

Mission 1: The Cliff Caves of Red River Canyon

AGENT 9 ::

Two Hover Pods were discovered near a cave entrance in the cliffs of the Red River Canyon. We have reason to suspect that several of Thistle's Cocklebur Scouts are gathering deadly Sicklescurge plants that grow at the base of the cave walls. They are hanging the plants upside down near the entrance to preserve the poisonous blooms.

We have no idea what the connection is between these plants and our beloved Queen Flora, but our instincts tell us they are not a token of Thistle's undying affection. We've provided you with a customized Milkweed Mach 4 Transport which should enable you to achieve a top speed of Mach 4 while maintaining absolute silence. You will use this to travel back and forth between any location this mission carries you and your home base. As always, these exercises are designed to provide the knowledge and skills to complete your mission while also helping you to maintain your cover. Now get going! There isn't much time! You must complete one of the following for the mission to be a success. ►►

Mission 1: The Cliff Caves of Red River Canyon

Importance & Uses of Plants

Options Accomplished

- Plant Plastic
- Hanging Stems
- Mystery Web Option

Date:

Red River Canyon Area

Red River Canyon

>Destruyan.547u01

Option 1

After locating the Cackleburs, use the plastic you'll make from the exercise below. While it is still warm, use it to attach a homing seed to the underside of one of their hover pods.

This seed is our only hope of precisely locating Thistle's secret lab. Make sure it is transmitting. When the seed reveals the whereabouts of the lab, you can sneak in and rescue the queen!

Plant plastic

You may not be aware of the many ways you can use plants or products made from plants everyday. Agent 9, did you know that plants are even used to make some plastics? You can make your own homemade plastic from corn!

You will need:

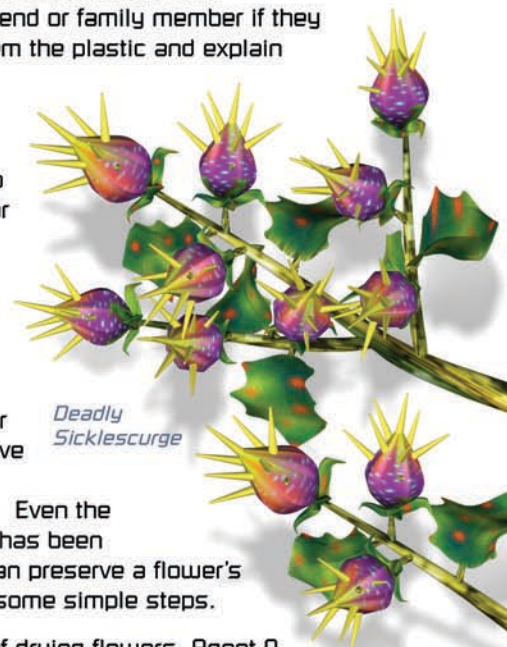
- 2 tablespoons of corn starch
- 2 tablespoons of water
- 2 drops of corn oil (or any type of vegetable oil)
- Sealable plastic bag

Drop ingredients into sealable plastic bag and mix together. Microwave on high for 20 seconds. Allow the mixture to cool and remove from bag. (Be careful of the steam Agent 9!) Ask a friend or family member if they have ever heard of plant plastic. Show them the plastic and explain how it was made.

Hanging Stems

Plants are valuable to our lives in so many ways. Plants provide food for all living things. They are used to make clothes we wear, they provide the materials to build the homes we live in, and plants even supply the air we need to breathe. There could be no life on earth without plants. Besides providing for just our basic needs, plants also have aesthetic(as-thet-ick) value which means they add beauty to our lives. Even the simple beauty of a blooming flower has been appreciated throughout time. You can preserve a flower's bloom for many years if you follow some simple steps.

The oldest and simplest method of drying flowers, Agent 9, is to hang dry them. Group your flowers into small bundles of 3 to 5 stems and tie with a rubber band. Tie the bundles to a coat hanger so that the blooms are upside down and allow them to dry for a few days. Dried flowers can be hung on a wall, used to fill a basket to decorate a shelf or even used to top a gift package.



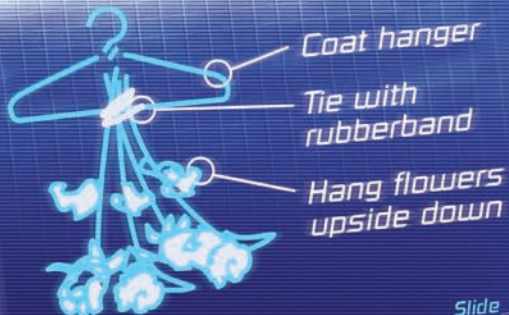
Deadly Sicklescurge



Col. Maranta here, Agent 9. I'll be guiding you through your mission. I'll contact you when you reach the canyon.

Option 2

Cackleburs have very poor eyesight so carefully replace the groups of hanging Sicklescurge with handfuls of colorful cave weeds. Among your equipment, Agent 9, you'll find a green homing stem that transmits a signal we can locate by satellite. Just insert the stem into the bundle of cave weeds. The Cackleburs will return to Dr. Thistle's hideout with the worthless weeds and with any luck the homing stem will reveal the location of the lab and you can sneak in and rescue the queen!



Coat hanger
Tie with rubberband
Hang flowers upside down

Slide 56



Want more, Agent 9?

Complete a third mission option at www.jmgkids.us/thistle



Mission 2: Commander Riddlethorn's Trading Post

AGENT 9 ::

Commander RiddleThorn is an old veteran of the Mushroom Wars. For his courage and bravery in the heat of battle, he earned the Purple Spore and the Bronze Seed. He has since retired and now runs a seedy little trading post in the marshlands to the south where he trades leaves of all varieties. Records from the JPI archives indicate that he was part of a top-secret mission in the Black Spore Swamp several decades ago. All details of the mission have been destroyed but sources tell us RiddleThorn was the sole survivor after the rest of his patrol mysteriously vanished. We hope that with coaxing and an irresistible leaf trade, he may reveal the secrets of the Black Spore Swamp. Until now, he has never spoken a word about his fateful mission and denies ever being involved. You must complete one of the mission options before paying the old commander a visit. Agent Jasmine will provide you with Leaf Margin and Shape Analyzers to help with leaf identification. We must know more about the Black Spore Swamp, Agent 9. We are counting on you. Good Luck! ▶▶

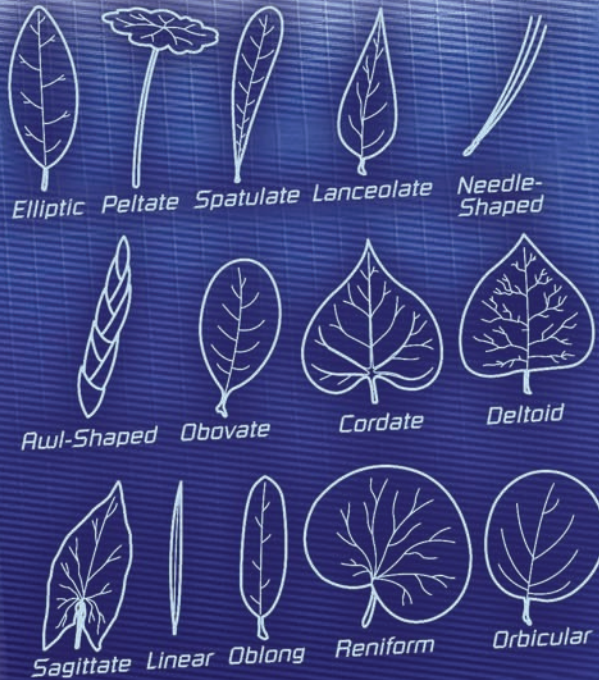
Mission 2: Commander Riddlethorn's Trading Post

Plant Classification

Option 1

Complete the following mission option using leaves shown in the Leaf Shape and Leaf Margin Analyzers below. Dry and preserve them to create a specimen book that is so tempting, the old commander will give up swamp secrets and his own combat boots just to look inside! The queen's life depends on this information, Agent 9. Find every specimen you can!

Leaf Shapes



Option 2

For another incentive, document the identification of poison ivy, poison oak and poison sumac. These plants are dangerous and extremely rare in Commander Riddlethorn's part of the world. He would trade almost anything to know how to find them. Use this against him if he gets stubborn and refuses to divulge the secrets of the Black Spore Swamp. This information could mean the difference between success and failure, Agent 9. Don't let us down!

Identifying Danger

You may have heard the expression, "Leaves of three, let it be." This saying helps us to remember that leaves of poison ivy grow from sets of three leaflets and if we come across a plant with leaves of three, do not touch it. Below are pictures of poison ivy, poison oak and poison sumac. On the back of this page, list symptoms that occur when a person comes in contact with each of these plants, and list the steps to take when the contact occurs. A good source of information would be to call a family doctor or local hospital/clinic. Information may also be found online or at a local library.

Poison Sumac

Poison Ivy

Poison Oak

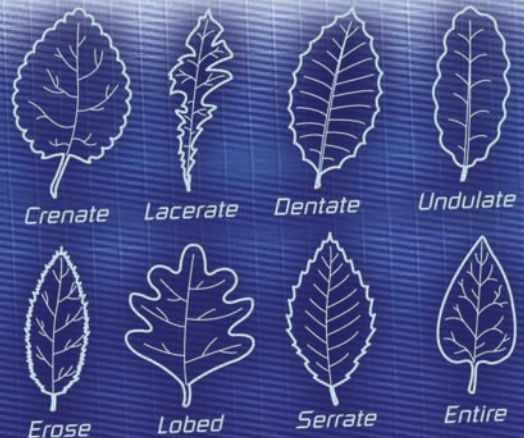


Leaf Book

Leaves come in many different shapes and sizes. They can vary based on their type, shape of the leaf and even the design of the edge of the leaf called the leaf's margin. To the left and below are examples of different leaf shapes and margins.

Your task is to go on a leaf collection hunt. When you find a leaf, use the pictures on this page to determine the leaf's shape and margin. When you find a match, circle it. You should find enough leaves to be able to circle at least 4 different leaf shapes and 4 different leaf margins on this page. Place the leaves you collect between the pages of a book to dry for 3 to 4 days. Then glue each leaf to a separate piece of paper and neatly label the page with the leaf type, leaf shape and leaf margin. Create a cover for your leaf book and staple along the edge to bind the book.

Leaf Margins



Options Accomplished

- Leaf Book
- Identifying Danger
- Mystery Web Option

Date: _____



Want more, Agent 9?

Complete a third mission option at www.jmgkids.us/thistle



Mission 3: Mission Training at the JPI Labs

AGENT 9 ::

Excellent work with Commander RiddleThorn, Agent 9! That mission log he traded with you is proving quite valuable. The lab has almost deciphered an ancient code within its pages. This code is the key to bringing down the defense grid that protects the Thistle Laboratory complex. Apparently there are four giant stone pillars at each corner of the lab. Each pillar has a carving of essential parts of the common flower. According to the inscriptions, you must locate specimens of the different parts from plants in the forest and then place each one into the depressions of the stone carvings. The giant pillars will then sink into the earth and the laboratory defenses will be eliminated! Get back to the JPI labs at once! You need to complete at least one of the following projects, Agent 9, so report to Agent Ginkgo's lab and get with it. We are running out of time! ▶▶

Mission 3:

Mission Training at the JPI Labs

Plant Parts

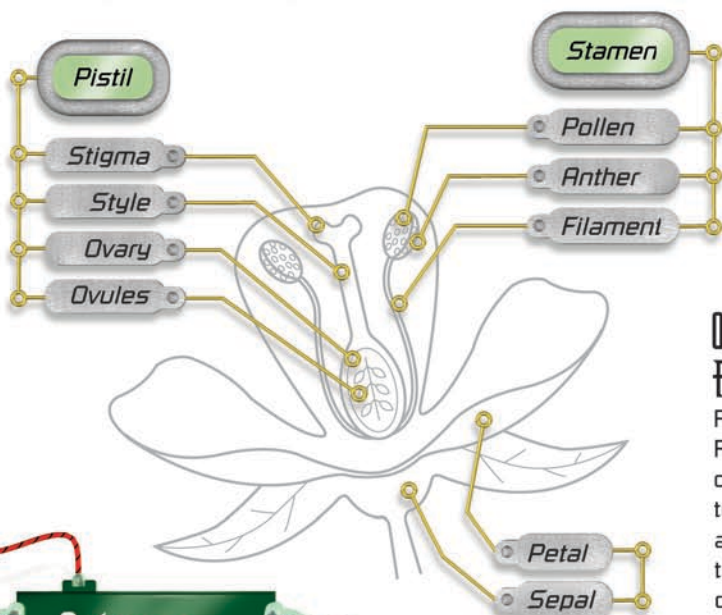
Options Accomplished

- Quick Draw Flowers
- Patchwork Plants
- Mystery Web Option

Date: _____

Option 1

Agent Ginkgo has developed this handy training game to help you with your flower dissection skills. It will teach you to draw and identify the different parts of the common flower. With these skills, you can locate the plant parts essential to bringing down **Dr. Thistle's** defense grid. Have fun, Agent 9!

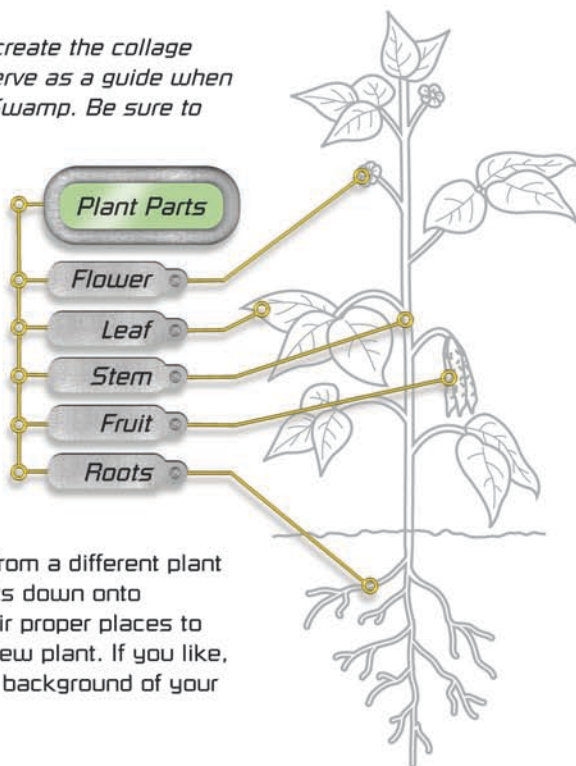


Option 2

Agent Ginkgo suggests you create the collage described below. This will serve as a guide when you reach *The Black Spore Swamp*. Be sure to clean up your mess this time, Agent 9. Agent Ginkgo's patience isn't what it used to be.

Patchwork Plants

Find old magazines or flyers with pictures of plants. Keep looking through the pictures until you find illustrations of all the 5 basic plant parts. As you find a different plant part, clip it out. Each of the parts you find should come from a different plant picture. Glue those plant parts down onto another piece of paper in their proper places to form a complete and brand new plant. If you like, you can color in the soil and background of your new patchwork plant.



Quick Draw Flowers

Find a friend, some pencils, paper and a deck of playing cards. Follow the key below to see who can be first to draw a complete flower. Lay the deck of cards face down and take turns drawing. For every card that is drawn, that person can add that flower part to their sketch. Use the diagram on the left to help players sketch the flowers. The first one to make a complete flower is the quickest draw!

Card	Flower part to draw
2 or 3	Petals
4 or 5	Sepals
6	Filament of the Stamen
7	Anther of the Stamen
8	Stigma of the Pistil
9	Style of the Pistil
10	Ovary of the Pistil
Jack	Erase one part from your drawing
Queen	Draw any remaining part of the Pistil
King	Draw any remaining part of the Stamen
Ace	Draw any missing part of the Flower

Subject Code
Peril 1

Subject

Dr. Thornicus Thistle

23

File no.
2738.4057



Want more, Agent 9?

Complete a third mission option at www.jmgkids.us/thistle



Mission 4: Mission Preparation at the JPI BioDome

AGENT 9 ::

Great news, Agent 9! Our operatives have discovered a large colony of pill bugs near the west edge of the Black Spore Swamp. President Zorba, the colony's dominant female has agreed to provide us a map showing the trails of the Black Spore Swamp and the many entrances to the Thistle Complex. With the precise coordinates we received from the homing device you planted in Red River Canyon, we have the information necessary to mount an attack and save the lovely Queen Flora!

Oh, by the way Agent 9, there is one more little detail we should discuss. JPI believes they have discovered the reason behind the many mysterious disappearances associated with the Black Spore Swamp. Guarding the many trails throughout the swamp are giant life-sucking Black Spores. According to first-hand accounts from Commander RiddleThorn's log, these spores devoured his entire patrol. He survived the attack thanks to a very fortunate discovery. In an attempt to avoid being swallowed, Commander RiddleThorn threw every object he could find at the spores. He watched in terror as the spores would simply swallow everything and continue to attack. Eventually, all that was left was the patrol's food packs which consisted mostly of Bean Sprouts. It was the food packs that saved his life! Bean Sprouts, while tasty to us, are actually very toxic to the spores and cause them to glow bright purple before swelling up and exploding into millions of tiny glowing bits. Come to think of it, you might want to take a rain coat, Agent 9. The good news, if you survive, is that the bright purple particles can be gathered up and used to light your way through the swamp! Better get over to the BioDome and complete one of the following mission options. You've got some sprouts to grow! ►►

Mission 4:

Mission Preparation at the JPI BioDome

Plant Needs

Options Accomplished

Bean Sprout Garden

Homemade BioJar

Mystery Web Option

Date:

Option 1

Better bring plenty of bean sprouts, Agent 9. We have no way of knowing how many spores there are! Here's what you need to do:

Bean Sprout Garden

Okay, Agent 9, pay attention. Hydroponics is growing plants without soil. You can create a hydroponic system and grow a crop that can be harvested within a few days! You will need a plastic dish with a lid (such as a large butter dish or ice cream container), a fork and a small bag of lentil beans (usually found with other dried beans in the grocery store).

Turn upside down to drain water

Rinse Beans

Poke holes in lid

Black Spore

This infant spore (shown actual size) will mature to a weight of 2 tons with a jaw diameter of over 2 feet!

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Option 2

You don't like bean sprouts, do you Agent 9? Well that's okay because there is another way to avoid those nasty spores altogether. President Zorba from the Pill Bug Colony has graciously provided us with the location of trails that the spores no longer occupy. Based on this data and using the instructions on the right. You need to create a BioJar. It will serve as a "living" map to help you make your way through the dense and confusing swamp. Take your time, Agent 9. You must follow the directions below carefully or you'll risk running into a hungry spore with no bean sprouts in your pack--not a pretty thought, is it?

Homemade BioJar

The earth is called a biosphere which means "ball of life." The earth is a totally contained system of plants and animals relying on each other to survive. The sun provides the energy for life to grow and helps drive the water cycle. Create your own contained system in a BioJar. Find a small plant and enough soil to cover the roots and place the plant in the bottom of the jar. Find several earthworms or insects like pill bugs and drop them into your BioJar. Add a few torn up leaves. Sprinkle just enough water into the soil to get it moist and seal the jar. Place the BioJar in a spot where it receives light but not direct sunlight. Direct sunlight causes the system to gather too much heat and kill all living organisms!

WARNING, AGENT 9!
Do not place your BioJar in direct sunlight!

Sprinkle water on soil

Seal lid

Plant

Soil to cover roots

Bugs and worms

Soon you will see water droplets form along the sides and top of the jar. This is the visible part of the water cycle condensing to send water back to the soil. The plants will provide oxygen for the other living creatures and those creatures' wastes should provide nutrients for the plants. Plan to bring your BioJar to your next JMG meeting so you can share your world with others in your group.



Want more, Agent 9?

Complete a third mission option at www.jmgkids.us/thistle



Mission 5: Entering the Black Spore Swamp

AGENT 9 ::

Ah! Agent 9! Great to hear from you! If JPI's coordinates are correct, you should be at the Pill Bug Colony and ready to enter the Black Spore Swamp.

Before you go in, there are things we need to discuss. We launched several spy moths which will penetrate the swamp from above and give us a better idea of what you may be facing once you reach Thistle's laboratory. Although the Pill Bugs refuse to get involved in the attack on Thistle's lab, the spy moths reveal that far above the swamp's canopy lives an army of Battle Slugs. They may not be fast, but they can expand up to three times their normal size and are an unstoppable force! We must figure a way to convince them to join the mission. You will need them to keep those pesky Grub Thugs busy so you can sneak inside the lab. Queen Flora's life depends on it. President Zorba has provided you with several transport vehicles to make your way through the swamp. These machines are powerful, incredibly agile and use an ancient form of technology the modern world has never seen. You will notice remarkable similarities between these ancient engines and the seed dispersal methods of everyday plants. You might want to brush up on these methods before taking a joy-ride. We don't need another international incident so learn how to fly these things without crashing one first, okay?

Your good buddy, Agent Ginkgo has a present for you in your equipment pack. It's a freezing tube. Just place it near something you want to freeze and everything within 10 feet is frozen solid in seconds. Be sure to use the remote activator from a safe distance, Agent 9, so you don't freeze yourself. We don't want to give those swamp spores a Popsicle treat, now do we? JPI tells me you're out of time. Dr. Thistle is moving Queen Flora to a more secure part of his lab. You must go now! Study up on one of the following mission options. You'll have to figure out the other one on the way. Get going, Agent 9! Go! Go! Go! ▶▶

Mission 5: Entering the Black Spore Swamp

Plant Growth

Options Accomplished

Option 1

Make sure you learn all you can about seed dispersal, Agent 9. It is the key to understanding these ancient vehicles. We need you to get to Thistle's lab in one piece!

Super Seed Dispersal

To prevent seedlings from being overcrowded as they begin their new life, seeds have developed methods of being carried away from the parent plant to grow. This is called seed dispersal. Below are some of the ways seeds travel. Your task is to create a diagram of super seed dispersal that combines different methods of seed dispersal. For example, your diagram might include wings for using wind to drift away from the parent plant as well as thorny hooks for using animals to carry it even farther away. The diagram should be a sketch with the different dispersal methods labeled.

- Seed with spines* ---- Animal dispersal
- Fruit and nut* ----- Animal dispersal
- Floater* ----- Water dispersal
- Winged seeds* ----- Wind dispersal
- Plumed seeds* ----- Wind dispersal
- Explosive seeds* ----- Mechanical dispersal

Seed Dispersal Methods



Spiny Seeds
(by animals)



Fruit & Nut
(by animals)



Floaters
(by water)

(hollow center holds air)



Winged Seeds
(by wind)



Plumed Seeds
(by wind)



Explosive Seeds
(thrown or shot)

Option 2

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Agent Ginkgo is very proud of his freezing tube. He believes it is essential to capturing Dr. Thistle. Complete the following exercise to see how plants react to freezing temperatures. If you can catch up to him, Thistle won't stand a chance!

Temperature Tantrum

Find two paper towels and two glass jars. Wet each paper towel. Fold towels in half and place each inside a jar so that the towels stick flat against the sides of the jars. Slide a few pinto beans (or other seeds) in between the glass and the paper towel so that you can see the seed from the outside. Fill the jar almost to the top with soil. Pour in just enough water to moisten the soil. Keep the jar in a warm, well lit location and you'll be able to see the seeds germinate and form roots, a shoot and leaves.

You probably know that most plants need warm temperatures to grow and thrive, but what happens when exposed to freezing temperatures? Just like animals, plants are made up of cells. Each cell is like a box and the contents are made up mostly of water. When water freezes, it expands and takes up more space. So, what happens to the cell walls when the water inside the cells freezes and expands? The walls will break and the cells through-out the plant will no longer be able to support it. See the effect of this by trying this experiment...

I do hope you enjoy using my Freezing tube, Agent 9, but try to bring it back in one piece, okay?

Once the young plants have grown to be 4 -5 inches tall, place one of them in the freezer and check on it every 30 minutes. After you have checked on the plant 4 times, remove it from the freezer and place it next to the other jar. Examine both plants. Wait 30 minutes and examine both plants again. On the back of this page sketch a picture of the plants with the broken cell walls and the plants that were not placed in the freezer. Show the plants to a friend or family member and explain what happened to the cells of the frozen plant.



Want more, Agent 9?

Complete a third mission option at www.jmgkids.us/thistle

Subject:

Spy Moth

40

Antenna

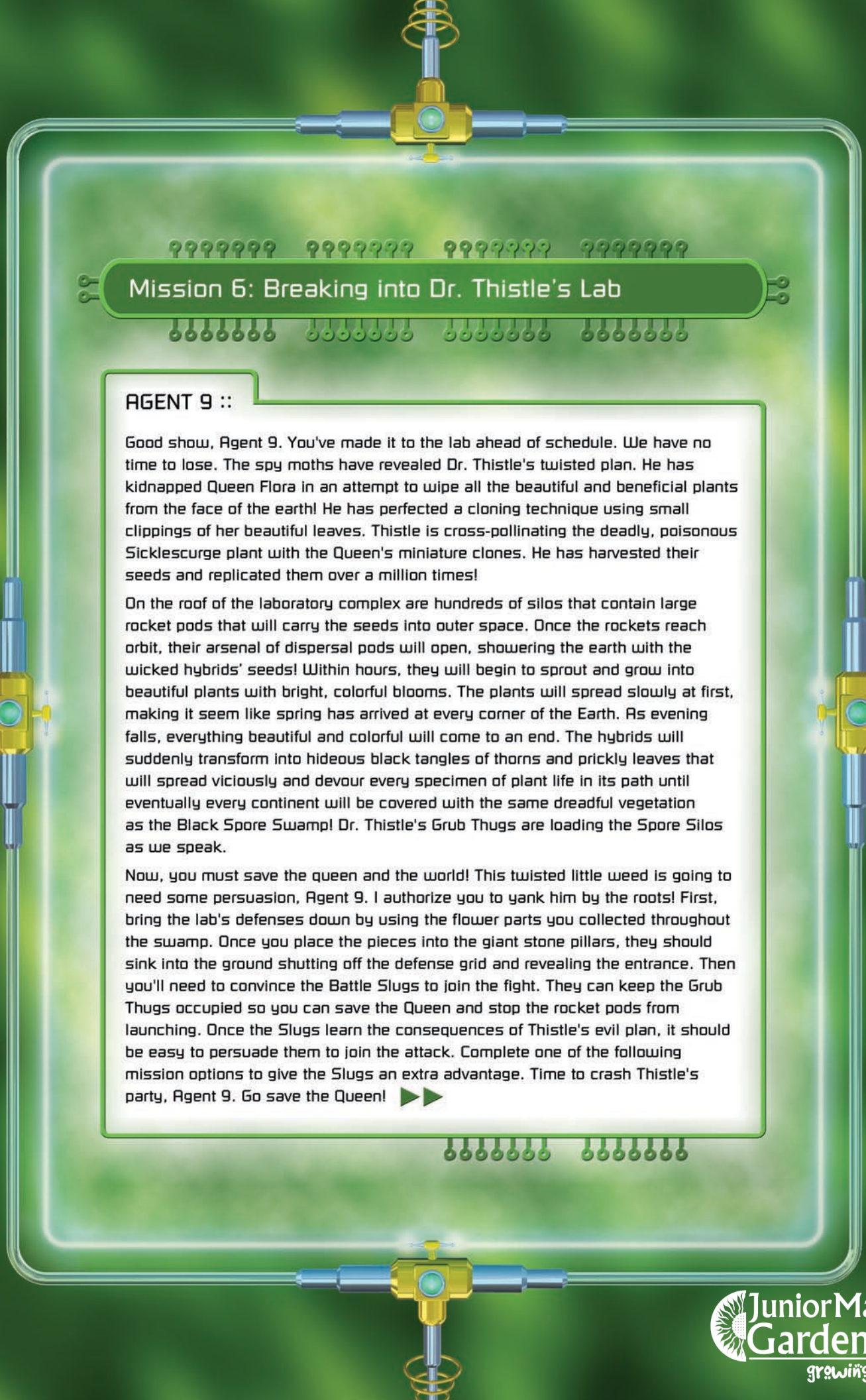
Satellite Relay

Solar Panel

Power Generator

Camera

Wing Detail F



Mission 6: Breaking into Dr. Thistle's Lab

AGENT 9 ::

Good show, Agent 9. You've made it to the lab ahead of schedule. We have no time to lose. The spy moths have revealed Dr. Thistle's twisted plan. He has kidnapped Queen Flora in an attempt to wipe all the beautiful and beneficial plants from the face of the earth! He has perfected a cloning technique using small clippings of her beautiful leaves. Thistle is cross-pollinating the deadly, poisonous Sicklescurge plant with the Queen's miniature clones. He has harvested their seeds and replicated them over a million times!

On the roof of the laboratory complex are hundreds of silos that contain large rocket pods that will carry the seeds into outer space. Once the rockets reach orbit, their arsenal of dispersal pods will open, showering the earth with the wicked hybrids' seeds! Within hours, they will begin to sprout and grow into beautiful plants with bright, colorful blooms. The plants will spread slowly at first, making it seem like spring has arrived at every corner of the Earth. As evening falls, everything beautiful and colorful will come to an end. The hybrids will suddenly transform into hideous black tangles of thorns and prickly leaves that will spread viciously and devour every specimen of plant life in its path until eventually every continent will be covered with the same dreadful vegetation as the Black Spore Swamp! Dr. Thistle's Grub Thugs are loading the Spore Silos as we speak.

Now, you must save the queen and the world! This twisted little weed is going to need some persuasion, Agent 9. I authorize you to yank him by the roots! First, bring the lab's defenses down by using the flower parts you collected throughout the swamp. Once you place the pieces into the giant stone pillars, they should sink into the ground shutting off the defense grid and revealing the entrance. Then you'll need to convince the Battle Slugs to join the fight. They can keep the Grub Thugs occupied so you can save the Queen and stop the rocket pods from launching. Once the Slugs learn the consequences of Thistle's evil plan, it should be easy to persuade them to join the attack. Complete one of the following mission options to give the Slugs an extra advantage. Time to crash Thistle's party, Agent 9. Go save the Queen! ▶▶

Mission 6: Breaking into Dr. Thistle's Lab

Plant Processes

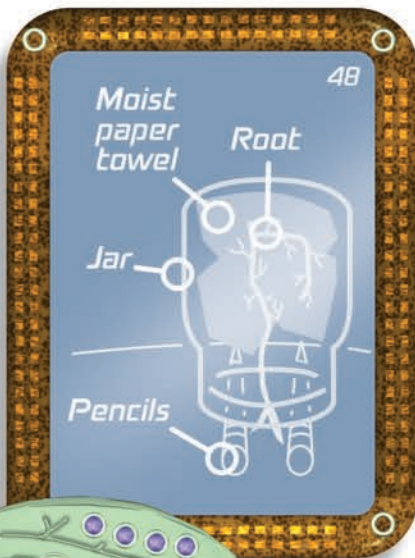
Options Accomplished

- Root Shapes
- Adaptive Coats
- Mystery Web Option

Date:

Option 1

The Battle Slugs can do more damage if they access the complex from more than one side. You need to open the maintenance hatches and air vents that surround the laboratory. By following the instructions below, you can create a square wrench from the root of a giant swamp tree, allowing you to loosen the giant bolts. With the maintenance hatches and air vents cleared, the slugs can surround the lab and cut off any escape routes! Chop, chop, Agent 9! Get going!

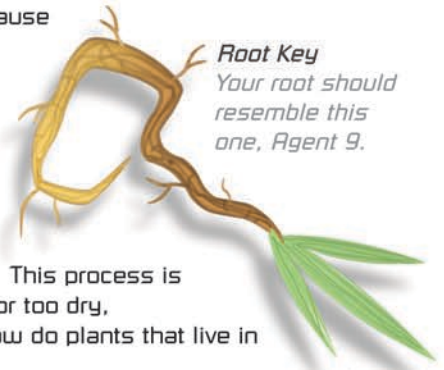


Root Shapes

Find a paper towel and a glass jar. Wet the towel, fold it in half, and place it inside the jar so that the towel sticks flat against the inside of the jar. Slide a few pinto beans (or other seeds) in between the glass and the paper towel so that you can see the seeds from the outside. Ball up several sheets of paper and place them in the jar so that the seeds are held firmly against the sides. Slowly pour in just enough water to moisten the paper in the jar. Keep the jar in a warm, well lit location and soon you'll be able to see the seeds germinate and form roots, a shoot and leaves.

Allow the root to grow one inch long and then place the jar on its side. Soon the root will begin to change the direction of its growth and turn downward. Now here is the tricky part. Slowly turn the jar upside down and rest the mouth of the jar on two pencils. Once the root grows one more inch, it can be placed on its side one last time. When this last one inch of root is allowed to grow, it will complete the side of the shape and you have a square root!

The root will always grow downward. This is because of geotropism which is the process that causes roots to grow toward the force of gravity and the shoots to grow opposite the force of gravity.



Root Key
Your root should resemble this one, Agent 9.

Option 2

The Battle Slugs may look fierce, but they have no body armor to protect their slimy skin. Dr. Thistle's Grub Thugs are known to carry salt darts. Salt and slugs don't mix, Agent 9. Before the battle can begin you must show the Battle slugs the benefits of leaves that have a waxy coating. These leaves will make excellent shields and will protect the slugs in the heat of battle. Use the following exercise to train the Battle Slugs before initiating your attack.

Adaptive Coats

Leaves are the plants' food factory. Plants are the only living things on the planet that can convert the sun's energy into food, providing energy for the plant. This process is called photosynthesis. If a plant becomes too warm or too dry, photosynthesis will stop and the plant will die. So how do plants that live in areas of high heat and low rainfall survive?

Cut two leaf shapes out of paper. Make the leaves the same shape and size. Wet the paper and place the two paper leaves flat in front of a window or outdoors in a spot that gets sunlight. Now find a piece of wax paper and cut out one more leaf shape that is the same size as the paper leaves. Lay the wax paper leaf on top of one of the paper leaves. Check both paper leaves every hour to see how long it takes each to dry.

Many plants living in very dry, hot climates have adapted to form special coatings on their leaves that help prevent water from being lost through the leaves. These waxy coatings keep water from evaporating, or transpiring, from the leaves. Which leaf in your adaptive coat experiment was able to stay wet longer?



Want more,
Agent 9?

Complete a third mission option at www.jmgkids.us/thistle

Mission 7: Saving Queen Flora!

AGENT 9 ::

Well done, Agent 9! The Battle Slugs have the Grub Thugs completely surrounded. Now is your chance to save Queen Flora. She is in the Pollination Chamber on the second floor and as luck would have it, she is unguarded! Sneak up there and free her from the pollination chamber. Keep an eye out for Dr. Thistle. His whereabouts are not known at the moment.

Once you reach the Pollination Chamber, you will see rows of hybrid clones that Thistle created from the Queen's leaves. By initiating the sequence, the pollination chamber holding the Queen will open allowing you to free her! Before you can initiate the sequence, Agent 9, you must deal with the hybrid clones. Use one of the following methods to destroy them. ▶▶

Mission 7: Saving Queen Flora!

Seed Propagation

Options Accomplished

Paintbrush
Pollination

Frankenstein
Hybrid

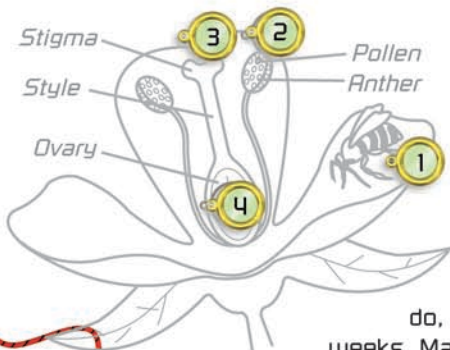
Mystery
Web
Option

Date:

Option 1

The Story of Pollination

- 1 A pollinator (such as a bee, bird, bat or butterfly) visits a plant in search of nectar.
- 2 While crawling around the plant's blossoms, pollen from the anther becomes attached to the pollinator's body.
- 3 When the pollinator visits another blossom, it transfers the pollen grains from its body to the blossom's stigma.
- 4 After it reaches the stigma, the pollen grain grows a tiny pollen tube down the style and into an egg-filled ovary. Eventually the pollen and the egg form a seed.



Option 2

Want to beat Dr. Thistle at his own game, Agent 9? JPI has a way for you to create a nasty little hybrid of your own! According to our data on the Pollination Chamber, Thistle has several specimens that mutated incorrectly during his hybrid experiments. If you can locate these specimens, you could pollinate them with the hybrid clones which would cause them to mutate, wither and die! You must plan this carefully, Agent 9. Complete the following exercise before attempting the cross-pollination procedure. Good luck! You must work quickly before you are discovered!

In your equipment pack, you'll find a glass sphere containing Anti-pollen developed by Agent Ginkgo. Using the instructions below, practice pollinating several flowers at your home base. Once you have mastered this skill, you will then pollinate each of Thistle's hybrids by spreading the Anti-pollen over the clone's stigma. This will cause the hybrid clone to swell up and die instantly. When all the clones are dead, simply begin the sequence and the pollination chamber will open allowing you to free Queen Flora! You must do this quickly, Agent 9, before you are discovered!

Paintbrush Pollination

Flowers are the seed-making factories for a plant. A flower's beauty and appealing fragrance is not there to impress people, they are there to attract a pollinator. A pollinator is an insect or animal that carries the pollen of a flower to the stigma of a flower. When the

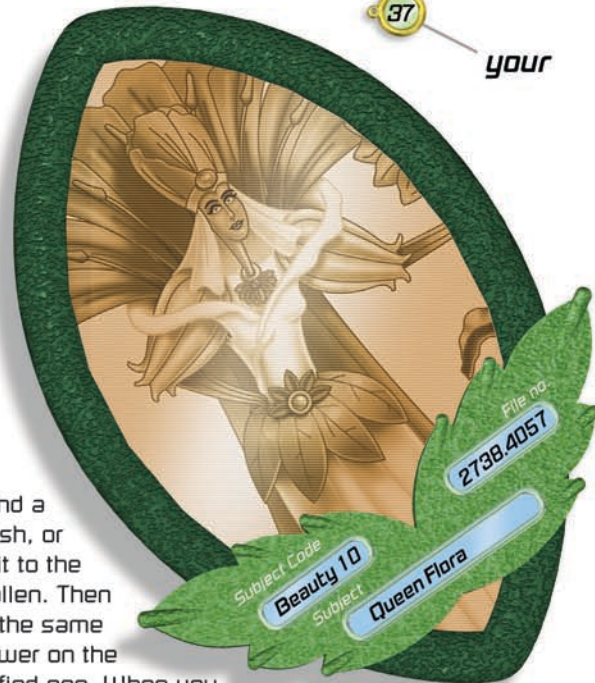
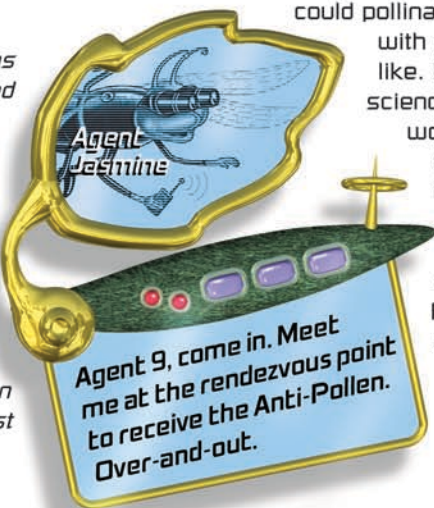
pollen comes in contact with the stigma, the pollen will make its way to the ovules in the flower and then a seed will develop. You can help a flower produce seeds by becoming a pollinator too! First, find a plant that is flowering. Use a small paintbrush, or cotton swab, or even your finger and touch it to the anthers of the flower that are holding the pollen. Then find the stigma. There may be a stigma in the same flower or you may have to look in other flower on the same plant or same kind of plant until you find one. When you do, touch the pollen to the stigma. Now your job is almost done! Observe the plant for a few weeks. Many times the ovary at the base of the flower will swell up and then dry or a fruit will form with the seeds inside. If possible, plant these seeds to help the life cycle to start once again.

Frankenstein Hybrid

Imagine if you could grow a vegetable that was a combination of pumpkin with a tomato! Would it be possible to have a tasty, red tomato that could grow to the same size of a huge pumpkin?! A plant hybrid is a new type of plant that scientists have created to combine the positive characteristics of one plant with those of another. One way they can do this is by pollinating the flowers of one plant with those flowers from another plant. For example, a rose with red flowers

could pollinate with a rose with white flowers to produce a new hybrid rose with pink flowers. Think of two different fruits or vegetables that you like. Now be creative and think about combining the two in a science fiction hybrid! What would be the characteristics that you would like the new hybrid would have. On the back of this page write the names of those two fruits or vegetables and describe how the hybrid would be even better than the either of the plants they came from. Draw a picture of what the hybrid you have created

would look like. Note - Most plants will only pollinate with a plant that is very closely related!



your



Want more, Agent 9?

Complete a third mission option at www.jmgkids.us/thistle



Mission 8: Destroy the Rocket Pods and Freeze Dr. Thistle

AGENT 9 ::

Great job, Agent 9, you've saved Queen Flora! Now you must work together to stop Dr. Thistle from launching the Rocket Pods! Thistle was spotted entering the Firing Room where he intends to initiate the rocket launch. We have jammed his auto-targeting transmissions which will prevent him from firing. But Thistle can still override the system and target them manually so you don't have much time!

This room is heavily secured, Agent 9. There is a scanner at the entrance that scans the molecular structure of whoever is trying to enter. Only Dr. Thistle is allowed in. Fortunately for you, Queen Flora has a tiny thistle leaf she removed from Dr. Thistle's coat as he kidnapped her from the palace. Use the leaf to gain entrance to the Firing Room. Do this carefully. If the system detects you, you will be vaporized on the spot! The Battle Slugs have the Grub Army under control so you should have easy access. Once you get inside, use the freezing tube Agent Ginkgo gave you and put that nasty weed on ice! Before you go, you need to show Queen Flora how to sabotage the Rocket Pods so you can concentrate on getting into the Firing Room. Use one of the following mission options to help you. ▶▶

Mission 8:

Destroy the Rocket Pods and Freeze Dr. Thistle

Vegetative Propagation

Options Accomplished

Cut and Clone

Veggie Soak

Mystery Web Option

Date:

Option 1

JPI has discovered a way to eliminate the Rocket Pods, but you need a small portion of a Sicklescurge plant to do it. There should be some discarded pieces near the hybrid clones you destroyed earlier.

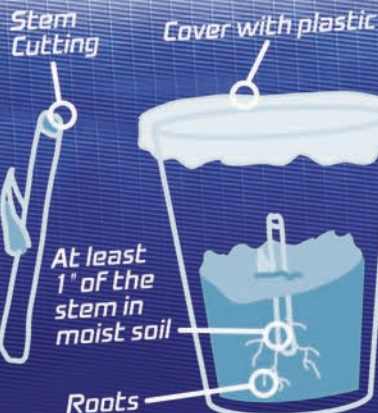
Practice cloning using the instructions below and then pass this information on to the Queen. Tell her to take the Sicklescurge plant to the Pollination Chamber and extract its pollen. Sicklescurge pollen will poison any plant it comes in contact with. Have her dump the poisonous pollen into all of the Rocket Pods which should eliminate their deadly seeds instantly. This way, if Dr. Thistle manages to launch a few rockets before you can stop him, they will have no effect on the plants on Earth. Get Going Agent 9. Queen Flora can take over from here. Go get Dr. Thistle!

Cut and Clone

Have you ever come across a plant that you thought was beautiful or seen a plant somewhere you wished was growing at your house? Well, you might be able to clone it to make an exact copy of that plant! Many times you can cut a portion of a plant away and care for it so that it grows a new, smaller version of that same plant. Look for three different plants in your area that you would like to clone. Select stem cuttings that are not too thick or woody (anything larger than the diameter of a pencil is too large). Obtain permission from the plant's owner to take a cutting similar to the one shown here.

Place at least an inch of the stem of each of those cuttings in a container of moist soil. Cover the cuttings and container with plastic to keep the

moisture in. After one week, gently lift the cutting to see if there are any noticeable roots. If roots have developed, keep the soil moist. (If the cutting has dried up, it is likely from a plant that could not propagate, or grow a new plant, from cuttings.) Allow the roots to grow for a few more weeks and it should be ready to survive on its own. Good luck with you cloning experiment!



Option 2

There's another way Queen Flora can stop the Rockets, Agent 9. Just like in Option 1, you must find a small portion of a Sicklescurge plant. Look over by the hybrid clones you eliminated earlier. Using the instructions here, practice the following propagation procedure, then show Queen Flora how to grow a new specimen. If she can extract the pollen from the new plant, she can poison the pods making the rockets useless! Even if Dr. Thistle manages to launch a few rockets before you can stop him, they will have no effect on the plants on Earth. Get going Agent 9! Queen Flora has things under control. Go get Dr. Thistle!

Veggie Soak

Plant propagation means growing new plants. You can create a new and free plant from the leftovers in your kitchen that you would probably be tossing in the trash can. Cut the tops off of plant parts as shown in the dotted line boxes here. Insert 3 toothpicks around the side of the plant part and place in a jar of water so that about one inch of the plant part is in the water.

You have just begun the process of plant propagation for your new plant. The piece that you placed in the water is the crown, and it will be able to grow all of the parts needed for a new plant.

When the plant has developed a mass of roots that are at least 3 to 4 inches long, you can transplant it to a pot of loose soil or directly into a garden. If you care for the plant and keep the soil moist, you might be able to even grow food from the part you were going to throw away.

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Cutting Diagram

Mission



Potato



Radish

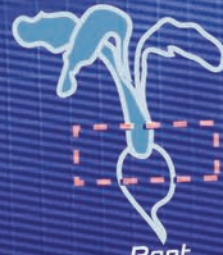
>> Trim an area similar to the dotted boxes, Agent 9.



Carrot



Sweet Potato



Beet



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