Regenerative Farming Patch Program

Welcome to the Regenerative Farming Patch Program!

This program is designed for Cadettes, Seniors, and Ambassadors.

Earning this patch will give you a greater understanding of how planning tools, such as crop rotation plans and garden maps, help to create a regenerative farm or garden. In this program you will analyze regenerative farming techniques by learning about the basics of plant families, crop rotations, and cover crops. Through hands-on activities, you will understand how these principles and methodologies connect to soil health and biodiversity. The program will culminate in creating a crop rotation plan using a farm map and the basics of crop rotations.

To earn the patch, complete the required activities detailed in the program!

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Topic #1: Regenerative Agriculture

Goal: Understand the meaning of a regenerative farm and learn about regenerative methodologies.

Regenerative farming is the application of sustainable methods of farming that improve soil health and encourages biodiversity. Chemicals and monocultures used in conventional agriculture are replaced with regenerative methods that do not deplete resources and harm the environment. Plants take up nutrients in the soil to grow, so it is important to replenish the soil. Regenerative farms use many different techniques, such as composting, not tilling the soil, crop rotations, cover-crops, and using organic farming practices.

There are so many methods you can learn about! In this patch program, we will be focusing on learning about crop rotations that you can implement in your own garden (either real or your dream garden space)!

Regenerative Agriculture Activities:

1. Choose one option:

    - ☐ Watch Kiss the Ground to learn about regenerative agriculture and why it is important!

    - ☐ Explore why regenerative farming and sustainable agricultural solutions are important on Project Drawdown's website: https://drawdown.org/discover?audience=tid-81&sector=tid-22

2. In addition:

    - ☐ Create a mind map connecting the ideas that you learned about! Use the central idea of regenerative agriculture and create connections.

Topic #2: Plant Families:

Goal: Analyze different plant families through research or a community garden walk through in order to grasp a holistic understanding of plant families.

Plants are grouped into families based on similar characteristics. The distinctive features of plants allow us to identify them. Different plant families have different needs when it comes to farming and gardening. Knowing about plant families will help you understand the nutrient needs, growth habits, and the disease and pest prevention needed for different crops.

List of Plant Families:

- Brassicaceae
- Solanaceae
- Amaranthaceae
- Fabaceae (Legume family. Important Nitrogen fixing family!)
    - Watch https://youtu.be/l2xC_WMvo5g for more information
- Cucurbitaceae
- Rosaceae
- Asteraceae
- Amaryllidaceae
- Poaceae
- Apiaceae

Plant Family Activities:

1. Complete this activity:

    - ☐ Research the different plant families. Create a sketchnote on common crops and characteristics in the family. If you are doing the patch program with your troop, you can split everyone in groups and assign each group a couple of different plant families. After doing their research and sketchnotes, groups can share what they have learned with the whole troop.

      For each family:
        1. Write down the family name
        2. Write down one fun fact

3. Draw some crops in the family
4. Get Creative with your note taking!

2. In addition, choose one option:

- ☐ Do a community garden walk through to visually see characteristics of the different plant families and recall the research that you did. Write down the crops and their families that you see as inspiration for your own crop plan that you will make later on! See how many different plant families you can identify!

- ☐ Complete the Plant Family Memory Game (activity in back of the packet)

Topic #3: Crop Rotation

Goal: Analyze crop rotation methods in order to understand how they help create a regenerative farm or garden.

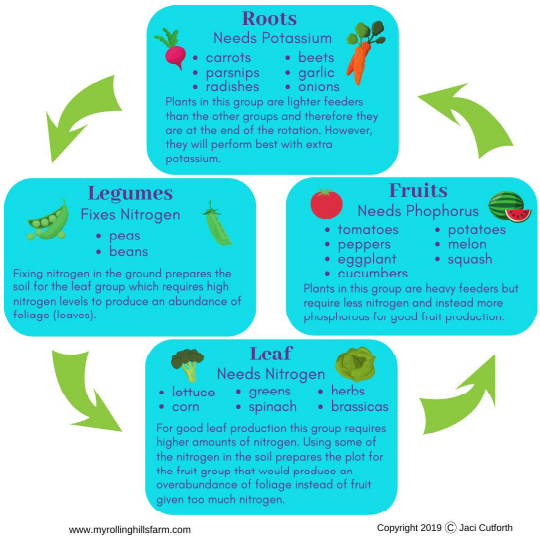
Crop rotation is one of the greatest tools regenerative farmers can implement to improve soil health and grow healthy crops. There are numerous methods you can choose to implement in a crop rotation cycle. The most important thing is to avoid planting the same plant in the same place year after year.

Crop rotation helps foster healthy soil. Soil contains nitrogen (N), phosphorus (P), and potassium (K). Having good amounts of NPK is important to growing healthy plants:

- Nitrogen: Crucial to chlorophyll content in a plant. This is what enables a plant to photosynthesize. Think about the green leafy stuff on plants.
- Phosphorus: Essential for root development, and especially important for fruits.
- Potassium: Strengthens and keeps plants healthy.

Certain plants take different nutrients in the soil, making crop rotation a great tool for soil replenishment. Crop rotation also helps reduce pest problems and breaks the cycle of disease spread. Below are two different methods of crop rotation:

- Plant Family: Rotating crops by plant family ensures that crops with similar characteristics are not planted in the same place every year. If you are using this method, make sure to understand what each plant family takes from and offers to the soil.
- Root, Legume, Leaf, Fruit: Below is a chart detailing how to use this method. This method is especially helpful if the crops you want to grow are all in the same family. The Root, Legume, Leaf, Fruit method can be more straightforward to use, so for the activity, we will be using this method.



One more important thing to note about crop rotation is cover crops! Cover crops are planted after a crop is harvested, often in the fall. They have deep root depths, helping to create soil aggregation (binding the soil together) and prevent soil erosion. Cover crops provide nutrients to the soil and are often legumes (Fabaceae) which adds nitrogen to the soil, or grasses (Poaceae).

Crop Rotation Activities:

1. Choose one:

    ☐ Complete the Crop Rotation Puzzles (activity at the back of the packet)

    ☐ Interview a farmer or gardener about how they use crop rotation and/or cover cropping in their farms/gardens! Some potential questions you can ask:

        - What method of crop rotation do you implement in your garden/ farm?
        - If you have tried different methods, have you noticed any differences?
        - Have you noticed that some crops grow better than others? If so, which crops? Why do you think that is the case?
        - Do you use cover cropping? If not, do you use any other methods to bring nutrients in the soil and protect against erosion in the winter?

Topic #4: Farm Planning

Goals: Apply the basic strategy of crop rotation through a farm/garden map in order to create a comprehensive garden plan including a crop rotation plan. Create a crop rotation plan using a farm map and the basics of crop rotations in order to demonstrate understanding of plant families, and rotation methods.

Apply what you have learned about regenerative farming and crop rotation. Below are the two final cumulative activities you need to complete to earn your patch!

Farm Planning Activities:

1. Complete both activities to earn your patch!

    ☐ Create a drawing or collage of a farm/garden map showing the layout and crop beds. This could be based off of a real space, or even a fun dream space! Get creative, but keep it realistic if you want to implement it in real life. An example will be in the back of this packet.

    Some important things to think about:
    - Where are you farming? Is it a city or rural area?
    - How many beds will you have? Make sure there are enough for rotating crops.
    - How will you water your crops? (Watering by hand is totally okay!)
    - Will there be a greenhouse?
    - Will there be an orchard area? Livestock? Bees? (Have fun with this if you are creating a dream garden/farm space!)

    ☐ Create a crop rotation plan for the garden/farm you just planned out. Pick a crop rotation method, either by plant family or using the Leaf, Root, Fruit, Legume method (the latter might be easier to plan). Pick the crops you want to grow. Keep in mind the location you are growing in, and if the plants will be able to grow there. For example, growing bananas in the Pacific Northwest doesn't make sense as they are a tropical fruit.

    (An example and detailed instructions will be in the back of this packet. In addition, there will be a template with steps that you can use if you wish.)

Activities:

Plant Family Memory Game (Topic #2):

This activity is a play on the game Memory. The game will help you associate crops with their plant families!

Materials:

- Game print out
- Scissors

Instructions:

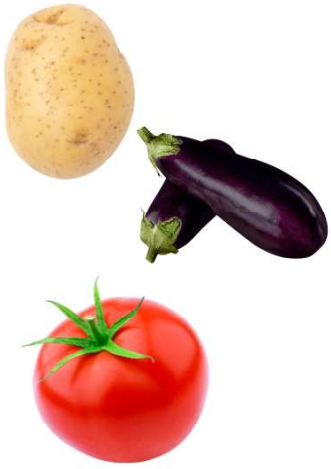
1. Cut out all the cards and place them face down on the table.
2. Shuffle the cards around.
3. Flip over two cards. If the cards are matching (in this case the plants that go with the plant family name) remove those two cards from play. If the cards do not match, flip those cards back over keeping them in the same position. The next play takes their turn, repeating this step.

   For example, these two cards are a pair.

4. The game ends when all the matches are found. The player with the most matched cards wins!

Brassicaceae

Solanaceae



Amaranthaceae

Fabaceae

Cucurbitaceae

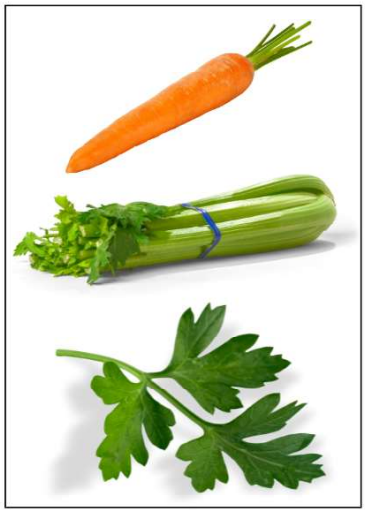
Rosaceae

Asteraceae

Amaryllidaceae

Poaceae

Apiaceae



Crop Rotation Puzzles (Topic #3)

This activity is meant to be a warm up to creating your own crop rotation plan! There are three beds and every year there needs to be a new crop. Using the Root, Legume, Leaf, Fruit method, fill out the crop rotation puzzle to test your knowledge!

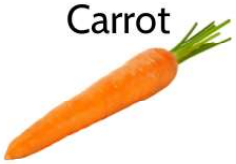
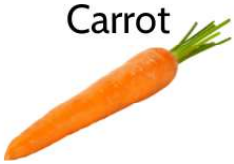
Materials:

- Activity print out
- Pencils, pens, crayons, or markers.

Instructions:

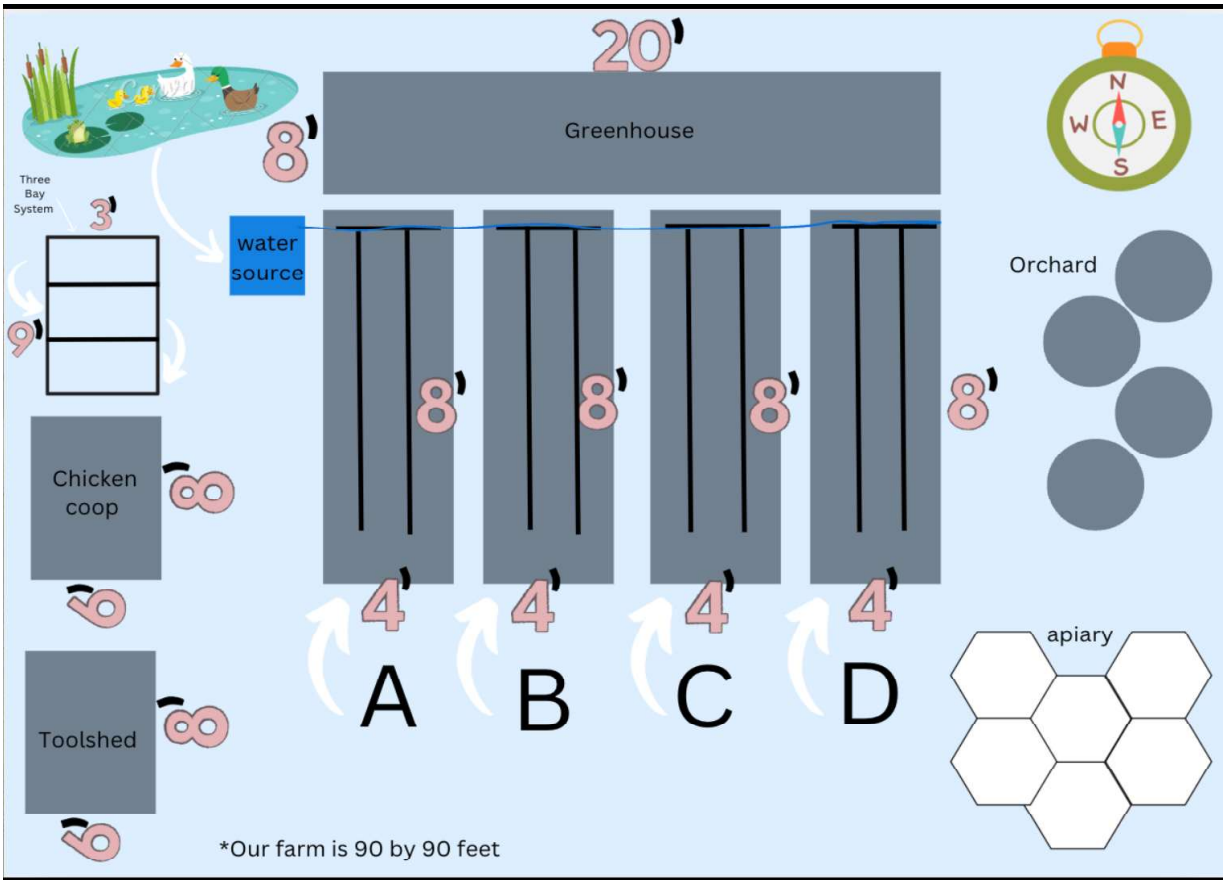
1. Circle the missing crop that best follows the Root, Legume, Leaf, Fruit method.
2. Draw a picture of the missing crop.

	Year 1	Year 2	Year 3
Bed A	Tomato 	Potato / Beans	Spinach 
Bed B	Green Beans 	Kale 	Lettuce / Cucumber
Bed C	Kale 	Tomato 	Peas / Cilantro

	Year 1	Year 2	Year 3
Bed A	Green Beans 	Onion / Spinach	Carrot 
Bed B	Cucumber 	Carrot 	Beans / Garlic
Bed C	Spinach 	Beans / Carrot	Onion 

Farm Map (Topic #4, Part 1)

In this activity, you will begin planning your own farm or garden space. This can be done individually or in groups! Below is an example of a farm map, but remember that you can be creative! You can draw, paint, create a collage, ect. The simple example outline map below includes dimensions and an irrigation set up. You do not have to include these details, but they are helpful if you want to use your plan in real life! The main thing you need to do is label your beds. Include at least two beds.



Some important things to think about:

- Where are you farming? Is it a city or rural area?
- How many beds will you have? Make sure there are enough for rotating crops.
- How will you water your crops? (Watering by hand is totally okay!)
- Will there be a greenhouse?
- Will there be an orchard area? Livestock? Bees? (Have fun with this if you are creating a dream garden/farm space!)

Crop Planning

In this activity you will finish planning your own farm/garden by creating a crop plan! The fist image is an example of an in-depth crop rotation plan. You can create a plan like this if you would like, or use the template provided in this packet. The template is created to utilize the Root, Legume, Leaf, Fruit method, but you can also rotate by plant family if you wish. You will need to create three years of plans. If your Farm Map includes numerous beds, you do not have to plan for them all, but do at least two (not including an orchard if you have one). If you are going to use your plan for an actual farm/garden, it will be useful to plan for all of your beds!

Year 1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	Bed A			Kale (Brassica) 3/31		HV*						Hairy Vetch		Key:
	Bed B					Lima Beans (Fabaceae) 5/25			HV	Rye				Leaf
	Bed C					Watermelon (Cucurbitaceae) 5/25				HV		Garlic (Liliaceae) 11/1		Fruit
	Bed D					Tomatoes (Solanaceae) 5/20				HV	Hairy Vetch			Root
Notes:	Orchard				4/15 pears		Perennial: Pears							Legume
A			start kale in greenhouse in feb			*Kale harvest throughout the year, harvest the outer leaves so it keeps growing								HV= harvest
B														Perennial
C					Start Watermelon in greenhouse 4/25									Cover Crops
D				start tomatoes in greenhouse in march										
Orhcard					Plant pears 25 to 35 feet apart									

Year 2		Jan	Fed	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Bed A				Mow	Aubergine (Solanacea) 5/25			HV		Hairy Vetch		
	Bed B			Mow	Corn (Poaceae) 03/25					HV	Crimson clover		
	Bed C					HV	Soybeans (Fabacea)			HV	Rye		
	Bed D				mow	Green Beans 05/11			HV	Rye			
Notes:	Orchard		Perrenial: Pears										
A													
B													
C						Plant soybeans in the greenhouse 05/05							
D													
Orchard													

Year 3		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Bed A		Mow	Onion 04/1					HV	Hairy vetch			
	Bed B		Mow	Potatoes 04/15						HV	Rye		
	Bed C			Mow	Spinach 04/1	HV			Spinach 08/15	HV			
	Bed D				Radish (Brassica) 04/01		HV*	Radish 07/01		HV**	Crimson Clover		
Notes:	Orchard			Perrenial: Pears									
A		Start onion in greenhouse in January											
B													
C													
D						*Spring harvest				**Fall Harvest			
Orchard													

To create your crop plan:

- Print the template.
- Pick crop rotation method (the template uses Root, Legume, Leaf, Fruit)
- Create your key. Color in each Key square with a different color, so you can visually see your rotation.
- Fill in the names of your beds on the left-hand side.
- Pick the crops you want to grow, remembering to use crops from each group.
- Research when each crop is to be planted and harvested.
- Figure out your crop rotation on scratch paper. Once you are ready, fill in the template.
- Write the crop name for the bed in which it is to be planted under the month it will be planted in.
- Color in the squares until the month when the plant will be harvested. Then write HV, to signify that the plant will be harvested.

- Remember to include cover crops!

An example of one bed and an orchard is included below:

Crop Rotation Planning

Ella Farms
Your Farm Name

Year One	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bed Name A			Kale							HV	Hairy Vetch	
Bed Name Orchard				Pears								
Bed Name												
Bed Name												
Bed Name												

Key:

Leaf	Cover Crop
Fruit	Perennial
Root	HV = Harvest
Legume	

Notes:

Crop Rotation Planning

Ella Farms
Your Farm Name

Year Two	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bed Name				Mow	Eggplant			HV	Hairy Vetch			
Bed Name												
Bed Name												
Bed Name												
Bed Name												

Key:

Leaf	Cover Crop
Fruit	Perennial
Root	HV = Harvest
Legume	

Notes:

Crop Rotation Planning

Ella Farms
Your Farm Name

Year Three	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bed Name		Mow	Onion						Hairy Vetch			
Bed Name												
Bed Name												
Bed Name												
Bed Name												

Key:

Leaf	Cover Crop
Fruit	Perennial
Root	HV = Harvest
Legume	

Notes:

Crop Rotation Planning

Your Farm Name

Year One	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bed Name												
Bed Name												
Bed Name												
Bed Name												
Bed Name												

Key:

Leaf	Cover Crop
Fruit	Perennial
Root	HV = Harvest
Legume	

Notes:

Crop Rotation Planning

Your Farm Name

Year Two	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bed Name												
Bed Name												
Bed Name												
Bed Name												
Bed Name												

Key:

Leaf	Cover Crop
Fruit	Perennial
Root	HV = Harvest
Legume	

Notes:

Crop Rotation Planning

Your Farm Name

Year Three	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bed Name												
Bed Name												
Bed Name												
Bed Name												
Bed Name												

Key:

Leaf	Cover Crop
Fruit	Perennial
Root	HV = Harvest
Legume	

Notes: