LAPBOOK PATTERNS

NOTE: If you would like to print out these pattern pages instead of photocopying them out of the book, you can download the PDF files for the images by going to <u>www.ellenjmchenry.com</u>. Click on FREE DOWNLOADS, then on BOTANY, then on "<u>Printable pages for Botany in 8 Lessons</u>." After downloading this file, you can print the pages using your computer printer or you can ask a print shop to print them for you. **COVER DESIGNS** for your lapbook are avaialable as part of the digital download "Printable pages for *Botany in 8 Lessons*" at www.ellenjmchenry.com. (Click on FREE DOWNLOADS, then on BOTANY.)



NOTE: Don't limit yourself to the project ideas presented here. Be sure to add some of your own creations, as well!

GENERAL INSTRUCTIONS FOR LAPBOOK

These lapbook patterns are "modular" in design. Each project fits into either one half of a page or one quarter of a page. This makes it easy to mix and match (and to add your own ideas, too). You don't have to spend much time planning the overall design of the book. You already know everything will fit. A bit predictable, yes, but very easy. A few possible arrangement are shown here.









It's up to you how to make the blank lapbook. You can use cardboard, poster board, card stock (very heavy paper), file folders, or anything else you have on hand. It's also up to you to decide how complex to make it. You can do just two pages that open up like book, you can make a tri-fold, or you can do something fancy with flaps that fold in from the top and bottom. You can make it all one piece or you can use individual panels with taped seams.



NOTE: In the patterns that follow, the outside dimensions are slightly smaller than a half-page or a quarter-page, so that there is a bit of "breathing room," so to speak, between the projects. The projects should not touch each other when they are glued into place. You might want to keep this in mind if you decide to add your own projects.



LAPBOOK IDEA #1: "RECORD-HOLDING" PLANTS

You will need:

- Copy of this pattern page (card stock or regular paper)
- Glue stick
- Scissors
- X-acto knife or razor blade to cut flaps
- Optional: colored pencils

How to assemble:

1) Cut out both long rectangles.

2) Cut the flaps using a sharp knife or razor blade.

3) Apply glue stick very carefully to the back of the flap page, making sure you won't get any glue on the backs of the flaps. Stick the flap page onto the picture page. (Add color if you wish.)

<u>Option</u>: Print two copies of the page, one on colored paper (I recommend a pastel color) and one on white. Use the colored flap rectangle and the white picture rectangle. The colored flaps will contrast nicely with white pictures underneath.

Alternative method of assembly:

If cutting (or pre-cutting) the flaps with a sharp knife is not an option for you, just cut out the flaps from the flap page, leaving some extra space at the top of each flap. Paste the flaps (with glue on just the top edges!) over the correct pictures on the picture page. Cut out the title and transfer it to the top of the picture page. The flaps won't stay flat quite as well using this method, but this is a minor problem considering that it would possibly will allow the project to be done entirely by the student(s).

LAPBOOK IDEA #2: DESIGN A FLOWER STAMP

You will need:

• A copy of this pattern (or make your own if you would rather have a more square shape)

Art supplies

• Optional: images of real flower stamps (many are available online using Google search)

Flowers are a very popular theme for stamps. If possible, look at some real stamps that feature flowers. Then choose your favorite flower and make it into a stamp. Don't forget to include in your design the name of the country (doesn't have to be your country!) and the number of cents the stamp is worth.













LAPBOOK IDEA #3: "TREE TRUNK TRIVIA" WHEEL

You will need:

- Copy of this pattern page on card stock (or regular paper if you can't get card stock)
- Scissors
- X-acto knife or razor blade to cut flaps
- Paper fastener

How to assemble:

1) Cut the page in half across the middle line and cut out the wheel.

2) Use the sharp knife or razor to cut out the question window, to make the answer flap, and to cut along the flat side on the trunk section.

3) Punch a small hole in the two center dots (middle of wheel and middle of trunk). Put the wheel behind the trunk page, match up the centers and secure with a paper fastener. Slip the edge of the wheel through the slit on the side of the trunk.



This window should be cut as a flap that can open and close.

Remember, you can download printable digital patterns for all these projects at www.ellenjmchenry.com. Click on FREE DOWNLOADS, then on BOTANY, then on "Printable pages for *Botany in 8 Lessons*."



LAPBOOK IDEA #4: ENVELOPES FOR VARIOUS COLLECTIONS

Here is a pattern for a large envelope that can be used to store things you have collected during the unit—pressed flowers or leaves, pictures of plants, drawings, magazine clippings, etc. There is a pattern for a small envelope on the next page.

You will need:

- Copy of this pattern page printed onto card stock (or regular paper can be used)
- Glue stick or white glue (use white glue very sparingly!)
- · Scissors, and an X-acto blade or razor blade

How to assemble:

Print the pattern page onto the paper you would like to make into an envelope. You can even use a fancy printed piece of paper (the type of paper used for scrapbooking). The back side of the pattern will be the outside of your envelope, so if your paper has a top side and a reverse side, make sure this pattern gets printed onto the reverse side.

Cut on the solid line and fold on the dotted lines. Cut the slot line at the bottom with an X-acto blade or a razor blade.

TIP: If you are working with heavy paper, scoring on the dotted lines will make them much easier to fold. To score the paper, lay a ruler along the line and run either the scissor blade or the X-acto blade VERY LIGHTLY along the line, just enough to scratch the paper but not cut it.

Fold the envelope along the middle line, then fold the edges around to the back and glue them in place. If you are using liquid glue, don't use too much. No leaking or seeping! If you are using a glue stick, use plenty. Fold the top flap over to the front. The half-circle should tuck into the slot.

You can decorate or label the envelope in whatever way is appropriate for the contents.







Front

View of back side

This assembles in the same way the large envelope does. You can use the instructions for the large envelope.





LAPBOOK IDEA #5: PORTRAITS OF MONOCOT AND DICOT SEEDLINGS

You will need:

- Copies of these frame patterns (or make your own pattern)
- Seedlings to observe
- Pencil, or colored pencils

What to do:

Sketch two portraits: a monocot seedling and a dicot seedling. Make sure the cotyledons (seed leaves) can be seen. If the seedlings are growing in dirt, take them out of the dirt and rinse them off so you can see all of the roots. Work carefully to make the drawings as accurate as possible. The drawings can be left as pencil sketches, or can be traced over with a fine tip ink pen.

Don't forget to write either MONOCOT or DICOT in the white spaces at the bottom of the frames.

You can cut out the frames and use them separately, or you can leave them together as a half page. You can also make two copies of this page and use the same pattern twice, for both the monocot and dicot.

Option: If you need to save space in your lapbook, you can draw both seedlings in one frame (assuming that both of them are tall and thin).



LAPBOOK IDEA #6: PHOTOSYNTHESIS REVIEW LEAF (WITH PULL-OUT TABS)

You will need:

- Copy of the pattern page (on card stock, if possible)
- Scissors and sharp craft knife
- Optional: colored pencils

How to assemble:

1) If you want to add color, do this first.

2) DON'T cut out the leaf. Cut out the rectangle around the leaf.

3) Use a sharp craft knife to cut the six slits in the sides of the leaf (the thin lines with hash marks on either end).

4) Cut out the six tabs.

5) Insert the tabs into the slits. You will have to fold the ends of the tabs temporarily to get them through the slit. After the tab is inserted, unfold it.



6) When you glue this into your lapbook, be very careful not to get glue near the flaps. Apply glue only around the edges.





This is how the tabs look on the back.

LAPBOOK IDEA #7: PERSONALIZE YOUR LAPBOOK WITH PHOTOGRAPHS

You will need:

• Photos you've taken while doing this unit study

What to do:

Personalize the lapbook with some photos you've taken while doing various botany activities. They could be photos taken while playing games, doing the scavenger hunt, setting up experiments, going on a field trip, or doing outside gardening. Bear in mind your format when sizing and trimming the pictures. Photos are usually oblong in the horizontal direction and your lapbook may have empty spaces that are oblong in the vertical direction. One solution would be to scale down the photos and put two of them onto quarter page space. If you have a lot of photos, you could make a little booklet. However you do it, photos scattered throughout will make the lapbook into a more cherished item as the years go by, as it will contain sentimental childhood photos. (If you really don't want to create something that will become a "sacred" item that can't be disposed of, skip this idea and don't include any photos.)



LAPBOOK IDEA #8: POP-UP LEAF CROSS SECTION

You will need:

- A copy of this pattern page printed onto card stock (or regular paper if card stock is unavailable)
- Scissors
- Glue stick (or white glue)
- Green marker or colored pencil (or piece of green paper)
- Pencil and ink pen
- Optional: colored pencils

How to assemble:

1) Cut out the two rectangles.

2) Do all coloring and labeling before any folding or gluing. The rectangle right under "FLAP A" should be colored green. This rectangle will represent the top side of the leaf. If you don't want to use marker or colored pencil, you could also cut out a piece of green paper this size and glue it on. If you'd like to add one extra touch of realism, you can sketch light outlines of where cells can be seen through the cuticle.



6) Fold the background rectangle in half. Make fold lines where indicted on the cross section rectangle. Notice that the thin cross section of the cuticle appears on the front side of the pop-up.

7) Glue the flaps as indicated, so that they are on the inside of the pop-up (not visible). Before the glue dries completely, fold the pop-up in half and make sure it will close properly. Adjust the flaps if it does not. (Or, adjust the fold line on the corner that sticks out.)



LAPBOOK IDEA #9: LEAF ID WRAP-UP

You will need:

- A copy of this pattern page
- Scissors and glue stick
- A piece of thin string or thread that is about 6 ft (2 meters) long
- A piece of thin cardboard (an old cereal box is ideal)

How to assemble:

1) Cut out the rectangular pattern with the leaves printed on it. The blank pattern is an extra in case you get really inspired by this activity and want to make another one with your own pictures on it.

2) Fold the paper in half and cut a piece of thin cardboard that will fit perfectly inside this folded paper. Glue the cardboard inside using a glue stick. (Glue stick is recommended so that the paper does not wrinkle.)

- 3) Cut the notches on the sides.
- 4) Punch the hole next to the word "lobed." Put one end of the string through this hole and tie securely.

How it works:

Start with the word "lobed." Find the picture that you think matches this word and pull the string so that it goes through the notch next to that picture. Wind the string around the back and then up through the notch next to the word "linear." Now take the string over to the notch that is next to the picture that you think goes with the word "linear." Then make the string go around the back again and then into the notch that says "pinnate." Continue like this until you have the string wrapped around the card nine times. The last wrap should leave the string on the back side of the card, but ending right behind the word END. Pinch that corner so the string stays in place, then turn the card over. If you guessed correctly, all of your strings will match up with the lines on the back of the card. If you see some lines that don't match your strings, unwind the string and try again.

(If you find that your string is too long, trim it to the right length.)

Storage in the lapbook:

Print this "envelope" pattern (preferably onto heavy paper) and then cut and assemble it as shown. It will fit exactly on one quarter of a page in your lapbook. Put the "leaf wrap" into the pocket. During storage, the string can be wound around the card so that the strings do not overlap very much, thus avoiding a big lump.





LAPBOOK IDEA #10: GENUS SPECIES MATCHING CHALLENGE

You will need:

• A copy of this pattern page, scissors, glue stick, pen or pencil

How to assemble:

Cut out the rectangle below. Make squiggly lines between the names on the left and the correct answers on the right. You can make the lines go however you want, but don't make them so complicated that you can't manage to follow them. You might want to make the lines lightly in pencil first, then go over them in pen.

When it is done it will be a quiz. The person taking the quiz puts their finger on a name on the left, guesses the right answer, then traces the squiggly line all the way over to see where it ends up.

You can paste this into the lapbook as an open half page, or you can fold it in half so that it only takes up a quarter page. You can use this cover design or make one of your own.

Sample showing what to do. Your lines can be very different from these, but you get the idea.

LAPBOOK IDEA #11: "SECRET LIFE" DIAGRAM OF THE INSIDE OF A FLOWER

You will need:

- A copy of this pattern page
- Scissors
- Pencils, pen, colored pencils
- Glue stick

How to assemble:

1) Cut out the rectangle below and draw an ovule inside the ovary. Include the seven female cells. Draw the stamens

next to the pistil. If you wish, you may also add color to the petals. Just make sure the color does not obscure any color and/or labeling you did on the pistil and stamens.

- 2) Optional: Add pollen grains and a pollen tube.
- 3) Cut out the piece with the sepals. Color this piece green.

4) Put glue on the back of the sepals and stick under the pistil so that the oval flap covers the bottom of the pistil. You will be able to fold back this oval flap to reveal the ovule underneath.

5) Cut out the large petals and color them if you wish. Place them over the base picture so that you have a left and right petal flap. The petals will overlap quite a bit. Put glue on the back of the flaps and secure in place.

The Secret Life q	of a Flower
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211

LAPBOOK IDEA #12: SKETCHBOOK OF FRUITS

Can you think of a more classic subject to paint or draw than fruit? Most artists draw fruit, or bowls of fruit, at some ponit in their career. In this activity, the students will keep a fruit sketchbook, but they will be allowed to include any kind of botanical fruit. Remember, botanical fruits include nuts, many "vegetables," and seeds from flowers and weeds. Maple tree "helicopters" and those fluffy white dandelion seeds are also fruits. If it's got a seed, it's a fruit.

You will need:

• Two copies of the blank page pattern (or make your own pages by cutting paper in half, folding, stapling, then trimming it to size

- Scissors
- Pencils, pen, colored pencils
- Fruits, or pictures of fruits (remember to include nuts, seeds, and vegetables that are botanical fruits)
- Optional: copy of the image below as a cover design (or make your own!)

How to assemble:

Make copies of the this pattern page. Or, as stated above, just cut pieces of paper in half, then fold, stack, and staple them. This pattern will give you a booklet that is a little bit smaller than a quarter page, so that when you glue the booklet into your lapbook, the sketchbook doesn't bump into the other projects in the book. If you make a booklet simply by folding pieces of paper, consider whether you want to trim down the final size a bit, or leave it as a full quarter page. You can make the sketchbook as thin or thick as you like, depending on how much sketching you want to do.

Sketch lots of fruits. Look at real fruits whenever possible, but you could also use images from books or the Internet, especially for fruits from other parts of the world. Make sure to observe and draw shadows and highlights, as these are what make objects look three-dimensional.

SKETCHING HELP:

If you would find it helpful to watch some "how to" drawing videos, there are some videos posted at the bottom of the Botany playlist.

LAPBOOK IDEA #13: DRAW A CELL

You will need:

- A copy of the cell outline below (or make your own)
- Scissors
- · Pencil and pen, colored pencils if you wish

What to draw:

1) The large empty blob is the cell's vacuole. Label it.

2) The large circle (with the endoplasmic reticulum attached to it) is the nucleus of the cell. Draw some DNA inside of it. You can draw DNA as a mass of squiggly lines. Label the nucleus.

3) Add some more endoplasmic reticulum to the other side of the nucleus. Choose one of these ERs to be the smooth ER and one to be the rough ER. On the rough ER, add some little dots all along the sides of the squiggles. These will represent ribosomes. Label the smooth and rough ER. (The ribosomes sticking to the ER makes the ER look "rough" when viewed under a microscope, thus the name. There isn't anything actually rough about the rough ER.)

4) The cell needs more chloroplasts. The chloroplast is the organelle with the thylakoid "pancake" stacks inside of it. Label the chloroplast, then draw at least six more. You can draw more than six, but leave space for some other organelles. Put at least a few thylakoid stacks in each one. (The chlorophyll molecules are too small to see at this scale.)

5) Now add some Golgi bodies. That's the organelle that looks like a stack of pancakes but is not inside the chloroplast. (Don't forget to label one of them.) The Golgi body is like the post office of the cell, packaging and labeling things that need to be delivered various places. You only need to add one or two more Golgi bodies.

6) Draw some more mitochondria. The mitochondrion is the oval with half-lines across it. The mitochondria really do look a bit like this when viewed under the microscope. The half-lines represent the internal structure. Remember, the mitochondria are where the ATP synthase generators are located. However, at this scale, the ATP synthases are invisible. Don't forget to label one of your mitochondria.

7) The last major organelle you need to add is some leucoplasts (the plain oval). "Leuco" means "white" so don't color them. However, you might want to add some dots or circles inside of them to represent the substances they are storing. Leucoplasts are like warehouses that store the proteins, fats, or carbohydrates that the cell manufactures. Label a leucoplast. (You could color the substances they are storing.)

8) Now that you have the major organelles in place you can decide whether you want to add some cytoskeleton lines. If you feel that your cell is pretty full and you want to stop at this point, you may do so. If you want to add the cytoskeleton, get a ruler and draw light lines that go behind the organelles. You don't want the lines to obscure the beautiful organelles you have just drawn, so don't draw any cytoskeleton lines on top of the organelles. Keep the lines very light. If you make the lines too dark, it will make your cell look very confusing.

9) Check to see if you have everything labeled. You may want to add CELL WALL and CYTOPLASM.

10) Add color if you wish. Real cells are colorless except for the chlorophyll and perhaps some other pigments. But you may take artistic license and color the organelles different colors. (Just be consistent and make all the same types of organelles the same color.)

11) You can paste this into the lapbook as a half-page picture, or you can fold it in half to save space. If you decide to fold it, label the front with something like "INSIDE A PLANT CELL."

Here are some micrograph pictures of real plant cells:

LAPBOOK IDEA #14: "FOLD-OUT" OF FAVORITE FLOWERS

You will need:

- A copy of the pattern page (any type of paper you choose, either white or colored paper)
- Scissors
- Glue stick
- Small pictures of your favorite flowers (Pictures from the "Flower Flip" game are just the right size.)

How to assemble:

1) Copy the pattern onto your choice of paper, cut out, and fold on the dotted lines.

2) Cut out pictures of your favorite flowers and glue them into the "booklet" as shown in the photos. You can draw your own pictures, you can use pictures from a garden catalog, you can print some using Internet photos, or you can go to www.ellenjmchenry.com and use the pictures from the Flower Flip game (click on FREE DOWNLOADS, then on BOTANY).

How it will look when it is all folded up.

Open the cover, then the righthand flap.

Then open the bottom and top flaps.

View from the back.

LAPBOOK IDEA #15: MAKE A CACTI POP-UP PICTURE

You will need:

- Copies of the pattern pages (card stock is best)
- Scissors
- Glue stick or white glue
- Clear tape
- Colored pencils or crayons

How to assemble:

1) Do any coloring you want to do. (Colored pencils are recommended.) Note that the prickly pear cactus has three fruits on it. Color the fruits red. You might want to add a very yellow sun in the sky.

2) Use the lines provided to write some information you have learned about cacti or other desert plants.

3) Cut out the pieces. The desert scene will be the "lid" and the piece with the writing lines will be the "base."

4) Tape the top and bottom pieces together so that the desert scene will form the background of the scene and the information will be on the bottom.

5) Fold the glue tabs at the bottom of the cacti, then glue them onto the indicated rectangles on the bottom of the scene.

6) Fold the support pieces on the dotted lines. Glue the narrower piece between the barrel cactus and the prickly pear cactus. Glue the wider supports between the barrel and the saguaro, and the saguaro and the background. It doesn't matter exactly where you glue the supports, as long as they are parallel to the bottom of the scene. Before the glue is completely dry, gently fold down the scene and pull it back up again. Make any adjustments necessary (and re-glue) if the supports are too crooked.

ADDITIONAL IDEAS:

1) If you made an expandable model in chapter 7 (activity 2) you could glue it above the information section.

2) You could make your own cactus scene from scratch, without these patterns. All you have to do is make sure that the support pieces are the same width as the distance that the pop-up piece is from the background.

