants and fungi and animals, *Tables 3 and 4*. The entire inventory site will be used to assess trees and shrubs.

During periods of observation, students will determine the inventory site's richness and evenness of plant and animal life. **Richness** is the number of species per sample - the more species present in a sample, the richer the sample. **Evenness** is the measure of the abundance of the different species making up the richness of the area. The team needs to observe the entire space. Ask students to slowly look up, down and all around their site. When they look up, do they see birds flying by? Is there a lizard on the tree in the observation area? How many different plants (richness) are in the observation area?





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**TABLE 1. DEFINING THE INVENTORY SITE**

<p>1. Is your school in a city, just outside of a big city or in the country?</p>																																							
<p>2. After identifying the area(s) for use and while investigating biodiversity, mark all the boxes that describe the land cover observed in the <b>inventory site</b>.</p>	<p>___ concrete</p>	<p>___ asphalt</p>																																					
	<p>___ bare soil</p>	<p>___ trees</p>																																					
	<p>___ grass</p>	<p>___ rocky/pebbles</p>																																					
	<p>___ garden</p>	<p>___ stream/river</p>																																					
	<p>___ pond</p>																																						
	<p>___ containers on concrete/asphalt</p>																																						
<p>3. What are the GPS coordinates for your investigation site? Use your smartphone's GPS or go to: <a href="https://nomessgps.com/">https://nomessgps.com/</a> to find the coordinates.</p>	<p>Latitude N _____</p> <p>Longitude W _____</p>																																						
<p>4. What is the perimeter of each <b>observation area</b>?</p>	<table border="1"> <thead> <tr> <th colspan="2">SITE 1</th> <th colspan="2">SITE 2</th> <th colspan="2">SITE 3</th> </tr> </thead> <tbody> <tr> <td>Side 1</td> <td>ft</td> <td>Side 1</td> <td>ft</td> <td>Side 1</td> <td>ft</td> </tr> <tr> <td>Side 2</td> <td>ft</td> <td>Side 2</td> <td>ft</td> <td>Side 2</td> <td>ft</td> </tr> <tr> <td>Side 3</td> <td>ft</td> <td>Side 3</td> <td>ft</td> <td>Side 3</td> <td>ft</td> </tr> <tr> <td>Side 4</td> <td>ft</td> <td>Side 4</td> <td>ft</td> <td>Side 4</td> <td>ft</td> </tr> <tr> <td>Total</td> <td>ft<sup>2</sup></td> <td>Total</td> <td>ft<sup>2</sup></td> <td>Total</td> <td>ft<sup>2</sup></td> </tr> </tbody> </table>			SITE 1		SITE 2		SITE 3		Side 1	ft	Side 1	ft	Side 1	ft	Side 2	ft	Side 2	ft	Side 2	ft	Side 3	ft	Side 3	ft	Side 3	ft	Side 4	ft	Side 4	ft	Side 4	ft	Total	ft <sup>2</sup>	Total	ft <sup>2</sup>	Total	ft <sup>2</sup>
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Think about the following question as you summarize the information in Table 1.

1. What are student/team ideas about what plants and animals need to survive and to grow in number?



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## TABLE 2. TREES AND SHRUBS – INVENTORY SITE

THIS TABLE SHOULD REFLECT THE DATA COLLECTED FROM THE COMBINED DATA FROM TEAM WORKSHEETS.

Use the iNaturalist SEEK app or Google Lens app, local field guides and/or local experts to provide identification assistance. If the name of the tree or shrub cannot be found, enter a description.

1. CATEGORY (TREE OR SHRUB)	NAME OR DESCRIPTION	QUANTITY	ALIVE	DEAD	HOLLOW
EXAMPLE. TREE TYPE A, or if tree is known-Live Oak	TALLER THAN THE SCHOOL, LEAVES ARE DARK GREEN ON TOP AND ARE OVAL, BARK IS ROUGH AND DARK GREY	10	8	1	1
<b>TOTALS</b>					
2. <b>Total number</b> of trees and shrubs combined from the inventory site. _____ (If greater than 50, write 50+)					
3. <b>Richness</b> Number of different tree and shrub types _____					



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## TABLE 3. PLANTS AND FUNGI-OBSERVATION AREAS

THIS TABLE SHOULD REFLECT THE DATA COLLECTED FROM THE COMBINED DATA FROM TEAM WORKSHEETS.

Use the iNaturalist SEEK app or Google Lens app, local field guides and/or local experts to provide identification assistance. If the name of the plant or fungus cannot be found, enter a description.

1.	CATEGORY (PLANT OR FUNGUS)	NAME OR DESCRIPTION	QUANTITY	ALIVE	DEAD
	EXAMPLE: PLANT TYPE A, or if type is known-Black-Eyed Susan	AS TALL AS A RULER, YELLOW FLOWERS WITH BIG BLACK/BROWN CENTER	5	4	1
		TOTALS			
2.	<b>Total number</b> of plants and fungi combined from all observation areas within the inventory site. _____				
3.	<b>Richness</b> <b>Number of different</b> plant and fungus types _____				



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**TABLE 4. ANIMALS-OBSERVATION AREAS**

THIS TABLE SHOULD REFLECT THE DATA COLLECTED FROM THE COMBINED DATA FROM TEAM WORKSHEETS.

Insert both the total number of each animal type observed and how many different kinds of each type.

ANIMAL TYPE	NUMBER OF ANIMAL TYPE OBSERVED	NUMBER OF DIFFERENT KINDS OBSERVED
1. <b>B</b>  <b>birds</b>		
2. <b>M</b>  <b>mammals</b>		
3. <b>I</b>  <b>invertebrates</b>		
4. <b>A</b>  <b>amphibians</b>		
5. <b>R</b>  <b>reptiles</b>		
6. <b>F</b>  <b>fish</b>		

**OPTIONAL:** If known list the names of the types of wildlife observed.



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**Think about the following questions as you summarize the data in Table 2-4.**

1. After the team has spent time talking about (analyzing) their observations (data), answer the following questions.
  - Does the team feel like there are enough different kinds of trees and shrubs to support neighborhood wildlife?  
 Yes  No
  - Does the team feel like there are enough different kinds of plants and fungi to support neighborhood wildlife?  
 Yes  No
  - Based on the bird observations, would the team like to see more birds on the school grounds?  
 Yes  No
  - Based on the mammal observations, would the team like to see more mammals on the school grounds?  
 Yes  No
  - Based on the invertebrate observations, would the team like to see more kinds of invertebrates on the school grounds?  
 Yes  No
  - Based on the amphibian observations, would the team like to see more amphibians on the school grounds?  
 Yes  No
  - Based on the reptile observations, would the team like to see more reptiles on the school grounds?  
 Yes  No
  - Based on the fish observations, would the team like to see more fish on the school grounds?  
 Yes  No



