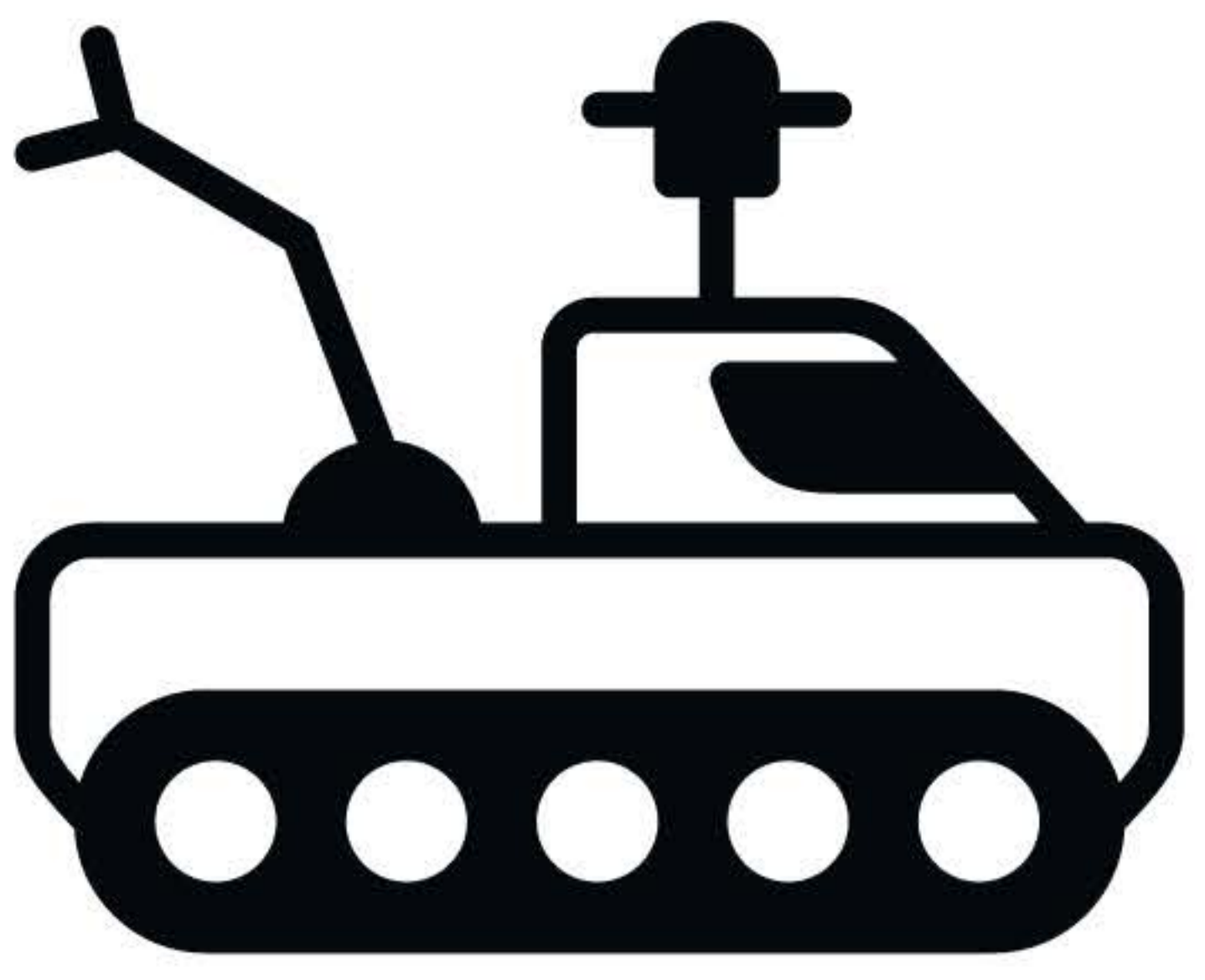


# Seafloor Seeker



How can advanced manufacturing technology and equipment be utilized in teaching people about the use of ROV's?

## Suggested Equipment Skill Level

Intermediate User

## Equipment Skills

3D Design  
Coding

ROV Technician, ROV Pilot, Project Manager

### Career & Skillset Connections

- Communication
- Adaptability
- Attention to detail

### Project Guiding Themes

- Engineering design process
- Designing in 3D modeling software
- Designing a prototype that meets multiple constraints

### Suggested Software & Materials

- 3D Modeling Software
- Recyclable Materials
- AquaTrak

## Aligned VDOE CTE Course(s) and Competencies

**Electronics/Industrial Robotics Technology**

36-Weeks

**Engineering Studies**

36-Weeks

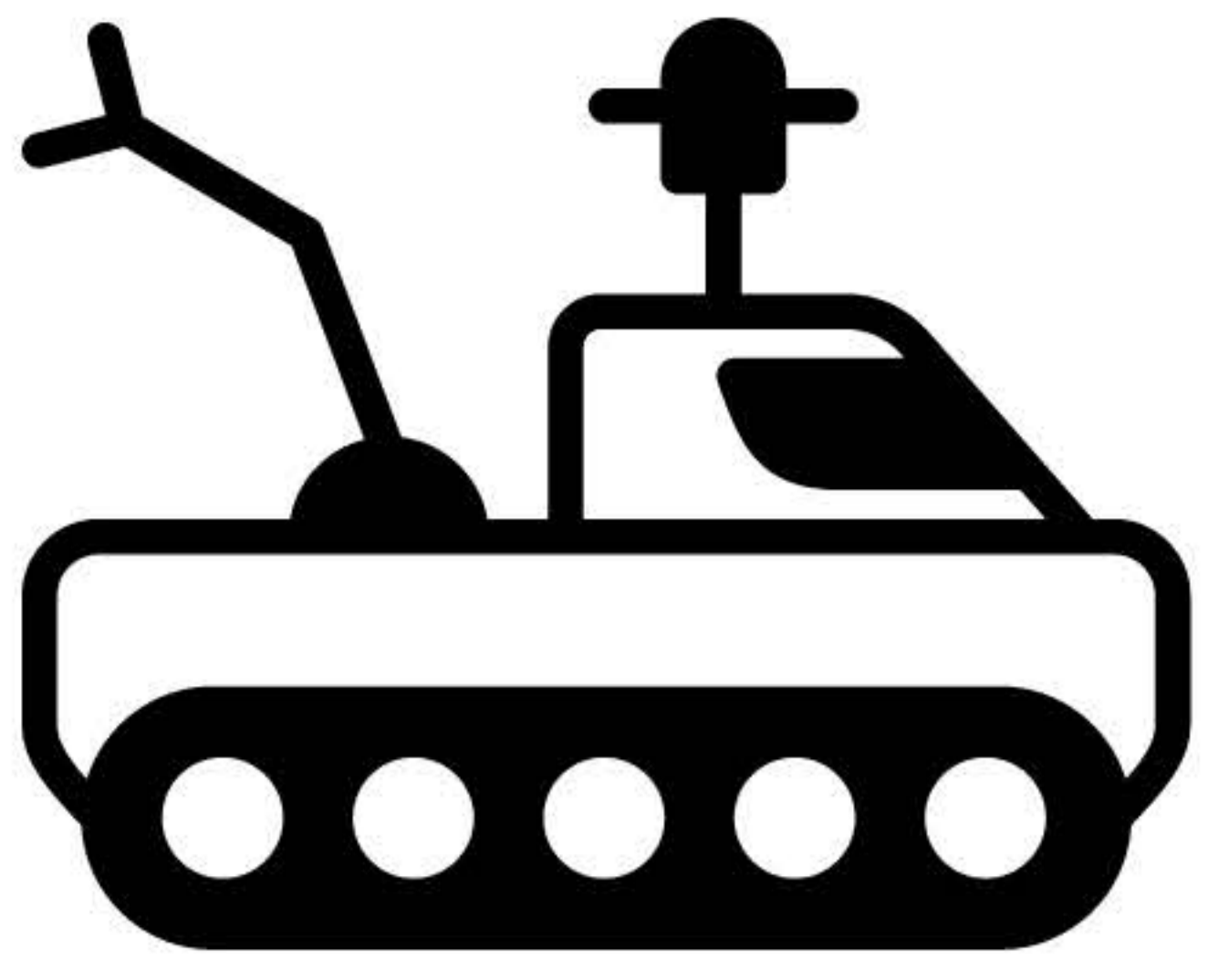
**Technology of Robotic Design**

36-Weeks



# Seafloor Seeker

Intermediate Skill Level



**How can advanced manufacturing technology and equipment be utilized in teaching people about the use of ROV's?**

## Project Problem & Career Prompt

You and your team are a part of the workforce development department at HydroVenture Robotics. The workforce development department has been tasked to design and develop an underwater course that can help demonstrate ROV capabilities. Advanced manufacturing technologies should be incorporated into the design and development. Each team from the department must develop their own course, ROV, and attachment system to the boat. This will give the head of the department, options to choose from.

## Project Background & Resources

What is an ROV and how do they operate?

How are ROV's tethered to boats and why?

## Investigative Questions

- What can be used to connect the Sphero Bolt Boat to the ROV?
- How does moving the boat which is tethered to the ROV change the way the ROV moves?

## Project Criteria

- Prototype boat (using Sphero Bolt) must be able to connect with the prototype ROV
- Prototype must be able to travel down the AquaTrak without any aid from an outside source while navigating the course underwater
- Final working prototypes must be completed by the project deadline

## Project Constraints

- A minimum of one part each must be constructed using the 3D printer and CNC Machine
- Cannot use prefabricated 3D models as parts to be 3D printed or machined

## Suggested Pacing

2-3 Days of research and sketching ideas

5-7 Days of 3D modeling, making parts (3D printer, CNC Machine), construction

3-4 Days of testing and adjusting (then retesting)



# Seafloor Seeker

## Career & Skill Set Connections

### ROV Pilot

ROV Pilots relay information during the "dive" and carry out technical tasks on the small boat (operating, rigging, hydraulics, etc).

### ROV Technician

ROV Technicians operate, maintain, and repair ROVs.

### Project Manager

The project manager identifies the project's goals, objectives, and create a plan that outlines the tasks, timeline, and resources needed.

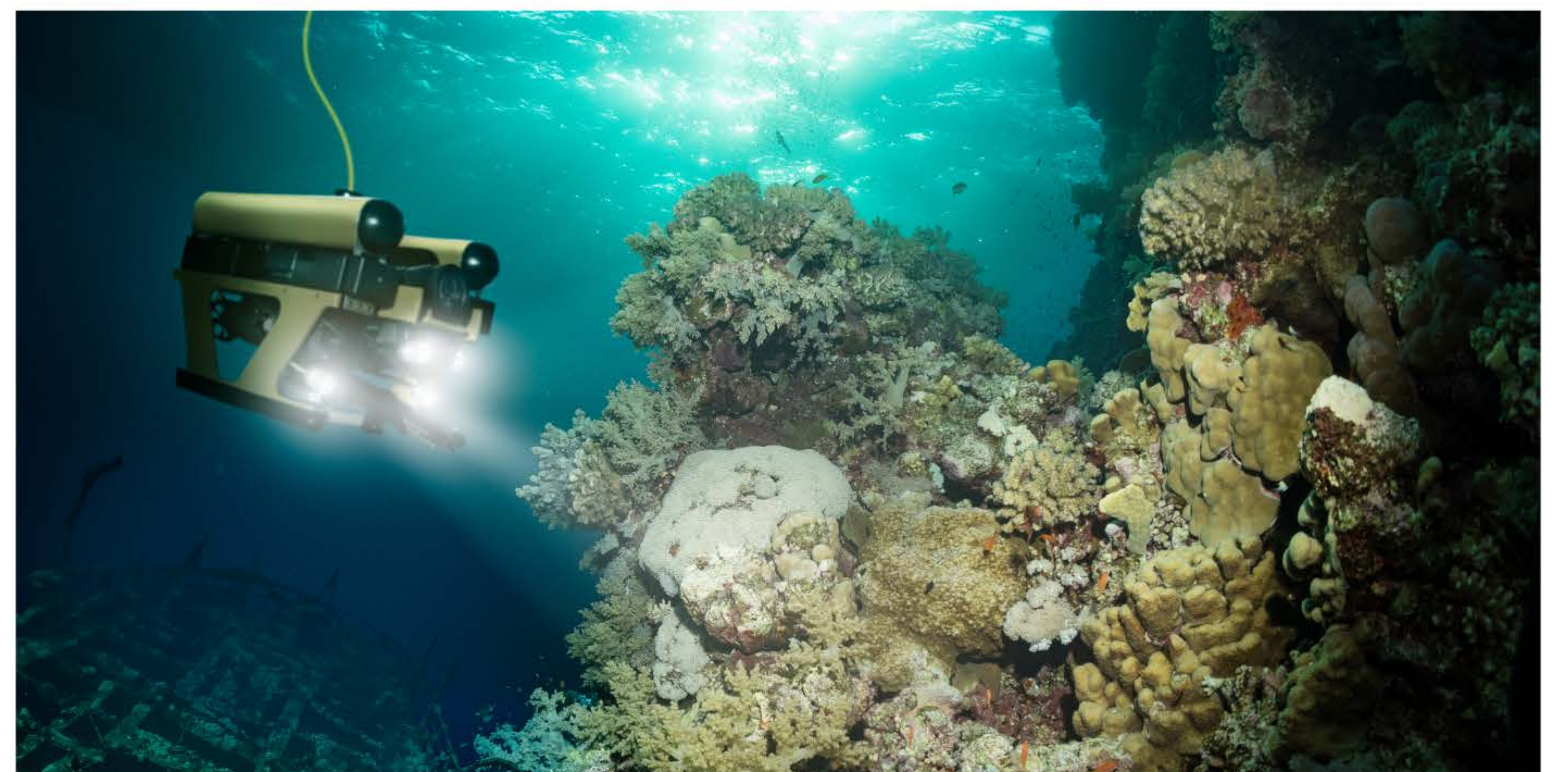
## Essential Skills

- \*Intrpersonal
- \*Flexibility
- \*Troubleshooting
- \*Time Management
- \*Problem Solving



## Academic Pathway

High School Diploma  
and  
Community College/Certification  
or  
Bachelor's degree



## Aligned VDOE CTE Course(s) and Competencies

Workplace Readiness Skills & Work-Based Learning Opportunities & Examine All Aspects of an Industry

### Electronics/Industrial Robotics Technology

Exploring Electronics/Robotics Technology Careers

Describe the skills and characteristics of a good technician

Explore occupations related to electronics and robotics technology

Explaining Robotics Applications

Explain the use of robotics for industrial applications

Introducing Robotics

Identify types of robot geometry, manipulators, and end effectors

Identify types of robot controls and drive systems

### Engineering Studies

Examining the Engineering Profession

Research an application of emerging technologies that may have significant influence on contemporary society and the environment

Practicing Engineering Fundamentals

Communicate engineering ideas using computer applications

Demonstrate teamwork skills necessary for success when working in a technological team

Communicating Fundamental Information

Communicate with stakeholders to inform requirements

Identify different types of models available to engineers

Use rapid prototyping to develop models

Create a model or simulation for an engineering product, process, or idea

### Technology of Robotic Design

Exploring Robotics and Automation Systems

Investigate careers in robotics, automation, and control systems

Research the history and development of robotics, automation, and control systems

Exploring Communication and Networking

Explain types of communication/networking and layers

Describe various types of ports, channels, and controllers for robotic communication

Exploring the Components of Robotics and Automation Systems

Describe various hardware and software used in the industry

Describe precision measurement equipment and techniques



# Project Management Plan

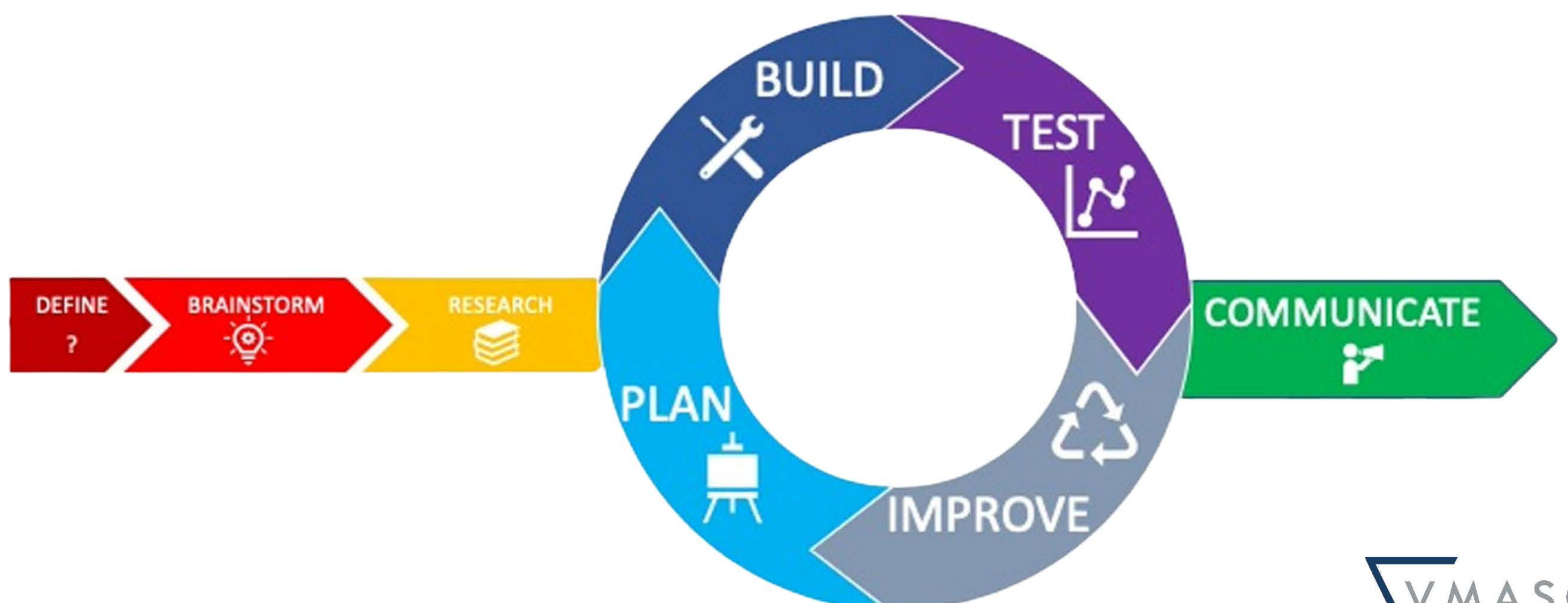
Team  
Member  
Roles

Team  
Goals &  
Timelines

Team  
Member  
Tasking



# Sketches & Design Planning





# Notes

# Notes