**Title:**

Day 8

**Length of Time:**

1 class period between 45-50 minutes

**Opener:**

What happens chemically when something burns?

**Environment:** The classroom desks will be in straight rows. Students will be working in the lab today, with group members given the choice between labs.

**Standards:**

B.3.5 Describe how energy from the sun flows through an ecosystem by way of food chains and food webs and how only a small portion of that energy is used by individual organisms while the majority is lost as heat.

**Objectives:**

Students will compare waxes of various compositions (soy and paraffin) for their energy density. After burning their candles for a set amount of time, students will record the length of wax melted and the mass of melted wax. Students should see that waxes made of a petroleum base (paraffin) burn slower than those of a soy base. (Students may struggle with this come away and may need more instruction or supplemental help to reach this conclusion).

Students completing the calorimeter lab will compare the energy density found in various organic substances. Students will burn these substances and record the temperature change observed in a mass of water. Using a provided equation, the students will determine an estimated energy density for their organic samples, allowing for an easy comparison.

**General Procedure**:

Students will complete daily opener (5 minutes).

Teacher will explain the two lab choices for the period (5-10 minutes).

Group members will chose the lab they are most interested in, but each group must have a member do a different lab. Students will need to record all laboratory data before class is dismissed (35 minutes).

If time remains after lab work, students may begin calculating data for tomorrow.

**Materials:**

Candle lab

* Two Large Birthday candles, tea lights, short tapers, or votive candles
	1. (One should be paraffin wax and the other should be soy/plant based wax)
* Ruler, 30 cm
* Foil pan/Saucer
* Matches
* Balance/Weigh Boat
* Beaker or Glass drinking glass
* Cup of water for extinguished matches
* Stop Watch

Calorimeter lab

|  |  |
| --- | --- |
| Ring stand | 0.5-1.0g of biomass samples (e.g., cotton ball, wood shavings) |
| 1 clamp | 25 mL graduated cylinder |
| Thermometer | Beakers (1-600 mL, 1-250 mL) |
| Large sheet aluminum foil | Wire mesh (4in x 4in square) |
| Distilled water | Lab balance |
| Fireplace matches | 18 x 150 mm test tube |
| Glass stirring rod | Forceps or tweezers to handle sample residues |

**Exit Question**

What is one thing that you now know that you did NOT know when you walked in today?

**Assessment** Students will complete their closing question and need to complete the data reflections for their lab.