

1. Open the PhysicsQuiz.html file.
2. Locate the text [add quiz here] and replace it with the following form:

```
<form>
```

```
</form>
```

3. Add the following lines for the first question to the <form> element. The four radio buttons represent the answers. You will notice that each radio button is assigned a value corresponding to its answer letter: a, b, c or d. For each radio button group, the onclick event sends the button value to an individual function that scores the answer. Notice that the value for each button is sent to the function as a parameter.

```
<p> <strong>1. How many natural elements are there?</strong></p>
```

```
<p><input type="radio" name="question1" value="a"
onclick="scoreQuestion1('a')" >92<br>
```

```
<!-- correct answer -->
```

```
<input type="radio" name="question1" value="b"
onclick="scoreQuestion1('b')" >113<br>
```

```
<input type="radio" name="question1" value="c"
onclick="scoreQuestion1('c')" >103<br>
```

```
<input type="radio" name="question1" value="d"
onclick="scoreQuestion1('d')" >88</p>
```

4. Add the following lines for the second question:

```
<p>
```

```
<strong>2. If one kg of air is compressed from 1 m3 to 0.5 m3, which
of the following statements is true?</strong></p>
```

```
<p><input type="radio" name="question2" value="a"
onclick="scoreQuestion2('a')" >The density is halved.<br>
```

```
<input type="radio" name="question2" value="b"
onclick="scoreQuestion2('b')" >The mass is halved.<br>
```

```
<input type="radio" name="question2" value="c"
onclick="scoreQuestion2('c')" >The density is doubled.<br>
```

```
<!-- correct answer -->
```

```
<input type="radio" name="question2" value="d"
onclick="scoreQuestion2('d')" >The mass is doubled.</p>
```

5. Add the following lines for the third question:

```
<p>

<strong>3. What is the acceleration due to gravity?</strong></p>

<p>

<input type="radio" name="question3" value="a"
onclick="scoreQuestion3('a')" >980 m/s2<br>

<input type="radio" name="question3" value="b"
onclick="scoreQuestion3('b')" >9.8 m/s2<br>

<!-- correct answer -->

<input type="radio" name="question3" value="c"
onclick="scoreQuestion3('c')" >98 m/s2<br>

<input type="radio" name="question3" value="d"
onclick="scoreQuestion3('d')" >0.98 m/s2</p>
```

6. Add the following lines for the fourth question:

```
<p><strong>4. What is the SI unit of density?</strong></p>

<p>

<input type="radio" name="question4" value="a"
onclick="scoreQuestion4('a')" >cm3/g<br>

<input type="radio" name="question4" value="b"
onclick="scoreQuestion4('b')" >m3/kg<br>

<input type="radio" name="question4" value="c"
onclick="scoreQuestion4('c')" >kg/m3<br>

<!-- correct answer -->

<input type="radio" name="question4" value="d"
onclick="scoreQuestion4('d')" >g/cm3</p>
```

7. Add the following lines for the fifth question:

```
<p><strong>5. Which of these has the highest density?</strong></p>

<p>

<input type="radio" name="question5" value="a"
onclick="scoreQuestion5('a')" >Lead<br>

<input type="radio" name="question5" value="b"
onclick="scoreQuestion5('b')" >Water<br>

<input type="radio" name="question5" value="c"
onclick="scoreQuestion5('c')" >Mercury<br>

<input type="radio" name="question5" value="d"
onclick="scoreQuestion5('d')" >Tungsten</p>

<!-- correct answer -->
```

8. Save your file.

9. Next you will add the functions to score each of the questions. The functions contain if statements that evaluate each answer.

10. Add the following script section to the document head:

```
<script>

</script>
```

11. Add the following function to the script section which scores the first question. A response of "Correct Answer" appears if the user provides the correct answer. A response of "Incorrect Answer" appears if the answer is incorrect.

```
function scoreQuestion1(answer) {
  if (answer == "a")
    window.alert("Correct Answer");
  if (answer == "b")
    window.alert("Incorrect Answer");
  if (answer == "c")
```

```
        window.alert("Incorrect Answer");  
if (answer == "d")  
    window.alert("Incorrect Answer");  
}
```

12. Add the following scoreQuestion2() function after the scoreQuestion1 ()function:

```
function scoreQuestion2(answer) {  
    if (answer == "a")  
        window.alert("Incorrect Answer");  
    if (answer == "b")  
        window.alert("Incorrect Answer");  
    if (answer == "c")  
        window.alert("Correct Answer");  
    if (answer == "d")  
        window.alert("Incorrect Answer");  
}
```

13. Add the following scoreQuestion3() function after the scoreQuestion2 ()function:

```
function scoreQuestion3(answer) {  
    if (answer == "a")  
        window.alert("Incorrect Answer");  
    if (answer == "b")  
        window.alert("Correct Answer");  
    if (answer == "c")  
        window.alert("Incorrect Answer");  
    if (answer == "d")  
        window.alert("Incorrect Answer");  
}
```

14. Add the following scoreQuestion4() function after the scoreQuestion3 ()function:

```
function scoreQuestion4(answer) {  
  if (answer == "a")  
    window.alert("Incorrect Answer");  
  if (answer == "b")  
    window.alert("Incorrect Answer");  
  if (answer == "c")  
    window.alert("Correct Answer");  
  if (answer == "d")  
    window.alert("Incorrect Answer");  
}
```

15. Add the following scoreQuestion5() function after the scoreQuestion4()function:

```
function scoreQuestion5(answer) {  
  if (answer == "a")  
    window.alert("Incorrect Answer");  
  if (answer == "b")  
    window.alert("Incorrect Answer");  
  if (answer == "c")  
    window.alert("Incorrect Answer");  
  if (answer == "d")  
    window.alert("Correct Answer");  
}
```

16. Save and run your file.

To add if-else to your file:

17. Because you only need the `if` statement to test for the correct answer, you can group all the incorrect answers in the `else` clause. Modify each of the functions that scores a question so that multiple `if` statements are replaced with an `if...else` statement. The following code shows how the statements for the `scoreQuestions1()` function should look:

```
if (answer == 'a')  
    window.alert("Correct Answer");  
  
else  
    window.alert("Incorrect Answer");
```

18. You need to modify each of the functions to include an `if...else` statement.
19. Save and run the file. The file should run the same as when it contained only `if` statements.

To add nested `if...else` statements to your file:

20. Delete the 5 functions that score each question.
21. Add to the script section the first line for the single function that will check all the answers. The function will receive 2 arguments: the number argument which represents the questions number, and the answer argument selected by the user.

```
function scoreQuestions(number, answer) {
```

22. Add the following code to score Question 1:

```
if (number == 1) {  
    if (answer == "a")  
        window.alert("Correct Answer");  
    else  
        window.alert("Incorrect Answer");  
}
```

23. Add the following code to score Question 2:

```
else if (number == 2) {  
    if (answer == "c")  
        window.alert("Correct Answer");  
    else  
        window.alert("Incorrect Answer");  
}
```

24. Add the following code to score Question 3:

```
else if (number == 3) {  
    if (answer == "b")  
        window.alert("Correct Answer");  
    else  
        window.alert("Incorrect Answer");  
}
```

25. Add the following code to score Question 4:

```
else if (number == 4) {  
    if (answer == "c")  
        window.alert("Correct Answer");  
    else  
        window.alert("Incorrect Answer");  
}
```

26. Add the following code to score Question 5:

```
else if (number == 5) {  
    if (answer == "d")
```

```
        window.alert("Correct Answer");

    else

        window.alert("Incorrect Answer");

}
```

27. Add a closing `}` for the `scoreQuestions()` function.

28. Within each of the input elements, change the function called within the `onclick` event handler to `scoreQuestions(number,answer)`, changing the number argument to the appropriate question number and the answer argument to the appropriate answer. For example the event handler for question 1 should look like:

```
<p>

    <strong>1. How many natural elements are there?</strong></p>

<p>

    <input type="radio" name="question1" value="a"
onclick="scoreQuestions(1, 'a')" />92<br>

    <!-- correct answer -->

    <input type="radio" name="question1" value="b"
onclick="scoreQuestions(1, 'b')" />113<br>

    <input type="radio" name="question1" value="c"
onclick="scoreQuestions(1, 'c')" />103<br>

    <input type="radio" name="question1" value="d"
onclick="scoreQuestions(1, 'd')" />88</p>
```

29. Repeat for each question.

30. Save and run the file. It should run the same as it did previously.

To add a while loop to the file:

31. Delete the entire `scoreQuestions()` function from the head section, and then add the following lines to create 2 arrays, named `answers[]` and `correctAnswers[]`. The `answers[]` array will hold the answers selected each time the quiz runs, and the `correctAnswers[]` array will hold the correct response for each of the questions. The code also assigns the correct responses to each element of the `correctAnswers[]` array.

```
let answers = [];  
  
let correctAnswers = [];  
  
correctAnswers[0] = "a";  
correctAnswers[1] = "c";  
correctAnswers[2] = "b";  
correctAnswers[3] = "c";  
correctAnswers[4] = "d";
```

32. Add the following function, which assigns the response from each question to the appropriate element in the `answers[]` array. The program sends the actual question (1-5) to the function by using the `onclick` event of each radio button. To assign question responses to the correct element, 1 must be subtracted from the question variable, because the elements in the array start at 0.

```
function recordAnswers(question, answer) {  
    answers[question - 1] = answer;  
}
```

33. Type the following definition for a function that will score the quiz. You will call this function from a new `Score` button.

```
function scoreQuiz() {  
  
}
```

34. Add to the `scoreQuiz()` function the following statement, which declares a new variable, and assigns to it an initial value of 0. The `totalCorrect` variable holds the number of correct answers.

```
let totalCorrect = 0;
```

35. Add the following variable declaration and while statement at the end of the `scoreQuiz()` function. In this code, a counter named `count` is declared and initialised to a value of 0, because 0 is the starting index of an array. The conditional expression within the while statement checks to see if `count` is less than the length of the array, which is 1 number higher than the largest element in the `answers[]` array. With each iteration of the loop, the statement in the while loop increments the `count` variable by 1.

```
let count = 0;

while (count < correctAnswers.length) {

    ++count;

}
```

36. Add the following if statement to the beginning of the while loop, above the statement that increments the `count` variable. This `if` statement compares each element within the `answers[]` array to each corresponding element within the `correctAnswers[]` array. If the elements match, then the `totalCorrect` variable is incremented by 1.

```
if (answers[count] == correctAnswers[count])

    ++totalCorrect;
```

37. Write the quiz score to a textbox named `score`. After the while loop in the `scoreQuiz()` function add the following line.

```
document.getElementById('score').value = `You scored ${totalCorrect}
out of 5 answers correctly!`;
```

38. In the onclick event handlers for each radio button, change the name of the called function from `scoreQuestions()` to `recordAnswers()`, but use the same arguments that you used for the `scoreAnswers()` function, e.g. `onclick="recordAnswers(1, 'a')"`

39. Finally add the following `<input>` elements immediately above the closing `</form>` tag. The button `<input>` element creates a command button whose `onclick` event handler calls the `scoreQuiz` function. The text `<input>` element will contain the quiz score.

```
<p>
```

```
<input type="button" value="Score" onclick="scoreQuiz();">
```

```
<input type="text" id="score" size="40" style="color: white; border-  
style: none; border-color: inherit; border-width: medium;  
background-color: Transparent" text="0">
```

```
</p>
```

40. Save and run the file.