

TeachMe

STUDY NOTES



A1.2 DNA & STORAGE (HL)

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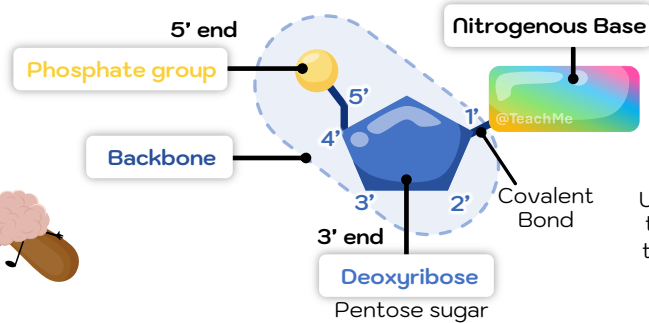


DNA & STORAGE (HL)

In the SL section, we learned about the structure of DNA and RNA. However, one concept we did not explore in detail is **DIRECTIONALITY**. We already know that the two DNA strands run antiparallel to one another, but as HL students we now need to understand exactly what this means.

DIRECTIONALITY

In DNA, the sugar component of each nucleotide is **DEOXYRIBOSE**, a **PENTOSE SUGAR** containing **FIVE CARBON ATOMS**. Each carbon is assigned a number, beginning with the carbon attached to the nitrogenous base and the fifth carbon is attached to the phosphate group.

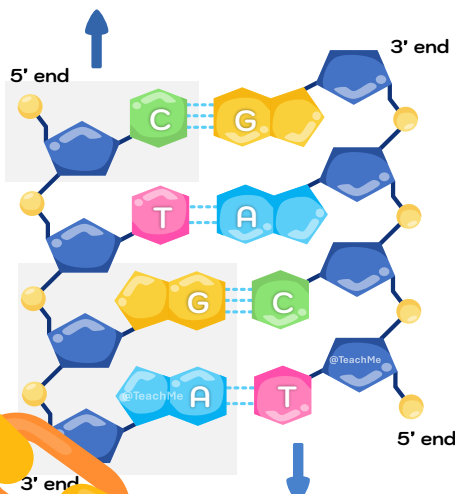


NOTE
5' is read as
"five-prime"



Using this numbering system, we refer to the phosphate end of the nucleotide as the **5' (five-prime) end** and the opposite end as the **3' (three-prime) end**.

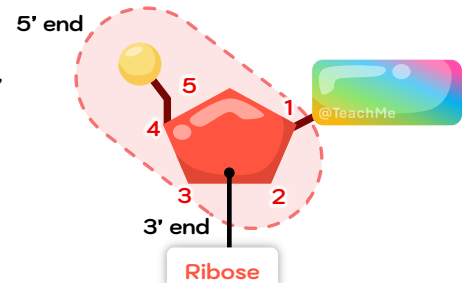
As nucleotides are joined together, they form a **polynucleotide chain**. This chain also has a **5' end** and a **3' end**.



The two DNA strands are antiparallel, meaning they run in **opposite directions**. One strand runs from 5' → 3', while the complementary strand runs from 3' → 5'.

RNA follows the same principle. Its sugar, **RIBOSE**, is also a **PENTOSE SUGAR**, so its carbon atoms are numbered in exactly the same way.

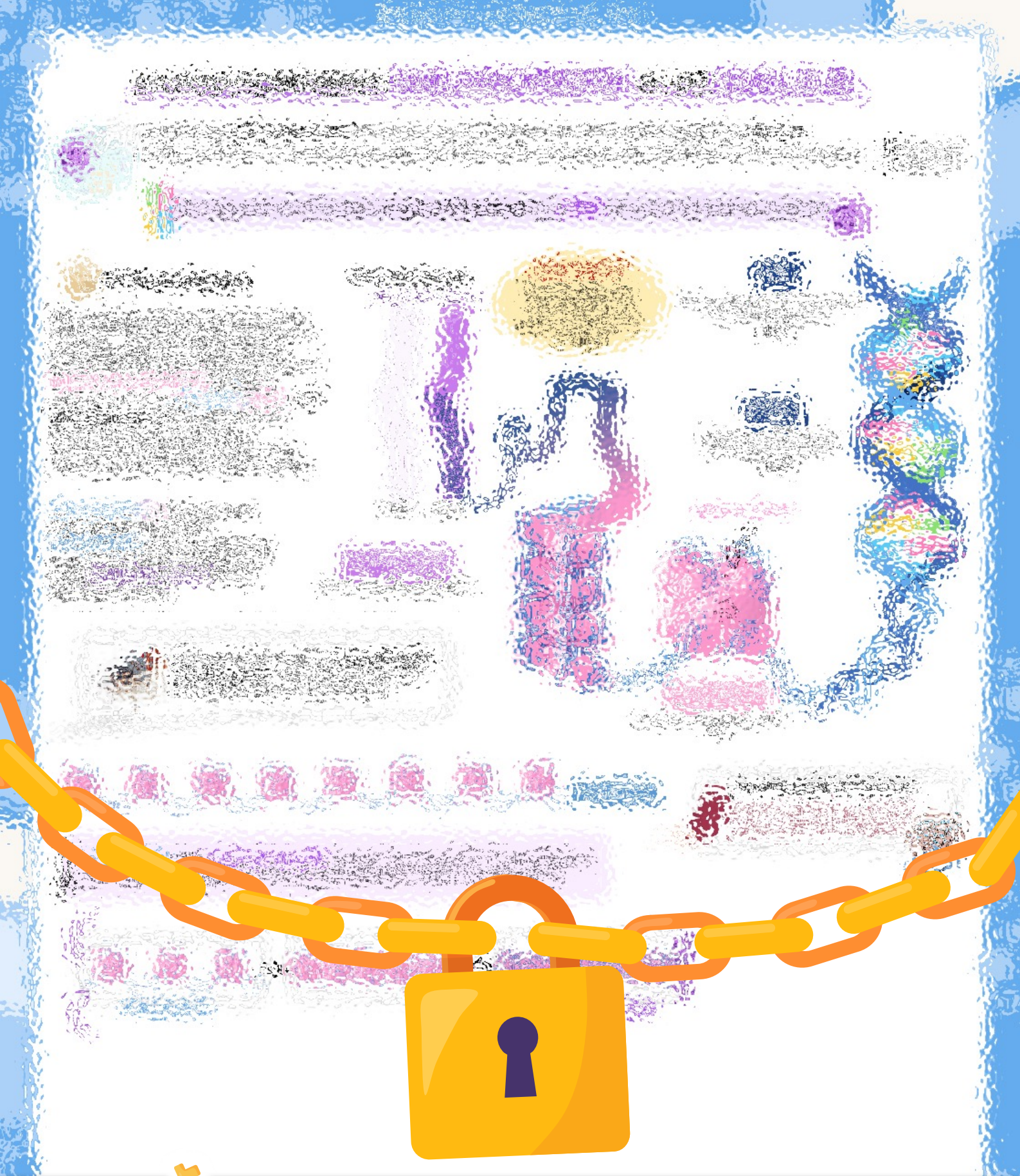
As a result, RNA molecules also have a **5' end** and a **3' end**.



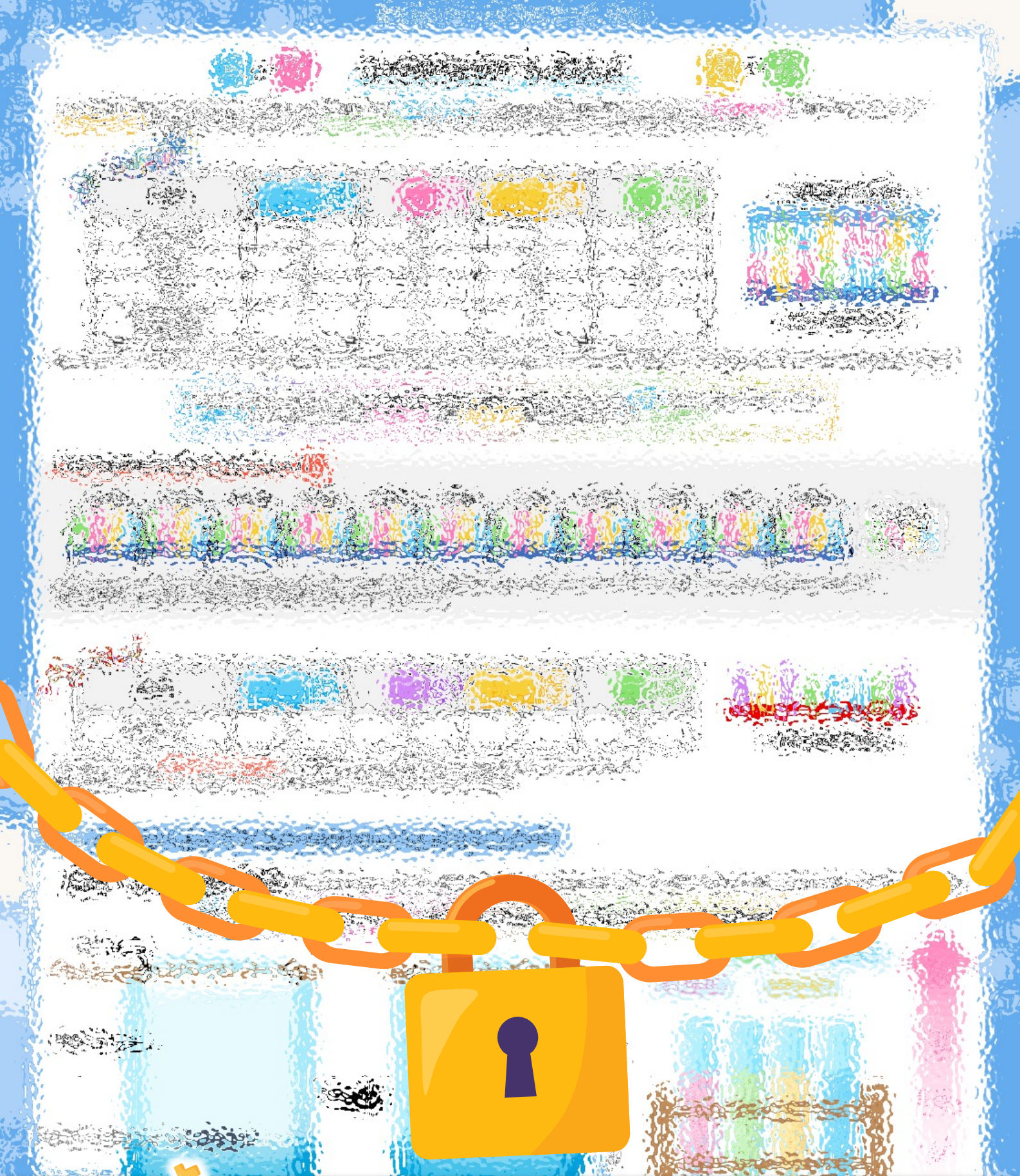
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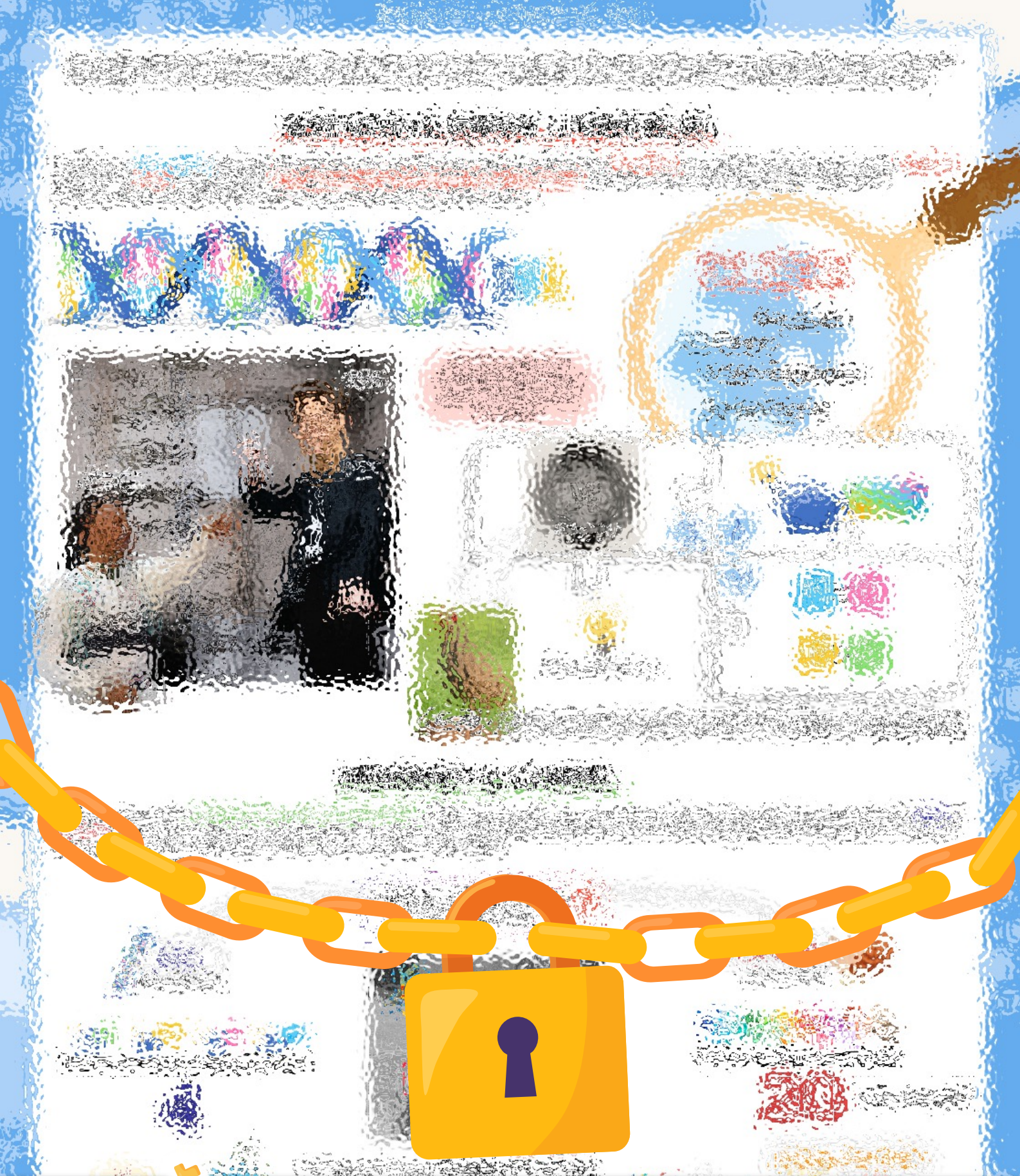
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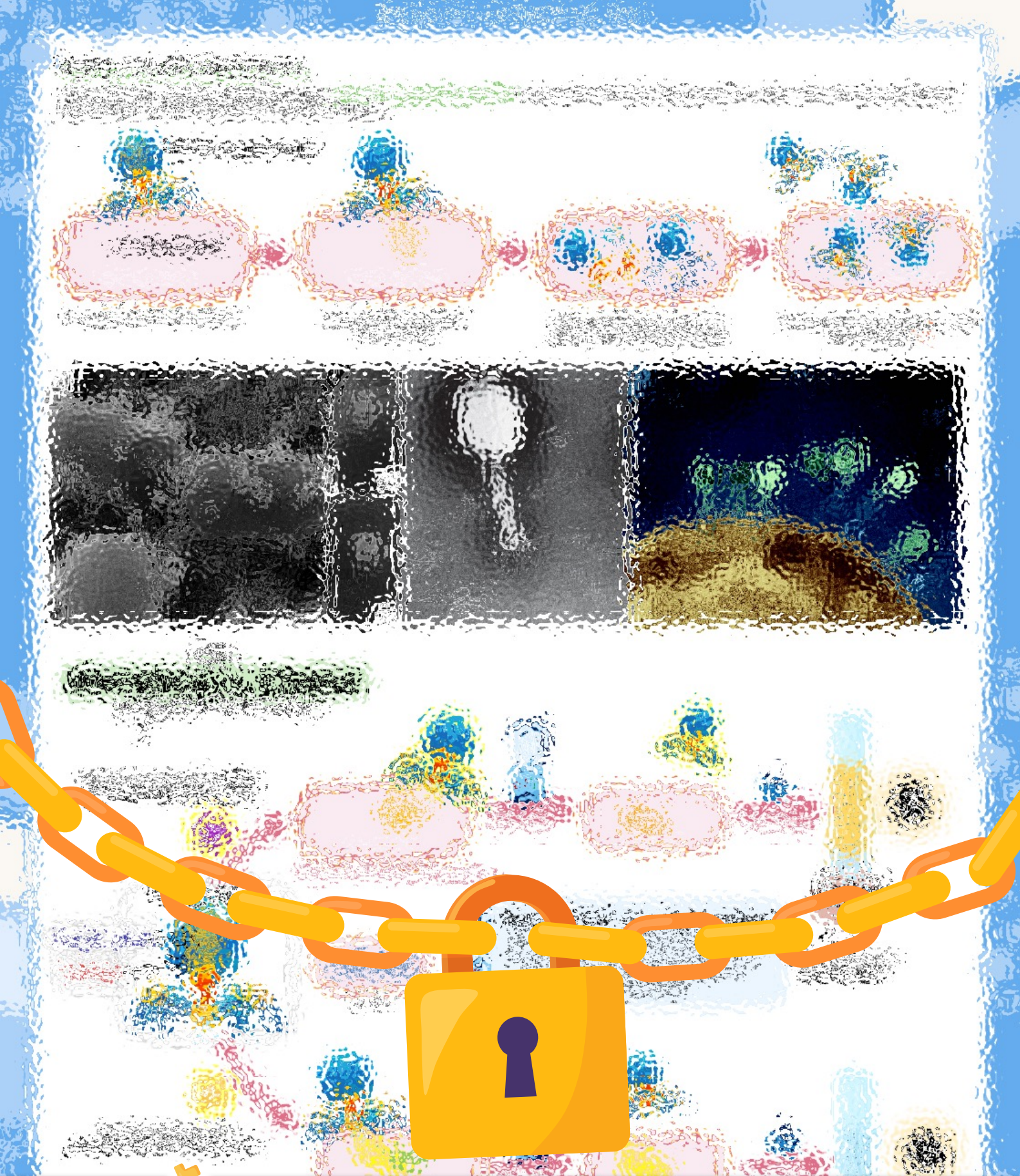
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