

## Smart Pet Feeder

### Project Overview

This Arduino-based project will be focused on making an automatic pet feeder.

Course Connections	21 <sup>st</sup> Century Skills	CTE Alignment
Middle School Science High School Physics High School Engineering	Communication, Critical Thinking, Collaboration	Energy, Environment, and Development Pathway

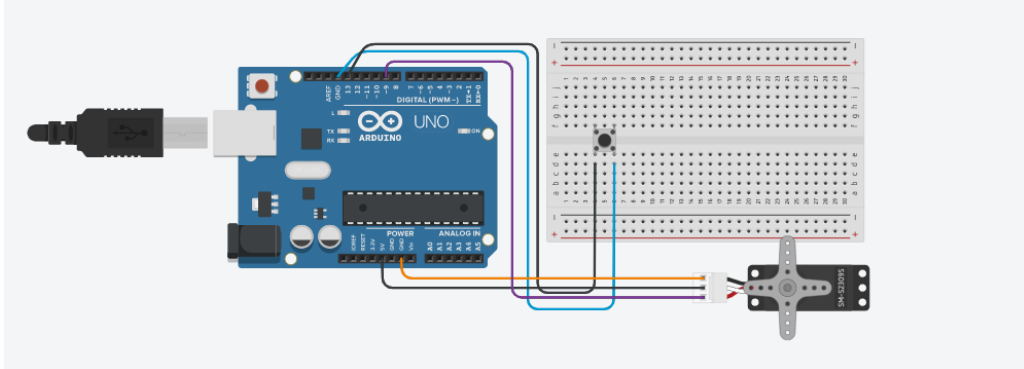
### Objective

Students will make an automatic pet feeder while owners are away.

### Materials

1. Wood/Water Bottle or Pringles Can (to construct the Pet Feeder)
2. Arduino IDE (program used for code)
3. Arduino Uno Board (power source)
4. Jump wires (connected on the breadboard)
5. Breadboard (for the circuits)
6. Pushbutton (helps feeder spin in order for food to spill out for pets)

### Block Diagram



## Application

The Automatic Pet Feeder can be used in households all over the nation when families go on vacation or have a long day at work. They can also help lower pet starvation rates! Since more households are keeping pets for different reasons, the automatic pet feeder can help owners to save time and money when they are at work or on vacation because the feeder can also control the time or the amount of pet food dispensed. With appropriate training with the pets, they will be able to press a button when they need food or a treat.

## Outline/Schedule

### Part 1: Introduction to Smart Pet Feeder

- Introduce the problem statement: feeding animals when owners are unable to feed them themselves, due to being away. By having a button, animals can feed themselves by simply pressing it and the device will also automatically dispense food at a designated time of day to ensure pets are being fed regularly.
- Introduce the solution of an automatic pet feeder and explain the benefits of using it.
- Discuss the materials needed for the project, draw the block diagram, explain how the system works.
- Assign team tasks, distribute materials, and plan the schedule.
- Record video clips for important steps.

### Part 2: Programming the ESP32 Microcontroller (complete by Jun. ??)

- Introduce the ESP32 Microcontroller and its capabilities.
- Review the basics of programming with Arduino and ESP32.
- Record video clips for important steps.

### Part 3: Adding a Servo Motor (complete by Jun. ??)

- Introduce the Servo Motor and how it can be used to control the opening and closing (rotating) of the pet feeder
- Install the ESP32Servo library.
- Demonstrate how to connect and control a Servo Motor with the ESP32 Microcontroller.
- Allow teams time to add a Servo Motor to their project and test it.
- Record video clips for important steps.

### Part 4: Adding LEDs and Blynk Integration (complete by Jun. ??)

- Install the Blynk library and how it can be used to display the status of the feeder (amount of food consumed) on a mobile app.
- Allow teams time to integrate Blynk into their project and test it.
- Record video clips for important steps.

### Part 5: Finalizing and Testing the Project (complete by Jun. ??)

- Design the testing plan based on the project objectives and requirements.
- Discuss the troubles that students may encounter and how to troubleshoot.
- Allow teams time to finalize their project and test it according to the testing plan provided.
- Have teams present their projects and demonstrate their functionality.
- Record video clips for important steps.
- Prepare the project presentation and make the video demo.

### Reflection

Have students reflect on their experience with the project and what they have learned about programming, robotics, and Arduino.

- Discuss how STEM skills and knowledge can be applied to real-world problems and applications.
- Allow time for students to provide feedback on the project and suggest improvements for future iterations.

### Sample Code

[Sample Code](#)