

GROW YOUR PALS PROGRAM GUIDE



Sponsored by



LESSON 1.14

Investigation: Propagation

Unit:
PLANTS AND GARDENING

PRECEPTS

H – Social Growth

H1. Acknowledge that differences exist
among people

K – Emotional Growth

K3. Develop self-assurance and confidence



Lesson Type:
One on One

NATIONAL STANDARDS

CS.01.01.01.a. Work productively with a group or independently.

PS.03.01.03.b. Demonstrate proper procedures in budding or
grafting selected materials.

NS.K-4.3 Life Science

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STUDENT LEARNING OBJECTIVES

As a result of this lesson, the student will ...

- Explain sexual vs. asexual propagation of plants.





TIME

Instruction time for this lesson: **20 minutes.**



RESOURCES

(1998). Plant Propagation. Retrieved May 1, 2010,
from <http://ag.arizona.edu/pubs/garden/mg/propagation/>



TOOLS, EQUIPMENT AND SUPPLIES

- ✓ Edible pineapple (*cut in chunks*)
- ✓ Edible guacamole and chips
- ✓ One avocado
- ✓ Top of a pineapple
- ✓ Three toothpicks
- ✓ Glass of water
- ✓ A pot about 6 inches in diameter
- ✓ Potting soil
- ✓ Knife



KEY TERMS

The following terms are
presented in this lesson
and appear in ***bold italics***:

Plant propagation
Propagation



CONTENT OUTLINE

Objective 1. | Explain sexual vs. asexual *propagation* of plants.

I. Define plant propagation

- A. Plant propagation is the process of multiplying the number of a plant
- B. Two types of plant propagation, sexual and asexual

II. Activity: Sexual Plant Propagation with a Seed

A. Materials Needed:

- 1. One avocado
- 2. Three toothpicks
- 3. Glass of water

B. Procedure:

- 1. Cut the avocado in half and remove the seed. Clean the seed gently
- 2. Push three toothpicks into the seed
- 3. Place the seed, pointed end up, in the glass of water. The toothpicks should hold the top half of the avocado seed in the air while the bottom half is in the water
- 4. Add water as it evaporates
- 5. Once roots grow, seed can be transplanted and will continue to grow into a new avocado tree sprout

III. Activity: Asexual Plant Propagation

A. Materials Needed:

- 1. The top of a pineapple (eat the rest with your PALS!)
- 2. A pot about six inches in diameter
- 3. Potting soil (soil needs to be sandy)
- 4. A knife

B. Procedure:

- 1. Cut about 2 inches off the top of a pineapple.
- 2. Plant the top in a pot that contains moist, sandy potting soil
- 3. This plant takes a long time to grow. It will grow around one foot a year as long as the plant is taken care of

INTEREST APPROACH

Before your PALS arrive, make a snack for them to eat when they get there; chunks of pineapple and guacamole and chips. Make sure to check and see if your PALS have any allergies that would prevent them from trying these two items. When your PALS arrive, greet him or her and introduce yourself, if necessary.



Before we get started today, I brought a snack for us so we have energy to get our activities done! What is this item?

Point to the chunks of pineapple.



These are chunks of fresh pineapple I just cut before you got here. Can you guess what this item is?

Your PALS may not be familiar with guacamole or may not know what it is called.



This is commonly found in Mexican food – it’s called guacamole. Do you know what the main ingredient of guacamole is?

Allow your PALS to guess. If they do not have a clue, assure them it is OK.



The main ingredient in guacamole is an avocado. So dig in and have a few bites before we get started today! *Allow PALS to try the items.*

These are great food items that really hit the spot! It would be a shame if we could not have these items again. Today let’s look at how these two items create new plants very differently. Get ready to get your hands dirty and learn more about **propagating** pineapples and avocados!

SUMMARY OF CONTENT AND TEACHING STRATEGIES

Prior to meeting with your PALS, make sure that you have all supplies listed in the ‘Tools, Equipment, and Supplies’ section.

It is amazing that plants go through a process called **propagation**, which allows them to multiply and create more plants. If plants did not propagate, we would not have our fruits and vegetables or beautiful flowers in the spring!

OBJECTIVE 1. | Explain sexual vs. asexual *propagation* of plants.



I. Define *plant propagation*

- A. ***Plant propagation*** is the process of multiplying the number of a plant.
- B. Two types of ***plant propagation***, sexual and asexual.



Help me name one way we know that new plants are created.

Allow PALS to respond seed. If they struggle, have them think about seeds found in fruits or planting seeds in order to create new plants.



The type of plant propagation that is probably most familiar is a seed. Of the two items we started with, the pineapple and the avocado, which do you think will grow from seed?

Allow PAL to guess.



The avocado has a large seed located in the middle. When we cut the avocado open, we have to remove the large seed in order to use the edible part for things like guacamole. Let's work together creating an experiment that will show us how important a seed can be.

II. Activity: Sexual ***Plant propagation*** with a Seed

A. Materials Needed:

1. One avocado
2. Three toothpicks
3. Glass of water

B. Procedure:

1. Cut the avocado in half and remove the seed. Clean the seed gently
2. Push three toothpicks into the seed
3. Place the seed, pointed end up, in the glass of water. The toothpicks should hold the top half of the avocado seed in the air while the bottom half is in the water
4. Add water as it evaporates
5. Once roots grow, seed can be transplanted and will continue to grow into a new avocado tree sprout



Let's take our fresh avocado and cut it in half to remove the seed.

To remain safe, your PALS should observe this step as you complete it.



Can you help me remove the seed?

Allow PALS to remove the seed with their hands. Carefully clean off the seed.



This is an avocado seed. How is this different from other seeds that you have seen?

Allow PALS to talk about the physical characteristics that are different in this seed. Avocado seeds are much larger than seeds they are probably use to seeing.



When we look at seeds from a variety of plants, not one seed is alike. Being different, just like you and I are different, makes us special and unique. This avocado seed is different, but will create something more amazing than we could ever realize – a brand new tree. In order to help this seed grow into that amazing tree, we need only four more items: three toothpicks and a glass of water. Let's get our seed ready to grow.

Our seed is going to be in water until it grows roots. Plants also need air to grow, so let's take our toothpicks and help it hang from the glass of water while it works on propagating. Carefully push the toothpicks into the seed an even distance from each other around the top.

Demonstrate this step by completing the first one. It is a good idea to show your PALS exactly where they need to insert the toothpick so it will suspend from the glass and not be too much under water.



Excellent placement of those toothpicks! The last step is setting the avocado in the glass of water so we can wait for the roots to grow. Let's place our seed in the water.

Allow your PALS to suspend the avocado in the water.



I cannot wait to see how our seed begins to grow. This will take some time, so we need to make sure to keep water in our cup until the roots grow. Once they do grow, then we can move it into a pot of soil so it can transform into that amazing tree sprout!

That was really fun! I will look forward to some homemade guacamole from you! Mmm...that makes me hungry and reminds me of that yummy pineapple we had earlier too. Let's think about that plant – were there any seeds on the part we were eating?

Allow your PALS to say no. If she/he can't remember, give him/her another piece of pineapple to examine.



If there are no seeds, how do you think more pineapples grow?

Allow your PALS to guess. If she/he is not sure, reassure them it's OK.



Pineapples grow differently. Instead of having a seed we plant to get a new plant, we actually use a part of the plant to make a brand new one! Let's put together this experiment so we can watch a part of a plant transform into a whole new one!

III. Activity: Asexual ***Plant propagation***

A. Materials Needed:

1. The top of a pineapple (eat the rest with your PALS!)
2. A pot about 6 inches in diameter
3. Potting soil (soil needs to be sandy)
4. A knife

B. Procedure:

1. Cut about 2 inches off the top of a pineapple
2. Plant the top in a pot that contains moist, sandy potting soil
3. This plant takes a long time to grow. It will grow around one foot a year as long as the plant is taken care of



After I cut up that yummy pineapple that we had as our snack, I kept the top for our experiment. The first thing we need to do is cut about two inches off the top of the pineapple.

Again, for safety you should complete this step and allow your PALS to observe.



We need somewhere for this pineapple top to go. What do we usually plant our plants in?

Allow PALS to respond with soil.



That's right – we plant most of our plants in soil. Let's carefully take this pot (*hold up the 6-inch diameter pot*) and fill it with our soil (*point to the location of the soil*).

We then need to take our pineapple top and plant it in the pot carefully. What do you think will happen to the pineapple top?

Allow your PALS to brainstorm ideas – things like grow a new plant or grow roots are two great answers.



I wish we had a magic wand to wave and have our new pineapple plant! Unfortunately it will take a little time, so let's go put our pot in a well-lit place so it can start growing!



I hope you're really excited about seeing how our plants grow. Let's take a look back and review all we have learned today.



REVIEW / SUMMARY



Great job planting our avocado and pineapple plants!

What is one difference between these two plants? Allow PAL to respond.

The large item we removed from the middle of the avocado plant was called what?

Allow your PAL to say seed.



The avocado plant will grow from a seed, but the pineapple will grow from what?

Allow your PAL to respond.



Remember, the pineapple plant was different because it will grow by just removing the top of the plant and planting it in soil.

It is amazing that, even though these are both items we eat, they are both created in such a different way. We only talked about two today, but maybe sometime in the future we could look at your favorite fruit, vegetable, or flower and see how we propagate those! Thanks for being such a great help today!

Wrap up and clean up any items with your PAL. Make sure they understand to continue to watch their plants and to add water to the avocado as needed and to water the pineapple as well.

APPLICATION



Large Group Idea

These activities can still be duplicated in a large group. To modify, place students in groups and have them complete a potato for the asexual reproduction. Different varieties of potatoes could be used, which will allow students to see that propagation of plants can happen at different rates even though they are the same species.



Small Group Idea

Allow for the student to select a plant they would like to learn how it is propagated. Allow them to research that plant, and if feasible, have them go through the steps in order for that plant to be propagated.