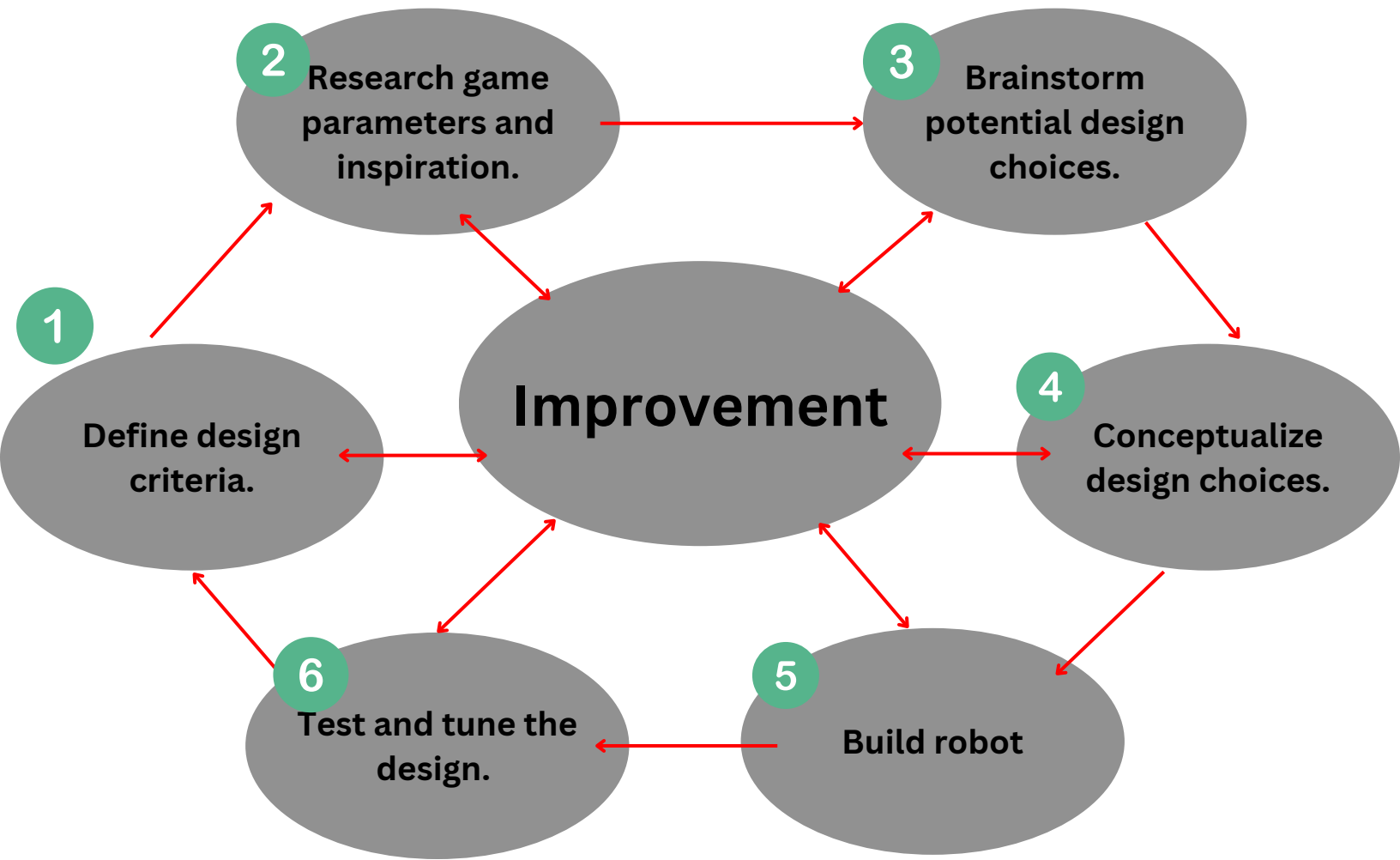
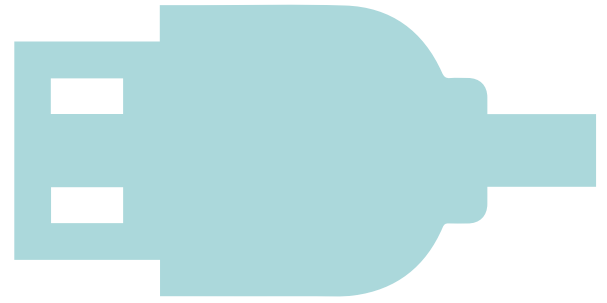


# ***The Design Hexagon***

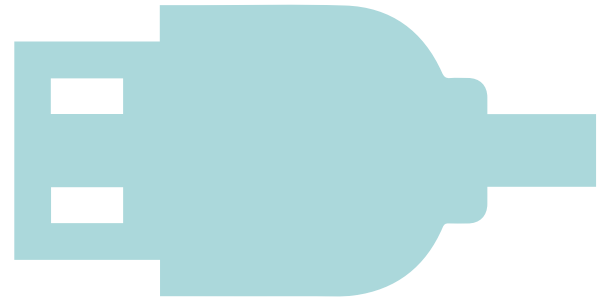
## ***By CAOS Robotics***



The Design Hexagon is a six-step design process used by CAOS Robotics. Learn more simply by turning to the next page!

# ***The Design Hexagon***

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### **Part 1: Define design criteria.**

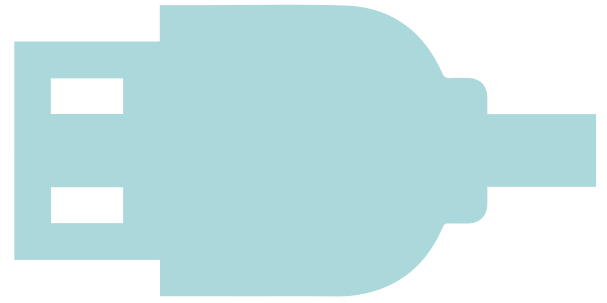
What are you designing? What will it be used for?

What kind of materials will you need for your design?

Is your design affordable? Where will you get the money? Estimate the cost of your design.

# ***The Design Hexagon***

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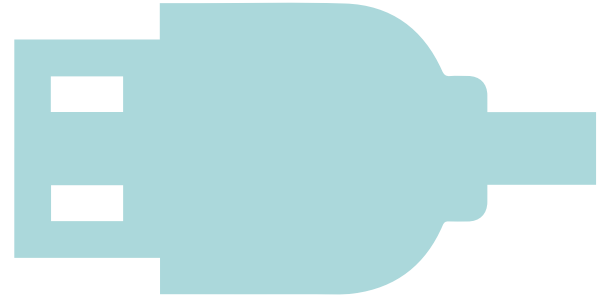
### **Part 2: Research game parameters and inspiration.**

If you are an FTC team, read the game manual for this season. Sumarize some design constraints that must be meant.

If you are not part of an FTC team, what are some rules and regulations your design must comply with?

# ***The Design Hexagon***

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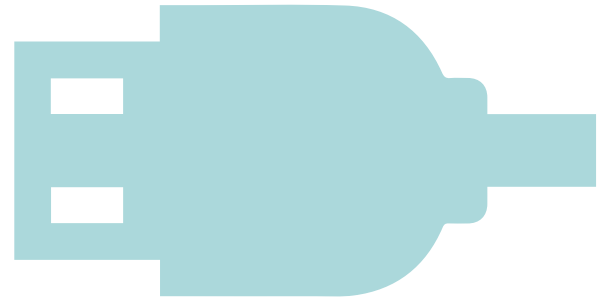


## **Part 2: Research game parameters and inspiration (continued).**

Time for some inspiration! List some design choices from other teams or companies that you may consider incorporating. Please be conscientious of copyright and patent laws. This process should serve only for inspiration and should not be used to fully imitate other people's designs. If you are unsure about a particular decision, research the patents of other companies

# ***The Design Hexagon***

## ***By CAOS Robotics***



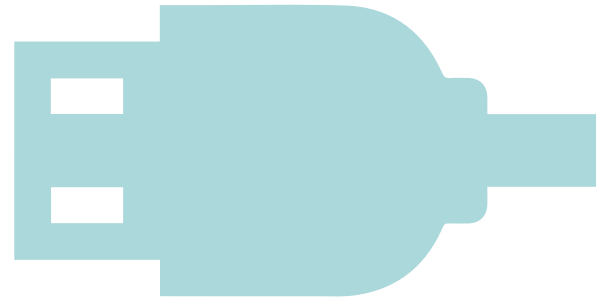
### **Part 3: Brainstorm design choices.**

Note: The brainstorming process can last several day and can occur several times in the process. You may repeat this step as many times as needed.

Spend 30 minutes, or the duration of one meeting, freely brainstorming and discussing ideas with your colleagues. Use the space below to list some ideas that stood out. Then, circle the idea(s) that you are considering using.

# ***The Design Hexagon***

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### **Part 4: Conceptualize Design Choices**

Conceptualizing a design is like a brainstorm with a plan. Answer the questions below to plan out how you will put the ideas selected from the brainstorm into action.

Which of the following will you use to conceptualize your idea? Choose all that apply.

☐ Computer Aided Design (recommended)

☐ A detailed sketch or blueprint

☐ A miniature 3D model/prototype

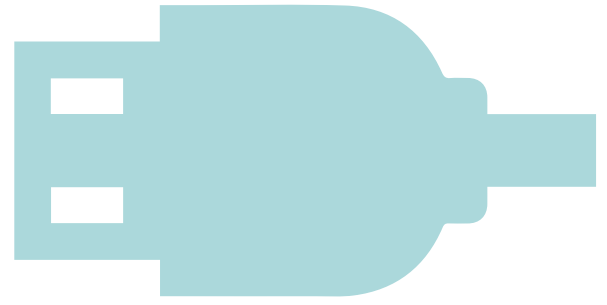
Will you divide your design concept into different parts (ex. intake is one CAD image, robotic arm is another CAD image, etc.) or will you bring together all parts of your concept into a single image or prototype?

☐ Divide it into parts

☐ Create a single image/prototype.

# ***The Design Hexagon***

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### **Part 4: Conceptualize Design Choices (continued...)**

What are some engineering and mathematical principles you will need to incorporate into your concept? How will you apply these concepts?

How will you know if your design is architecturally possible? What criteria will you have to meet to ensure your concept can actually be built?

# ***The Design Hexagon***

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### **Part 5: Building the robot**

Nothing much to write here! Now is the time to focus on building, not just conceptualizing the robot! Some things to consider:

- How will you design the robot? What steps and procedures will you take to build the robot?

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- What kind of safety concerns are there to designing your robot? Is there any safety equipment (goggles, gloves, etc.) you need to prevent injury?

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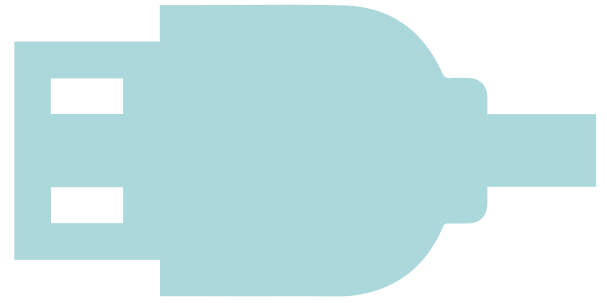
- How much time will you need to build the robot?

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# ***The Design Hexagon***

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### **Part 6: Test and tune the design**

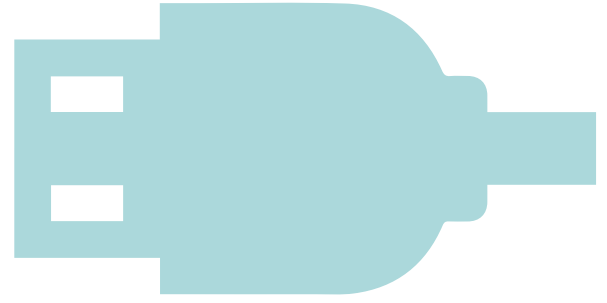
After testing and tuning the design, reflect on the following questions:

What worked well for your design?

What could have been improved about the design?

# ***The Design Hexagon***

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### **Part 6: Test and tune the design (continued...)**

What kind of changes (if any) will you make to your design? How will you make these changes?

# ***The Design Hexagon***

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### **THE END... or is it?**

The design hexagon is not just a rigid, linear process.

It is cyclical. It does not just revolve around completing projects; it revolves around improving them! This is why you may repeat any of the previous steps as needed! For example, if changes need to be made to your hardware, you may revert back to the brainstorming stage to decide what these changes are. Good luck, and enjoy designing your robot!

