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LAB CHALLENGE 2

C4: Periodic Table

HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=0.5">
  <title>Interactive Periodic Table</title>
  <link rel="stylesheet" href="style.css">
  <link
href="https://fonts.googleapis.com/css2?family=Roboto:wght@300;400;700&display=
swap" rel="stylesheet">
</head>
<body>
  <div class="periodic-table-container">
    <h1>Periodic Table of Elements</h1>
    <div id="legend">
      <h4>Legend:</h4>
      <div class="legend-item"><span class="color-box
alkali-metal"></span>Alkali Metal</div>
      <div class="legend-item"><span class="color-box
alkaline-earth-metal"></span>Alkaline Earth Metal</div>
      <div class="legend-item"><span class="color-box
lanthanide"></span>Lanthanide</div>
      <div class="legend-item"><span class="color-box
actinide"></span>Actinide</div>
      <div class="legend-item"><span class="color-box
transition-metal"></span>Transition Metal</div>
      <div class="legend-item"><span class="color-box
post-transition-metal"></span>Post-Transition Metal</div>
      <div class="legend-item"><span class="color-box
metalloid"></span>Metalloid</div>
      <div class="legend-item"><span class="color-box
reactive-nonmetal"></span>Reactive Nonmetal</div>
```

```

        <div class="legend-item"><span class="color-box
noble-gas"></span>Noble Gas</div>
        <div class="legend-item"><span class="color-box
unknown"></span>Unknown</div>
    </div>
    <div id="periodic-table">
    </div>

</div>

<div id="element-details-panel" class="hidden">
    <button id="close-btn">&times;</button>
    <div id="details-content">
    </div>
</div>
<div id="overlay" class="hidden"></div>

<script src="script.js"></script>
</body>
</html>

```

CSS

```

body {
    font-family: 'Roboto', sans-serif;
    background-color: #1a1a2e;
    color: #e0e0e0;
    margin: 0;
    padding: 20px;
    display: flex;
    justify-content: center;
    align-items: center;
    min-height: 100vh;
}

h1 {
    text-align: center;
    color: #f7c566;
    font-weight: 700;
    margin-bottom: 30px;
}

#legend {

```

```
display: flex;
flex-wrap: wrap;
justify-content: center;
gap: 0px 20px;
margin: 0 auto 30px auto;
max-width: 1000px;
padding: 15px;
background-color: #2a2a4e;
border-radius: 8px;
}

.legend-item {
display: flex;
align-items: center;
font-size: 0.9em;
}

.color-box {
width: 15px;
height: 15px;
border: 1px solid rgba(255, 255, 255, 0.2);
margin-right: 8px;
border-radius: 3px;
}

#periodic-table {
display: grid;
grid-template-columns: repeat(18, minmax(0, 1fr));
gap: 5px;
max-width: 1400px;
margin: auto;
}

.element {
position: relative;
padding: 5px;
border: 1px solid #4a4a6a;
border-radius: 5px;
background-color: #1e1e3f;
cursor: pointer;
transition: transform 0.2s ease, box-shadow 0.2s ease;
text-align: center;
```

```

    min-height: 80px;
    display: flex;
    flex-direction: column;
    justify-content: center;
    align-items: center;
}

.element:hover {
    transform: scale(1.1);
    box-shadow: 0 0 15px rgba(247, 197, 102, 0.5);
    z-index: 10;
}

.element .number {
    position: absolute;
    top: 4px;
    left: 4px;
    font-size: 0.7em;
    color: #a0a0c0;
}

.element .symbol {
    font-size: 1.5em;
    font-weight: bold;
    color: #ffffff;
}

.element .name {
    font-size: 0.7em;
    color: #c0c0e0;
    margin-top: 2px;
}

.alkali-metal { background-color: #e85d4f; }
.alkaline-earth-metal { background-color: #f7c566; }
.lanthanide { background-color: #f28b61; }
.actinide { background-color: #d17b88; }
.transition-metal { background-color: #6a8dcd; }
.post-transition-metal { background-color: #66cdad; }
.metalloid { background-color: #8a6acd; }
.reactive-nonmetal { background-color: #4dbf99; }
.noble-gas { background-color: #4a6a8a; }
.unknown { background-color: #555; }

```

```
#element-details-panel {
  position: fixed;
  top: 50%;
  left: 50%;
  transform: translate(-50%, -50%) scale(0.9);
  width: 90%;
  max-width: 500px;
  background: #2a2a4e;
  border-radius: 10px;
  padding: 25px;
  box-shadow: 0 10px 30px rgba(0, 0, 0, 0.5);
  z-index: 1001;
  transition: transform 0.3s ease, opacity 0.3s ease;
  opacity: 0;
}

#element-details-panel:not(.hidden) {
  transform: translate(-50%, -50%) scale(1);
  opacity: 1;
}

#close-btn {
  position: absolute;
  top: 10px;
  right: 15px;
  background: none;
  border: none;
  color: #e0e0e0;
  font-size: 2em;
  cursor: pointer;
}

#details-content h2 {
  color: #f7c566;
  margin-top: 0;
  font-size: 2em;
}

#details-content p {
  line-height: 1.6;
  font-size: 1.1em;
}
```

```
#details-content strong {
  color: #66cdad;
}

#overlay {
  position: fixed;
  top: 0;
  left: 0;
  width: 100%;
  height: 100%;
  background: rgba(0, 0, 0, 0.7);
  z-index: 1000;
}

.hidden {
  display: none;
}

@media (max-width: 1200px) {
  .element .symbol { font-size: 1.2em; }
  .element .name { font-size: 0.6em; }
  .element { min-height: 70px; }
}

@media (max-width: 768px) {
  body { padding: 10px; }
  #periodic-table { gap: 3px; }
  .element .symbol { font-size: 1em; }
  .element .name { display: none; }
  .element { min-height: 50px; padding: 2px; }
  .element .number { font-size: 0.6em; }
}

@media (max-width: 480px) {
  h1 { font-size: 1.5em; }
  .element { min-height: 40px; }
  #periodic-table { gap: 2px; }
}
```

JavaScript

```
document.addEventListener('DOMContentLoaded', () => {
  const periodicTable = document.getElementById('periodic-table');
  const detailsPanel = document.getElementById('element-details-panel');
  const detailsContent = document.getElementById('details-content');
  const closeBtn = document.getElementById('close-btn');
  const overlay = document.getElementById('overlay');

  const elementsData = [
    ['Hydrogen', 'H', 1, 'reactive-nonmetal', '1.008', '1s', [1, 1]],
    ['Helium', 'He', 2, 'noble-gas', '4.0026', '1s²', [1, 18]],
    ['Lithium', 'Li', 3, 'alkali-metal', '6.94', '[He] 2s', [2, 1]],
    ['Beryllium', 'Be', 4, 'alkaline-earth-metal', '9.0122', '[He] 2s²',
    [2, 2]],
    ['Boron', 'B', 5, 'metalloid', '10.81', '[He] 2s² 2p¹', [2, 13]],
    ['Carbon', 'C', 6, 'reactive-nonmetal', '12.011', '[He] 2s² 2p²', [2,
    14]],
    ['Nitrogen', 'N', 7, 'reactive-nonmetal', '14.007', '[He] 2s² 2p³', [2,
    15]],
    ['Oxygen', 'O', 8, 'reactive-nonmetal', '15.999', '[He] 2s² 2p⁴', [2,
    16]],
    ['Fluorine', 'F', 9, 'reactive-nonmetal', '18.998', '[He] 2s² 2p⁵', [2,
    17]],
    ['Neon', 'Ne', 10, 'noble-gas', '20.180', '[He] 2s² 2p⁶', [2, 18]],
    ['Sodium', 'Na', 11, 'alkali-metal', '22.990', '[Ne] 3s', [3, 1]],
    ['Magnesium', 'Mg', 12, 'alkaline-earth-metal', '24.305', '[Ne] 3s²',
    [3, 2]],
    ['Aluminium', 'Al', 13, 'post-transition-metal', '26.982', '[Ne] 3s²
    3p¹', [3, 13]],
    ['Silicon', 'Si', 14, 'metalloid', '28.085', '[Ne] 3s² 3p²', [3, 14]],
    ['Phosphorus', 'P', 15, 'reactive-nonmetal', '30.974', '[Ne] 3s² 3p³',
    [3, 15]],
    ['Sulfur', 'S', 16, 'reactive-nonmetal', '32.06', '[Ne] 3s² 3p⁴', [3,
    16]],
    ['Chlorine', 'Cl', 17, 'reactive-nonmetal', '35.45', '[Ne] 3s² 3p⁵', [3,
    17]],
    ['Argon', 'Ar', 18, 'noble-gas', '39.948', '[Ne] 3s² 3p⁶', [3, 18]],
    ['Potassium', 'K', 19, 'alkali-metal', '39.098', '[Ar] 4s', [4, 1]],
    ['Calcium', 'Ca', 20, 'alkaline-earth-metal', '40.078', '[Ar] 4s²', [4,
    2]],
    ['Scandium', 'Sc', 21, 'transition-metal', '44.956', '[Ar] 3d¹ 4s²',
    [4, 3]],
    ['Titanium', 'Ti', 22, 'transition-metal', '47.867', '[Ar] 3d² 4s²',
    [4, 4]],
```

```
['Vanadium', 'V', 23, 'transition-metal', '50.942', '[Ar] 3d3 4s2', [4, 5]],
['Chromium', 'Cr', 24, 'transition-metal', '51.996', '[Ar] 3d5 4s1', [4, 6]],
['Manganese', 'Mn', 25, 'transition-metal', '54.938', '[Ar] 3d5 4s2', [4, 7]],
['Iron', 'Fe', 26, 'transition-metal', '55.845', '[Ar] 3d6 4s2', [4, 8]],
['Cobalt', 'Co', 27, 'transition-metal', '58.933', '[Ar] 3d7 4s2', [4, 9]],
['Nickel', 'Ni', 28, 'transition-metal', '58.693', '[Ar] 3d8 4s2', [4, 10]],
['Copper', 'Cu', 29, 'transition-metal', '63.546', '[Ar] 3d10 4s1', [4, 11]],
['Zinc', 'Zn', 30, 'transition-metal', '65.38', '[Ar] 3d10 4s2', [4, 12]],
['Gallium', 'Ga', 31, 'post-transition-metal', '69.723', '[Ar] 3d10 4s2 4p1', [4, 13]],
['Germanium', 'Ge', 32, 'metalloid', '72.630', '[Ar] 3d10 4s2 4p2', [4, 14]],
['Arsenic', 'As', 33, 'metalloid', '74.922', '[Ar] 3d10 4s2 4p3', [4, 15]],
['Selenium', 'Se', 34, 'reactive-nonmetal', '78.971', '[Ar] 3d10 4s2 4p4', [4, 16]],
['Bromine', 'Br', 35, 'reactive-nonmetal', '79.904', '[Ar] 3d10 4s2 4p5', [4, 17]],
['Krypton', 'Kr', 36, 'noble-gas', '83.798', '[Ar] 3d10 4s2 4p6', [4, 18]],
['Rubidium', 'Rb', 37, 'alkali-metal', '85.468', '[Kr] 5s1', [5, 1]],
['Strontium', 'Sr', 38, 'alkaline-earth-metal', '87.62', '[Kr] 5s2', [5, 2]],
['Yttrium', 'Y', 39, 'transition-metal', '88.906', '[Kr] 4d1 5s2', [5, 3]],
['Zirconium', 'Zr', 40, 'transition-metal', '91.224', '[Kr] 4d2 5s2', [5, 4]],
['Niobium', 'Nb', 41, 'transition-metal', '92.906', '[Kr] 4d4 5s1', [5, 5]],
['Molybdenum', 'Mo', 42, 'transition-metal', '95.96', '[Kr] 4d5 5s1', [5, 6]],
['Technetium', 'Tc', 43, 'transition-metal', '(98)', '[Kr] 4d5 5s2', [5, 7]],
['Ruthenium', 'Ru', 44, 'transition-metal', '101.07', '[Kr] 4d7 5s1', [5, 8]],
```



```

9]],
    ['Rhodium', 'Rh', 45, 'transition-metal', '102.91', '[Kr] 4d8 5s1', [5,
10]],
    ['Palladium', 'Pd', 46, 'transition-metal', '106.42', '[Kr] 4d10', [5,
11]],
    ['Silver', 'Ag', 47, 'transition-metal', '107.87', '[Kr] 4d10 5s1', [5,
12]],
    ['Cadmium', 'Cd', 48, 'transition-metal', '112.41', '[Kr] 4d10 5s2', [5,
13]],
    ['Indium', 'In', 49, 'post-transition-metal', '114.82', '[Kr] 4d10 5s2
5p1', [5, 13]],
    ['Tin', 'Sn', 50, 'post-transition-metal', '118.71', '[Kr] 4d10 5s2
5p2', [5, 14]],
    ['Antimony', 'Sb', 51, 'metalloid', '121.76', '[Kr] 4d10 5s2 5p3', [5,
15]],
    ['Tellurium', 'Te', 52, 'metalloid', '127.60', '[Kr] 4d10 5s2 5p4', [5,
16]],
    ['Iodine', 'I', 53, 'reactive-nonmetal', '126.90', '[Kr] 4d10 5s2 5p5',
[5, 17]],
    ['Xenon', 'Xe', 54, 'noble-gas', '131.29', '[Kr] 4d10 5s2 5p6', [5,
18]],
    ['Caesium', 'Cs', 55, 'alkali-metal', '132.91', '[Xe] 6s1', [6, 1]],
    ['Barium', 'Ba', 56, 'alkaline-earth-metal', '137.33', '[Xe] 6s2', [6,
2]],
    ['Lanthanum', 'La', 57, 'lanthanide', '138.91', '[Xe] 5d1 6s2', [9,
3]],
    ['Lanthanum', 'La', 57, 'lanthanide', '138.91', '[Xe] 5d1 6s2', [6,
3]],
    ['Cerium', 'Ce', 58, 'lanthanide', '140.12', '[Xe] 4f1 5d1 6s2', [9,
4]],
    ['Praseodymium', 'Pr', 59, 'lanthanide', '140.91', '[Xe] 4f3 6s2', [9,
5]],
    ['Neodymium', 'Nd', 60, 'lanthanide', '144.24', '[Xe] 4f4 6s2', [9,
6]],
    ['Promethium', 'Pm', 61, 'lanthanide', '(145)', '[Xe] 4f5 6s2', [9, 7]],
    ['Samarium', 'Sm', 62, 'lanthanide', '150.36', '[Xe] 4f6 6s2', [9, 8]],
    ['Europium', 'Eu', 63, 'lanthanide', '151.96', '[Xe] 4f7 6s2', [9, 9]],
    ['Gadolinium', 'Gd', 64, 'lanthanide', '157.25', '[Xe] 4f7 5d1 6s2', [9,
10]],
    ['Terbium', 'Tb', 65, 'lanthanide', '158.93', '[Xe] 4f9 6s2', [9, 11]],
    ['Dysprosium', 'Dy', 66, 'lanthanide', '162.50', '[Xe] 4f10 6s2', [9,
12]],
    ['Holmium', 'Ho', 67, 'lanthanide', '164.93', '[Xe] 4f11 6s2', [9,
13]],
    ['Erbium', 'Er', 68, 'lanthanide', '167.26', '[Xe] 4f12 6s2', [9, 14]],

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    ['Thulium', 'Tm', 69, 'lanthanide', '168.93', '[Xe] 4f13 6s2', [9,
15]],
    ['Ytterbium', 'Yb', 70, 'lanthanide', '173.05', '[Xe] 4f14 6s2', [9,
16]],
    ['Lutetium', 'Lu', 71, 'lanthanide', '174.97', '[Xe] 4f14 5d1 6s2', [9,
17]],
    ['Hafnium', 'Hf', 72, 'transition-metal', '178.49', '[Xe] 4f14 5d2
6s2', [6, 4]],
    ['Tantalum', 'Ta', 73, 'transition-metal', '180.95', '[Xe] 4f14 5d3
6s2', [6, 5]],
    ['Tungsten', 'W', 74, 'transition-metal', '183.84', '[Xe] 4f14 5d4
6s2', [6, 6]],
    ['Rhenium', 'Re', 75, 'transition-metal', '186.21', '[Xe] 4f14 5d5 6s2',
[6, 7]],
    ['Osmium', 'Os', 76, 'transition-metal', '190.23', '[Xe] 4f14 5d6 6s2',
[6, 8]],
    ['Iridium', 'Ir', 77, 'transition-metal', '192.22', '[Xe] 4f14 5d7 6s2',
[6, 9]],
    ['Platinum', 'Pt', 78, 'transition-metal', '195.08', '[Xe] 4f14 5d9
6s1', [6, 10]],
    ['Gold', 'Au', 79, 'transition-metal', '196.97', '[Xe] 4f14 5d10 6s1',
[6, 11]],
    ['Mercury', 'Hg', 80, 'transition-metal', '200.59', '[Xe] 4f14 5d10
6s2', [6, 12]],
    ['Thallium', 'Tl', 81, 'post-transition-metal', '204.38', '[Xe] 4f14
5d10 6s2 6p1', [6, 13]],
    ['Lead', 'Pb', 82, 'post-transition-metal', '207.2', '[Xe] 4f14 5d10 6s2
6p2', [6, 14]],
    ['Bismuth', 'Bi', 83, 'post-transition-metal', '208.98', '[Xe] 4f14 5d10
6s2 6p3', [6, 15]],
    ['Polonium', 'Po', 84, 'post-transition-metal', '(209)', '[Xe] 4f14 5d10
6s2 6p4', [6, 16]],
    ['Astatine', 'At', 85, 'metalloid', '(210)', '[Xe] 4f14 5d10 6s2 6p5',
[6, 17]],
    ['Radon', 'Rn', 86, 'noble-gas', '(222)', '[Xe] 4f14 5d10 6s2 6p6', [6,
18]],
    ['Francium', 'Fr', 87, 'alkali-metal', '(223)', '[Rn] 7s1', [7, 1]],
    ['Radium', 'Ra', 88, 'alkaline-earth-metal', '(226)', '[Rn] 7s2', [7,
2]],
    ['Actinium', 'Ac', 89, 'actinide', '(227)', '[Rn] 6d1 7s2', [7, 3]],
    ['Actinium', 'Ac', 89, 'actinide', '(227)', '[Rn] 6d1 7s2', [10, 3]],
    ['Thorium', 'Th', 90, 'actinide', '232.04', '[Rn] 6d2 7s2', [10, 4]],
    ['Protactinium', 'Pa', 91, 'actinide', '231.04', '[Rn] 5f2 6d1 7s2',
[10, 5]],

```

```

        ['Uranium', 'U', 92, 'actinide', '238.03', '[Rn] 5f3 6d1 7s2', [10,
6]],
        ['Neptunium', 'Np', 93, 'actinide', '(237)', '[Rn] 5f4 6d1 7s2', [10,
7]],
        ['Plutonium', 'Pu', 94, 'actinide', '(244)', '[Rn] 5f6 7s2', [10, 8]],
        ['Americium', 'Am', 95, 'actinide', '(243)', '[Rn] 5f7 7s2', [10, 9]],
        ['Curium', 'Cm', 96, 'actinide', '(247)', '[Rn] 5f7 6d1 7s2', [10, 10]],
        ['Berkelium', 'Bk', 97, 'actinide', '(247)', '[Rn] 5f9 7s2', [10, 11]],
        ['Californium', 'Cf', 98, 'actinide', '(251)', '[Rn] 5f10 7s2', [10,
12]],
        ['Einsteinium', 'Es', 99, 'actinide', '(252)', '[Rn] 5f11 7s2', [10,
13]],
        ['Fermium', 'Fm', 100, 'actinide', '(257)', '[Rn] 5f12 7s2', [10, 14]],
        ['Mendelevium', 'Md', 101, 'actinide', '(258)', '[Rn] 5f13 7s2', [10,
15]],
        ['Nobelium', 'No', 102, 'actinide', '(259)', '[Rn] 5f14 7s2', [10,
16]],
        ['Lawrencium', 'Lr', 103, 'actinide', '(262)', '[Rn] 5f14 7s2 7p1',
[10, 17]],
        ['Rutherfordium', 'Rf', 104, 'transition-metal', '(267)', '[Rn] 5f14
6d2 7s2', [7, 4]],
        ['Dubnium', 'Db', 105, 'transition-metal', '(268)', '[Rn] 5f14 6d3
7s2', [7, 5]],
        ['Seaborgium', 'Sg', 106, 'transition-metal', '(271)', '[Rn] 5f14 6d4
7s2', [7, 6]],
        ['Bohrium', 'Bh', 107, 'transition-metal', '(272)', '[Rn] 5f14 6d5 7s2',
[7, 7]],
        ['Hassium', 'Hs', 108, 'transition-metal', '(277)', '[Rn] 5f14 6d6 7s2',
[7, 8]],
        ['Meitnerium', 'Mt', 109, 'unknown', '(276)', '[Rn] 5f14 6d7 7s2', [7,
9]],
        ['Darmstadtium', 'Ds', 110, 'unknown', '(281)', '[Rn] 5f14 6d8 7s2', [7,
10]],
        ['Roentgenium', 'Rg', 111, 'unknown', '(280)', '[Rn] 5f14 6d9 7s2', [7,
11]],
        ['Copernicium', 'Cn', 112, 'transition-metal', '(285)', '[Rn] 5f14 6d10
7s2', [7, 12]],
        ['Nihonium', 'Nh', 113, 'unknown', '(286)', '[Rn] 5f14 6d10 7s2 7p1',
[7, 13]],
        ['Flerovium', 'Fl', 114, 'post-transition-metal', '(289)', '[Rn] 5f14
6d10 7s2 7p2', [7, 14]],
        ['Moscovium', 'Mc', 115, 'unknown', '(290)', '[Rn] 5f14 6d10 7s2 7p3',
[7, 15]],

```

```

        ['Livermorium', 'Lv', 116, 'unknown', '(293)', '[Rn] 5f14 6d10 7s2 7p4',
[7, 16]],
        ['Tennessine', 'Ts', 117, 'unknown', '(294)', '[Rn] 5f14 6d10 7s2 7p5',
[7, 17]],
        ['Oganesson', 'Og', 118, 'unknown', '(294)', '[Rn] 5f14 6d10 7s2 7p6',
[7, 18]],
    ];

    elementsData.forEach(el => {
        const [name, symbol, number, category, mass, config, [row, col]] = el;

        const elementCell = document.createElement('div');
        elementCell.className = `element ${category}`;
        elementCell.style.gridRow = row;
        elementCell.style.gridColumn = col;

        elementCell.dataset.name = name;
        elementCell.dataset.symbol = symbol;
        elementCell.dataset.number = number;
        elementCell.dataset.category = category.replace('-', ' ');
    }).replace(/\b\w/g, l => l.toUpperCase());
        elementCell.dataset.mass = mass;
        elementCell.dataset.config = config;

        elementCell.innerHTML = `
            <div class="number">${number}</div>
            <div class="symbol">${symbol}</div>
            <div class="name">${name}</div>
        `;

        elementCell.addEventListener('click', () => showDetails(elementCell));
        periodicTable.appendChild(elementCell);
    });

    function showDetails(element) {
        const { name, symbol, number, category, mass, config } =
element.dataset;
        detailsContent.innerHTML = `
            <h2>${name} (${symbol})</h2>
            <p><strong>Atomic Number:</strong> ${number}</p>
            <p><strong>Category:</strong> ${category}</p>
            <p><strong>Atomic Mass:</strong> ${mass}</p>
            <p><strong>Electron Configuration:</strong> ${config}</p>
        `;
    }

```

```

    detailsPanel.classList.remove('hidden');
    overlay.classList.remove('hidden');
  }

  function hideDetails() {
    detailsPanel.classList.add('hidden');
    overlay.classList.add('hidden');
  }

  closeBtn.addEventListener('click', hideDetails);
  overlay.addEventListener('click', hideDetails);
});

```

Fig. 1

Periodic Table of Elements

Legend:

- Alkali Metal
- Alkaline Earth Metal
- Lanthanide
- Actinide
- Transition Metal
- Post-Transition Metal
- Metalloid
- Reactive Nonmetal
- Noble Gas
- Unknown

H Hydrogen																	He Helium						
Li Lithium	Be Beryllium																	B Boron	C Carbon	N Nitrogen	O Oxygen	F Fluorine	Ne Neon
Na Sodium	Mg Magnesium																	Al Aluminum	Si Silicon	P Phosphorus	S Sulfur	Cl Chlorine	Ar Argon
K Potassium	Ca Calcium	Sc Scandium	Ti Titanium	V Vanadium	Cr Chromium	Mn Manganese	Fe Iron	Co Cobalt	Ni Nickel	Cu Copper	Zn Zinc	Ga Gallium	Ge Germanium	As Arsenic	Se Selenium	Br Bromine	Kr Krypton						
Rb Rubidium	Sr Strontium	Y Yttrium	Zr Zirconium	Nb Niobium	Mo Molybdenum	Tc Technetium	Ru Ruthenium	Rh Rhodium	Pd Palladium	Ag Silver	Cd Cadmium	In Indium	Sn Tin	Sb Antimony	Te Tellurium	I Iodine	Xe Xenon						
Cs Cesium	Ba Barium	La Lanthanum	Hf Hafnium	Ta Tantalum	W Tungsten	Re Rhenium	Os Osmium	Ir Iridium	Pt Platinum	Au Gold	Hg Mercury	Tl Thallium	Pb Lead	Bi Bismuth	Po Polonium	At Astatine	Rn Radon						
Fr Francium	Ra Radium	Ac Actinium	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium	Hs Hassium	Mt Meitnerium	Ds Darmstadtium	Rg Roentgenium	Cn Copernicium	Nh Nihonium	Fl Flerovium	Mc Moscovium	Lv Livermorium	Ts Tennessine	Og Oganesson						
		La Lanthanum	Ce Cerium	Pr Praseodymium	Nd Neodymium	Pm Promethium	Sm Samarium	Eu Europium	Gd Gadolinium	Tb Terbium	Dy Dysprosium	Ho Holmium	Er Erbium	Tm Thulium	Yb Ytterbium	Lu Lutetium							
		Ac Actinium	Th Thorium	Pa Protactinium	U Uranium	Np Neptunium	Pu Plutonium	Am Americium	Cm Curium	Bk Berkelium	Cf Californium	Es Einsteinium	Fm Fermium	Md Mendelevium	No Nobelium	Lr Lawrencium							

Fig. 2

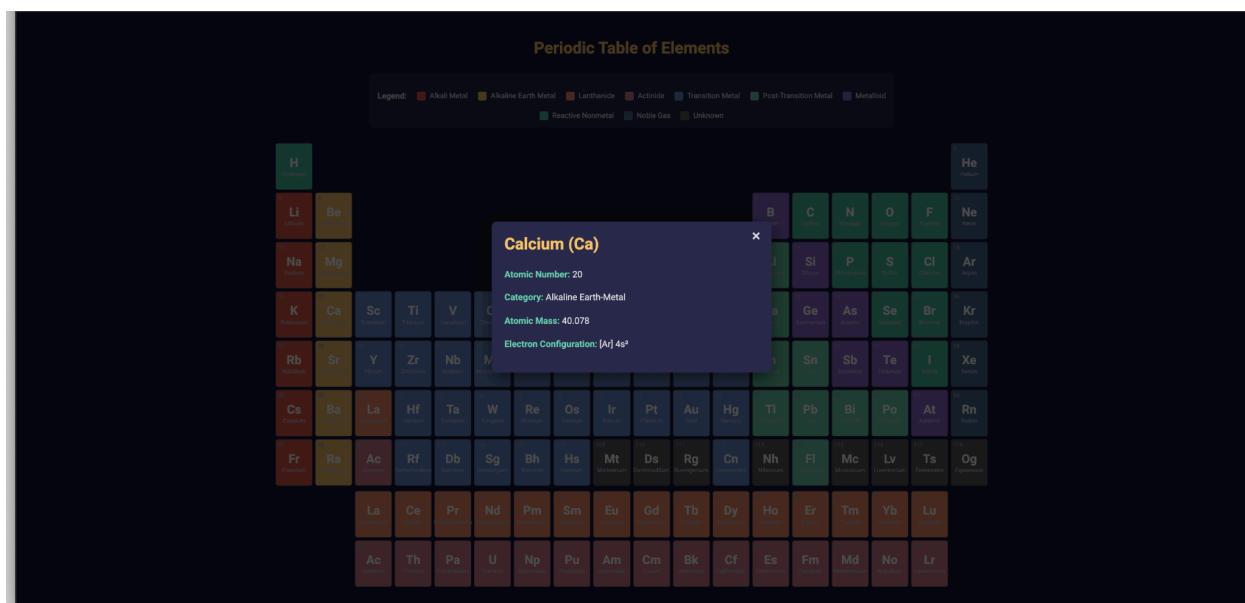


Fig. 3

