growing & caring for your plants

Petunia

Sprouting Your Seed

Petunia seed is very small; your seeds have been pelletized for ease of handling. The pellet is a clay coating that is put around the seed to make it easy to see. It is important to completely break down the pellet so your seed can germinate. To achieve this, simply press the seed pellet into the soil; do not cover the seed with media. Light is required for germination. You will need to saturate the media for 24 hours. This will supply enough moisture to break down the clay coating. After the first 24 hours of soaking, and once the pellet has melted away, allow the planting media dry out completely. Then you can water your plants as needed. You want to maintain an even moisture level; do not over water young plants. Also take care not to water too frequently. You can allow the seedlings to dry out slightly between watering. Place the container inside the germination bag and seal with a rubber band. Place the container on a bright windowsill where it will receive plenty of light. Your seed will germinate in 1-2 weeks. You can remove the container from the germination bag 1 week after germination.

Growing On

After your Petunia seed sprouts, it is best to water your plants in the early morning. You should rotate your plants every couple of days. This will promote an even, full growth habit.

You can plant your Petunia outside in your 4' x 4' garden after the plants are well established and all fear of frost has passed. Petunias require full sunlight to grow well, but they will tolerate some shade. The more shade they receive, the fewer flowers they'll produce. Soil should be average to rich and well drained. Prior to planting work a shovelful or two of organic matter, such as compost or well aged manure, into the soil. You will want to dig a planting area twice the size of your soil and root mass. Chop up or loosen the soil at the bottom of your planting hole. This helps condition the soil, which improves drainage, and will also increase the ability of lighter soils to hold water and nutrients.

For good ground cover, space your Petunias 12-18 inches apart. Fertilize monthly with a balanced organic fertilizer to promote healthy growth, and remove spent flowers on a regular basis to extend the blooming period. You can also pinch off the top growth at the node or point of branching; this will cause the plant to branch out and display a more uniform bushy habit. Flowers will start to appear in as little as twelve weeks.

Thumbelina Zinnia

Sprouting Your Seed

Thumbelina Zinnia is very easy to germinate and grow. When sowing your seeds only cover them with 1/8th of an inch of soil. Place the container inside the germination bag and seal with a rubber band. Place them on a windowsill or in bright light. Keep the soil moderately moist during germination. Seeds will germinate in a week. You can remove the container from the germination bag 1 week after germination.

Growing On

After your Zinnia seed sprouts, it is best to water your plants in the early morning. You should rotate your plants every couple of days. This will promote an even, full growth habit.

You can plant your Zinnia outside in your 4'x 4' garden after the plants are well established and all fear of frost has passed. Your plants will require full sunlight to grow well. Plant your Zinnia in a sunny area with well-drained rich, fertile soil. Water deeply by soaking soil and avoid spraying foliage. The reason for this is water droplets can sit on the leaf, and in the sunniest times of day the water droplets will magnify the light and can "burn" the leaves. This will make little blemishes on the leaves commonly called sun spots. Pinch plants when young at nodes or branching points for denser foliage. You can promote prolonged bloom time by removing spent blossoms before the onset of seed pods. Planting your Zinnia in the flower bed 6-8 inches apart will give the plants enough room to fill out. Flower buds will start to appear in twelve to fourteen weeks.

Evening Primrose

Sprouting Your Seed

Evening Primrose is easy to germinate. Simply sow the seeds 1/3rd of an inch deep. The soil should be kept evenly moist. Place the container inside the germination bag and seal with a rubber band. Place your planted seeds on a windowsill or in bright light. The seeds will germinate in one to three weeks. You can remove the container from the germination bag 1 week after germination. Plants can be taken outside after they are well established and all fear of frost has passed.

Growing On

After your Evening Primrose seed sprouts, it is best to water your plants in the early morning. You should rotate your plants every couple of days. This will promote an even, full growth habit.

You can plant your Evening Primrose outside in your 4' x 4' garden after the plants are well established and all fear of frost has passed. The Evening Primrose prefers a growing location in average, dry to medium moisture, and well-drained soils providing full sun to part shade. You should allow your plants to dry out between watering. When planting in the flower bed, space your plants 12-14 inches apart. This will allow enough room for plants to fill out. You can pinch or trim back upward growth to the node or branching point; this will promote a more even bushy appearance. Flower buds will start to appear in twelve to fourteen weeks.

flower descriptions

Petunias are a long loved favorite among gardeners. The plants produce beautiful trumpet shaped flowers. Petunias are called annuals because their roots are not able to withstand the cold winters in the north and they are killed by hard frost when it arrives at the end of the season. Petunias combine the best greenhouse performance with unsurpassed garden performance. Celebrity Petunia's tight window of bloom time and its wide range of colors make the series a growers' delight. Petunia Celebrity series is one of the most popular and showy of all flowering plants. They flower early and continue until frost. They are easily cultivated, requiring rich soil and sun. Pinch off faded flowers to encourage more blossoms. Flowers will start to appear in as little as twelve weeks.

Thumbelina Zinnias have brightly colored, button like blooms. They bloom profusely all summer long in a wide range of colors. The Thumbelina series is a dwarf, well branched variety of Zinnia. They are very useful in the foreground and borders of flower beds. Zinnias are fast to flower you will start seeing blooms in seven to eight weeks.

Evening Primrose is a North American native biennial plant (two year plant). The flowers are bright yellow in color. The flowers open in the evening and close up during the day and are strongly scented with a delicious sweet perfume which attracts pollinating moths. The scented flowers are hermaphrodite (have both male and female organs). The Evening Primrose has been known to self seed itself in the garden.

What Happens When A Seed Germinates?

The first stage of plant growth or germination is called radicle emergence. The radicle is the first root that a plant makes. This root will grow and form the root structure of the plant.

The stem will be the second growth out of the seed. The stem will grow and penetrate the soil level.

When the stem emerges from the soil one set of leaves will be present. These leaves are called cotyledons or seed leaves. These leaves will expand and start photosynthesis and gather enough energy for the plant to grow. The next set of leaves the plant produces are the true leaves. These are the leaves your plant will produce for the rest of its life.

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Grow Your Own

Outdoor flower garden™

Classroom Kit

Contents

1 Evening Star (Oenothera lamarkiana) Seed Pack, 35 mg
1 Petunia (Petunia x hybrid) Seed Pack, 35 mg
1 Thumbelina Zinnia (Zinnia elegans) Seed Pack, 175 mg
18 Biodegradable Germination Pots
18 Biodegradable Corn Germination Bags
18 Blank Plant Stakes
1 Bag Planting Mixture
1 Growing and Experiment Guide

DuneCraft

planting instructions

Fill up three of the included planters so they are ¾ full of soil. Remove and dispose of any large clumps that remain, leaving only the fine soil. Add ½ cup of water to each planter and mix. Place one type of seed in each planter on top of the soil, at least 3/8 of an inch apart. Each planter holds about 3 seeds. Insert one planting marker into each planter to identify the three varieties of seeds. Gently apply additional water on all seeds until the soil is thoroughly wet (be careful not to wash away seeds). Place the containers inside the germination bags and seal with a rubber band for at least one week. Be sure to put all the planters in a bright, sunny area. Germination bags may then be removed if desired one week after your seed sprouts.

individual & group experiments

Either every student can do every experiment, or students can break into groups of three and observe the other group lessons.

How do greenhouses work?
Fill two of the empty planters with water. Place them next to each other in the sun (either on a windowsill or outside). Enclose the first planter in an included germination bag, and make sure it's sealed. Leave the second planter open. Leave the planters in the sun for about an hour. Then, remove the bag from the first planter and feel the water in both planters. Which planter has warmer water? Why? How would having the bag on the planter affect the planter?

How do plants breathe?
Water the plants in the containers. Put the containers inside germination bags and make sure both are tightly sealed. Set the plants near a sunny window where they will get good light. After one day, check the plants. There should be drops of water inside the bags. Where do you think this water came from?

All plants breathe, taking in carbon dioxide and giving off oxygen. They take in sunlight and carbon dioxide and through photosynthesis, produce food for themselves, and give off the oxygen. When the terrarium is sealed, the moisture in the soil condenses and will turn back into moisture and run down the sides, effectively watering the plants. The water in the terrarium is called condensation.

Do plants sprout at different rates?
Plant the Petunia, Zinnia and Evening Primrose seeds in the planters according to the above directions. Make sure to water the seeds, and place the planters in a sunny area. Observe the seeds for the next week or two. Which seeds sprout fastest?

Plants do sprout at different rates. Germination is the beginning of a plant's life cycle. Seeds sprout at different rates because every type of seed is different. Also, different seeds require different conditions to sprout. Some seeds need cool and dry conditions, whereas other seeds need high humidity and warmth to sprout.

Does humidity have an effect on how quickly seeds sprout?
Plant the Petunia and Zinnia seeds in the planters according to the above directions. Place the first planter inside a germination bag and seal the top with a rubber band. Put it on a sunny windowsill. Put the second planter on the windowsill beside the first, but do not put a germination bag around this one. Observe the planters for the next week. Does one planter sprout faster than the other? Is there any condensation in the first planter? Does humidity make the seeds sprout faster?

Do these two plants have the same root structure?
Carefully dig up the plants from the planter. Look at the root structure of both the Petunia plant and the Zinnia plant. Can you identify the type of root structure of these two plants? Why are they different? Why are roots important to plants?

The first part to emerge from a germinating seed is usually a root. The root grows rapidly, lengthening and thickening at a very fast rate. Roots are important to plants because water is absorbed through them. Water is absorbed by roots through the fine hairs that grow near the root tips. Roots keep growing until the plant dies.

How do terrariums affect the growth rate of plants?
Make sure both planters are completely sealed inside the included bags. Leave one bag open at the top. Leave the second planter completely enclosed in the bags. Place both on a sunny windowsill. Over the next week, observe the plant growth and water retention. Does the terrarium with the completely enclosed bag need more water, or does the one with the open bag need more water? Why?

The following experiments are to be done when both plants have reached maturity.

How do plants react to minimal sunlight?
Place the potted plants in an area of the classroom that is a few feet or more from a window. Observe the plants over the course of several days, noting whether they are straight or bent. If they are bent, in what direction are they curved? Turn the plants around (so that the bend is facing in the opposite direction) and observe what occurs over a period of two or three days.

The plants that are set on the windowsill soon turn towards the outside to receive sunlight and have to be rotated to maintain their shape. This orientation towards light is called phototropism, and is an automatic adjustment made by the plant as it grows. For the plant, it is not bending over (as it would be for humans.) Instead, it bends by growing in a particular direction. A plant's growth movements are controlled by internal chemical substances. When one side of a plant is shaded, a growth hormone called an auxin moves to the darker side of the plant and causes that side to grow much faster. As a result, the stem becomes bent toward the light.

How do plants react to being in the dark?
Place one potted planter on a sunny windowsill. Place another potted planter in a closet or somewhere completely dark and without windows. Leave the plants in these areas for two days. After the second day, take the plants out of the closet. Compare these plants to the ones that have been on the windowsill. Are there any differences? How do plants react to being in darkness versus light?

How does fertilizer affect plant growth?
(Fertilizer is not included.) Add a small amount of fertilizer to the first planter. Water and set on a sunny windowsill. Water the second planter and set it beside the first one, with no fertilizer. (Make sure to leave the bags off of both.) Observe the plants' growth over a week's time. Which one grows faster, the one with fertilizer or the one without? What is the purpose of fertilizer?

Just as the human body needs vitamins and minerals, plants need nutrients in order to grow. Plants need large amounts of three nutrients: nitrogen, phosphorus, and potassium. These are commonly referred to as macronutrients. Fertilizer makers take those three nutrients from nature and put them into soluble forms that plants can easily use. There are a number of other nutrients plants need in small amounts. These are referred to as the minor nutrients, or micronutrients. The plant with the fertilizer will grow faster because of the necessary nutrients that it receives from the fertilizer.

Discussion Questions

What is photosynthesis? How do plants manufacture food? What are the two main components a plant needs to manufacture food?

The basic raw materials utilized by plants in manufacturing food are water and carbon dioxide. The water is taken in by the roots and carbon dioxide by pores in the leaves. From these ingredients the plant makes a simple sugar that is converted into more complex sugars, starches, proteins, and fats. All life depends on this putting together by light, which is what photosynthesis means. The light, solar energy is captured by the plant and transformed into chemical energy contained in the sugar. In photosynthesis, water is split apart into hydrogen and oxygen. The oxygen is given off as a byproduct, and the hydrogen is combined chemically with the carbon dioxide to produce the simple sugar, which easily dissolves and is transported through the plant.

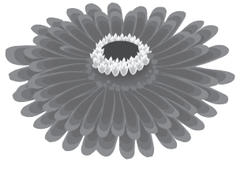
Do we need plants to live? Do plants give off oxygen? What do we give plants and what do they give us that are necessary for survival?

Without the vast amount of vegetation in the world, animal life as we know it would not exist. Plants are the ultimate source of the food we eat and the oxygen in the air that we breathe In the process of photosynthesis, green plants form simple sugars in the presence of sunlight. As part of the reaction, they release oxygen into the atmosphere; this is what we need to survive. In a never-ending cycle, we in turn exhale the carbon dioxide that plants require for photosynthesis.

suggested flower garden layout

Size of Garden: 4' x 4'

Petunia
Space 12 inches apart for good ground cover. Prefers full sunlight and average to rich well-drained soil.



Thumbelina Zinnia
Spacing plants 6-8 inches apart will give them enough room to fill out. Prefers full sunlight and well-drained rich, fertile soil. Great border plant.

Evening Primrose
Space 12 inches apart to allow room for the plants to fill out. Primroses refer average, dry to medium moisture well-drained soils providing full sun to part shade.