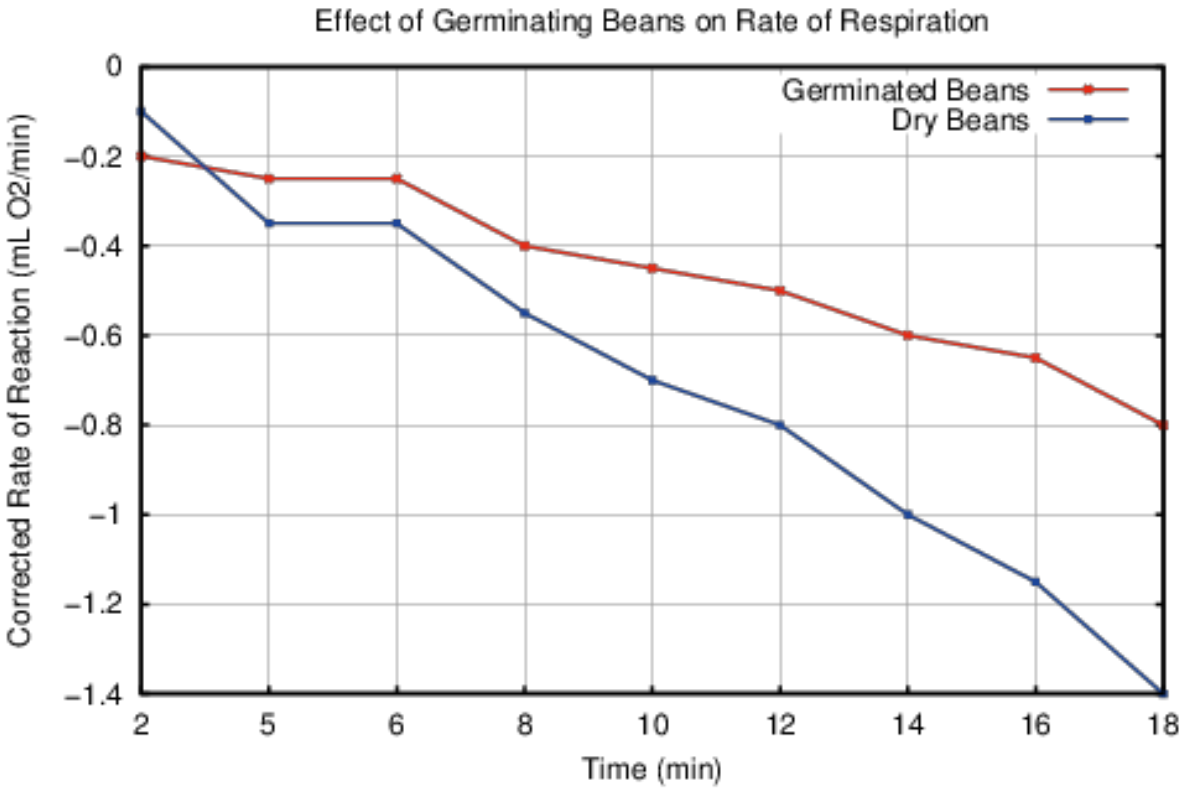
Respiration Lab

3. a) independent: time reading was taken (min)
   b) dependent: rate of respiration (mL O2/sec)

	Beads alone	Beads alone	Germinating Peas	Germinating Peas	Germinating Peas	Dry Peas and beads	Dry Peas and beads	Dry Peas and beads
Time	Reading at time x	Difference	Reading at time x	Difference	Corrected difference	Reading at time x	Difference	Corrected difference
0	8.7	N/A	8.8	N/A	N/A	8.6	N/A	N/A
2	8.4	0.3	8.7	0.1	-0.2	8.4	0.2	-0.1
5	8	0.7	8.35	0.45	-0.25	8.25	0.35	-0.35
6	7.95	0.75	8.3	0.5	-0.25	8.2	0.4	-0.35
8	7.65	1.05	8.15	0.65	-0.4	8.1	0.5	-0.55
10	7.45	1.25	8	0.8	-0.45	8.05	0.55	-0.7
12	7.3	1.4	7.9	0.9	-0.5	8	0.6	-0.8
14	7.1	1.6	7.8	1	-0.6	8	0.6	-1
16	6.95	1.75	7.7	1.1	-0.65	8	0.6	-1.15
18	6.7	2	7.6	1.2	-0.8	8	0.6	-1.4



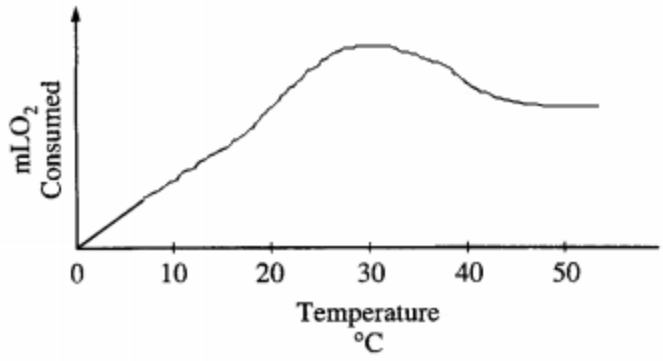
5.

Condition	Calculations	Rate of Respiration (mL O2/min)
Germinating Seeds	rate = Δy/Δx = (-.8-.2)/(18-0)	-.0555
Dry Peas and Seeds	rate = Δy/Δx = (-1.4-.1)/(18-0)	-.0833

7. Germinating the seeds was achieved by submerging the seeds in water. The collected experimental results show that germinating the seeds caused them to produce ess O2 than the non-germinating seeds. This trend shows that germinating the seeds decreased the O2 production when compared to the non-germinating seeds. The expected data would show that germinating the seeds caused them to consume more O2 than the non-germinated seeds. This trend means that germinating the seeds increased the rate of seed respiration when compared to the non-germinating seeds.

8. The rate of O2 production will likely increase with an increase in temperature because the cells and enzymes involved in respiration will be moving faster and can therefore metabolize food molecules more quickly. The rate of respiration will likely decrease after 40C because the seeds could begin to become dehydrated and will not be able to carry out as many hydrolysis reactions, very important in respiration and use of ATP.

Graph 5.2 **Title:** Increased O2 Consumed with an Increase in Temperature



11. The reptile will probably have a lower rate of respiration when compared to the rate of respiration of the mammal. This will most likely be due to the fact that mammals are warm blooded and reptiles are cold blooded. To be warm blooded, the mammal must produce more energy that will be used to heat the body, especially in extreme conditions near 10. This extra energy will need to be created along with other energy necessary to carry out other cellular functions. The reptile only needs o produce enough energy to carry out the other cellular functions. Since the reptile needs less energy because it does not need to heat itself its rate of respiration will be lower.

13. Water moved into the pipette of the respirometer because the seeds in the respirometer consumed O_2, a gas at room temperature, and produced CO_2, also a gas at room temperature. The CO_2 gas was turned into a solid with KOH, leaving only O_2 as the gas in the respirometer. This fact means that as O_2 is consumed, there is a lower pressure in the respirometer. To equalize this low pressure in the respirometer with atmospheric pressure, water moves into the pipette of the respirometer.

14.
Procedure:

1. Begin germinating seeds by submerging the seeds in tap water at 0, 24, 48, and 72 hours before continuing the rest of the experiment.
2. Prepare a room temperature water bath (25C)
3. Prepare respirometers (3 times)
    a. find volume of seeds with water displacement
    b. obtain a 100 mL graduated cylinder
    c. place absorbent cotton at bottom of graduated cylinder and soak with KOH
    d. cover with non-absorbent cotton
    e. add seeds and beads to equal the volume of germinating seeds
    f. cap off with stopper and pipette
    g. place respirometer in water bath to equalize
4. submerge all respirometers at the same time
5. begin recording data

Results:
Seeds that germinated for the longest will have the highest rate of respiration when compared to all the data collected from this modified experiment.

Explanation:
Seeds that germinated for the longest will have the highest rate of respiration because those seeds will have grown and blown up the most. Because the germinated seeds will be the largest, and therefore have the more cells, they will need more energy to carry out cellular functions when compared to the new smaller un-germinated seeds. This would yield a direct relationship between the time spent germination and rate of respiration of the seeds.