6.)
(i) This problem relates to the methods we learned in class because it requires an understanding of R, p-values, confidence intervals and paired data.

Let $\mu 1$ = average percentage of soil passing through sieve at location 1
Let $\mu 2$ = average percentage of soil passing through sieve at location 2

H_0: $\mu 1 - \mu 2 = 0$
H_a: $\mu 1 - \mu 2 \neq 0$

(a)

```
Soil=read.table("SoilDataNhi.txt", header = T)
attach(soil)
t.test(Soil1, Soil2, paired = T)
```

```
        Paired t-test

data:  Soil1 and Soil2
t = -2.182, df = 31, p-value = 0.03681
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -5.4896542 -0.1853458
sample estimates:
mean of the differences
                -2.8375
```

From the output, we are 95% certain that the true difference in means lies between -5.4896542 and -0.1853458.

(b)

```
wilcox.test(Soil1, Soil2, conf.int=T, conf.level=0.95,
              paired=TRUE)
```

```
        Wilcoxon signed rank test with continuity correction

data:  Soil1 and Soil2
V = 141, p-value = 0.03688
alternative hypothesis: true location shift is not equal to 0
95 percent confidence interval:
 -5.4500073 -0.1000166
sample estimates:
(pseudo)median
     -2.949974
```

By utilizing our signed-rank procedure, we find that the resulting p-value and 95% confidence interval are remarkably similar to those found in part (a).