Vefi
Makers Club

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Maker's Club 40-Week Schedule: Reverse Engineering of Appliances and Devices

This updated plan integrates reverse engineering (RE) of common appliances and devices like radios, televisions, computers, refrigerators and air conditioners into the Maker's Club schedule. The goal is to teach students how everyday appliances work, encouraging curiosity, problem-solving and technical skills.

Week-by-Week Reverse Engineering Schedule

Module 1: Introduction and Basics (Weeks 1–4)

	Week Theme	Activity	Materials/Tools Needed	Learning Outcome
1	Introduction to Reverse Engineering	Overview of RE, safety practices and tools	Screwdrivers, pliers, safety goggles	Understanding tools and safety
2	Disassemble Everyday Items	Take apart pens, staplers, etc.	Small household items, screwdrivers	Hands-on exploration
3	Electrical Basics	Build and test basic circuits	LEDs, batteries, wires	Understanding electricity and circuits
4	Material Identification	Learn about materials in appliances	Everyday objects, magnets	Material science basics

Module 2: Small Electronic Devices (Weeks 5–10)

	Week Theme	Activity	Materials/Tools Needed	Learning Outcome
5	Radio Basics	Disassemble a radio; identify components	Old radios, multimeters, manuals	Understanding analog circuits
6	Signal Reception	Study antenna and frequency tuning	Antennas, wires	Concept of frequency and signals
7	Reassemble and Test Radio	Rebuild the disassembled radio	Radio parts, soldering kits	Reassembly skills and debugging
8	TV Basics	Explore TV components like CRT/LED panels	Old TVs, screwdrivers	Introduction to visual electronics
9	Signal and Image Processing	Study the working of a tuner and screen	Screens, connectors, manuals	Basics of video signals
10	Create a Mini Project	Build a simple AM/FM radio	Kits with transistors, capacitors	Application of learned skills

Module 3: Computing Devices (Weeks 11–16)

Week	Theme	Activity	Materials/Tools Needed	Learning Outcome
11	Computer Basics	Disassemble a CPU	Old desktops, screwdrivers	Understanding internal computer parts
12	Functionality of Components	Study RAM, motherboard, HDD and PSU	Individual components, manuals	Component-level understanding
13	Assembling a Computer	Rebuild the disassembled computer	CPU parts, thermal paste	Hands-on assembly skills
14	Software and Hardware	Install a basic OS and drivers	USB drives, OS installers	Hardware-software integration
15	Build a DIY Computer	Assemble a Raspberry Pi setup	Raspberry Pi kits, peripherals	Basics of modern computing
16	Coding Basics	Program on the assembled computer	Raspberry Pi, Python tutorials	Programming and system interaction

Module 4: Household Appliances (Weeks 17–28)

Section A: Refrigeration and Cooling (Weeks 17–22)

Week	Theme	Activity	Materials/Tools Needed	Learning Outcome
17	Refrigerator Basics	Disassemble a refrigerator	Old refrigerator, wrenches	Understanding refrigeration components
18	Cooling Cycle	Study compressors, coils and refrigerants	Refrigerant models, demo parts	Concept of heat exchange
19	Fault Diagnosis	Identify common refrigerator issues	Thermometers, multimeters	Troubleshooting skills
20	Air Conditioner Basics	Disassemble an air conditioner	Old AC units, tools	Understanding cooling and ventilation
21	Cooling Systems Comparison	Compare refrigerator and AC systems	Charts, manuals	Analytical thinking
22	DIY Cooler	Build a portable evaporative cooler	Fans, motors, foam boards	Engineering and design thinking

Section B: Kitchen and Utility Appliances (Weeks 23–28)

Week	Theme	Activity	Materials/Tools Needed	Learning Outcome
23	Microwave Basics	Disassemble a microwave oven	Old microwaves, screwdrivers	Understanding electromagnetic heating
24	Heating Mechanisms	Study the magnetron and power supply	Magnetron models, voltmeters	Electrical and thermal concepts
25	Washing Machine Basics	Disassemble a washing machine	Old machines, wrenches	Introduction to motor-based systems
26	Working of Motors and Pumps	Study motor-driven water pumps	DC motors, water models	Mechanics of fluid and motion
27	Home Automation Concepts	Retrofit appliances with smart controls	Arduino, relays, sensors	Basics of IoT
28	Prototype Appliance	Build a simple smart appliance	Microcontrollers, switches	Integration of electronics with design

Module 5: Advanced Projects (Weeks 29–36)

Week	Theme	Activity	Materials/Tools Needed	Learning Outcome
29	Fault Analysis in Devices	Diagnose issues in various appliances	Multimeters, broken appliances	Advanced troubleshooting
30	Energy Efficiency Study	Compare energy usage across appliances	Wattmeters, energy charts	Awareness of energy efficiency
31	Solar-Powered Refrigerator	Convert a fridge to run on solar power	Solar panels, batteries	Renewable energy integration
32	DIY Air Purifier	Build an air purifier from scratch	Fans, filters, containers	Environmental awareness
33	Miniature Home Appliances	Create models of common appliances	Mixed materials	Model design and engineering
34	Smart Home Prototype	Integrate devices for home automation	IoT kits, sensors	IoT and control systems
35	Advanced Coding Integration	Program appliances with automation	Microcontrollers, software tools	Advanced programming skills
36	Final Projects	Complete and test advanced prototypes	Mixed materials	Application of all learned skills

Module 6: Exhibition and Review (Weeks 37–40)

Week	Theme	Activity	Materials/Tools Needed	Learning Outcome
37	Exhibition Preparation	Finalize and polish projects	Completed projects	Presentation and attention to detail
38	Project Showcase	Exhibit all reverse-engineered projects	Display boards, tools	Communication and presentation skills
39	Reflection and Feedback	Share experiences and feedback	Feedback forms	Self-evaluation and learning
40	Certification and Celebration	Distribute certificates and celebrate	Certificates, snacks	Recognition and closure

Conclusion

This 40-week plan combines reverse engineering with hands-on learning and innovation. By the end of the program, students will have gained a deep understanding of how various appliances work, fostering technical skills, curiosity, and confidence.

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