**Life-Cycle Assessment GROUP Worksheets**

**~Environmental Impact of Cupcakes~**

**Stage 1: Wet Ingredients**

**Inventory Analysis**

Each component used to make a cupcake has its own life cycle of production, use and waste. You will collect the values for the energy used and greenhouse gases (GHG) emitted during the *production phase* of each ingredient. From the ingredient cards, gather the data of each item needed to make cupcakes for your assigned stage. The information you gather should be enough to make **12** cupcakes.

**Data Collection and Calculations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **You need:** | | | **Calculate This:** | | | |
| **Item** | **Amount** | **Unit** | **Energy Used** | **Unit** | **GHG emissions** | **Unit** |
| Egg | 2 | egg |  | kJ |  | g CO2e |
| Milk | 120 | ml |  | kJ |  | g CO2e |
| Butter | 120 | ml |  | kJ |  | g CO2e |
| Vanilla | 2.5 | ml |  | kJ |  | g CO2e |
| **TOTAL** | | |  | **kJ** |  | **g CO2e** |

Use the space below to calculate the energy used and GHG emissions for each ingredient.

*Example*: 1 egg needs 2000 kJ energy and you need 2 eggs: Energy used = 2 x 2000 kJ = 4000 kJ

**Stage 2: Dry Ingredients**

**Inventory Analysis**

Each component used to make a cupcake has its own life cycle of production, use and waste. You will collect the values for the energy used and greenhouse gases (GHG) emitted during the *production phase* of each ingredient. From the ingredient cards, gather the data of each item needed to make cupcakes for your assigned stage. The information you gather should be enough to make **12** cupcakes.

**Data Collection and Calculations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **You need:** | | | **Calculate This:** | | | |
| **Item** | **Amount** | **Unit** | **Energy Used** | **Unit** | **GHG emissions** | **Unit** |
| Flour | 210 | g |  | kJ |  | g CO2e |
| Sugar | 230 | g |  | kJ |  | g CO2e |
| Baking powder | 6 | g |  | kJ |  | g CO2e |
| **Total** | | |  | **kJ** |  | **g CO2e** |

Use this space to calculate the energy used and GHG emissions for each item.

*Example*: 1 egg needs 2000 kJ energy and you need 2 eggs: Energy used = 2 x 2000 kJ = 4000 kJ

**Stage 3: Baking Materials**

**Inventory Analysis**

Each component used to make a cupcake has its own life cycle of production, use and waste. You will collect the values for the energy used and greenhouse gases (GHG) emitted during the *production phase* of each ingredient. From the ingredient cards, gather the data of each item needed to make cupcakes for your assigned stage. The information you gather should be enough to make **12** cupcakes.

**Data Collection and Calculations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **You need:** | | | **Calculate This:** | | | |
| **Item** | **Amount** | **Unit** | **Energy Used** | **Unit** | **GHG emissions** | **Unit** |
| Paper liner | 12 | liner |  | kJ |  | g CO2e |
| Metal cupcake tray | 1 | tray |  | kJ |  | g CO2e |
| Metal mixing bowl | 1 | bowl |  | kJ |  | g CO2e |
| **Total** | | |  | **kJ** |  | **g CO2e** |

Use this space to calculate the energy used and GHG emissions for each item.

*Example*: 1 egg needs 2000 kJ energy and you need 2 eggs: Energy used = 2 x 2000 kJ = 4000 kJ

**Stage 4: Oven Baking**

**Inventory Analysis**

Each component used to make a cupcake has its own life cycle of production, use and waste. You will collect the values for the energy used and greenhouse gases (GHG) emitted during the *production phase* of each ingredient. From the ingredient cards, gather the data of each item needed to make cupcakes for your assigned stage. The information you gather should be enough to make **12** cupcakes.

**Data Collection and Calculations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **You need:** | | | **Calculate This:** | | | |
| **Item** | **Amount** | **Unit** | **Energy Used** | **Unit** | **GHG emissions** | **Unit** |
| Electricity (177°C) | 20 | minute |  | kJ |  | g CO2e |

Use this space to calculate the energy used and GHG emissions for each item.

*Example*: 1 egg needs 2000 kJ energy and you need 2 eggs: Energy used = 2 x 2000 kJ = 4000 kJ

**Stage 5: Frosting**

**Inventory Analysis**

Each component used to make a cupcake has its own life cycle of production, use and waste. You will collect the values for the energy used and greenhouse gases (GHG) emitted during the *production phase* of each ingredient. From the ingredient cards, gather the data of each item needed to make cupcakes for your assigned stage. The information you gather should be enough to make **12** cupcakes.

**Data Collection and Calculations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **You need:** | | | **Calculate This:** | | | |
| **Item** | **Amount** | **Unit** | **Energy Used** | **Unit** | **GHG emissions** | **Unit** |
| Sugar | 800 | g |  | kJ |  | g CO2e |
| Milk | 5 | ml |  | kJ |  | g CO2e |
| Butter | 240 | ml |  | kJ |  | g CO2e |
| Vanilla | 5 | ml |  | kJ |  | g CO2e |
| **Total** | | |  | **kJ** |  | **g CO2e** |

Use this space to calculate the energy used and GHG emissions for each item.

*Example*: 1 egg needs 2000 kJ energy and you need 2 eggs: Energy used = 2 x 2000 kJ = 4000 kJ

**Stage 6: Disposal**

**Inventory Analysis**

Each component used to make a cupcake has its own life cycle of production, use and waste. You will collect the values for the energy used and greenhouse gases (GHG) emitted during the *production phase* of each ingredient. From the ingredient cards, gather the data of each item needed to make cupcakes for your assigned stage. The information you gather should be enough to make **12** cupcakes.

**Data Collection and Calculations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **You need:** | | | **Calculate This:** | | | |
| **Item** | **Amount** | **Unit** | **Energy Used** | **Unit** | **GHG emissions** | **Unit** |
| Landfill paper liner | 12 | liner |  | kJ |  | g CO2e |
| Compost paper liner | 12 | liner |  | kJ |  | g CO2e |

Use this space to calculate the energy used and GHG emissions for each item.

*Example*: 1 egg needs 2000 kJ energy and you need 2 eggs: Energy used = 2 x 2000 kJ = 4000 kJ