

THE 6TH GRADE STUDENT'S GUIDE TO LAB REPORT WRITING

This guide explains the sections of a Lab Report. You can view sample student work and learn how to earn a level 3 and 4. Resources to help you are included as [RED](#) links.

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ADDITIONAL MATERIALS MAY BE ADDED IN THE FUTURE!
 ANYTHING THAT IS NEW WILL BE MARKED WITH: **NEW!**

FORMAT

Your lab report should have a heading for each section as well as your name date and class on the first page.

You should have the following sections in this order:

- IDD**
- Hypothesis**
- Procedure**
- Data**
- Discussion**
- Conclusion**

Click [HERE](#) to view a sample student Lab Report.

Click [HERE](#) to view the entire lab report rubric.

Level 4

- Full Heading is on first page
- Every section has a title
- Cover page is included
- Work is typed
- Bibliography is included and is in MLA or APA format

Level 3

- Full Heading is on first page
- Every section has a title
 - Bibliography is included

IDD

The IDD, or Investigation Design Diagram, is a graphic organizer that will help you write every other part of your lab report.

You should have the following information in your IDD:

- Testable question
- Independent Variable
- Dependent Variable
- Levels
- Trials
- Constant/Controlled Variables

It is very important to make sure that your variables are consistent throughout your lab report. For example, if you have number of paper clips as your IV in your IDD you should not have wing shape as your IV in your hypothesis.

Resources for the IDD:

- [Variable Self-Check](#)
- [IDD Prompts](#)
- [IDD Assistance](#)
(Color Coded IDD with Prompts)
- [ShowMe](#) on the IDD

Level 4

Complete and correct

Click [HERE](#) to view a sample student IDD

Level 3

Complete with 1-2 errors

HYPOTHESIS

A hypothesis is an educated prediction based on observation, prior knowledge and text-based research.

You should have the following information in your Hypothesis:

- ❑ “If” containing your Independent Variable
- ❑ “Then” containing your Dependent Variable
- ❑ “Because” statement containing a rationale (reason) with a quote (TBD) and explanation of the quote.

It is very important to make sure that your IV and DV match what you have in your IDD. Your hypothesis needs to be a specific prediction. You should choose 1 level of your IV and explain what you will measure in your data and WHY this will happen.

Remember: The **IV** is the **CAUSE** and the **DV** is the **EFFECT**.

Resources for the Hypothesis:

- [Variable Self-Check](#)
- [Hypothesis Worksheet II](#)
- [Hypothesis Worksheet I](#)
(with sample)

Click [HERE](#) to view a sample student Hypothesis

Level 4

The hypothesis

- ❑ includes a specific IV and DV **AND**
- ❑ predicts the effect that changing the IV will have on the DV **AND**
- ❑ includes a rationale that explains the reason for the prediction (because...) **AND**
- ❑ uses well-chosen domain specific vocabulary in the rationale

Level 3

The hypothesis

- ❑ includes an IV and DV **AND**
- ❑ predicts the effect that changing the IV will have on the DV **AND**
- ❑ includes a rationale that explains the reason for the prediction (because...)

PROCEDURE

The procedure is a detailed “How-to” for how you set up your experiment and how you collected your data.

You should have the following information in your Procedure:

- A materials List
- Detailed directions for how to set up your experiment
- Detailed directions for how you collected data
- Your IV, Levels, DV, and CV
- Repeated Trials

It is very important to make sure that someone else can repeat your experiment EXACTLY as you did it! Do not just provide a list of generic steps.

Resources for the Procedure:

- [How to Write a High Quality Procedure](#)

Click [HERE](#) to view a sample student Procedure

Level 4

The procedure is

- a step-by-step description of how the investigation was done AND
- uses precise language and domain specific vocabulary to describe BOTH a logical sequence of actions taken and materials used AND
- is sufficiently detailed to enable the reader to replicate (copy) the investigation AND
- is consistent with the IDD and is an appropriate test of the hypothesis AND
- includes diagrams that assist the reader in completing the investigation

Level 3

The procedure contains 3-4 of the elements of a 4

DATA

The data section contains your data table and a graph.

You should have the following information in your Data Section:

- A data table
- A graph
 - A title
 - Labels for your IV (x-axis) and DV (y-axis)
 - If a bar graph, labels for each of your levels for each bar
 - Units on the Y axis for your DV

It is very important to make sure that your graph has all of the required elements on it so that someone reading it knows what they are looking at.

Resources for the Data Section:

- [ShowMe](#) on Making a Line Graph
- [Line and Bar Graph Reference Sheet](#)

Click [HERE](#) to view a sample student Data Table. Click [HERE](#) to view a sample student Graph.

Level 4

The data section contains ALL of the elements below

- a graph with a relevant title in the format “the effect of IV on DV”
- a graph that includes a scale that uses the space provided
- annotations are made AND a brief summary is provided
- the x-axis is correctly labeled with units and the y-axis is correctly labeled with units
- The data on the graph matches what is provided in the included data table
- A key for symbols/colors is provided OR clear labels are placed neatly on the graph
- Colors used on the graph(s) are intentional and strategic

Level 3

The data section contains 5-6 of the elements of a 4

DISCUSSION

The purpose of the discussion section is to explain the scientific reasoning for your results.

You should have the following sections in your Discussion:

- ❑ Claim
 - ❑ A one sentence summary of what your data is showing.
- ❑ Evidence
 - ❑ 3 pieces of quantitative data (or qualitative data)
- ❑ Reasoning
 - ❑ Quotes (TBD's) from at least 2 texts
 - ❑ An explanation of the quote along with a link to your results.

It is very important to make sure that your reasoning doesn't just explain what a concept is, but also explains WHY you observed this scientific phenomenon.

Resources for the Discussion:

- [Discussion Organizer](#)

Click [HERE](#) to view a sample student Discussion

Level 4

The claim answers the question accurately and clearly

- ❑ At least 3 or more specific examples from the data are provided as evidence
- ❑ Reasoning connects the evidence to the claim using relevant and well-chosen domain specific vocabulary
- ❑ At least 2 relevant and well-chosen quotations are used and explained and support the scientific reasoning

Student demonstrates a clear and thorough understanding of the concepts and is able to make a strong connection between the data and the texts read.

Level 3

The claim is logical and relevant

- ❑ At least 2 specific examples from the data are provided as evidence
- ❑ Reasoning connects the evidence to the claim
- ❑ At least 2 relevant quotations are used and support the scientific reasoning; more accurate quotations could have been used

Student demonstrates an understanding of the concepts and is able to make a connection between the data and the concepts.

CONCLUSION

The purpose of the conclusion section is to reflect on your scientific process and what you have learned.

You should have the following sections in your Conclusion:

- ❑ A statement comparing your hypothesis to the claim in your discussion.
- ❑ A discussion of any sources of error that might have occurred.
- ❑ A reflection on what you could improve if you were to do this experiment again.
- ❑ What did you learn?

It is very important to make sure that your reasoning doesn't just explain what a concept is, but also explains WHY you observed this scientific phenomenon.

Resources for the Conclusion:

- [Conclusion Organizer](#)

Student work sample not yet available

Level 4

Conclusion contains ALL of the elements listed below:

- ❑ Restates the hypothesis and explains why the hypothesis is or is not supported by the data.
- ❑ Answers the testable question accurately and clearly Identifies AND discusses how sources of error could affect the outcome of the investigation
- ❑ Applies information learned during this investigation to the real world.
- ❑ Contains new questions for further investigation
- ❑ Reflects on what what was learned while completing this investigation
- ❑ Provides suggestions for how to improve this investigation if it were to be repeated in the future

Level 3

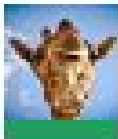
The conclusion contains 4-5 elements of a level

4

SAMPLE STUDENT IDD

IDD

Testable Question: What is the effect of the different type of wings on the amount of time it takes to fall?				
Independent Variable (IV): We changed the type of wings for the helicopter.				
Levels: --->	Fold each of the wings inwards	Fold both wings down-wards	Fold each half of each wing cross-wards.	Cut each wing half-way vertically
Trials: --->	3 times	3 times	3 times	3 times
Dependent Variable (DV): The result of the change was the helicopter didn't twirl as much as the original model, and it took a shorter time to fall. (seconds)				
Constant/Controlled Variables (CV): The materials used to make the helicopter and the number of trials per level stayed the same in the experiment. Also, the body and the size of the paper clip stayed the same. Furthermore, the paper clip stayed where it was on the helicopter.				



Angelique Con...
4:17 PM Yesterday

Resolve ⋮

The IDD has a question in the correct format, the IV and DV are clear and specific, the levels are clear and specific, the trials are consistent with the data table, and there are a sufficient list of CV's. (Level 4)

Click [HERE](#) to return to the IDD Page

Click [HERE](#) to view the Hypothesis Page

SAMPLE STUDENT HYPOTHESIS

HYPOTHESIS

If I fold each of the helicopter's wings upward, the helicopter will take a shorter time to fall than the helicopter whose wings we didn't fold, determined in seconds. According to the article, "What is Drag?" , "The air molecules push against the object and the difference between the velocity and direction of the air and the object cause the object to slow its movement." So, if I decrease the amount of space that the air molecules can push against the object, this will cause the helicopter to take a quicker time to fall. Also, this means that if I increase the amount of space that the air molecules can push against the helicopter, this would cause the helicopter to take a longer time to fall. Therefore, if I fold each of the helicopters wings upwards, it gives less space for the air molecules to push against it which proves why my hypothesis is correct.



Angelique Con...

4:20 PM Yesterday

Resolve



The hypothesis uses the "If (IV) then (DV) because (rationale with quote and explanation) format. There is a thorough explanation of the concepts with a link to the variables. This hypothesis shows that the student has a thorough understanding of scientific thinking and the concepts for this lab. (Level 4)

Click [HERE](#) to return to the Hypothesis Page

Click [HERE](#) to view the Procedure Page

SAMPLE STUDENT PROCEDURE

Materials:

- 8.5 x 11 computer Paper (Helicopter Sample sheet)
- Notepad/Idd chart
- Meter Stick
- Standard Paperclip
- Pen/Pencil
- Scissors

Step 1: Cut out a helicopter sample out from the computer paper

Step 2: Cut the dotted line in between the 2 rectangles X and Y

Step 3: Fold Rectangle A and rectangle C into section B.

Step 4: Then fold the square D upwards onto the folded rectangles A, B and C.

Step 5: Attach the paperclip fully onto the square D upwards.

Step 6: Finally, fold rectangle Y onto either side of the helicopter .

However, rectangle X has to be folded in the opposite direction of rectangle Y. (Lightly crease when you fold, not too hard)

Step 7: Drop your helicopter with rectangles X & Y facing the ceiling and the paperclip facing the floor. When you drop it, see how rectangles X & Y (Now the wings) twirl, causing the helicopter to take a long time to fall. (seconds)

Step 8: Then change the wings for the first level. Fold both wings inward halfway so they stick up. The body of the helicopter and the paperclip should stay the same. The drop height should stay the same

Step 10: Record the results on the amount of seconds the helicopter took to reach the floor in your data table.

Step 11: Repeat this change 2 more times. (Total of 3 trials)

Step 12: Change the wings for the second level. Fold both wings downward halfway so they face down. The body of the helicopter and the paperclip should stay the same. The drop height should stay the same.

Step 13: Record the results on the amount of seconds the helicopter took to reach the floor in your data table.

Step 14: Repeat this change 2 more times. (Total of 3 trials)

Step 15: Change the wings for the third level. Fold each half of each wing cross-wards. The body of the helicopter and the paperclip should stay the same. The drop height should stay the same.

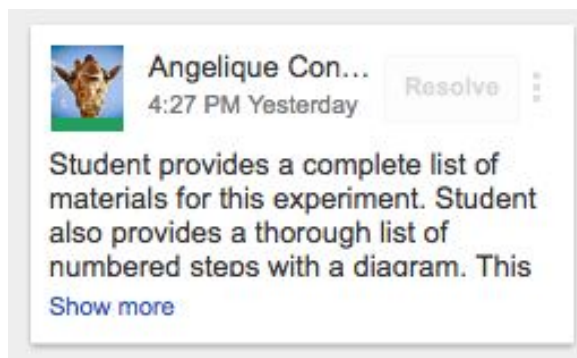
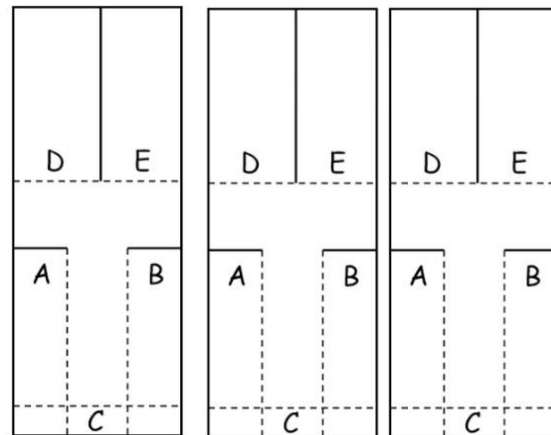
Step 16: Record the results on the amount of seconds the helicopter took to reach the floor in your data table.

Step 17: Repeat this change 2 more times. (Total of 3 trials)

Step 18: Change the wings for the fourth and final level. Cut each wing half-way vertically. The body of the helicopter and the paperclip should stay the same. The drop height should stay the same.


Step 19: Record the results on the amount of seconds the helicopter took to reach the floor in your data table.

Step 20: Repeat this change 2 more times. (Total of 3 trials)



SAMPLE STUDENT DATA TABLE (SEE NEXT PAGE FOR GRAPH)

Independent Variable: The shape of the wings		Dependent Variable: How long it takes for the helicopter to fall to the floor, measured by a timer from the time it's dropped.			
		Trial 1	Trial 2	Trial 3	Average (Add up the numbers across the row then divide by 3)
L E V E L S	Original Model	1.36 seconds	1.29 seconds	0.83 seconds	1.16 seconds
	Fold both wings downwards.	0.96 seconds	1.46 seconds	1.28 seconds	1.23 seconds (continues on)
	Fold each half of each wing cross-wards	0.86 seconds	0.96 seconds	0.71 seconds	0.843 seconds (continues on)
	Fold each of the wings Inwards	0.79 seconds	0.79 seconds	0.69 seconds	0.756 seconds (continues on)
	Cut each wing half-way vertically	0.84 seconds	1.37 seconds	1.56	1.256 seconds (continues on)



Angelique Con...
6:02 PM Nov 26

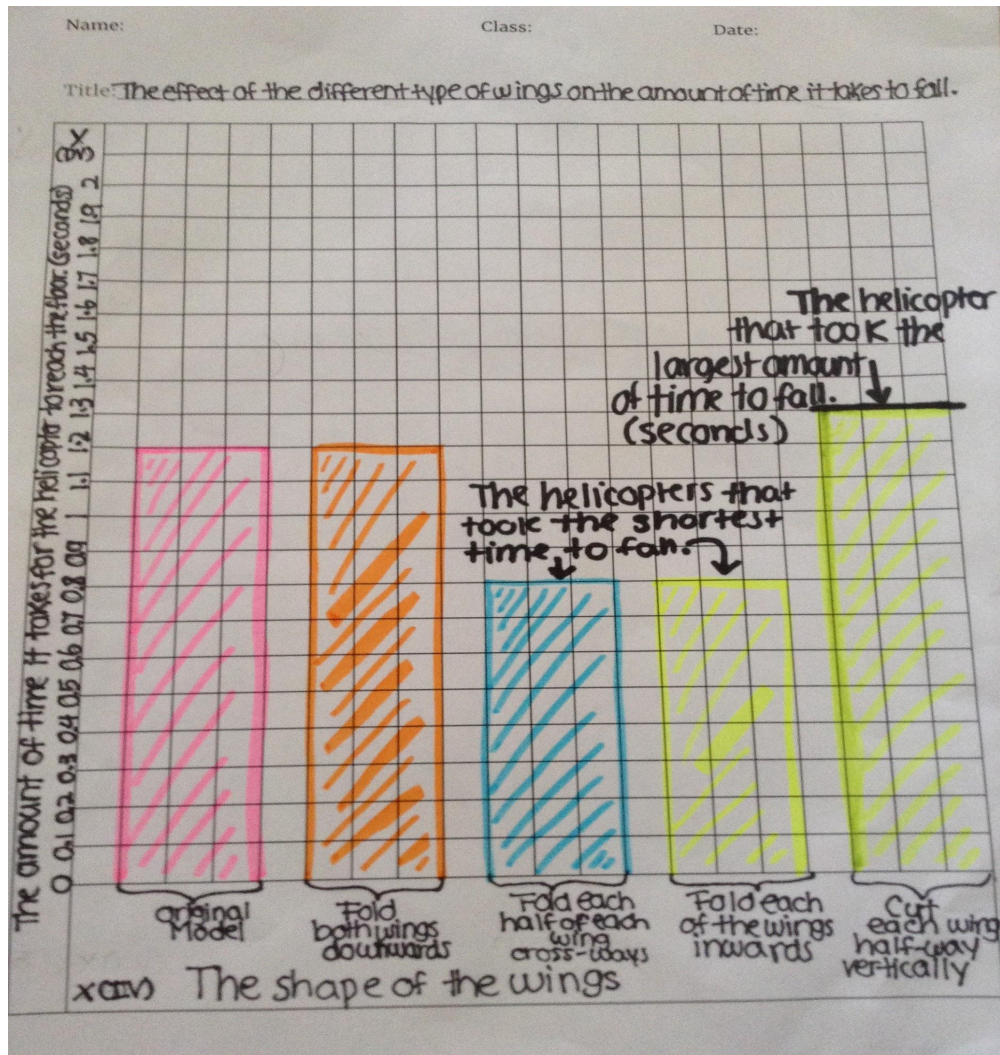
Resolve
⋮


This student has a data table consistent with the IDD. To improve he/she should include sample calculations for the average. (Level 3.5)

Click [HERE](#) to return to the Data Page

Click [HERE](#) to view the Discussion Page

SAMPLE STUDENT GRAPH



 Angelique Con...
6:04 PM Nov 26

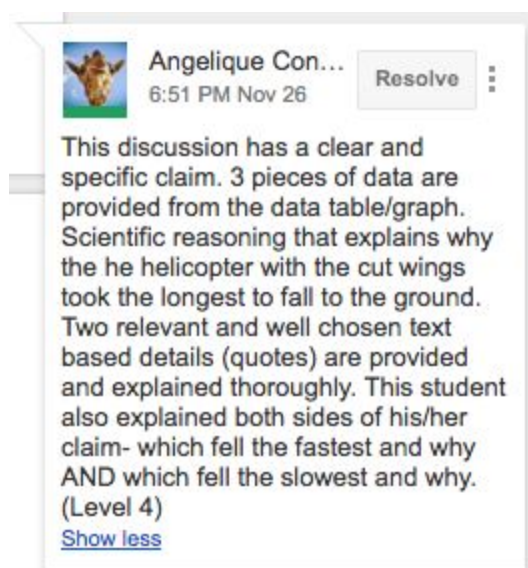
This graph is a level 4. This student has annotated the graph to show analysis of the data. All parts of the graph are present. The graph is neat and stragically colorful. This means that the colors are not there for the sake of coloring the graph, but are meaningful.

Click [HERE](#) to return to the Data Page

Click [HERE](#) to view the Discussion Page

SAMPLE STUDENT DISCUSSION

A pattern I see when I look at my data table/graph is cutting the helicopter's wings will cause the helicopter to stay in the air longer and folding the wings will cause it to reach the floor at a quicker pace. According to my data, when i cut each wing half-way vertically, it stayed in the air an average of about 1.3 seconds. Also, when I folded each wing inwards, it took an average of 0.8 seconds to fall. Furthermore, when I folded each half of each wing, it also took an average of 0.8 seconds to fall. According to the yellow article it states, " The paper helicopter falls to the ground as a result of gravity, a force that pulls two objects together. In this case, the earth's gravitational force pulls the helicopter down towards the ground. As the paper helicopter drops, it passes through a large number of air molecules." This means that because of the weight of each wing when they were folded, more gravity must be pulling the helicopter down, causing it to take a quicker time to reach the floor. Moreover, according to, "What is Drag", "The air molecules push the object and the difference between velocity and direction of the air and the object cause the object to slow its movement." This means that the less amount of space that the air molecules can push against the helicopter, the quicker it will take to fall. Also, this means that the larger amount of space that the air molecules can push against the helicopter, the longer amount of seconds it will take to fall which explains why the helicopter took the most time to fall when we cut each wing in half-way vertically. It gave more space for the air molecules to push against it.



Angelique Con...
6:51 PM Nov 26

This discussion has a clear and specific claim. 3 pieces of data are provided from the data table/graph. Scientific reasoning that explains why the he helicopter with the cut wings took the longest to fall to the ground. Two relevant and well chosen text based details (quotes) are provided and explained thoroughly. This student also explained both sides of his/her claim- which fell the fastest and why AND which fell the slowest and why. (Level 4)
[Show less](#)

Click [HERE](#) to return to the Discussion Page

Click [HERE](#) to view the Conclusion Page