



**2025–2026 ACADEMIC YEAR**  
**GRADE 9 CHEMISTRY PROJECT**

**NAME OF THE PROJECT: CONNECTIONS IN CHEMISTRY-BONDS EXPLAINED**

Grade	Content	Acquisition	Duration	Assessment
9	Chemical and Physical Bonds and their properties	Explain the interactions between molecules	Academic year	Research & Model Rubric

Dear student;

The objective of this project is to ensure you understand the interactions between chemical species. Chemical species react with each other, and we can get new substances as a product as a result of the occurrence of certain interactions among them. We can classify these interactions as strong (chemical) interactions and there are also weak (physical) interactions holding the unit structures of species together. Students should research and classify the types of bonds inside the molecules (intramolecular forces) and the effect of intermolecular bonds on physical properties. You may use any source you choose to obtain information needed to complete your assignment.

**Important Warning**

- Do not copy sentences directly from books, the internet, or AI tools (such as ChatGPT).
- Write in your own words.
- Always give the reference when you use another person's idea, picture, or sentence.
- When you complete the experiment, you must also submit a **video recording**. In the video, it must be clear that **you are doing the experiment yourself**.
- During poster or model-making assignments, the entire process of **your work must be photographed or recorded as a time-lapse video**.

**You should follow the following steps;**

- A. Research**
- B. Research report**
- C. Modelling**
- D. Important Notes**

**A. Research:**

- Determine the subtitles
- Determine the references (At least 3 books should be determined as a reference! Not only the internet!)

**B. Research report should contain;**

- A cover paper, research of the subtitles, preface, process, evaluation of your work, quotation, footnote etc.
- Explain why you chose this assignment in a preface.



- Associate the interactions between the chemical species with the concept of strong bonding.
- Classification of the bonds based on the formation mechanism.
- Examination of the changes that occur in the substance because of weak bond formation.
- Explain details of dipole-dipole interaction, ion-dipole interaction, and London forces.
- Explain fundamentals of Hydrogen bonding.
- Give the strength order of weak forces.
- Explain the effect of intermolecular attractions on physical properties.
- A legend or key which identify the structures.
- List the materials used to construct your models.
- Explain how you construct your work step by step
- Pictures
- A glossary
- References

### **C. Modelling**

#### **Guidelines:**

1. Identify the types of interactions between the given pairs of chemical species.
2. There must be at least a total of 4 molecules in your models (2 of them polar, 2 of them nonpolar molecules).
3. You must show the correct bond types for the molecules. (Intermolecular forces)
4. Select your molecules with pairs to show the type of intermolecular forces between them.
5. London forces, dipole-dipole forces and Hydrogen bonds should be visible if there are any, between each molecule pairs.
6. You should include an accurate key identifying each part of the model.
7. Be creative with your materials. You can use consumable materials (candy, food, etc.).
8. Your model must be freestanding and self-supportive. Do not attach your model to poster board.
9. No handwritten information! All work must be typed neatly.

#### **Evaluation of your own work and Conclusion:**

- \* Add all the details about the difficulties you had throughout your modelling experience.
  - \* Explain how you improved your research methods in this study. (What contributions did this assignment make to you?)
  - \* What would you change about this assignment if you were at the beginning of your study? Why? Criticize your work in a paragraph.
  - \* Evaluate your own work by responding to the questions below;
1. Does the model contain all the necessary parts and their correct differences? Do the parts present provide an accurate representation of the structures?
  2. Is the model sturdy enough to be moved without the pieces falling apart?
  3. Is the choice of materials original? Does construction technique show originality?
  4. Are the models constructed neat enough to avoid confusion in structures and a sloppy appearance?
  5. Are all structures labeled correctly?

### **D. Important Notes**



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- Do not copy-paste directly from sources; summarize in your own words.
- If you make a direct quotation, provide proper citation.
- The report must be submitted both digitally (Word or PDF) and in printed form.
- Use a readable font (e.g., Times New Roman, size 12) and double line spacing.
- The report should be between 5–8 pages, excluding visuals.

### **FIRST CHECK: (Planning)**

Do your research and determine the materials.

### **SECOND CHECK:**

Complete your research report and model's framework.

**Assessment criteria are attached.**



**ACADEMIC YEAR 2025-2026**  
**SCIENCE DEPARTMENT**

**RESEARCH & MODEL RUBRIC**

	<b>CRITERIA</b>	<b>EXCELLENT (5 POINTS)</b>	<b>GOOD (3-4 POINTS)</b>	<b>FAIR (2-3 POINTS)</b>	<b>POOR (1-2 POINTS)</b>	<b>NOT EXIST AT ALL (0 POINT)</b>	<b>POINTS EARNED</b>
<b>Content of the research paper (25 points)</b>	Determination of the subtitles.						
	Research of the subtitles.						
	Accuracy of the content.						
	Relevancy of the content to grade level.						
	Originality.						
<b>Neatness of the research</b>	Cover paper.						
	Content, design of the title and foreword.						



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rch pape r (30 point s)	Page design. (Fonts, style)						
	Plan, introduction, body, conclusion.						
	Quotation, footnote, references.						
	Grammar, Labeling, Spelling.						
Quali ty of the Mode l (45 point s)	Relevancy of the model to grade level.						
	Explanation of the working principle of the model by the student.						
	Selecting appropriate materials and equipment. Originality of the materials and usage of recycled material.						
	Make comments on the method.						
	Creativity.						
	Effectiveness of model or its applications in solving problems.						
	Effort. (Number of trials, difficulty in process.)						
	Draft drawings of the model.						
Relevancy of the model to the aim.							
<b>TIMING</b>		<b>FIRST CHECK (IF NOT; -5 POINTS) FIRST DRAFT:</b>	<b>SECOND CHECK (IF NOT; - 5 POINTS) SECOND DRAFT:</b>	<b>SUBMISSION (IF LATE FOR 2 DAYS; -10 POINTS) SUBMISSION:</b>			



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**DATE:**

**DATE:**

**DATE:**