Plant Enzymes & Heat – Teacher Notes

As discovered with the experiment where a human hand was plunged into freezing water, enzyme activity in organisms is temperature dependant. This explains why the growth of plants is confined to climatic zones. The "Wheat Belts" of Australia are constrained by both temperature and rainfall.

An agricultural scientist was concerned about the effect of possible global warming on wheat crops. They grew groups of 100 seedlings under different temperature conditions and measured the amount of carbon dioxide produced by the group.

Why did they measure carbon dioxide produced? Carbon dioxide is produced from respiration. It is therefore a measure of the amount of cellular activity of wheat.

Why did they measure groups of 100 seedlings? To limit the effects of any outlying results and make the average more reliable.

Graph the data from the experiment below. Remember, graphs require

1. A title.
2. Labelled axes.
3. Units on axes.
4. A scale to fill the paper provided.

Temp. °C	Vol. CO_2 mL	Temp. °C	Vol. CO_2 mL	Temp. °C	Vol. CO_2 mL	Temp. °C	Vol. CO_2 mL
1	0	11	430	21	532	31	130
2	0	12	500	22	532	32	80
3	0	13	520	23	535	33	55
4	10	14	523	24	505	34	40
5	90	15	528	25	490	35	10
6	175	16	530	26	430	36	5
7	250	17	529	27	370	37	0
8	270	18	532	28	300	38	0
9	345	19	530	29	250	39	0
10	380	20	530	30	190	40	0

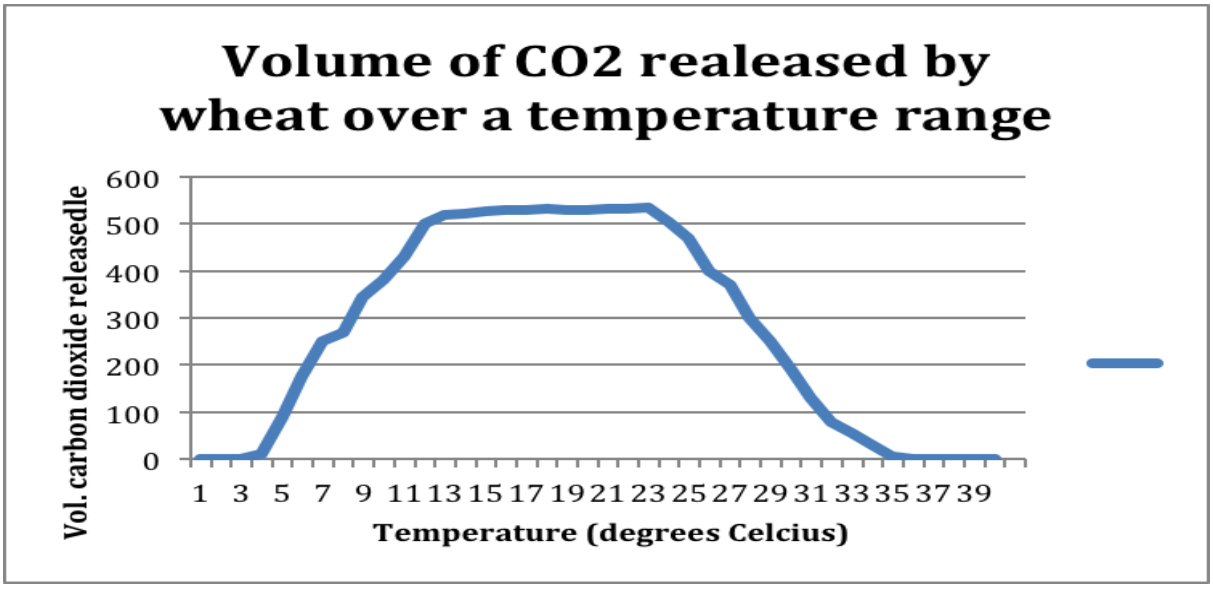
In the experiment, which is the dependent (measured) variable? Volume of carbon dioxide

And which is the independent (experimental) variable? Temperature

Which variable should be on your horizontal axis (Temperature or volume of CO_2) and explain why.

Temperature should be on the horizontal axis because it is controlled.

Should your graph be a line graph or a bar graph? Explain your answer. It should be line graph as it describes a change of one thing relative to another.



This graph form is typical for the effects of temperature or pH on enzyme activity.