

Abstract:

This lesson focuses on an introduction video for basic robotics that covers the different design elements: Locomotion, End-effectors, and Appearance of a typical robot. We discuss the pros and cons of different options and explain why a particular combination may help the robot to perform its assigned task better or faster.

Objective:

By the end of this lesson, students will be able to:

- Identify the design elements
- Compare and contrast the value of different types of elements
- Create two combinations of elements for solving specific problems

Standards:

Computer Science Teachers Association (CSTA):

- 2-CS-01 Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices.
- 2-AP-15 Seek and incorporate feedback from team members and users to refine a solution that meets user needs.
- 2-IC-20 Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.

Resources / Materials:

Playlist Overview: [The Robot Doctor Series](#)

Lesson Video: [Lesson 101 - Robotics: An Introduction](#)

Student Handout: [101 Student Handout](#)

Teacher Handout: [101 Teacher Handout](#)

Student Survey: <https://forms.gle/vNkUqjGNyuC2X8zNA>

(Have students complete this at the end of the lesson)

Procedures:

1. Opening Question: **Why don't all robots look the same?**
2. Review Opening Question: Explain that different robots perform different activities. Depending on the type of activity that the robot has to do, the robot will look different and function differently. Make sure to support/compliment student ideas about the opening question.
3. Explain that the video was created by **WQED** (Television Company) and **RobotWits** (Artificial Intelligence Company) who partnered to create the Robot Doctor educational video series.
4. Read the Abstract to the students or explain in your own words what the video will be about.
5. Prepare the room for the video by asking students to eliminate distractions (close laptops, lower blinds, put away folders, set down pencils, ect.).
6. **Show the video** to the students.
7. After the video, ask the students to share **what they liked** and **what they learned** from the video with someone beside them. Facilitate discussion, then ask for volunteers to share with Pass out the **Student Handout** to each student.
8. Discuss the elements of robot design and their examples from the student handout.

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9. Have the students work on the Challenge questions. They may work individually or in small groups.
10. Provide light guidance to each student on their progress with the challenge questions, if needed.
11. After the majority of the students have finished the student handout (or a majority are stuck), prepare to review the challenge questions one at a time.
12. Use the **Teacher Handout** to help students walk through each part of the Student Handout.
13. Review with the students the concept of robots looking differently because they serve different purposes and therefore each element of the robot may be different.
14. Have the students go to this link: <https://forms.gle/vNKUqjGNyuC2X8zNA> and fill out the survey.

Modification:

Students will have their lesson modified according to their IEPs and individual capabilities.

Enrichment:

Students who are advanced will finish early and have extra time. They may watch other episodes of the Robot Doctor or they may assist students who are struggling with the assignment.

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