

MFMA SUSTAINABILITY **Student Observation Data Sheet**

USING SPORTS TO UNDERSTAND SUSTAINABLE FORESTRY &
THE ENVIRONMENTAL BENEFITS OF HARDWOOD

www.maplefloor.org

ACTIVITY 1:

Dribble test: Hardwood and Non-wood Alternative (synthetic floor/concrete)

For questions 1 and 2, students will bounce the ball five times in place before passing it to the next student in the group. For questions 3 and 4, students will bounce the ball next to the chalk-measured wall surface to measure ball rebound.

Measuring Ball Rebound (Qualitative)

1. What does the ball sound like when it bounces on the hardwood? What does it feel like
2. What does the ball sound like when it bounces on the non-wood surface? What does it feel like?

Measuring Ball Rebound (Qualitative)

Hold the ball with both hands extended from your chest. Standing next to the measurement wall, drop the ball without any downward motion and measure the rebound height.

3. What height does the ball rebound to when you drop it on hardwood?
4. What height does the ball rebound to when you drop it on the alternative surface?

JUMP TEST: HARDWOOD VS. NON-WOOD ALTERNATIVE (SYNTHETIC FLOOR/CONCRETE)

Understanding Vertical Deflection

Each student will perform the jump test on both surfaces (hardwood and non-wood alternative). Students will progressively jump in sequences of 2, 4, 6, 8, and 10 times, with increasing break times between each sequence of jumps. For example, the first student in each group of three will jump twice and rest for 5 seconds, then jump four times and rest for 10 seconds, and so on, with slightly longer breaks as the number of jumps increases.

Measuring Area Deflection (Qualitative)

1. What does it feel like to jump on the wood?
2. What does it feel like jumping on the non-wood surface?

EXERCISE 1

Record the basic formula for calculating carbon dioxide stored in wood products below.

Basic Formula:

1. Calculate the volume of wood used (m³) by entering in the data below and completing calculation.
 - a. Length of gym floor (ft):
2. Width of gym floor (ft):
 - a. **Calculate the area:** Multiple length x width (ft).
 - b. Answer

3. **Completing volume calculation.** Volume=length x width x height (thickness of floor panels)
 - a. Height of floor panels= 0.95 inches
 - b. Convert 0.95 inches to feet: 0.95 in/ 12 in per foot
 - c. Answer:

4. **Complete the carbon storage calculation.**

kg CO₂=3.67 x .5 x (volume of wood, answer from 4c), x density (650)

 - a. Answer:

5. **Convert to metric tons**

A metric ton is a unit of weight that is equal to 1,000 kilograms or 2,204.6 pounds.

 - a. Divide answer from 5a by 1000.
 - b. Answer:

ACTIVITY 1.1

Dribble test: Hardwood and Non-wood Alternative

1. Visit the following website link: [Species Growth Calculator](#)
2. Recall answer from Exercise 1, question 4c. **Volume:**
3. Use the calculator to determine how long it takes to grow back the volume of wood in your gym floor.
 - a. Select American Hard Maple from the dropdown.
 - b. Multiply the orange number by your volume from Exercise 1, question 4c.
 - i. Time it takes to grow back (answer):

ACTIVITY 1.2

Dribble test: Hardwood and Non-wood Alternative

1. Visit the following website link: [Interactive Forest Map](#). Use the drop downs to select *American Hard Maple*, and the state your school is located.
2. Look at the graph on the right-hand side of the page and enter the data below.
3. Growth:
4. Removals:
5. Subtract the difference between growth and removals.
Answer:

ACTIVITY 1.3

1. Visit the following website link: [Greenhouse Gas Equivalencies Calculator](#). Under step 1, use the drop downs to select emissions data.
2. Under “Enter data for one or more gases,” use the carbon dioxide box and enter your answer from Exercise 1, question 6b. Ensure the units are in metric tons.
3. Scroll down to Step 2 – *View Results*. Write down the greenhouse gas equivalencies or emissions for the number of cell phones charged and other equivalencies you observe.
 1. Number of cellphones charged:
 2. Equivalencies:
 3. Equivalencies:
 4. Equivalencies:
 5. Equivalencies:

4. How do these metrics relate to a school bus?

Consider how many miles a school bus would need to drive to match the amount of carbon dioxide stored in the gym floor.

1. Open the UC Berkeley Report that provides data to support calculating emission equivalencies with school buses. [Download and view report \[here: UC Berkeley School Bus Data\]](#)
2. Scroll down to find page 41 of the report and view the table. In Row V, under “Operation, per vehicle mile traveled (VMT),” a school bus emits 1,600 grams of gasoline per VMT.
3. Convert 1,600 grams per mile to metric tons. (1 ton = 1,000,000 grams).
 - i. Divide 1 million grams by 1,600
 - ii. Answer:
 - iii. Refer to your answer from Exercise 1, question 6b for the carbon dioxide stored in your gym floor. Multiply that answer by the value from 3.i to get the total vehicle miles traveled.

1. Final Answer:

ACTIVITY 2

Use the table below to enter your data and observations while interacting with the local trees/forest. After completing the “Natural Material” exercise, reference the table to record observations for the sensory exercise break.

Hardwood Characteristic	Forest + Tree Data/Observations
Biodiversity	Tree species: Other organisms observed:
Renewability	Number of seedlings/saplings identified from which species: Describe the sunlight exposure in the tree stand, where is light able to reach the forest floor to promote growth:
Natural Material	Natural materials observed:
Sustainability	Describe example and type of the removed or harvested hardwood material and why it may have been removed:
Biodegradable	Describe example of forest debris:
Durable + Long life span	Tree species identified: Janka hardness scale rating of tree identified:
Versatile	Describe discussion and observations about the versatility of the identified tree:

Sensory exercise break! Connection with nature.

Enter observations below:

What does it mean to connect with nature:

Why is it important to build a connection with nature?

What did you observe in your sensory exercise: