

Radioactive Contamination

```
In[1]:= index = {2.5, 2.6, 3.4, 1.3, 1.6, 3.8, 11.6, 6.4, 8.3};  
deaths = {147, 130, 130, 114, 138, 162, 208, 178, 210};  
list1 = Transpose[{index, deaths}];  
table = Sort[list1];  
labelled = Prepend[table, {"Index", "Deaths"}];  
Grid[labelled, Frame -> All]
```

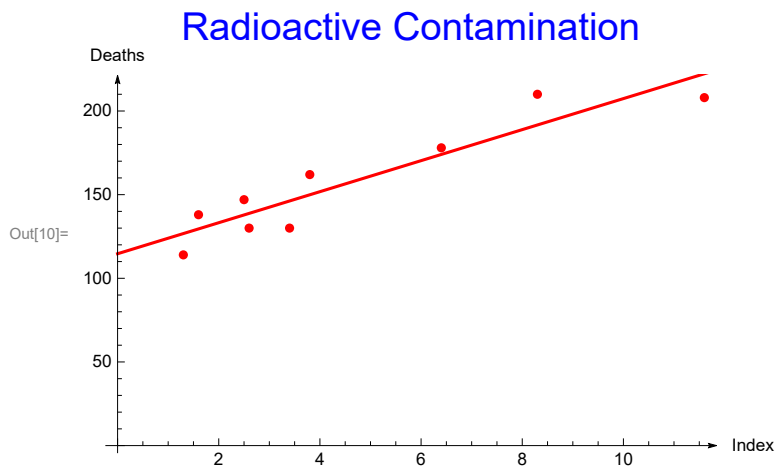
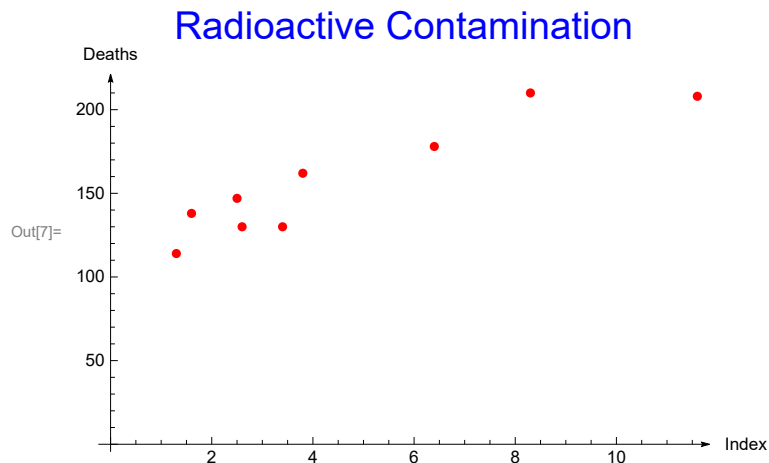
Out[6]=

Index	Deaths
1.3	114
1.6	138
2.5	147
2.6	130
3.4	130
3.8	162
6.4	178
8.3	210
11.6	208

```

In[7]:= lp1 = ListPlot[table, AxesLabel → {"Index", "Deaths"}, ImageSize → Medium,
  PlotStyle → {Red, PointSize[0.015]}, AxesOrigin → {0, 0}, AxesStyle → Arrowheads[0.013],
  PlotLabel → Style["Radioactive Contamination", 20, Blue]]
fitline = Fit[table, {1, x}, x];
lpfit = Plot[fitline, {x, 0, 15}, PlotStyle → Red];
Show[lp1, lpfit]

```



Finding Medians and Lines

Summary Points

```

In[11]:= sp1x = Median[Take[table, 3]][[1]];
sp1y = Median[Take[table, 3]][[2]];
sp2x = Median[Take[table, {7, 9}]] [[1]];
sp2y = Median[Take[table, {7, 9}]] [[2]];
sp3x = Median[Take[table, {4, 6}]] [[1]];
sp3y = Median[Take[table, {4, 6}]] [[2]];

```

```

In[17]:=

```

Median - Median Line

Method 1

```

In[18]:= m =  $\frac{(sp2y - sp1y)}{(sp2x - sp1x)}$ ;
In[19]:= line1[x_] := m * (x - sp1x) + sp1y // N
In[20]:= line1[0]
Out[20]= 121.284
In[21]:= line2[x_] := m * (x - sp3x) + sp3y // N
          line2[0]
Out[22]= 94.4776
In[23]:= yint = (2 * line1[0] + line2[0]) / 3
Out[23]= 112.348
In[24]:= medline[x_] := m * x + yint // N
          medline[x]
Out[25]= 112.348 + 10.4478 x

```

Method 2

```

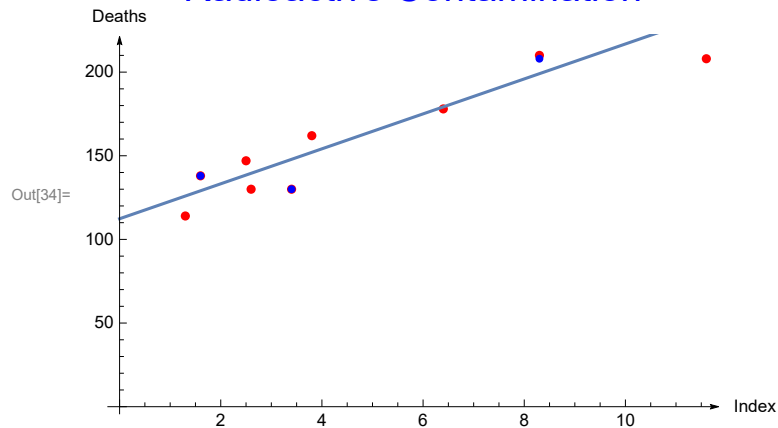
In[26]:= newYint = (line1[sp3x] - sp3y) / 3 + yint
Out[26]= 121.284
In[27]:= medline2[x_] = m * x + newYint // N
          medline2[x]
Out[27]= 121.284 + 10.4478 x
Out[28]= 121.284 + 10.4478 x

```

Plotting Everything That Just Happened

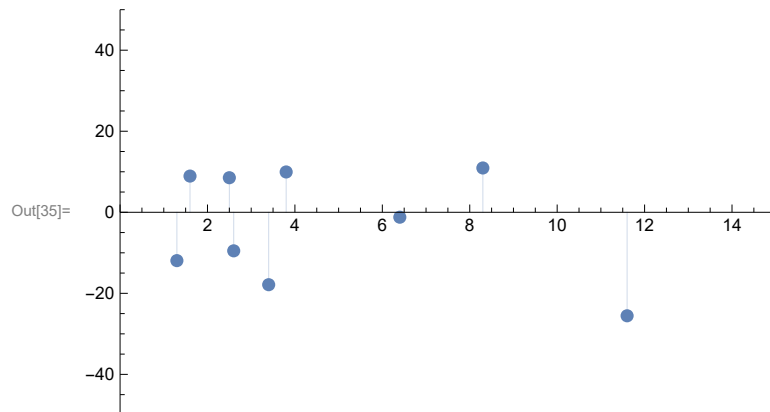
```
In[29]:= lp2 = Plot[medline[x], {x, 0, 15}];
sumpointsx = {sp1x, sp2x, sp3x};
sumpointsy = {sp1y, sp2y, sp3y};
medpoints = Transpose[{sumpointsx, sumpointsy}];
lp3 = ListPlot[medpoints, PlotStyle -> Blue];
Show[lp1, lp2, lp3]
```

Radioactive Contamination



Residuals

```
In[35]:= residualsplot =
ListPlot[Transpose[{list1[[All, 1]], list1[[All, 2]] - medline[list1[[All, 1]]}],
PlotRange -> {{0, 15}, {-50, 50}}, PlotStyle -> {PointSize[.02]}, Filling -> Axis]
```



```
In[36]:= residualsfit =  
  ListPlot[Transpose[{list1[[All, 1]], list1[[All, 2]] - fitline[list1[[All, 1]]}],  
    PlotRange → {{0, 15}, {-50, 50}}, PlotStyle → {PointSize[.02]}, Filling → Axis]
```

