Institut Montserrat Colomer
Laura Serra Font, Anna Tarafa Mata and Carmen Torres Piñango

Generació Plurilingüe (GEP)
Year 2
2019-2020

Identification of the GEP project

Title	**What do we find inside the living things?**
Authorship	**Laura Serra Font, Anna Tarafa Mata and Carmen Torres Piñango**
School	**Institut Montserrat Colomer**
Students' CEFR Level (A1, A2...)	**A1**
Grade	**1st ESO**
Content area(s)	**Biology-Geology and Technology**
Number of sessions (4, 6 or 9)	**10 sessions**
Teacher(s) involved	**Laura Serra Font, Anna Tarafa Mata and Carmen Torres Piñango**
Keywords	**Living things, cell, prokaryote and eukaryote, animal and plant cell, unicellular, pluricellular, draw, cut, paste, build, weld, program, block, move, degrees, clear, LED, motor, wire, tin, recycled material, plastic, wood, paper.**

1. OUR PROJECT

Introduction: The aim of the project is to make students aware of the importance of cells in our body by making them know what is the difference between having cells or not , being able to distinguish between living things and non- living things.

To accomplish it, our students will study the types of the cells and their structures by building a 3D cell model using recycled materials so they will learn the importance of reusing and recycling and will be able to give advice to their partners on how to make a sustainable use of them.

All the activities carried out throughout the project are uploaded in Google Classroom so the students can have access to them in a very easy way.

Driving question: What do we find inside the living things?

Final product: The final product will be a 3D cell model with organelles movement using arduino technology and an oral presentation in order to make people aware of the importance of having cells inside our body.

2. GOALS	2. HOW DO YOU KNOW STUDENTS ARE MAKING PROGRESS? (assessment criteria)
1. **Describe** the parts and functions of the cells and be able to explain them to the rest of the class helped by a 3D cell model.	1. They can explain what the cell is and distinguish all its types and and their structures by using the appropriate language.
2. **Make a model** to appreciate the movement of the different organelles that form the cell.	2. They can make other students aware of the importance of having cells inside our body in a simple way by using the appropriate vocabulary.
3. **Persuade** the students of the importance of recycling.	3. They can give advice to other students and teachers on how to make a sustainable use of materials by recycling paper and plastic by using the correct modal verbs (must, should and could).

3. CURRICULUM CONNECTIONS
SPECIFIC COMPETENCES AND KEY CONTENTS

Subject-matter curriculum		Foreign language curriculum	
Specific Competences	**Key Contents**	**Specific Competences**	**Key Contents**
Science Competences C2. Identificar i caracteritzar els sistemes biològics i geològics des de la perspectiva dels models, per comunicar i predir el comportament dels fenòmens naturals. C5. Resoldre problemes de la vida quotidiana aplicant el raonament científic. C11. Adoptar mesures amb criteris científics que evitin o minimitzin els impactes mediambientals derivats de la intervenció humana. **Technology Competences** C9. Dissenyar i construir objectes tecnològics senzills que resolguin un problema i	**Science Contents** CC9. Cell model CC10. Living things model **Technology Contents** CC24. Disseny i construcció d'objectes tecnològics. CCD6. Robòtica i programació CCD27.Sostenibilitat: mesures d'estalvi	C1. Obtenir informació i interpretar textos orals de la vida quotidiana, dels mitjans de comunicació i de l'àmbit acadèmic C3. Emprar estratègies d'interacció oral d'acord amb la situació comunicativa per iniciar, mantenir i acabar el discurs C5. Interpretar els trets contextuals, discursius i lingüístics d'un text i reconèixer la seva tipologia per comprendre'l. C8. Produir textos escrits de diferents tipologies i formats aplicant estratègies de textualització.	CC1. Comprensió oral: global, literal i interpretativa, a partir de fonts adaptades o autèntiques. CC2. Estratègies de comprensió oral: identificació de paraules i expressions clau; anticipació i formulació d'hipòtesis a partir dels coneixements previs sobre la situació, selecció, interpretació, inferència, retenció. CC3. Estratègies de producció oral: compensació, fórmules d'inici, manteniment i finalització del text oral. Textos semiformals i no formals, planificats i no planificats, presencials o digitals. CC4. Estratègies d'interacció oral: fórmules d'inici,

avaluar-ne la idoneïtat del resultat C11. Adoptar mesures amb criteris científics que evitin o minimitzin els impactes mediambientals derivats de la intervenció humana			manteniment i finalització de la conversa; fórmules de cortesia, acord i discrepància, oferiment i demanda d'aclariments, confirmació de la informació i de la comprensió, col·laboració, autocorrecció, correcció mútua. CC8. Estratègies de comprensió per a l'abans, durant i després de la lectura: distinció d'idees rellevants i secundàries, realització d'hipòtesis i d'inferències, localització de paraules clau, identificació de la idea general del text, així com d'informació específica. CC12. Adequació, coherència i cohesió per a la producció de textos escrits.

4. 21st CENTURY COMPETENCES			
Collaboration	X	Information, media and technology	
Communication	X	Leadership & Responsibility	
Critical Thinking and Problem Solving	X	Initiative & Self-direction	
Creativity & Innovation	X	Social & Cross-cultural	
Others: **Scientific and Technology literacy**			

5. KEY COMPETENCES			
Communicative, linguistic and audiovisual competence	X	Digital competence	X
Mathematical competence		Social and civic competence	
Interaction with the physical world competence	X	Learning to learn competence	
Cultural & artistic competence		Personal initiative and entrepreneurship competence	

6. CONTENT (Knowledge and Skills)	
CONTENT-RELATED KNOWLEDGE	**CONTENT-RELATED SKILLS**
Science knowledge: - Structure and functions of the cell. - Types of cells. - Functions of the organelles. **Technology knowledge:** - A cell model. - A sustainable use of materials by recycling (paper and plastic).	- Being creative when building a cell model. - Being able to communicate themselves properly in an oral presentation. - Collaborating in working groups in order to develop all the proposed activities. - Showing interest and curiosity throughout the project.

7. REFERENCES

Websites:
https://pixabay.com/ (free images)
https://www.pexels.com/ (free images)
http://www.sheppardsoftware.com/health/anatomy/cell/index.htm (online activities)
Books:
Biologia i Geologia 1ESO, Santillana Grup Promotor.

8. COMMENTS (optional)

9. ACKNOWLEDGEMENTS (optional)

Skills: R: reading , S:speaking, L: listening, W: writing, I: Interaction
Interaction: T-S: teacher-student, S-S: student-student, SG: small groups, WG: whole group, S-Expert, S-World
Assessment: PA: Peer assessment, SA: Self-assessment, TA: Teacher assessment, AT: Assessment tools

10. UNIT OVERVIEW

Session	Activities	Timing	Skills	Interaction	ICT	Assessment
1	1. A video visualization.	5 min	S, L			
	2. Introduction about the project.	10 min	L	T-S		
	3. KPSI	10 min	R, W		X	SA
	4. Brainstorming.	30 min	S, L	T-S, WG		
2	5. Storyboard	55 min	S, L, R, W	T-S, WG		PA
3	6. Quizlet	40 min	R, L	T-S, S-S	X	

	7. Making teams, distribution of members' roles and general daily scaffolding.	15 min	S, L, I	T-S, S-S, SG		
4	8. A video visualization.	5 min	L	WG		
	9. Visual input activity	50 min	L, W, I	T-S, SG		PA
5	10. Placemat	35 min	L, R, S, W, I	T-S, S-S, SG, WG		
	11. Introduction of materials and giving a technical report	10 min	L	T-S		
	12. Distribution of the things to build.	10 min	L, S, I	T-S, S-S, SG		
6	13. Use of English	5 min	L	T-S		
	14. Kahoot (Tools)	25 min	S, R	T-S, SG	X	TA
	15. Construction the 3D cell model	25 min	S, W, R, I	T-S, S-S, SG	X	

7	14. Construction the 3D cell model	20 min	S, W, R, I	T-S, S-S, SG	X	
	15. Programming.	35 min	L, S, W, I	T-S, SG	X	
8	16. Programming.	55 min	S, W, I	S-S, SG	X	
9	17. Building the 3D cell model.	55 min	S, W, I	S-S, SG	X	
10	18. Oral presentation preparation.	55 min	S, W, I	S-S, SG		
11	19. Oral presentation.	45 min	S, L	T-S, S-S		AT
	20. KPSI	10 min	R, W		X	SA

11. SESSION PLANNING

SESSION 1: Initial activity

Objectives of the session: **Introducing the topic and checking the students' previous knowledge.**

Content-obligatory language for the session: vocabulary related to the video, students' language support to discuss (starters, expressing an opinion, time to think, communication control-listener, agreeing, disagreeing, expressing doubts, turn taking…) and roles in a group of work.

	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
1.1	First of all, the students watch a video recorded by the teachers to introduce the project. The materials used for the activity are the teacher's laptop and the projector.	5 min	S, L			
1.2	Introduction about the project. The teacher will explain the students how the project will be throughout the sessions. The materials used for the activity are the teacher's laptop and the projector.	10 min	L	T-S		

1.3	**KPSI**. The teacher gives each student a kpsi which consists on a series of questions to check the students' previous knowledge at this point. The materials used for the activity are the teacher's laptop, students' laptop and the projector.	10 min	R, W		X	SA
1.4	**Brainstorming.** After watching the video and doing the KPSI, the teacher asks the students to guess their previous knowledge. Once the brainstorming is done, the teacher makes a summary helped by a PowerPoint presentation and the following posters that will be hanged in the classroom walls throughout the project to help the students acquire the concepts. The materials used for the activity are the scaffolding (that will be hanged in the classroom walls throughout the project to help students with their speaking skills), the laptop and the projector. At the end of the session, the students have to write what they have learnt during the session, what difficulties they have found and what they think they have to reinforce or improve for next session (Google Classroom).	30 min	S, L	T-S, WG		

	SESSION 2: What is a cell? Objectives of the session: **Distinguishing the basic organelles of a cell and its different types.**					
	Content-obligatory language for the session: vocabulary related to the cell					
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
2.1	**Storyboard**. The teacher tells a story writing the main concepts or key words on the board. She retells the story several times and the students must repeat what the teacher says. Once the teacher has finished, the students have to write the story on a piece of paper. If they want, they can draw pictures to complete the story and to make it nicer. The teacher's voice and intonation and the key words and drawings made by the teacher on the board. The students do peer review by using checklists provided by the teacher. The materials used for the activity are the board, paper, scaffolding and checklists.	55 min	S, L, R,W	T-S, WG		PA

	At the end of the session, the students have to write what they have learnt during the session, what difficulties they have found and what they think they have to reinforce or improve for next session (Google Classroom).					

	SESSION 3: Different types of cells. Objectives of the session: **Distinguishing between eukaryote and prokaryote cells and between animal and plant cells.**					
	Content-obligatory language for the session: vocabulary related to the cell.					
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
3.1	**Quizlet** Explicit questions in the following website: quizlet.com/_7mwx1o?x=1jqt&i=1r468jhttps:// (Password: **GEP2**) to understand the differences types de the cells. Students do the activities on their own during 25 minutes and in pairs the rest of the class. Every 10 minutes, the teacher stops to make sure the students understand the contents asking some questions. At the same time, the teacher helps the students to understand the contents supported by a PowerPoint presentation. The materials used for the activity are the student's laptop and the projector.	40 min	R, L	T-S,S-S	X	

	At the end of the session, the students have to write what they have learnt during the session, what difficulties they have found and what they think they have to reinforce or improve for next session (Google Classroom).					
3.2	The next part of the class consists on making heterogeneous groups. The teacher arranges students into fours. These groups will be kept for the whole project. The groups will be cooperative where each student will have an specific role. The teacher assigns a number to each student from 1 to 4: **1. Manager:** manages the group by helping to ensure that the group stays on task, focused, and that there is room for everyone in the conversation. **2. Secretary:** takes notes and distributes these notes to the rest of the group. **3. Logistics manager:** makes sure the material is ready to work with, makes sure all the group members keep the workplace clean and so on. **4. Speaker.** Presents the group's ideas to the rest of the class. Once the roles are assigned, the teacher presents the general scaffolding which will be necessary every day and the behavior and teamwork rubric which they will be assessed.	15 min	S, L, I	T-S, S-S, SG		

	SESSION 4: The organelles of the cells. Objectives of the session: **Learning the name of the organelles and their functions.**					
	Content-obligatory language for the session: vocabulary related to the cell.					
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
4.1	A video visualization. This video is to familiarize the students with the content of the next activity. The materials used for the activity are the teacher's laptop and the projector.	5 min	L	WG		
4.2	Visual input activity. The steps to be followed to accomplish this task are: A. The teacher gives picture cards with the different organelles to each group. B. The teacher reads the name of each organelle aloud together with its definition and each group has to put the picture cards in the order the teacher reads the name of each organelle. C. Once the picture cards are ordered, each group compares them with the group next to them.	50 min	L, W, I	T-S, S-G		PA

	D. The teacher gives the text with gaps to be filled in and reads it for two times and the students have to fill in them. This text will be completed individually. E. The students put their answers in common with the rest of the group and complete it to give a final version. F. The teacher shows the full text to the whole class and highlights the answers with a pen of a different colour for a better understanding. G. The students hand in their texts to the teacher to be checked. Finally, the teacher helps the students to understand the contents supported by a PowerPoint presentation. The materials used for the activity are flashcards, the teacher's laptop and the projector. At the end of the session, the students have to write what they have learnt during the session, what difficulties they have found and what they think they have to reinforce or improve for next session (Google Classroom).					

	SESSION 5: The importance of recycling materials Objectives of the session: **Learning the importance of using recycled materials, especially when building objects.**
	Content-obligatory language for the session: roles in a group of work, vocabulary related to recycling and recycled materials, speaking formulas and student's language support, vocabulary related to the cell, vocabulary related to the technology instruments and devices.
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*     

5.1	**Placemat** With the same groups we made the first day, the teachers explain what the students have to do in the activity which is called: "Placemat" Each group has to decide the roles of each member of the group (speaker, writer, secretary, manager). The students are given the same image per group and a piece of paper with a question in the middle and divided into empty spaces for each group to answer it. The students will have 3 minutes each to reach an agreement and answer it in the paper. Then, they will have to pass it to another group and so on. The fourth question is about matching different photos of materials with their specific container. To help them answer, the teacher provides them a language support card and a visual dictionary. Once the groups have answered, the speakers will say what they have written and they start a dialogue and give the cards back to the teacher. The photo is about plastic pollution and the four questions are: 1. How do you feel when you observe the image? 2. What type of materials do you identify in the image? 3. Recycling is very important, but do you know the meaning of the 3R? 4. Can you match these materials (showed by photos) with the bin that they belong to? 5. How could we reduce pollution? 6. What consequences for the environment could we have? The materials used for the activity are placemat cards, the language support and the visual dictionary.	35 min	L, S, W, R, I	T-S, S-S, SG, WG		

5.2	**Introducing the model cell** The teacher explains what they are going to do in the next session. The pupils need to explain what they have learnt to the other classmates, to help in this oral presentation they have to start building a 3D cell model using recycled materials that they have at home. The teacher reads a technical report with all the specifications needed to build the cell and the technological process they will carry out. The pupils have to fill in this document. Each group will construct a model cell with their own organelles. To do this, the teacher makes groups so we will have 6 groups. Three of them will construct an animal cell and the others will construct the plant's one. The material used for the activity is the technical report.	5 min	L	T-S		
5.3	**Distribution of the things to construct** The pupils search on internet different kind of model cells with links that the teacher has previously provided to them and also other links always under the teacher's supervision. And make a list of the materials they need for the next session. At the end of the session, the students have to write what they have learnt during the session, what difficulties they have found and what they think they have to reinforce or improve for next session (Google Classroom).	15 min	L, S, I	T-S, S-S, SG		

	SESSION 6: Construction a 3D cell model Objectives of the session: **Planning and building a 3D cell model (animal or plant) using recycled materials.**					
	Content-obligatory language for the session: roles in a group of work, vocabulary related to recycling and recycled materials, speaking formulas and student's language support, vocabulary related to the cell, vocabulary related to the technology instruments and devices.					
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
6.1	**Use of English** During the activity of the cell construction is difficult that the pupils speak in English. To encourage them, the teacher will walk around the class listening to the groups and giving them a blue card if they speak in English, a green card if they speak but not much, and a yellow card if they don't speak. At the end of the class, the teacher will pick up them. The teacher will follow this strategy to make them speak English during sessions 6,7,8 and 9. The materials used for the activity are the coloured cards. Also, there will be a visual dictionary about tools.	5 min	L	T-S		
6.2	**Kahoot** A game with technic vocabulary. They will do it in pairs.	25 min	R, S	T-S, SG	X	TA

	The materials used during the activity are a laptop and the projector					
6.3	**Building the 3D model Cells** In groups of four they start to build the model cell and the organelles. The materials used during the activity are cardboards, cardboard boxes, plastics, plasticine, paint bottles, brushes, silicone, glue, wires, scissors, chopsticks and recycled material.	25 min	S, W, R, I	T-S, SG	X	

	SESSION 7: Construction and Programming the organelles' movements with Scratch for Arduino. Objectives of the session: **Programming movements with Scratch for Arduino program.**					
	Content-obligatory language for the session: vocabulary related to Scratch for Arduino program (to programme blocks), verbs and vocabulary to give instructions (move, straight, right, left), technology classroom vocabulary (degrees, stop, motor, LED cable, scissors, wire, tin), vocabulary related to the cell.					
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
7.1	**Building the 3D model Cells** In groups of four they continue to build the model cell and the organelles. The materials used during the activity are cardboards, cardboard boxes, plastics, plasticine, paint bottles, brushes, silicone, glue, wires, scissors, chopsticks and recycled material.	20 min	S, W, R, I	T-S, SG	X	
7.2	**Movement challenge with Scratch** All the pupils have the program installed in their laptop.	35'	L, S, W, I	T-S, SG	*X*	

	The teacher proposes them a movement challenge of the organelles. Each group has to be able to move or lightening at least two of the organelles they have made with scratch for arduino. The instructions are in the technical report. Once they have got the challenge, the teacher provides them the materials to connect the movement they have programmed with scratch to join with Arduino and the cell organelles. The materials used for the activity are the technical report and their laptops. At the end of the session, the students have to write what they have learnt during the session, what difficulties they have found and what they think they have to reinforce or improve for next session (Google Classroom). The materials used during the activity are the laptops and electronic material like Arduino board, protoboard, wires, resistors, LEDs, tin, servo motors, scissors, welding guns.					

	SESSION 9: Building the 3D cell model Objectives of the session: **Planning and building a 3D cell model (eukaryote or prokaryote) using recycled materials**					
	Content-obligatory language for the session: vocabulary related to Scratch and Arduino programs (to programme, blocks), verbs and vocabulary to give instructions (move, straight, right, left), technology classroom vocabulary (degrees, stop, motor, LED cable, scissors, wire, tin), vocabulary related to the cell, student's language support, speaking formulas.					
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
9.1	**Building the 3D cell model** During this session, they will have to finish the cell model, join the organelles in the cell and finish the technical report with the group. If there are students who finish the cell model sooner, the teacher will provide some online activities linked in the classroom. The materials used during the session are the technic report, laptops and the same material as in session 7	55 min	S, W, I	S-S, SG	X	

	At the end of the session, the students have to write what they have learnt during the session, what difficulties they have found and what they think they have to reinforce or improve for next session (Google Classroom).					

	SESSION 11: Oral presentation Objectives of the session: **Showing their 3D cell models and demonstrating what they have learnt.**					
	Content-obligatory language for the session: vocabulary related to Scratch and Arduino programs (to programme, blocks), verbs and vocabulary to give instructions (move, straight, right, left), technology classroom vocabulary (degrees, stop, motor, LED cable, scissors, wire, tin), vocabulary related to the cell, language support to be able to carry out a oral presentation for the rest of the class taking into account their body language or eye contact when doing an oral presentation.					
	Activities *include : Name and description; Assessment tool (if any); Material (including language support)*					
11.1	**Oral presentation** The students will do an oral presentation showing the cell models they have built to their partners. They have to demonstrate their knowledge about the different types of cells, their structure and functions. The oral presentation will take place in front of the class where contents and oral skills will be assessed. It will also take place for the whole high school students during the Cultural Week in April. The students have to answer the final questionnaire(KPSI).	45'	S	T-S,S-S		AT

	The materials used for the activity are the cell model made by the groups.					
11.2	**KPSI**. The students answer what they have learnt during the project in the final part of the KPSI. The materials used for the activity are the teacher's laptop, students' laptop and the projector.	10 min	R, W		X	SA

ANNEXES

INS Montserrat Colomer

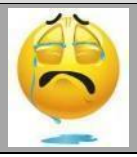
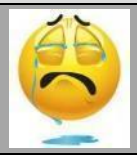
KPSI
WHAT DO WE FIND INSIDE THE LIVING THINGS?

Biology-Geology-Technology
1st ESO

Name: Group:

Assess yourself with a cross (X) according to what you know about raw materials and fabrication processes:

 No idea  A vague idea  I know  I know very well and I can explain

OBJECTIVES	SELF-ASSESSMENT							
I know:	**At the beginning Date:**				**At the end Date:**			
								
how to distinguish between living things and non-living things.								
what a cell is.								
how to explain the functions of a cell.								
the name of the different types of cells.								
the parts of a cell.								
what are the organelles that a cell has.								
the name of the materials that can be recycled and reused.								
how to program movements with scratch.								

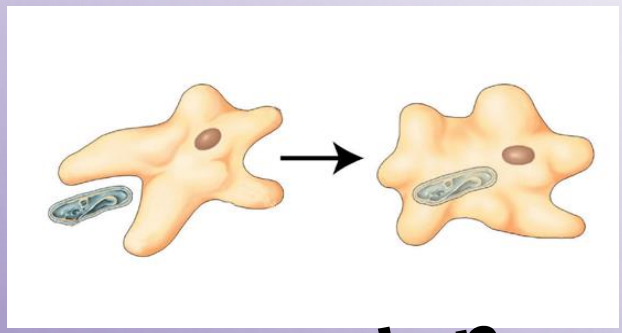
If your answer is “I know very well”, please give a short explanation here:

BRAINSTORMING QUESTIONS

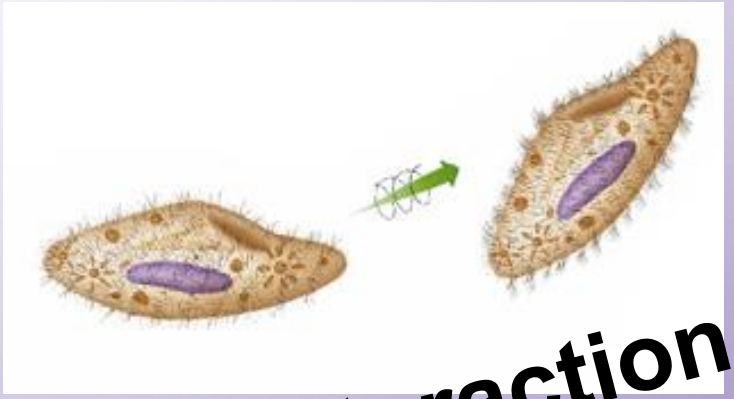
- How can a lizard be still alive after being cut its tail?
- Did you know that its tail will grow again?
- Do you want to know why?
- Why will my skin end up joining if I cut myself but in the case of a rock or a paper will never join again? Can you guess why?
- What is the difference between living things and non-living things?
- Could you guess what we find inside the living things?

PowerPoint PRESENTATION

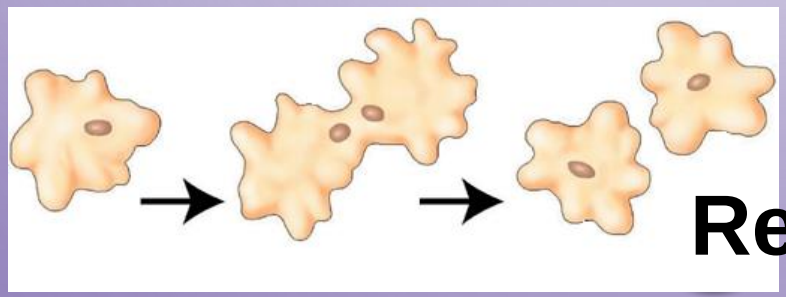
- Cells are the smallest structures of living things.
- Cells are able to feed, interact and reproduce.
- They exist from the division of another cell.



Nutrition



Interaction



Reproduction

STARTERS

Well,...
Now,...
Let me see...

TIME TO THINK

It’s on the tip of my tongue
Let me think...
Wait a second...

EXPRESSING OPINION

I think that...
In my opinion...
I believe...
I feel that...
From my point of view...
In my opinion,...

COMMUNICATION CONTROL-LISTENER

Pardon?
Sorry?
Could you say that again, please?
Could you repeat it, please?

EXPRESSING DOUBTS

I have my doubts about that...
You haven’t convinced me yet...
It depends...
I’m not sure about it...

AGREEING

I (totally) agree
I couldn’t agree more
That’s exactly what I think about it.

TURN TAKING

Can I interrupt here?
I'm sorry to interrupt you but...
What would you say about this...?
Can I say something?

DISAGREEING

I'm sorry but I don't agree...
OK, but that's not the point.
I disagree with you...

Nutrition

All living things have ways of taking in the substances they need to grow and survive.

There are two types of nutrition:

Autotrophic nutrition: plants and certain bacteria prepare their own food and do not depend on any other organism. They prepare their food from co2, water and sunlight.

Heterotrophic nutrition: all the animals eat living things.

Relation

Living things have a relationship with the environment that surrounds them. Humans use their senses (seeing, hearing, smelling, tasting, touching) to relate with the world to look for food, take care of their babies or run away from danger.

Reproduction

All living things are born, live for a period of time and then die.

All living things are born from a previous living thing.

The new living things can have one or two parents, depending on their type of reproduction:

Asexual reproduction: the individual has only one parent.

Sexual reproduction: the individual has two parents: a male and a female.

STORYBOARD

Cells are the basic units in living things.

All living things are made up of cells.

Living organisms made up of a single cell are called **unicellular** and the ones made up of several cells are called **multicellular**.

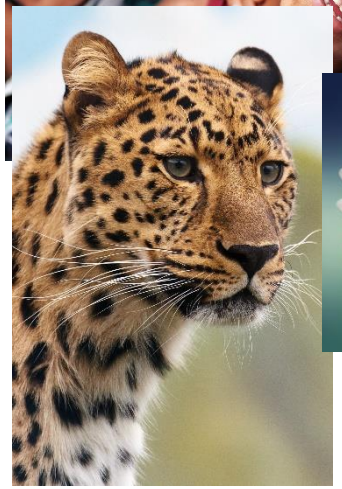
The cell has these basic elements:

- **Membrane**: a protective layer around the cell.
- **Cytoplasm**: a fluid inside the cell. Some organelles can be present.
- **Nucleus**: made up of genetic material (DNA).

There are two types of cells:

- **Prokaryotic cell**: the genetic material is directly in the cytoplasm.
- **Eukaryotic cell**: the genetic material is inside the nucleus.

LIVING THINGS



Are the basic unit

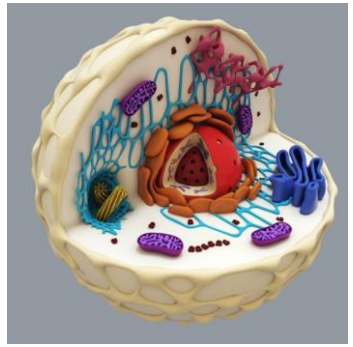
Are made up of

CELLS

have 3 basic elements

MEMBRANE

CYTOPLASM



NUCLEUS

single cell are called

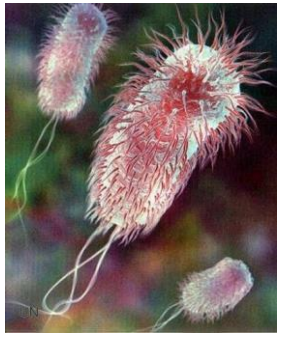
UNICELLULAR

several cells are called

PLURICELLULAR

types

PROKARYOTIC CELLS

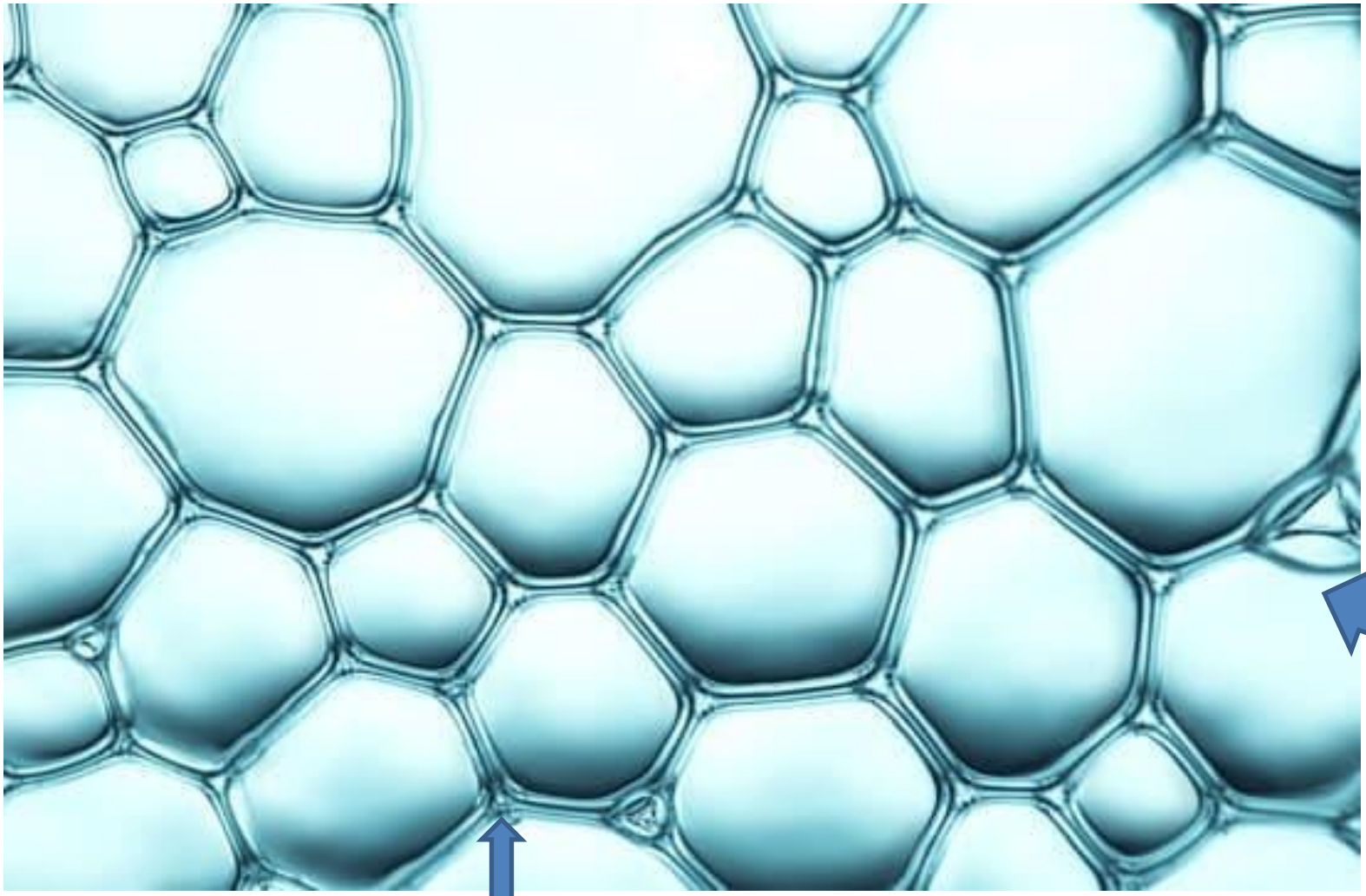


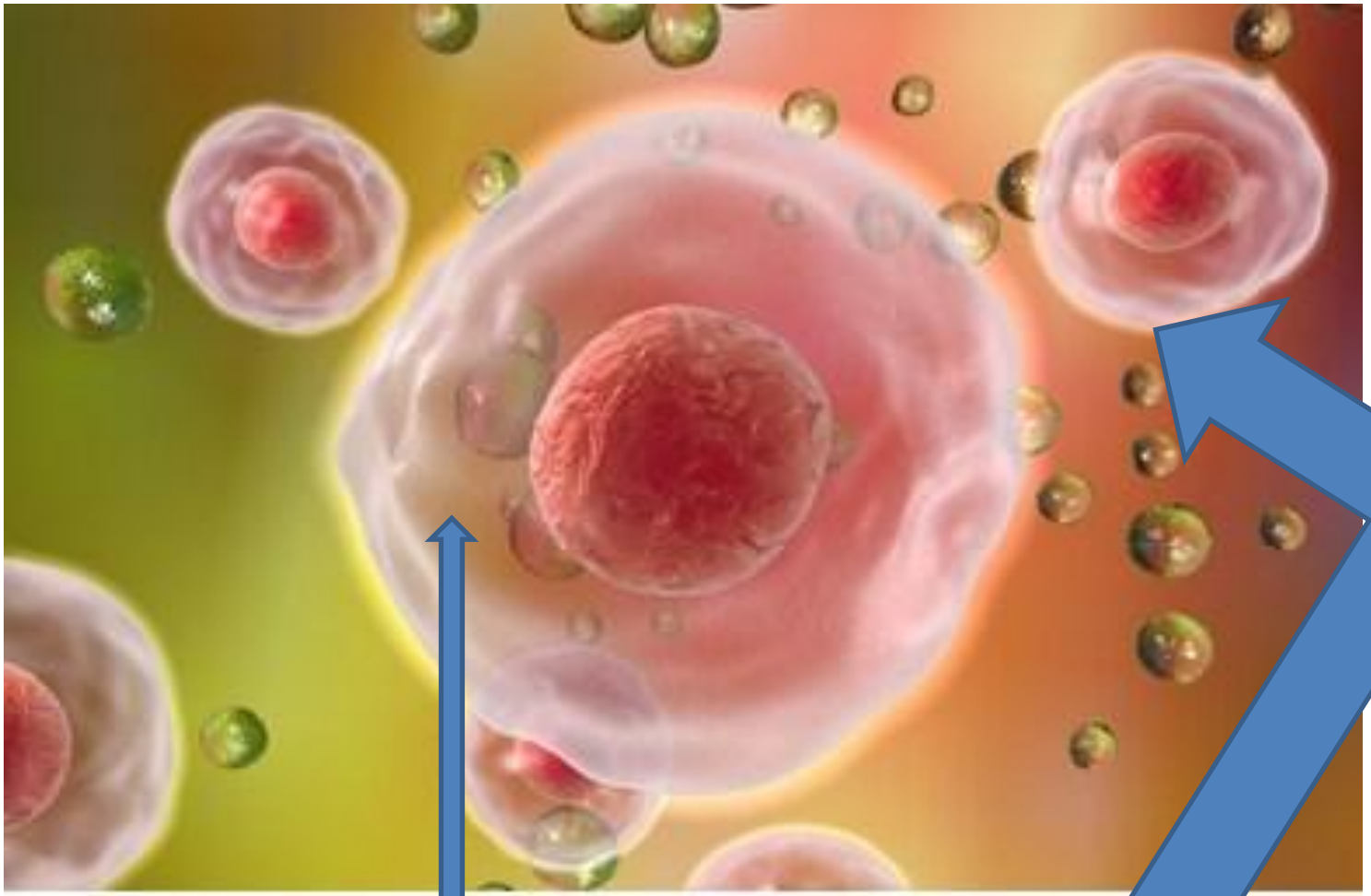
EUKARYOTIC CELLS

MY CLASSMATE'S WRITING CHECKLIST

Name:

Did I...?	Yes	No
Use capital letters at the beginning of the sentences		
Use ending punctuation		
Quotation marks ONLY at the end of the sentences		
Follow this sentence structure (S+V+O) in affirmative sentences		
Place adjectives before nouns		
Use capital letters for proper names		
Write –s/-es for 3rd person singular		


Cell
Membrane



Cytoplasm

Nucleus

PowerPoint PRESENTATION

Cell Parts

Membrane

Thin layer around the cell. Controls the access of substances.

Cytoplasm

Viscous fluid inside the membrane.

Nucleus

Made up of genetic material.

Types of cells

Eukaryotic

Genetic material in the nucleus

- **ANIMAL CELL**
- **PLANT CELL**

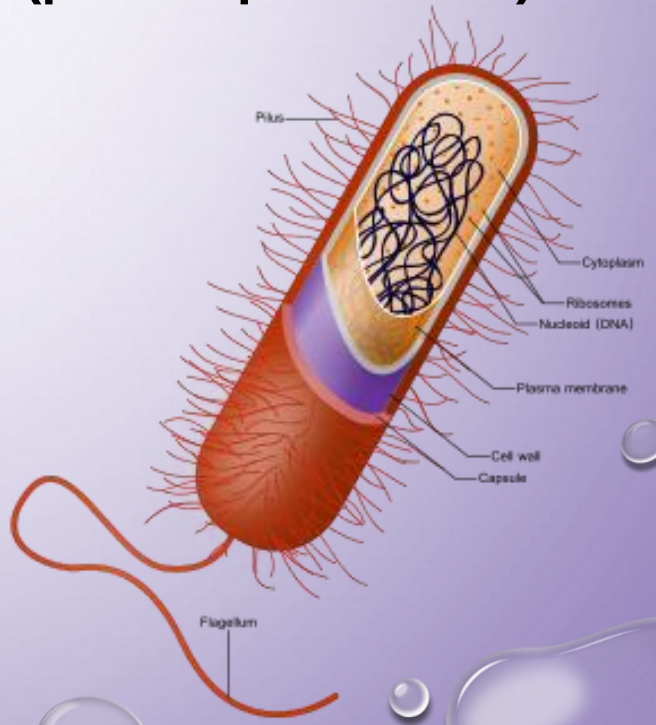
Prokaryotic

Genetic material in the cytoplasm.

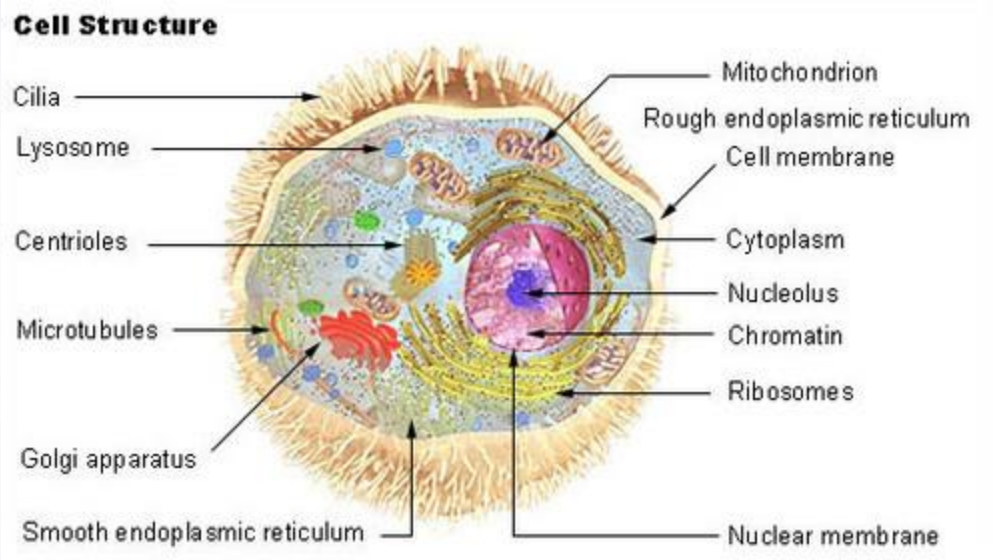
- **UNICELULAR ORGANISMS**
- **E.g: Bacteria**

PROKARYOTIC CELL STRUCTURE

- **Smaller and simpler cells.**
- **Unicelular organisms.**
- **Genetic material in the cytoplasm. There’s no nucleus.**
- **Just one type of organelle: RIBOSOMES (protein production)**
- **Some have flagellum (movement)**



EUKARYOTIC CELL STRUCTURE



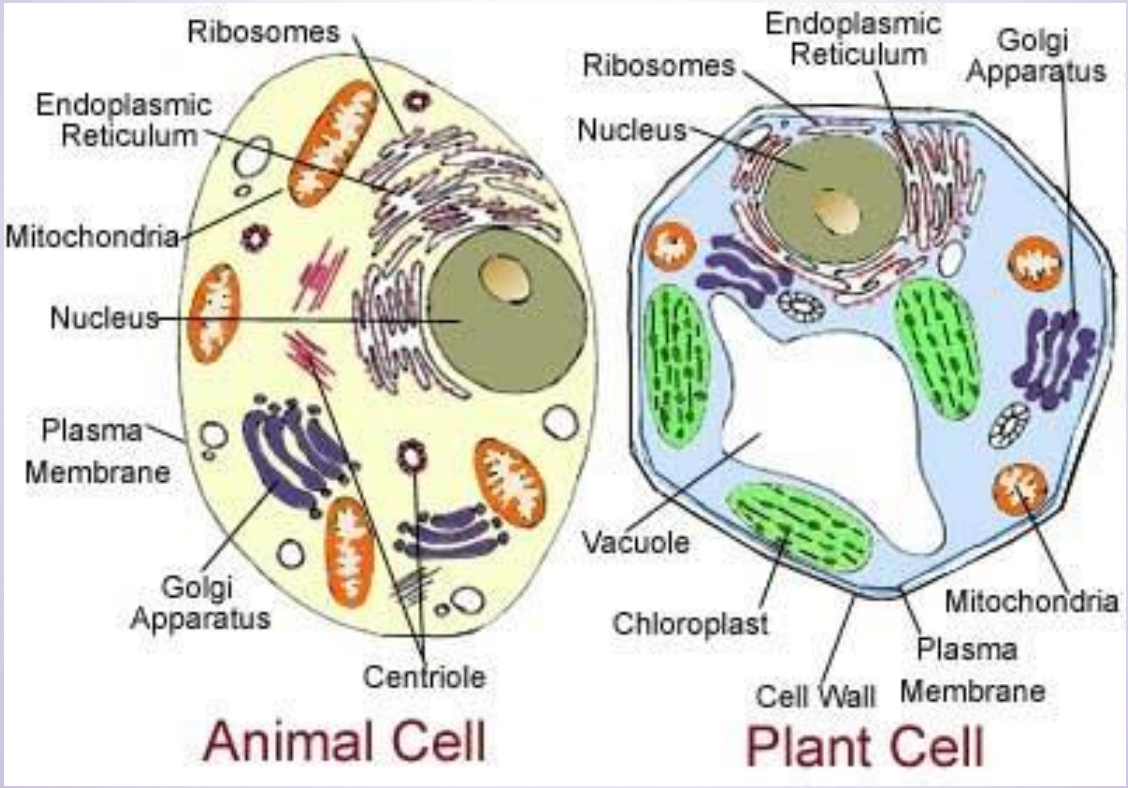
- **Bigger and more sophisticated than prokaryotic cells.**

- **They can be unicellular or pluricellular.**

- **They have a separated nucleus with a membrane. Inside the nucleus there is the genetic material.**

- **In the cytoplasm there are a wide range of organelles: mitochondria, chloroplasts, endoplasmic reticulum, Golgi complex...**

TYPES OF EUKARYOTIC CELLS



VEGETAL CELL:

- Has a rigid **cell wall**.
- Has a big **vacuole.**
- Has **chloroplasts.**

ANIMAL CELL:

- Has **centrosomes.**
- Has a small **vacuole.**

MANAGER: manages the group by helping to ensure that the group stays on task, focused, and that there is room for everyone in the conversation.

SECRETARY: takes notes and distributes these notes to the rest of the group.

LOGISTICS MANAGER: makes sure the material is ready to work with, makes sure all the group members keep the workplace clean and so on.

SPEAKER. Presents the group's ideas to the rest of the class.

SKILL	GOOD	VERY GOOD	EXCELLENT
Learning behaviour	Occasionally able to maintain attention; has difficulty staying engaged in classroom tasks.	Often shows good attention but may need support to become engaged in classroom tasks.	Always shows good attention and engages in classroom tasks.
citizenship	Occasionally respects the rights of others and school property; needs teacher guidance to follow classroom rules, including responsible digital use and safety.	Often respects the rights of others and school property; follows classroom rules, including responsible digital use and safety.	Always respects the rights of others and school property; follows classroom rules, including responsible digital use and safety.
cooperation	Student occasionally uses polite words and kind manners with others, helping when needed.	Student often uses polite words and kind manners with others, helping when needed.	Student always uses polite words and kind manners with others, helping when needed.
Problem-solving	Does not suggest or refine solutions, but is willing to try out solutions suggested by others.	Often looks for and suggests solutions.	Always looks for and suggests solutions to problems.
Focus on the task	Occasionally focuses on the task and what needs to be done. Other group members must sometimes remind to keep this person on task.	Often focuses on the task and what needs to be done most of the time. Other group members can count on this person.	Always stays focused on the task and what needs to be done.

ORGANELLES AND THEIR FUNCTIONS

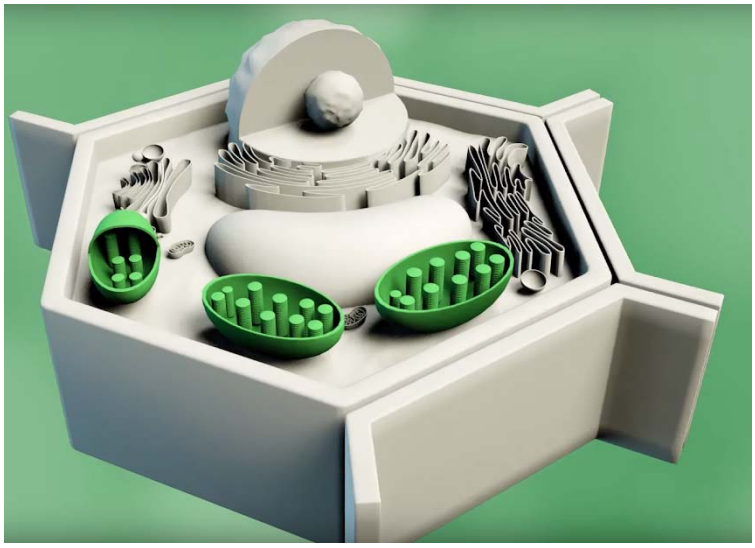
- Fill in the gaps with the followings words:

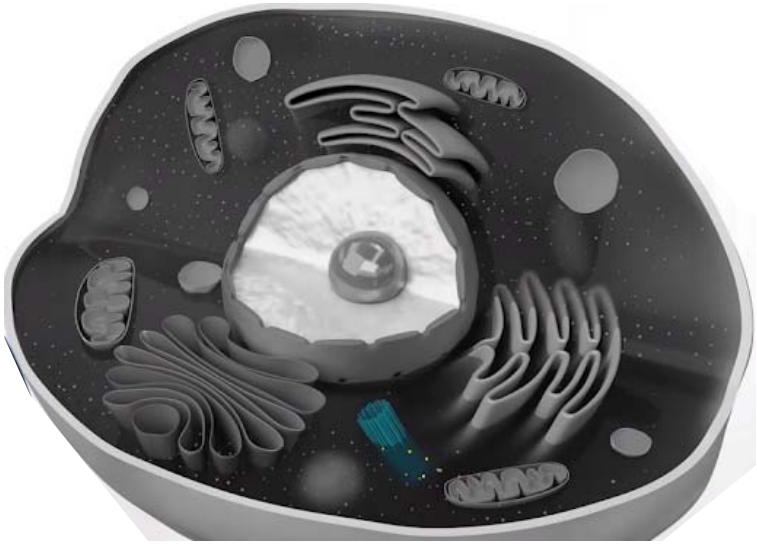
organelles	respiration	endoplasmatic
vacuoles	Golgi	larger
ribosomes	plant	transportation
photosynthesis	animal	energy
cell	centrosomes	smooth
lysosomes	digest	division
movement	chloroplasts	reticulum
chlorophyll	function	mitochondria
ribosomes	rough	membrane

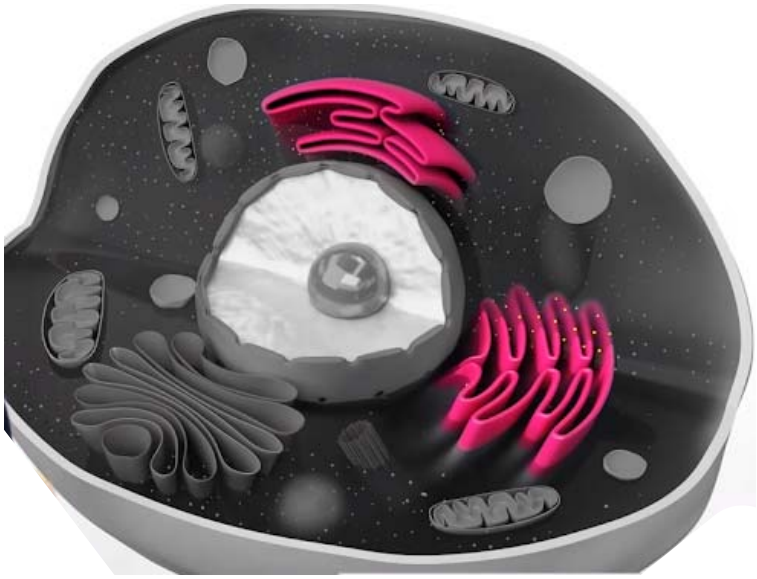
_____ make up the subunits of a _____. There are numerous organelles and each one has its own _____.

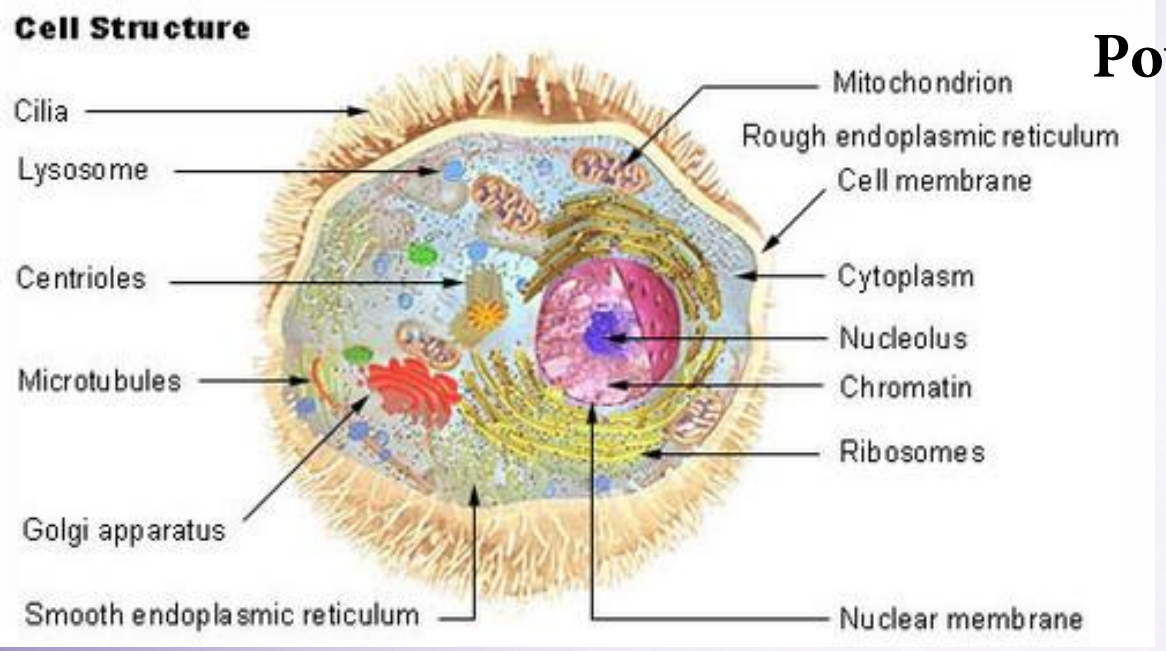
- _____ contain RNA and specific proteins within the cytoplasm.
- _____ contain a double-membrane. They produce _____ and take part in the cellular _____.
- _____ are filled with a fluid and contain food that the cell needs to survive. They are much _____ in plant cells.
- **Endoplasmic** _____ is inside a membrane.
    - _____ **endoplasmic reticulum** does not contain a ribosome on its surface. It takes part in the synthesis of lipids (fats) that are used to build the cell _____.
    - _____ **endoplasmic reticulum** has _____ joined to its surface. It is involved in the storing and the _____ of proteins elaborated by ribosomes.
- _____ are membranous organelles that serve to _____ complex substances.
- _____ **apparatus** takes part in the elaboration, storage and transportation of products from the _____ reticulum and sends them out of the cell.
- _____ contain the pigment _____ that captures energy from sunlight for _____. They are only found in _____ cells.
- _____ are composed of two centrioles. They are involved in the cellular _____ and in the cellular _____. They are only found in _____ cells.

PICTURE CARDS









PowerPoint PRESENTATION

Organelles in eukaryotic cells have different shapes and each one has a specific function:

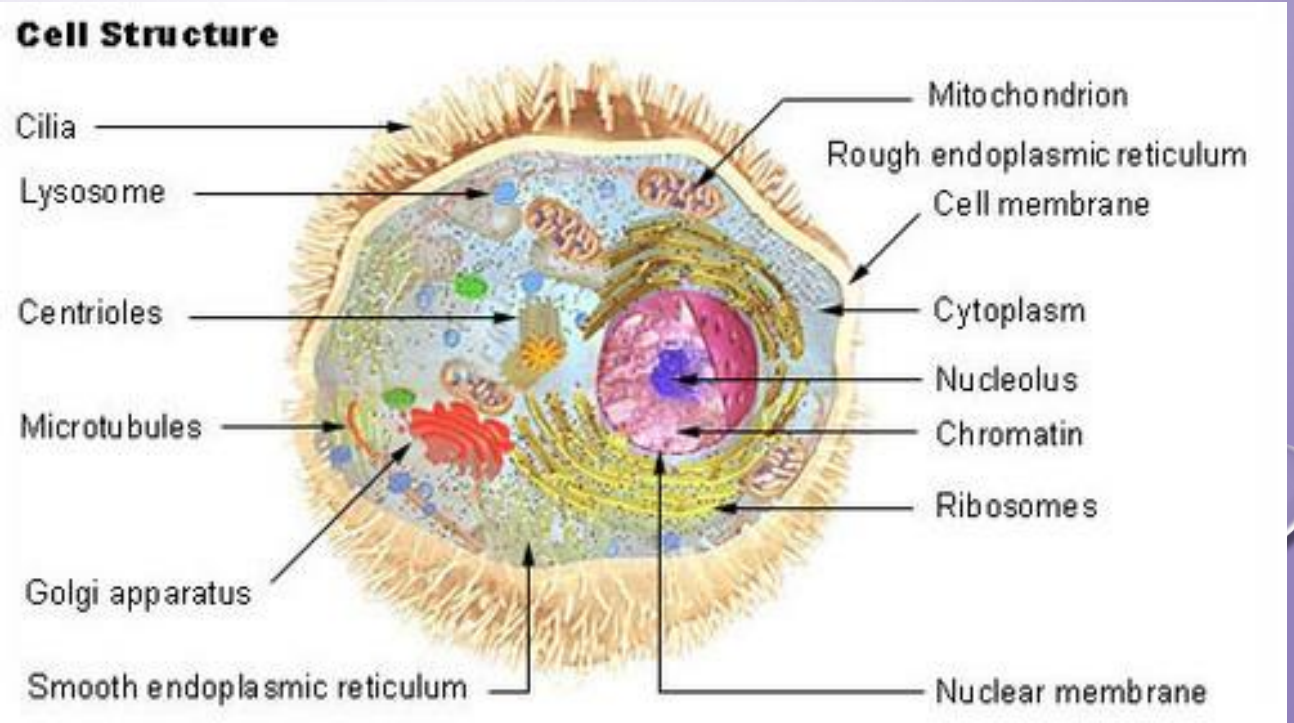
Mitochondria: They produce energy and take part in the cellular respiration.

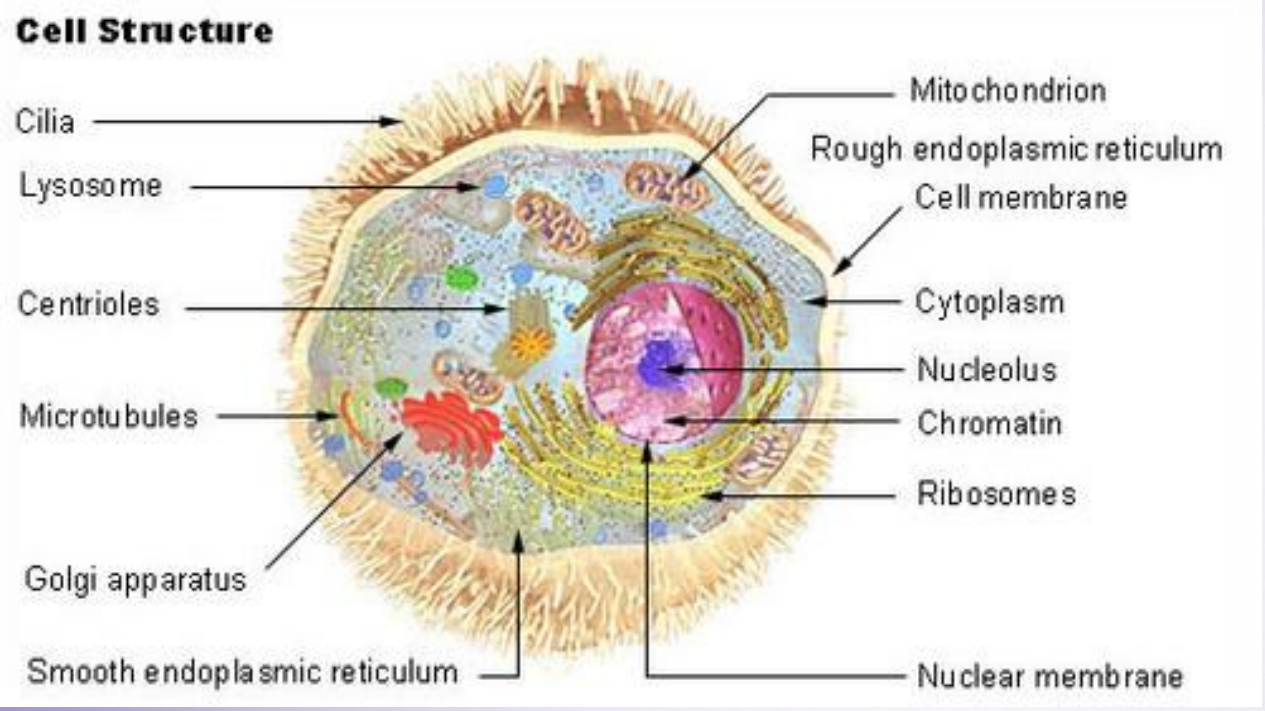
Lysosomes: membranous organelles that serve to digest complex substances.

Ribosomes: Free organelles found in the cytoplasm or in the membrane of the endoplasmic reticulum. Responsible in the proteins synthesis.

Centrosomes: are composed of two centrioles. They are involved in the cellular movement and in the cellular division. They are only found in animal cells.

Golgi complex: takes part in the elaboration, storage and transportation of products from the Endoplasmic Reticulum and sends them out of the cell.





Vacuoles: are filled with a fluid and contain food that the cell needs to survive. They are much larger in plant cells.

Endoplasmic Reticulum: Complex network of membranes where lipids and proteins synthesis takes place.

Chloroplasts: contain the pigment chlorophyll that captures energy from sunlight for photosynthesis. They are only found in plant cells.

GROUP 1

GROUP 2

GROUP 6

PLACEMAT QUESTION 1

HOW DO YOU FEEL WHEN YOU OBSERVE THE IMAGE?

GROUP 3

GROUP 5

GROUP 4

GROUP 1

GROUP 2

GROUP 6

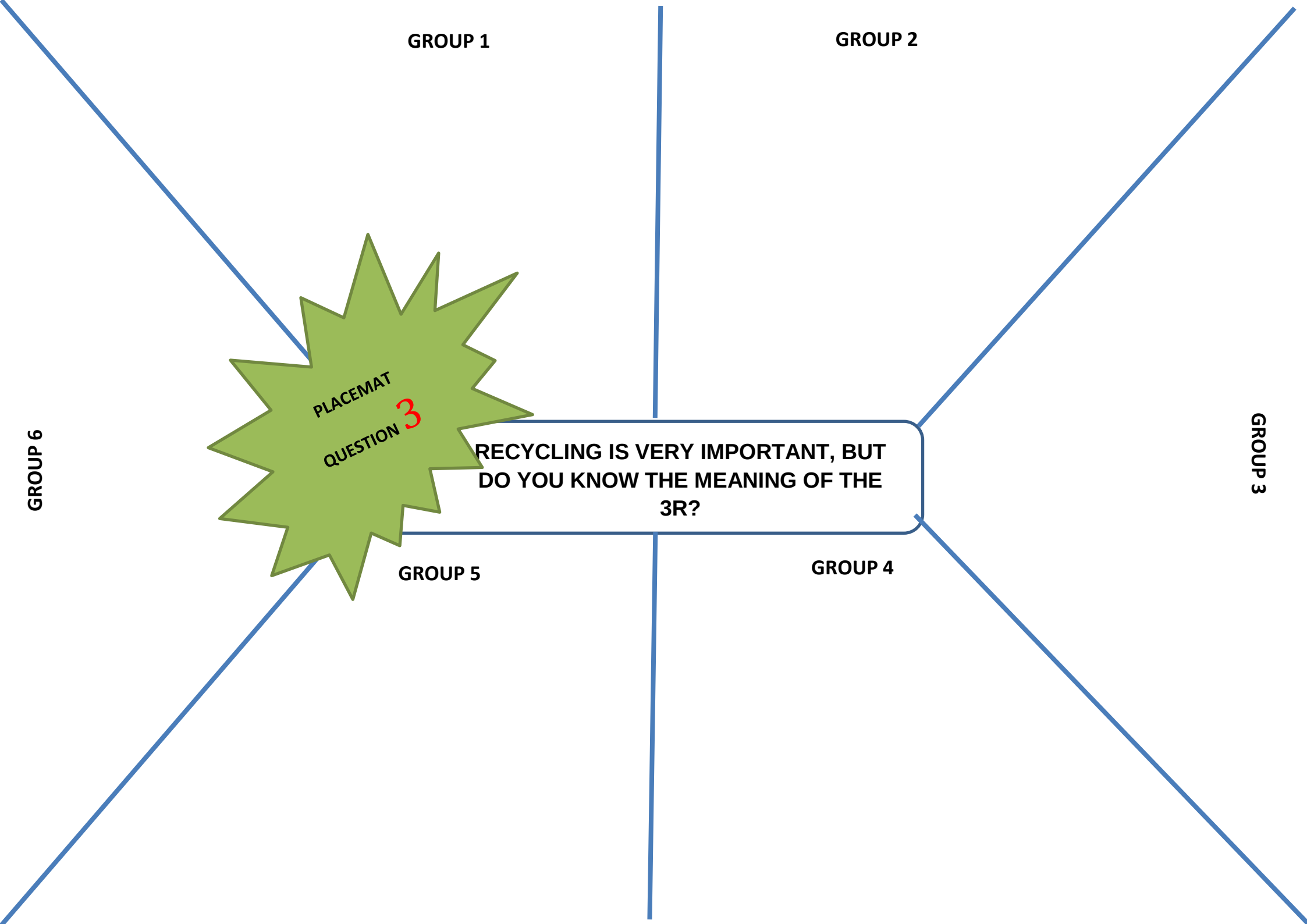
PLACEMAT QUESTION 2

WHAT TYPE OF MATERIALS DO YOU IDENTIFY IN THE IMAGE?

GROUP 3

GROUP 5

GROUP 4


GROUP 1
GROUP 2
GROUP 3
GROUP 4
GROUP 5
GROUP 6
PLACEMAT
QUESTION 3
RECYCLING IS VERY IMPORTANT, BUT DO YOU KNOW THE MEANING OF THE 3R?

GROUP 1

GROUP 2

GROUP 6

PLACEMAT

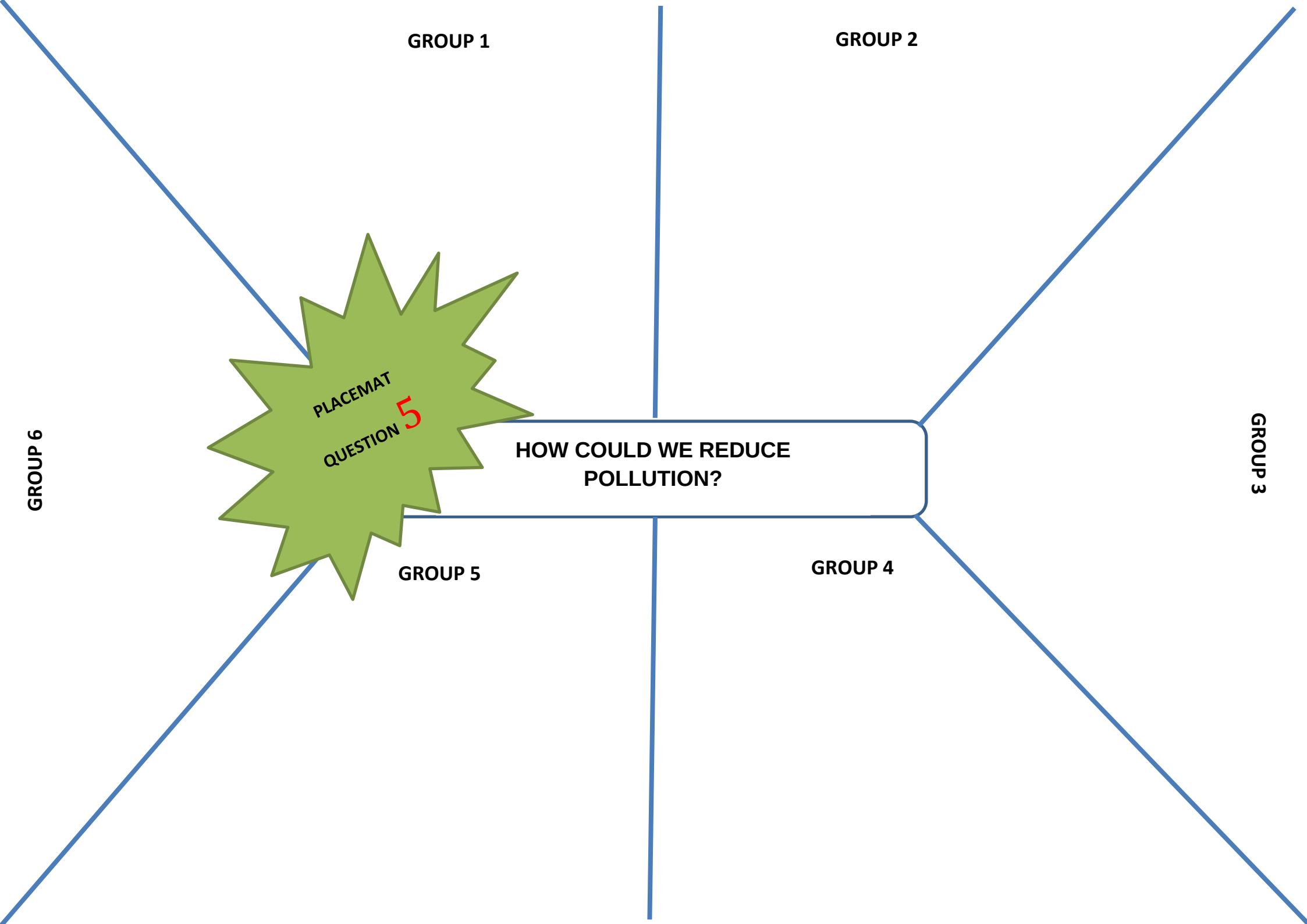
QUESTION 4

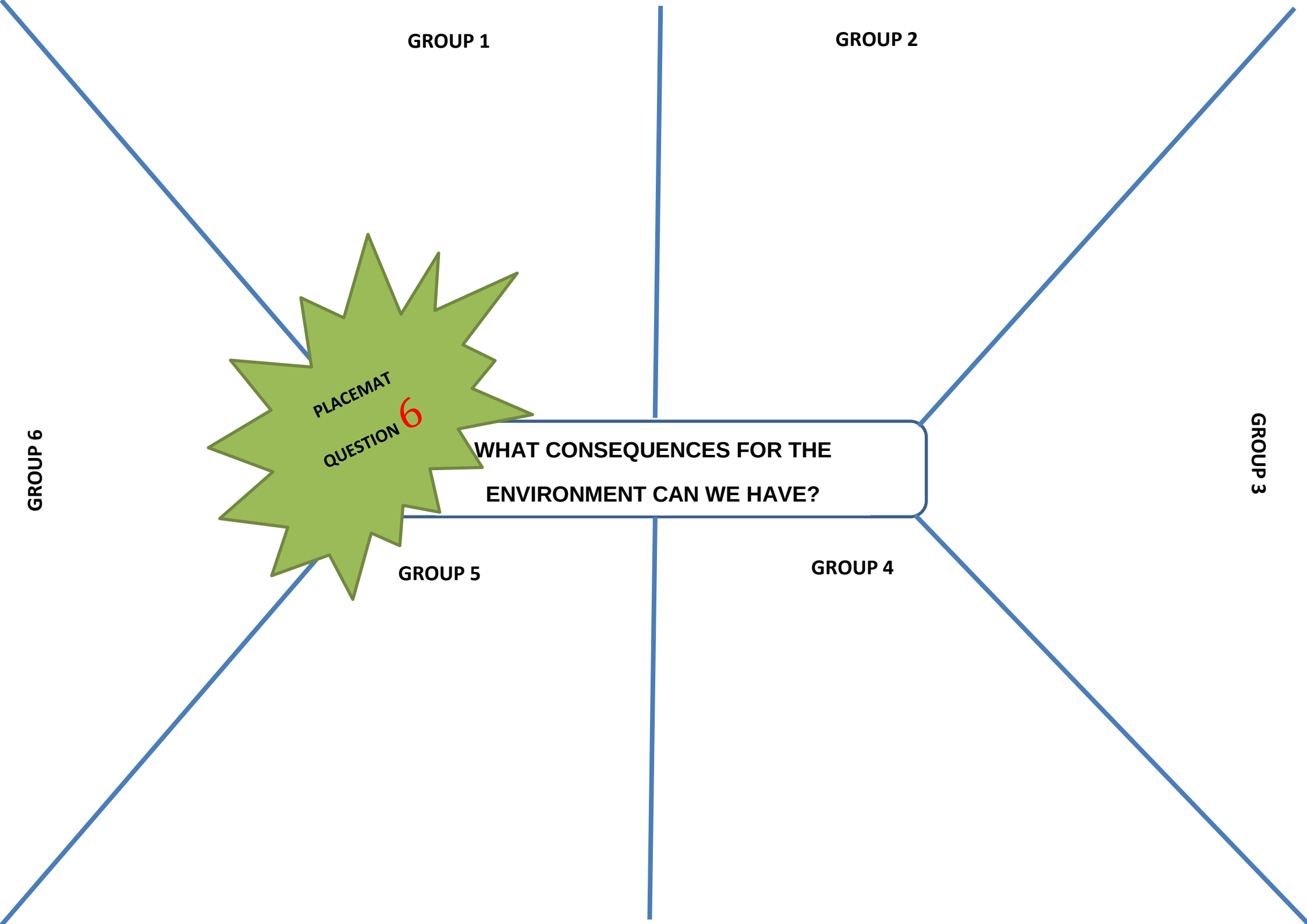
CAN YOU MATCH THESE MATERIALS WITH THE RECYCLING BINS THAT THEY BELONG TO?

GROUP 3

GROUP 5

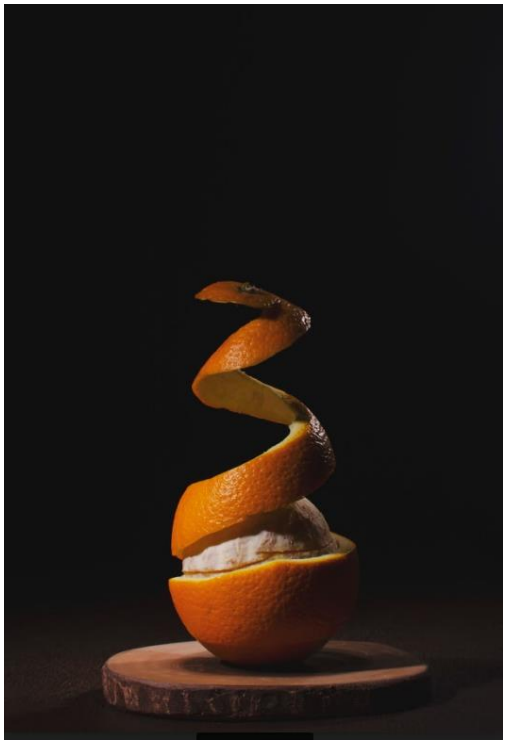
GROUP 4


GROUP 1
GROUP 2
GROUP 3
GROUP 4
GROUP 5
GROUP 6
PLACEMAT
QUESTION 5
HOW COULD WE REDUCE POLLUTION?


GROUP 1
GROUP 2
GROUP 3
GROUP 4
GROUP 5
GROUP 6
PLACEMAT
QUESTION 6
WHAT CONSEQUENCES FOR THE ENVIRONMENT CAN WE HAVE?

PLACEMAT PHOTO

PLACEMAT. QUESTION 4 PHOTOS.

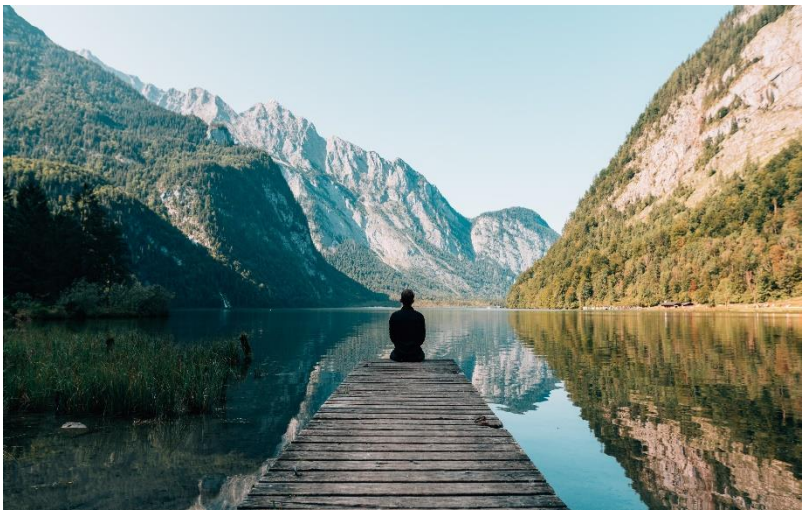


PLACEMAT VISUAL DICTIONARY

FEELINGS

POLLUTION

ENVIRONMENT



CLIMATE CHANGE

TECHNICAL REPORT:

Cell's model

LEVEL AND GROUP	
NAME 1	
NAME 2	
NAME 3	
NAME 4	

INDEX

1. REQUIREMENTS

In this project, you will construct a model cell with all its organelles. At least two of the organelles have to move or light.

Some groups will do the animal cell and the others, the plant cell.

The main requirement is that it has to be made with materials that you have at home and the dimensions cannot be bigger than 500 X 400 mm

2. RESEARCH

You have to do a research of the product on the internet or consult books, catalogues…

3. SELECT THE BEST SOLUTION

Once you have done the research, select on option and draw a sketch, take a photo and copy it below

4. BUILD IT

List of materials and tools used

MATERIALS

TOOLS

Summarize what is done every day

Day 1

Day 2

Day 3

Day 4

5. PHOTOS OF FINAL PRODUCT

Put some photos about the final product.

6. TEST THE RESULT

- Do you agree with the result?
- Would you improve anything?

7. PEER ASSESSMENT

Once finished the construction, the members of the group evaluate the others. Please, put a cross in the right box after reaching an agreement with the members of your group.

Name 1:				
	Always	**Often**	**Sometimes**	**Rarely**
He/she brings the material				
He/she participates in group's work				
He/she helps, encourages and motivates the other members				
He/she contributes with useful ideas				
He/she is tolerant with the other members				
He/she cleans the work desk				

Name 2:				
	Always	**Often**	**Sometimes**	**Rarely**
He/she brings the material				
He/she participates in group's work				
He/she helps, encourages and motivates the other members				
He/she contributes with useful ideas				
He/she is tolerant with the other members				
He/she cleans the work desk				

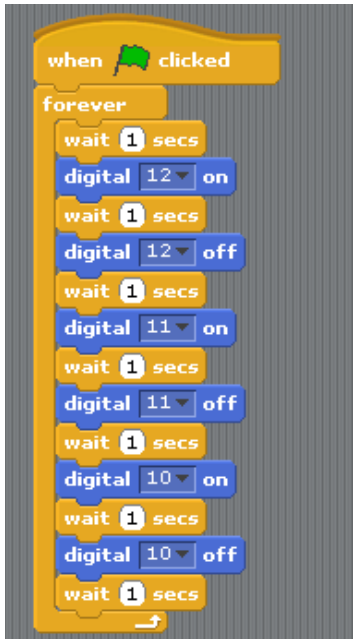
Name 3:				
	Always	**Often**	**Sometimes**	**Rarely**
He/she brings the material				
He/she participates in group's work				
He/she helps, encourages and motivates the other members				
He/she contributes with useful ideas				
He/she is tolerant with the other members				
He/she cleans the work desk				

Name 4:				
	Always	**Often**	**Sometimes**	**Rarely**
He/she brings the material				
He/she participates in group's work				
He/she helps, encourages and motivates the other members				
He/she contributes with useful ideas				
He/she is tolerant with the other members				
He/she cleans the work desk				

8.1. MOVEMENTS WITH S4A: LIGHTING UP AN ORGANELLE

S4A PROGRAM:

Step 1. Reproduce:



Step 2. You will need:

An Arduino board

A protoboard

3 LEDs (Green, yellow and red)

3 resistors (330 Ω)

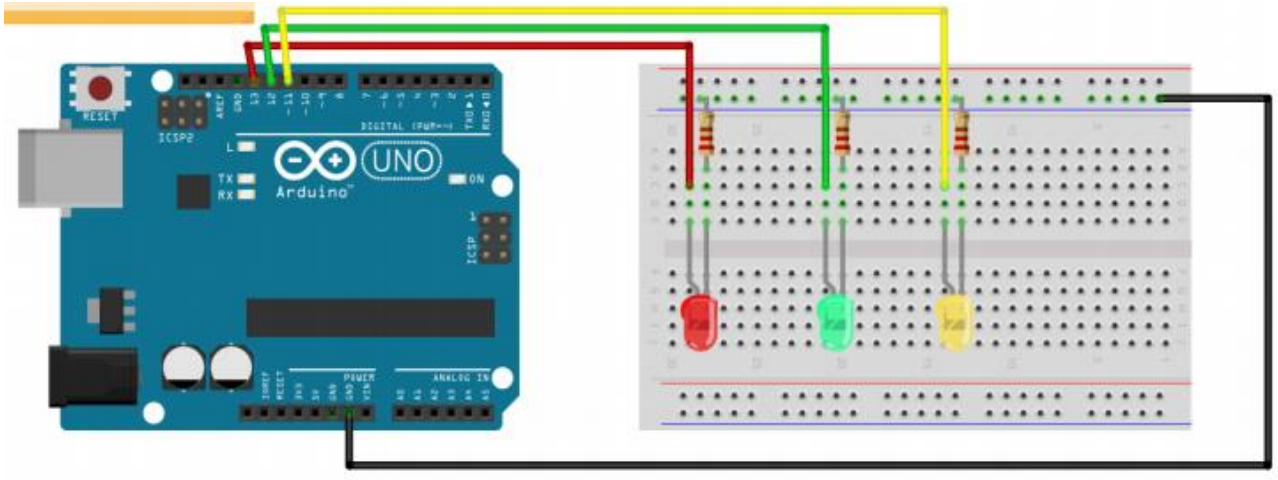
Some wires

A scissors

Tin

A welding gun

Step 3. ASSEMBLY. Check if it works:



Step 4. ASSEMBLY ON THE CELL MODEL

If it works, follow the teacher instructions and build it on the cell model

8.2. MOVEMENTS: TURNING ON THE NUCLEUS

Step 1. You will need:

An Arduino board

A protoboard

A servomotor

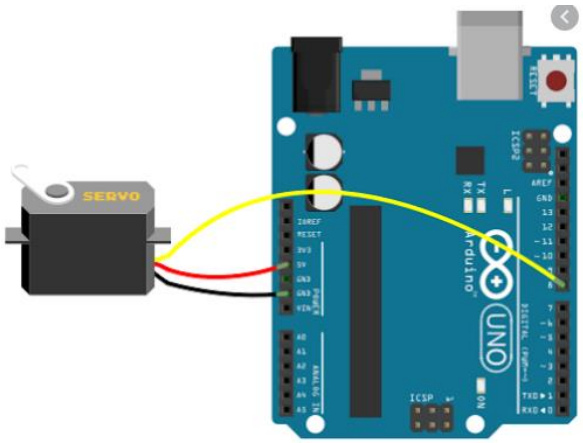
Some wires

A scissors

Tin

A welding gun

Step 2. ASSEMBLY. Check if it works:



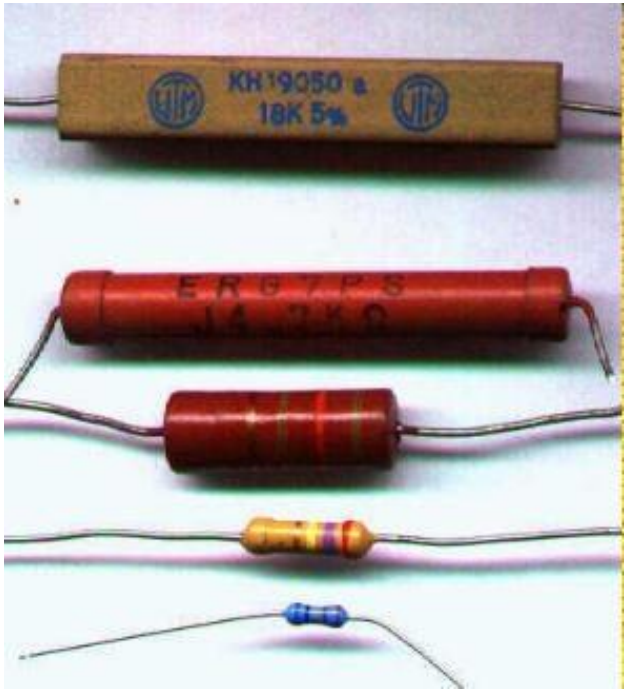
Step 3. ASSEMBLY ON THE CELL MODEL

If it works, follow the teacher instructions and build it on the cell model

COLOURED CARDS

LED

RESISTOR



SCISSORS

PLIERS

MOTOR

HAMMER

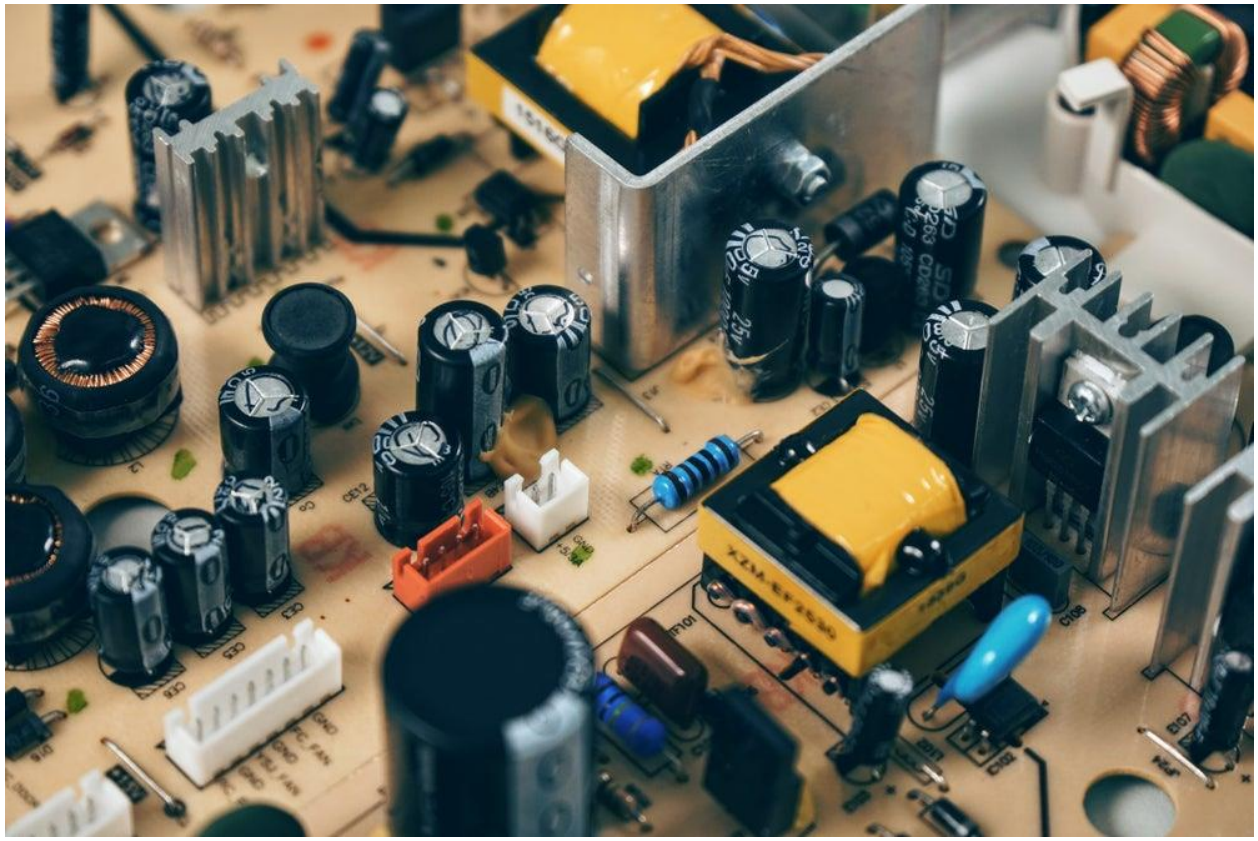
WIRE

COOPER WIRE

HE’S WELDING

RULER

ELECTRONIC COMPONENTS



CATEGORY	GOOD	VERY GOOD	EXCELLENT
Content	Shows a good understanding of some parts of the topic. Knows that there are different types of cells as well as it is made of some organelles but is unable to explain their functions.	Shows a good understanding of the topic. Is able to explain that there are different types of cells, that the cell is made of organelles, but has difficulties to explain their functions.	Shows a full understanding of the topic. Is able to explain that there are different types of cells, that the cell is made of organelles, and is able to explain their functions.
Vocabulary	Uses vocabulary which is not very appropriate for the purpose. Knows only a few words.	Uses vocabulary which is quite appropriate for the purpose. Knows most of the words.	Uses vocabulary appropriate for the purpose. Knows all the specific words.
Comprehension	Ability to accurately answer a few questions posed by the teacher about the presentation.	Ability to accurately answer most questions posed by the teacher about the presentation.	Ability to accurately answer almost all questions posed by the teacher about the presentation.
Speaking skills	Sometimes speaks loudly and clearly and sometimes speaks in complete sentences.	Mostly speaks loudly and clearly and mostly uses complete sentences.	Always speaks loudly and clearly and uses complete sentences.
Body language	Sometimes keeps the eye contact with the audience and makes gestures and keeps an active posture.	Mostly keeps the eye contact with the audience and makes gestures. S/he mostly keeps an active posture.	Always keeps the eye contact with the audience and makes gestures. S/he always keeps an active posture.
Creativity	Materials presented with little interpretation or originality.	Some apparent originality displayed through use of original interpretation of presented materials.	Exceptional originality of presented material and interpretation.