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Citation: Jones, A.M., and Ellis, J. (2012). My Life As A Plant. Rockville, Md.: American Society of Plant Biologists.

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## Library of Congress Cataloging-in-Publication Data

LC control no.: 2012939279
LCCN permalink: http://lcen.loc.gov/2012939279
Type of material: Book (Print, Microform, Electronic, etc.)
Personal name: Jones, Alan.
Main title: My life as a plant / Alan Jones, Jane Ellis.
Edition: 1st ed.
Published/Created: Rockville, MD : American Society of Plant Biologists, 2012.
Description: p. cm.
Projected pub date: 1206
ISBN: 9780943088020 (alk. paper)

Printed in the United States of America
First impression, June 2012, Minuteman Press, Inc.


Plants grow from seeds up towards the sun
Help the seedling find its way to the sun.



"We both need food, but we prepare our food in different ways. Let's compare recipes."

"Mmm...looks yummy. Let's get cooking! Always ask an adult for help."

# No-Bake Peanut Butter Cookies 

 Ask an adult for help.
## Combine:

graham cracker crumbs, raisins,

peanut butter,
and honey in a small bowl.
Mix with a spoon.


Pat into 8 cookies, and press lightly in coconut.

Chill until firm.


Did you know that everything in these cookies comes from plants?




Color all the cell walls (W) brown. Color all the cells (C) yellow. Connect the dots of Sally's cell walls.

Color all the green. They are called "chloroplasts." They give Sally her green color.


Plants can get hurt just like you.
Plants grow new parts. People do not.
Draw new roots on the flower below that was cut by the shovel. The flowers are also looking pale.
Why not give them some color while you are at it?



# Can you find the plans 

Draw a line to Sally's...


1. Petals
2. Seeds
3. Stem
4. Roots


This is Sally's family album.
"I grew from a very old family.
My family changed a lot over the years. That is what makes me what I am today!"

"Now tell me about your family! Can you draw your family album too?"


Find leaves of different shapes and sizes.

Find plants and animals living together.

"Hi! I'm Fran Fern.
I live in shady areas below the trees."

"Hi! I'm Charlie Cactus.
I live in the desert where it is hot and dry."


## Can you match the plant to where it lives?




## Plant Plumbing

What you need:

- 1 mug (heavy cup that won't tip over)
- 1 celery stalk
- food coloring

1. Fill mug halfway with water.
2. Add 4 drops of food coloring and stir.
3. Trim one end of the celery stalk.
4. Put celery stalk in the water. Put the cut end down.
5. What will happen to the celery? Draw your prediction.
6. See what happens. Check every 6 hours.
7. What do you see now? Draw it.
8. Cut the stalk open. What's inside? Draw it.

Repeat with other plants that have long stems. What happens that is the same? What is not the same?



Guide Betty Bee to the beehive, picking up pollen as you go!




Autumn Leaves
In the autumn, leaves of some trees stop using green chlorophyll. The green color fades. Color the leaves in autumn colors.


All sorts of things are made from plants.


## Circle the items that are made of plants.



## Painting with Plants Activity

What you need:

- A variety of colorful vegetables, fruits, flowers, and spices, such as blueberries (fresh or frozen), carrots, coffee (instant works well), prepared mustard, greens (dark lettuces, spinach), curry powder and others you might want to try
- Small containers
- Paintbrushes or cotton swabs for painting
- Water
- Optional: lemon juice and baking soda

In different small containers, put small amounts of already ground or liquid plant material and add a very small amount of water. Mix until forming a thick liquid that can be used to paint. Some samples will need to be chopped, ground or crushed into tiny pieces with a little water added. These include the blueberries, carrots, red peppers, and lettuces/spinach. Once crushed, the liquid can be filtered using a paper coffee filter. Lettuces can be used to make a beautiful green color by placing the dark leaf over the area to be colored and running a coin (such as a quarter) over it. The green color will be transferred to the paper. Blueberries and many purple fruits, vegetables and flowers change color in acidic or basic conditions. If you add a small amount of vinegar to some of the blueberry liquid, it will turn pink. When you add baking soda mixed with a little water, the blueberry liquid will turn a beautiful purple. You can also use these to "dye" things like cloth, fibers and boiled eggs.

## More Activities!

## Feed your Veggies!

What you need:

- 1 pack of bean seeds
- 2 small cups for planting seeds
- sand
- water
- plant fertilizer

Soak about 6 seeds in water overnight. Gather 2 cups and fill each with moist sand. Put 3 seeds in each cup just below the surface of the sand. Put the cups in the window and check them every day. Make sure they don't dry out! After you see the plants starting to grow, add fertilizer to 1 cup. Be sure to follow the instructions on the fertilizer container to see how much to add. Do not put fertilizer in the other cup. After 3-4 weeks, take the plants out of the sand and draw them below. How did each grow differently?

Plants with fertilizer:
Plants with no fertilizer:

## More Activities!

## How Plants Make More Plants!

What you need:

- lima beans, sunflower seeds, pumpkin seeds
- water
- small cups
- soil

Soak the lima beans in water for about an hour. With your parent's help, take one bean and separate it into its two parts. Look at the baby plant on the inside and find the small leaves and roots. Soak about 6-8 beans or other seeds in water overnight. Plant the seeds in cups with moist soil and put them on the windowsill. Now watch your plants grow every day! You can also cut the top off a carrot and put it in a shallow dish with water. Make sure it does not dry out and watch it grow without a seed!

## Which Way to Grow?

What you need:

- lima or other bean seeds
- small pots or cups for planting seeds
- soil
- water

Soak about 6-8 bean seeds in water overnight. Gather 2 small pots or cups and fill each with moistened soil. Put about 3-4 seeds in each cup just below the surface. Place cups in the window and check them everyday. Make sure they do not dry out. Once the plants have grown about 5-6 inches in height, turn one of the pots carefully on its side. What do you think will happen to the plants now? Watch what happens over the next week. After about 10 days take the plants out of each pot and wash off the soil. What has happened to each of the plants? Place these on paper and draw and color each plant on the next page. What do you think caused the change in the growth of the plants? Try this experiment again, placing one of the cups in the dark and one in the light. What do you think will happen to the plants growing in the dark? Take the plants growing in the dark out after about 10 days. What was different about the plants growing in the dark?

## Draw and color your plants here.

Teachers, Parents and Guardians: This coloring/activity book was created with support from the American Society of Plant Biologists to include even the youngest learners in the Society's vision to help all people see the importance, relevance, and beauty of plants in our daily lives.
This book covers the 12 Principles of Plant Biology developed by the ASPB Education Foundation (see back cover)
in a way that pre- and early readers can understand and appreciate. It is meant to provide a fun way to learn about plant anatomy, physiology, ecology, and evolution. To request copies of this book or to ask about possibilities to connect with plant scientists in your area, please contact info@aspb.org.
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## The 12 Principles of Plant Biology

1. Plants contain the same biological processes and biochemistry as microbes and animals. However, plants are unique in that they have the ability to use energy from sunlight along with other chemical elements for growth. This process of photosynthesis provides the world's supply of food and energy.
2. Plants require certain inorganic elements for growth and play an essential role in the circulation of these nutrients within the biosphere.
3. Land plants evolved from ocean-dwelling, algae-like ancestors, and plants have played a role in the evolution of life, including the addition of oxygen and ozone to the atmosphere.
4. Reproduction in flowering plants takes place sexually, resulting in the production of a seed. Reproduction can also occur via asexual propagation.
5. Plants, like animals and many microbes, respire and utilize energy to grow and reproduce.
6. Cell walls provide structural support for the plant and also provide fibers and building materials for humans, insects, birds, and many other organisms.
7. Plants exhibit diversity in size and shape ranging from single cells to gigantic trees.
8. Plants are a primary source of fiber, medicines, and countless other important products in everyday use.
9. Plants, like animals, are subject to injury and death due to infectious diseases caused by microorganisms. Plants have unique ways to defend themselves against pests and diseases.
10. Water is the major molecule present in plant cells and organs. In addition to an essential role in plant structure, development, and growth, water can be important for the internal circulation of organic molecules and salts.
11. Plant growth and development are under the control of hormones and can be affected by external signals such as light, gravity, touch, or environmental stresses.
12. Plants live and adapt to a wide variety of environments. Plants provide diverse habitats for birds, beneficial insects, and other wildlife in ecosystems.

## Please RECYCLE this book-it is made from plants.

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