Name: ________________________________

Use www.worldfactbook.com search engine to answer the following questions

**Country:** Kenya
Life expectancy: Male 44.79 yrs  Female 45.1 yrs
Highways: Paved 9137 km  Unpaved 56,205 km
Number of tractors: ______
Arable land: 8.08 %

The climate of this country: Tropical
Temperature range:
Low _________  High _________
Rainfall (determine inches or mm):
Low _________  High _________

Terrain- types of land and soil: low plains, rift valley, fertile plateau

Agricultural products – what people eat and grow: tea, coffee, cotton, wheat, sugar, fruit, vegetables, dairy products, beef, pork, poultry, eggs

Total population: 32,021,852, year: 2004

**Labor force by occupation:**
Year 2002  Agricultural  14.7 %
Year 2003  Services  51.8 %
Year 2002  Industry  18.6 %

Literacy rate
Male 96.6 %  Female 79.7 %  year 2003

(Amosako/Narishkin 2003)
How Do They Help Out?

Each part of a plant has a different function. Each is very important in order for the plant to grow healthy and strong.

Try to match the plant parts with their functions.

- **stem**
  - This part keeps the plant in the soil.
  - It also collects moisture from the soil.

- **leaves**
  - This part helps the plant stand up.
  - It carries moisture and food to all parts of the plant.

- **roots**
  - This part makes seeds so we can grow new plants.

- **flowers**
  - This part makes food for the plant from the sun's rays and carbon dioxide.
photosynthesis

A process by which a plant produces its food using energy from sunlight, carbon dioxide from the air, and water from the soil.
Plant Parts
Can you fill in the blanks with the correct words?

stem  flower  leaf  roots

Name: ________________________________

Name ________________________________
Flower Facts

Why Do Plants Have Flowers?

The goal of every plant and animal is the same: To create the next generation. The way a plant makes another generation of its species is by making seeds. Flowers are the tools that plants use to make their seeds.

A seed contains all the information needed to make a new plant. This information is stored as a code in tiny genes within the seed. This genetic code forces the seed to grow into a plant like its parents. Although the new plant will be the same species as its parents, it will not be exactly the same as either of them. Its genetic code is a new mix of genes, half from each parent.

Only flowers from the same species of plant can produce seeds. A flower provides a place to combine the genetic code from a male and a female into a single seed. The combination happens when the pollen, from the male parts of one flower, connects with an ovule (egg) from the female parts of another flower. This is called pollination.

Here are the basic parts of a flower:

Inside a flower:

But how does the pollen from one flower get to the ovules of another flower? Unlike animals, plants can't exactly go out hunting for a mate! Instead of working very hard at attracting each other, plants make flowers to attract pollinators to do the work of mating for them.

Pollinators can be bees, flies, beetles, moths, hummingbirds, bats and other animals that visit flowers. They gladly travel from flower to flower to gather the nectar and pollen to feed themselves or their young. The plants make the nectar and pollen just to attract the pollinators. Flowers are like big signs that advertise to pollinators: Eat Here!
When a pollinator goes into a flower to collect nectar or pollen, tiny grains of pollen from the **anthers** of the flower (the male parts) stick to their bodies. When the pollinator visits another flower of the same species, some of this pollen brushes onto the sticky **stigma**. The stigma is the receiving end of the **pistil** (the female part of a flower), where the ovules (eggs) in the **ovary** wait to be fertilized by the pollen. The pollen travels from the stigma, down the style, to the ovary. When an ovule is fertilized, the genes from the pollen combine with the genes of the ovule and a seed is made!

![Picture of pollination](image)

1. The pollinator receives **pollen** from the **stamen** of the first flower.
2. And deposits it on the **stigma** of the next flower.
3. The pollen moves down the style to join with the **ovules** in the **ovary**.

This is how it happens:

The job of a flower is to help its pollinator put pollen exactly in the right place at the right time to make a seed. When a plant’s flower succeeds at this, the plant gets to pass the secret for this success to the next generation, through the genetic code in its seeds! When a plant fails to grow up and make seeds, its genetic code does not get passed on. It becomes a loser in the game of life.

The environment is constantly testing each plant. Competition for sunlight, water, nutrients and space is fierce. **Herbivores** are hungry and plants are their breakfast, lunch and dinner! Only the strongest individuals survive long enough to reproduce. These survivors keep making seeds, letting the environment select the winners and losers. Through this selection process plants have **evolved** (developed) to survive life in every habitat on our planet. This **evolution** has filled even the harshest habitats with life, including vernal pools.

Although the pollination of a flower may appear to happen by accident, plants and pollinators have been practicing for millions of years to make sure that this “accident” happens. Often a plant and pollinator co-evolve (evolve together), adapting to changes in each other to improve their own survival. A plant species may depend on a single species of pollinator to make its seeds. Likewise, many pollinators rely on one plant species to provide all the food for their young. The complex relationship between solitary bees and certain vernal pools plants is a good example of this co-evolution.
Name: 

**Flower Parts & Pollination Worksheet**

Fill in the boxes with the name of the flower part from the words in the box below. Color the petals red, the sepals green, and the pollen yellow.

![Diagram of a flower with labeled parts: stigma, petals, style, anther, ovary, filament, sepal, filet, leaf, style, stigma, twig.]

| anther | filament | stem | ovary | petal | sepal | leaf | style | stigma | twig |

**How Pollination Works**

Fill in the blanks.

1. For plants to make seeds, the pollen from the [anther] of one flower needs to fertilize the ovule of another flower.

2. The seeds are produced in the flower’s [ovary], at the base of the pistil.

3. A variety of critters collect pollen and nectar to feed themselves and their young. These critters also carry pollen from one flower to another and are called [pollinators].

4. Name at least four critters that might be pollinators:
   - [bees]
   - [bats]
   - [moths]
   - [butterflies]
Stems -- The functions of the stem is to 1) hold up the plant and 2) to transport water and nutrients absorbed from the roots up to the rest of the plant and to transport energy containing compounds made in the leaves down to the rest of the plant. To perform the function of holding up the plant the stem must be strong enough to support the weight of all the branches and leaves that are above the stem. The thickness and rigidity of the stem will depend on the size of the plant.

To perform the function of transporting water, nutrient, and energy containing compounds, the stem must have veins (tubes) that run up and down the inside of the stem (you might want to ask the students if they have ever noticed the string-like veins in celery, which is a stem that we eat).

Leaves -- The function of the leaves is to capture energy from the sun and store this energy in carbon-based molecules through the process of photosynthesis. The students will learn more about photosynthesis in the next lesson. The leaves are thick and wide in order to have maximum surface area facing the sun.

Flowers -- The function of the flower is to enable the plant to produce seeds, the flower often has large petals that lead to the center to enable insects that germinate the flowers to get in.

Fruit -- The function of the fruit is to store seeds and to give nourishment to the seeds. The seeds are most often stored deep within the fruit to protect them. (Strawberries are an exception since the seeds are on the outside.) The skin of the fruit serves as the protector and the “fleshy” part of the fruit serves as storage for nutrients for the seeds.

Seeds -- The function of the seeds is to enable the plant to reproduce. Different plants have different size, shape and weight seeds. Some plants have small light seeds that are easy to distribute since they can blow in the wind. However, other plants have large seeds (like peaches) that are more challenging to disperse and are usually taken from place to place by people or animals.
Photosynthesis

The Process of energy transformation

Solar Energy (Light)

SUN

Oxygen is released

GREEN LEAF

(CHLOROPLAST)

Solar energy is converted into chemical energy in the chloroplast

then changed into:

Glucose
The plant’s food

= the flow of energy from the sun into the plant’s food

The Process of energy transformation

The combination of 6 carbon dioxide molecules (CO₂) and 6 water molecules (H₂O) produces 1 molecule of sugar (glucose) (C₆H₁₂O₆) and 6 molecules of oxygen (O₂) that get released into the air:

6 CO₂ + 6 H₂O → C₆H₁₂O₆ + 6 O₂
Photosynthesis

Green plants can make their own food by using the process of photosynthesis. Photosynthesis happens in a part of the leaf called the chloroplast. There are millions of chloroplasts in each leaf! The chloroplasts contain a special chemical called chlorophyll. Chlorophyll is green and gives green plants their color.

Chlorophyll is very special because it can trap the light energy that plant leaves get from the sun.

Here is how photosynthesis works. The chloroplasts within the leaves take in carbon dioxide (CO₂) from the air, water (H₂O) from the soil (that travels from the roots to the stems to the leaves), and light energy from the sun. The CO₂, H₂O, and light energy are put together to make glucose. Glucose is a type of sugar. It is made of carbon (C), hydrogen (H), and oxygen (O) and has lots of chemical energy stored within it. When the CO₂ and H₂O combine to make glucose there is extra oxygen left over. This extra oxygen is released as O₂ into the air. This is the oxygen that we breathe!

Photosynthesis is very important for many reasons. The energy the plants capture from the sun is used by the plants to help them grow. Also, animals depend on this energy as their source of energy too. This is because animals eat plants or eat other animals that ate plants. In addition, plants and animals share another important relationship. Plants take in CO₂ from the air and release O₂ back into the air. Animals (including humans) take in O₂ and release CO₂. Therefore, plants and animals depend on each other.

Photosynthesis Homework:

1. Photosynthesis is the process of converting light energy into chemical energy.

2. Photosynthesis is made possible by the green pigment called chlorophyll.

3. To perform photosynthesis plants need water from the soil, light energy from the sun, and CO₂ from the air.

4. The products of photosynthesis are H₂O and glucose.

5. Light energy for photosynthesis usually comes from the sun.

6. The part of the plant cell where photosynthesis takes place is called the chloroplast.

7. Glucose is a type of sugar. It is made of carbon, hydrogen, and oxygen. It has lots of chemical energy stored within it.

* photo means "light"

** synthesis means "put together"
The Bee and the Brassica: Interdependence

Bees and Brassica plants need each other in order to live. Each one takes something from the other and gives something in return. You might say that they have a real partnership.

Why does a flower need a bee? The main reason is so that the flower can make seeds. The Brassica flower holds both the male and the female parts of the plant. The male parts, the filament and anther, produce the pollen, which looks like fine yellow powder. Pollen must travel to the female parts, the pistil and stigma, of another flower on a different Brassica plant. Unless the pollen from one plant can reach another plant, no new seeds will form. Then, no new Brassica seedlings will grow.
So it is very important that the pollen get from one plant to another. But the problem is that the pollen is sticky and cannot easily travel in the wind. How can the pollen travel? That's where the worker bee comes in. With its bright yellow color and sweet perfume, the flower lures the bee and offers not only one but two kinds of food: nectar and pollen.

The bee's body is covered with feathery hairs. As the bee dips her head into the flower to sip the sweet nectar deep inside the blossom, her hairy body rubs against the anthers holding the pollen. Her body traps some of it. When the bee flies off to the next flower, some of the pollen on her body sticks to the stigma there.

Now the bee has done her job. The bee has collected two kinds of food from the flower. At the same time, it has carried pollen from one flower to another. New seeds will form. Soon new flowers will bloom.
The United Nations

Name: Nick Ewener

In what year was the UN established? 24th October 1945

How many countries are members? 191

If the United Nations is not a world government, what is it? Or what do they do?

A group of nations that help 3rd world countries

Where is the United Nations building?

New York

What are the six main organs of the UN? General Assembly, Security Council, Economic and Social Council, Trusteeship Council, Secretariat, International Court of Justice

What is the General Assembly?

An Parliament of Nations

(Amoako & Narishkin 2006)
General Assembly

They consider and make recommendations on the principles of cooperation including the principles governing disarmament. They discuss any question relating to international peace.

Security Council

They have power for the maintenance of national security.

They rotate every month.

Economics and Social Council

They coordinate Economic and Social affairs.

They review UN Funds and programs.

Trusteeship

They settle self-independence.

Secretariat

The Secretary-General heads this party.