PHASEOLUS
LESSON ONE
PHASEOLUS and the FABACEAE

In this lesson we will begin our study of the GENUS *Phaseolus*, a member of the Fabaceae family. The Fabaceae are also known as the Legume Family. We will learn about this family, the Fabaceae and some of the other LEGUMES. When we study about the GENUS and family a plant belongs to, we are studying its TAXONOMY.

For this lesson to be complete you must:

_____ do everything in bold print;

_____ answer the questions at the end of the lesson;

_____ complete the world map at the end of the lesson;

_____ complete the table at the end of the lesson;

_____ learn to identify the different members of the Fabaceae (use the study materials at www.geauga4h.org); and

_____ complete one of the projects at the end of the lesson.

Parts of the lesson are in underlined and/or in a different print. Younger members can ignore these parts. WORDS PRINTED IN ALL CAPITAL LETTERS may be new vocabulary words. For help, see the glossary at the end of the lesson.

INTRODUCTION TO THE FABACEAE

The genus *Phaseolus* is part of the Fabaceae, or the Pea or Legume Family. This family is also known as the Leguminosae. TAXONOMISTS have different opinions on naming the family and how to treat the family.

Members of the Fabaceae are HERBS, SHRUBS and TREES. Most of the members have alternate compound leaves. The FRUIT is usually a LEGUME, also called a pod. Members of the Fabaceae are often called LEGUMES. Legume crops like chickpeas, dry beans, dry peas, faba beans, lentils and lupine commonly have root nodules inhabited by beneficial bacteria called rhizobia. The relationship between the bacteria and plant is symbiotic. Symbiosis is a relationship in which both organisms benefit. The bacteria convert nitrogen from the atmosphere into fixed nitrogen (NITROGEN FIXATION), which benefits the

plant. In turn, the plant provides the bacteria with nutrients. NITROGEN FIXATION is an important characteristic of the FABACEAE.

The Fabaceae are one of the three largest families of flowering plants. It has 690 GENERA with 13,000 SPECIES. The Pea Family is found all over the world. It contains some of the most important agriculture crops. Some of these crops are used as human food, for example beans, peas, lentils, cowpeas, soybean, and peanuts. Legumes which are grown for their SEEDS are also called grain legumes. Legumes are also important sources of animal food. These include soybeans but also FORAGE crops like clover, lupine and alfalfa. FORAGE is plant material eaten by grazing animals.

Legumes are important as foods and FORAGE because the seeds and plants are high in protein. LEGUMES are also important in crop rotation because they can fix nitrogen through a process called NITROGEN FIXATION. Adding nitrogen to the soil allows plants to grow better. NITROGEN FIXATION will be studied in a later lesson.

Another word associated with the Fabaceae is the word PULSE. The Food and Agriculture Organization of the United Nations defines PULSES as: "annual leguminous crops yielding from one to twelve grains or seeds of variable size, shape and color within a pod. Pulses are used for food and animal feed. " The word PULSE is not used for green beans or green peas, they are considered vegetable crops. It is also not used for crops which are used mostly for oils, for example soybeans and peanuts. Also not included in PULSES, are crops which are used for seed.

The Leguminosae are also important because half of the first plants DOMESTICATED in the Fertile Crescent, (Southwest Asia or the Middle East) were LEGUEMS. These plants were DOMESTICATED between 8,000 B.C. and 6000 B.C. (or 8,000 to 10,000 BP or Before Present). These first DOMESTICATED plants of the Fertile Crescent are known as 'founder crops'.

The **Neolithic founder crops** (or 'primary domesticates') are the eight species of plant that were domesticated by early Holocene (Pre-Pottery Neolithic A and B) farming communities in the Fertile Crescent region of Southwest Asia. They consist of flax, three cereals and four pulses, and are the first known domesticated plants in the world. These plants are:

Cereals

- Emmer (*Triticum dicoccum*, descended from the wild *T. dicoccoides*) – a type of wheat
- Einkorn (*Triticum monococcum*, descended from the wild *T. boeoticum*) – a type of wheat

- Barley (*Hordeum vulgare/sativum*, descended from the wild *H. spontaneum*)

Pulses

- Lentil (*Lens culinaris*)
- Pea (*Pisum sativum*)
- Chick pea (*Cicer arietinum*)
- Bitter vetch (*Vicia ervilia*)

Other

- Flax (*Linum usitatissimum*)

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Some experts also include Broad bean (*Vicia faba*) in this list.

We will concentrate on the genus *Phaseolus* over this next year. However, we will begin by learning about other members in the Pea Family. In this lesson we will talk about different GENERA. You will be expected to identify the different members of the Fabaceae discussed below.

Family Portrait of the Fabacaea - Members of the Family

Below are some examples of the Fabaceae. Remember, there are 690 GENERA and 13,000 SPECIES in this family. This 'Family Portrait' includes only a few of the family members, but some very important ones!

There are line drawings or colored drawings for some of the SPECIES described below. These types of drawings are important parts of TAXONOMY books. Many of the drawings will show the leaves, flowers and fruits of the plant, sometimes even seeds. Take a close look at these drawings. You will be making a similar drawing of the plant you will grow (see Lesson 2). Some SPECIES have a photograph of the organ which is the most important agricultural or horticultural product of the SPECIES. For others, there is simply a photograph to help you identify the plant. Read the information about each GENUS and SPECIES carefully and complete the map assignment and the table at the end of the lesson. Use the Fabaceae Family Portrait and the interactive study guide at the WEB site (geauga4h.org) to help you learn the common and scientific names of these important or interesting plants.

Members of the Fabaceae which we will study are:

1. *Phaseolus vulgaris* - bean
2. *Pisum sativum* – garden pea
3. *Arachis hypogaea* – peanut
4. *Lathyrus odoratus – sweet pea*
5. *Trifolium* – clover genus
6. *Robinia* –
7. *Gleditsia triacanthos* L. – honey locust
8. *Glycine max* – soybean
10. *Vicia faba* – broad bean
11. *Cicer arietinum* L. – chickpea
12. *Lens culinaris* – lentil
13. *Lupinus* – lupine genus
14. *Medicago sativa*- alfalfa
15.. *Acacia* – acacia genus

Different members of the Legume Family are listed below with a brief description of each member. Club members in elementary school and junior (middle) high only have to study #1 to #7.

1. Phaseolus vulgaris – common bean

Prof. Dr. Otto Wilhelm Thomé
Flora von Deutschland Österreich und der Schweiz.
1885, Gera, Germany

© Park Seeds. Used with permission.

Habit: herb
Life Cycle: annual
Leaves: trifoliate pinnate compound
Flower: papilionaceous
Fruit: legume

The word “bean” is used for plants and fruits of many different GENERA. Originally it was used for the broad bean, or Vicia faba. However when other bean-type fruits came from other parts of the world, the word was extended to several different plants. Bean is even used for the fruits of plants which are not “beans” at all. However their FRUITS resemble beans, for example coffee beans, cocoa beans, and vanilla beans.

The beans we are familiar with in chili and in our gardens belong to the Phaseolus GENUS. We will study several SPECIES of Phaseolus in Lesson Two. In this introduction to the legumes, we will look only at one SPECIES in this GENUS, Phaseolus vulgaris. The SPECIES Phaseolus vulgaris includes green beans, wax beans, and dry beans.

The common bean, Phaseolus vulgaris, comes from the Americas, from Central America and the Andes. The whole FRUIT, known as LEGUMES or pods, are eaten from green or wax beans. The SEEDS are eaten from varieties we call dried beans. Phaseolus vulgaris is a HERB and a WARM SEASON ANNAUL. Some types are VINES while other varieties are bushy. Pods can be green, yellow, black or purple from 8 to 20 centimeters long. The pods have 4 to 6

SEEDs. FLOWERS come in white, pink or purple. The PAPILIONACEOUS FLOWERS are typical of the family. This FLOWER type is sometimes called a pea flower. Take a good look at the illustration above. Label a FLOWER, a FRUIT, and a SEED.

2. *Pisum* sativum - Pea

Prof. Dr. Otto Wilhelm Thomé Flora von Deutschland, Österreich und der Schweiz 1885, Gera, Germany. Permission granted to use under GFDL by Kurt Stueber

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Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

Pisum sativum is the common garden pea. As with the word “bean”, the word “pea” can refer to several plants. *Pisum sativum* is the pea that we eat and call green pea or garden pea. In the South cowpeas, another LEGUME, are called peas. Peas originate in the Near East. They have been found in archaeological sites that date back to 7500 B.C.

Peas are ANNUALS and a COOL SEASON crop. SEEDS can be planted when the soil is 10°C. Plants grow best when it is cool, between 13 and 18°C. They will not thrive in the heat of summer. Some CULTIVARS of peas can be picked in 60 days.

Peas are vines or low growing plants. Vines have tendrils from the leaves. They can be up to 2 meters high. In many areas, fruit tree pruning comes just before planting peas. Sometimes vining peas are planted so that they can grow up branches that have been pruned from trees. These are called “pea bushes”. Peas have PAPILIANCEOUS FLOWERS and a LEGUME or pod for a FRUIT. **Take a good look at the illustration above. Label a FLOWER, a FRUIT, and a SEED.**

3. Arachis hypogaea – Peanut

Koehler's Medicinal-Plants 1887 Public domain

© Park Seeds. Used with permission.
Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

Arachis hypogaea is the peanut. Peanuts are also known as goobers, goober peas, groundpeas, ground nuts, pindas, jack nuts, pinders, manila nuts monkey nuts, and earth nuts. Its origins are in southern Bolivia and northern Argentina. There are archaeological records showing that peanuts were cultivated before 2000 B.C. in Peru.

Peanuts are warm season ANNUALS or PERRENNIALS. To thrive, peanuts need hot summers and sandy soils. Plants grow to 1 to 1 ½ feet tall. The FLOWERS are typical pea flowers in shape. They are yellow with red veins. The FRUIT are LEGUMES also called pods.

Peanuts have a special and interesting development of FRUITS. The LEGUME or pod develops underground. How does this happen? After FLOWERS are POLLINATED, the PEDUNCLE, or stem of the young pod, grows longer and longer. Eventually the pod is pushed into the ground. In the ground, the pod

matures. Once mature, the pod opens. The two SEEDS inside the pod can begin to grow. Scientists think that burying the pod in the ground promotes seed survival in dry periods.
Take a good look at the illustration above. Label a FLOWER, a FRUIT, and a SEED.

4. *Lathyrus odoratus* - sweet pea

W. Curtis *Botanic Garden* 1789

© Park Seeds. Used with permission.

Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

Lathyrus odoratus is the sweet pea. Sweet peas are a flowering vine. They are COOL SEASON ANNUALS. They are grown in gardens for their sweet scented and beautiful FLOWERS. Henry Eckford bred more than 115 CULTIVARS of sweet pea. Sweet peas were the flower sensation of the Victorian era. The sweet pea is native to the eastern Mediterranean region, from Sicily to Crete.

The vine grows to 1 to 2 meters and needs support. The original color of the flowers is purple. Now, there are CULTIVARS of many different colors. It is important to remember that the seeds are poisonous and should not be eaten.

Take a good look at the illustration above. Label a FLOWER and FRUIT.

5. *Trifolium* – clover genus

USDA-NRCS PLANTS Database / **Britton, N.L., and A. Brown. 1913. *Illustrated flora of the northern states and Canada*. Vol. 2: 355.**

William S. Justice @ USDA-NRCS PLANTS Database
Habit: herb
Life Cycle: annual, biennial, perennial
Leaves: palmate trifoliate compound
Flower: papilionaceous
Fruit: legume

The GENUS *Trifolium* has 300 SPECIES. Clovers are small plants which can be ANNUALS, BIENNIALS, or PERRENNIALS. Members of the GENUS are found all over the world. However, most of the SPECIES are found in the Northern Hemisphere. Clovers grow in areas where it is cool and moist or they grow during moist and cool seasons in areas which get hot. Although there are SPECIES that are native to North America, the important agricultural clovers come from Europe. Clovers play an important role in agriculture. Because they FIX NITROGEN they are important as a soil cover. They are an important FORAGE or food source for grazing animals and for bees for making honey. Clovers are the most important honey plant for bees. Flowers can be red, purple, white or yellow. Clovers have pods as FRUITS.

Trifolium pretense is the red clover. It is one of the most important LEGUMES in the world. It is native to Europe, western Asia, and northwest Africa. The colonists brought red clover with them from Europe. Red clover is a short lived PERENNIAL. It is a productive plant for about three years. It is variable in size. Take a good look at the illustration above. Label a FLOWER.

6. *Robinia pseudoacacai* – Black locust

USDA-NRCS PLANTS Database / **Britton, N.L., and A. Brown. 1913. *Illustrated flora of the northern states and Canada*. Vol. 2: 375.**

Larry Allain @ USDA-NRCS PLANTS Database
Habit: tree
Life Cycle: perennial
Leaves: alternate, pinnate compound
Flower: papilionaceous
Fruit: legume

Robinia pseudoacacai is the black locust tree. It is native to North America and Mexico. It is planted as a shade tree. It is a fast growing tree, reaching 30 to 50 feet tall within 20 to 40 years. It rarely lives past 100 years. The trunk can be up to one foot in diameter.

The compound leaves are up to 12 inches long. They fold up and droop when it is cloudy and in the evening. At the base of the leaves there are woody spines. Black locust has many drooping flowers in the late spring. They are white or pink and fragrant. The flowers are a major source of nectar for bees.

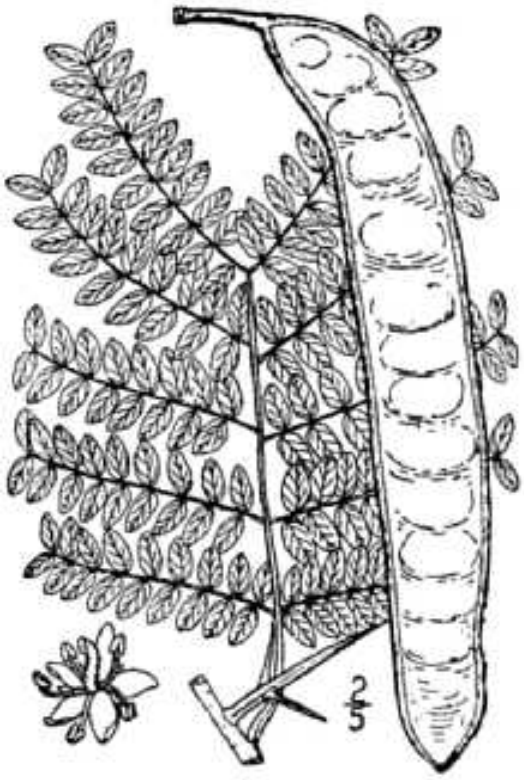
The nectar of the black locust is so abundant that a monofloral honey can result. **Monofloral honey** is a type of honey which has a high value in the marketplace because it has a distinctive flavor or other attribute due to its being predominantly from the nectar of one plant species. In Eastern North America and Europe acacia honey is actually from a false acacia, *Robinia pseudoacacia*, commonly known as black locust, a tree native to eastern North America and widely planted in Europe. The honey in the US is sometimes labeled "American Acacia." Its colour ranges from light yellow to almost colourless. It is sweet and mellow-flavored with a lower acid content than other honeys. Its high fructose content means that it can stay liquid for a long time. The main producers are Bulgaria, Hungary and Romania but it is also found in Canada, China, France and Italy. [Material above taken from Wikipedia under the **GNU Free Documentation License** (GFDL).]

The fruit is 2 to 4 inches long. These pods or LEGUMES stay on the tree until winter. They open while still on the tree.

The other members of the GENUS *Robinia* are trees and shrubs. It is a small GENUS with 4 to 10 SPECIES.

Take a good look at the illustration above. Label a FLOWER and FRUIT.

7. *Gleditsia triacanthos* L. – honey locust



USDA-NRCS PLANTS Database / **Britton, N.L., and A. Brown. 1913. *Illustrated flora of the northern states and Canada*. Vol. 2: 339.**

Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database / **USDA NRCS. 1995. *Northeast wetland flora: Field office guide to plant species*. Northeast National Technical Center, Chester, PA.**

Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

USDA-NRCS PLANTS Database / **Herman, D.E. et al. 1996. *North Dakota tree handbook*. USDA NRCS ND State Soil Conservation Committee; NDSU Extension and Western Area Power Admin., Bismarck, ND.**

USDA-NRCS PLANTS Database / **Herman, D.E. et al. 1996. *North Dakota tree handbook*. USDA NRCS ND State Soil Conservation Committee; NDSU Extension and Western Area Power Admin., Bismarck, ND.**

Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

Gleditsia triacanthos is the honey locust tree. It is native to North America and Asia. Leaves are 8 inches long. Flowers are white-green and very fragrant. Honey locust is a minor source of nectar for bees in May and June. The fruit are 6 to 8 inches long. As the pods dry they become reddish brown and twisted. They mature from September to October. The trees have branched thorns.

There are 12 SPEICES in the *Gleditsia* GENUS.

Take a good look at the illustration above. Label a FRUIT.

8. *Glycine max* - Soybean

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Habit: herb
Life Cycle: annual
Leaves: trifoliate pinnate compound
Flower: papilionaceous
Fruit: legume

Glycine max is known in the United States as soybean and in the United Kingdom as soya bean. The ancestor of the soybean was native to eastern Asia, probably northeastern China. It has been cultivated since 1000 B.C. Many of the plants we study have a wild-growing ancestor. Soybeans, like corn, have been DOMESTICATED so long that it is not possible to trace our modern soybeans to a wild ancestor. Soybeans are a CULTURAL VARIEITY or a CULTIGEN. Although we do not have a wild ancestor, scientists believe that soybean's ancestor was a vine which grew close to the ground.

Soybean is an ANNUAL WARM SEASON crop. It grows to about 2 to 2 ½ feet. The stems, leaves, and FRUITS are covered with fine PUBESCENCE (hairs). The FRUIT is a LEGUME or pod. The flowers are white to purple.

9. *Vicia faba* - Broad bean

Prof. Dr. Otto Wilhelm Thomé *Flora von Deutschland, Österreich und der Schweiz* 1885

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Manitoba Agriculture, Food and Rural Initiatives

Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

Vicia faba is the broad bean. It is also called fava bean, faba bean, horse bean, field bean or tic bean. It was the bean known in Europe before *Phaseolus* beans arrived from America. The broad bean is native to north Africa and southwest Asia. It was domesticated about 8,000 B.C. It is extensively cultivated all over the world.

The plants are 0.5 to 1.7 meters tall. The leaves are compound with 2-7 leaflets. An easy way to tell *Vicia faba* bean plants from *Phaseolus* beans is to compare leaves**. How are the leaves of *Phaseolus vulgaris* different from the leaves of *Vicia faba*?**

_____

The plants have a grey-green color. The broad bean has the typical “pea” flower of the LEGUME Family. **Take a good look at the illustration above. Label a FLOWER, a FRUIT, and a SEED.**

10. Cicer arietinum L. – chickpea

Ferdinand Bernhard Vietz ICONES PLANTARUM MEDICO-OECONOMICO-TECHNOLOGICARUM 1800-1822

Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

(Cicer arietinum) is the chickpea, garbanzo bean, ceci bean, bengal gram, or chana bean. Chickpeas are a COOL SEASON ANNUALS from the Fertile Crescent of the Near East. Chickpeas were one of the first LEGUMES cultivated by humans, dating to 7000-6000 BC.

It grows to be 20 to 50 cm tall. FLOWERS are white or reddish-blue. The FRUIT is a pod or LEGUME.

Take a good look at the illustration above. Label a FLOWER and a FRUIT.

11. *Lens culinaris* - Lentil

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Habit: herb
Life Cycle: annual
Leaves: pinnate compound
Flower: papilionaceous
Fruit: legume

Prof. Dr. Otto Wilhelm Thomé *Flora von Deutschland, Österreich und der Schweiz* 1885,
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Lens culinaris is the lentil. It is a COOL SEASON ANNUAL. It grows to 40 cm. The plant originated in the Near East. There is evidence it was domesticated as far back at 11,000 B.C. BOTANISTS think it may be the oldest cultivated LEGUME.

Pods have two SEEDS each. SEEDS come in many colors including brown, green, black, yellow and red-orange. There are also large and small varieties. Lentils have 25% protein. Except for soybeans, lentils are the vegetable with the highest level of protein. They play a crucial role in the diets of people all over the world. They are especially important to vegetarian populations as in South Asia.

Take a good look at the illustration above. Label a FLOWER and a FRUIT.

12. *Lupinus* – Lupine

Ministere de l'Agriculture, de l'Alimentation, et des Affaires rurales - Ontario

Brother Alfred Brousseau @ USDA-NRCS PLANTS Database

Habit: herb
Life Cycle: perennial
Leaves: palmately compound
Flower: papilionaceous
Fruit: legume

Lupinus is the GENUS of the lupins or lupines. We know them as beautiful garden flowers or have seen them growing wild in huge numbers in New England and out West. One of these SPECEIS is *Lupinus polyphyllus*, pictured above. But, Lupinus is a big GENUS with 150 to 200 SPECIES. It is widely distributed and native to the Mediterranean region and in the Americas.

Other lupins are grown for FORAGE or grain legumes. Some SPECIES are raised for livestock, poultry, or human food.

Some lupins are quite small, others grow to 1.5 m tall. Most are PERENNIAL with a few ANNUALS. All the lupins have a leaf divided into 5 to 17 finger-like leaflets. The leaflets all begin at a central point. Many SPECIES have hairy gray or silvery leaves. The FLOWERS are the typical pea flower. The FRUIT is a LEGUME. As with other LEGUMES, lupins FIX NITROGEN.

13. *Medicago sativa*- alfalfa

Patrick J. Alexander @ USDA-NRCS PLANTS Database

Habit: herb
Life Cycle: annual
Leaves: : trifoliate pinnate compound
Flower: papilionaceous
Fruit: legume

USDA-NRCS PLANTS Database / **Britton, N.L., and A. Brown. 1913.** ***Illustrated flora of the northern states and Canada*****. Vol. 2: 351.**

Medicago sativa is alfalfa. It is also called lucerne, purple medick and trefoil. It is a COOL SEASON PERENNIAL. It grows from 5 to 12 years. It is native to Iran and was DOMESTICATED 1000 to 2000 B.C. Scientists think alfalfa was DOMESTICATED as a FORAGE crop for horses. It is an important FORAGE crop both as pasture and as harvested hay. As with all the LEGUMES, alfalfa is so valuable as a FORAGE because the plants can fix nitrogen. The plant is high in protein when eaten. Remember, nitrogen is a building block of proteins. Also, the plant can grow where soils may not be fertile. Alfalfa is the highest yielding FORAGE plant.

It grows to be 1 meter tall and looks like clover. The root systems are extensive, sometimes over 4 meters long. This large root system makes alfalfa very drought resistant. The FLOWERS are purple.

QUESTION FOR LESSON ONE

Question One:

"Soybeans, together with bananas, barley, common beans, cassavas, coconuts, maize, peanuts, potatoes, rice, sorghum, sugar beets, sugarcane, sweet potatoes and wheat, are man's principal food plants." (from Brooks, H. (Chairman) 1966. *Applied and economic botany. In the plant sciences now and in the coming decade*. Nat. Acad. Sci.—Nat. Res. Council Publ. No. 14.05: 100-114)

Which of these belong to the Fabaceae?

_____

Question Two

Many of the legumes have several names. Why do you think this is?

Question Three

Which plants should you start as soon as possible in the spring?

_____

ASSIGNMENTS FOR LESSON ONE

1. Using the information on the previous, show where the different genera of Fabaceae originated on the map of the world at the end of the lesson. Also complete Table A.

2. Study the common names, scientific names and origins using the exercises at the WEB site (www.geauga4h.org)

PROJECTS FOR LESSON ONE
Do one of the projects listed below.

1. Make a poster showing different members of the Fabaceae family. Use pictures from seed catalogues or draw pictures. Label the pictures with the scientific name and the variety name.

2. Choose a member of the Fabaceae you have never eaten, find a recipe, and prepare the dish for your family. Copy the recipe onto a piece of paper and include your family's opinion of the dish.

GLOSSARY FOR LESSON ONE

annuals - plant which completes its life cycle in one year.
biennial - plant which completes its life cycle in two years
botanist – scientist who studies plant life
cultivar – a cultivated plant which is distinct from other plants
cultural variety or cultigen – name given to plants that do not have a wild counterpart
domestication – wild biological organism is habituated to survive in the company of, or by the labour of, human beings (Wikipedia)
flower –- the reproductive unit of some plants (angiosperms). Parts of the flower include petals, sepals, ovary (the female reproductive organs), and stamens (the male reproductive organs).
forage – herbaceous plant material eaten by grazing animals (Wikipedia)
fruit – the plant structure that develops from the ovary, usually after fertilization by pollen; mature ovary of a seed plant which contains the seed(s)
genus (pl. genera) – a group of plants (or other living things) between a family and a species. A genus has one or more species which have certain characteristics in common. The italicized names are the scientific names of plants. Plants can have many common names, but they each have only one scientific name. The genus (first part of the scientific name) is always capitalized and the species (second part of the scientific name) is not capitalized unless the plant is named after a person.
habit – general appearance of a plant, for example tree, herb, vine
herb – plant that does not form wood
legume –" The common name for plant species in the Family Fabaceae (or Leguminosae); or The name of a type of fruit, characteristic of leguminous plants: A *legume* is a *simple dry fruit* which develops from a simple *carpel* and usually *dehisces* (opens along a seam) on two sides. A common name for this type of fruit is a "pod"," (Wikipedia)
perennial - a plant whose life cycle lasts for three or more seasons; lasting year after year
peduncle - stem like structure which attaches the flower to the stem
pubescence – covering of short hairs
pulse – annual legume yielding 1 to 12 seeds or grains inside a pod
seed - contains the plant embryo
shrub – a woody perennial smaller than a tree, usually with several stems
species – a group of similar organisms which breed only among themselves, see genus above.
taxonomy - The classification of organisms based on genetic similarities
tree - a woody self-supporting perennial plant usually with a single main stem and generally growing more than 20 feet tall.

variety - a plant which retains most of the characteristics of the species, but differs in some way such as flower or leaf color, size of mature plant, etc. A variety is added to the specific binomial and preceded by "var.," such as *saxatilis* in the epthet *Juniperus communis* var. *saxatilis.*
vine - a plant that trails, clings, or twines; it requires support to grow vertically.