



## Sustainable App Development Curriculum (Summer 2025)

Our Sustainable App Development summer program is a **3-week, full-day** program for rising 7th-9th graders. The program is designed for students to master fundamentals in computer science – AI, app development, and system architecture – while building real-world sustainable tech apps aimed at reducing carbon emissions in key industries like tech, transportation, and energy consumption. Students also investigate the causes, consequences, and solutions for climate change through socratic discussions, watching documentaries, and fun group activities.

Students will build their apps using Stanford University's d.school 5-stage Design Thinking process: Empathize, Ideate, Define, Prototype, Test. Each project concludes with an analysis of technology scale-up and impact measured in tons of CO2 saved.

**Week 1:** Sustainable Lifestyle Tracker web app (Python, HTML, CSS, Javascript)

**Week 2:** AI Solar Panel Optimizer mobile app (React Native, Expo)

**Week 3:** EV Charging Station Finder mobile app (React Native, Expo)

### Daily Schedule

8:30am-8:45am: Review

8:30am-10:10am: App dev sprint 1

10:10am-10:30am: Snack break

10:30am-12:15pm: App dev sprint 2

12:15pm-1pm: Lunch

1pm-3pm: App dev sprint 3

3pm-3:30pm: Office hours



## Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
Program Introduction	Review	Review	Review	Review
Icebreakers	Home screen development (HTML)	Styling and functionality (CSS and Javascript)	Energy Consumption Endpoint + Algorithm (Python)	Waste Generation Endpoint + Algorithm (Python)
"Tragedy of the Commons"				
Snack break	Snack break	Snack break	Snack break	Snack break
Intro to global warming and climate change	Styling and functionality (CSS and Javascript)	Food Consumption Endpoint + Algorithm (Python)	Transportation screen development (HTML, CSS, and Javascript)	Team Challenge: Goods and Services Screen, Endpoint, and Algorithm
Present-day impacts of climate change	Intro to Git version control			
Lunch	Lunch	Lunch	Lunch	Lunch
Personal impact on climate change	Dev setup	Energy Consumption screen development (HTML)	Transportation Endpoint + Algorithm (Python)	Results Screen development (HTML, CSS, and Javascript)
Understanding carbon footprint				Calculating Sustainability Score (Python)
Sustainability Lifestyle Tracker	Food Consumption screen development (HTML)	Styling and functionality (CSS and Javascript)	Waste Generation screen development (HTML, CSS, and Javascript)	Debugging session
Intro to Python: variables, loops, conditionals, functions				Scale-up and impact analysis
Office hours	Office hours	Office hours	Office hours	Office hours

\*Session 1: Due to Week 1 Day 4 being off due to Juneteenth (June 19), students will not be including waste generation and consumption of goods and services in their Sustainable Lifestyle Tracker app.

## Week 2

Monday	Tuesday	Wednesday	Thursday	Friday
Intro to Electricity	Review	Review	Review	Review
Intro to Energy and Power	Prediction Input Screen development (Components)	Intro to APIs: Solar Output Prediction ML model app integration	Prediction Results Screen development (backend)	App Feature Challenge: Feature Development
Renewable vs nonrenewable energy				
Snack break	Snack break	Snack break	Snack break	Snack break
Energy and climate change	Prediction Input Screen development (Components)	Intro to APIs: Solar Output Prediction ML model app integration	Debugging session	App Feature Challenge: Feature Development
Solar panel lab	Intro to ML: Decision Trees and Random Forest		Scale-up and impact analysis	
			App Feature Challenge Prep	
Lunch	Lunch	Lunch	Lunch	Lunch
AI Solar Panel Optimizer	Intro to ML: Decision Trees and Random Forest	Prediction Results Screen development (frontend)	App Feature Challenge: Feature Design and Development	App Feature Challenge: Feature Development
React Native/Expo dev setup				
App.js (Screens & Navigation)	Train Solar Output Prediction ML model	The 9 planetary boundaries		Presentations and judging
Prediction Input Screen development (Views)				
Office hours	Office hours	Office hours	Office hours	Office hours



## Week 3

Monday	Tuesday	Wednesday	Thursday	Friday
Transportation and climate change	Review	Review	Review	Review
Electric vehicles	Google Maps API Key Setup	Map Screen Integration with Open Charge Map API	EV Charger Details Screen development (frontend)	EV Charger Details Screen development (backend)
EV Charging Station Finder				
React Native/Expo dev setup				
Snack break	Snack break	Snack break	Snack break	Snack break
App.js (Screens & Navigation)	Open Charge Map API Key Setup + Data Exploration	Map Screen Integration with Open Charge Map API	EV Charger Details Screen development (frontend)	EV Charger Details Screen development (backend)
Map Screen development (Views)				
Lunch	Lunch	Lunch	Lunch	Lunch (pizza party!)
Map Screen development (Views)	Map Screen Integration with Open Charge Map API	EV Charger Details Screen development (frontend)	EV Charger Details Screen development (backend)	EV Charger Details Screen development (backend)
		Negative emissions tech		Debugging Session
				Scale-up and impact analysis
Office hours	Office hours	Office hours	Office hours	Office hours

\*Session 1: Due to Week 3 Day 5 being off for July 4, students will not do the App Feature Challenge on Week 2 Day 5 and will instead start their EV Charging Station Finder on that day (they will be 1 day ahead of this schedule in Week 3).

\*This schedule is *tentative* and is subject to being modified slightly.