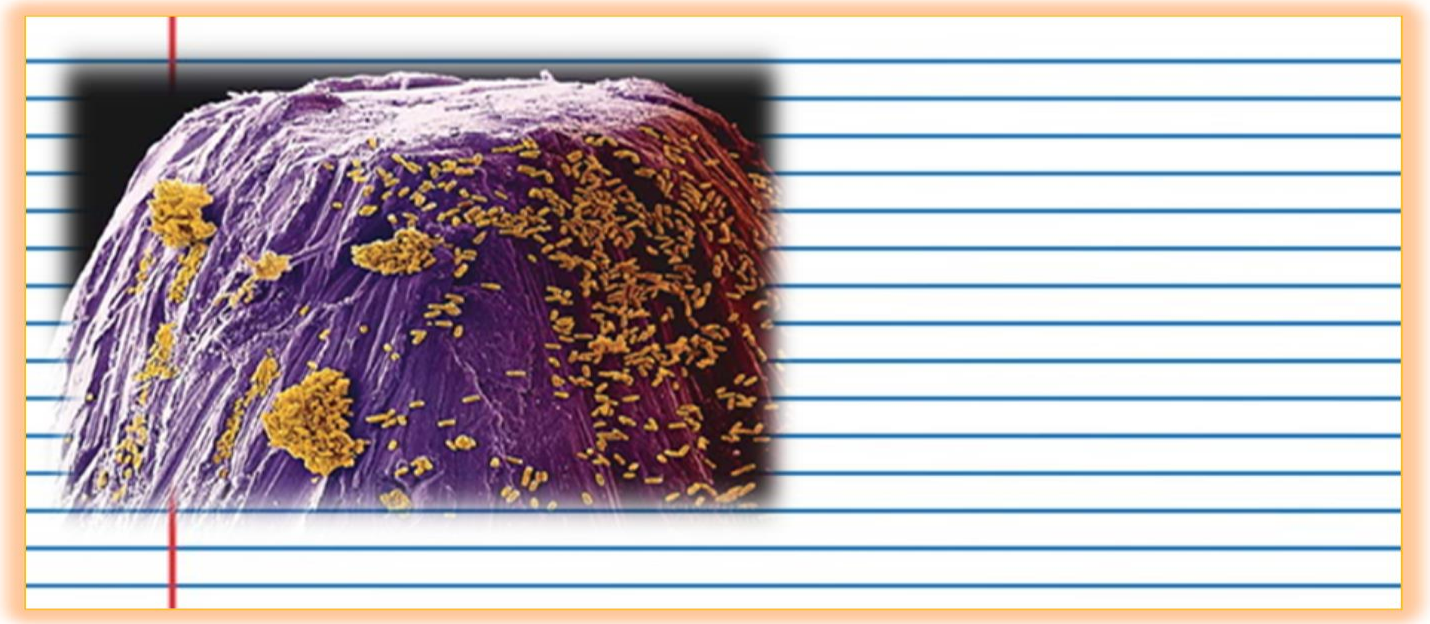
Part 2 Bacteria

Name:

Part 2 Lesson 1 Bacteria Intro and Archaea

What is this a picture of? Be as specific as possible? What does it show us?



Archaea: _____microorganisms that is genetically different from bacteria and eukaryotes.

Often inhabiting _____ environmental conditions.

Use the matrix to describe how Archaea and Bacteria are different from other Domains of Life?

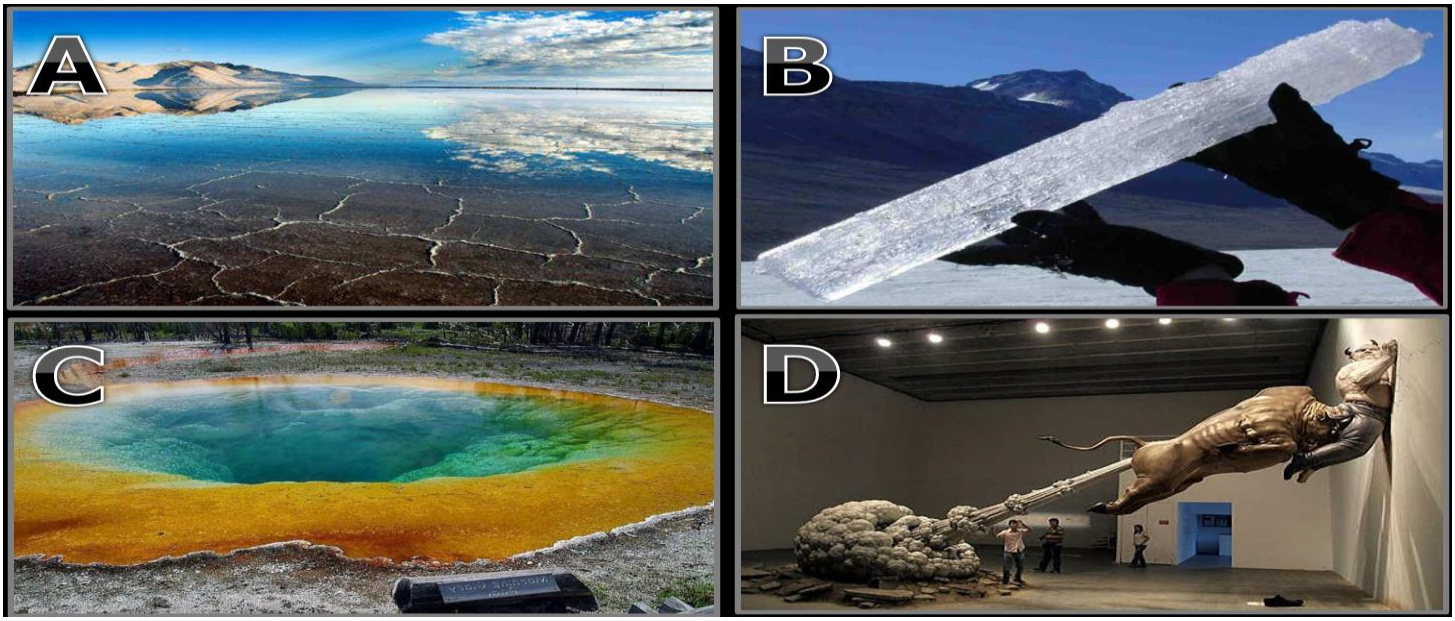
Domain	Bacteria	Archaea	Eukarya			
Kingdom	Bacteria	Archaea	Protista	Plantae	Fungi	Animalia
Cell Type	Prokaryotic (No nucleus)	Prokaryotic (No nucleus)	Eukaryotic (Nucleus)	Eukaryotic (Nucleus)	Eukaryotic (Nucleus)	Eukaryotic (Nucleus)
Single or Multi-Cellular	Single (Unicellular)	Single (Unicellular)	Single (Unicellular)	Multicellular	Multicellular	Multicellular
Gets Energy from..	Varies	Varies	Varies	Sunlight	Absorbs	Consumes Food

Archaea includes…

Methanogens: Ones that produce _____gas as a waste product of their digestion.
Halophiles: Ones that live in _____ environments.
Thermophiles: They live at extremely _____ temperatures.
Psychrophiles: Those that live at unusually _____ temperatures.

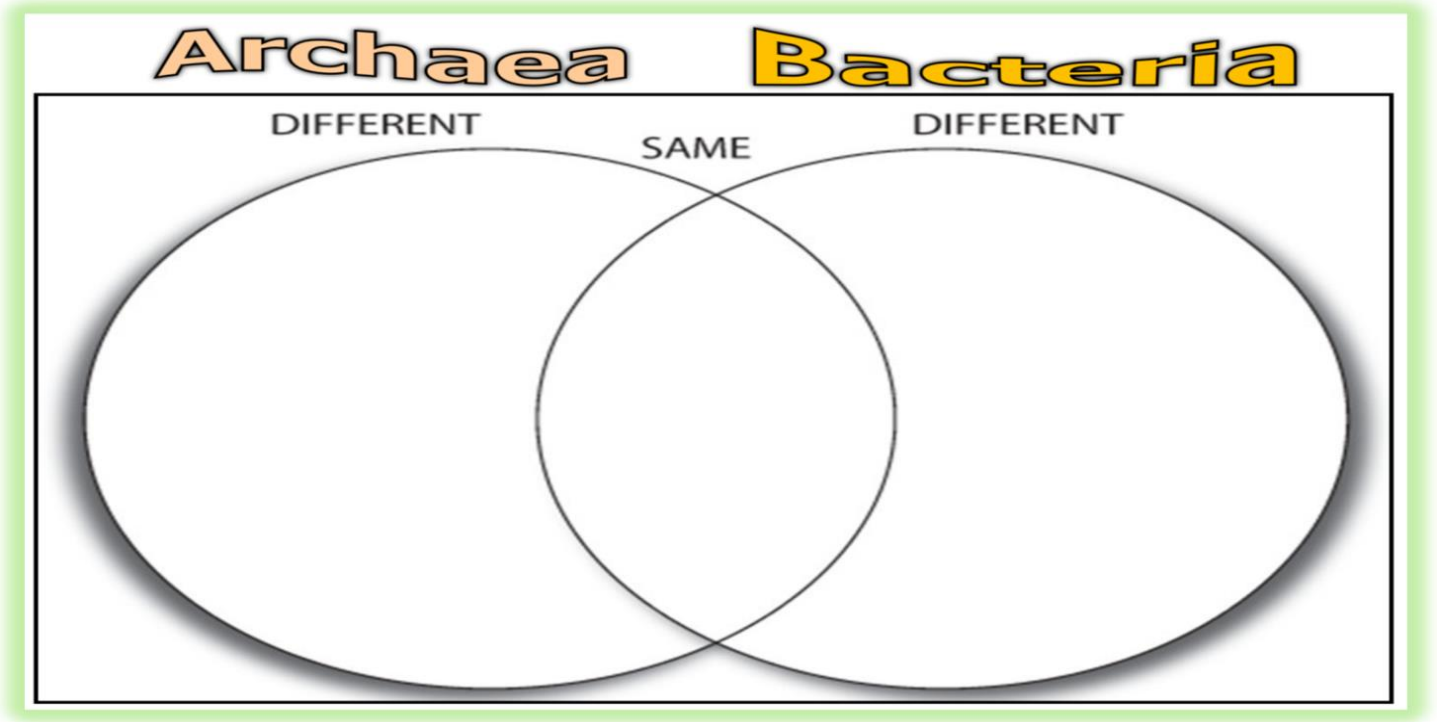
Name the type of Archaea? Methanogen, Halophile, Thermophile, Psychrophile

A)	B)
C)	D)

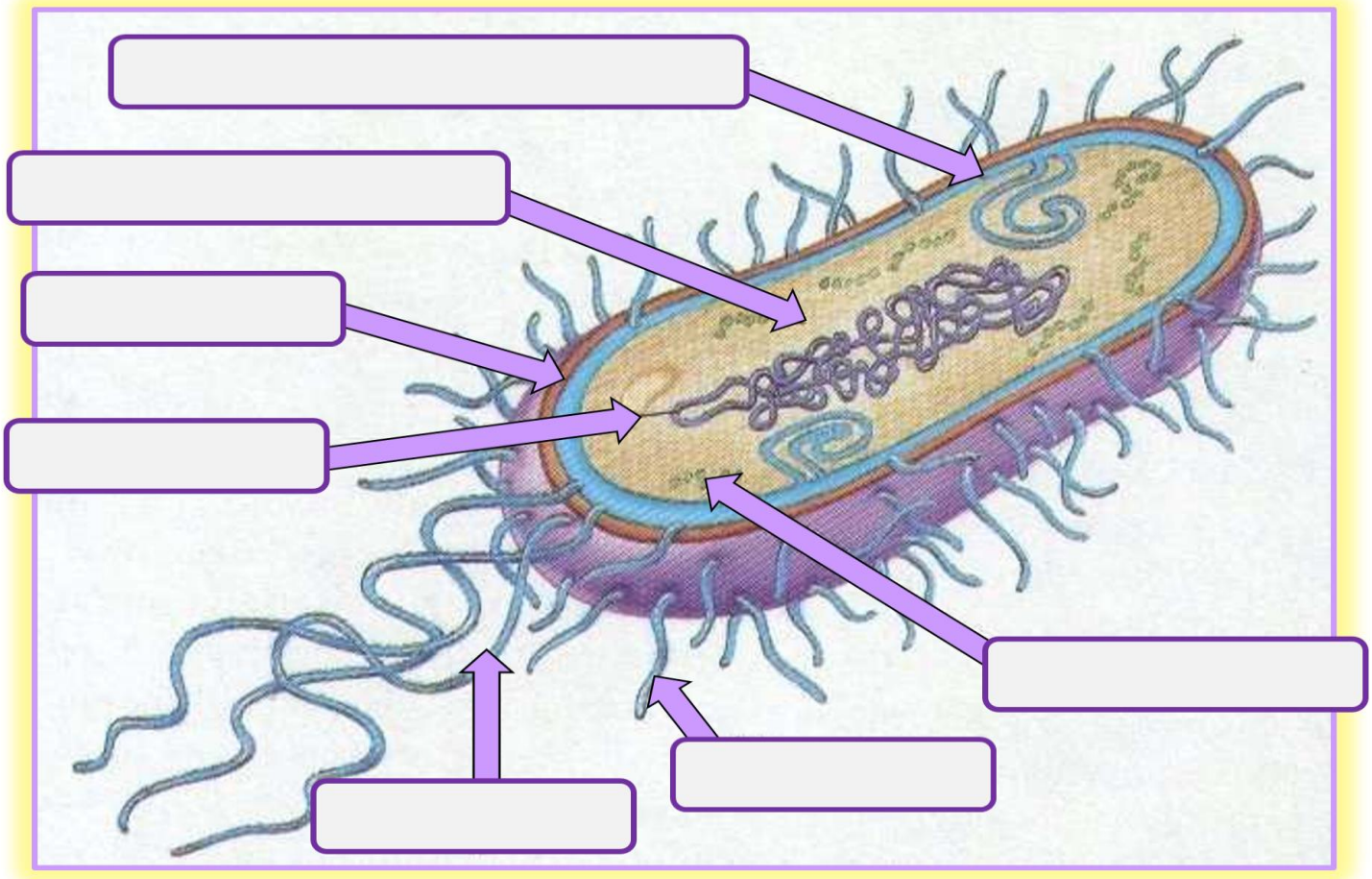


Archaeans are among the earliest forms of life that appeared on Earth.

-4 Billion years ago.
-It's now generally believed that the archaea and bacteria developed separately.
-Eukaryotes are believed to have split off from the archaea.



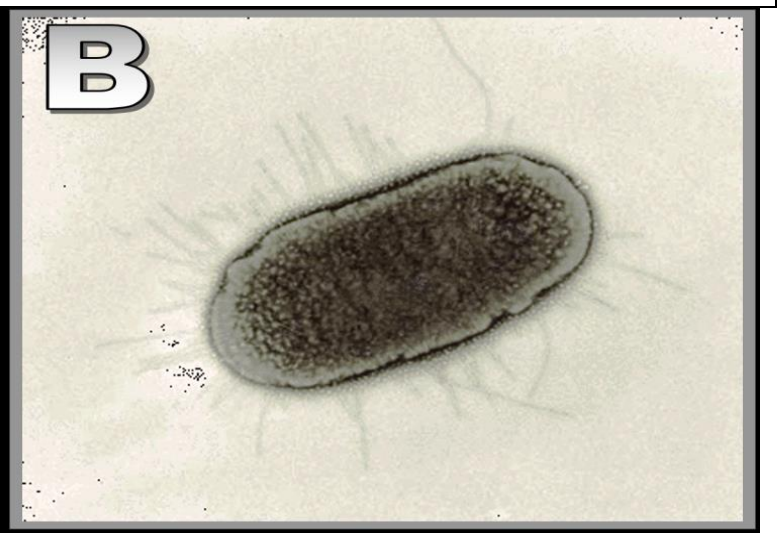
Domain Bacteria is composed of microorganisms that are much more common than Archaea and live almost anywhere.



Part 2 Lesson 2 Types of Bacteria

Prokaryotic (_____) and no internal organelles.

Which cell has a nucleus (Eukaryotic), and which is a bacteria (Prokaryotic).

A)	B)
	

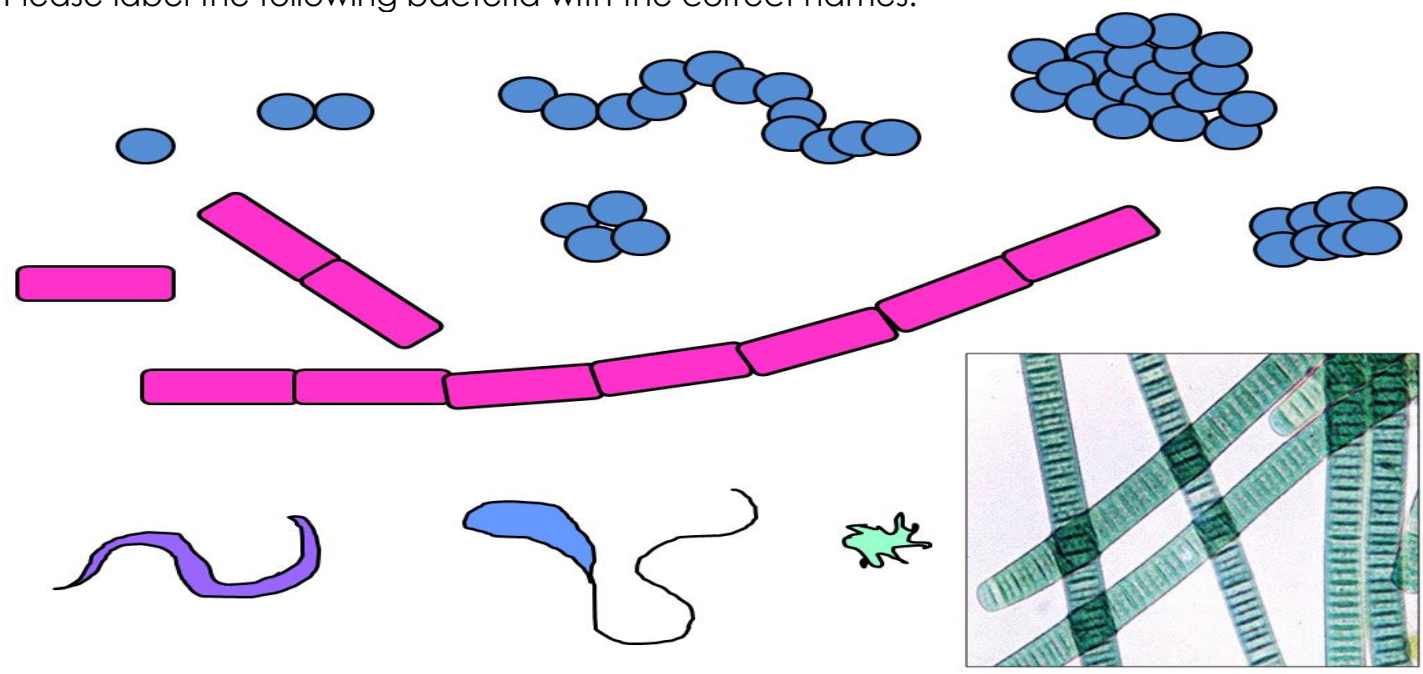
Types of Bacteria

Sphere (_____) Shaped – Cocci
_____ shaped – Bacilli
_____shaped – Spirilla
Mycoplasma bacteria – smallest known life form (_____).
Vibrio - _____shaped

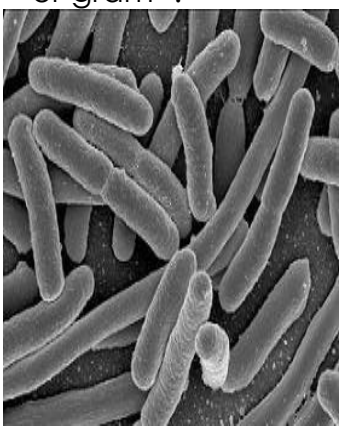
Cyanobacteria.

-It's _____ (gets energy from sun).
-Cyanobacteria is the oldest known fossils, more than _____ billion years old. They are one of the largest and most important groups of bacteria on earth.

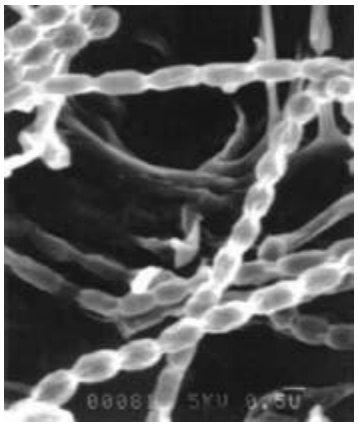
Please label the following bacteria with the correct names.

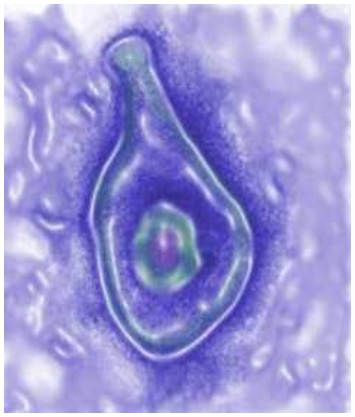


Please continue to name the bacteria below based on actual images. Mention if it is gram + or gram -.


Stained Purple

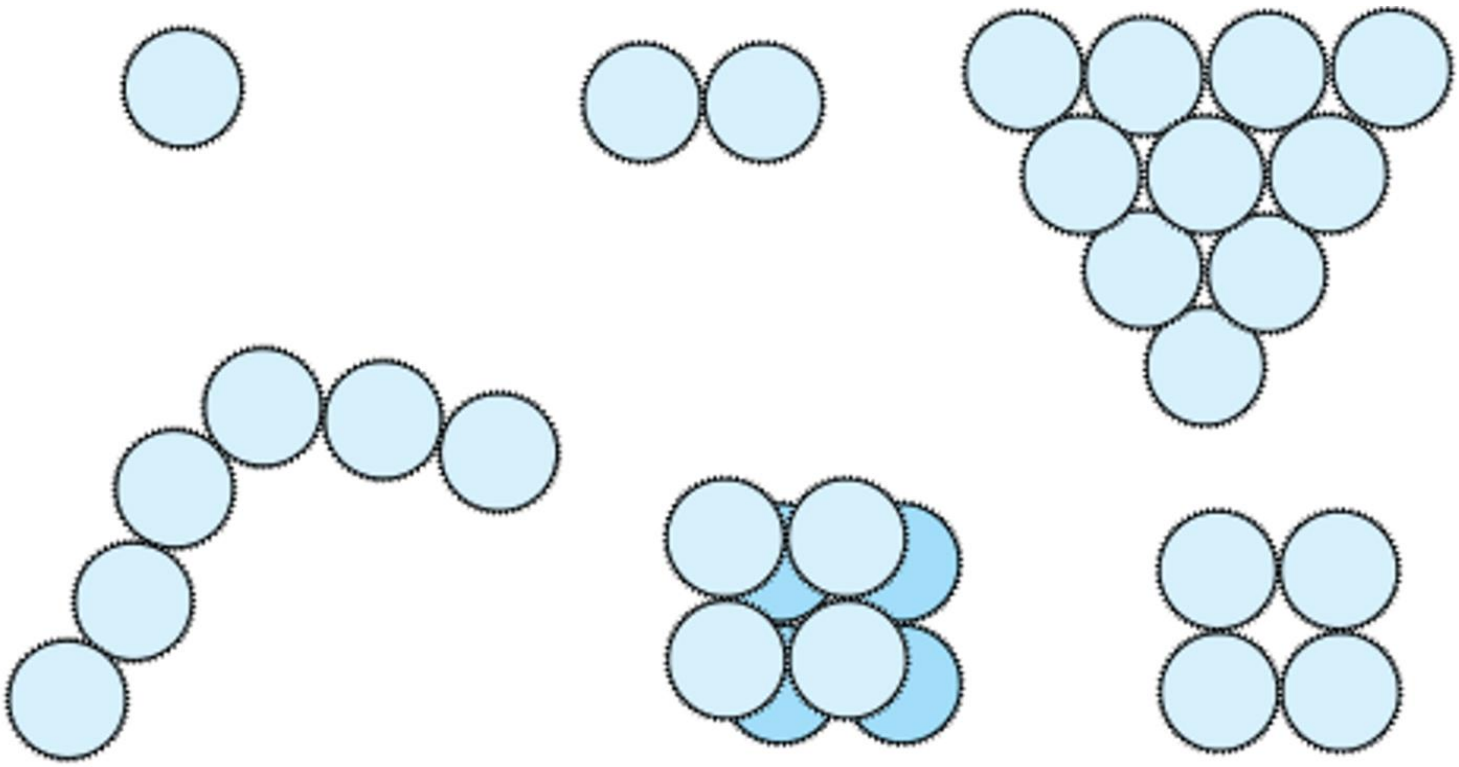

(Blue and Green)


Stained Pink


(Jagged and Random)

Part 2 Lesson 3 Organization of Bacteria, Gram Staining

Diplo = Pair ..
-Tetrad = Groups of four ::
-Sarcinae = Groups of Eight. ::::
-Staphylo = Cluster
-Strepto = Chain ----------



Gram staining: Technique used to identify bacteria.
Pink and Red: Gram _____
Dark Purple: Gram _____

Quiz 1-10 Name the type of bacteria,

- Be specific so include diplo, tetrad, sarcinae, strepto, staphylo.
- and gram + or – if applicable.
- As well as Cocci, Bacilli, Spirilli, Vibrio, Cyanobacteria

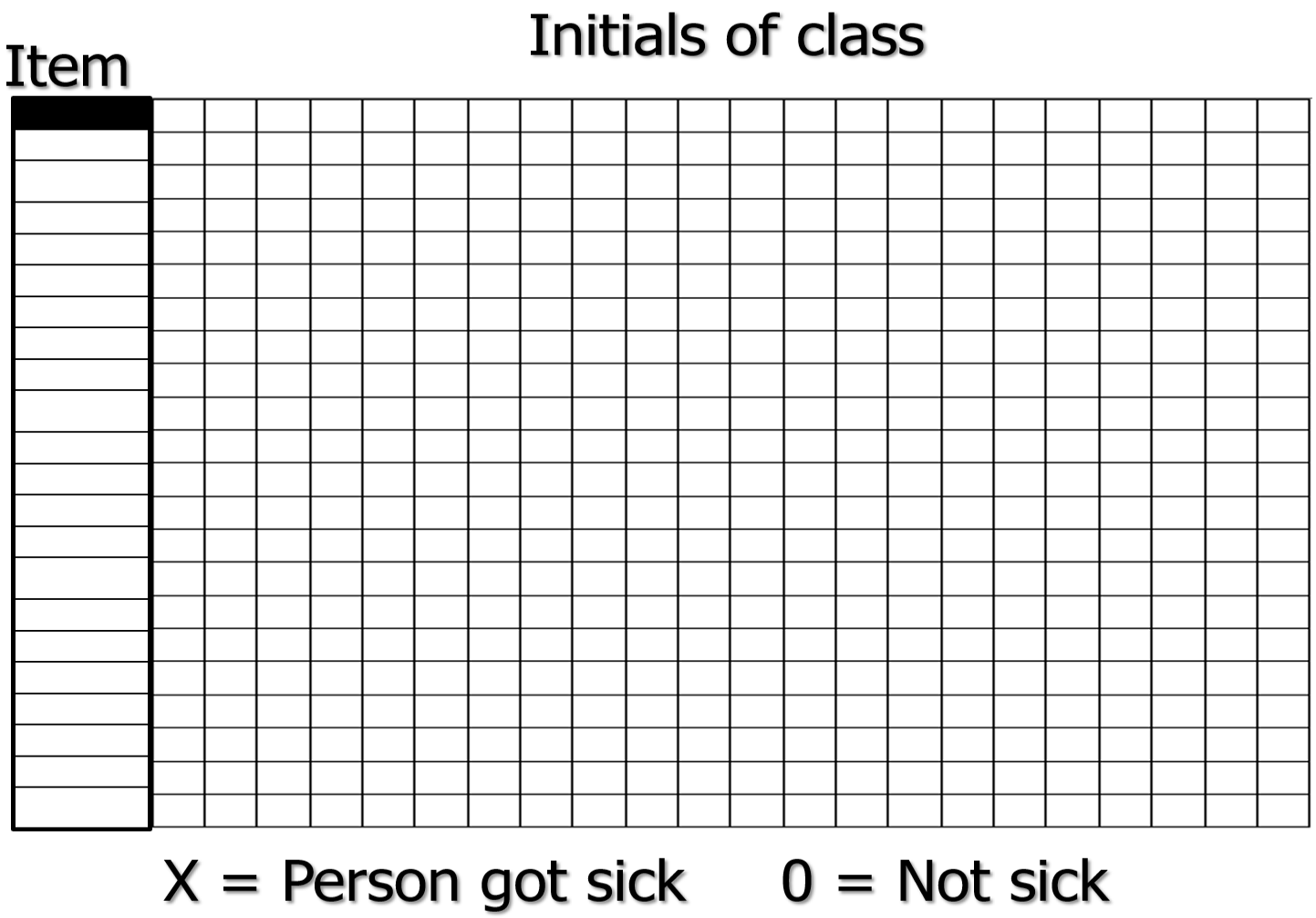
1)	2)	3)	4)
5)	6)	7)	8)
9)	10)	*11)	

Part 2 Lesson 4 Sam and Ella's Café

Activity! A trip to Sam and Ella's Café.

- Please record the names of the 4 food items that you choose from the four groups.

1)	2)
3)	4)



You are the health inspector / person assigned to the outbreak.

- Record the food items in the buffet on the right, and the classes initials above.

- Record an X if they got sick and an O if they didn't for <u>each food they ate</u> from the buffet.

"What items in the buffet made people sick?"

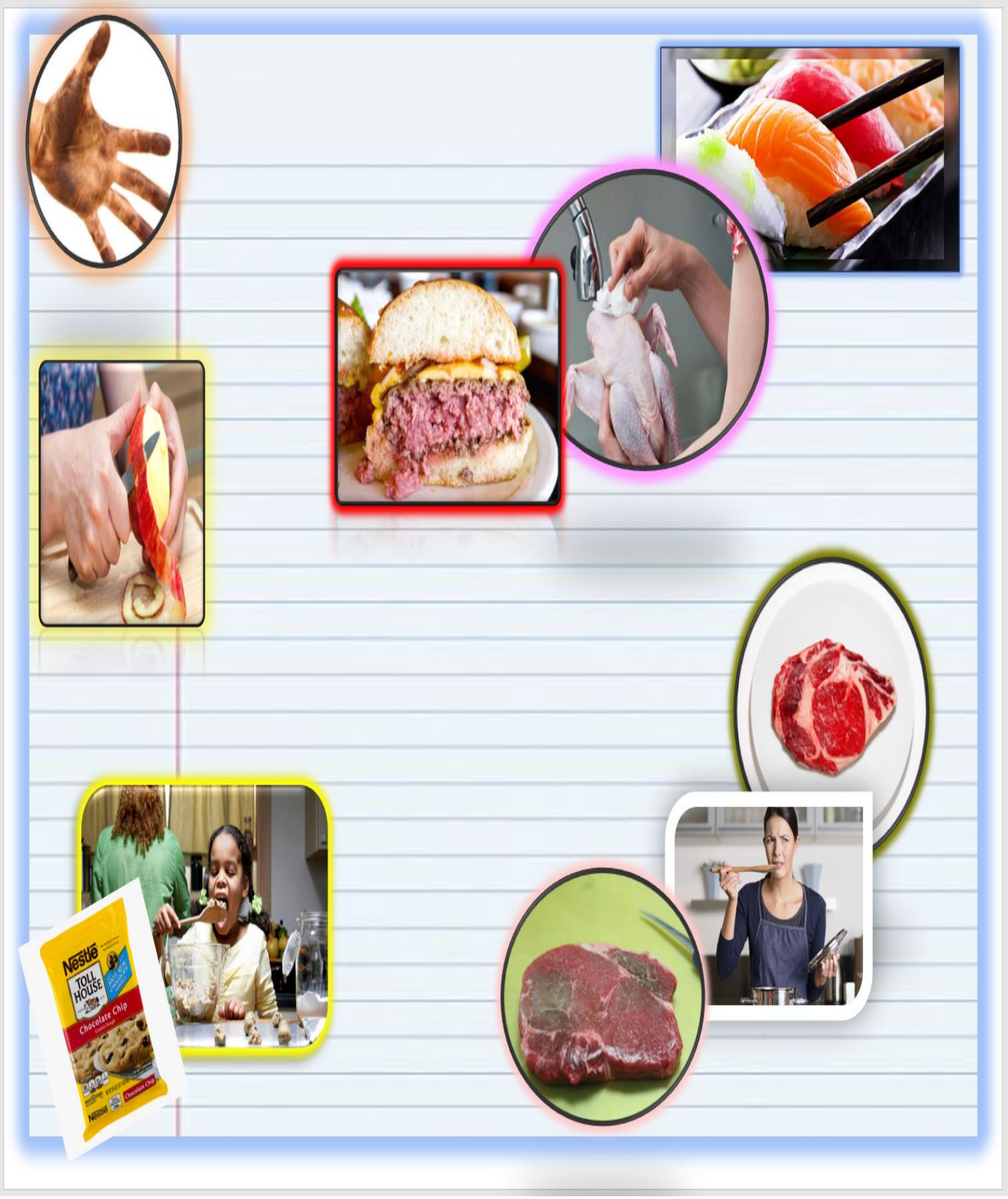
Part 2 Lesson 5 Preventing Food Borne Illness

Bacterial food borne illness can be prevented by….

-_____ the initial number of bacteria present.
-Refrigeration – Prevents the small number of bacteria from _____.
-Destroying the bacteria by proper _____.
-Avoiding re-contamination. Clean _____ immediately after use.

What are 10 Common mistakes people make with their food / Ways to avoid contracting a food borne illness? Visit the site below and use the images to assist you.

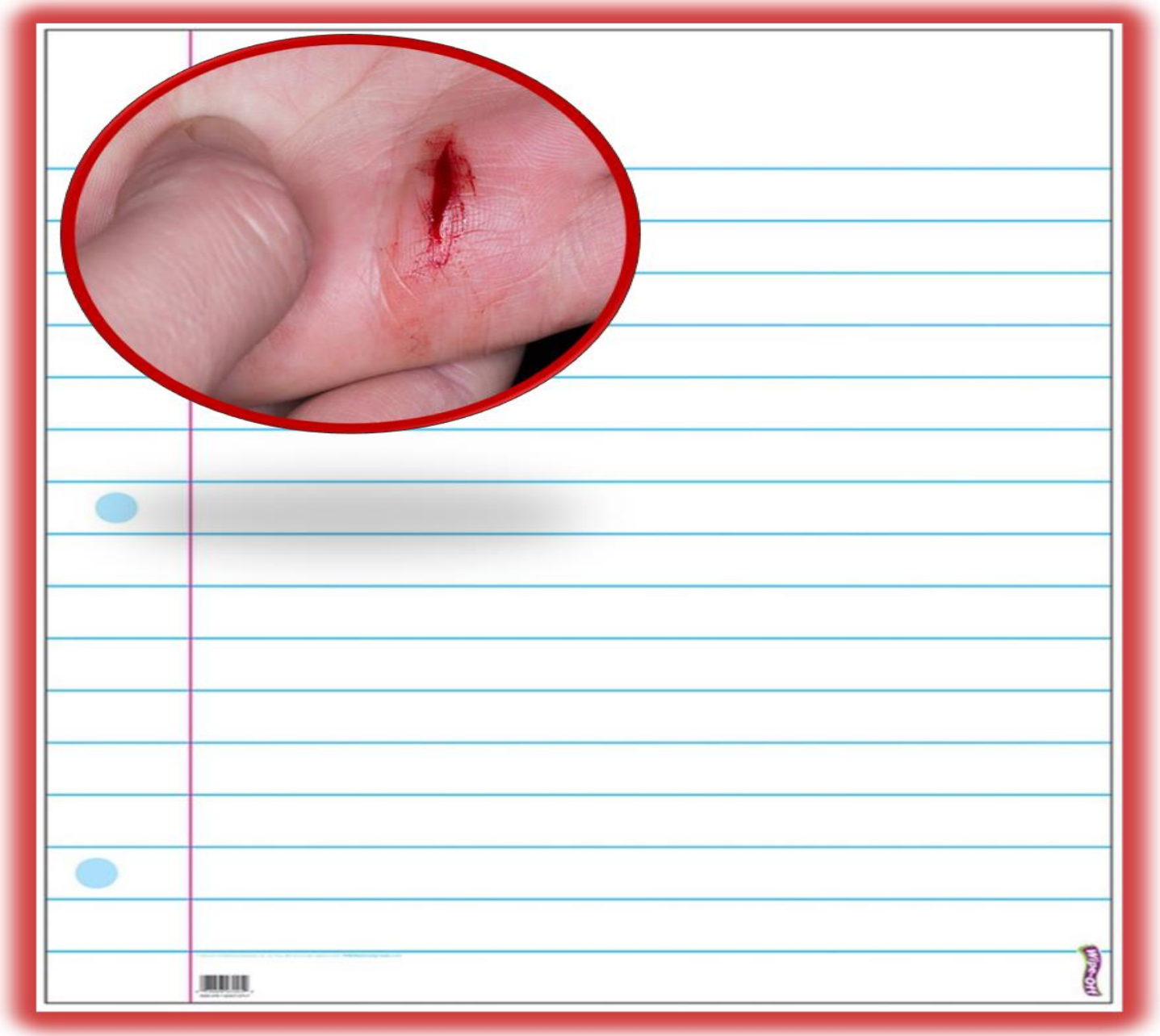
– https://www.cdc.gov/foodsafety/ten-dangerous-mistakes.html



Part 2 Lesson 5 Penicillin and Dental Hygiene

Penicillin: _____ that destroys bacteria derived from penicillin mold (_____).
Penicillin won't kill a virus, it only attacks _____.
Not completing prescription allows bacteria to become resistant.

If you get cut, what should you do to protect yourself from bacterial infection?

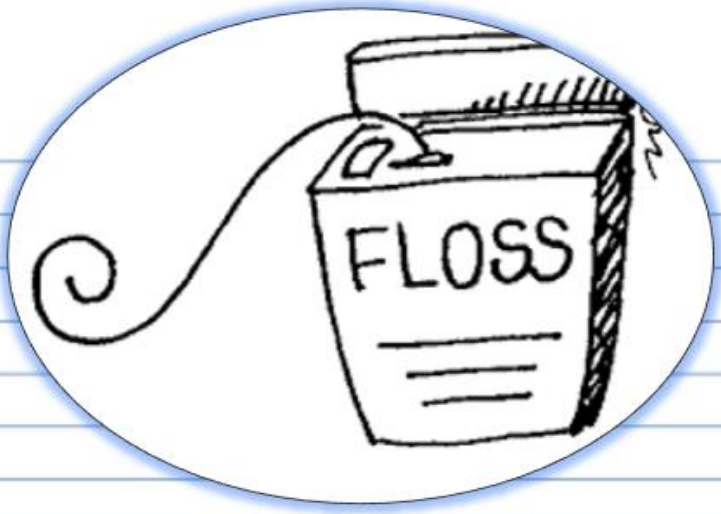


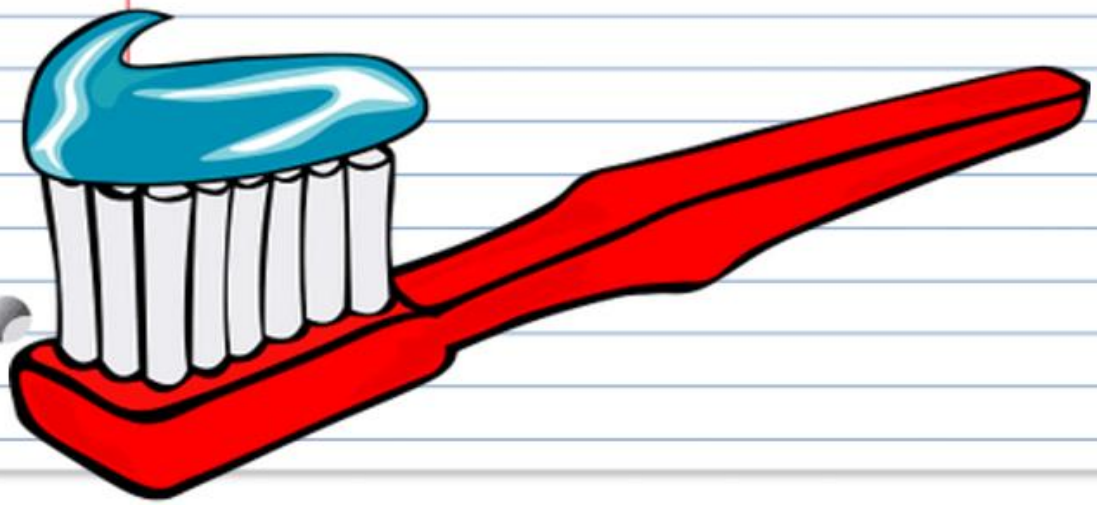
_____ is the accumulation of bacteria and micro-organisms on a tooth.

_____ is dental plaque that has mineralized.
Tartar can form when plaque is not removed from the tooth surface.

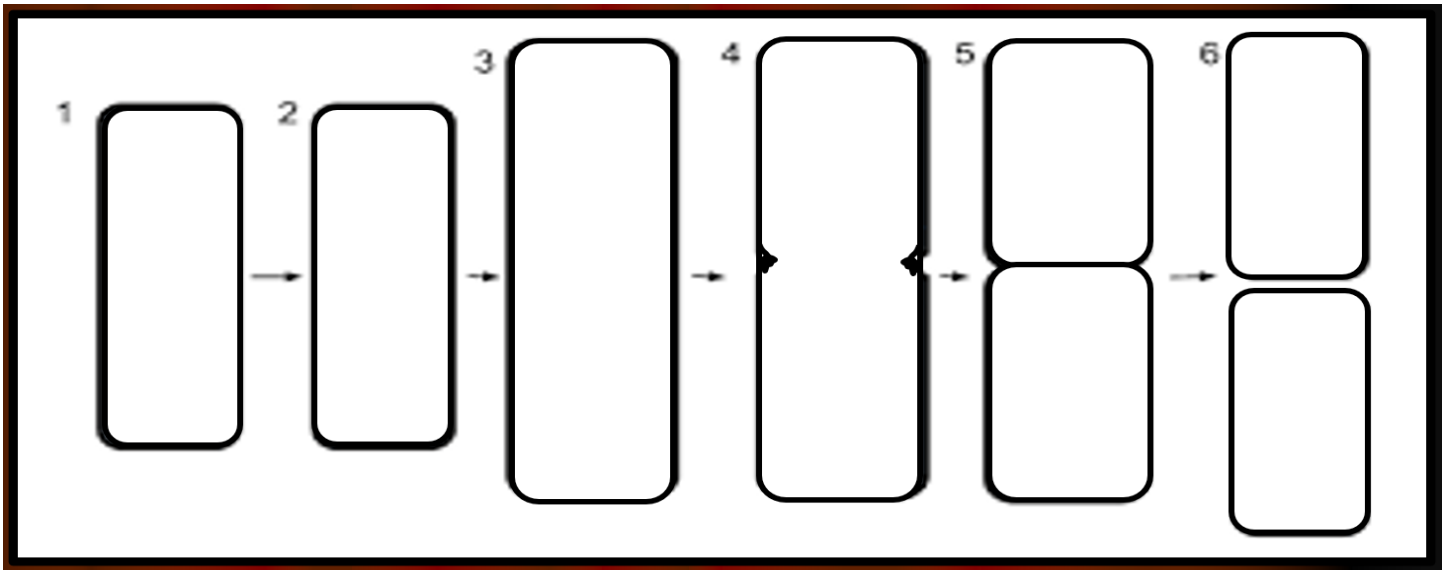
_____: A swelling and soreness of the gums that, without treatment, can cause serious gum problems and disease. Brushing your gums helps prevent.

Please discuss the importance and techniques to good dental hygiene


FLOSS



Binary Fission: The process by which a bacterium multiplies by _____



In asexual reproduction, one individual produces offspring that are genetically _____ to itself.

Bacterial Reproduction over 7 hours. Put a / for one bacteria and then ~~////~~ for 5. I'll do the first few.

20 min /	40 min //	1 hour ////	1:20	1:40
2 hours	2:20	2:40	3 hours	3:20
3:40	4 hours	4:20	4:40	5 hours
5:20	5:40	6 hours	6:20	6:40
7 hours	7:20	7:40	8 hours	8:20

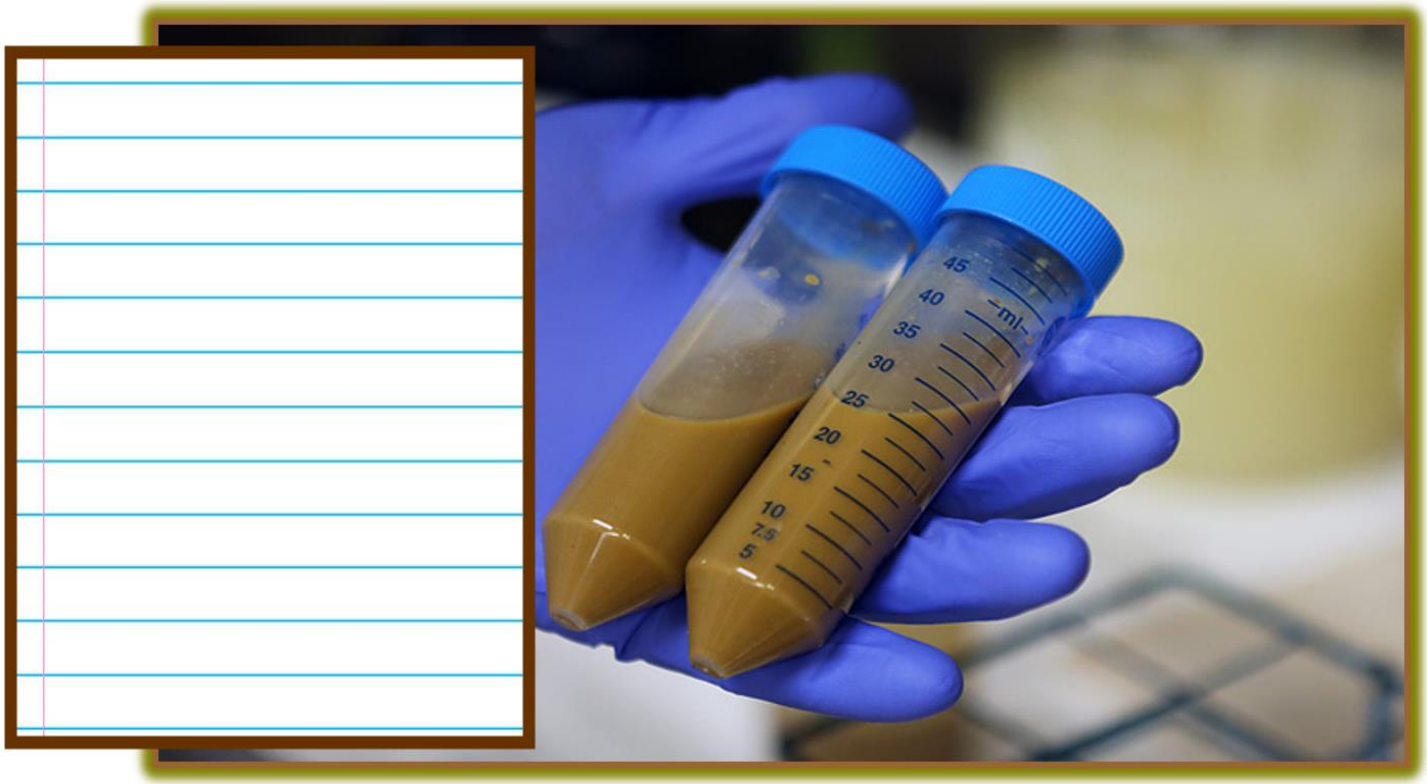
Bacteria live in our body. They are…

-**Mutualistic:** We provide a place to live and food, while the bacteria attack _____ microbes and digest food.

-**Commensalistic:** Most bacteria in our body, they benefit but don't cause us _____

-**Parasitic:** Harmful bacteria that eat _____ and release _____.

Tell me about the picture below as described in the slideshow/video.



Part 2 Lesson 8 Positives and Negatives of Bacteria / Wrap-Up

Positives of Bacteria (+)	Negatives of Bacteria (-)

Across

3. This prevents the small number of bacteria from growing rapidly on your food.
10. Sphere (Round) Shaped: C_____
11. Domain _____ is composed of microorganisms that are much more common than Archaea and live almost anywhere.
12. These type of bacteria attack harmful microbes and digest food.
16. In _____ reproduction, one individual produces offspring that are genetically identical to itself.
17. Prefix for a chain of bacteria
18. Archaea that live at unusually cold temperatures.
20. Rod shaped bacteria
21. These type of bacteria cause harm to our body by eating tissue and releasing toxins. P_____
23. Prefix for a pair of bacteria
24. This is a swelling and soreness of the gums that, without treatment, can cause serious gum problems and disease. Brushing your gums helps prevent.
27. Prefix for a cluster or large group of bacteria

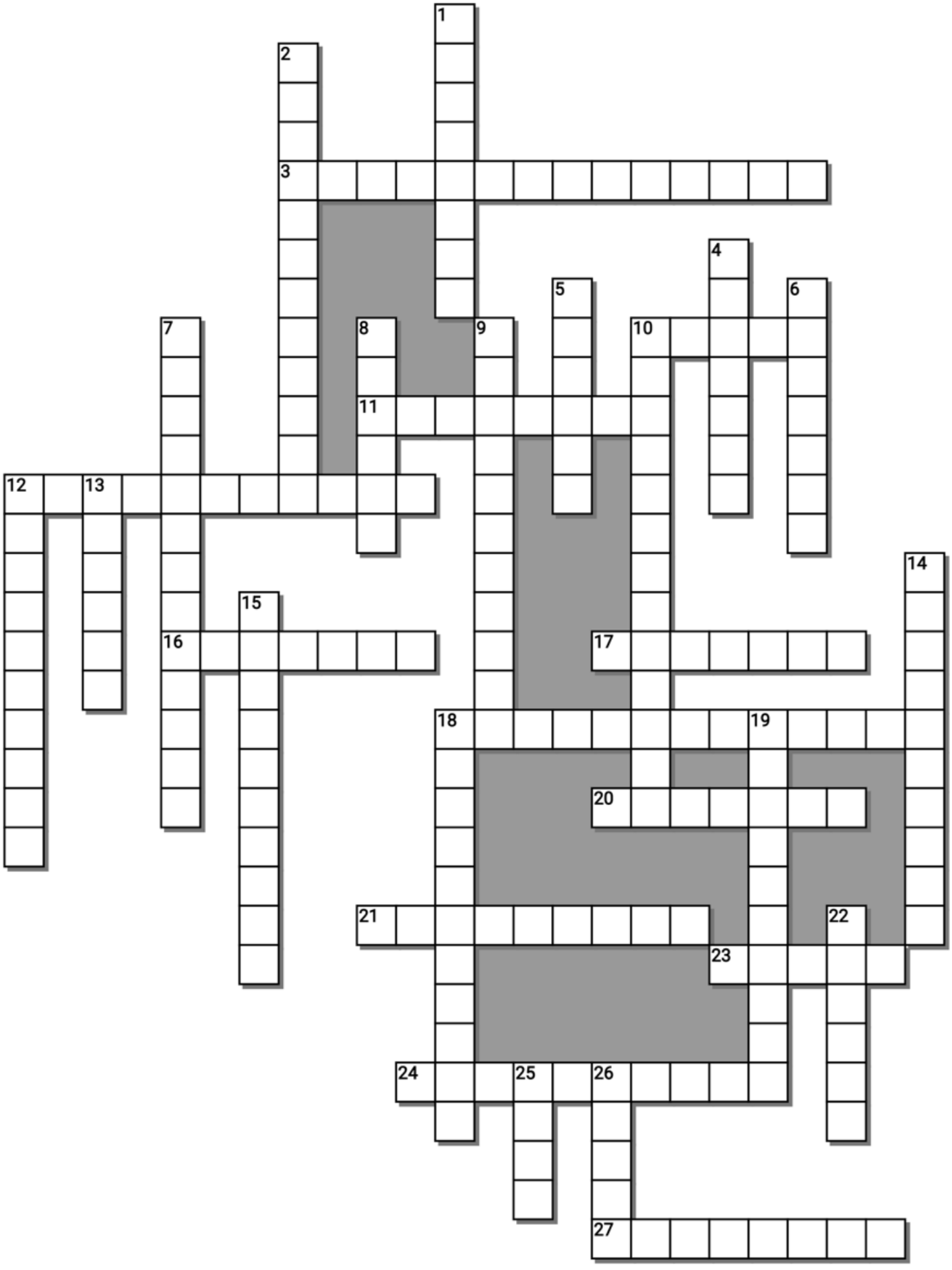
Down

1. Spiral shaped bacteria
2. Archaea that live at extremely hot temperatures.
4. Unicellular microorganisms that is genetically different from bacteria and eukaryotes.
5. Prefix for a group of four bacteria
6. Binary _____: The process by which a bacterium multiplies by splitting in two.
7. Avoiding re-_____ By clean cutting board immediately after use.
8. Comma shaped bacteria
9. Archaea that produce methane gas as a waste product of their digestion.
10. Photosynthetic bacteria (gets energy from sun).
12. _____ bacteria: Smallest known life form (jagged and random).
13. This is dental plaque that has become mineralized.
14. Agent that kills or inhibits the growth of micro-organisms on the external surfaces of the body.
15. This is an antibiotic that destroys bacteria derived from penicillin mold (fungi).
18. Organisms that have no nucleus, and no internal organelles.
19. Archaea that live in salty environments.
22. This is the accumulation of bacteria and micro-organisms on a tooth.
25. _____ staining: Technique used to identify bacteria.
26. Penicillin won't kill a _____, it only attacks bacteria.

----------Teacher can remove this word bank to make puzzle more challenging----------

Possible Answers

BACTERIA, PSYCHROPHILES, ANTISEPTIC, ARCHAEA, BACILLI, COCCI, CYANOBACTERIA, DIPLO, FISSION, GINGIVITIS, GRAM, HALOPHILES, METHANOGENS, MUTUALISTIC, MYCOPLASMA, PARASITIC, PENICILLIN, PLAQUE, PROKARYOTIC, REFRIDGERATION, SPIRILLI, STAPHYLO, STREPTO, TARTAR, THERMOPHILES, VIBRIO, VIRUS, ASEXUAL, CONTAMINATION, TETRAD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Part 2 Review Game Lesson 9

Name:

1-20 = 5 pts * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Due: Today
Score ____ / 100

BACT-OFF!	YO-SOCCUS	STOMACH PAINS	THAT"s JUST GROSS	SMELLY PANTS Bonus round 1 pt each
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

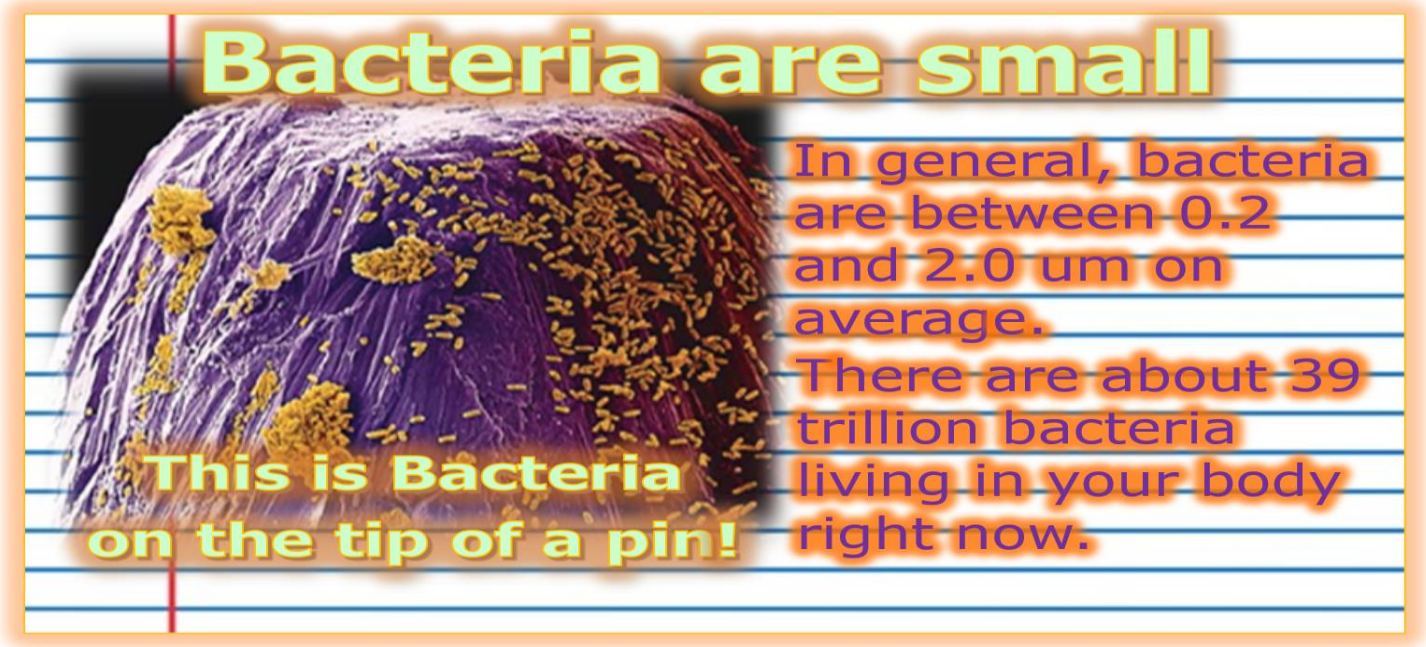
Final Question Wager ___ /5 Answer: _____

Part 2 Bacteria

Name:

Part 2 Lesson 1 Bacteria Intro and Archaea

What is this a picture of? Be as specific as possible? What does it show us?

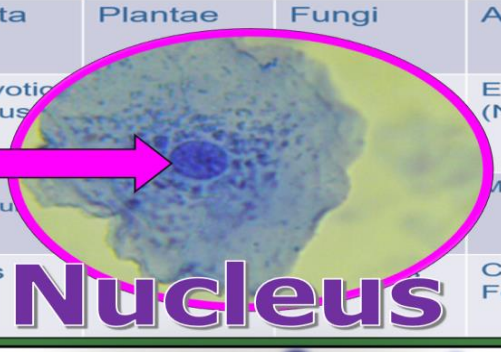


Archaea: Unicellular microorganisms that is genetically different from bacteria and eukaryotes.

Often inhabiting extreme environmental conditions.

Use the matrix to describe how Archaea and Bacteria are different from other Domains of Life?

Domain	Bacteria	Archaea	Eukarya			
Kingdom	Bacteria	Archaea	Protista	Plantae	Fungi	Animalia
Cell Type	Prokaryotic (No nucleus)	Prokaryotic (No nucleus)	Eukaryotic (Nucleus			Eukaryotic (Nucleus)
Single or Multi-Cellular	Single (Unicellular)	Single (Unicellular)	Single (Unicellu			Multicellular
Gets Energy from..	Varies	Varies	Varies			Consumes Food



Both Bacteria and Archaea are prokaryotes, single-celled microorganisms with no nuclei, and Eukarya includes us and all other animals, plants, fungi, and single-celled protists – all organisms whose cells have nuclei to enclose their DNA apart from the rest of the cell.

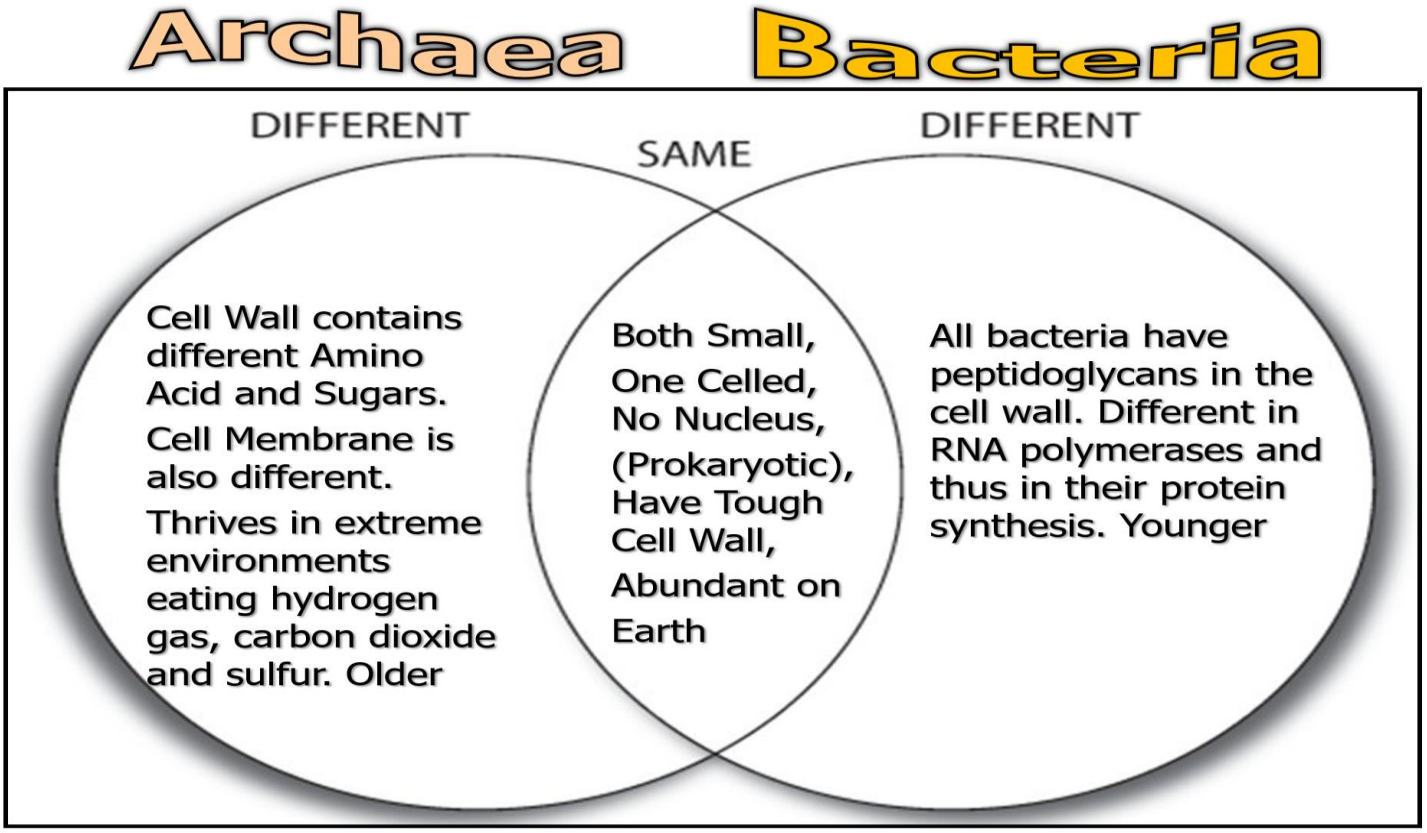
Archaea includes…

Methanogens: Ones that produce methane gas as a waste product of their digestion.
Halophiles: Ones that live in salty environments.
Thermophiles: They live at extremely high temperatures.
Psychrophiles: Those that live at unusually low temperatures.

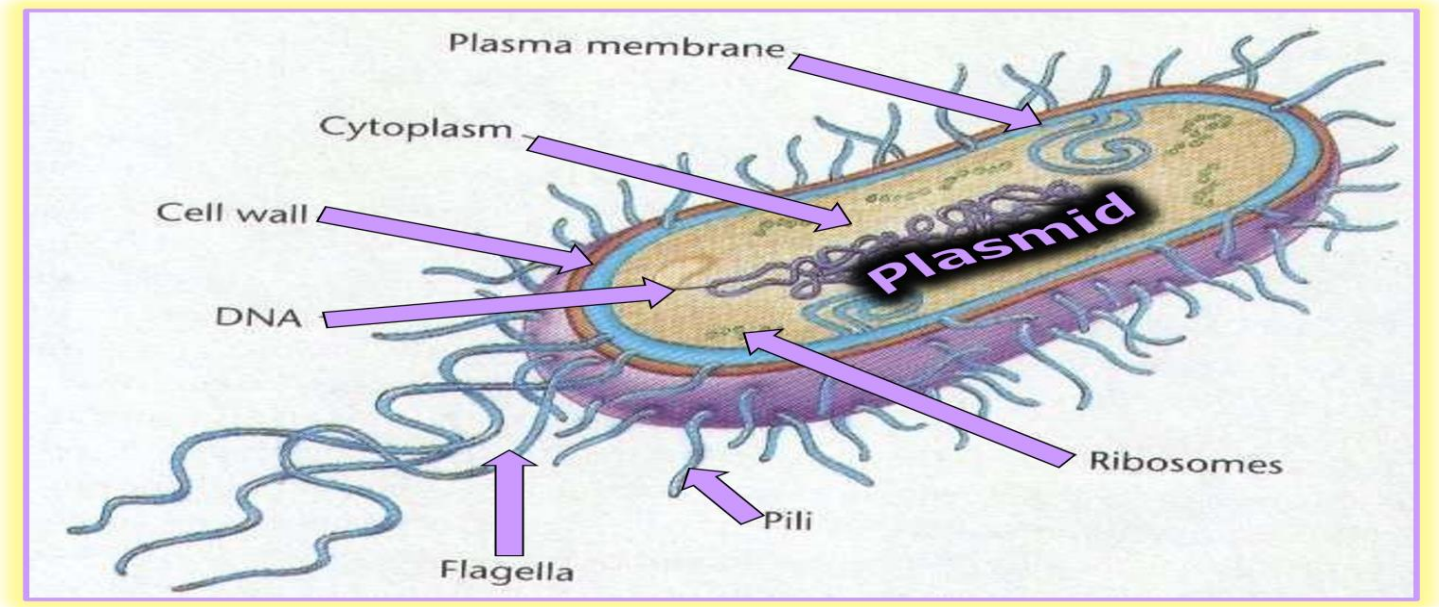
Name the type of Archaea? Methanogen, Halophile, Thermophile, Psychrophile

Archaeans are among the earliest forms of life that appeared on Earth.

-4 Billion years ago.
-It's now generally believed that the archaea and bacteria developed separately.
-Eukaryotes are believed to have split off from the archaea.



Domain Bacteria is composed of microorganisms that are much more common than Archaea and live almost anywhere.



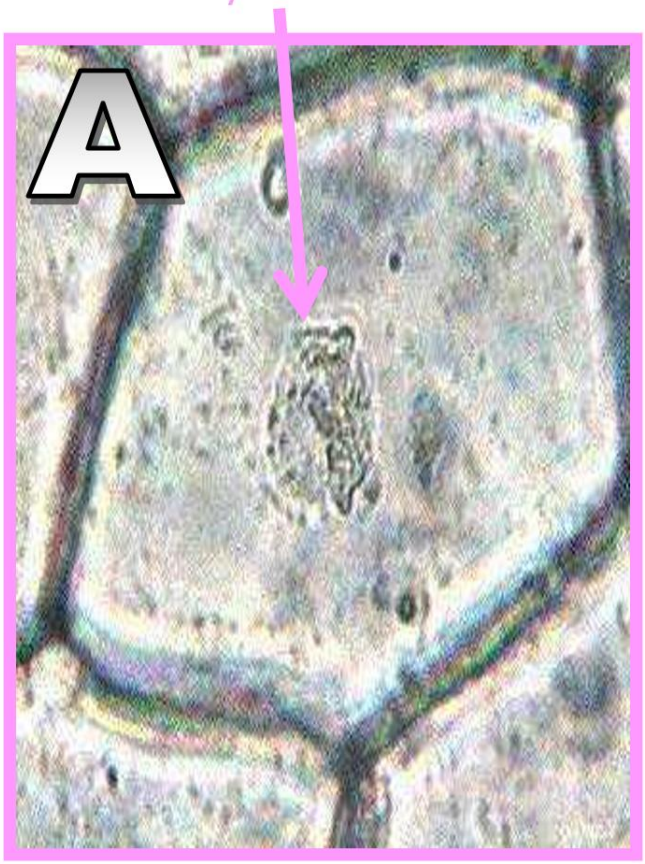
Part 2 Lesson 2 Types of Bacteria

Prokaryotic (No Nucleus) and no internal organelles.

Which cell has a nucleus (Eukaryotic), and which is a bacteria (Prokaryotic).

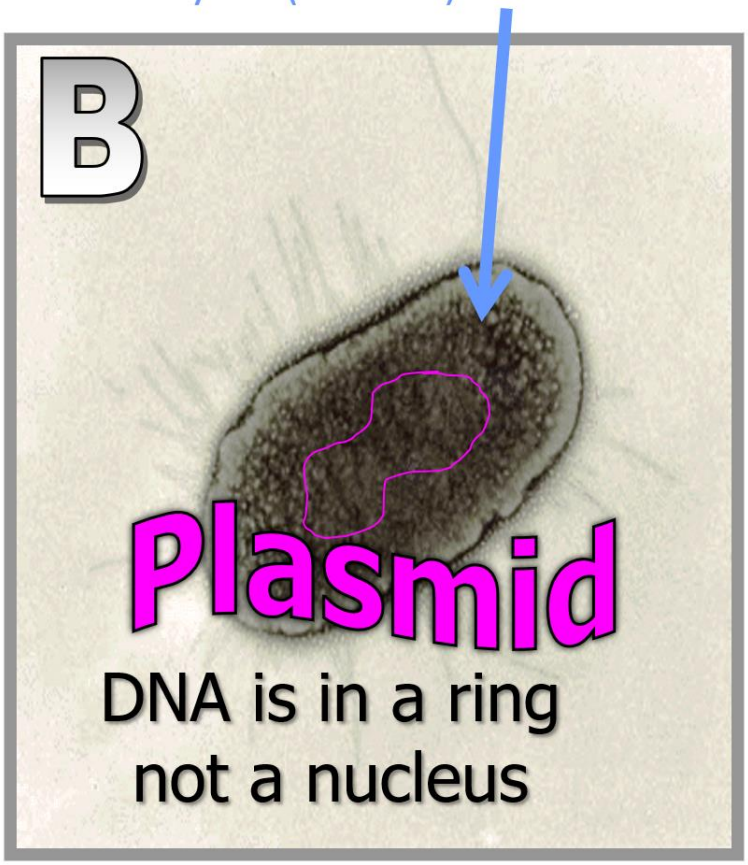
Cell with nucleus

Eukaryotic



Cell without nucleus

Prokaryotic (Bacteria)



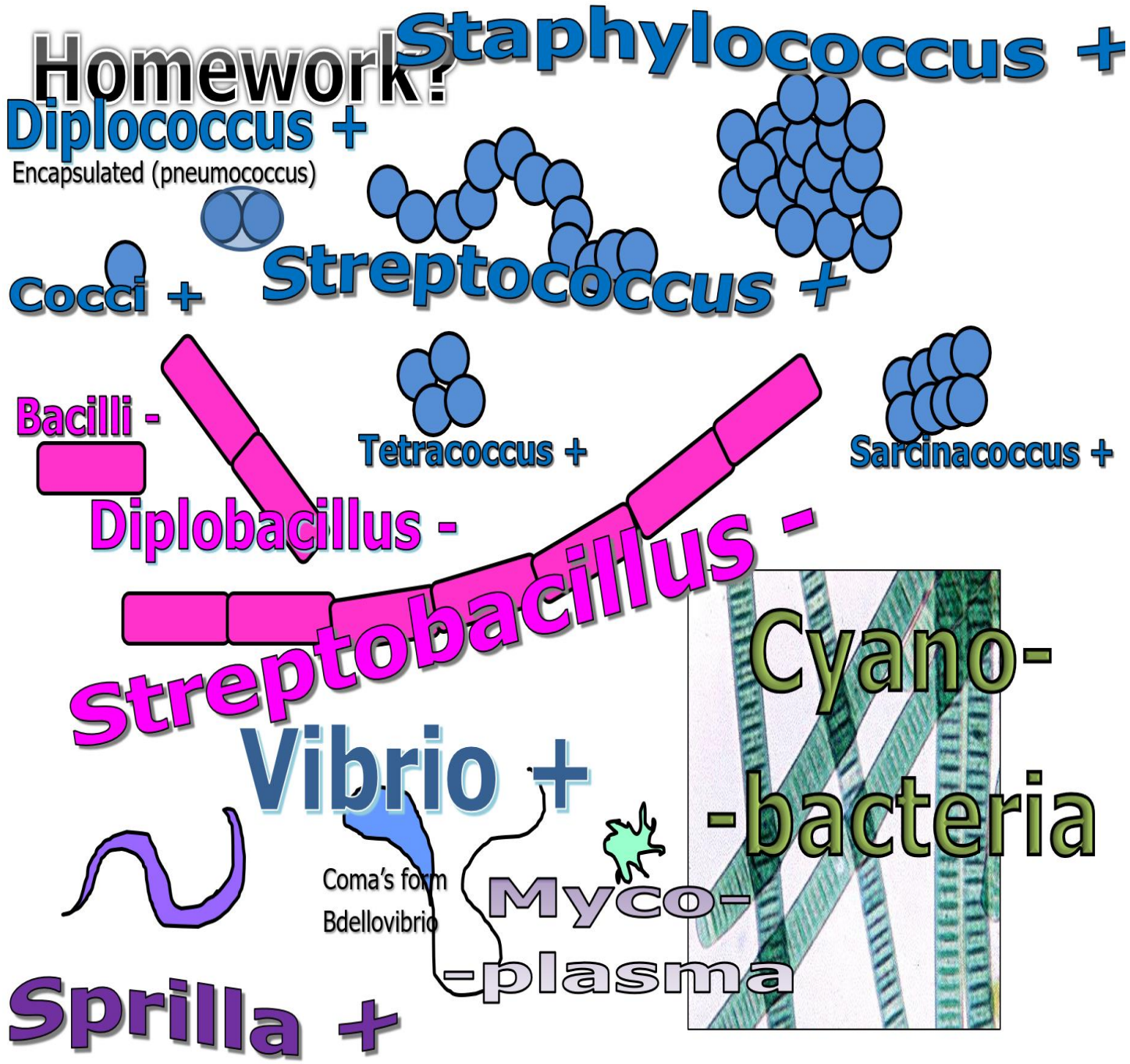
Types of Bacteria

Sphere (Round) Shaped – Cocci
Rod shaped – Bacilli
Spiral shaped – Spirilla
Mycoplasma bacteria – smallest known life form (shape is jagged and random).
Vibrio – Coma shaped

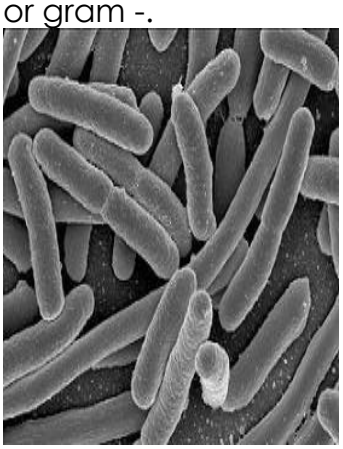
Cyanobacteria.

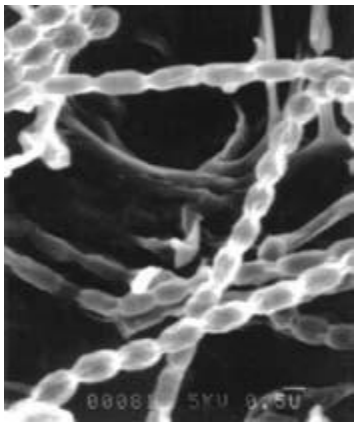
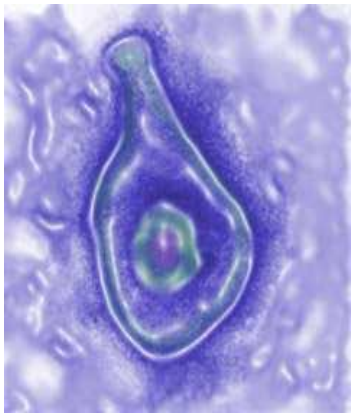
-It's photosynthetic (gets energy from sun).
-Cyanobacteria is the oldest known fossils, more than 3.5 billion years old.
They are one of the largest and most important groups of bacteria on earth.

Please label the following bacteria with the correct names.



Please continue to name the bacteria below based on actual images. Mention if it is gram + or gram -.



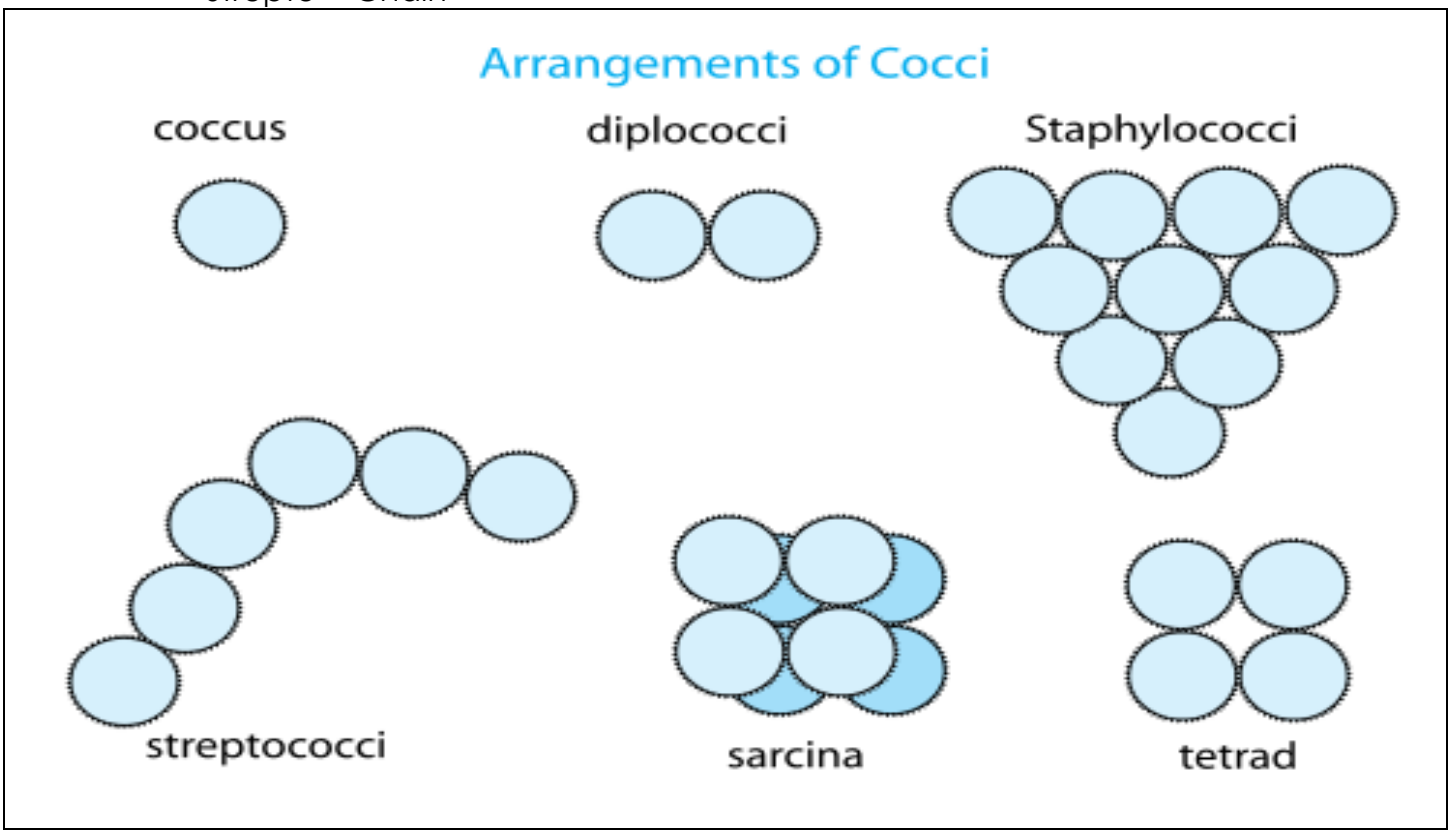



Stained Purple (Blue and Green) Stained Pink (Jagged and Random)

Diplobacillus (gram +)	Cyanobacteria	Streptobacillus (Gram -)	Mycoplasma

Part 2 Lesson 3 Organization of Bacteria, Gram Staining

Diplo = Pair ..
-Tetrad = Groups of four ::
-Sarcinae = Groups of Eight. ::::
-Staphylo = Cluster
-Strepto = Chain ----------



Gram staining: Technique used to identify bacteria.
Pink and Red: Gram Negative
Dark Purple: Gram Positive

Quiz 1-10 Name the type of bacteria,

- Be specific so include diplo, tetrad, sarcinae, strepto, staphylo.
- and gram + or – if applicable.
- As well as Cocci, Bacilli, Spirilli, Vibrio, Cyanobacteria

1) Staphylococcus (Gram +)	2) Diplobacillus	3) Streptococcus	4) Spirilla Vibrio (Gram -)
5) Cyanobacteria	6) Sarcinacoccus (gram -)	7) Staphylococcus (gram +)	8) Baccilli (Gram -)
9) Staphylococcus (Gram +)	10) Streptobacillus (Gram +)	*11) Mr. T.	

Part 2 Lesson 4 Sam and Ella's Café

Activity! A trip to Sam and Ella's Café.

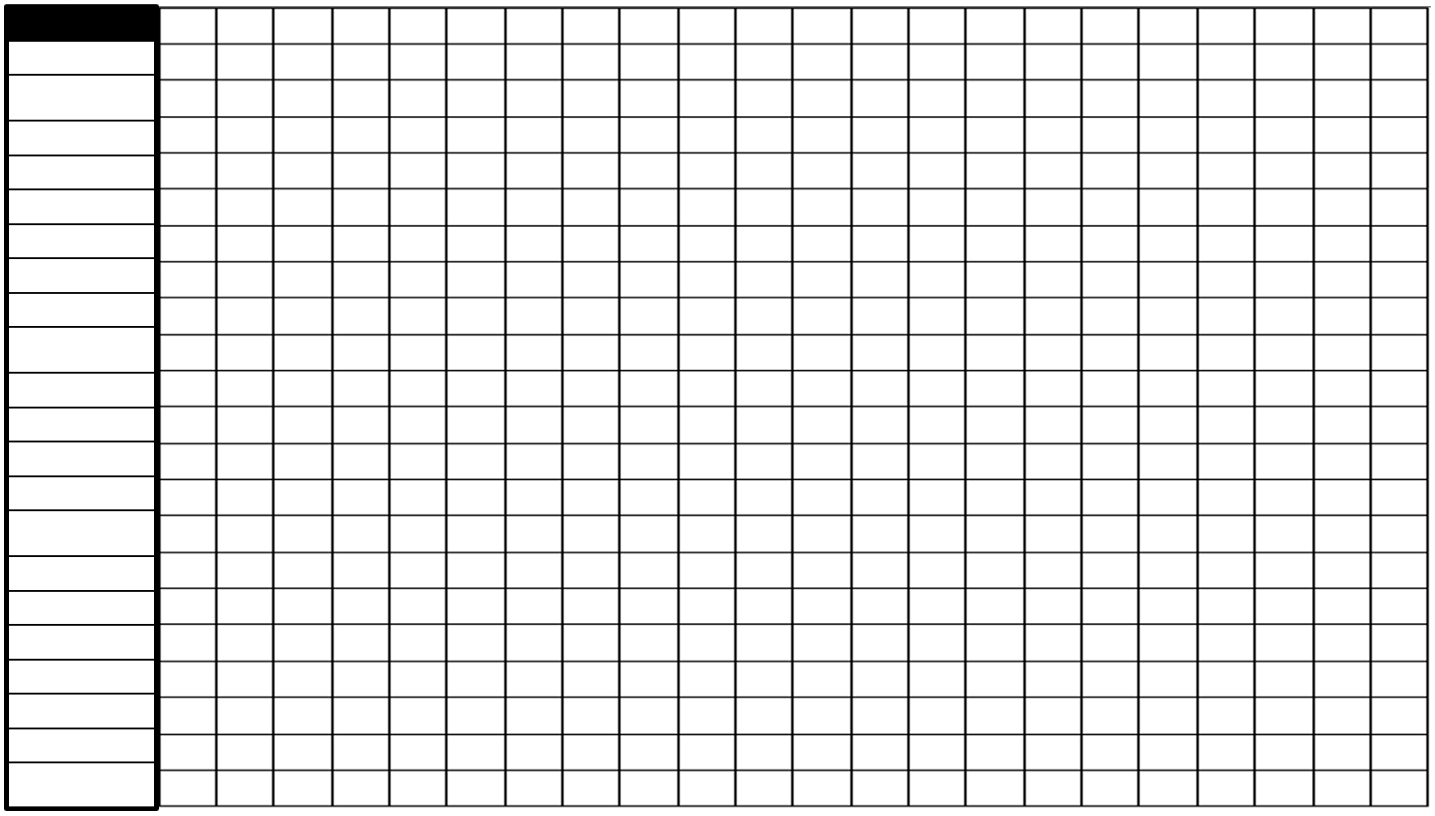
- Please record the names of the 4 food items that you choose from the four groups.

1)	2)
3)	4)

Answers will vary based on what foods teacher selects to be tainted with "Salmonella"

Initials of class

Item



X = Person got sick 0 = Not sick

You are the health inspector / person assigned to the outbreak.

- Record the food items in the buffet on the right, and the classes initials above.
- Record an X if they got sick and an O if they didn't for each food they ate from the buffet.

"What items in the buffet made people sick?"

Answers will vary here	

Part 2 Lesson 5 Bacterial Reproduction

Bacterial food borne illness can be prevented by….

-Controlling the initial number of bacteria present.

-Refrigeration – Prevents the small number of bacteria from growing rapidly.
-Destroying the bacteria by proper cooking / heat.
-Avoiding re-contamination. Clean surfaces immediately after use.

What are 10 Common mistakes people make with their food / Ways to avoid contracting a food borne illness? Visit the site below and use the images to assist you.

– https://www.cdc.gov/foodsafety/ten-dangerous-mistakes.html

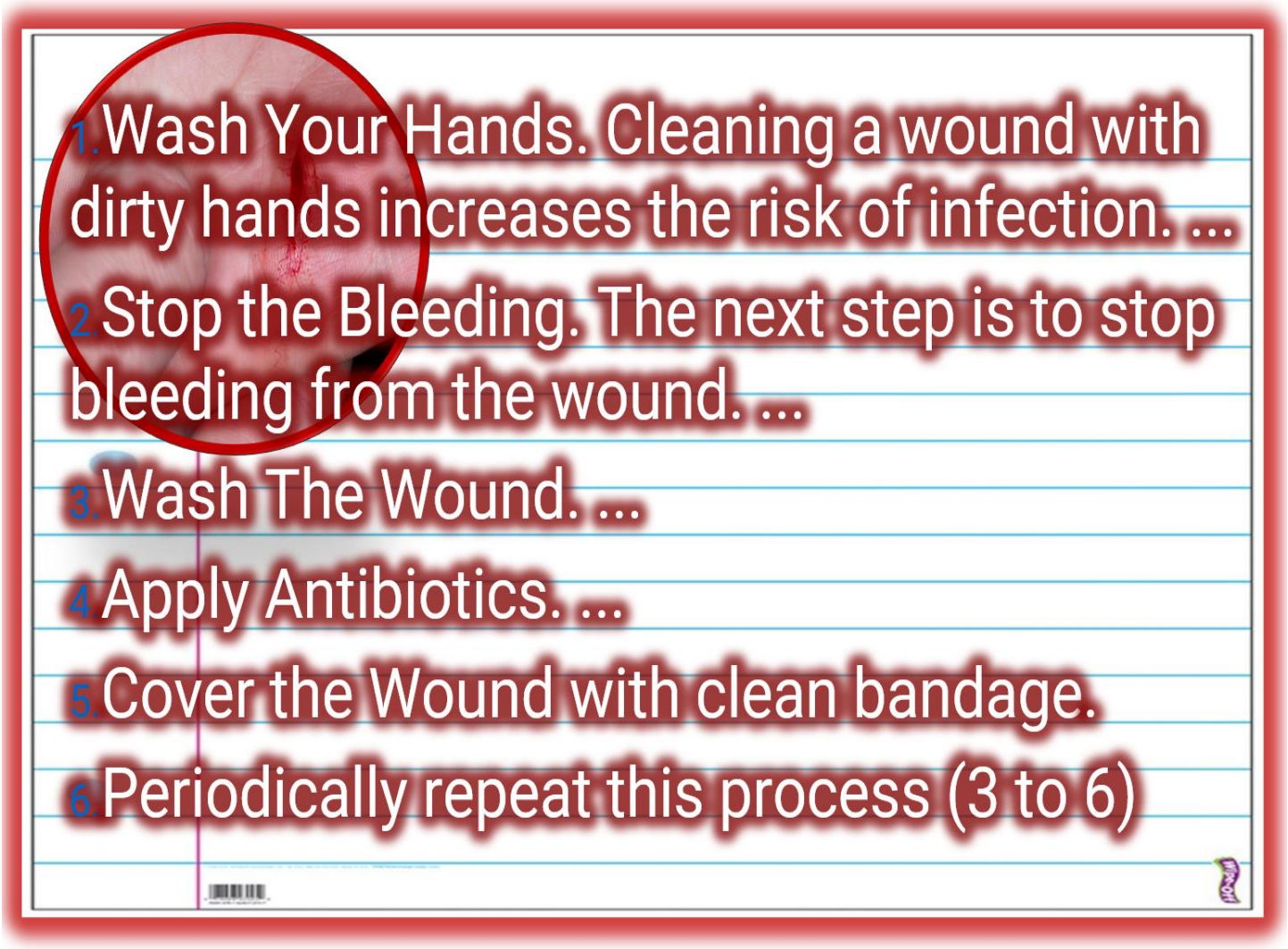
Part 2 Lesson 5 Penicillin and Dental Hygiene

Penicillin: Antibiotic that destroys bacteria derived from penicillin mold (Kingdom Fungi).

Penicillin won't kill a virus, it only attacks bacteria.

Not completing prescription allows bacteria to become resistant.

If you get cut, what should you do to protect yourself from bacterial infection?



Plaque is the accumulation of bacteria and micro-organisms on a tooth.

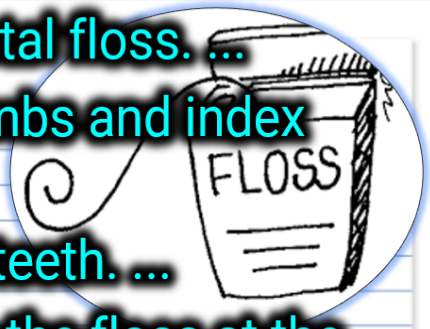
Tartar is dental plaque that has mineralized.

Tartar can form when plaque is not removed from the tooth surface.

Gingivitis: A swelling and soreness of the gums that, without treatment, can cause serious gum problems and disease. Brushing your gums helps prevent.

Please discuss the importance and techniques to good dental hygiene

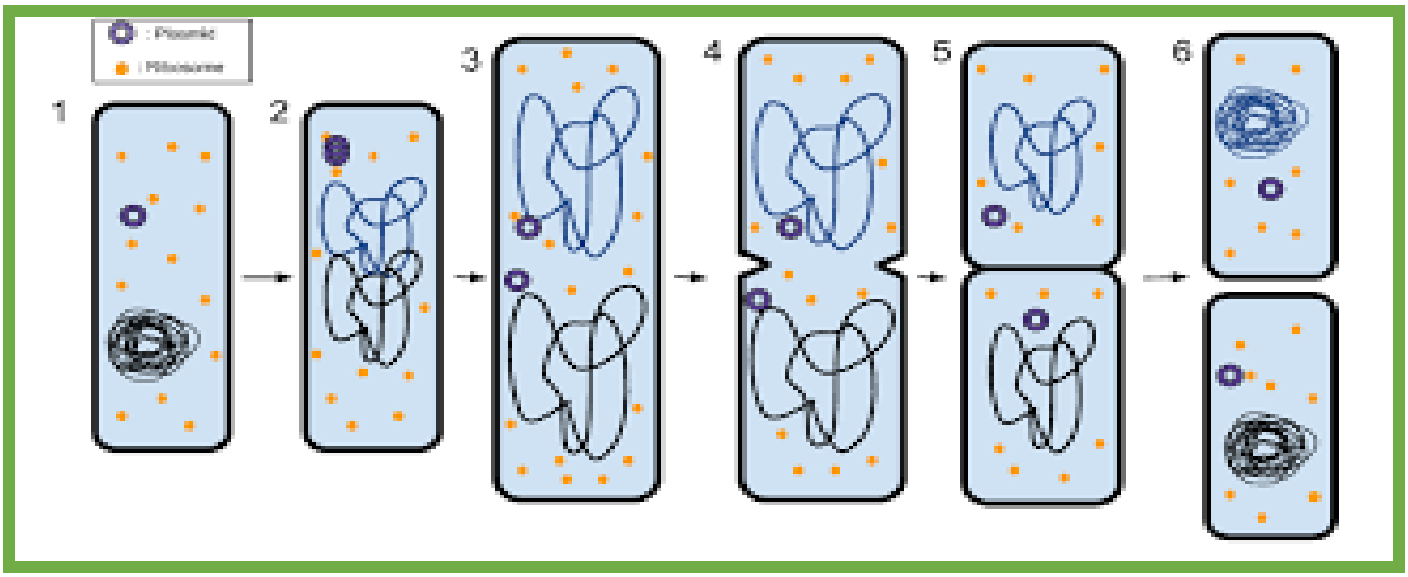
1. Break off about 18 to 24 inches of dental floss. ...
2. Next, hold the floss taut with your thumbs and index fingers.
3. Place the dental floss in between two teeth. ...
4. As the floss reaches your gums, curve the floss at the base of the tooth to form a C shape. ...
5. Repeat the steps as you move from tooth to tooth.



- Use fluoride toothpaste. Fluoride is what protects teeth from tooth decay (cavities). ...
- Angle the bristles toward the gumline, so they clean between the gums and teeth.
- Brush gently using small, circular motions. Do not scrub hard back and forth.
- Brush all sides of each tooth.
- Brush your tongue.

Part 2 Lesson 6 Bacterial Reproduction

Binary Fission: The process by which a bacterium multiplies by growing and splitting in two.



In asexual reproduction, one individual produces offspring that are genetically identical to itself.

Bacterial Reproduction over 7 hours. Put a / for one bacteria and then ~~////~~ for 5. I'll do the first few.

20 min /	40 min //	1 hour ///	1:20	1:40
2 hours	2:20	2:40	3 hours	3:20
3:40	4 hours	4:20	4:40	5 hours
5:20	5:40	6:00	6:20	6:40

1	2	4	8	16
32	64	128	256	512
1024	2048	4096	8192	16384
10,000	20,000	40,000	80,000	160,000
				163,840,000

Bacteria live in our body. They are…

-**Mutualistic:** We provide a place to live and food, while the bacteria attack harmful microbes and digest food.

-**Commensalistic:** Most bacteria in our body, they benefit but don't cause us harm

-**Parasitic:** Harmful bacteria that eat tissue and release toxins.

Tell me about the picture below as described in the slideshow/video.

Fecal transplantation is a procedure to collect feces, also called stool or poop, from a healthy donor and introduce them into a patient's gastrointestinal tract. The procedure can control an infection called Clostridium difficile, or C. diff, by adding healthy bacteria into the recipient's intestines.

Part 2 Lesson 8 Positives and Negatives of Bacteria / Wrap-Up

Positives of Bacteria (+) Negatives of Bacteria (-)

Bacteria

- They are a part of many food products.
- Symbiotic relationships with plants (nitrogen fixation).
- They decompose waste.
- They recycle nutrients.
- They detoxify pollution.
- Help to digest food and absorb vitamins.
- Fecal transplants ☺
- Used in industry.

- Bacteria can kill our species in the millions.
- Bacteria destroys food and property.
- Can create general unpleasantness such as bad breath, odors, acne, etc.

Across

3. This prevents the small number of bacteria from growing rapidly on your food.
10. Sphere (Round) Shaped: C_____
11. Domain _____ is composed of microorganisms that are much more common than Archaea and live almost anywhere.
12. These type of bacteria attack harmful microbes and digest food.
16. In _____ reproduction, one individual produces offspring that are genetically identical to itself.
17. Prefix for a chain of bacteria
18. Archaea that live at unusually cold temperatures.
20. Rod shaped bacteria
21. These type of bacteria cause harm to our body by eating tissue and releasing toxins. P_____
23. Prefix for a pair of bacteria
24. This is a swelling and soreness of the gums that, without treatment, can cause serious gum problems and disease. Brushing your gums helps prevent.
27. Prefix for a cluster or large group of bacteria

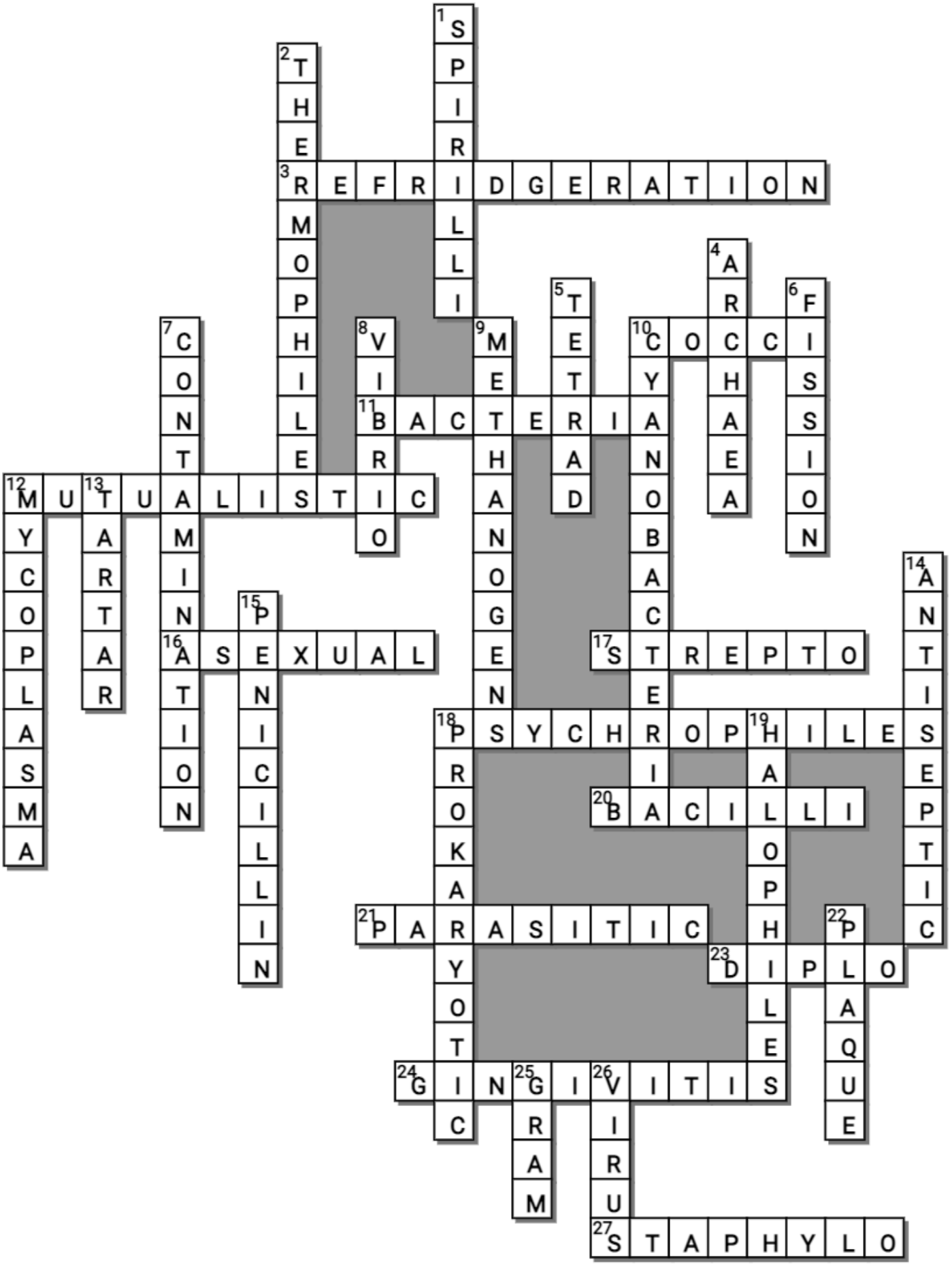
Down

1. Spiral shaped bacteria
2. Archaea that live at extremely hot temperatures.
4. Unicellular microorganisms that is genetically different from bacteria and eukaryotes.
5. Prefix for a group of four bacteria
6. Binary _____: The process by which a bacterium multiplies by splitting in two.
7. Avoiding re-_____ By clean cutting board immediately after use.
8. Comma shaped bacteria
9. Archaea that produce methane gas as a waste product of their digestion.
10. Photosynthetic bacteria (gets energy from sun).
12. _____ bacteria: Smallest known life form (jagged and random).
13. This is dental plaque that has become mineralized.
14. Agent that kills or inhibits the growth of micro-organisms on the external surfaces of the body.
15. This is an antibiotic that destroys bacteria derived from penicillin mold (fungi).
18. Organisms that have no nucleus, and no internal organelles.
19. Archaea that live in salty environments.
22. This is the accumulation of bacteria and micro-organisms on a tooth.
25. _____ staining: Technique used to identify bacteria.
26. Penicillin won't kill a _____, it only attacks bacteria.

----------Teacher can remove this word bank to make puzzle more challenging----------

Possible Answers

BACTERIA, PSYCHROPHILES, ANTISEPTIC, ARCHAEA, BACILLI, COCCI, CYANOBACTERIA, DIPLO, FISSION, GINGIVITIS, GRAM, HALOPHILES, METHANOGENS, MUTUALISTIC, MYCOPLASMA, PARASITIC, PENICILLIN, PLAQUE, PROKARYOTIC, REFRIDGERATION, SPIRILLI, STAPHYLO, STREPTO, TARTAR, THERMOPHILES, VIBRIO, VIRUS, ASEXUAL, CONTAMINATION, TETRAD


1 SPIRILLI
2 THE
3 REFRIDGERATION
4 ARCHAEA
5 TETHAD
6 FISSION
7 CONTINUATION
8 VIRION
9 METHANOGEN
10 COCCIANOBACTE
11 BACTERIAL
12 MUTUALISTIC
13 TARTAR
14 ANTISEPTIC
15 PENICILLIN
16 ASEXUAL
17 STREPTO
18 PSYCHROPHILE
19 HALOPHILES
20 BACILLI
21 PARASITIC
22 PLAQUE
23 DIPLOBACILLES
24 GINGIVITIS
25 GRAM
26 VIRUS
27 STAPHYLO
MYCOPLASMA

Part 2 Review Game Lesson 9

Name:

1-20 = 5 pts * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Due: Today
Score ____ / 100

BACT-OFF!	YO-SOCCUS	STOMACH PAINS	THAT"s JUST GROSS	SMELLY PANTS Bonus round 1 pt each
1) Letter B	6) Spirilla (gram -)	11) Letter E All of the Above	16) Antiseptic	*21) Moaning Myrtle
2) Cytoplasm DNA Cell Wall	7) Diplobacillus	12) Letter C	17) Letter B "Itching"	*22) Fire Swamp
3) A=Eukaryotic B=Prokaryotic	8) Strepto- -coccus	13) Penicillin	18) Binary Fission	*23) Toothless & Hiccup
4) Domain Archaea	9) A=Bacilli B=Sprilla C=Cocci D=Virbrio (Sprilla)	14) Letter C It doesn't work On viruses	19) Plaque	*24) SHREK
5) Cyano- -bacteria	10) Mycoplasma	15) Gangrene	20) Mitochondria Chloroplast	*25) Stand By Me

Final Question Wager ____ /5 Answer: Conjunctivitis, Staphylococcus Bacteria