The background is a dark, textured surface with a fine grid pattern. Overlaid on this are several diagonal stripes of varying widths and colors, including shades of pink, yellow, green, and blue. The stripes run from the top-left towards the bottom-right. A thin, light green rectangular border is positioned on the left side of the image, partially enclosing the text.

CHEVRON ENERGY
WEBSITE

WHO ARE WE?



Le Vo Hoang

- Computer Science Major
- Head Coder



Emmanuel Maqueda

- Computer Science Major
- Head Research and Coder



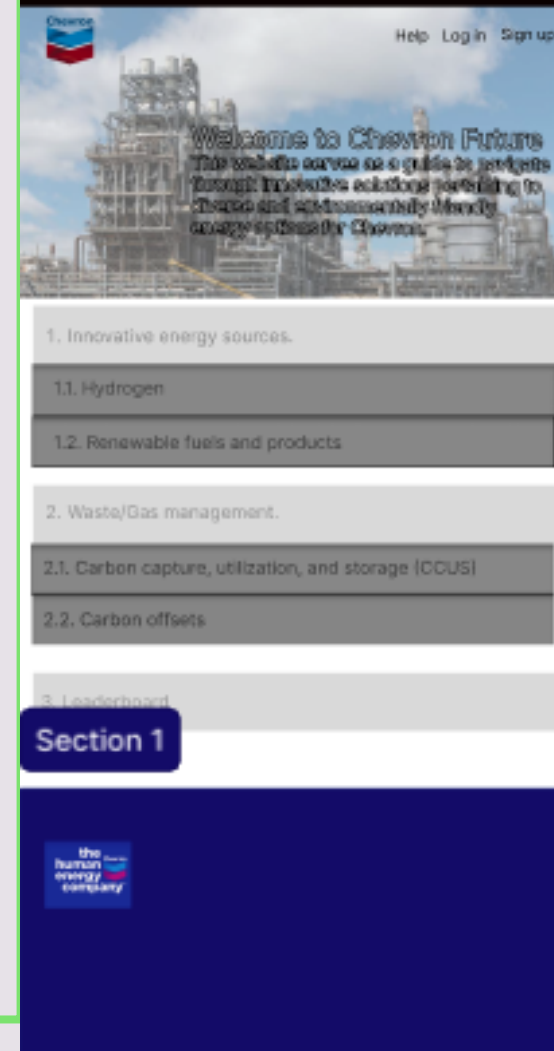
Nick Misleh

- Metals and Materials Major
- Researcher and Head Styler

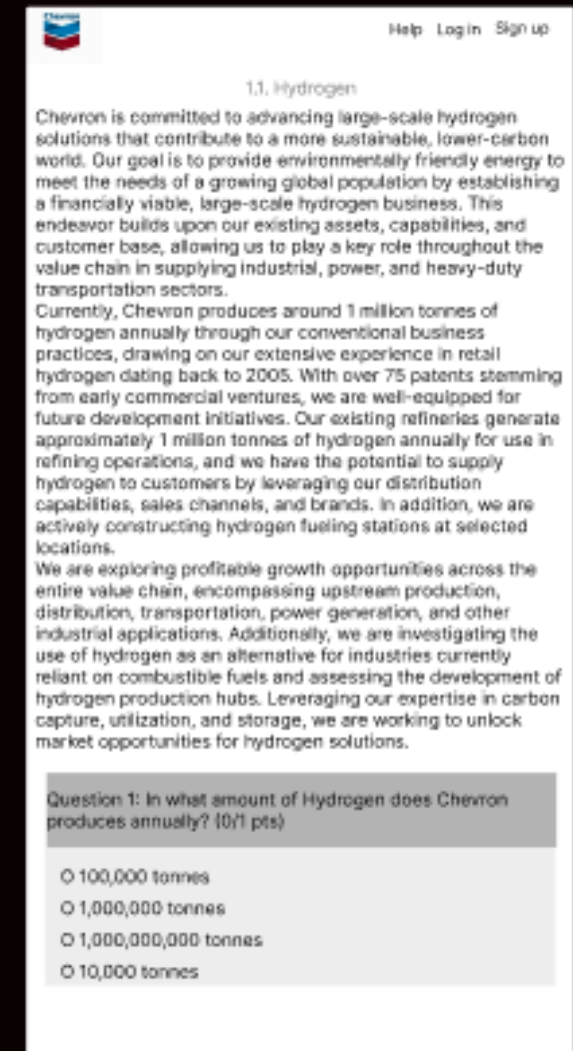
OUR INITIAL IDEAS

- We began with looking into one of the websites used for our computer science class called zyBooks.
- We did our initial sketch in Figma
- This kickstarted the idea of how we wanted to present our website.

Frame 1

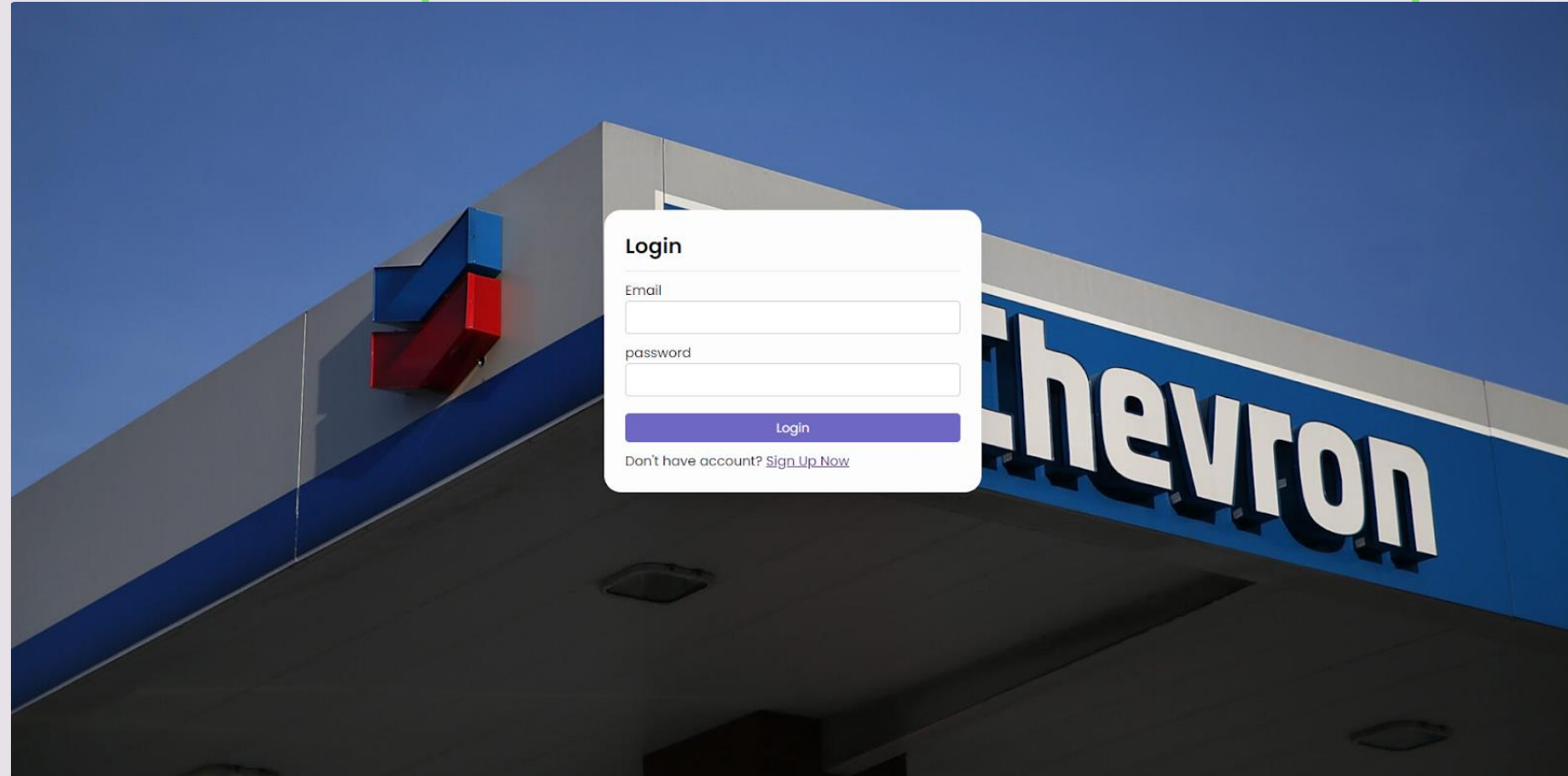


Frame 2



LOG IN PAGE

- We incorporated a log in page so it could keep track of the number of users that are registered to the website
- The sign-up page takes the input of:
 - Username
 - Email
 - Password

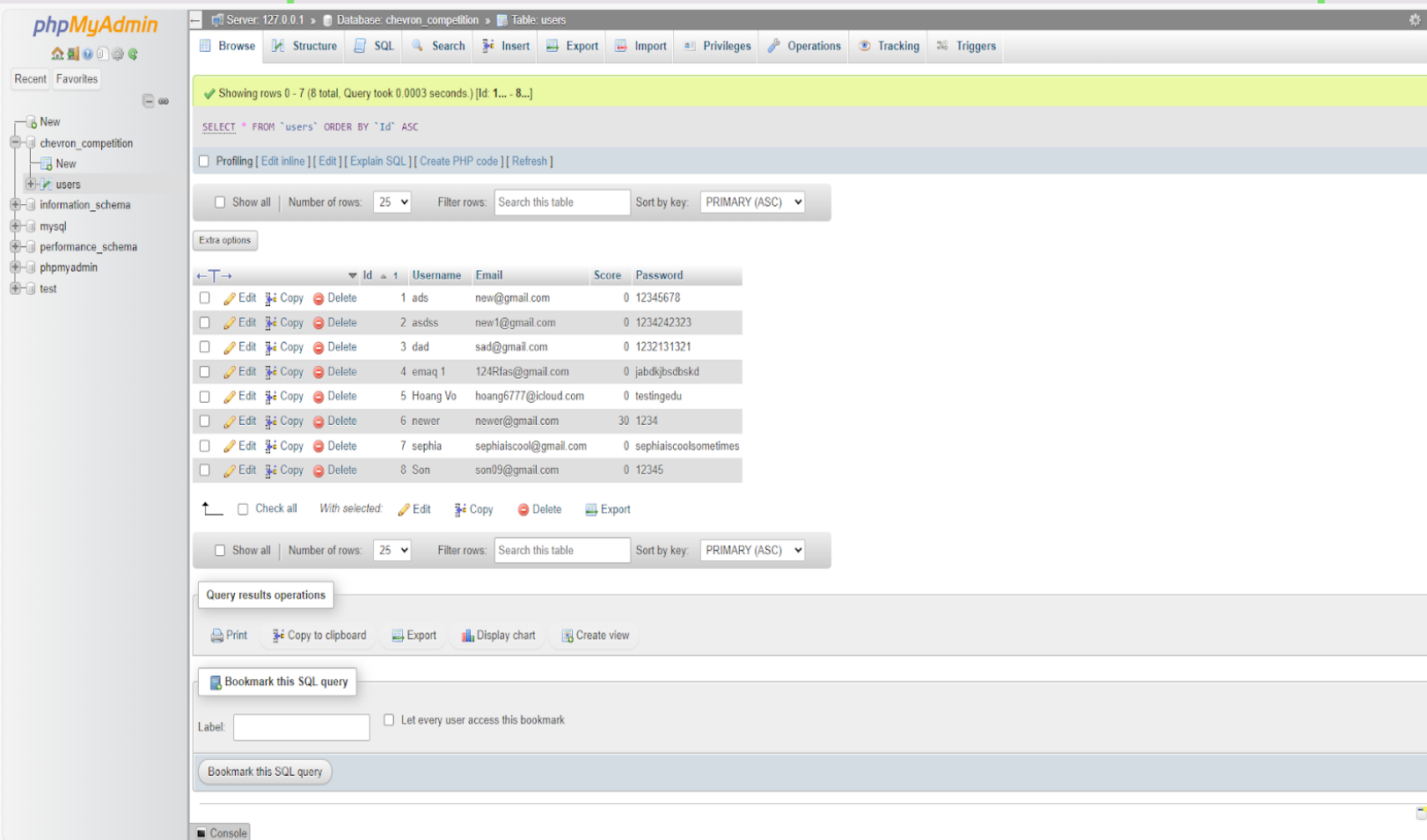


index.php

```
6 <head>
12 </head>
13 <body>
14 <div class="container">
15 <div class="box form-box">
16 <?php
17
18     include("php/config.php");
19     if(isset($_POST['submit'])){
20         $email = mysqli_real_escape_string($con, $_POST['email']);
21         $password = mysqli_real_escape_string($con,$_POST['password']);
22         $result = mysqli_query($con, "SELECT * FROM users WHERE Email='$email' AND Password='$password'") or die("Select Error");
23         $row = mysqli_fetch_assoc($result);
24         if(is_array($row) && !empty($row)){
25             $_SESSION['valid'] = $row['Email'];
26             $_SESSION['username'] = $row['Username'];
27             $_SESSION['score'] = $row['Score'];
28             $_SESSION['id'] = $row['Id'];
29         }else{
30             echo "<div class='message'>
31                 <p>Wrong Email or Password</p>
32                 </div> <br>";
33             echo "<a href='index.php'><button class='btn'>Go Back</button>";
34         }
35         if(isset($_SESSION['valid'])){
36             header("Location: home.php");
37         }
38     }else{
39 ?>
40 <header>Login</header>
41 <form action="" method="post">
42 <div class="field input">
43 <label for="email">Email</label>
44 <input type="text" name="email" id="email" required>
45 </div>
46 <div class="field input">
47 <label for="password">password</label>
48 <input type="password" name="password" id="password" required>
49 </div>
50 <div class="field">
51 <input type="submit" class="btn" name="submit" value="Login" required>
52 </div>
53 <div class="links">
54 Don't have account? <a href="register.php">Sign Up Now</a>
55 </div>
```

CODE OF LOG IN PAGE

INCORPORATING DATABASE



The screenshot shows the phpMyAdmin interface for a MySQL database named 'chevron_competition'. The 'users' table is selected, and the SQL query 'SELECT * FROM `users` ORDER BY `Id` ASC' is displayed. The table contains 8 rows of user data. The interface includes a sidebar with a tree view of the database structure, a top navigation bar with various tools, and a bottom console area.

	Id	Username	Email	Score	Password
<input type="checkbox"/>	1	ads	new@gmail.com	0	12345678
<input type="checkbox"/>	2	asdss	new1@gmail.com	0	1234242323
<input type="checkbox"/>	3	dad	sad@gmail.com	0	1232131321
<input type="checkbox"/>	4	emaq 1	124Rfas@gmail.com	0	jabdkjbsdbkskd
<input type="checkbox"/>	5	Hoang Vo	hoang6777@icloud.com	0	testingedu
<input type="checkbox"/>	6	newer	newer@gmail.com	30	1234
<input type="checkbox"/>	7	sephia	sephia1scool@gmail.com	0	sephia1scoolsometimes
<input type="checkbox"/>	8	Son	son09@gmail.com	0	12345

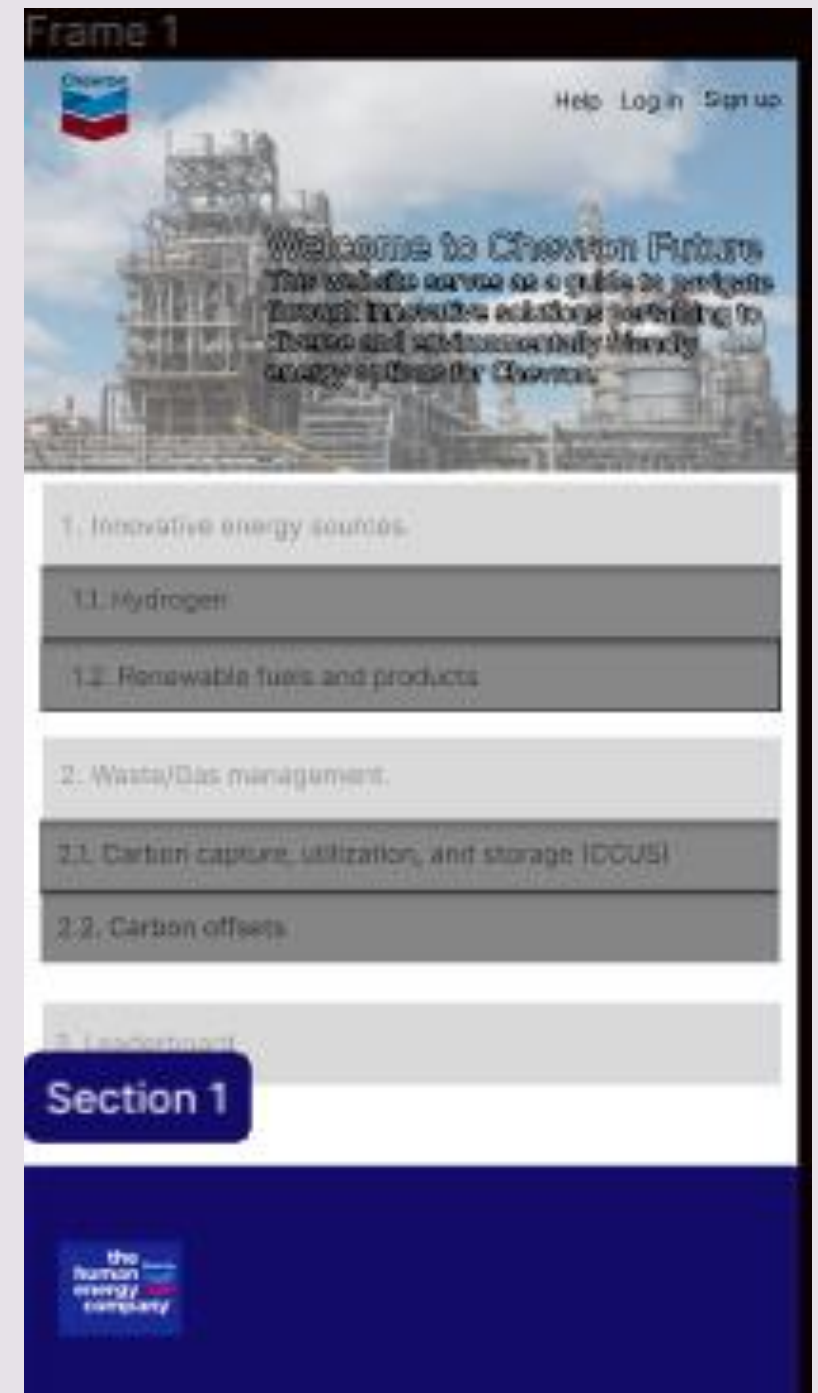
- For our Log-in page and sign-up page we needed to include a database
- We temporarily created a local database which is being run on XAMPE
- This keeps track of our users to make it all easier.

CODE TO FOR THE DATABASE ENTRY

```
4 + CREATE TABLE users (  
5 +     Id INT PRIMARY KEY AUTO_INCREMENT,  
6 +     Username VARCHAR(200),  
7 +     Email VARCHAR(200),  
8 +     Score INT,  
9 +     Password VARCHAR(200)  
10 + );
```


HOME PAGE CODE

- Coding our home page required including a header and making proper links to be able to make the website function
- This gives you the option to choose a lesson and once you've finished decide to logout once finished




```
home.php x README.md # home.css chapter1_1.php .hintc chapter2_1.php ethanolimport.png ethanolpie.png chapter2_1.php chapter2_2.php You, 10 minutes ago | 1 author (You) 1 <?php 2 session_start(); 3 4 include("php/config.php"); 5 if(!isset($_SESSION['valid'])){ 6 header("Location: index.php"); 7 } 8 ?> 9 <!DOCTYPE html> 10 <html lang="en"> 11 <head> 12 <meta charset="UTF-8"> 13 <meta name="viewport" content="width=device-width, initial-scale=1.0"> 14 <link rel="stylesheet" type="text/css" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/6.5.1/css/all.min.css"/> 15 <link rel="stylesheet" href="style/home.css"> 16 <title>Home</title> 17 </head> 18 <body> 19 <header> 20 <div class="navbar"> 21 <div class="logo"><a href="home.php">Chevron Educational</a></div> 22 <ul class="links"> 23 <?php 24 $id = $_SESSION['id']; 25 $query = mysqli_query($con, "SELECT * FROM users WHERE Id=$id"); 26 while($result = mysqli_fetch_assoc($query)){ 27 $res_Uname = $result['Username']; 28 $res_Email = $result['Email']; 29 $res_Score = $result['Score']; 30 $res_id = $result['Id']; 31 } 32 ?> 33 <li><a href="home.php">Home</a></li> 34 <li><a href="cited_work.php">Citation</a></li> 35 <li><a href="https://www.chevron.com/who-we-are/our-brands/fuel-stations">Service</a></li> 36 <li><a href="https://www.chevron.com/who-we-are/contact">Contact us</a></li> 37 <li><a href="php/logout.php">Logout</a></li> 38 </ul> 39 40 <div class="toggle_btn"> 41 <i class="fa-solid fa-bars"></i> 42 <div class="dropdown-content"> 43 <li><a href="home.php">Home</a></li> 44 <li><a href="cited_work.php">Citation</a></li> 45 <li><a href="https://www.chevron.com/who-we-are/our-brands/fuel-stations">Service</a></li> 46 <li><a href="https://www.chevron.com/who-we-are/contact">Contact us</a></li> 47 <li><a href="php/logout.php">Logout</a></li> 48 </div>
```

```
home.php
18 <body>
19 <header>
20 <div class="navbar">
40 <div class="toggle_btn">
48 </div>
49 </div>
50 </div>
51 <section id="hero">
52 <h1>Welcome</h1>
53 <p>
54 This website serves as a guide to navigate through innovative solutions pertaining to diverse <br>
55 and environmentally friendly energy options for Chevron.
56 </p>
57 </section>
58
59
60 </header>
61 <main>
62 <div class="lesson">
63 <ul>
64 <li>
65 <div><p>1. Innovative energy sources</p></div>
66 </li>
67 <li>
68 <div><a href='lessons/chapter1_1.php'><p>1.1. Hydrogen</p></a></div>
69 </li>
70 <li>
71 <div><a href='lessons/chapter1_2.php'><p>1.2. Renewable fuels</p></a></div>
72 </li>
73 </ul>
74 </div>
75 <div class="lesson">
76 <ul>
77 <li>
78 <div><p>2. Waste/Gas management.</p></div>
79 </li>
80 <li>
81 <div><a href='lessons/chapter2_1.php'><p>2.1. Carbon capture, utilization, and storage (CCUS)</p></a></div>
82 </li>
83 <li>
84 <div><a href='lessons/chapter2_2.php'><p>2.2. Carbon credits</p></a></div>
85 </li>
86 </ul>
87 </div>
88 <div class="segment"><ul><li><div><a href='leaderboard.php'><p>3. Leaderboard</p></a></div></li></ul></div>
89
90 </main>
91
92
```

SAMPLE OF ONE OF THE LESSONS

- Our hydrogen sample page consists of relatively the same source code but involves additional aspects.
- These include:
 - Quiz Questions
 - Graphs
 - Tally of your Score throughout the lesson

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Next lesson

1.1. Hydrogen

Introduction:

Hydrogen (H₂) is considered to be an alternative fuel source for domestic resources. These resources can involve vehicles such as buses, industrial vehicles and even may include standard vehicles we use everyday. These vehicles are known as FCEVs (Fuel Cell Electric Vehicles). Furthermore, hydrogen fuel cells can also be used for internal combustion engines, however, unlike FCEVs, it produces more tailpipe emissions and is less efficient. So it is not entirely useless but not useful for the environment.

Hydrogen Gas:

When it comes to hydrogen gas energy, 2.2 pounds of hydrogen gas is equivalent to 1 gallon (6.2 pounds) of gasoline. The reason for this is that since Hydrogen has a low volumetric energy density, it is stored onboard the vehicle as a compressed gas to achieve the proper driving range or a conventional vehicle. Currently this gas is being stored in high-pressure tanks that are capable of storing around 5,000 to 10,000 pounds per square inch (PSI). In the graph demonstrated below we have the average fueling times for FCEVs. As we can clearly see for the standard refueling time, it is estimated to take around 4 minutes to fill up the tank with hydrogen.

FCEV Fueling Times

Target	Time (min)
2020 DOE target	3.7
Ultimate DOE target	2.5

Average fueling time: 3.7 minutes
37% of fueling times: <3.3 minutes
15% of fueling times: <2.5 minutes

Figure 1: FCEV Fueling Times

Creating Hydrogen:


```
47 <h3>Introduction:</h3>
48
49 <p><br>Hydrogen (H2) is considered to be an alternative fuel source for domestic resources. These resources can involve vehicles such as buses, industrial vehicles and even may inc
50
51 </p><br><h3>Hydrogen Gas:</h3><br>
52
53 <p>When it comes to hydrogen gas energy, 2.2 pounds of hydrogen gas is equivalent to 1 gallon (6.2 pounds) of gasoline. The reason for this is that since Hydrogen has a low volumet
54 </p>
55 <center><img class='graphs' src='../image/fuelgraph.png'></center>
56 <center><p>Figure 1: FCEV Fueling Times</p></center><br>
57
58 <h3>Creating Hydrogen:</h3><br>
59
60 <p><br>Currently there are 4 different methods of producing hydrogen:
61
62 <br><br><b>Natural Gas Reforming</b> - Synthesis gas is a mixture of hydrogen and carbon monoxide, and a small amount of carbon dioxide and is created with high-temperature steam.
63 <br><b>Electrolysis</b> - It is the process of using electric currents to split water into hydrogen and oxygen. Since the current goal is to make renewable energy, such as solar or
64 <br><b>Biomass-Derived Liquid Reforming</b> - They are renewable liquid fuels, such as ethanol, that are reacted in high-temperature steam to produce hydrogen when it is near the e
65 <br><b>Microbial Biomass Conversion</b> - This method uses biomass to then convert it into sugar-rich feedstocks that are later fermented to make hydrogen.
66
67 <br><br>There different ways are currently used as they are fully researched and are proven to be effective in production, however, there 3 methods that are in development:
68
69 <br><br><b>Thermochemical Water Splitting</b> - This method would use high temperatures generated by solar concentrators or nuclear reactors that create chemical reactions to be ab
70 <br><b>Photobiological Water Splitting</b> - Microbes, such as green algae, consume water in the presence of sunlight that produce hydrogen as a byproduct.
71 <br><b>Photoelectrochemical Water Splitting</b> - This process produces hydrogen from water using special semiconductors and energy from sunlight.
72
73 <br><br>These methods will prove to be useful and effective with other methods of producing renewable energy. It will be able to provide alternatives within each of the following c
74
75 </p><br><h3>Methods of Transporting Hydrogen:</h3>
76
77 <p><br>Not currently with the research that has been done, there are 3 distributing methods that are crucial for safely transporting hydrogen, however, each method has its disadvan
78
79 <br><br><b>Pipeline</b> - This form of distribution is considered the least-expensive method of delivering large volumes of hydrogen gas. Yet the capacity is limited due to there c
80 <br><b>High-Pressure Tube Trailers</b> - This method would be similar to how we transport gallons of gasoline, using boats, railcars and trailers, however, each vehicle must be cor
81 <br><b>Liquified Hydrogen Tankers</b> - This method uses Cryogenic liquefaction which is the process that cools hydrogen to a temperature where it becomes a liquid. Although the li
82
83 </p><br><h3>Hydrogen Storage and Stations:</h3>
84
85 <p><br>When it comes to the U.S Department of Energy (DOE), their research and development team wants to improve technology to be able to safely and store enough FCEVs. The purpose
86
87 <br><br>Furthermore, around half of the U.S population lives in areas where air pollution levels are higher than the recommended safety level for human health. Such emissions from
88
89 </p>
90 <center><iframe style="width: 900px; height: 664.594px;" src="https://afdc.energy.gov/data/widgets/10802" frameborder="0" marginwidth="0" marginheight="0" scrolling="no"></iframe>
```

PORTION OF THE CODE

DESIGN FOR THE QUESTIONS

- We went with multiple choice question both true and false generate by us
- We found this to be important information to create as questions
- When you answer correctly it gives you +1 point and if you answer incorrectly then you lose a point. You are given multiple attempts to get the correct answer.
- The database keeps track of each users score and once correct you will be presented with your score.

Question 1

Which of the following is not a way of transporting hydrogen?

Pipelines

High Pressure Tube Trailers

Planes

Liquified Hydrogen Tankers

Question 2

You can technically use hydrogen in internal combustion engines and it would be more efficient and less tailpipe emissions would be produced.

True

False

PARTIAL CODE FOR QUIZ

```
19 <body>
95 <?php
119 }else{
120 ?>
121 <div class="app">
122 <h1>Question 1</h1>
123 <div class="quiz">
124 <h2 id="question">Which of the following is not a way of transporting hydrogen?</h2>
125 <div id="answer-buttons">
126 <form method="post">
127 <button class="btn" type="submit" name="submit[Answer1]" value="Answer1">Pipelines</button>
128 <button class="btn" type="submit" name="submit[Answer2]" value="Answer2">High Pressure Tube Trailers</button>
129 <button class="btn" type="submit" name="submit[Answer3]" value="Answer3">Planes</button>
130 <button class="btn" type="submit" name="submit[Answer4]" value="Answer4">Liquified Hydrogen Tankers</button>
131 </form>
132 </div>
133 </div>
134 </div>
135 <?php } ?>
136 <?php
137 if (isset($_POST['submit1'])) {
138     $answer = "Answer2"; // Change this to the correct answer
139     $selected_answer = array_keys($_POST['submit1'])[0];
140     $id = $_SESSION['id'];
141     $result = mysqli_query($con, "SELECT Score FROM users WHERE Id=$id");
142     $row = mysqli_fetch_assoc($result);
143     $score = $row['Score'];
144
145     if ($selected_answer == $answer) {
146         $score = $score + 1;
147     } else {
148         if ($score >= 1) {
149             $score = $score - 1;
150         }
151     }
152
153     $edit_query = mysqli_query($con, "UPDATE users SET Score='$score' WHERE Id=$id") or die("Error occurred");
154
155     if ($edit_query) {
156         echo "<div class='message'>
157             <p>Your total score is $score</p>
158             </div> <br>";
159     }
160 }else{
161 ?>
162 <div class="app">
```


WHY WE ADDED A LEADERBOARD

- We want people to be engaged and feel a sense of friendly competition with other users
- We also wanted it so you could have an idea of where that user falls with other people.

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The Leaderboard

Rank	Username	Score
1	newer	30
2	ads	0
3	asdss	0
4	dad	0
5	emaq 1	0
6	Hoang Vo	0
7	sephia	0
8	Son	0

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