

SAN01_ MÒDUL 07: OPERACIONS BÀSIQUES DE LABORATORI
UF 2 Activitat N°4 Mrs. Hydes at Pharmaceutical Laboratory

Type of activity: Role game	Topic: Mrs. Hydes at Pharmaceutical Laboratory
Grouping: Individual, pairs, small group and whole group	Resources: TIC 1. Student document: The beginning. Character's description. Cards. Pharmaceutical problems. 2. Student grammar support: descriptive words 3. Teacher documents: problem's solutions 4. Teacher grammar support - answer key 5. New terminology template. 6. Bibliography
Timing: 120'	Outcomes: At the end of the lesson, students will be able to prepare pharmaceutical products with a determinate concentration, doing the needed mathematical operations and employing the appropriate technique and lab equipment.

The **aim** of this activity is to review all the contents studied on this UF while the entire group is playing at *Hrs. Hydes*. This role game enhances to develop an emphasis the motivation on students using English and reviewing the contents, in order to complete work requirements, enhancing communication strategies and techniques, adapting to the contents that will be transmitted, to the purpose and to the characteristics of the receivers, to ensure the efficiency in the communication processes.

Directions

The best time to play at Mrs Hydes it's at the end of the UF before the exam, in order to review all the important contents in a dynamic and hilarious game.

There are two especial grammar focus; one on descriptive words in orders to enrich the vocabulary; the second grammar goal is focused on reviewing the principal types of questions, and uses them while the game is running.

- The teacher reads the background story (student document: *The beginning*) and explains the role playing game's rules supported by the projected information (Student document: *character description; goals and skills*).
- Once all the students have understood the Role game, they will sit down in a circle with enough space between them in order to allow the Narrator to movement.
- The teacher hands out the character cards (student document *Character card*), one for each student, and repeats the skills and game's goal of each one, showing the information projected on the whiteboard (students document *Character's description*)
- The students see their card, but cannot see anybody else's.

- The teacher will be the Narrator, managing the game and giving **instructions** each time:
- **Go to sleep!** Every night all the participants will close their eyes with their card in front of them and be quiet.
 - **Wake up silently!** The exceptionally skill's characters will be called once at time during the night, while the rest are sleeping (cupid, exceptionally gifted, Hrs Hydes...). The called characters will open their eyes at a time and they will recognize themselves and complain to use their skills in order to advance in their own goal and win the game.
Nobody can see or hear their movements because they are acting silently at night while everybody else is sleeping. Once their action is done, they close their eyes again.
 - **Everybody, wake up!** When all of the characters with special skills have acted, all of workers open their eyes, and listen to the Narrator explain what happened last night.
 - **Consequence** of last **night**. The Narrator explains what happened last night, which was *selected* by Mrs. Hydes to solve a pharmaceutical problem. If the selected worker doesn't know to solve the problem in time, he/she will be fired and his/her game will finish.
 - **Hunting Mrs. Hydes:** Every morning, after hearing about the tragic act that happened the previous night, all of the lab workers will discuss, and defence themselves to prove their and vote who they think Mr. Hyde is. The most voted student will solve a pharmaceutical problem. If the selected worker doesn't know to solve the problem in time, he/she will be fired and his/her game will finish.

Fired workers have to show their card at the rest of the ex-colleges

1. Before starting

- The teacher reinforces the importance of no cheating in order to play a fair game.
- The descriptions of the different characters are projected onto the whiteboard in order to help the students learn the rules, especially at the beginning of the game.
- Everybody has a card and understands their role.
- The teacher encourages to use a huge variety of descriptive words supported by the document *Descriptive words*, in order to give the grammar price at the end of the game. This price will be given at player how most times have been used descriptive words.

2. Start Mr Hyde in Pharmaceutical Laboratory

- Everybody sits in a circle and has their card in front of them, but making sure no one else can see who their character is.
- The game starts with the selection of the principal investigator. This position grants special privileges.
- After their first day at work, every worker goes to sleep and the Narrator begins explaining the instructions.

3. When it finish?

- When there are most Mrs. Hyde playing than normal workers, Mrs. Hyde win the game.
- If all Mrs. Hyde are fired, normal workers will win the game.
- The players are encouraged to use descriptive words while they are playing. The narrator has written how many times have used one descriptive word, in order to nominate the grammar winner at the end of the game.

1. STUDENT DOCUMENTS

The beginning of Mr Hydes

In an international and enormous chemical laboratory where English is the language used at work, there are different characters working, like the principal investigator, some laboratory technicians, one student intern, one exceptionally gifted worker, a trade unionist, and a few Mister Hydes has hidden among the rest of the characters.

Every morning at work, one of the members of the working team finds a wicked problem that must be solved in two minutes or risks losing his/her job. Everybody knows how difficult it is to find a good job like this and also how easy it is to lose it.

All of the members of the laboratory want to work without this anguish every morning and they must discover and fire all of the Mrs. Hydes hidden among them.

Characters description: Goals and skills

Laboratory worker

They have to study and make a lot of effort to obtain this job; two years at La Guineueta and then pass English exam.

They don't have any special skills, just dream at night and run the risk of being fired each morning if Mr. Hyde has put a wicked problem on their desk.

They have to determine who Mr. Hyde is to keep their work safe. They discuss every day to try to determine who he is, and fire the suspected person if he/she doesn't resolve one Chemistry problem.

Student intern

There is only one member of the lab staff who is still studying and doing her/his laboratory internship.

Her/his special skill is to be safe in case he/she doesn't know how to answer the wicked problem.

Trade unionist

He/she is a laboratory worker, but also a trade unionist. AETEL is the union of laboratory technicians in Spain.

He/she knows all of the workers' rights very well and if he/she is fired, he/she can fire whoever he/she wants with him/her.

If Mr. Hyde knows who the trade unionist is, he avoids giving a wicked problem to him/her.

Exceptionally gifted

Only one of the workers was the best student and now is an exceptional worker.

His/her skill is to see who each of their colleagues is each night, and tries to convince the rest of the group to fire Mr. Hyde

Be careful! Mr. Hyde wants to fire him/her because he/she is very dangerous for him.

Principal investigator

This important position is chosen by the entire staff, anyone could be selected as a principal investigator, including Mr. Hyde.

All candidates have to explain their investigation in order to be selected.

Her/his skill is very important because their vote is worth double, in case of a draw the principal investigator's vote is worth double.

Mr Hyde

During the day they are normal workers.

Each night they wake up and work together looking for one victim, putting one wicked problem to fire every normal worker, especially the "exceptionally gifted" worker.

If Mr Hyde knows who the "exceptionally gifted" is, they will go for him/her, because he/she is dangerous for them.

They avoid the trade unionist, because he/she could fire them with him/her.

Cupid

During the day cupid is a normal laboratory worker.

The first night he/she wakes up and choose the couple of lovers, his/herself could be selected to drink the potion of love.

If any of the fooling in love is fired, the other will goes with him/her, for this reason they must protect each other.

Character cards

There is one card for student and six different characters. They have to be cut off and paste the same back card.



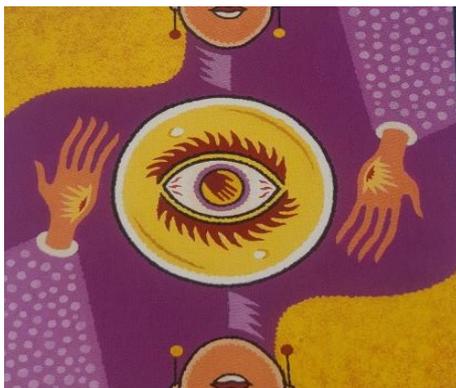
Laboratory worker

Fig 1 image taken from Moziru.com



Intern student

Fig 2 image taken from Moziru.com



Exceptionally gifted

Fig 3 taken from Castronegro



Trade unionist

Fig 4 image taken from Comic Rack – Dexter's Laboratory



Back card (one for each card)

Fig 5 taken from Fandom



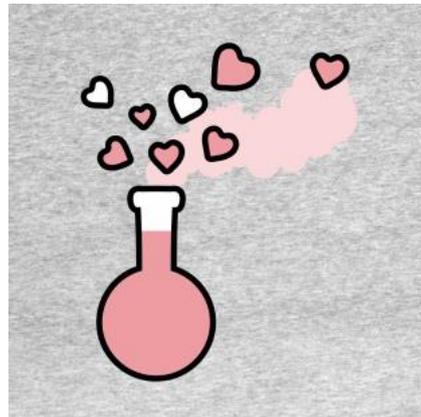
Mr Hyde

Fig 6 taken from Fandom



Principal investigator

Fig 7 image taken from Castronegro



Cupid

Fig 8

Pharmaceutical problems

Each morning everybody come back to the laboratory, but the consequence of last night is that one of them - how has been selected by Mrs. Hydes - has in his/her desk one pharmaceutical problem. The Mrs. Hydes victim has to resolve the problem to avoid been fired.



1. **What should be the Molarity and Normality of a dissolved dissolution solution:** W_A : Na= 23; O = 16; H = 1.

a) 4 g of sodium hydroxide (NaOH) in 1 liter of water?

b) And if they had been dissolved in 250 ml of water instead of 1 liter?



2. a) How many (Å) are 240 dm?

b) How many kilograms are 3,9 ng?

c) How many femtomols are 2,5 pmol?

d) How many miligrams per deciliter are 23 g/l?



3. **Fill the gaps:**

Factor	Prefix	Symbol
10^3		
	hecto-	
		n
	deca	
		d
10^{-12}		
	mili	



4. **Change the units:**

• $1.25 \mu\text{L} = \underline{\hspace{2cm}} \text{ mL}$

• $7.6 \text{ mg/mL} = \underline{\hspace{2cm}} \text{ g/L}$

• $4.87 \text{ ng} = \underline{\hspace{2cm}} \text{ g}$



5. **Write the formula:**

- % experimental error =
- E_{absolute} =
- % E_{relative} =



6. Calculate the E_a and E_r for this measure $4,500 \pm 0,005$ g.



7. Calculate the % $E_{\text{experimental}}$ in a lab experiment with a density's liquid = $0,9876$ g/cm³ and theoretical value = $0,1325$ g/cm³



8. Convert into scientific notation:

- 0.000045 g = _____ g
- 679 dg = _____ dg
- 129876 μ L = _____ μ L



9. Say how to mix this solid according to *Geometrical dilutions*:

- Magnesium stearate 7g
- Talc _____ 1g
- Lactose _____ 28g
- Roboflavine _____ csp



10. Say what is the external -majority- phase:

- W/O - A/O in Spanish
- O/W - O/A



11. What're the components in a solution?



12. Say a pharmaceutical example of heterogeneous mixture.



13. Calculate the %w/w of a solution with 15 g of C_uSO_4 in 0,5 Kg of water.



14. If there are 200 g of paracetamol in 15% w/w lactose, how many grams there are of lactose?

15.  Calculate the concentration % v/v in a solution with 150 mL of ethanol and water since arriving at 1000 mL.
16.  Calculate the concentration – g/L – in a solution prepared after dissolved 0.15 Kg of a solute in enough water since complete 0.25 L of solution.
17.  Write the molarity's formula:
18.  How many grams are necessary to obtain 250 mL in a solution 2.5M?

2. STUDENT GRAMMAR SUPPORT

The aim of this session is to review how to generate the different types of questions, follow the teacher explications to review how to construct a question.

Then enrich your vocabulary and made your character more interesting, using describing words.

To practice this grammar there are **two activities**:

I. Look at the next table and fill the gaps using the correct question.

Q-ANSWER YES/NO	NORMAL VERBS	<i>Ex: Do Mrs. Hydes choose a victim?</i>	Yes, they do. Mr Hyde chooses a victim.	
	TO BE		Yes, she is. She is Mr Hyde	
	MODALS VERBS		Yes, she can. She can resolve the problem.	
Q- WORD ANSWERS	WHO person		You are Hr Hyde.	
	WHAT thing		I think that her alibi is false.	
	WHEN time		I weak up in the morning.	
	WHERE place		I go to sleep early. I live in the city, close to the laboratory.	
	WHICH a chooses among few items		The most believable alibi is made the problem.	
	WHY reason		I take that medicine because, I have a cold	
	HOW the way somebody do something		I help my colleagues resolving problems.	
Q- W + AUXILIARY VERB + SUBJECT + MAIN VERB	HOW State of being		I'm fine, thanks	
	Q- WORDS - WITH TWO OR MORE – WORDS	WHAT + TIME hour minutes	I wake up at seven o'clock in the morning.	
	Q- W + Ws + AUXILIARY VERB + SUBJECT + MAIN VERB	WHOSE + NOUN possession		It's a cupid's potion. They are Mr Hyde's potions
		HOW LONG time		It takes two minutes maximum.
		HOW FAR distance		It's about 500 miles
		HOW MUCH + UNCOUNTABLE NOUN quantity		I have so much fear of Mr Hyde.
HOW MANY + COUNTABLE NOUN quantity			I have to resolve one problem.	

II. Use descriptive words to analysis characters.

3. TEACHER DOCUMENTS

The **key words** of the student document: "Pharmaceutical problem" are hyperlinked to Oxford dictionary.

Molarity	Concentration
Dissolution	Formula
Error	Units
Mixture	Solute

Problem's solutions

1.

a) 0,1 M i 0,1 N

b) 0,4 M i 0,4 N

2.

a) $2,4 \times 10^{11}$ Å

b) $3,9 \times 10^{-12}$ kg

c) $2,5 \times 10^3$ fmol

d) $2,3 \times 10^3$ mg/dl

3.

Factor	Prefix	Symbol
10^3	Kilo-	k
10^2	hecto-	h
10^{-9}	nano	n
10	deca	da
10^{-1}	deci	d
10^{-12}	pico	p
10^{-3}	mili	m

4.

- $1.25 \mu\text{L} = 1.25 \cdot 10^{-3} \text{ mL}$

- $7.6 \text{ mg/mL} = 7.6 \text{ g/L}$

- $4.87 \text{ ng} = 4.87 \cdot 10^{-12} \text{ g}$

5.

- $$\% \text{ experimental error} = \frac{|\text{experimental result} - \text{theory result}|}{\text{Theory result}} \cdot 100$$
- $$E_{\text{absolute}} = |V_{\text{real}} - V_{\text{aprox}}|$$
- $$\% E_{\text{relative}} = \frac{E_a}{V_{\text{real}}} \cdot 100$$

6.

$$E_a = 0.005$$

$$E_r = \frac{0.005}{4.5} \cdot 100 = 0.11 \%$$

7.

$$\% E_{\text{experimental}} = 86.58\%$$

8.

- $0.000045 \text{ g} = 4.5 \cdot 10^{-5} \text{ g}$
- $679 \text{ dg} = 6.79 \cdot 10^2 \text{ dg}$
- $129876 \text{ }\mu\text{L} = 1.29876 \cdot 10^5 \text{ }\mu\text{L}$

9.

- 1st: 1g Talc + 1g Mg and riboflavine
- 2nd: add 2g Mg
- 3rd: add 4g Mg
- 4th: add 8 g Lac
- 5th: add 16 g Lac
- 6th: add 4 g Lac

10.

- W/O - A/O in Spanish: **Oil**
- O/W - O/A: **Water**

11.
Solute and solvent
12.
Effervescent pill in water
13.
3%
14.
30 g lactose
15.
15 % v/v
16.
30.44g/L
17.
 $M = \text{g solute/L dissolution}$
18.
0.625 g

4. TEACHER GRAMMAR SUPPORT - ANSWER KEY:

I. Solutions different types of questions.

During the game, the students should use different types of questions in order to discover how Mr Hyde is. This question's table could be a useful summary.

Q-ANSWER YES/NO	NORMAL VERBS	Does Mr Hyde choose a victim?	Yes, he does. Mr Hyde chooses a victim.	
	TO BE	Is she Mr Hyde?	Yes, she is. She is Mr Hyde	
	MODALS VERBS	Can she resolve the problem?	Yes, she can. She can resolve the problem.	
Q-WORD ANSWERS	WHO person	Who is Mr Hyde?	You are Hr Hyde.	
	WHAT thing	What do you think about her alibi?	I think that her alibi is false.	
	WHEN time	When do you wake up?	I wake up in the morning.	
	WHERE place	Where did you go last night? Where do you live?	I go to sleep early. I live in the city, close to the laboratory.	
	WHICH a choose among few items	Which is the most believable alibi?	The most believable alibi is made the problem.	
	WHY reason	Why do you believe her?	I take that medicine because, I have a cold	
	HOW the way somebody do something	How do you help your colleagues?	I help my colleagues resolving problems.	
Q-W + AUXILIARY VERB + SUBJECT + MAIN VERB	HOW State of being	How are you?	I'm fine, thanks	
	Q- WORDS - WITH TWO OR MORE - WORDS	WHAT + TIME hour minutes..	What time do you wake up?	I wake up at seven o'clock in the morning.
	Q-W + Ws + AUXILIARY VERB + SUBJECT + MAIN VERB	WHOSE + NOUN possession	Whose potion is this? Whose potions are those?	It's cupid's potion. They are Mr Hyde's potions
		HOW LONG time	How long does it take to resolve the pharmaceutical problem?	It takes two minutes maximum.
		HOW FAR distance	How far is the pharmacy laboratory from your home?	It's about 500 miles
		HOW MUCH + UNCOUNTABLE NOUN quantity	How much time do you have to resolve the problem?	I have only two minutes to resolve the problem.
	HOW MANY + COUNTABLE NOUN quantity	How many problems do you have to resolve?	I have to resolve one problem.	

TO KNOW MORE

If you want to know more about questions in English, you could see this video



[Learn about "Wh" Questions in English Grammar](#)

Other grammar goal is to use some of these describing words in order to describe their character, formulate their alibi, or to convince their colleagues how Mr Hyde is.

Descriptive words that can be used for a person's **Physical qualities**

Positive

Authentic	Inspirational	Reactionary
Conservative	Ironic	Realistic
Controversial	Liberal	Recondite
Credible	Melodramatic	Romantic
Cultural	Mystical	Satiric
Didactic	Naturalistic	Scholarly
Dramatic	Objective	Significant
Esoteric	Orthodox	Spiritual
Expressionistic	Philosophic	Subjective
Fanciful	Plausible	Symbolic
Humanistic	Pragmatic	Utilitarian
Humorous	Profound	Impressionistic
Radical		

Negative

Absurd	Commonplace	Heretical
Improbable	Incredible	Insignificant
Intolerant	Pedantic	Prejudiced
Shallow	Superficial	Trivial
Unscholarly		

Positive

Active	Exquisite	Pretty
Adept	Fair	Ravishing
Adroit	Fascinating	Robust
Agile	Good-looking	Shapely
Attractive	Graceful	Skilful
Beautiful	Handsome	Spirited
Brawny	Hardy	Spruce
Charming	Immaculate	Stalwart
Comely	Lively	Strapping
Dainty	Lovely	Strong
Dapper	Manly	Sturdy
Delicate	Muscular	Virile
Dexterous	Neat	Vivacious
Elegant	Nimble	Winsome

Negative

Awkward	Graceless	Repulsive
Bizarre	Grotesque	Sickly
Cadaverous	Hideous	Slovenly
Clumsy	Homely	Spare
Coarse	Horrible	Thin
Decrepit	Incongruous	Ugly
Effeminate	Invidious	Ungainly
Emaciated	Loathsome	Unkempt
Feeble	Odious	Unmanly
Frail	Repellent	Unwomanly
Gawky	Repugnant	Weak

In order to understand all the *descriptions words* the teacher will ask at the students the meaning of each one, using feedback most of the vocabulary will be understood and will be prepared to be used during the game.

Each time one of them have used new vocabulary, the teacher will write the word on the whiteboard connected to the player's name. The grammar goal is to use the new vocabulary, the more the better.

You will be able to learn the following descriptive words, it could be useful when you're playing to Mrs. Hydes.

6. BIBLIOGRAPHY

Imatge	Dades
	<p>Nom: Baker street</p> <p>Autoria:</p> <p>Llicència:</p> <p>URL: http://bakerstreet.wikia.com/wiki/Doctor_Jekyll_and_Mister_Hyde</p>
Imatge	Dades
	<p>Nom: Moziru</p> <p>Autoria:</p> <p>Llicència:</p> <p>URL: http://moziru.com/explore/Scientist%20clipart%20science%20class/</p>
Imatge	Dades
	<p>Nom: dad's big plan</p> <p>Autoria:</p> <p>Llicència:</p> <p>URL: http://www.dadsbigplan.com/2014/06/comic-rack-dexters-laboratory-2014-2/</p>
Imatge	Dades
	<p>Nom: Los hombres lobo de Castronegro</p> <p>Autoria: Castronegro</p> <p>Llicència:</p> <p>URL: http://www.fotolog.com/teidolatro/30280075/</p>
Imatge	Dades
	<p>Nom: Jessica Lu, Bachelor of Arts (Cell Biology), Columbia University</p> <p>Autoria: Audio and grammar correction</p> <p>Llicència:</p> <p>URL: https://www.linkedin.com/in/jessica-lu-89b15348</p>