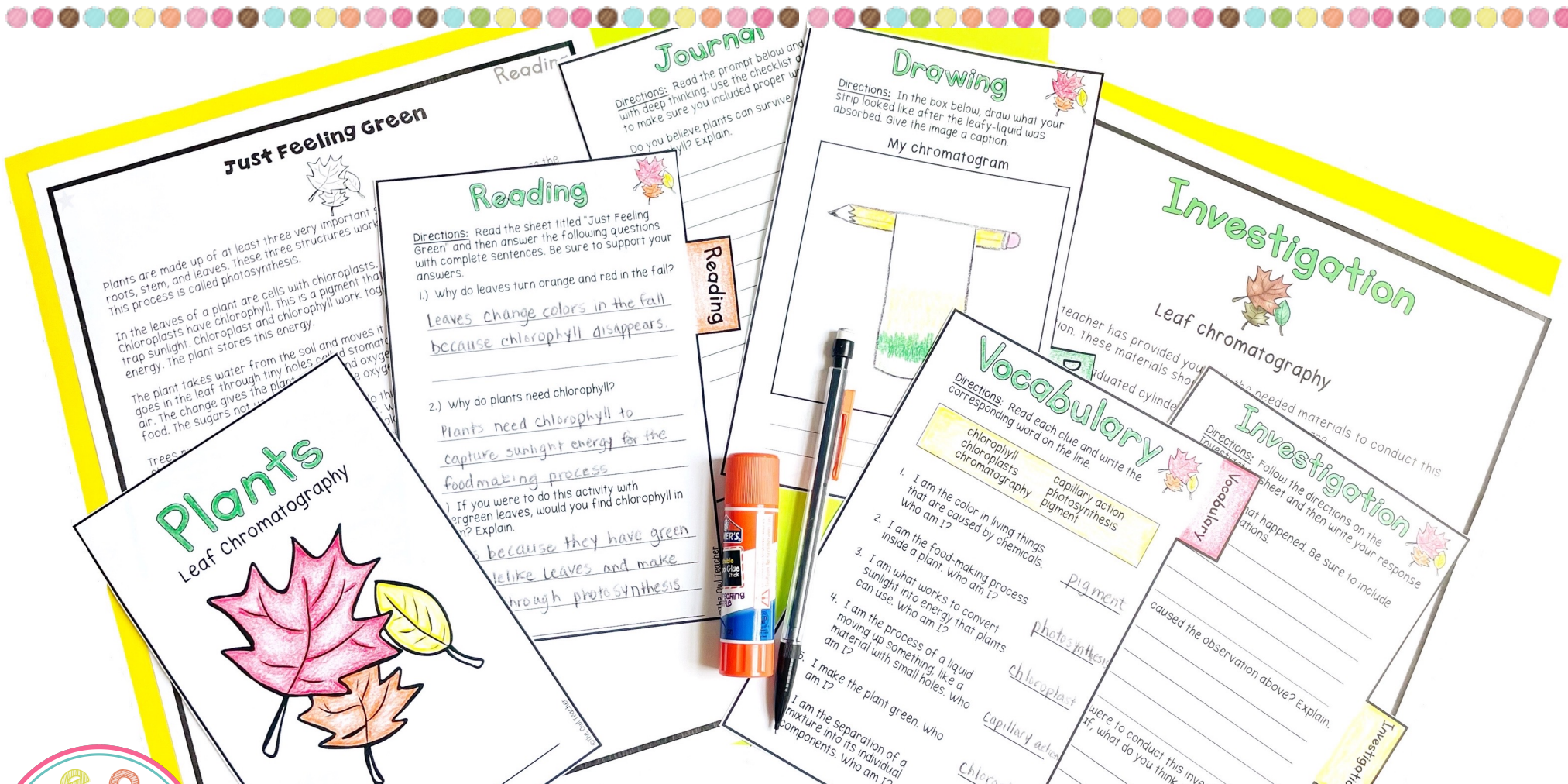


Science Booklets

LEAF CHROMATOGRAPHY



PRINTABLE & DIGITAL



Plants

Leaf Chromatography



Scientist: _____

Vocabulary



Directions: Read each clue and write the corresponding word on the line.

chlorophyll
chloroplasts
chromatography

capillary action
photosynthesis
pigment

1. I am the color in living things that are made by chemicals. What am I? _____
2. I am the food-making process inside a plant. What am I? _____
3. I am what works to convert sunlight into energy that plants can use. What am I? _____
4. I am the process of a liquid moving up something, like a material with small holes. What am I? _____
5. I make the plant green. What am I? _____
6. I am the separation of a mixture into its individual components. What am I? _____

Reading



Directions: Read the sheet titled "Just Feeling Green" and then answer the following questions with complete sentences. Be sure to support your answers.

1.) Why do leaves turn orange and red in the fall?

2.) Why do plants need chlorophyll?

3.) If you were to do this activity with evergreen leaves, would you find chlorophyll in them? Explain.

Reading

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Investigation



Directions: Follow the directions on the Investigation sheet and then write your response below.

1.) Describe what happened. Be sure to include all your observations.

2.) How can you explain this?

3.) If you were to conduct this investigation with a brown leaf, what do you think would occur?

Investigation

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Drawing



Directions: In the box below, draw what your strip looked like after the leafy-liquid was absorbed. Give the image a caption.

My chromatogram

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Drawing

Journal



Directions: Read the prompt below and respond with deep thinking. Use the checklist at the bottom to make sure you included proper writing skills.

Do you believe plants can survive without chlorophyll? Explain.



Excellent Writing Checklist:

Did you remember...

- | | |
|-----------------------------------|---------------------------------------------|
| <input type="checkbox"/> Capitals | <input type="checkbox"/> End marks |
| <input type="checkbox"/> Spelling | <input type="checkbox"/> Complete sentences |

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Journal



Just Feeling Green



Plants are made up of at least three very important structures: the roots, stem, and leaves. These three structures work together to make food for the plant. This process is called photosynthesis.

The leaves of a plant have cells with chloroplasts. Chloroplasts change sunlight into energy. Chloroplasts have chlorophyll, a pigment that makes plants green. Chlorophyll also helps trap sunlight. Chloroplast and chlorophyll work together to change light energy into chemical energy. The plant stores this energy.

The plant takes water from the soil and moves it throughout the plant. It also takes in air. The air goes into the leaf through tiny holes called stomata. The plant uses energy to change water and air. The change gives the plant sugars and oxygen. The plant uses some of the sugars as food. The sugars not used are stored. The oxygen is let out into the air.

Trees prepare for winter in the fall. They do this by stopping the food-making process. Chlorophyll starts to disappear from leaves. When the green color disappears, we begin to see other pigments. We see yellow and orange colors. These colors were always in the leaf. They were hidden by the chlorophyll. The sugars that are trapped inside the leaves begin to react. New colors show when sugars join light.

We can see the colors in a leaf. We can do this through chromatography. Chromatography is the separation of a mixture into its individual components, or parts. We can dip coffee filters into a leafy-liquid. The liquid will travel up the coffee filter. This is called capillary action. Capillary action is the process of a liquid moving up something. This could be a material with a lot of small holes. Capillary action happens when cohesion, adhesion, and surface tension work together. Cohesion and adhesion makes things stick together. Surface tension allows objects to float on top of it. Capillary action moves water through the plant. This happens when the plant roots bring water up to the stem. This is similar to how a straw works.

Liquid moves up the coffee filter. Pigments also move up the filter. Pigments are colors in living things created by chemicals. Pigments are different shapes and sizes. They move up in different speeds and distances up the filter. You may see a bluish-green or yellow-green on the filter. This means there is chlorophyll in the plant. If you don't see these colors, then there is no chlorophyll in the plant.

Investigation



Leaf chromatography



Your teacher has provided you with the needed materials to conduct this investigation. These materials should be treated with care.

Step 1 – Take a graduated cylinder and measure 20 mL of nail polish remover.

Step 2 – Pour the nail polish remover in the cup with the ground up leaves. Stir the leaves slightly.

Step 3 – Using a piece of tape, tape one end of the coffee filter to your pencil so that just the tip of the other end touches the mixture.

Step 4 – Allow the coffee filter to soak in the mixture for about 15-20 minutes.

Step 5 – Remove the coffee filter from the mixture and record your observations.