The Robot Doctor
Episode 101: Intro to Robotics

Review:
Robot Design must reflect the purpose of the robot

Some elements in the Robot Design are

a) The type of locomotion
b) Style of end-effectors (hands)
c) Appearance

Locomotion:
- Wheels – fast, cheap, energy efficient but limited by terrain
- Tracks – better than wheels on bumpy or soft terrain, but not as good as legs
- Legs – great for rough terrain but slow and inefficient
- Flying – ignores terrain and fast, but limits the weight the robot can carry
- Stationary – lets the work come to the robot which may limit application outside

- End-effectors (hands):
  o Tools – customized tools to perform task quickly and efficiently
  o Simple gripper – can grab most objects but lacks fine dexterity
  o Human-like hands – can interact with humans easier and use human-centric tools
  o Suction cups/bag-like grippers – can pick up fragile items safely

- Appearance:
  o Human-like is useful for tasks that require interaction with people or operating in the vicinity of humans

Challenge Questions

For these questions, think about what kind of design decisions would need to be made for a particular task. For example, a robot operating in Antarctica may have tracks to drive over the snow, while a robot used in your house would need an end-effector capable of opening doors.

1) Choose a task for your robot whether it is working on a farm, say collecting strawberries, or working on a construction site, excavating ground for a basement, or even a job around your home

2) Choose your design elements, what does your robot need to get its job done

3) Then, explain how those design elements help the robot to perform its job

4) Finally, do the same steps for a different task and describe why the two tasks result in different design elements and different robots