STEP AWAY FROM THE TEXTBOOK!

Plants

Activities, Parodies, Games, Jokes, Review Sheets, "3-D Templates", Cold Reading Passages, and much more!

- Types of Plants
- Plant Structures
- Plant Processes
- Life Cycles
- Plant Reproduction
Can I really make copies of these pages to use as handouts?

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Okay, now that you’ve got all of the disclaimers out of the way—go have fun!!!
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“A teacher who is attempting to teach without inspiring the pupil with a desire to learn is hammering on cold iron.”

—Horace Mann (1796-1859)
“The Father of American Public Education”
Over the next few pages I will share some of my personal classroom secrets that are sure to engage and excite your students!

Here’s how it works:

The left-hand page includes the song parody, activity, poem, game, etc. for you to share with your students.

The right-hand page includes my personal commentary, including the reasons I’ve had success with this exercise, any key directions, and other tid-bits that might be helpful.

***The exercises on the next few pages are great to use for this topic area, but you can easily modify them to use for other topics and even subject areas. The simple format and extra notes that are provided will really help with this!
**Classroom Game**

**Plants "Zip Around" Game**

**Description:** “Zip Around” game to review plants

**Instructions:** One student asks the question on their card, and the student with the appropriate card reads the answer. That student then asks his or her question, and the “zip around” continues. Use as a review tool at end of unit and for end-of-year testing.

<table>
<thead>
<tr>
<th>I am the roots.</th>
<th>I am a stem.</th>
<th>I am the pistil and stamen.</th>
<th>I am the leaves.</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the stalk of the plant that supports the leaves and flowers?</td>
<td>What are the reproductive parts of the plant?</td>
<td>What is the part of the plant where photosynthesis takes place?</td>
<td>What is the container that contains the embryo of a new plant?</td>
</tr>
<tr>
<td>I am a seed.</td>
<td>I am germination.</td>
<td>I am photosynthesis.</td>
<td>I am transpiration.</td>
</tr>
<tr>
<td>What is the early stage of a plant’s life cycle where the seed starts to sprout?</td>
<td>What is the process by which a plant makes its own food using sunlight?</td>
<td>What is the term for a plant releasing water and oxygen through its leaves?</td>
<td>What is the breaking down of sugar into energy so the plant can survive?</td>
</tr>
<tr>
<td>I am respiration.</td>
<td>I am a tropism.</td>
<td>I am a spore-producing plant.</td>
<td>I am pollen.</td>
</tr>
<tr>
<td>What is a plant’s response to its surrounding environment?</td>
<td>What is a fern, for example?</td>
<td>What is the powder-like material made by plants &amp; used during reproduction?</td>
<td>What is the anchor of the plant that can also absorb nutrients?</td>
</tr>
</tbody>
</table>
All students love to play games for review! This is fast-paced and helps get the blood flowing (and brain working). This review game is a quick, informal assessment that’s great for the end-of-unit or end-of-year. It can also be adjusted to review as much, or as little, information as you want.

Cut out the cards and give one to each student. If there are extras, I have volunteers take more than one. Pick one student to stand up and read the QUESTION aloud on their card. Whoever in the class has the answer, stands up and reads only the ANSWER. You tell them if they are right. If they are, they then read their question and so on.

Essentially, you will be “zipping” around the room with the questions and answers! The first time you do the game, it might take a little while, but you will be amazed how fast they get used to it!

I time the class to see if they can “beat their time”. You will find students helping each other – which in turn helps everyone! I have had classes zip all the way around in less than a minute! I suggest bringing the same game back at the end of the year, and have the class try to beat its time from earlier in the year (it will take a while to get back up to speed).
Song Parody

Plant Life Cycle

Description: A song used to help students understand the stages of a plant’s life cycle.

Instructions: Sung to the tune of “The Wheels on the Bus…”

The Plant Cycle Song
(Sung to the tune of “The Wheels on the Bus”)

The seeds from a plant fall to the ground,
To the ground, to the ground.
The seeds from a plant fall to the ground,
And then begin to grow.

When a seed grows it germinates,
Germinates, germinates.
When a seed grows it germinates,
A seedling it becomes.

The seedling then grows into a plant,
Into a plant, into a plant.
The seedling then grows into a plant,
And that’s the plant cycle!

Hand Motions:

Start with hands up in the air and bring them down, moving the fingers, every time you say “to the ground.”

Clasp hands together, (representing a seed) and then open fingers (with hands still clasped) on the word “germinates.”

Hold hands at shoulder level and raise to the sky on the word “plant.”

Finish by making a circle motion with your pointer finger on the phrase “the plant cycle.”
Some of My Thoughts...

Why I think this is a great exercise...

This quick song covers the broad stages in a plant's life cycle. It's a great mnemonic device to distinguish between the three, especially when you throw in the hand motions. Not to mention it adds some enthusiasm to the classroom and gets the blood flowing.

The Step-by-Step in the classroom...

I always recommend “reading” the songs before singing. This allows struggling readers to make sure they know the words and gives students a chance to ask questions about any vocabulary they need to know before singing. After all, the purpose of this song is to help students understand specific terms within the science standards.

Reading it as a class also allows you to address poetic language in the songs and integrate those ELA standards. We reviewed the song as a poem, discussing stanzas, rhythm, and rhyming scheme — all ELA standards. We then sang it, and it became our poem of the week. By doing so, it became a subtle reminder throughout the day about what we were learning in science class.

Taking it a step further:

After a lesson on plants, my students drew posters where they displayed and labeled each step in the plant’s life cycle. By doing this exercise and singing the song a few more times (at random times throughout the year), I think they were all very comfortable with the topic.
Riddles

Plants will tell you sunlight is a treat.
They use it in this process,
and that's how they eat.
Answer: Photosynthesis

They hold to the ground,
keeping plants sturdy and strong.
Some are short and some are long.
Answer: Roots

I'm a plant, but I use energy just like you.
And that's what causes this process,
where I release oxygen & water in the form of dew.
Answer: Transpiration

For a species to survive,
reproduction is a must.
And if you're a plant,
you depend on this grainy dust.
Answer: Pollen

I start as a seed,
and then I stretch out.
This is the stage when I start to sprout.
Answer: Germination

I grow towards light or water,
and let me tell you why.
The fancy word for it is a
“response to stimuli.”
Answer: Tropism
Some of My Thoughts...

Why I think this is a great exercise...

These riddles are a unique way to process information. To answer them, students need to apply what they’ve learned in a way that is “beyond the textbook.” These also make a great launching activity for students to create their own riddles - for any subject!

The Step-by-Step in the classroom...

I have these riddles, as well as more that the students create, at a station for review at the end of the year. It’s a quick way to jumpstart the memory.

I also use these riddles as a study guide at the end of a unit. Whether students know the answers or not helps me determine which assessment items I should use on the test.

Lastly, I have students create their own science riddles that they type onto colored paper. I laminate them for the students to keep. It has been a great way to tie in ELA writing standards into science review.

Helpful Hint:

When you get a lot of these laminated and ready for a station, put them on a key ring and hang them up for space keeping. They become an instant game students can play during your guided reading groups. I also use them as transitions - I start saying the lines to the riddle while students are packing up and getting ready for the next subject. By the time we get to the end of the riddle, they have an answer and are ready for the next area!
Ok, here’s the deal. My name is Mel, but my close friends call me “Messy Mel.” I think it’s their way of showing respect.

I’m a construction worker by day and a scientist by night (well, an “honorary” scientist, anyway).

I know that science is full of fancy terms, concepts, and theories. And that’s just the basics.

Well, I’m about as basic as you can get. Let me break down some of that scientific jargon in a way that’s easy to understand and remember.

Like I said, I’m no rocket scientist (for what it’s worth, my dear Mother used to tell me I had rocks in my head), but I might be just what you need!
I know it comes as no surprise, but I'm a top-notch gardener when I'm not on the construction site. Some people say I just have a bunch of weeds growing in my backyard, but I know better.

**A few of my favorites:**

I like this seed-producing flowering plant I took from my neighbor's garden... ...and don't forget the spore-producing fern that came from his porch.

Why do I like these plants? Well, I like to think of myself as a guy who stays in touch with his roots (in fact, I haven't traveled out of town for 27 years). So you'll notice that my favorite plants are both nice, strong vascular plants with well-developed root systems. Just like me!
It's a hard life being a flower in Messy Mel's garden. I have to do everything I can to survive. ...like absorb water & nutrients through my roots.

...and I need to make sure my stem supports me, and that my leaves take in the light I'll need for energy.

It's not just about me. I need to look out for future generations. You can't do that without a stamen and a pistil that are ready to reproduce.

So, if I play my cards right, I'll be strong, healthy, and I'll get to enjoy the entire life cycle of a plant.

What's more, I'll pave the way for new plants that come after me. For that, of course, I might need the help of a little pollen-transporting bumblebee.
Every organism needs to reproduce. In fact, this is a good time to introduce my boy, Mel, Jr. Isn’t he a fine looking young man?

I’m glad you asked. Plants can reproduce in two ways, and it just so happens that they are both explained right here. Aren’t you lucky?

1) Sexual Reproduction: This just means that the plant uses male and female parts to fertilize an egg with sperm cells. But here’s the kicker—a plant can have both parts. That’s what’s happening on the left-hand page. Remember that “pistil” and “stamen”? Well the pistil is the female part, and the stamen is the male.

*Remember this:* All flowering plants use sexual reproduction.

And, just because I’m nice, let me once again direct your attention to the life-cycle of flowering plants on the previous page.

2) Asexual Reproduction: Now this one is “cool” (*I think that’s what you kids are saying these days*). This means that a plant can sprout a new plant right from its stem, roots, or leaves. The result—a new plant that is exactly the same as the original.

It might seem like something you’d see in an alien movie, but this sprouting of new offspring isn’t as crazy as you might think. Or, to put it another way, do you think it is exciting when you watch a potato sprout off a new plant?

I didn’t think so.
As energy is used throughout the plant, water and oxygen are released through the leaves (sort of like how I sweat like a pig when I eat jalapeno peppers). This is called Transpiration.

The leaves of the plant absorb sunlight and combine carbon dioxide and water to form sugar, which is the energy for the plant (like cheeseburgers are for me). This is called Photosynthesis.

The sugar created by the plant is broken down into energy throughout the plant so that it can carry on its life functions. This is called Respiration.

After watching me water my plants, I’m sure that you’re all going to want to run home and work in the garden. I have that effect on people.

But first, you should know the basics about how plants grow. Lucky for you, Messy Mel is here to share his vast wisdom.
So, you've taken good care of your plants, and you're just sitting around waiting for them to grow. Well, there still might be some surprises in store.

While you're waiting, you might as well let me prepare you. It will help pass the time.

Plants don't always grow straight up and down (that would be too easy). Instead, plants respond to their environment. This response is called a (get ready for a fancy vocabulary word) tropism. For example:

- **Phototropism** means it's growing towards the sun
- **Hydrotropism** means it's growing towards water
- **Thigmotropism** means it's responding to something it is touching (like a fence)
- **Gravitropism** means it's responding to the pull of gravity

And sometimes, just to keep things interesting, a plant will look like it's NOT GROWING AT ALL. This means it's dormant, and it's probably saving energy because it doesn't have enough food or water. It's kind of like the way I will leave the TV on the same channel for weeks just because I can't find the remote control.
Well, if you've taken advantage of my expertise, by now you should have learned a lot about caring for plants. But sometimes, just like people, plants do get sick. And it's not just from eating month-old leftovers, either.

There are certain fungi that can make for a very unhappy plant. They have great names like grain mold, wheat rust, and corn smut.

These are not to be taken lightly. They can destroy entire crops, cause millions of dollars of damage, and be downright disgusting.

For example, would you like to eat a grain of corn that has been infected by corn smut?

I didn't think so!
Activity - "A Rose is a Rose" (plants)

This activity gives your students the opportunity to go outside and see nature firsthand.

Divide your students into groups of two or three. Each group must walk around outside and choose a different plant, flower, or tree. They must closely review it and answer these questions:

- Is the plant vascular or non-vascular; seed or spore-producing; flowering or cone-bearing; monocot or dicot?

- How does the plant reproduce, and what are its reproductive organs?

- How does the plant defend itself?

- What parts of the plant are used for photosynthesis?

- What parts of the plant are used for respiration?

- What parts of the plant are used for transpiration?

- Has the plant responded in any way to external stimuli (i.e. phototropism, gravitropism, hydrotropism, or thigmotropism)?

- What is the greatest immediate threat to the plant's health?

When you are back in the classroom, have the groups compare their findings with one another.

See if they can identify the plant, flower, or tree that they were examining. If so, have them research to find the scientific classification of their plant. This will help them know which groups were examining very similar species, and which groups were examining more unique ones.
Plants & Vegetation:

Q: What does the letter 'A' have in common with a plant?
A: They both have bees coming after them!

(A terrible pun, but a good way to introduce pollination and plant reproduction)

Teacher: Always remember that a yard is made up of three feet.
Student: Wow, you're lucky! It must be easy to mow your lawn.

(There’s probably no instructional advantage in telling this joke, but it will get a polite chuckle)

Teacher: Do you want to hear a very gruesome story?
Students: YES!
Teacher: Okay, there was a vine that was planted at the bottom of a wall. When
Springtime came, it “grew some”, and grew some, and grew some...

(Your “gruesome” story might disappoint your students, but they’ll appreciate your attempt at humor)

In the nation of India, a banana tree got into an argument with a cluster of bananas
hanging from its branches.
The argument went on for hours, until the bananas finally yelled, “Why don’t you
make a like a tree and leave!”
To this, the tree shouted, “Oh yeah? Well, why don’t you make like a banana and
split!”

(Once again, it’s another bad pun, but it’s enough to lighten the mood late in the day)

A King was very proud of the giant tree that lived in the forest beside his castle. He
had heard rumors that it was over 150 years old, and he wanted to know for sure. He
offered a large reward to anybody who could tell him the exact age of the great tree.
One day, a young man came to the King and shouted, “You’ll be very pleased, Your
Majesty. That tree is even older than we thought. It is 214 years old!”

“Wow!” said the King. “The people in my Kingdom should be proud to have such a great
specimen. By the way, how did you find out its exact age?”

“Easy. I just cut it down and counted the rings.”

(A simple story, but this gives you a chance to bring up the neat way to determine the age of a tree)
“Turn over a new leaf.”

Every once in a while, it’s necessary to break away from old habits and start with a new beginning. That’s what it means to “turn over a new leaf”. But, when you pick a leaf up off of the ground, it’s tough to make that connection. As it turns out, that’s not where the expression came from.

The phrase “turn over a new leaf” is really another way of saying, “turn the page,” which makes a little a more sense. When you turn the page of a book, you allow yourself to experience something new, and you leave the pages already turned behind you. It just so happens that the first pages were made out of leaves—the leaves of the papyrus plant. People have been using some form of paper for nearly two thousand years. By the year 900, the Egyptians were manufacturing paper fairly extensively, and they had developed an advanced method for turning the papyrus plant into pages for writing. It’s from them that the concept of “turn over a new leaf” was created, and it didn’t have anything to do with a leaf that had recently fallen off of a tree. Unless, of course, those leaves happened to be from a papyrus plant!
Meet the
“Father of the Green Revolution”

“Let’s just start growing!”
Norman Borlaug (1984)

Renowned agronomist Norman Borlaug decided that age seventy-one was a little too young to retire. Instead, he focused his expertise on helping the dismal agricultural industry in Africa. On a trip to the continent to see firsthand just how bad it really was, Borlaug saw the multitude of starving people and came up with his plan—“Let’s just start growing!” He went to work immediately, aiding the famished nations by teaching the locals his modern techniques.

In his younger years, Borlaug had led the frontier of the Green Revolution, a worldwide effort to improve agriculture in less developed countries. He was an expert in helping uneducated farmers upgrade their techniques, and he trained other technicians to teach those principles throughout the world. In 1970, he was awarded the Nobel Peace Prize.

Surprisingly, despite his worldwide influence, Borlaug had never been a part of any programs in Africa. In 1984 he was approached by Japanese philanthropist, Ryoichi Sasakawa, who encouraged him to expand to the continent. But, by that time, Borlaug was already over seventy years old, and was a little hesitant to take on the new challenge. Offering him the financial backing, Sasakawa finally convinced Borlaug to bring his expertise to yet another undeveloped corner of the world. The result has had an extraordinarily positive impact on millions of people.

Thanks to new techniques, fertilizers, and education, the yields of wheat (and other important crops) in developing countries has seen a dramatic increase over the past few decades.
“A weed is no more than a flower in disguise,
Which is seen through at once,
If love give a man eyes.”
—James Russell Lowell

“A weed is a plant that has mastered every survival skill except learning how to
grow in a row.”
—Gary Larson

“When you have two pennies left in the world, buy a loaf of bread with one and a
lily with the other.”
—Chinese Proverb

I wandered lonely as a cloud
That floats on high o'er vales and hills,
When all at once I saw a crowd,
A host of golden daffodils;
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze.

Continuous as the stars that shine
And twinkle on the milky way,
They stretched in never-ending line
Along the margin of a bay:
Ten thousand saw I at a glance,
Tossing their heads in sprightly dance.
—William Wordsworth

“If dandelions were hard to grow, they would be most welcome on any lawn.”
—Andrew Mason

“Gardening requires lots of water—most of it in the form of perspiration.”
—Lou Erickson
Characteristics of Living Organisms:
Plants

Directions: Unscramble the tiles to reveal sentences about the characteristics of plants.

R O M A K H E I E T D W N F O O

PLANTS .

O S U L I D T R E S P O N T I M

PLANTS .

C E E P R P O L O D U A T E L I N A N D R

PLANTS .

A T E D D L O P E V E A N G E R M I N

PLANTS .
Characteristics of Living Organisms: Plants

**PLANTS MAKE THEIR OWN FOOD.**

**PLANTS RESPOND TO STIMULI.**

**PLANTS POLLINATE AND REPRODUCE.**

**PLANTS GERMINATE AND DEVELOP.**
Plant Structures

Across

5 ______ Roots: A root system with several main roots
8 Prickly defense structure
10 Embryo container

Down

1 The part where pollination takes place
2 Roots that have one main root
6 The pollen-producing part
Plant Structures

Feel free to make copies of the puzzles to distribute to your students for review

Across

5   ______ Roots: A root system with several main roots
8   Prickly defense structure
10  Embryo container

Down

1   The part where pollination takes place
2   Roots that have one main root
6   The pollen-producing part
Why 3-D Templates?

Our 3-D Templates give students a hands-on way to interact with information. This kinesthetic technique engages the learner while the information is being presented, and also helps in the processing and cognitive organization of it. To put it another way:

“Tell me and I’ll forget; show me and I may remember; involve me and I’ll understand.”

Parts of a Flowering Plant

This template is a great way to identify the location and main function of different parts of a plant. While a flowering plant is included here, the template can be easily be modified to study any kind of plant life (such as trees, ferns, etc.) Once completed, the 3-D Template will make a great review sheet!

Watch as it “Unfolds”

Step 1: Students cut and fold the template as shown on the paper. They should hand draw the arrows.

Step 2: Students fold back each tab to describe the main function of the different parts of the flowering plant.

Step 3: Repeat the steps for each part shown. This can be used as a great study sheet when reviewing the parts of a plant and their functions.

The template is provided on the next page. Make copies to hand out to your students.
Parts of a Flowering Plant

Main Function:

- **Flower**
- **Stem**
- **Leaf**
- **Roots**

Fold

CUT OUT

Fold

CUT OUT

Fold

CUT OUT

Fold

CUT OUT

Fold

CUT OUT

Fold

CUT OUT

Fold

CUT OUT

Fold

CUT OUT

Fold

CUT OUT
**Life Cycle of a Plant**

This template is a great way to remember the different stages of the plant life cycle, as well as the highlights of each stage. Once completed, the 3-D Template will make a great review sheet!

**Why 3-D Templates?**

Our 3-D Templates give students a hands-on way to interact with information. This kinesthetic technique engages the learner while the information is being presented, and also helps in the processing and cognitive organization of it. To put it another way:

*"Tell me and I’ll forget; show me and I may remember; involve me and I’ll understand."*

**Watch as it “Unfolds”**

**Step 1:** Students cut and fold the template as shown on the paper. This will cover the name of each stage in the plant cycle.

**Step 2:** Students unfold the paper to reveal each stage of the plant cycle, and a description of what happens at the stage (which they write in themselves). This forms a great study sheet.

Repeat for each stage.

The template is provided on the next page. Make copies to hand out to your students.
### Science

- Ecosystems, Habitats, & the Environment
- Plants
- Animals
- The Human Body & Heredity
- Cells & Living Things
- Heat & States of Matter
- Energy & Electricity
- Light & Sound
- Astronomy
- Weather
- Earth’s Materials & Processes
- Earth’s Biological History
- Landforms & Oceans
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