**Phase 2: Innovation**

Creating a noise pollution monitor involves building a device that can measure and record sound levels in our environment. Here are the general steps to create the noise pollution monitor:

**Materials and Components Needed:**

1. Sound Sensor: The Microphone captures sound levels. We are going to use L393 sound sensor.

2. Microphone Amplifier: To amplify the weak audio signals from the microphone, we need an amplifier circuit.

3. Microcontroller: A microcontroller to process the amplified audio signals and record or display the noise level. (Arduino or Raspberry Pi)

4. Analog-to-Digital Converter (ADC): If we don't have a built-in ADC in our microcontroller, we'll need an external ADC to convert the analog audio signal to digital.

5. Display or Data Logging: We can display the noise level on an LCD screen or log it to an SD card or transmit it to a computer for further analysis.

6. Power Supply: We need a power supply for the microcontroller, microphone, and other components.

7. Enclosure: An enclosure to protect our components and make the monitor portable.

**Steps to Create a Noise Pollution Monitor:**

1. Connect the Microphone: Connect the microphone to the microphone amplifier circuit. Ensure that we have the appropriate connections and voltage for our specific microphone.

2. Amplify the Signal: Use the amplifier circuit to amplify the weak audio signal from the microphone. Adjust the gain to our needs but not to the level of distortion.

3. Connect to Microcontroller: Connect the output of the amplifier to the microcontroller. If our microcontroller doesn't have a built-in ADC, connect an external ADC to digitize the signal.

4. Code the Microcontroller: Write code for the microcontroller to process the digitized audio signal. Calculate the noise level (usually in decibels, dB), and update the display or log the data.

5. Display/Logging: Set up the display to show the noise level or configure the microcontroller to log data to an SD card or transmit it to a computer.

6. Power Supply: Ensure that all components have a stable power supply. Depending on our design, we may need batteries, a power adapter, or a combination of both.

7. Calibration: It's essential to calibrate the noise monitor to provide accurate measurements. You can do this by comparing the readings with a calibrated sound level meter.

8. Enclosure: Place all components inside a suitable enclosure to protect them from environmental factors.

9. Testing: Test the noise pollution monitor in different locations and conditions to ensure its accuracy and reliability.

10. Data Analysis: For logging the data, we can analyse it using software to identify trends and patterns in noise pollution.

With this noise pollution monitor, we can detect the sound levels of specific areas, **like** **as** we see the weather or the temperature level of a specific area. We can log them in our software to monitor them and to take actions accordingly.