

# COLÓQUIO INTERNACIONAL

## Educação Formação de professores e Humanidades Digitais

Universidade de Coimbra  
14 fevereiro de 2018

*Teresa Maia e Carmo*

# ANATOMIA DE UM CRIME\*



INSTITUTO POLITÉCNICO DE SANTARÉM  
ESCOLA SUPERIOR DE EDUCAÇÃO



LICENCIATURA EM EDUCAÇÃO BÁSICA

Comunicar em Língua Portuguesa

Teresa Maia e Carmo



Ciências Físicas e Químicas

Marisa Correia

\* Filme de Otto Preminger, 1959, "de tribunal", <http://50anosdefilmes.com.br/2012/anatomia-de-um-crime-anatomy-of-a-murder/>

Chromosomes are  
ribbons of DNA, each  
containing a single  
copy of all the genetic  
information for an  
organism. DNA is  
organized into  
chromosomes, which  
are made up of DNA  
molecules that are  
tightly packed together.  
The DNA molecules  
are made up of two  
strands, one for each  
parent. The two  
strands are joined  
together by hydrogen  
bonds between the  
sugar-phosphate  
backbones of the  
two strands. The  
base pairing between  
the two strands is  
complementary, with  
adenine pairing with  
thymine, and guanine  
pairing with cytosine.  
The DNA molecule  
is a double helix, with  
the two strands  
twisting around each  
other. The DNA  
molecule is a  
polymer, with the  
sugar-phosphate  
backbone forming the  
main chain, and the  
nitrogenous bases  
forming the rungs of  
the ladder. The DNA  
molecule is a  
long, thin, flexible  
structure, which can  
be easily broken  
into fragments. The  
DNA molecule is a  
stable structure, but  
it can be damaged  
by physical or  
chemical agents. The  
DNA molecule is a  
key component of  
the cell, and it is  
essential for the  
storage and  
transmission of  
genetic information.

The first published reports of a DNA X-ray diffraction pattern were those of Rosalind Franklin and Maurice Wilkins in 1953. The DNA X-ray diffraction pattern is a characteristic 'X' shape, which is a result of the helical structure of the DNA molecule. The DNA X-ray diffraction pattern is a key piece of evidence that supports the double helix model of DNA. The DNA X-ray diffraction pattern is a complex structure, and it is a result of the interaction of X-rays with the DNA molecule. The DNA X-ray diffraction pattern is a key component of the DNA molecule, and it is essential for the storage and transmission of genetic information.

Within cells, DNA is organized into long, thin, flexible structures called chromosomes. These chromosomes are made up of DNA molecules that are tightly packed together. The DNA molecules are made up of two strands, one for each parent. The two strands are joined together by hydrogen bonds between the sugar-phosphate backbones of the two strands. The base pairing between the two strands is complementary, with adenine pairing with thymine, and guanine pairing with cytosine. The DNA molecule is a double helix, with the two strands twisting around each other. The DNA molecule is a polymer, with the sugar-phosphate backbone forming the main chain, and the nitrogenous bases forming the rungs of the ladder. The DNA molecule is a long, thin, flexible structure, which can be easily broken into fragments. The DNA molecule is a stable structure, but it can be damaged by physical or chemical agents. The DNA molecule is a key component of the cell, and it is essential for the storage and transmission of genetic information.

Trata-se de formar  
futuros professores  
do 1º Ciclo

Conhecimento  
holístico e  
integrado



# Ligando Ciências e Humanidades

...



... E trabalhando  
o aumento das  
competências  
digitais...

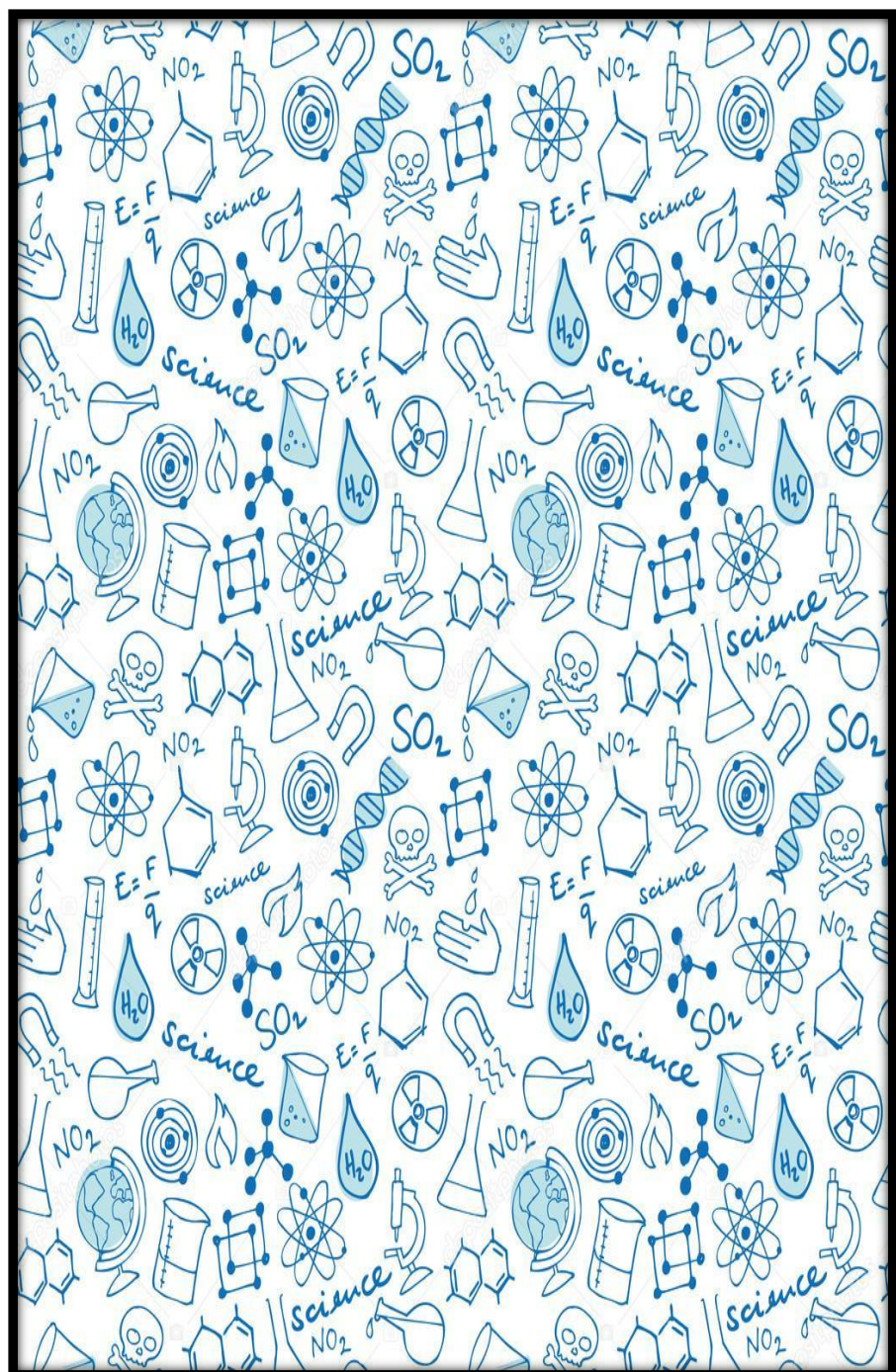


Capitalizámos o interesse pela  
ciência forense que tem crescido  
devido à disseminação das  
(muitas e boas) séries televisivas...  
juntando o interesse pelo MISTÉRIO  
de resolver crimes através de  
narrativas bem contadas

...

# E da Ciência!

*“A ciência forense é uma área interdisciplinar que envolve física, biologia, química, matemática e várias outras ciências de fronteira, com o objetivo de dar suporte às investigações relativas à justiça civil e criminal. Recentemente o público começou a dar-se conta da importância da ciência no desvendamento de crimes, talvez pelo fato da grande proliferação de programas de televisão, documentários e ficção científica ”(Chemello, 2006, p. 2)*



The background is a decorative illustration featuring several hanging lanterns of various styles, some with intricate metalwork and others with simpler designs. The lanterns are suspended by chains and are set against a backdrop of stylized, dark green foliage with small leaves. The overall color palette is a mix of dark greens, blues, and purples, creating a moody and artistic atmosphere. The text is centered in the lower half of the image.

Na UC “Comunicar em  
Língua Portuguesa”  
trabalhámos  
intensivamente a escrita...

Começando pela correção gramatical e ortográfica, pontuação, construção... todo um programa de dificuldades

**...eliminação de repetições, enriquecimento de vocabulário...**

**Técnicas de Escrita Criativa ... Tipologias Textuais ...**

Texto

Poético

Descriptivo

Informativo

Narrativo

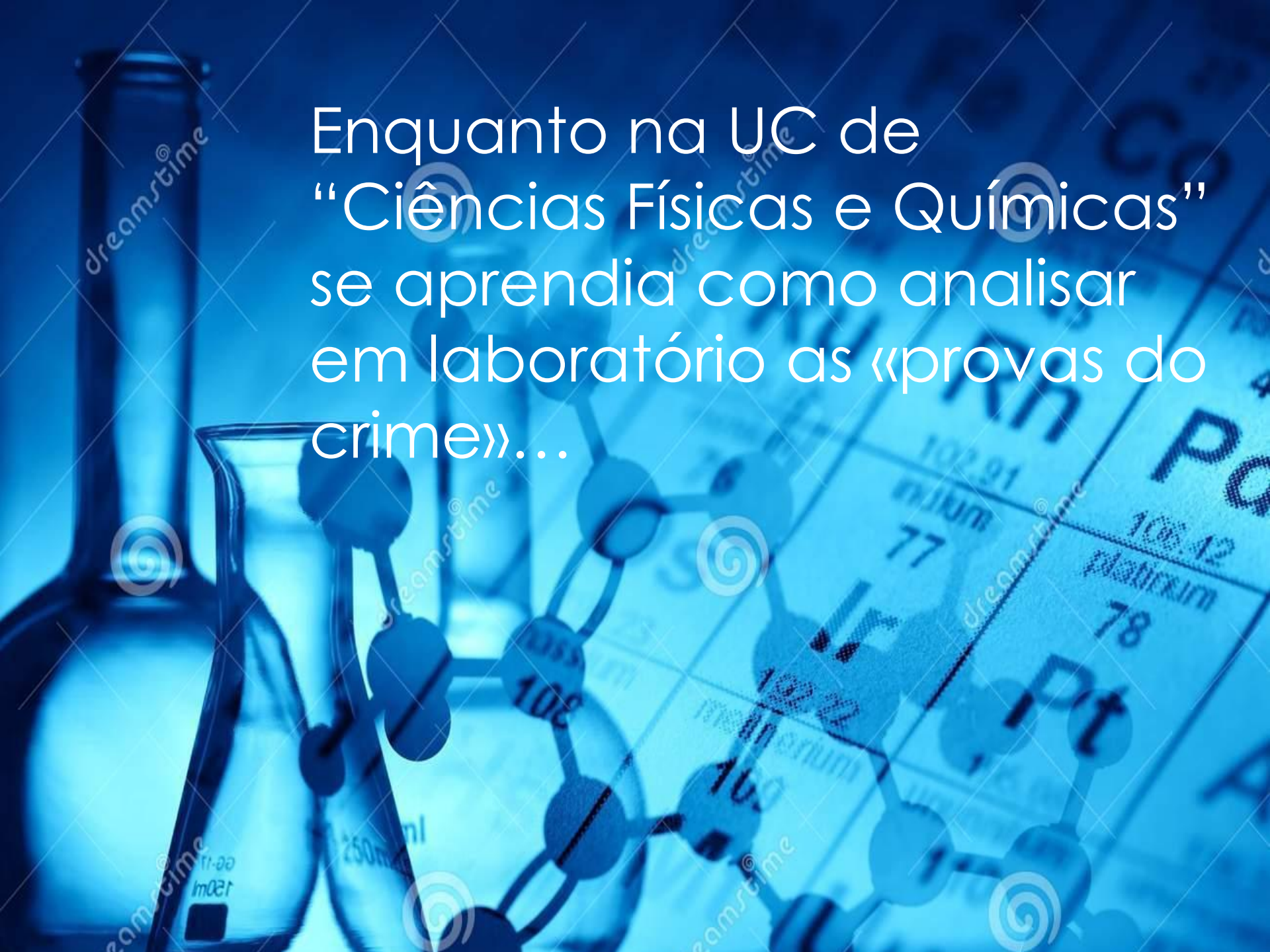
Argumentativo



# Construção e caracterização de personagens...

Alta, baixo,  
loiro,  
morena?  
Profissão dos  
pais? Local?  
Época?  
Contexto?





Enquanto na UC de  
“Ciências Físicas e Químicas”  
se aprendia como analisar  
em laboratório as «provas do  
crime»...

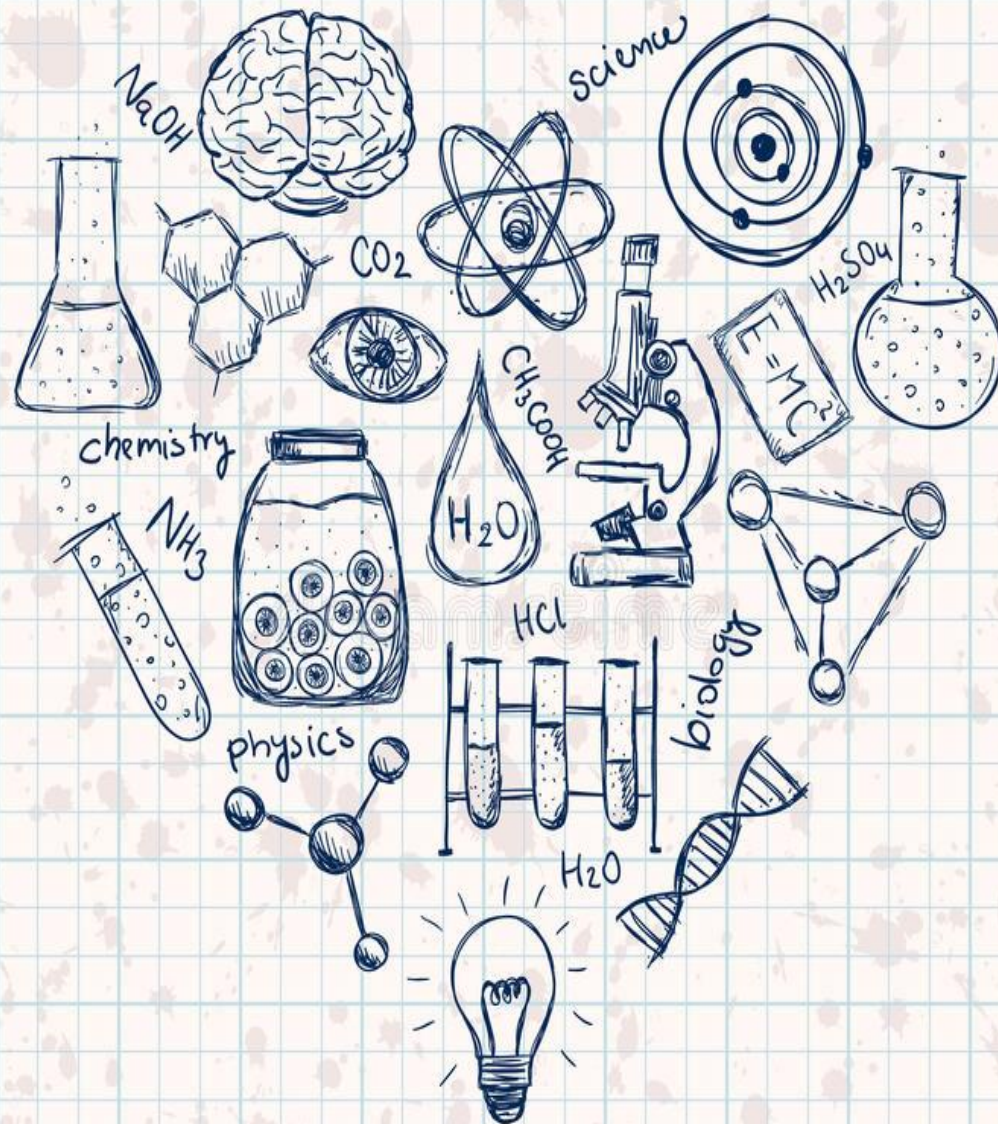
Técnicas de análise forense de:

-Impressões Digitais

-Vestígios de solo

-Amostras de Cabelo

... os três elementos que teriam de entrar na «história do crime»...



A atividade começou a ser dinamizada através do moodle...

<https://moodle.esesantarem.pt/course/view.php?id=1875>

## Investigação Criminal



Esta atividade consiste na realização de uma investigação em torno de um caso de homicídio fictício e realiza-se em colaboração com a unidade curricular *Comunicar em Língua Portuguesa*.

Acedam à página <http://cfqeses.wixsite.com/eseslabcrime>, onde encontrarão todas as informações relativas a esta atividade.

Tarefa 1 - 11 a 17/12

Técnicas de análise de provas - T1

**Acesso restrito** Disponível se: Pertence a Turma 1

Disciplina: Ciências Física X X Investigação Criminal na X

Inseguro | cfqeses.wixsite.com/eseslabcrime

Bookmarks Importado do IE Definições sapo - Pesquisa Goo The scientists who m Relaxing jazz music f Google for Education teoria hipodermica Novo separador Outros marcadores

Crie seu site WIX



**Investigação Criminal nas Aulas de Química**

WEBQUEST

Licenciatura em Educação Básica

Íncio Química Forense Etapas da Investigação Contactos



## CIÊNCIA FORENSE E INVESTIGAÇÃO CRIMINAL

*A ciência forense é uma área interdisciplinar que envolve física, biologia, química, matemática e várias outras ciências de fronteira, com o objetivo de dar suporte às investigações relativas à justiça civil e criminal. Recentemente o público*

Este site foi criado com WIX.com. [Crie Seu Site >](#)

PT 22:38 13-02-2018

Foi criado um website com todas as etapas da investigação...

<http://cfqeses.wixsite.com/eseslabcrime>

As turmas foram divididas em grupos, que criaram várias (e muito divertidas) “Histórias de um Crime”...

Foi eleita – via moodle – a **MELHOR HISTÓRIA...**

The screenshot shows a Moodle course page with a list of activities. The activities are organized into two main sections, one for Turma 1 and one for Turma 2, separated by horizontal lines. Each activity has a status icon (a purple person icon for restricted access or a green question mark for voting) and a blue 'Acesso restrito' (Restricted Access) label. The activities are:

- "História do Crime" - T1 (Restricted Access: Disponível se: Pertence a Turma 1)
- Votação da melhor "História do Crime" - T1 (Restricted Access: Disponível se: Pertence a Turma 1)
- "História do Crime" - T2 (Restricted Access: Disponível se: Pertence a Turma 2)
- Votação da melhor "História do Crime" - T2 (Restricted Access: Disponível se: Pertence a Turma 2)
- Tarefa 4 - 15 a 19/01
- Orientações para a construção dos argumentos - T1
- Orientações para a construção dos argumentos - T2
- Argumentação para o julgamento - T1

Para ir a **JULGAMENTO**  
Em TRIBUNAL

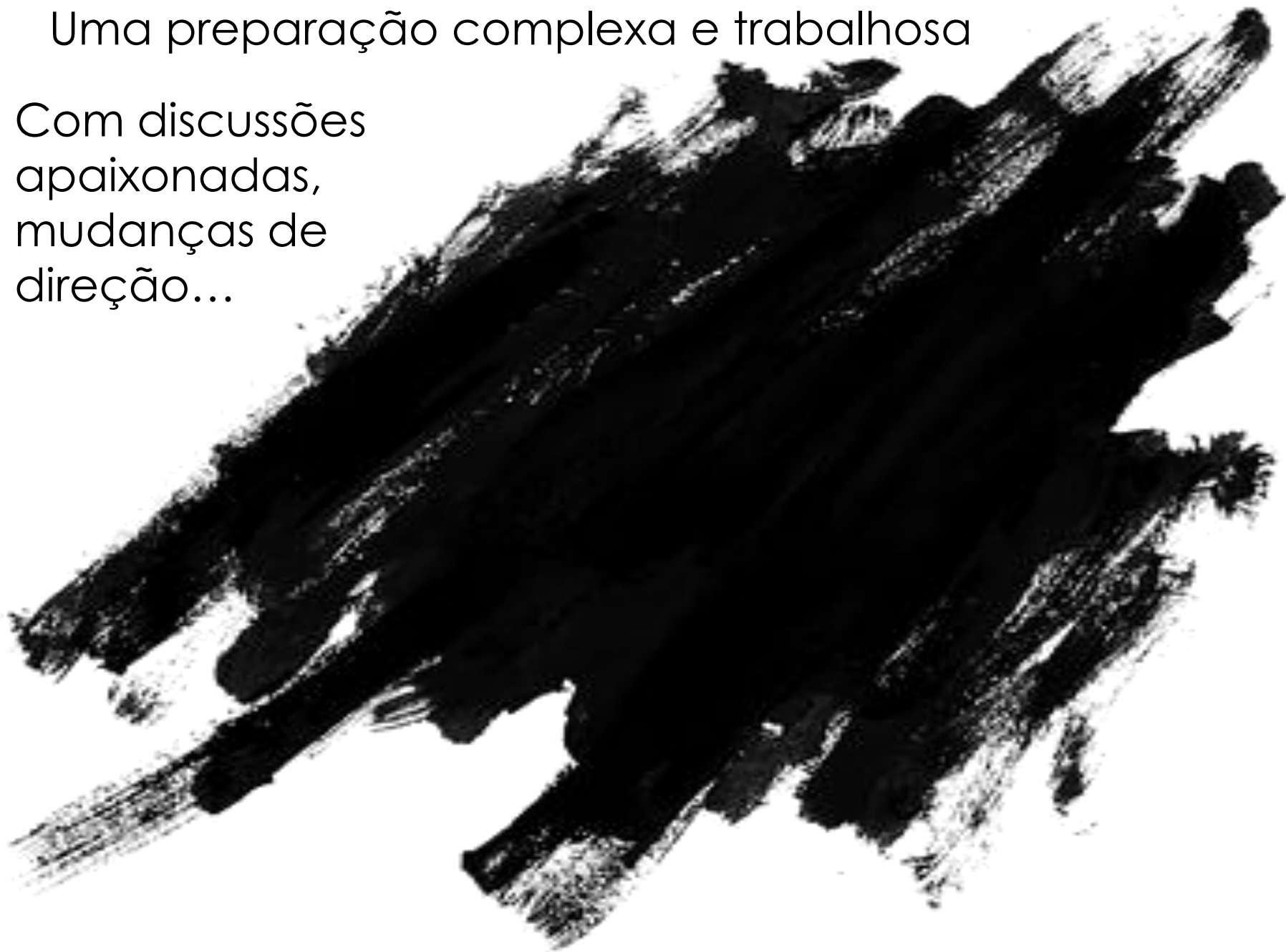


Onde cada grupo desempenhava uma função: procurador, advogado de defesa, cientista forense ou jurado...



Uma preparação complexa e trabalhosa


Com discussões  
apaixonadas,  
mudanças de  
direção...





E, sobretudo, **ARGUMENTAÇÃO**. Saber construir premissas e **defender um ponto de vista**... Científico ou retórico...

Algo muito diferente da «opinião instantânea» das redes sociais, em que tudo se resume a *likes* ou *emojis*...



tendo que resolver  
problemas, muitos deles  
decorrentes das  
plataformas digitais em  
que também decorria o  
exercício

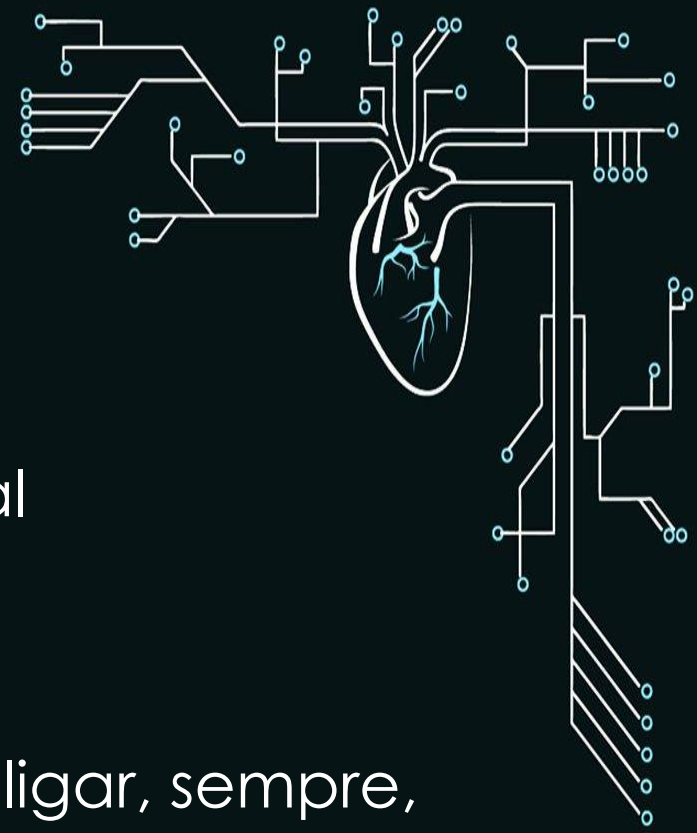


... mas que, no final, acabou por resultar numa atividade de que os alunos reconhecidamente gostaram (inquéritos em fase de tratamento)

... e às docentes forneceu pistas de melhoria e caminhos de superação das dificuldades observadas



Especialmente no papel que, precocemente, devem ter as tecnologias digitais na formação de futuros professores, “condenados” a novas gerações cada vez mais tecnológicas... não sendo algo tão evidente como se pensa, em especial em alunos de primeiro ano.



Além da importância de ligar, sempre, ciências exatas e humanidades, conhecimento e *soft skills*, competência(s) e empatia.



Muito obrigada pela  
vossa atenção!

Teresa Maia e Carmo

Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known organisms and many viruses. Like all nucleic acids, DNA is a long polymer of nucleotides. Each nucleotide consists of a phosphate group, a deoxyribose sugar, and a nitrogenous base. The bases are attached to the sugar-phosphate backbone and are therefore not generally visible to the naked eye. The sequence of these bases encodes the genetic information. This information is passed on from one generation to the next through the process of copying stretches of DNA into the messenger RNA, a process called transcription.

Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cell division. In prokaryotes, a single circular DNA molecule contains the entire genome. In eukaryotes, DNA is organized into chromosomes, each containing a single molecule of DNA. The DNA is packaged into nucleosomes, which are further organized into higher-order structures such as chromatin fibers and chromosomes. These compact structures are essential for the efficient storage and transmission of genetic information. The interaction between DNA and other proteins, such as histones, is crucial for the regulation of gene expression and the overall structure of the DNA molecule.

DNA exists in more possible conformations than RNA. A DNA, B DNA and Z DNA. Although only B DNA and Z DNA have been directly observed in nature, A DNA and C DNA have been observed in laboratory experiments. The conformation that DNA adopts depends on the hydration level, chemical environment and electrical properties. Chemical and physical properties, such as the type and concentration of ions, and the presence of polyanions in solution.

The first published reports of A DNA X-ray diffraction patterns were published in 1953 by Rosalind Franklin and Maurice Wilkins. The A DNA conformation is a compact, wide, zig-zag structure. It is the most common form of DNA in dehydrated conditions. The A DNA conformation is characterized by a deep major groove and a shallow minor groove. The A DNA conformation is also characterized by a high degree of base pairing and a high degree of stability.

Compared to B DNA, the A DNA form is a more compact, wide, zig-zag structure. It is the most common form of DNA in dehydrated conditions. The A DNA conformation is characterized by a deep major groove and a shallow minor groove. The A DNA conformation is also characterized by a high degree of base pairing and a high degree of stability.

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