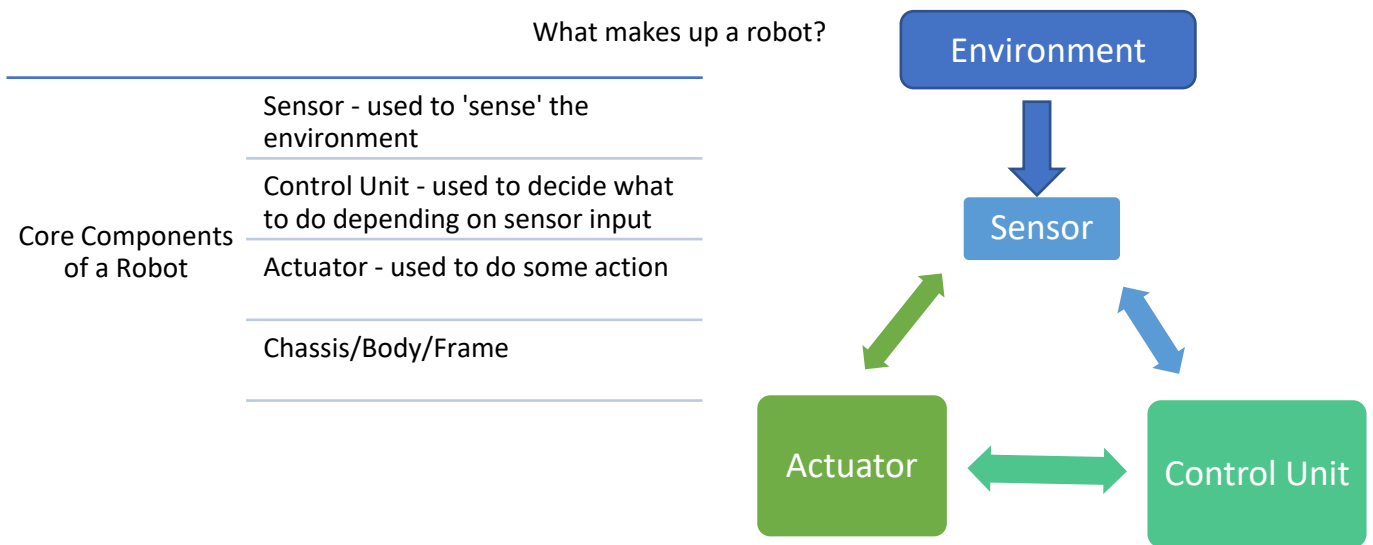# Building Robots

Using robotics and related kits in the Atal Tinkering Lab as an educational tool

A robot is defined as a machine capable of carrying out a series of actions automatically. For ATL students, robots often serve as a very basic platform to deploy a variety of innovations e.g. a carpet cleaning robot, automatic following luggage, etc. At an even more basic level, building a simple robot, even if it is just a simple wheeled robot, is a very interest-generating activity and can act as a triggering factor to encourage students to "tinker" and innovate.

What makes up a robot?

	Sensor - used to 'sense' the environment
	Control Unit - used to decide what to do depending on sensor input
Core Components of a Robot	Actuator - used to do some action
	Chassis/Body/Frame

The interesting thing about this framework is that there is not just one way to make a device that works in the above scheme. This means, there are practically unlimited types of robots that the ATL students can dream up and make!

A typical case of how the students will make a robot will start with first deciding what the robot is going to do – its purpose. After that the students will have to decide what sensors are most appropriate for the robot depending on its function – touch sensor, IR sensor, ultra-sound sensor.

Similarly, they will have to decide what actuators are they going to use – wheels, legs, servo motors, stepper motors, etc. The control unit will most likely be an Arduino micro-controller, which will interface with the sensors and actuators and direct the robot's actions depending on the programming done by the students.

Building a robot will combine several skills like – physical computing, computational thinking, physical prototyping, etc. This synergistic exercise will be an excellent means to make students more aware about the technologies that they have access to and how can they utilize them to find solutions to the problems the see in the world around them.

Mentors shall find different robotics kits in Atal Tinkering Labs. Mentors are requested to educate themselves about the kits to deliver the best experience with the students.

References:

The following is a non-exhaustive and suggestive list of resources on the concept of 3D modelling:

Resource Description	
Types of robot sensors	Link
Actuators for robots	Link
Sensors and actuators	Link
Make your first Arduino robot	Link
Making the simplest autonomous robot	Link
Line-follower robot using Arduino	Link
How to make a robot	Link

Note:
1. Mentors are recommended to build their content and not plagiarize and then deliver to their audience in the ATLs.
2. Mentors are encouraged to explore resources and share critical observations within communities and with AIM.
3. Please note that these are third party links and AIM or NITI Aayog does not endorse any person(s) or organization(s) mentioned on or related to these links.
4. The opinions and views expressed by the mentors during their interaction are of their own and do not necessarily reflect the views of AIM or NITI Aayog.
5. Mentors are aware that the engagement with the ATLs is treated as a community service and there shall be no financial transactions between any stakeholder and mentor for any official ATL related activity.