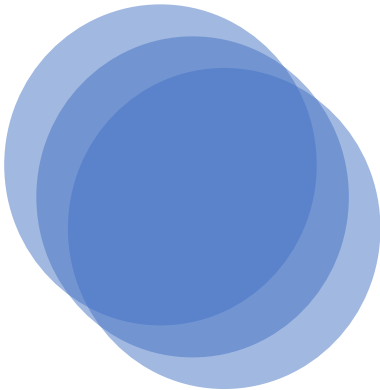
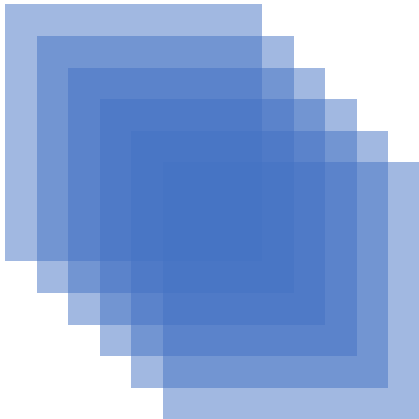


# A Process To A New World

By Elijah 393V



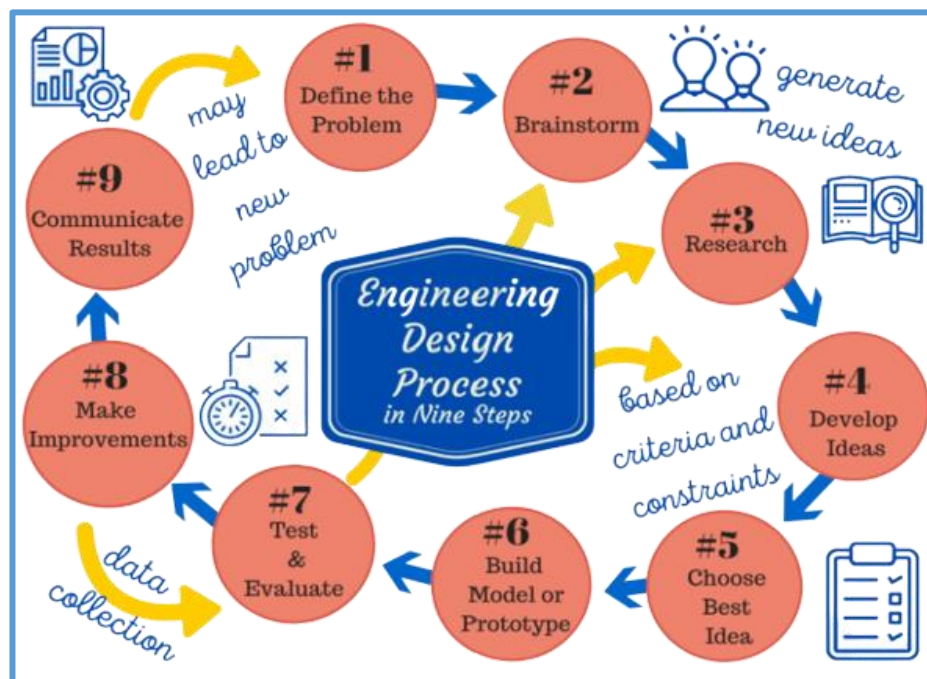
# A New World of Imagination

Creating a game is like creating a world. Endless boundaries awaiting every direction. A world unique to your imagination. You can design plants, animals, mechanics, and much more. Something that takes a huge amount of creativity, using every aspect of your imagination. Everything you can dream of right in front of you. The endless opportunities are just like your robot in robotics.



This is why I aspire to be a game creator. I've learned so much in VEX robotics to help me with my future career. A game creator is just like robotics. You need to use many steps to get to your full design. This is called the engineering design process, something both VEX and game creators use to create their designs. The series of steps are defining the problem, brainstorm, research, develop ideas, choose the best idea, build prototype, test, improve, and communicate results. Furthermore, let's go over the important steps that prepare us for this career.

# The Engineering Process

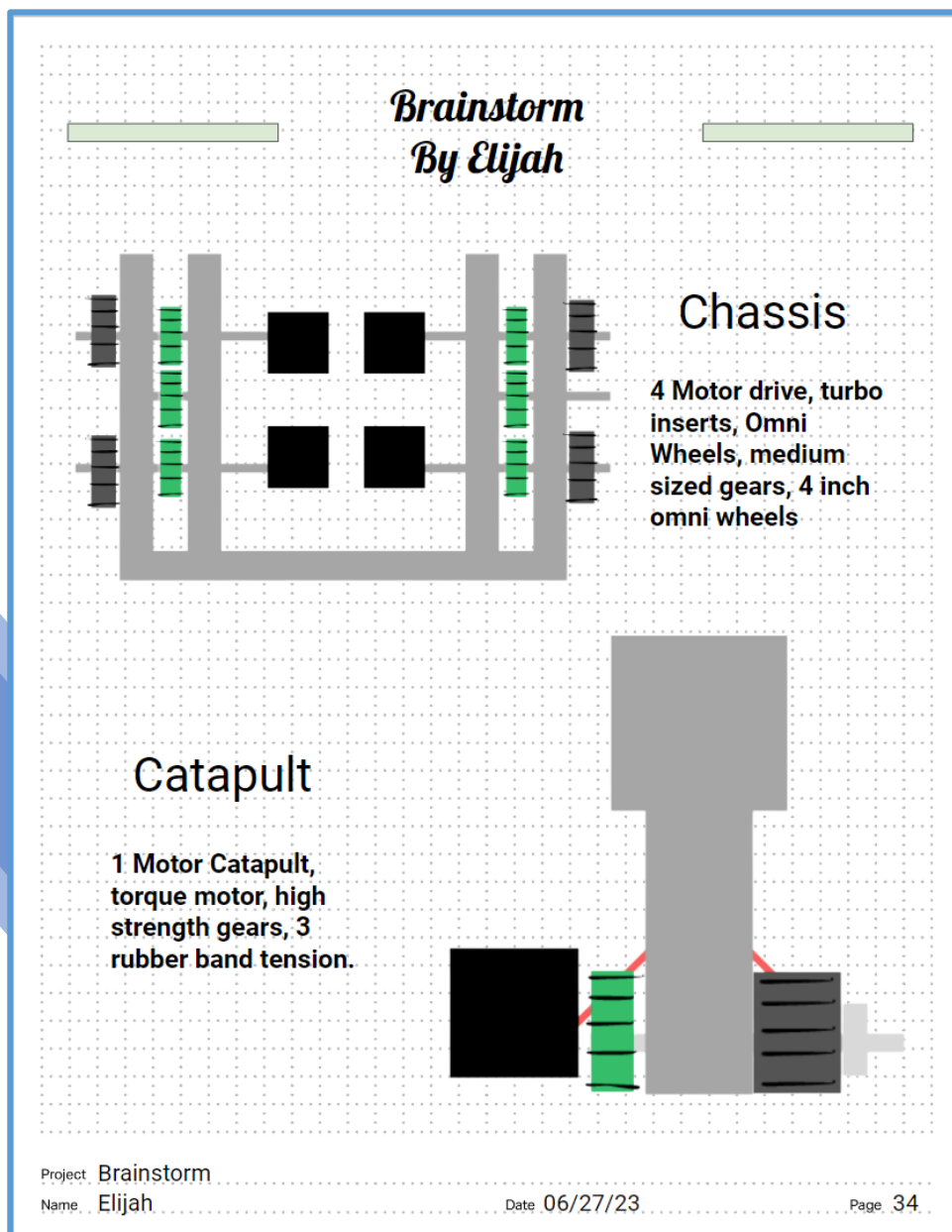


## Define the Problem

Criteria & constraints are something that should always be included in your design. This is important in both VEX and being a game creator. As a game creator you must know your criteria and constraints. Furthermore, you must set a goal for your project or game and consider many things such as what you would want in an ideal game. In addition, you also must consider constraints such as time constraints, and money constraints for your design. This is very similar to VEX robotics where you must set your goals for each step and know your constraints.

# Brainstorm

Brainstorm is the time where you come up with a bunch of ideas. This is a very important step. Both game creators and VEX both use brainstorming. This is something that our team really prioritizes. In our brainstorm, we planned out ideas for our robot with each individual member thinking of an idea, then shared our ideas with one another. Game creators also need to brainstorm many ideas, such as design features or gameplay features. With this they have ideas that they can use.



# Research

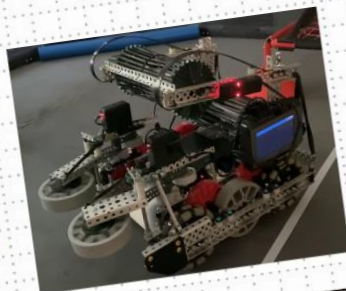
Research is an important part of robotics as we need to research information on our ideas or on how to do things. Furthermore, game creators must do a lot of research before creating their game. They must research their ideas and how they can improve upon ideas. Research doesn't only give you ideas, but it can also help you do things that you don't know, allowing you to learn many things. This is a very important step for both VEX and game creators.

## Robot Reveals

### Mankato Area Robotics Club:

55W Drive, 4 omni wheels, 2 light grey flex wheels, Two 5.5WM, Flex wheel intake, 2m Rubber band and sprocket flywheel

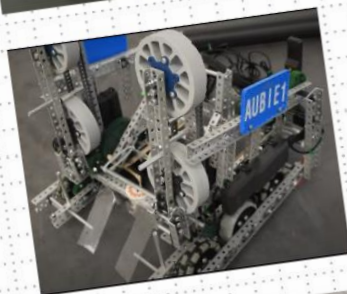
[https://www.youtube.com/watch?v=9\\_axb-xmTZc](https://www.youtube.com/watch?v=9_axb-xmTZc)



### AUBIE1:

4m Drive, 4 omni wheels, 2 traction wheels, 333 RPM, 2 5.5m Intake (Plus a piston to lower intake) 200 RPM, 1m catapult, 43 RPM, 2m climber, 20 RPM

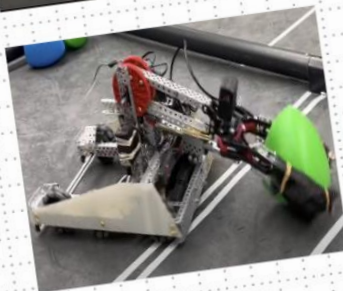
<https://www.youtube.com/watch?v=vRCXzFoNknc>



### Clockwork Robotics:

4m Drive, 360 RPM, 6 omni wheels, 1m 100 RPM puncher, 1m 14 RPM lift, 1m 66 RPM extendable claw (used to drop triballs in goal)

<https://www.youtube.com/watch?v=bRQEcHsIPMg>



Project: Robot Reveals  
Name: Rhys & Ella

Date: 06/27/23

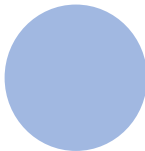
Page: 39



# Develop Solutions

This is the step where you break down all your brainstorming into a few ideas. These ideas may be improved ideas from a brainstorm or even combining brainstorm ideas.

Game creators also need to follow this step to turn their ideas into quality ideas.



**Develop Ideas**

On this page we will decide, as a team which intake designs we will want to incorporate into our decision matrix.

**Intake**  
One 11 W motor, 600 rpm motors, rubber bands.

One 11W motor, 600 rpm motors, flex wheel/flywheel intake,

Project: **Develop Ideas**  
Name:  Date:  Page: **48**

# Choose the Best Idea

This is where you choose the best idea that fits your game/robot the best. As a team, we created a design matrix. This design matrix is like a rubric where we assign a number value for each teammates' ideas using constraints such as time, speed, performance, etc. This is very useful in both robotics and game creation where you must truly think of the constraints and how each design works. This

really prepares us in robotics allowing us to choose the best idea objectively.

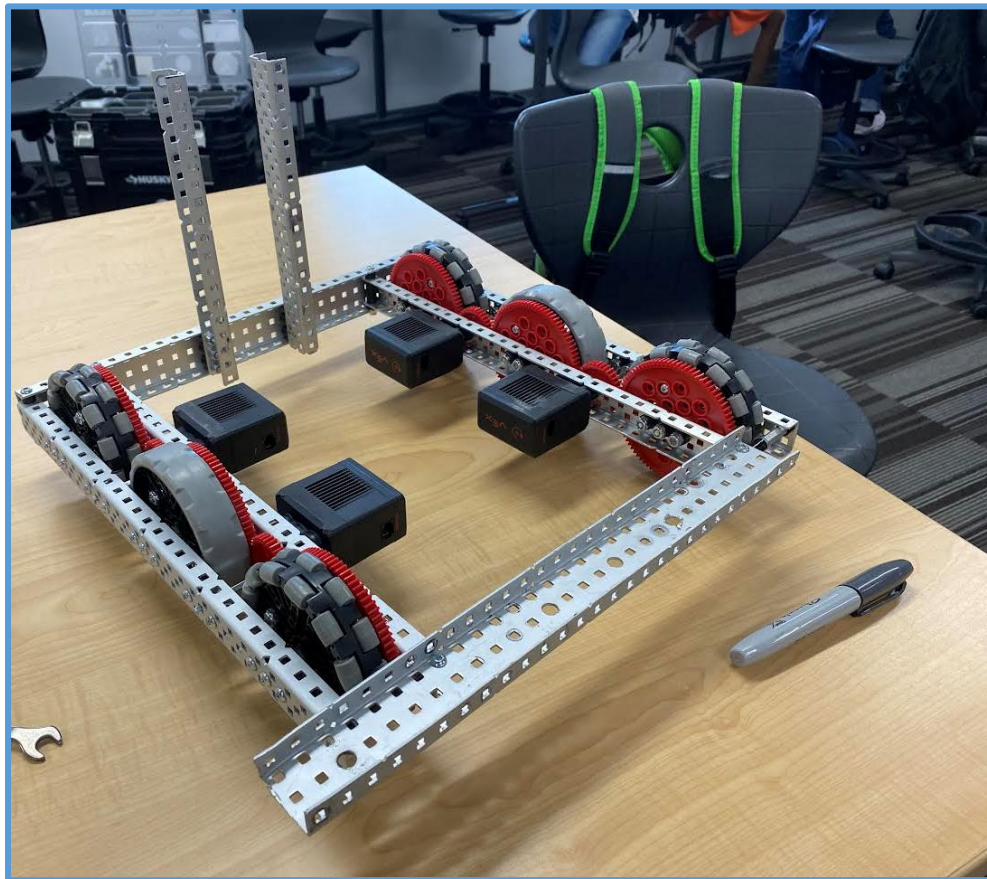
Criteria	Time	Ease	Speed	Integration	Total
4M 4 Inch 4 Omni Wheel 2 Flex Wheel	8.5/10	8/10	7/10	9/10	32.5
4M Drive, 6 Omni Wheel, 2 Flex	6/10	5/10	9/10	8/10	28
2M traction wheel 600 rpm chain drive	7/10	5/10	10/10	6/10	28
4M 4 Inch 4 Omni Wheel Chassis	8/10	9/10	6/10	8/10	31

Criteria	Time	Ease	Speed	Integration	Total
2M Rubber Band Intake, 2 Rubber Band Rollers	7/10	7/10	9/10	8.5/10	31.5
2.5.5W Motor Flex Wheel Intake	7/10	8/10	6/10	9/10	30
2.11W Motor Flex Wheel Intake	7/10	8/10	8/10	8/10	31
1 Motor, Rubber band Intake	8/10	7/10	6/10	8.5/10	29.5

# Build Model or Prototype

After following the previous steps, it is unlikely your robot build is flawless.

Similarly, if you were to interview a game creator it would be unlikely that they would say their game was perfect the first try. It's the same as robotics. Therefore, a prototype is needed. The prototype will come with many problems, but it is part of the design process that allows us to improve our product. Game creators also create

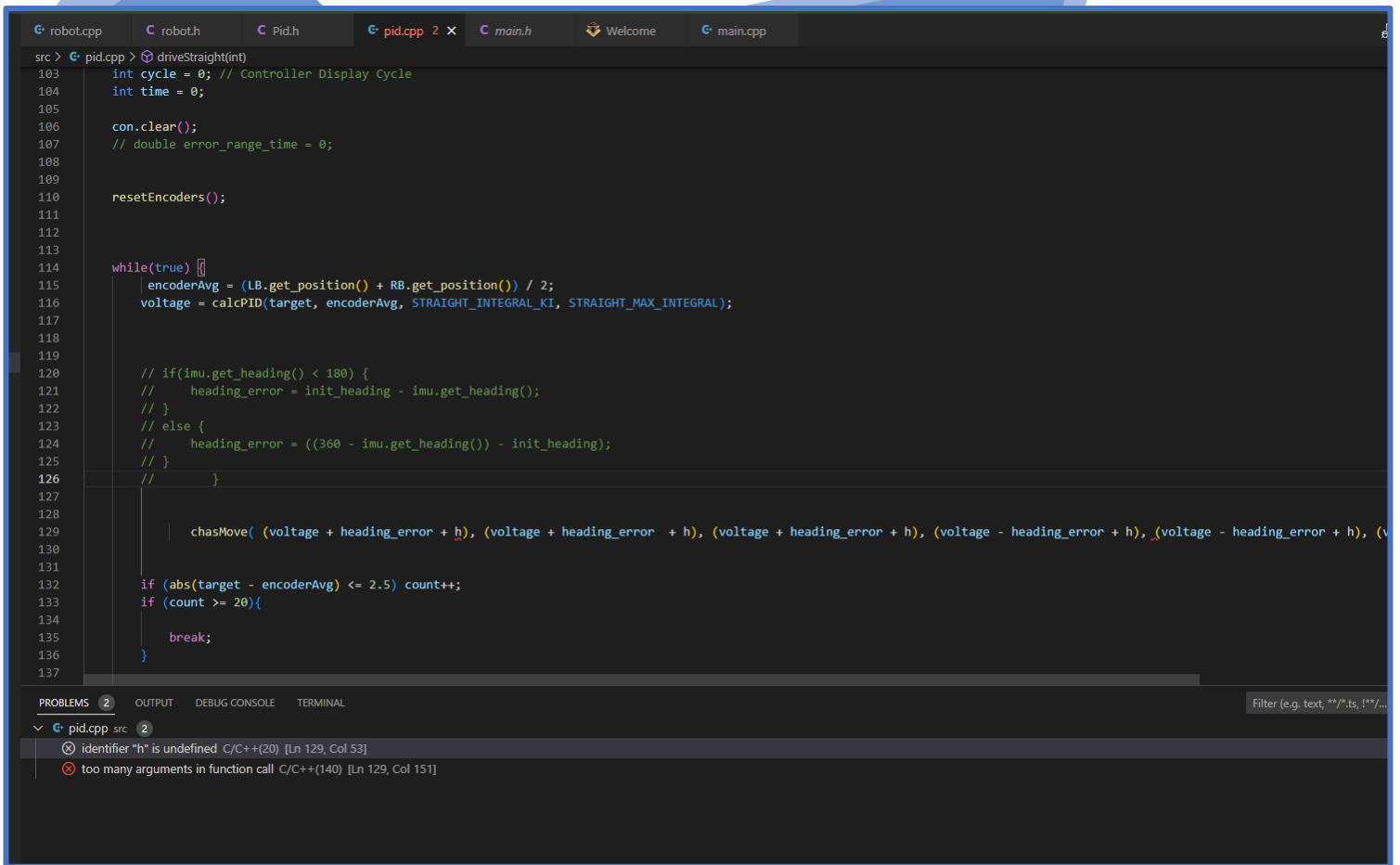


games in stages such as the alpha or beta stage. To fix these problems, the next step needs to be implemented which is called test and evaluate.



# Test, Evaluate, and Improve

In this step, our team tested the prototype to see what went well and what was wrong. Without this evaluative part, we would just be testing not knowing what needs to be fixed. In game creation, it also needs to be tested so they can fix issues or find problems in the game. This step allows game creators and robotics students to improve their design after testing it. Without this step the glitches and problems would never be fixed.



```
src > pid.cpp > driveStraight(int)
103 int cycle = 0; // Controller Display Cycle
104 int time = 0;
105
106 con.clear();
107 // double error_range_time = 0;
108
109
110 resetEncoders();
111
112
113
114 while(true) {
115     encoderAvg = (LB.get_position() + RB.get_position()) / 2;
116     voltage = calcPID(target, encoderAvg, STRAIGHT_INTEGRAL_KI, STRAIGHT_MAX_INTEGRAL);
117
118
119     // if(imu.get_heading() < 180) {
120     //     heading_error = init_heading - imu.get_heading();
121     // }
122     // else {
123     //     heading_error = ((360 - imu.get_heading()) - init_heading);
124     // }
125     // }
126 }
127
128
129     chasMove( (voltage + heading_error + h), (voltage + heading_error + h), (voltage + heading_error + h), (voltage - heading_error + h), (voltage - heading_error + h), (v
130
131
132     if (abs(target - encoderAvg) <= 2.5) count++;
133     if (count >= 20){
134         break;
135     }
136 }
137
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL Filter (e.g. text, \*\*/\*.ts, !\*\*/...

- identifier "h" is undefined C/C++(20) [Ln 129, Col 53]
- too many arguments in function call C/C++(140) [Ln 129, Col 151]

# Communicate Results

The final step of the engineering design process is where you communicate your results. When communicating results, this is where you show your results to others. This can be going to a tournament where you interview, and perform the task required. The same goes for a game creator where you show your results to others, which can be finding sponsors or even presenting your business pitch. This can also be publishing your game.



# Inspiration

All the amazing things in robotics and as a game creator inspire me to choose this career because of all the creativity I can use, just like in VEX robotics. Creativity is something that makes the career stand out. Furthermore, I also get many opportunities with every aspect of STEAM as we can use science, technology, engineering, art, and even math skills. This is truly inspiring of what I can do in the world of technology. The opportunity VEX gives me is endless. An endless dream, and a new world where anything can be done. I am very motivated to choose this career and I am so grateful I have this opportunity to use what I learn in VEX robotics to one day help me in my future career.



## **Sources:**

Adobe Creative Cloud (used for visual effects)

[The Video Game Development Essentials Guide](#)