Strategy Dictates Design

Presented by:

Brandi Bolinger
Senior Program Manager

Richard Seniuk
Regional Support Manager

ROBOTICS EDUCATION & COMPETITION FOUNDATION
SUMMIT
VEX ROBOTICS PROGRAMS

REC FOUNDATION
VEX ROBOTICS

Introduction

Mission & Vision

Mission

The Robotics Education & Competition Foundation's global mission is to provide every educator with competition, education, and workforce readiness programs to increase student engagement in science, technology, engineering, math, and computer science.

Vision

We see a future where every student designs and innovates as part of a team, overcomes failure, perseveres, and emerges confident in their ability to meet global challenges.

Inspiring students, one robot at a time.

WE ARE NOT HERE TO:

DISCUSS GAME CALLS
Your Head Referee will make that decision based on the situation

DICTATE ROBOT DESIGN
Each Team's goals and measurement of success SHOULD be different

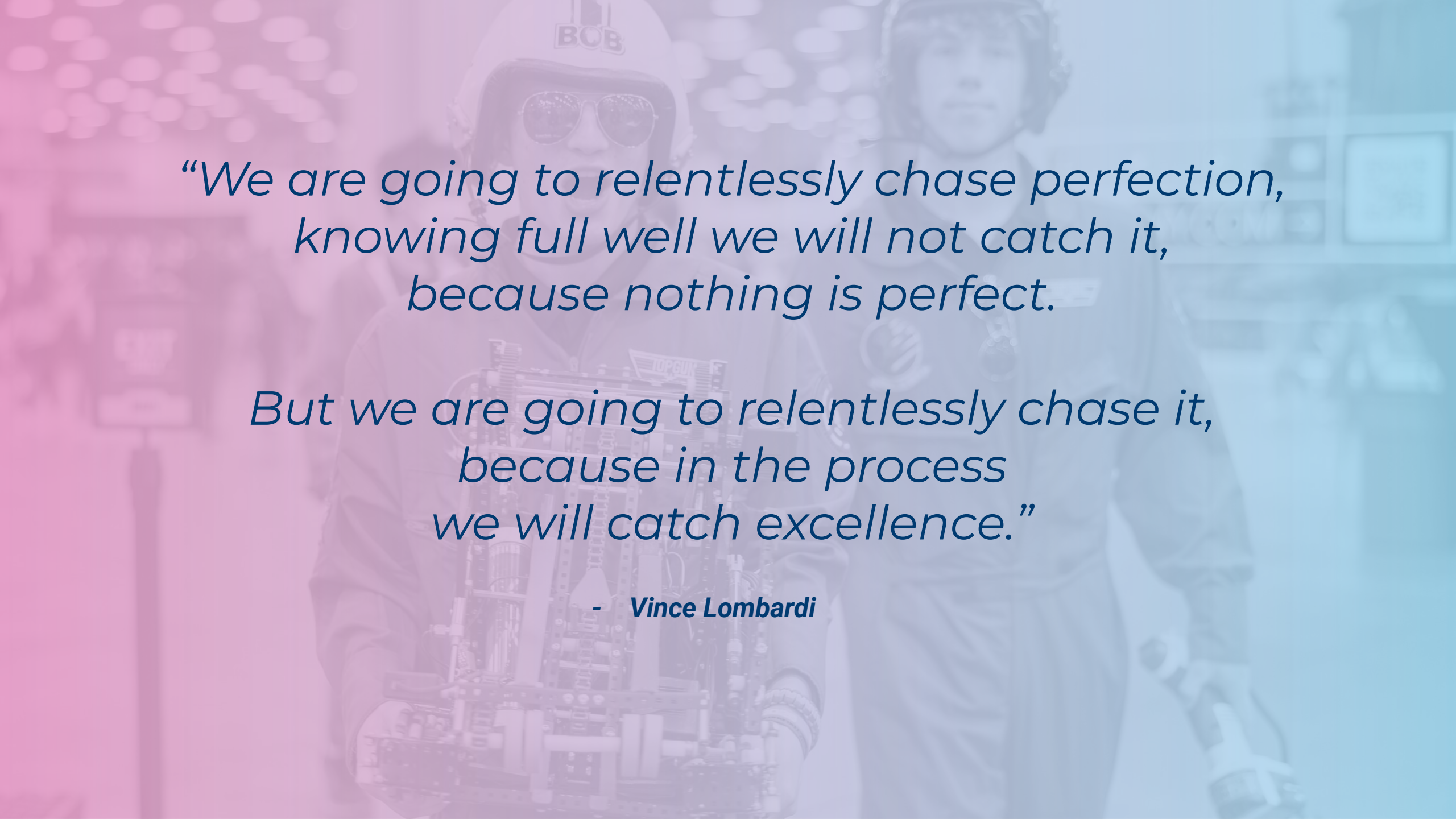
BREAK THE GAME
Read the rules with the intention of following them, not breaking them

THE MAIN GOALS ARE TO:

TEACH CRITICAL THINKING
Use your role as a teacher or coach to guide students through the learning process

OFFER NEW PERSPECTIVES
What works for one, may not work for another. Steal from the best, and design the rest

ENCOURAGE NEW IDEAS
Sometimes doing a little math can help you identify a strategy that you'd never considered before

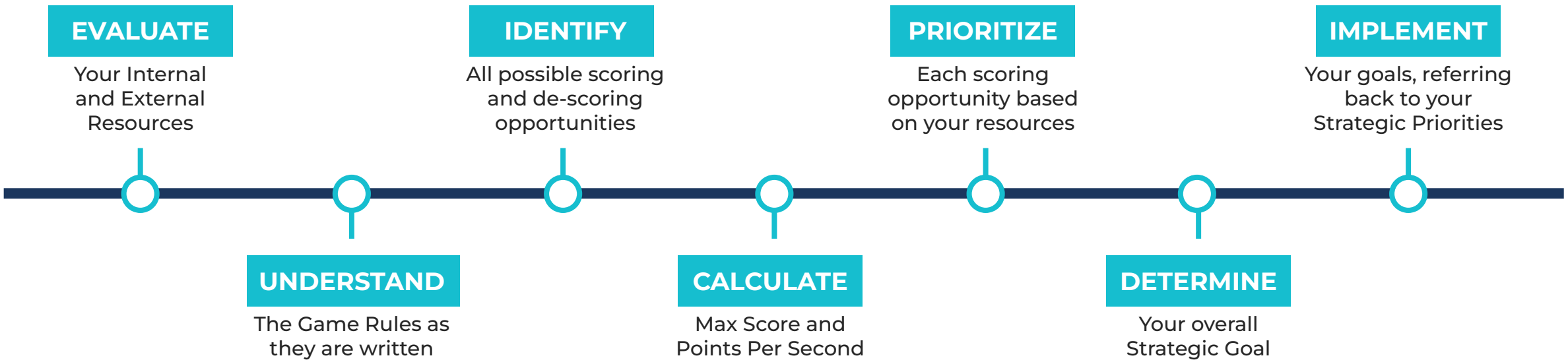


“We are going to relentlessly chase perfection,
knowing full well we will not catch it,
because nothing is perfect.

But we are going to relentlessly chase it,
because in the process
we will catch excellence.”

- Vince Lombardi

WHAT IS A STRATEGY DICTATED DESIGN?



EACH SEASON IS GOING TO LOOK DIFFERENT

ASSESSING YOUR RESOURCES

TIME

MATERIALS

TECHNOLOGY

BUDGET

WORK FORCE

KNOWLEDGE & SKILLS

UNDERSTANDING THE GAME EACH YEAR

What do the rules say?

Read the rules in a logical order and take notes for visual learners.

What are you ALLOWED to do?

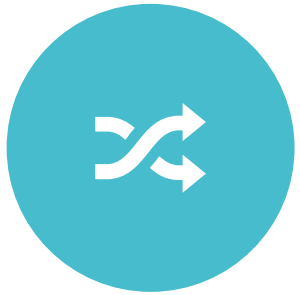
Some things are EXPLICITLY called out as allowable actions.

What are you PROHIBITED from doing?

Some things are EXPLICITLY called out as prohibited actions.

What don't the rules say?

Don't lawyer the rules! But if it doesn't say you CAN'T, maybe you can?



Strategic Moves & Maneuvers

Game plays are NOT going to be called out - it's up to you to develop them.

Maximum Benefit Opportunities

Is there a "flow" that you can achieve to get the most out of each match?

IDENTIFYING GAME PIECES AND TIMING

Types of Game Pieces

One or multiple types?

Different or same values?

How many of each type?

Access to Game Pieces

What are the starting locations?

Physical access restrictions?

Human-load vs on field?

Are there possession limits?

Can game pieces be reintroduced?

Match Breakdown

Autonomous bonus or Win Point?

End Game bonus or Win Point?

Access time limitations?

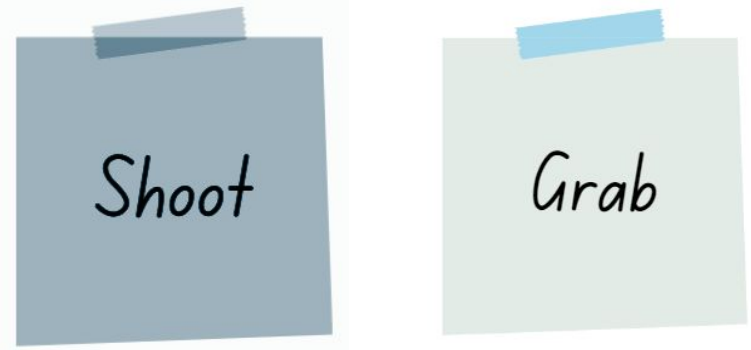
Compounding Bonuses?

IDENTIFY SCORING OPPORTUNITIES

FOCUS ON ***WHAT*** INSTEAD OF ***HOW***

- What *can* a robot do?
- Words that generically *describe* a mechanism or function
- How to break down each *individual task* into smaller tasks
- What belongs *together*, and what are *stand-alone* tasks

INSTEAD OF:



THINK ABOUT USING:

CAPTURING SCORING OPPORTUNITIES

STEPS FOR STUDENT-CENTERED SUCCESS:

- Decide ahead of time - digital or physical note-taking
- Designate a Scribe
- Begin leading the discussion to get the ball rolling
- Ask Students Open-Ended questions
- Have *students* populate the notes
- Write everything down, post it, and organize it *later*
- Keep the Students *organized* and *on-task*
- Don't give them the answers!
- If something is missing, *guide* them toward the answer
- *Assist* with "what not how" phrasing

CALCULATING YOUR CONTRIBUTION

Autonomous Bonus	10 points
Each Block Scored	3 points
Each Controlled Zone in a Long Goal	10 points
Controlled Center Goal - Upper	8 points
Controlled Center Goal - Lower	6 points
1 Parked Alliance Robot	8 points
2 Parked Alliance Robots	30 points

https://www.vexrobotics.com/v5/competition/vrc-current-game?q=&locale.name=English

THINGS TO CONSIDER:

- ❑ Are there designated scoring timeframes?
- ❑ How many times can you do the action?
- ❑ How many of each game piece are there?
- ❑ How many of each field element are there?
- ❑ Can your efforts be unscored?
- ❑ Can you perform more than one action at a time?

YOUR CONTRIBUTION:

- ❑ What is the maximum score of each match?
- ❑ What percentage of the max points can you score?
- ❑ How many points per second are you scoring?

CALCULATING MAX SCORE AND CONTRIBUTION

Imaginary Game Example with Finite Scoring

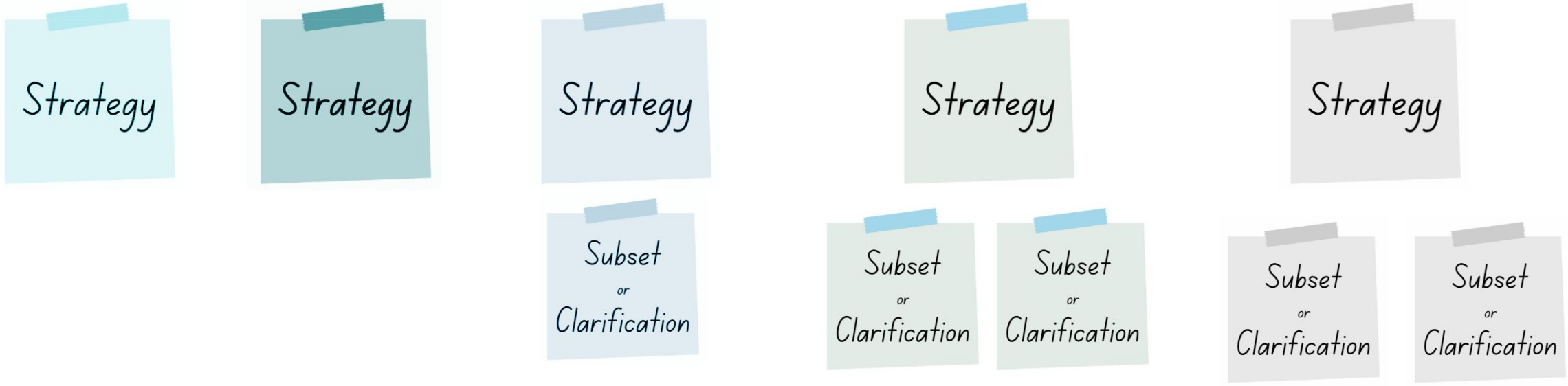
Description	Accessed During	Quantity Available	Points Per Action	Calculated Max Score	Contribution Percent of Total Max Score	Estimated Seconds Per Action	Points Per Second
Movement Bonus	Autonomous	1*	5	5	4%	2	5 ÷ 2 = 2.50
Autonomous Bonus	Autonomous	1	10	10	8%	15	10 ÷ 15 = 0.67
Game Element A Scored	Drive Control	20	1	20	17%	8	1 ÷ 8 = 0.13
Game Element B Scored	Driver Control	2	15	30	25%	20	15 ÷ 20 = 0.75
Zone Possession Bonus	End Game	3	5	15	13%	5	5 ÷ 5 = 1.00
End Game Bonus	End Game	1*	40	40	33%	10	40 ÷ 10 = 4.00
TOTAL PER ROBOT				120			

Autonomous = 15 seconds Driver Control = 105 seconds End Game = 15 seconds*

PRIORITIZING SCORING OPPORTUNITIES

QUESTIONS TO ASK YOUR TEAM:

- Realistically, what does our time together allow us to build or accomplish?
- How will our budget affect our abilities?
- Do we have access to the physical resources to make/build/program this?
- Do we already have, or can we find people to help?
- Can we work in parallel, or do we need to work in series?



DETERMINE OVERALL STRATEGY

MUST DO

Strategy

ADEQUATE RESOURCES TO INCLUDE

Strategy

Strategy

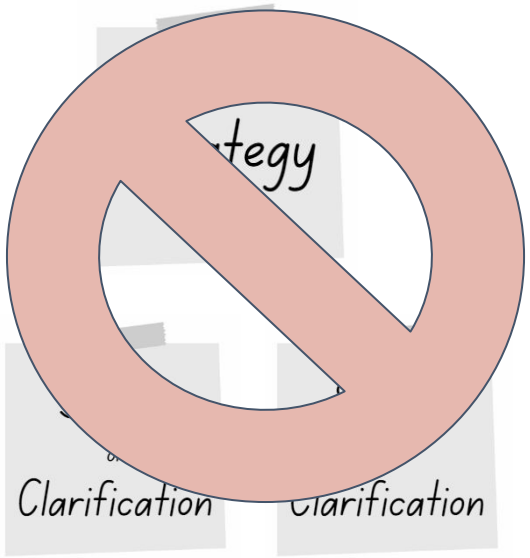
Subset or Clarification

Strategy

Subset or Clarification

Subset or Clarification

REMOVED



DETERMINING YOUR MATCH PLAY

THINGS TO CONSIDER:

- Are there designated scoring timeframes?
- How many times can you do the action?
- How many of each game piece are there?
- How many of each field element are there?
- What is your travel time?
- Can your efforts be unscored?
- Can you perform more than one action at a time?

YOUR CONTRIBUTION:

- What is the maximum score of each match?
- What percentage of the max points can you score?
- How many points per second are you scoring?
- What is your contingency plan?
- How are you going to coordinate with your Alliance Partners each match?
- Have you calculated your *actual* contribution?

Autonomous

- Action Goal
- Point Goal
- Set up for success

First 45 seconds

- Action Goal
- Point Goal
- Contingency Plan

Next 45 seconds

- Action Goal
- Point Goal
- Set up for success

End Game

- Action Goal
- Point Goal
- Contingency Plan

IMPLEMENT SOLUTIONS

Working in PARALLEL vs. SERIES

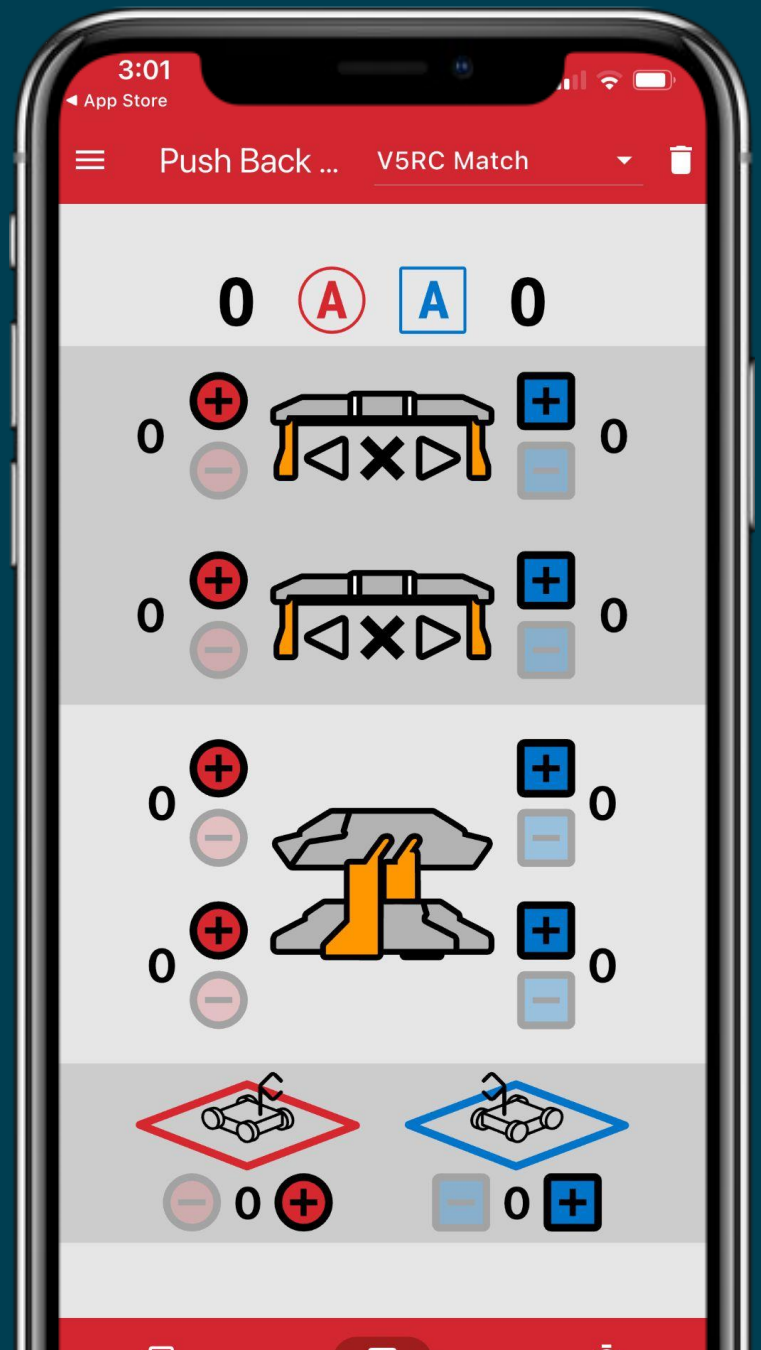
+

Let your RESOURCES guide your decisions

+

Master your MUST DO STRATEGY **before moving onto the next priority**

MAIN FOCUS



TIPS FOR IMPLEMENTING SUCCESS

ENCOURAGE YOUR STUDENTS TO:

- Read the Game Manual- paying close attention to the red boxes
- Read the Game Manual AGAIN
- Take the Drive Team Member Certifications
- Check the Official Q&A
- Evaluate your Team's resources
- Define Success for each individual and Team
- Check for Game Manual updates
- Set and prioritize their strategic objectives
- Keep the priorities posted in a public place
- Refer back to priorities often
- Iterate, ITERATE, **ITERATE!**
- **Commit to Continuous Improvement!**

CATCHING EXCELLENCE

WHAT DOES SUCCESS LOOK LIKE?

ASK YOURSELF AND YOUR ORGANIZATION:
“HOW CAN I CONTRIBUTE TO THE SUCCESS OF MY TEAM?”

ROLE OF THE STUDENTS:

- Set goals and measures of success
- Work toward achieving excellence
- Be the driving force of progress
- Build the Robot, document the process

ROLE OF THE COACHES AND MENTORS:

- Link the past and present
- Encourage Students
- Assist and enlist help when needed
- Share knowledge and skills
- Assess resources and plan accordingly

Contact

We are here for you

Event Partners and Coaches are the core of our competition program here at the REC Foundation. Please reach out to us with any questions or concerns. Thank you for all of your support.

Address

1519 Interstate 30 West
Greenville, Texas 75402

Phone & Email

903 401 8088
support@recf.org

Resources