

GROW YOUR PALS PROGRAM GUIDE



THE NATIONAL FFA MENTORING PROGRAM

Sponsored by



LESSON 1.1

*Rain, Rain Don't Go Away...
Germinate My Seeds Today!*

Unit:
PLANTS AND GARDENING

PRECEPTS

- G. Physical Growth
 - G1. Practice healthy eating habits



Lesson Type:
Large Group

NATIONAL STANDARDS

- PS.02.02.01.c. Formulate and prepare growing media for specific plants or crops.
- NL-ENG.K-12.3 – Evaluation Strategies
- NL-ENG.K-12.12 – Applying Language Skills
- NS.K-4.3 Life Science
- NS.K-4.6 Science in Personal and Social Perspectives

STUDENT LEARNING OBJECTIVES

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

- Understand water is required for *germination*.
- Observe and describe the differences in *edible* seeds.





TIME

Instruction time for this lesson: **50 minutes.**



RESOURCES

None Available



TOOLS, EQUIPMENT AND SUPPLIES

Supply amounts will vary depending on the number of students per group: Paper and writing utensils for brainstorming

- ✓ **Four small containers with lids**
- ✓ **Cotton balls**
- ✓ **Quick-sprouting seeds** (*try cress seeds*)
- ✓ **Marker**
- ✓ **Saucer or plate**
- ✓ **Paper towels**
- ✓ **Variety of edible seeds** (*dried beans, chickpeas, mung beans, rice or lentils*)

Supplies for each classroom:

- ✓ **Bag of lima bean seeds** - one per student
- ✓ **White computer paper** - two sheets per student
- ✓ **Writing utensils** - one per student
- ✓ **Glue sticks** - one per student
- ✓ **Writing surface** (*board/white board/large easel pad*)
- ✓ **Chalk/markers/white board markers**
- ✓ **PALS1.1. LG.TM.A-C** - one per class
- ✓ **PALS1.1.LG.AS.A** - one per student
- ✓ **PALS1.1.LG.ASSESS.A**

KEY TERMS



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

Germination

Edible



CONTENT OUTLINE

Objective 1. | Understand water is required for germination.

- I. Define **germination**
 - A. **Germination** is the process in which a seed begins to grow
- II. Requirements of **germination**
 - A. Correct amount of water, oxygen, temperature and light are required before a given seed will begin to grow or germinate
- III. Activity: Do Seeds Need Water to Germinate?
 - A. Obtain needed materials:
 - 1. Four small containers with lids
 - 2. Cotton balls
 - 3. Quick-sprouting seeds
 - 4. Marker
 - 5. Small container of water (can be one container per multiple groups depending on setup)
 - 6. Paper towels
 - B. Procedures:
 - 1. Label each container one through four
 - 2. In container one, put some wet seeds on wet cotton balls
 - 3. In container two, put wet seeds on dry cotton balls
 - 4. In container three, put some dry seeds on wet cotton balls. Add more water so the seeds are underwater
 - 5. In container four, put some dry seeds on dry cotton balls
 - 6. Cover all the containers
 - 7. In a few days, remove the covers and observe what took place

Objective 2. | Observe and describe the differences in *edible* seeds.

- I. Define **edible**
 - A. **Edible** means able to be eaten
- II. Activity: **Edible** Seeds
 - A. Obtain needed materials:
 - 1. Saucer or plate
 - 2. Paper towel
 - 3. Source of water (either a small container or a spray bottle)
 - 4. A variety of **edible** seeds
 - B. Procedures:
 - 1. Pass out the variety of seeds to each student or groups of students
 - 2. Wet a paper towel on a plate and dampen it
 - 3. Spread the seeds on top
 - 4. In about three days, seeds will either begin to germinate or not grow at all
In about a weeks time, seeds will be read to 'harvest'

LESSON PREP-WORK

There are two ways to deliver the content in this lesson. Most PALS chapters will only have the ability to visit their mentees once a week; therefore, this lesson will be taught from that perspective. If groups have the ability to meet more than once a week, this lesson can be split and more hands-on activity can be accomplished. For alternate methods to this lesson that include additional meeting time, refer to the Extended Classroom Activities section.

*In order to properly prepare for this activity, there are several items that should be accomplished prior to beginning the lesson. Because it can take several days to germinate seeds, depending on the environment, gather the following materials at least three days prior to meeting with the group: four small containers with lids, cotton balls, quick-sprouting seeds, a marker, a saucer, paper towels and several types of **edible** seeds (such as dried beans, chickpeas, mung beans, rice or lentils). There are two illustrations in this lesson that the students will be observing. The first illustration will show that seeds need water in order to germinate. Complete the following procedures, which should take about 10 minutes, at least three days prior to the meeting:*

1. Label each container one through four.
2. In container one, put some wet quick-sprouting seeds on wet cotton balls.
3. In container two, put wet quick-sprouting seeds on dry cotton balls.
4. In container three, put some dry quick-sprouting seeds on wet cotton balls.
Add more water so the seeds are underwater.
5. In container four, put some dry quick-sprouting seeds on dry cotton balls.
6. Cover all the containers.

*The second illustration will show that some **edible** seeds we encounter germinate, while others do not. Complete the following procedures, which should take about 10 minutes, at least three days prior to the meeting:*

1. Gather together the **edible** seeds, such as dried beans, chickpeas, mung beans, rice or lentils.
2. Wet a paper towel in a saucer or a plate and dampen it.
3. Spread the seeds on top.

Make sure to gather all materials and carefully transport them to the location on the day of the PALS activity.

INTEREST APPROACH

Prior to students arriving, puzzle piece (see PALS1.1.LG.AS.A, for the review activity) must be placed around the room, hidden and in the open. There should be six pieces for each puzzle to create a flower. Each student will create their own puzzle, so make sure that an accurate head count is completed before the beginning of the lesson.

As students arrive, pass out a seed, a piece of paper and a writing utensil to every student in the group. If possible, arrive to the classroom earlier and set up the materials at each desk location. If quantities are limited, have students partner up with their materials. Once students arrive, welcome them and introduce the group if necessary.

Hold up one of the same type of seeds that was just passed out to the group.



Raise your hand if you can tell everyone what this object is that we each received. Wait for responses from the group. Call on one student. Responses should be a seed, but if not, continue to ask students in a positive, encouraging way.

Show What You Know Moment:



Great! I thought many of you would be familiar with this object. The object you are holding is a seed. Think of all the different seeds you have seen and how they are used. When I say WRITE, write down a list of words or illustrations that describe seeds on the piece of paper in front of you. This could be where you have seen them, different types of seeds or what a seed does. Who will describe the activity we are about to do?

Allow a student or students to walk through the activity of Show Me What You Know. If students get stuck in one spot, take time to redirect until all students are ready to proceed.



Thank you! Oh by the way, to help your brain today, work with a partner on this activity. You will have one minute to get all you know about seeds on your piece of paper! What questions are there?

Answer any remaining questions.



Great!

WRITE!

As students are working on this activity, circulate the classroom and make sure everyone gets at least one idea down on their paper. Since some students may have a better ability to write than others, encourage students to also draw pictures if they would like. Help with spelling and any other questions as needed. At the end of one minute, have students wrap up their ideas and return their attention to the front of the room.



I saw a lot of great ideas as I was walking around the room! Who will be first to share one idea their group knew about seeds?

Write down the ideas as students share. Take as many ideas as you feel necessary and time will allow. If possible, get one idea from each group.



This is a great list! It is great to see that we know so much about seeds! Seeds are very important to our lives, from providing us a variety of food to turning into plants that are important resources for us. Today let's look and see how we can make sure seeds get all the things they need in order to grow and why some of those seeds are meant for us to eat instead. Put your thinking caps on and let's get ready to learn more about seeds.

SUMMARY OF CONTENT AND TEACHING STRATEGIES

OBJECTIVE 1. | Understand that water is required for germination.



Make sure to prepare PALS1.1.LG.TM.A – B prior to beginning the content lesson. If an overhead or technology is not available, have the content on posters that can be displayed large enough in the room for all students to see.

For the activities, students will need to be broken up into groups of no more than three. If the number of students is known prior to arriving, split up all the materials needed for the activities into enough groups so they will be easy to distribute when ready. One set of demo materials will be needed to help demonstrate the procedures of the activity during explanation.



We just learned from our list (*Refer back to the list generated in the Interest Approach*) that seeds mean many different things to us. Trees, flowers and bushes all start out as seeds. Seeds are very important because they are baby plants just waiting to grow. Reveal PALS1.1.LG.TM.A. When a seed begins to grow, we call this **germination**. This picture (*refer to PALS1.1.LG.TM.A*) is an example of how a seed starts and begins to grow.

I. Define **germination**

- a. **Germination** is the process in which a seeds begins to grow.

Choral Response Moment:



Through the rest of this activity, we will talk a lot about plants growing. Whenever someone is talking about seeds and says the word ‘GROW’, I want everyone to say the word ‘GERMINATE’ in their classroom voices. Let’s practice. Seeds GROW (*Extend hand, palm up, toward group and wait for their response of ‘GERMINATE’*) into plants. Great job! Keep this up and let’s find out how these tiny seeds transform and GROW (*Wait for students to say GERMINATE. If they forget, prompt them*) into big plants!

Raise your hand if you ate a meal or a snack today. Why do we have to eat and drink food on a daily basis?

Call on a few students to answer the question. Students should understand it is to give them energy and allow them to grow. If not, direct the students to understand that food helps them grow.



Food and water are important parts of our daily diet that makes sure we grow up to be big and strong. Plants are just like us. They require certain things in order to grow (*Allow students to say GERMINATE*) and become big plants. Let’s look closer at what a seed would need in order to grow.

Reveal PALS1.1.LG.TM.B



Who will identify one of the following items displayed?

Allow students to raise their hand and identify one of the items on PALS1.1.LG.TM.B. Students should identify the following: water, light, temperature, air.



Great job! The items are water, light, temperature and air. These four items are very important in helping the seed grow (*Allow students to say GERMINATE*) just like it is important that we get the right amount of food and water we need on a daily basis to help us grow.

II. Requirements of **germination**

- A. Correct amount of water, oxygen, temperature and light are required before a given seed will begin to grow, or germinate.

Well, what do you think would happen if a seed did not get all those things? Would it still grow the same? When I say THINK, I want you to think quietly to yourself whether or not seeds would still germinate without water. Remember, the four items we just discussed (*refer to PALS 1.1.LG.TM.B*) and their importance in seed **germination**. You will have 20 seconds to think to yourself. Who can tell me what you should be thinking about during this time? *Allow a student to explain that they should be determining whether or not a seed would grow if it did not have water.* Great! What questions are there?

THINK

As students think quietly, begin to gather materials for the following activity. This activity will help illustrate that seeds do indeed need water to germinate. At the conclusion of 20 seconds, refocus the attention of the group.

III. Activity: Do Seeds Need Water to Germinate?

A. Obtain needed materials

1. Four small containers with lids
2. Cotton balls
3. Quick-sprouting seeds
4. Marker
5. Small container of water (can be one container per multiple groups depending on setup)
6. Paper towels

B. Procedures:

1. Label each container one through four
2. In container one, put some wet seeds on wet cotton balls
3. In container two, put wet seeds on dry cotton balls
4. In container three, put some dry seeds on wet cotton balls
Add more water so the seeds are under water
5. In container four, put some dry seeds on dry cotton balls
6. Cover all the containers.
7. In a few days remove the covers and observe what took place



Great job thinking quietly! How many of you think that a seed will germinate without water? *Allow students to raise their hands.* OK – how many of you think that a seed needs water in order to germinate? *Allow students to raise their hands.* Well, there's only one way to find out! Let's break up into groups and put together a little experiment to see how important water is to seed **germination**.

At this point, break students into groups of no larger than three. The smaller the groups the better; however, make sure there are enough 'teachers' to circulate among all the groups for questions. Pass out the materials needed for 'Do Seeds Need Water to Germinate?' activity. Place the demo materials at the front of the room for this activity for all students to see. For each step, demonstrate what to do while talking through the procedures. This will allow students to see exactly what they should be doing.



For each group you should have four small containers with their lids, eight cotton balls, eight seeds, a small container of water, a paper towel and a marker. Does everyone have all the supplies needed?

Work through any issues here with supplies and make sure that all students are ready to start the first step of the activity.



Listen very carefully as we work together to get your experiment set up! As we work through the activity, I will demonstrate directions for you to see. If you have any questions as we are working, please raise your hand so we can make sure that we are still together!

During the following activity, go through each step with the demo materials to help students understand what is expected of them.



(Hold up a container and the marker) Have one person in your group take the marker and carefully label your containers one (*label demo container one*), two (*label demo container two*), three (*label demo container three*) and four (*label demo container four*). When your group has finished this step, please close your marker and place it on your desk.

Wait for groups to complete this task.



Great! Next, have a new group member take two cotton balls (*hold up two of the demo cotton balls*) and lightly wet them in the small container of water (*place two demo cotton balls in the water*) set out for your group. Just in case, there is a paper towel (*hold up demo paper towels*) with your materials if you need to use it. Once you have wet your cotton balls, carefully place them in the container marked number one (*place wet cotton balls into demo container one*).

Walk around and monitor this as it takes place. Help students complete this task.



Now, take two seeds and carefully wet them in the small container of water (*take two demo seeds, carefully dipping them in the small container of water*). Once they are wet, place them on top of the wet cotton balls in container number one (*take the now wet demo seeds and place them in the demo container one on top of the cotton balls*). When the seeds are in place, close container number one with the lid (*close demo container*). What questions are there? *Field any questions that students might have about what they need to complete.* Great! When you complete this step, put everything down and raise your hand.

Circulate the room and ensure that all students get two wet seeds on two wet cotton balls in container one. Make sure the lids on all containers are sealed. Once all students have their hands raised, then proceed to the next step.



We are well on our way! The next step in our experiment is very similar to the first so we will move a little quicker. If you have any questions while we are going over the steps, please raise your hand so we can work it out! *Answer any questions that students might have at this point, then move on.*



Have a new group member take two cotton balls (*hold up two of the demo cotton balls*) and carefully place them in the container marked number two (*place dry cotton balls into demo container two*).

Walk around and monitor this as it takes place. Help students complete this task.



Now, take two seeds and carefully wet them in the small container of water (*take two demo seeds, carefully dipping them in the small container of water*). Once they are wet, place them on top of the dry cotton balls in container number two (*take the now wet demo seeds and place them in the demo container two on top of the cotton balls*). When the seeds are in place, close container number two with the lid (*close demo container*). What questions are there?

Field any questions that students might have about what they need to complete.



Great! When you complete this step, put everything down and raise your hand.

How was the second container different than the first?

Allow students to realize that the second container had dry cotton balls, where the first one had wet ones.



Raise your hand if you think that what we will see in container number one will be different in container number two. *Acknowledge students.*

Well, we'll have to just wait and see. We have two more containers to prepare, so let get those together now!

Have a group member take two cotton balls (*hold up two of the demo cotton balls*) and lightly wet them in the small container of water (*place two demo cotton balls in the water*) set out for your group. Again, don't forget there is a paper towel (*hold up demo paper towels*) with your materials in case you need to use it. Once you have wet your cotton balls, carefully place them in the container marked number three (*place wet cotton balls into demo container three*).

Walk around and monitor this as it takes place. Help students complete this task.



Now, take two seeds and place them on top of the wet cotton balls in container number three (*take the dry demo seeds and place them in the demo container three on top of the wet cotton balls*). When the seeds are in place, close container number three with the lid (*close demo container*). What questions are there?

Field any questions that students might have about what they need to complete.



Great! When you complete this step, put everything down and raise your hand.

Alright, let's get together the last container. Have a group member take two cotton balls (*hold up two of the demo cotton balls*) and carefully place them in the container marked number four (*place dry cotton balls into demo container four*).

Walk around and monitor this as it takes place. Help students complete this task.



Now, take two seeds and place them on top of the dry cotton balls in container number four (*take the dry demo seeds and place them in the demo container four on top of the dry cotton balls*). When the seeds are in place, close container number four with the lid (*close demo container*). What questions are there?

Field any questions that students might have about what they need to complete.



Great. When you complete this step, put everything down and raise your hand.

Help any students that might need additional assistance in finishing up the experiment. Depending on the classroom, have students collect their four containers and place them in an area of the classroom where they will not be in the way for at least three days. Once students have finished have them clean up their space and return to their seats before moving on.



Great job putting together your experiment! It will take about three days for your results to show. Are you curious to see what is going to happen to your seeds? Well, you're in luck! A few days ago we put together this same experiment so we could show you what will happen.

At this point make sure all students in the group can see the results of the pre-assembled activity.



When we put together our four containers, did they all have water in them?

Allow students to raise their hands and answer no. Container four had dry cotton balls and dry seeds.



How many of you thought that seeds did not need water to germinate?

Allow students to raise their hands again.



Which container had no water in it? *Allow students to say four again.*

That's right. Let's open this container first and see if our seeds germinated with no water.

Carefully open the container. Slowly pull out the cotton balls and seeds inside. There should be no change from the condition they were placed in the containers. Hold up materials so that all students in the group can see.



Can you see any difference in these seeds from the ones you just placed in your containers? *Allow students to say no.*

So, if these seeds are the same, did the seeds grow (*prompt students to say GERMINATE*)?

Allow students to say no.



From seeing what happened in container four, we know right now that seeds that do not have water, do not germinate. Let's look in the other containers and see which ones, if any, had seeds that germinated.

Let's take a look at container one, which had our wet cotton balls and our wet seeds. Raise your hand if you think these seeds germinated?

Acknowledge students raising their hands. Carefully open the container and pull out the wet cotton balls with the seeds. It would be beneficial to have a few paper towels around to place the wet cotton balls on as you pull the seeds out to show the students.



Do these seeds look the same as they did when we placed them in the container?

Allow students to say no.



Who can tell me how this seed looks different?

Allow students to talk about the physical characteristics that are different. Since every seed will germinate differently, guide students in helping them see the noticeable differences that are present in these seeds that have germinated from the ones that they just placed in their jars.



So did this seed grow?

Allow students to respond, yes.



That's right! This seed did grow. What do we call a seed that is going through the process of growing?

Allow students to say germinate.



Great job! The seeds that we placed in here were wet seeds on wet cotton balls. These seeds received enough water for **germination** to occur. So is water required for seed **germination**?

Allow students to respond yes.



We have two more containers left to look at. Remember, both of these containers also had some type of water in them. Do you think we will also see seeds that have germinated in containers two and three?

Allow students to answer. Some may say yes, some may say no.



We'll let's take a look!

In container number two we placed wet seeds on dry cotton balls and in container three we placed dry seeds on wet cotton balls.

Carefully pull out the cotton balls and seeds. The seeds should not have germinated to the point that container one did.



Do containers two and three look anything like container number one?

There may be a slight resemblance; however, container one should have grown much more than containers two and three. Allow students to see the difference by walking around the group and ensuring all students see the seeds.



Did the seeds in containers two and three grow as much if at all more than the seeds in container one? *Students should reply no.*

As we grow up, we begin to eat more and more food to gain the energy we need in order to be healthy. If we do not get enough food or water, then we will not have enough energy and become very tired. Do you think the seeds in containers two and three received enough water in order to germinate?

Students should say no. If they struggle with this, try to get them to understand that as they get older they will need to consume more in order to have enough energy to grow. Relate this to parents or siblings that eat more at meals than them. The seeds may have had water, however there just was not enough for them to germinate as far as container one.



The seeds in containers two and three may have had water, they just didn't have quite enough for them to germinate like container one. The amount of water they received made a difference in whether or not they would germinate.

So after looking at all the containers, do seeds need water in order germinate?

Students should say yes. Some might go ahead and take it further and say as long as there is enough.



We have discovered from our experiment that it also matters how much water we give our seeds. If we do not give our seeds enough water, then they may not grow as quickly as others. In a few days you will be able look at your experiment and see how your seeds germinated. When seeds germinate, what do they turn into?

Allow students to raise their hands and answer. If they struggle, or if they say things very specific like tree or bush, redirect them to answer plants.



That's right! Seeds germinate and grow into plants. Some of those plants are very important to us because they provide us with important things, like food and clothing. But did you know that some seeds we actually eat? We call these seeds **edible**. When I say **EDIBLE**, you will have 30 seconds to brainstorm one type of seed we eat. What are we going to brainstorm?

Allow students to respond.



That's right! Come up with one type of seed we eat. Oh, by the way, complete this brainstorming session with a partner. What questions are there?

Answer any questions they might have.



OK

EDIBLE

OBJECTIVE 2. | Observe and describe the differences in *edible* seeds.



I. Define **edible**.

A. Able to be eaten

As students are brainstorming their seeds, prepare PALS1.1.LG.TM.C. Migrate around the classroom to make sure that students are actively brainstorming. At the completion of 30 seconds refocus the group's attention.



Great job using your brains! Which group will be first to share their **edible** seed?

*Allow as many students to share as time permits. If students struggle with types of **edible** seeds have them think about things they eat that might look like a seed. This will lead to them realizing there are many different types of **edible** seeds.*



Excellent job! All the seeds we just mentioned are considered to be **edible** seeds, or those that we can eat. *Reveal PALS.1.LG.TM.C.* Here are just a few seeds that we consider to be **edible**. Can someone tell me what these seeds are?

Allow students to identify the following pictures: corn, sunflower seeds, rice and peanuts.

Great job! These seeds - corn, sunflower seeds, rice and peanuts - are very important to our daily diet. We often consume different types of seeds on a daily basis. Do you think these seeds could still germinate?

Allow students think through the concept. If no one contributes, pause for at least 10 seconds to allow them to evaluate the idea.



Let's do another activity and see if seeds we might find in our kitchen that are **edible** still have the ability to grow (*Allow students to say GERMINATE. If not, prompt them*).

II. Activity: **Edible** Seeds

A. Obtain needed materials:

1. Saucer or plate
2. Paper towel
3. Source of water (either a small container or a spray bottle)
4. A variety of **edible** seeds

B. Procedures:

1. Pass out the variety of seeds to each student or groups of students.
2. Wet a paper towel on a plate and dampen it
3. Spread the seeds on top
4. In about three days, seeds will either begin to germinate or not grow at all. In about a week's time, seeds will be ready to 'harvest'

For this next activity, students will observe that some **edible** seeds germinate, where others are treated so that they do not. Break students up again into groups of no larger than three. If time is tight, have them stay in their original groups. If not, allow them to break up and work with other students in the group. Pass out the materials for the **'Edible Seeds'** activity. Place the demo materials at the front of the room for this activity for all students to see. For each step, demonstrate what to do while talking through the procedures. This will help students see exactly what they should be doing.



For each group there should be a plate, a paper towel, a source of water and a variety of **edible** seeds. Does everyone have all the supplies they need?

Walk around the groups and make sure all students have the necessary supplies to start the first step of the activity.



Great. Let's get started. Listen very carefully as we work together to get the activity set up. Like before, as we work through the activity, I will demonstrate the directions for everyone to see. If there are questions as we work, please raise your hand so we can make sure that we are still together!

For the first step of this activity you will need the paper towel, the plate, and the water source (*hold up these three items*).

Have one person in your group place the paper towel on the plate (*Demonstrate placing the paper towel on the plate*). Carefully wet the paper towel so that it is moist, but not dripping wet (*demonstrate dampening the paper towel so that the paper towel is very moist but will not drip if lifted up. Illustrate this by lifting up the paper towel and it showing that it is not dripping*). Notice how this paper towel is wet, but is not dripping?

Students should reply - make sure all see this illustration.



Great. Once the paper towel is moist, place it on the plate (*demonstrate this placing the dampened paper towel on the plate*). What questions are there?

Answer any questions that might arise.



When you complete this step, put everything down and raise your hand.

Circulate around the room and check to make sure students complete the first step.



Excellent job! Let's put the seeds on there next. Have another person in your group carefully place the seeds on the wet paper towel, spreading them out so they do not touch (*demonstrate placing the seeds on the paper towel*). When you place all the seeds on the paper towel, carefully fold over the towel, almost like you are tucking your seeds in for a long night's rest (*demonstrate folding the paper towel over the seeds showing the students to be careful that the seeds do not move when they are 'tucked' in*). When you complete this step, raise your hand.

Circulate around the room and assist where needed. Double check to make sure when students fold over their paper towels that they keep their seeds separated. If they do, show students and have them fix it to make sure each seed gets their own space in its 'bed'. Like the previous activity, have students collect their plates and place them in an area of the classroom where they will not be in the way for at least three days. Once students have finished, have them clean up their space and return to their seats before moving on.



How easy was that?! Everyone did an excellent job of putting together the activity. Like the first activity we did today, this one will take about three days for your results to show. But guess what?! You're in luck again! A few days ago we put together this experiment as well so we could see if the seeds we find in our kitchen's will grow (*Allow students to respond with GERMINATE*) too!

At this point make sure all students in the group can see the results of the pre-assembled activity.



In the experiment that we prepared for you to see, we used the same seeds as you placed in your wet paper towels today. Let's 'un-tuck' our seeds and find out the results!

Carefully unfold the paper towel to show the seeds. Depending on the type of seeds, some will germinate and others will not. This happens because some seeds are treated, like rice, so that they will not germinate and others, like lima beans, will germinate if given the right conditions and opportunity. Hold up the plate with the seeds to show the students the two different types of seeds - those that germinated and those that did not.



Is there a difference in these seeds? *Allow students to respond yes.*

Who can give me one difference that they can see in these seeds?

Allow students to talk about the color of the seeds, the **germination** or any other noticeable physical difference in the seeds.



Great job! Did some of these seeds grow (*Allow students to respond with GERMINATE*)?

Allow students to respond yes.



That's right! Some of these seeds did grow. We could actually plant those seeds and they could grow into a plant where we could harvest the crop. But, some of these seeds did not grow. Who can tell me how those seeds look different?

Allow students to point out that the seeds that did not grow still look like a seed.



The seeds that did not germinate still look like seeds. Some seeds that we find in our kitchen are actually made special so that they will not grow into plants. Even though they will not germinate, they still taste just as good! In a few days the seeds you tucked in today will either be germinating or still seeds. The ones that germinated can be placed in soil and you can grow some crops to eat!



Great job today learning about **germination** and **edible** seeds! Let's take a look back and review everything we learned today!



REVIEW / SUMMARY



We talked a lot today about how seeds can grow (*Allow students to respond GERMINATE*). Before you leave today, I want you to put together a little puzzle that will help us remember all the important things we discussed about seeds and **germination** today.

Go Get It Moment®:



How many of you have played hide and seek before?

Allow students to respond.



Great! Throughout this room there are pieces to a puzzle hidden and pieces that are out in the open. When I say PUZZLE, you will walk around the room and seek out the six puzzle pieces that will make up your puzzle. Once you retrieve all six, return to your seat and begin to place them together. Remember, this is a puzzle, so you will need six different pieces in order to create your picture. Who will describe the activity we are about to complete?

Allow a student or students to walk through the activity. If students get stuck, take time to redirect and make sure all students understand what they are about to do before proceeding.



Awesome! What questions do you have? OK - here we go!

PUZZLE!

As students walk around the room, place a plain sheet of paper on their table, one per student, along with one glue stick per student. When students return to their desks, have them place the pieces to create the final product, a flower. Assist any students as necessary in finding all six puzzle pieces.



I see a lot of great puzzles coming together! Once you have finished putting your puzzle together, take the glue stick and attach it to the piece of paper at your desk.

Allow students to complete this task before moving along. Walk around and double check to see that all students have created the flower and been able to glue the flower to their white sheet of paper.



Great job! Who can tell me what our puzzles created? *Allow a student to answer a flower.*

That's right. The puzzle created a flower. The petals of the flower had some important things written on them. Who can tell me what one of the petals says and why it is important to seeds?

Allow students to walk through all six puzzle pieces, reading what it says and why it is important to seeds. If students struggle, help them understand the importance of each word from what was discussed in the lesson that day.



I am very impressed! Everyone did an excellent job today! After today's lesson I hope you now know how important water is in allowing seeds to grow and that some seeds we eat on a daily basis can actually germinate into a plant! Next time we meet we will look a little closer in what we plant our seeds in, the soil, and how we can make sure the soil we use is the best! So get ready to get your hands a little dirty and learn some more about plants!

APPLICATION



Small Group Idea

For a small group activity, have one student personify a seed and have four other students personify water, sun, air and warmth. The student that is the seed will only germinate if the other four students are present. Play through scenarios where there is, for example, sun, air, water, but no warmth is present and then the seed would not germinate.



One-on-One Idea

Read together 'Plant Packages' by Susan Blackaby.

*Or, the first activity focuses on water only; to continue discussion, seeds could also be asked to germinate in the darkness, partial light and direct UV. This will allow students to see that water is not the only thing required to allow for seed **germination**.*



PALS1.1.LG.ASSESS.A | EVALUATION - ANSWER KEY

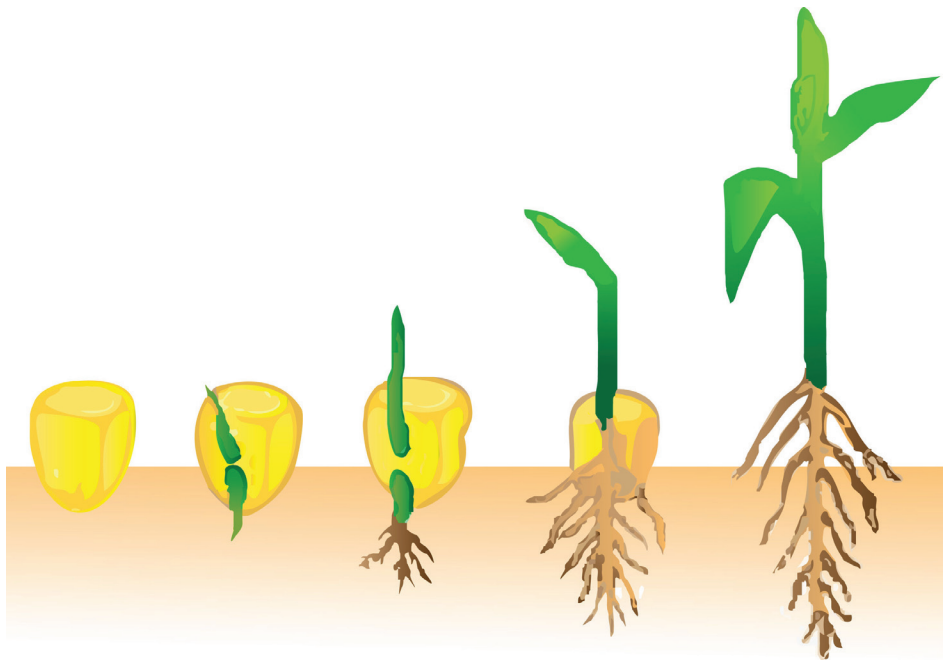
- 1) Grow
- 2) Illustrations should include sun, water, light, temperature
- 3) Answers will vary but can include things such as peanuts, corn, rice or lima beans

PALS1.1.LG.TM.A

What is Germination?

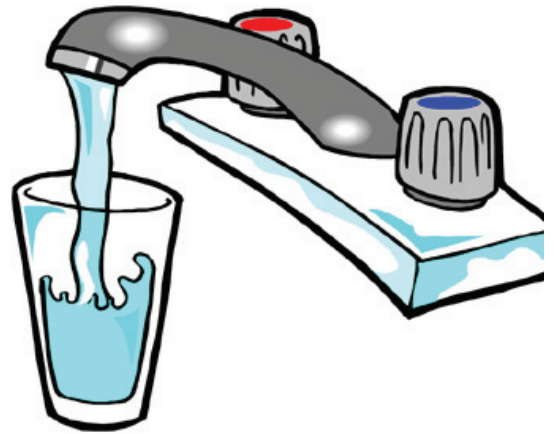
Germination is the process in which a seed begins to grow.

What Does Germination Look Like?



PALS1.1.LG.TM.B

Seeds Requirements for Germination



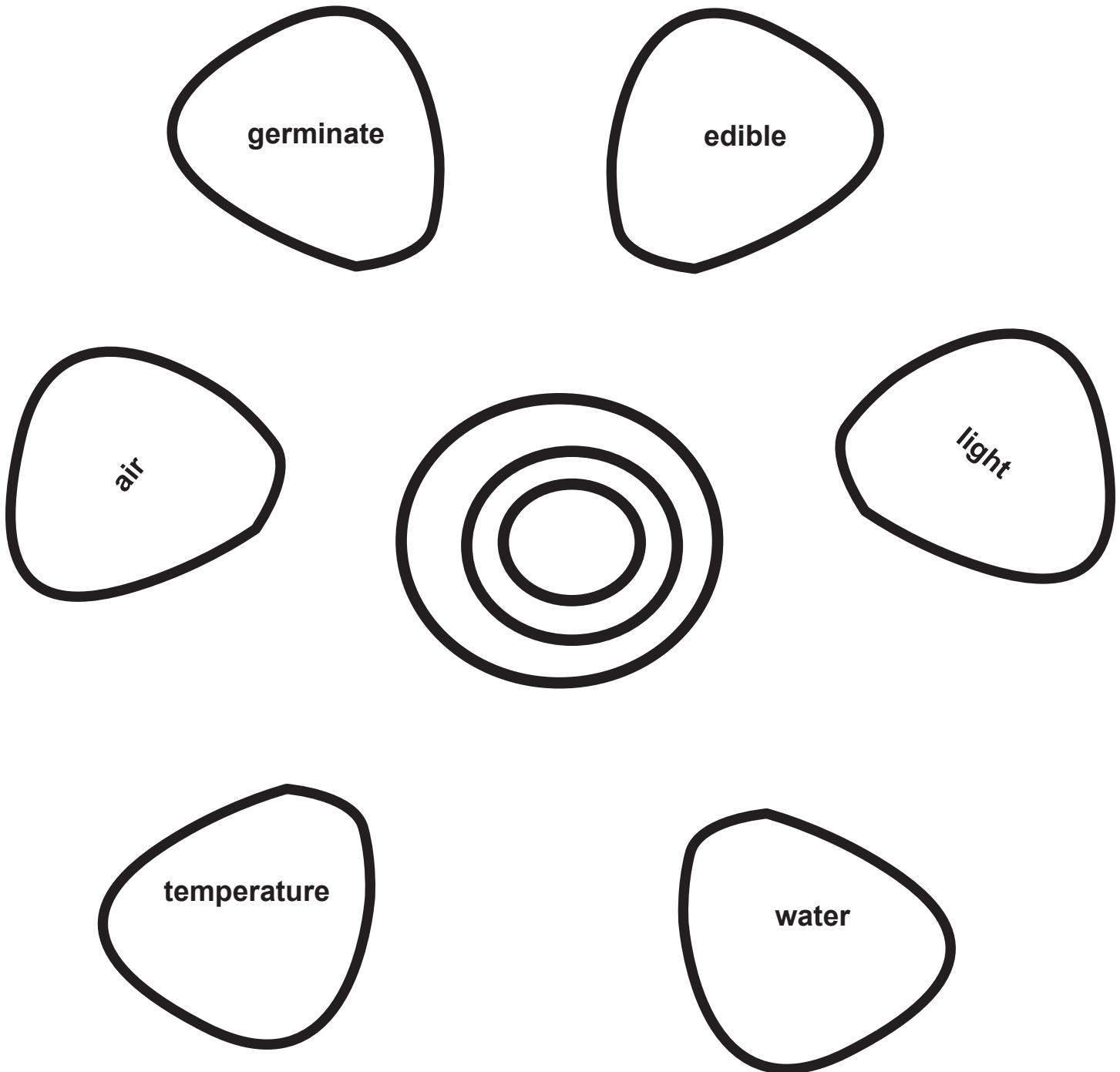
PALS1.1.LG.TM.C

Examples of Seeds



PALS1.1.LG.AS.A

Flower Puzzle Pieces





PALS1.1.LG.ASSESS.A

Rain, Rain, Don't Go Away.....Germinate My Seeds Today!

Answer the following questions about seed germination:

- 1) What is another word for germination?

- 2) Draw the four items that seeds need in order to grow.

- 3) Name one type of seed that you eat.