# HW1_631

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## Exercise 2.2

```
x = c(-1, 6, 4, 6, 2, -3, 5)
t.test(x, alternative = 'greater')
```

```
##
##  One Sample t-test
##
## data:  x
## t = 2.0254, df = 6, p-value = 0.04461
## alternative hypothesis: true mean is greater than 0
## 95 percent confidence interval:
##  0.1101933       Inf
## sample estimates:
## mean of x
##  2.714286
```

We get a p-value of 0.04 meaning we reject the null hypothesis stating that the drug has no effect. The drug improves fertility.

## Exercise 2.3

1. Letting them choose may let the participants be happier to be in the experiment however it is not completely random and you may end up with most children picking diet B.
2. Taking the first 10 ensures that the two samples are equal however it is not always completely random as the order at which they come in could be a confounding variable.
3. Taking every other 10 keeps the two samples equal but it still could be seen as a confounding variable because it is not completely random because the order at which they come in could still play a role.
4. Tossing a coin ensures randomization however it could lead to different size samples which may lead to a lower power.
5. Choosing 10 at random ensures randomization.

## Exercise 2.4

```
Reduced = c(256,159,149)
Neutral = c(54,123,248)

t.test(Neutral, Reduced, var.equal = TRUE)
```

```
##
##  Two Sample t-test
##
## data:  Neutral and Reduced
## t = -0.69947, df = 4, p-value = 0.5228
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -230.2459  137.5792
## sample estimates:
## mean of x mean of y
##  141.6667  188.0000
```

Because the p-value is greater than 0.05, we fail to reject the null hypothesis.