Zero Emission Vehicles
What is a Zero Emission Vehicle?
WHAT IS TRANSPORTATION?
HOW DO WE USE TRANSPORTATION?
Internal Combustion Engine
Thomas Edison’s Electric Vehicle 1884, converting coal to electricity to power the engine.
How EVs Work?
How are Electric Vehicles a benefit to our environment?
Safety

Do not put electrical components in your mouth.

Always have a load in the circuit.

Never run the path directly from the battery, back to the battery.

If anything get hots, call over the teacher.
Build your own Zero Emission Vehicle (ZEV)
WONDER
TIME
<table>
<thead>
<tr>
<th>INTERNAL COMBUSTION VEHICLE</th>
<th>ZERO EMISSION VEHICLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollution</td>
<td>No air pollution, zero emission</td>
</tr>
<tr>
<td>Paying for gas</td>
<td>No gasoline</td>
</tr>
<tr>
<td>Noise of engine</td>
<td>Quiet engine</td>
</tr>
<tr>
<td>A lot maintenance</td>
<td>Less maintenance</td>
</tr>
<tr>
<td>Replacement of a lot of parts</td>
<td>Less part to replace</td>
</tr>
</tbody>
</table>
Would you rather...

1. Create air pollution or wait 4 hours for your car to charge?
2. Have over 300 moving parts in your car or under 20 moving parts?
3. Make a lot of noise when driving or hear nothing when cars pass by?
4. Use fossil fuels to bring you your chicken sandwich or use clean energy to bring you your salad?
5. Use heat or magnets to move?
HOW WOULD OUR COMMUNITY CHANGE IF ALL OF OUR TRANSPORTATION WAS ZERO EMISSIONS?
Charging Zero Emission Vehicles in the Community
Charging an EV Battery
Safety

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### ZEV Charging Station

<table>
<thead>
<tr>
<th>4X4 OFF ROAD VEHICLE</th>
<th>VEHICLE USAGE DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weight of Vehicle: 4400 lb.</td>
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<tr>
<td></td>
<td>Number of Passengers: Max number 4 (2 adults, 2 children)</td>
</tr>
<tr>
<td></td>
<td>Full Charge Battery Range: 230 miles</td>
</tr>
<tr>
<td></td>
<td>Time Needed to Fully Charge Battery: Standard Charger - 12 hours, Rapid Charger - 2 hours</td>
</tr>
</tbody>
</table>
Guiding Questions

- What is important for the person charging the vehicle?
- What else would be nearby the charging station?
- Where would the charging station be located?
- What type of power source would work for this type of charging station?
- What type of charger will the charging station use? Rapid or Standard? Why?
Brainstorm

IDEA 1

IDEA 2

IDEA 3

IDEA 4
Sketch

Include the answers to the guiding questions.

- Scenario
- Location
- Vehicle
Prototype
Design Journal Questions

TESTING

REAL WORLD APPLICATION

REFLECTING
WONDER
TIME
HOW WOULD THE INFRASTRUCTURE OF THE STATE CHANGE WITH ADDITION OF CHARGING STATIONS AROUND THE STATE OF NY?