

Sample Grading for a fictional science project about growing plants with different fertilizers:

RESEARCH QUESTION: Must be in the form of:
What is the effect of *IV* on *DV*?

Points	Example
1	What happens to plants with fertilizer? (MUST have)
2	What is the effect of fertilizer on plants?
3	What is the effect of fertilizers on plant growth?
4	What is the effect of fertilizers on the height plants grow?
5	What is the effect of nitrogen based fertilizers on the amount of height sunflower plants can grow in 3 weeks

INDEPENDENT VARIABLE: What YOU change/test

Points	Example
1	1 fertilizer
2	2 fertilizers
3	2 fertilizers with 2 trials each and a water control
4	3 fertilizers with 2 trials each and a water control
5	3 fertilizers with 3+ trials each and water controls

DEPENDENT VARIABLE: What you MEASURE – must be numbers

Points	Example
1	height at end in customary units
2	
3	height at end in metric
4	
5	height each day in metric – ONLY if used to analyze rate of height

HYPOTHESIS: Must be in the form of:

I think *if*..... *then*..... because.....

The because should not be complete research – it should prove that the student has tried to place this experiment into the context of information they have learned.

Points	Example
1	I think that fertilizer will help.
2	I think that fertilizer make the plants grow.
3	I think that if you give plants fertilizer then they will grow because it gives them food.
4	I think that if you give plants fertilizers then they will get taller because the fertilizer will give them nutrients.
5	I think that if you give sunflower plants nitrogen based fertilizers then the sunflowers will grow taller because nitrogen helps plants build cells to grow taller.

MATERIALS: must be a COMPLETE list, with amounts – in METRIC!!

Points	Example
1	Sunflower seeds dirt fertilizers
2	Sunflower seeds Dirt Water Fertilizers environment
3	Sunflower seeds flower pots potting soil water, 3 fertilizers sunny place
4	12 sunflower seeds 6 8" flower pots enough potting soil to fill pots 3 Nitrogen based fertilizers sunny window to place all pots
5	12 "name" sunflower seeds 6 8" terracotta flower pots professional potting soil to fill pots 3 SPECIFIC fertilizers by kinds of nitrogen sunny window where all pots can be placed measuring cup water to use daily measuring device for height

PROCEDURE: Must be numbered and in list form. Does not have to say things like paper and pencils, but should show a copy of any data collection tables etc.

Points	Example
1	<ol style="list-style-type: none"> 1. plant seeds in pots 2. put in window 3. water daily 4. measure
2	<ol style="list-style-type: none"> 1. plant seeds in dirt in pots 2. give fertilizer to different plants 3. water daily 4. measure
3	<ol style="list-style-type: none"> 1. fill terracotta pots with potting soil - label as A, B or C 2. Plant sunflower seeds 3. add fertilizer to A and B, none to C 4. water daily 5. measure growth
4	<ol style="list-style-type: none"> 1. Fill 6 terracotta pots with potting soil. Label 4 each as A, B and C 2. Plant sunflower seeds according to packet directions 3. Fertilize seeds in A pots with fertilizer A according to directions from fertilizer A 4. Fertilize seeds in A pots with fertilizer B according to directions from fertilizer B 5. Seeds in pots C receive no fertilizer as control 6. Keep in sunny spot and give ½ cup of water each day 7. Measure the growth every day and record 8. At end of 3 weeks see which ones grew the most
5	<ol style="list-style-type: none"> 1. Fill 12 8" terracotta pots with potting soil. Label 4 as A, B and C 2. Plant 'name' sunflower seeds according to packet directions 3. Fertilize seeds in A pots with fertilizer A according to directions from fertilizer A 4. Fertilize seeds in A pots with fertilizer B according to directions from fertilizer B 5. Seeds in pots C receive no fertilizer as control 6. Keep in sunny spot and give metric measure of water each day 7. Measure the height every day and record in data table 8. Average the height of the 4 plants in each trial and record as the result for each fertilizer 9. At end of 3 weeks see plot the average heights for each day 10. Conclude which fertilizer's seeds grew the tallest in 3 weeks.

DATA TABLE: reading data table alone should explain experiment

Must have title that tells what you did – ie use Research Question but skip the “what is the”

Must include ALL data measured and place for averages of trials

Must have METRIC labels

Control goes in first row or wherever most obvious to compare to

The effect of different fertilizer delivery systems
of the height of grass grown in 2 weeks

Ind variable	Trial 1	Trial 2	Trial 3	Trial 4	Average
Control					

The effect of different exercisers on the
change in pulse rate

Ind Variable	Before	After	Change
Control			

GRAPH: reading graph alone should explain experiment

Must show the final averages of what happened if just doing what the end result is.

If you are going to go further and tell which one sprouted, grew fastest vs which one had overall ending height you have to have all of that data on the graph.

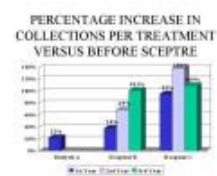
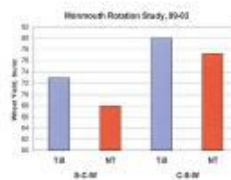
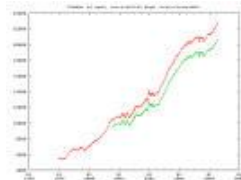
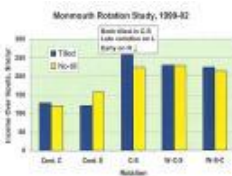
Generally X axis = independent variable

Y axis = dependent variable

Use proper graph: Bar graph = actual readings

Line graph = change over time

Pie Chart = part of whole



CONCLUSION: What happened and how that compares to your hypothesis.

Does NOT include why you think it happened

Points	Example
1	height at end in customary units My hypothesis was
2	
3	height at end in metric My hypothesis was
4	
5	height each day in metric – ONLY if used to analyze <u>rate</u> of height My hypothesis was