

BUILD-FLY-CODE
-COMPETE-



AGRICULTURE

STUDENT WORKBOOK

NAME: _____

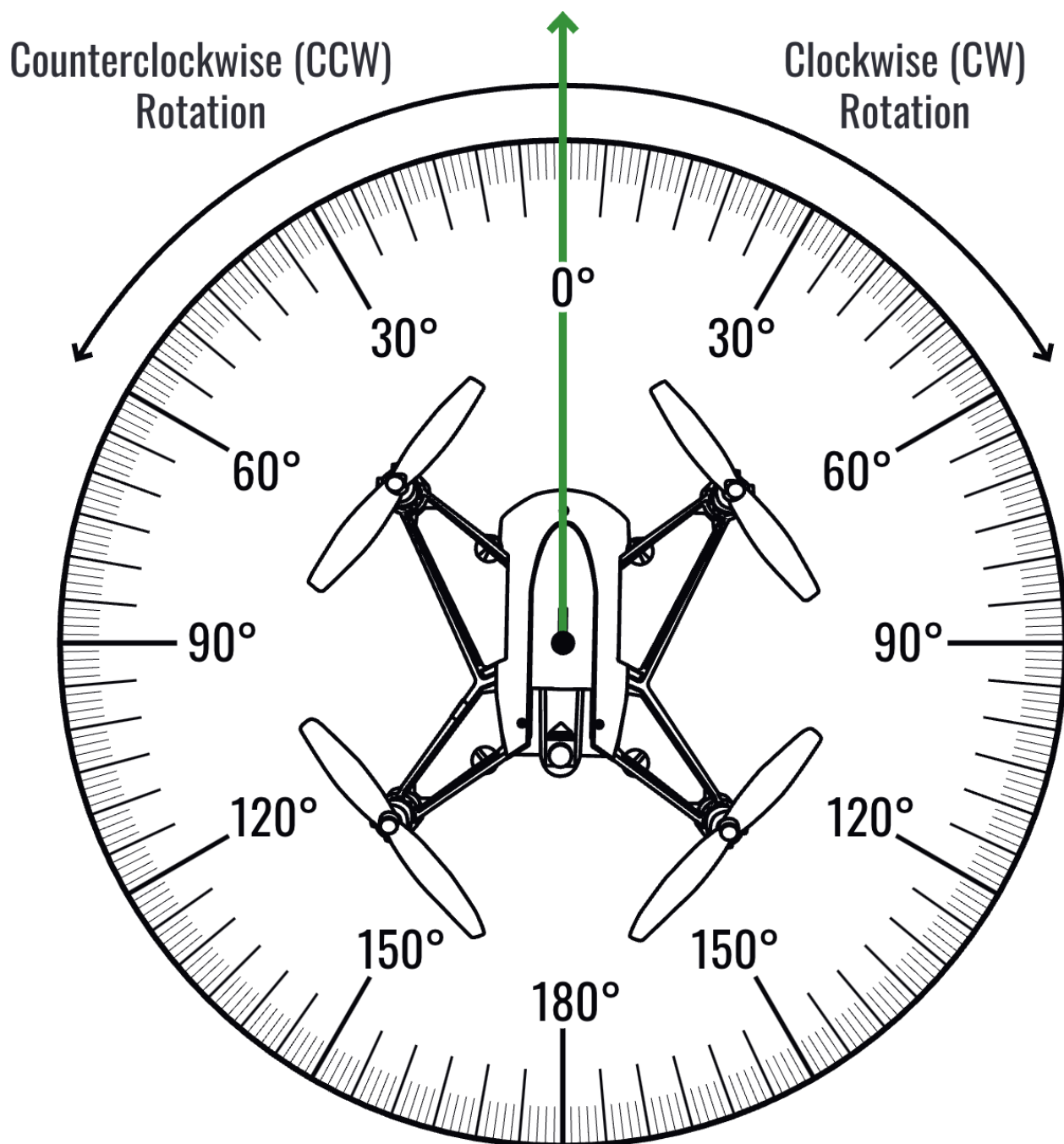
FOR THE WIN
■■■■■■■■■■
ROBOTICS

2025 | VERSION 2

PILOT FLIGHT LOG

DATE	DRONE MODEL	LOCATION	FLIGHT TIME	NOTES

ANGLES REFERENCE



LESSON 1: AERIAL SEEDING

According to the manufacturer of the seeds, it is recommended that this grass mixture be planted at **20 pounds per acre**. Using this unit rate, you will find the amount of seeds needed to cover this orchard.

Then, you will write an equation that you can use for other orchards with different acreages to determine how much seed is needed.

1. Fill in the rest of the table below.

Acreage (a)	Pounds (p)
1	
2	
4	
8	
16	

2. How did you find the missing values in the table above? What did you do with the unit rate of 20 pounds per acre?

3. Write an equation where a is the acreage and p is the pounds of seeds.

4. How many pounds do you need to cover your 10-acre peach orchard?

5. If you need to fill up Hopper four times to cover the entire orchard, how many pounds will Hopper hold at one time?

LESSON 2: ROTATIONAL GRAZING (1)

1. Write the color of the landing pad in each paddock below.

1	2	3
6	5	4

Use the following table to find the range of the switchgrass height in each paddock.

Color	Switchgrass Height (as a range)
Blue	1 – 6 inches
Green	7 – 12 inches
Yellow	13 – 18 inches
Red	19 – 24 inches

2. Paddock 1: _____ inches

3. Paddock 2: _____ inches

4. Paddock 3: _____ inches

5. Paddock 4: _____ inches

6. Paddock 5: _____ inches

7. Paddock 6: _____ inches

LESSON 2: ROTATIONAL GRAZING (2)

Use the switchgrass height measurements you collected and the following information to create a rotational grazing plan in the chart below starting at the month of April 2025.

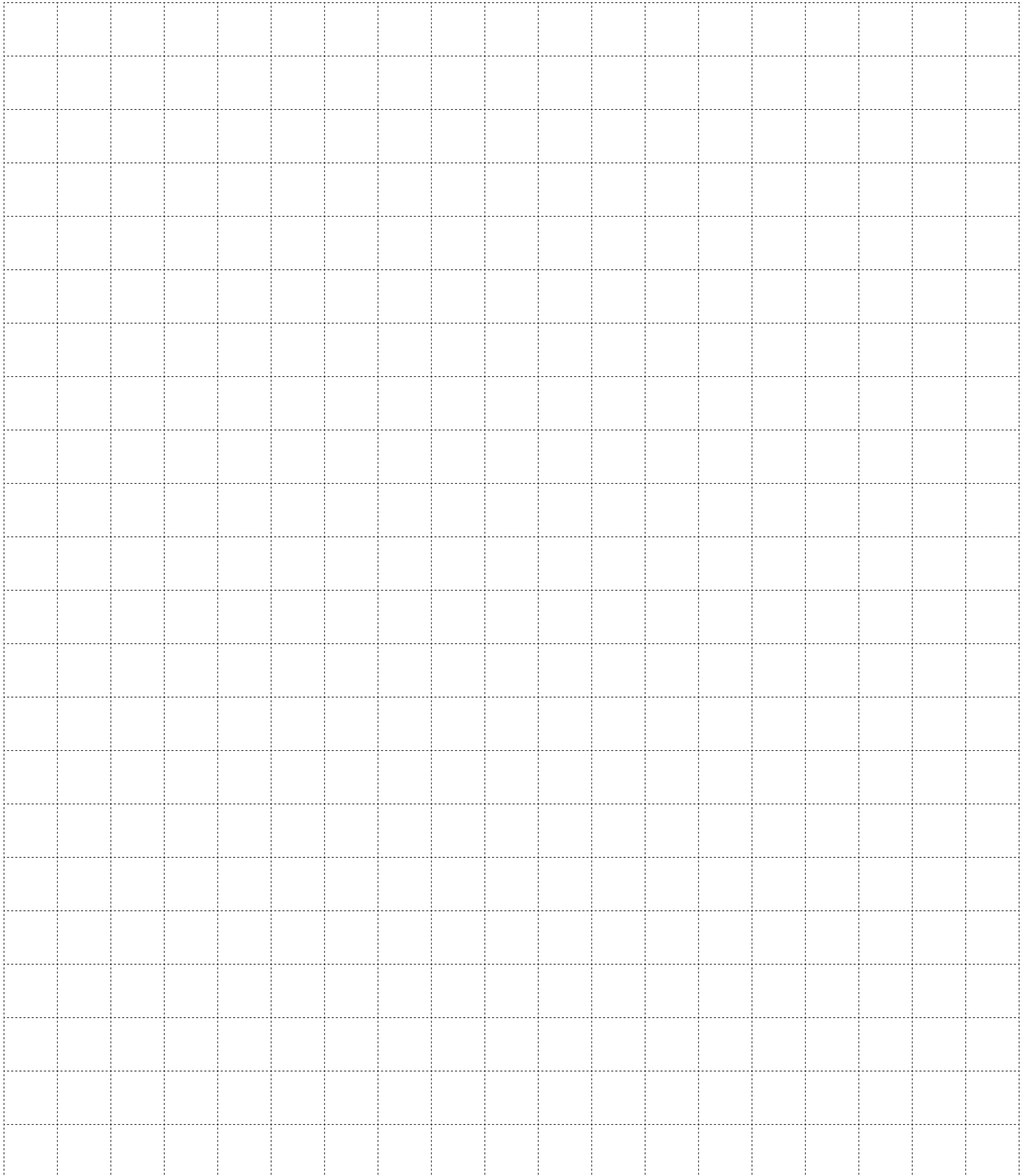
- A pasture with six paddocks typically requires 3 – 6 grazing days per paddock.
- A paddock in this pasture typically requires 15 – 20 days of rest and no more than 20 days of rest.
- The target height of switchgrass to *start* grazing is 18 – 22 inches.
- The target height of switchgrass to *stop* grazing is 5 – 7 inches.
- Your herd of cattle is large enough to allow for *up to* two paddocks to be grazed at once.

Fill in the missing information. Draw x's in cells for the grazing days, and leave cells blank for the days of rest. The sizes of the paddocks are in acres.

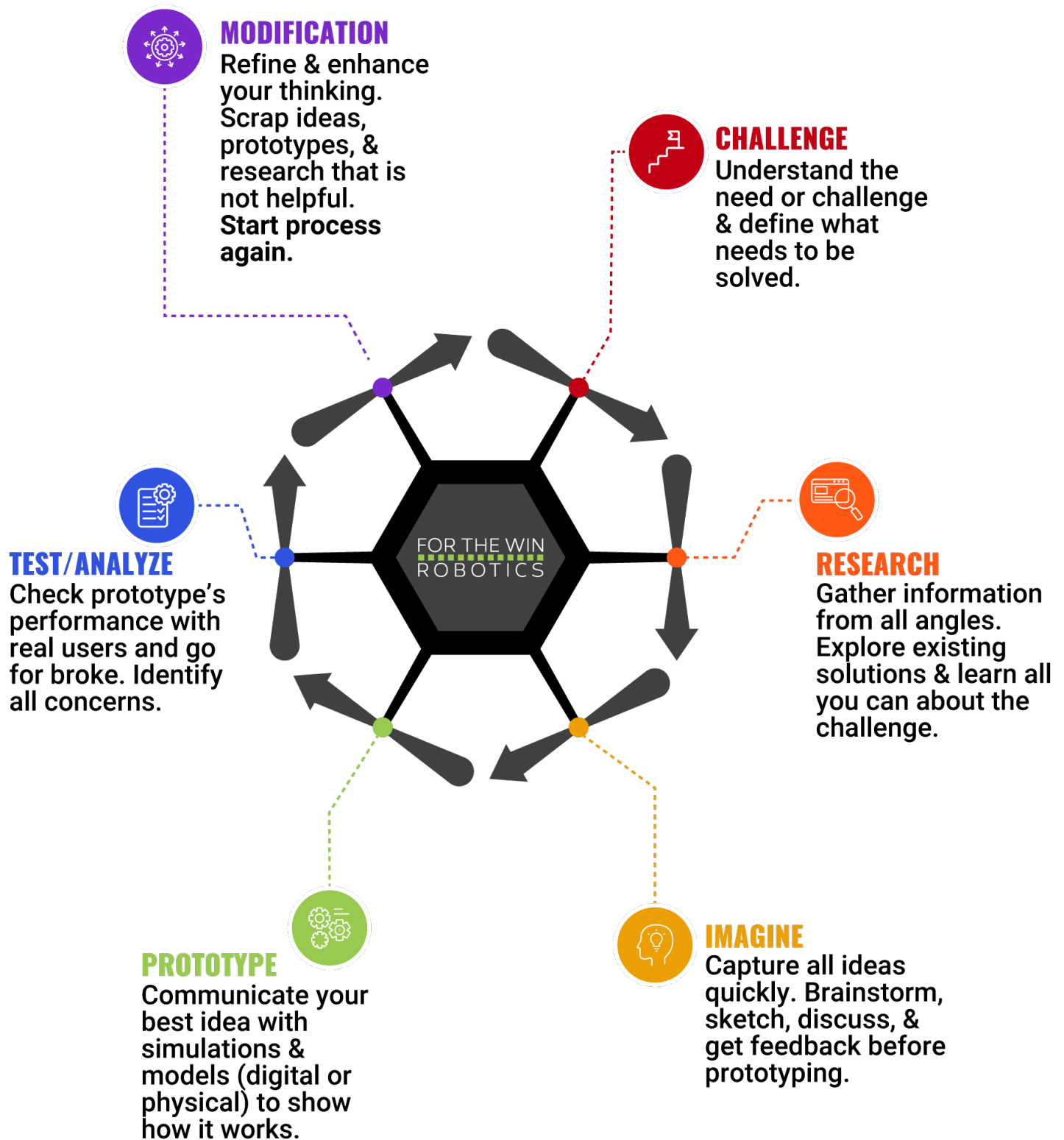
Paddocks		April 2025																													
Size	Number																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
		T	W	Th	F	Sa	S	M	T	W	Th	F	Sa	S	M	T	W	Th	F	Sa	S	M	T	W	Th	F	Sa	S	M	T	W

LESSON 3: VERTICAL FARM INSPECTION

Use this page for any drawings, notes, or calculations during the Vertical Farm Inspection activity.



ENGINEERING DESIGN PROCESS



ENGINEERING DESIGN PROCESS NOTES

Challenge:

Research:

Imagine:

Prototype:

Test/Analyze:

Modification:

GLOSSARY

Aerial Seeding – the process of planting seeds by spraying them onto a field from a plane, helicopter, or drone

Cover Crop – a crop that is grown to cover and benefit the soil, not for harvesting

Loop – a command that directs the code it covers to repeat until certain conditions are met

Navigator – the person responsible for giving the RPIC directions on where to fly

Remote Pilot in Command (RPIC) – the person flying the drone

Rotational Grazing – a system where a pasture is divided into smaller sections, called paddocks, and a herd of cattle is rotated through the paddocks to allow the vegetation to regrow

Vertical Farming – a modern form of agriculture where crops are grown in stacked layers, usually indoors

Visual Observer (VO) – the person maintaining visual contact with the drone and in communication with the RPIC

MATH FORMULAS:

Direct Variation Formula – $y = kx$ where y and x are variables, and k is the constant of variation.

Distance Formula – distance = rate $\times$ time