World Science Day
for Peace and Development 2015



Today is special day. United Nations Educational, Scientific, and Cultural Organization [UNESCO] has chosen today to promote *Science for a Sustainable Future* Science will be essential to reach many of the goals of the 2030 Agenda for Sustainable Development and, thus, to ensure a sustainable future.

PROBLEM: [summarize in your journal]

In order to celebrate we must remember that all matter on this planet must cycle. Locking waste from your home in a heap on South East edge of Minot is crazy. Our schools daily use of styrofoam lunch trays, using oil to make them, and then burying 500 per day is inexcusable. You must me the ones to make the change, we adults are to old and set in our ways.

PROCEDURE: [answer questions in your journal]

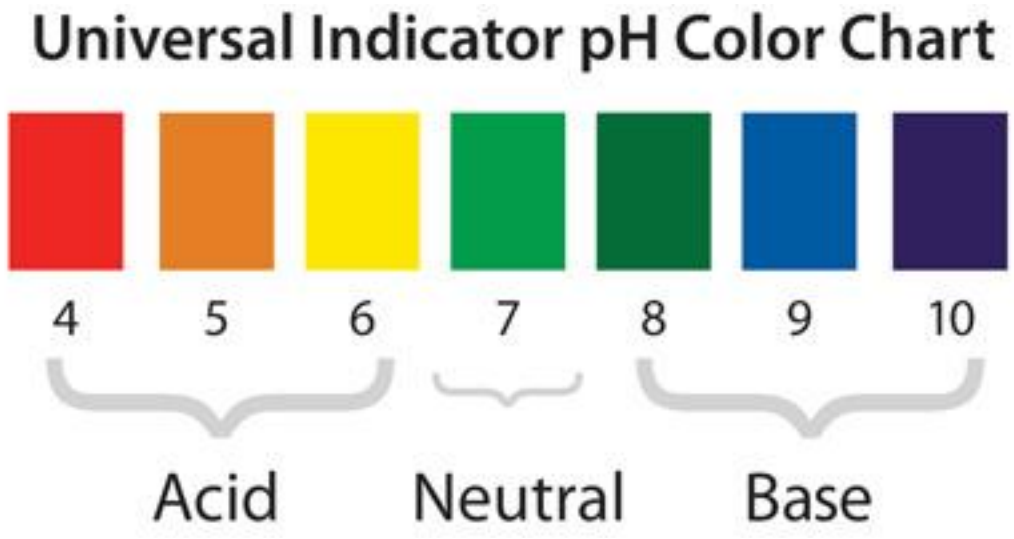
1. Please read the handout "How to Compost", what types of waste go into compost?
2. Write down three things you threw away recently that could have gone into compost.
3. What types of matter cycles through compost? name three atoms.
4. Separate a small amount of waste, try to identify the items in compost.
   [warning this compost is a bio hazard, do not touch]
5. Make a table of the types of materials in this compost and what percent of sample they occupy. [browns and greens]
6. Measure the pH of waste, develop a method to mix distilled water with waste, filter and record the pH. Draw a picture of your groups method.

DATA TABLE - see procedure step 5

RESULTS/ ANALYSIS [answer in your journal, paraphrase the question]

1. From reading, what percent of your household waste can be composted?
2. What percent is composted from Minot Public Schools?
3. What was the largest component of compost sample?
4. Compare your results with the other groups in room, what changes do you notice.
5. What is the difference between brown and green waste
6. How is this similar to your digestive system?
7. Why does compost have to have water and air?
8. What percent of household waste could be composted?

CONCLUSION: WHY IS THIS AN IMPORTANT ISSUE FOR TODAY, science for a sustainable future?



Greens are high in **nitrogen or protein**, thus organic nitrogen sources. These products help the composting microherd to grow, breed, and multiply fast in the piles, thus creating extreme internal temperatures in hot compost piles.

Browns are high in **carbon or carbohydrates**, thus organic carbon sources. These products supply the energy and food that mostly all soil organism need to survive. Carbons also help absorb the offensive odors and capture and help prevent most of the organic nitrogen in the piles from escaping by evaporation or leaching. Carbons are also essential in the faster formation of humus from the organic matter in a composting process.

A simple test to determine if your organic matter is a "green" or a "brown", is to wet it, and wait a few days. If it stinks, it is definitely a green. If not, it's a brown.

Normal compost has a C:N ratio ranging from **25:1 to 30:1**. This is considered the origin or dividing line for all organic materials.

Any organic matter that a C:N ratio **smaller** than 30:1 is considered a **GREEN**.

Any organic matter that a C:N ratio **larger** than 30:1 is considered a **BROWN**.

Alfalfa Hay can be brown in color, but it is always a **"GREEN", or "NITROGEN"** source because it's C:N ratio is around 12:1.

All Leaves can change from green, to orange, or to brown in color, but they are usually always considered **"BROWNS" or "CARBON"** sources because their C:N is on the average from 40:1 to 80:1. Evergreen leaves are higher in carbons than most leaves. Deciduous leaves are best for composting. Oak leaves (that is fresh green oak leaves, not the dry oak leaves) are an exception. They can be classed as a **GREEN** and should be added as a nitrogen material (Fresh Green Oak Leaves can have a C:N ratio of 26:1).

All animal manures, grass clippings, and food scraps are **"GREENS"**.

All sawdusts, bark mulches, papers, and other wood products are **"BROWNS"**.

Most sugar products are considered "browns" because they have a C:N ratio near 50:1. However all aerobic microbes love sugar as an quick, easily digestible energy food. So by adding a little tea made from molasses, sugar, syrups, or flat soft drinks, to your compost piles, you will increase the microbial activity and internal heating of a compost pile.