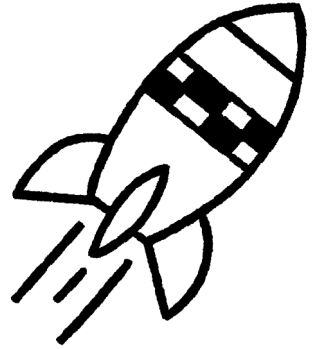


Diffusion: dhaqdhaqaaq (movement) particles

Sayniska

Cutub: Diffusion



Natiijo

Waxaan sharxi karaa in diffusion uu yahay dhaqdhaqaaq (movement) particles of substance ka yimid meel sare ilaa meel hoose oo concentration ah.

Erayada muhiimka ah

Jawaabaha:

passive process
concentration
concentration gradient

Passive process ma u baahna tamar dheeri ah.

Concentration waa tirada particles ee ku jira mugga biyo (water) ama gas.

Concentration gradient waa farqiga u dhexeeya concentration particles ee meel ilaa meel kale.

Net movement waa dhaqdhaqaaq (movement) guud ee particles ee meel ilaa meel kale.

Diffusion waa net movement (dhaqdhaqaaq) ee substance ka yimid meel sare oo concentration ah ilaa meel hoose oo concentration ah.

Diffusion: dhaqdhaqaaq (movement) particles



Substances iyo dhaqdhaqaaqa (movement) particles



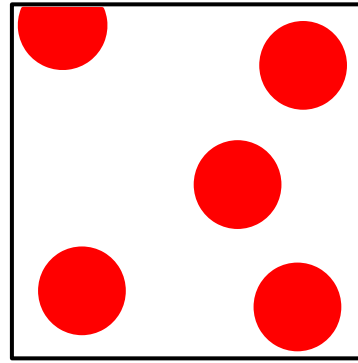
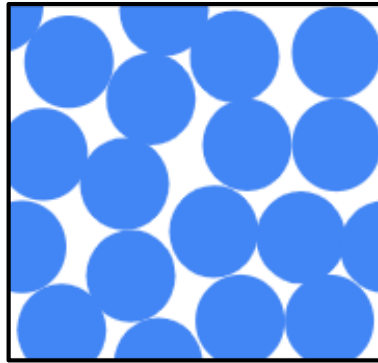
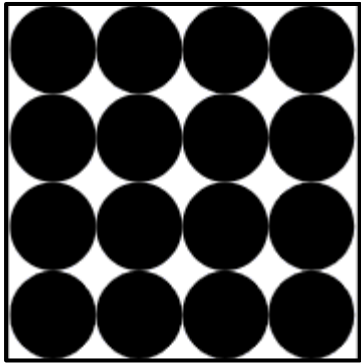
Diffusion ee unugyada (cells)



Concentration iyo net movement

Substances waxay ka kooban yihiin particles.

Adkaha (solids), dareeraha (liquids) iyo neefaha (gases) waxay ka samaysan yihiin walxaha (particles).

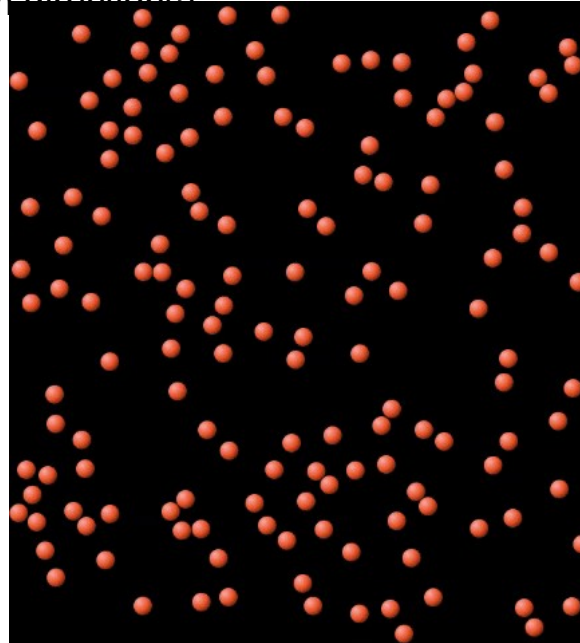


Jawaabaha:

Walxaha (substances) iyo dhaqdhaqaaqa (movement) walxaha (particles)

Dareeraha (liquid) ama neefaha (gas) dhexdooda, walxaha (particles) waxay had iyo jeer u dhaqaaqaan jihooyin kala duwan (random directions).

Walxaha (particles) waxay beddelaan jihada (direction) markay isku dhacaan (collide) midba midka kale, ama weel (container) la.



neef (gas)

Walxaha (substances) iyo dhaqdhaqaaqa (movement) walxaha (particles)



Dhamaystir weedhaha ku saabsan dhaqdhaqaaqa (movement) walxaha (particles).

Adeegso ereyada liiska:

kala duwan (randomly) isku dhacaan (collide) dhaqaaqaya (moving) dareerayaal (liquids) walxo (particles)

Walxaha (substances) oo dhan waxay ka samaysan yihiin .

_____ -ta _____ iyo neefaha (gases) waxay si joogto ah u _____ .

Waxay u dhaqaaqaan _____ waxayna inta badan _____ midba midka kale.

Jawaabaha:

walxo (particles).

kala duwan
(randomly)

walxo (particles)

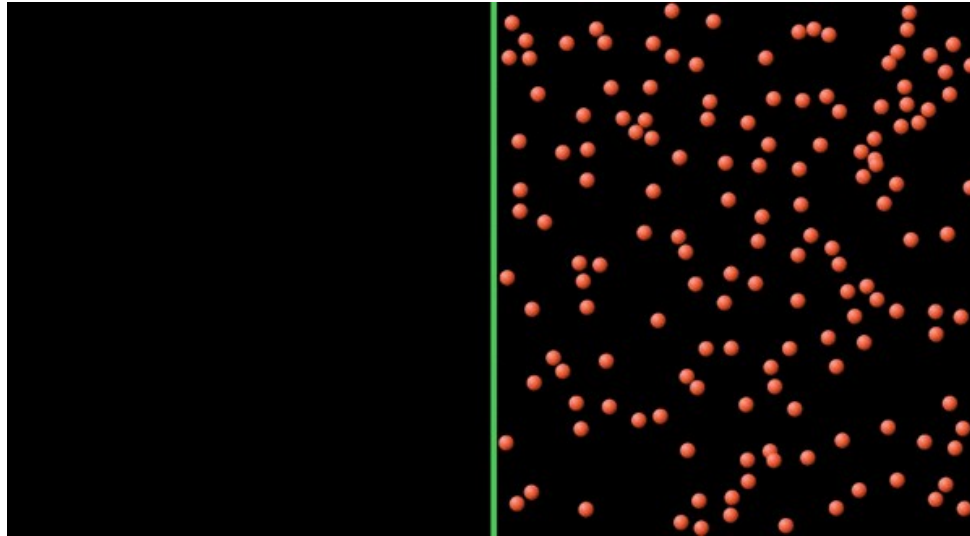
isku dhacaan
(collide)

dareerayaal
(liquids)

dhaqaaqaya (moving).

Walxaha (substances) iyo dhaqdhaqaaqa (movement) walxaha (particles)

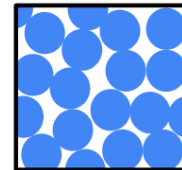
Dhaqdhaqaaqa (motion) joogtada ah iyo kan kala duwan (random) ee walxaha (particles) wuxuu sababaa inay fidiyaan (spread out).



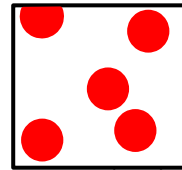
Dhaqdhaqaaqan (movement) wuxuu ku dhacaa oo keliya dareerayaasha (liquids) iyo gaasaska (gases). Sababtoo ah walxaha (particles) waa xor inay dhaqaaqaan.

Walxaha (particles) ku jira gaaska (gas) iyo dareeraha (liquid) si joogto ah ayay u dhaqaaqaan oo isku dhacaan.

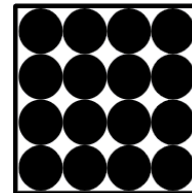
Adkaha (solid), walxaha (particles) waa ku go'an meel, mana awoodaan inay si xor ah u dhaqaaqaan.



dareere (liquid)



gaas (gas)

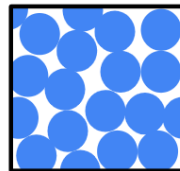


adag (solid)

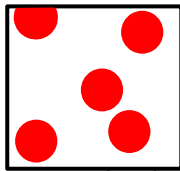
Dhaqdhaqaaqa walxaha (particles) ee dareeraha (liquid) iyo gaaska (gas) wuxuu dhacaa si joogto ah.

Walxaha (particles) uma baahna in lagu daro tamar (energy) kulayl (heat) si ay u dhaqaaqaan.

Sidaa darteed waxaan ugu yeernaa dhaqdhaqaaqan (movement) hab dadban (passive process), sababtoo ah uma baahna tamar (energy) dheeri ah oo ka badan tan walxuhu (particles) horey u haystaan.



dareere (liquid)



gaas (gas)

Calamee hal sanduuq (box) oo mid kasta oo ka mid ah bayaannada.

a

Walxaha (particles) waa xor inay dhaqaaqaan dareerayaasha (liquids).

b

Walxaha (particles) waa xor inay dhaqaaqaan adkaha (solids).

c

Walxaha (particles) waa xor inay dhaqaaqaan gaasaska (gases).

Waxaan ahay hubaa inay sax tahay	I qiyaasa a inay sax tahay	I waxaan u malaynay aa kani waa qalad	Waxaan ahay hubi in kani waa qalad

Ku calaamadee hal sanduuq (box) hadal kasta.



Dhaqdhaqaaqa (movement) walxaha (particle) wuxuu u baahan yahay tamar (energy) dheeri ah.

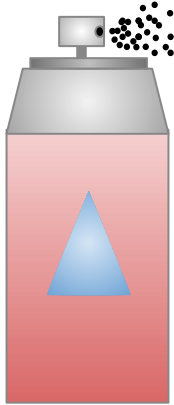


Dhaqdhaqaaqa (movement) walxaha (particle) waa nidaam (process) dabiici ah (passive).

Waxaan ahay hubi in kani waa sax	I waxaan u malayna yaa kani waa sax	I waxaan u malaynay aa kani waa qalad	Waxaan ahay hubi in kani waa qalad

Walxaha iyo dhaqdhaqaaqa (movement) walxaha (particle)

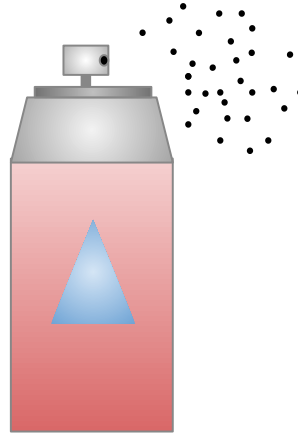
Deodorant-ka (Deodorant) waa la buufiyaa 1 ilbiriqsi (second). Jaantusyada (diagrams) waxay muujinayaan waxa ku dhaca walxaha (particles) deodorant-ka ka dib 1 iyo 2 daqiiqo (minutes).



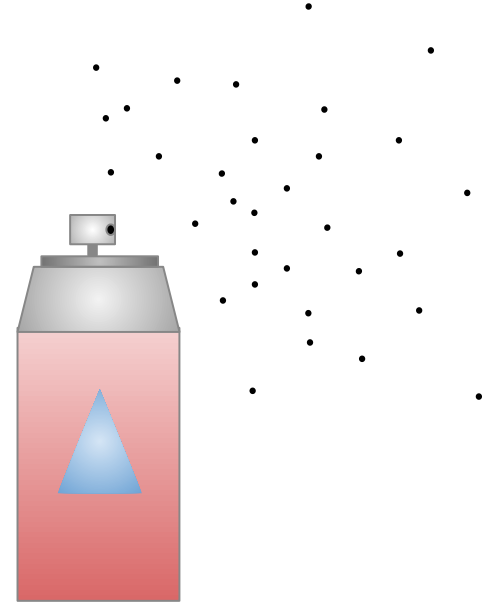
Jawaabaha:

1 ilbiriqsi (second)

1 daqiiqo (minute)



2 daqiiqo (minutes)



Macallinku wuxuu buufiyaa deodorant-ka (deodorant) xagga hore ee fasalka (classroom).

Laba ka mid ah kuwan soo socda waa kuwa run ah (true)?

a

Walxaha (particles) deodorant-ka waxay isku dayaan inay faafaan (spread out) si ay u helaan boos (space) badan.

b

Qaybaha deodorantu waxay dhaafaan qaybaha hawada (air).



c

Deodorantu wuxuu u kala go'aa qaybo yaryar si uu ula qasmo biyaha (water).

d

Qaybaha hawada (air) waxay dhaafaan qaybaha deodoranta.



Dhibco midab ah ayaa lagu daray koob biyo (water) ah.

Lama walaaqin.

Waxaa loo daayay inta maalinta ka hartay.

Saadaali waxa dhici doona midabka iyo biyaha (water).

Sharax sababta aad u malaynayso inay tani dhici doonto.



1. Saadaali waxa dhici doona midabka iyo biyaha (water).

- Midabku wuxuu ku faafi doonaa biyaha (water), isagoo sababi doona in biyuhu (water) beddelaan midabkooda.

2. Sharax sababta aad u malaynayso inay tani dhici doonto.

- Biyaha (water) iyo midabku waxay ka samaysan yihiin qaybo.
- Qaybaha biyaha (water) iyo midabku waxay si joogto ah u dhaqaaqaan.
- Qaybaha biyaha (water) iyo midabku waxay si aan kala sooc lahayn ugu dhaqaaqaan dhammaan jihooyinka.
- Dhaqdhaqaaqa (movement) qaybaha midabka iyo biyaha (water) ayaa sababa inay isku qasmaan.



Faafinta (Diffusion): qaybaha dhaqaaqaya



Maaddooyinka iyo dhaqdhaqaaqa (movement) qaybaha



Fiiro gaar ah (Concentration) iyo dhaqdhaqaaqa saafiga ah (net movement)

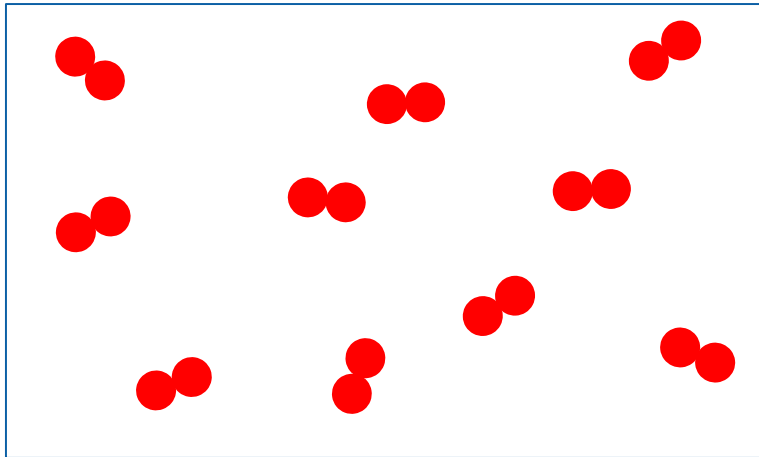


Faafinta (Diffusion) unugyada

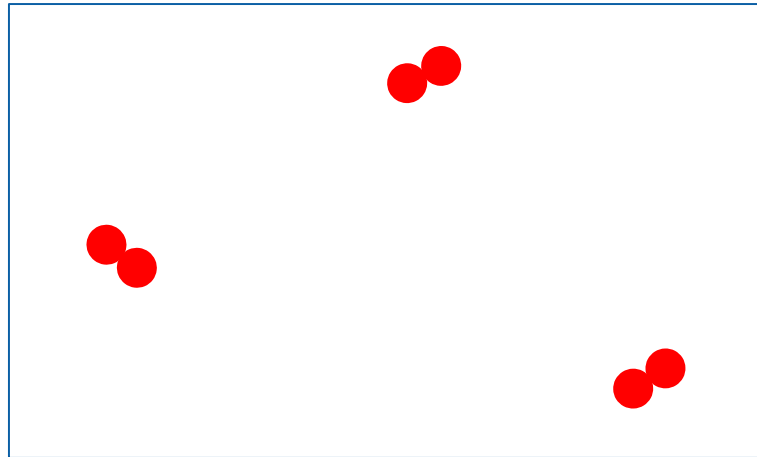
Isku-ururinta (Concentration) waa tirada walxaha (particles) ku jira mugga (volume) biyaha (water) ama neefta (gas).

dareeraha (liquid) ama neefta (gas).

Waxyaalaha (particles) inta badan, ayaa walaxda (substance) u badan tahay isku-ururinta (concentration).



isku-ururinta (concentration) sare ee walxaha (particles)

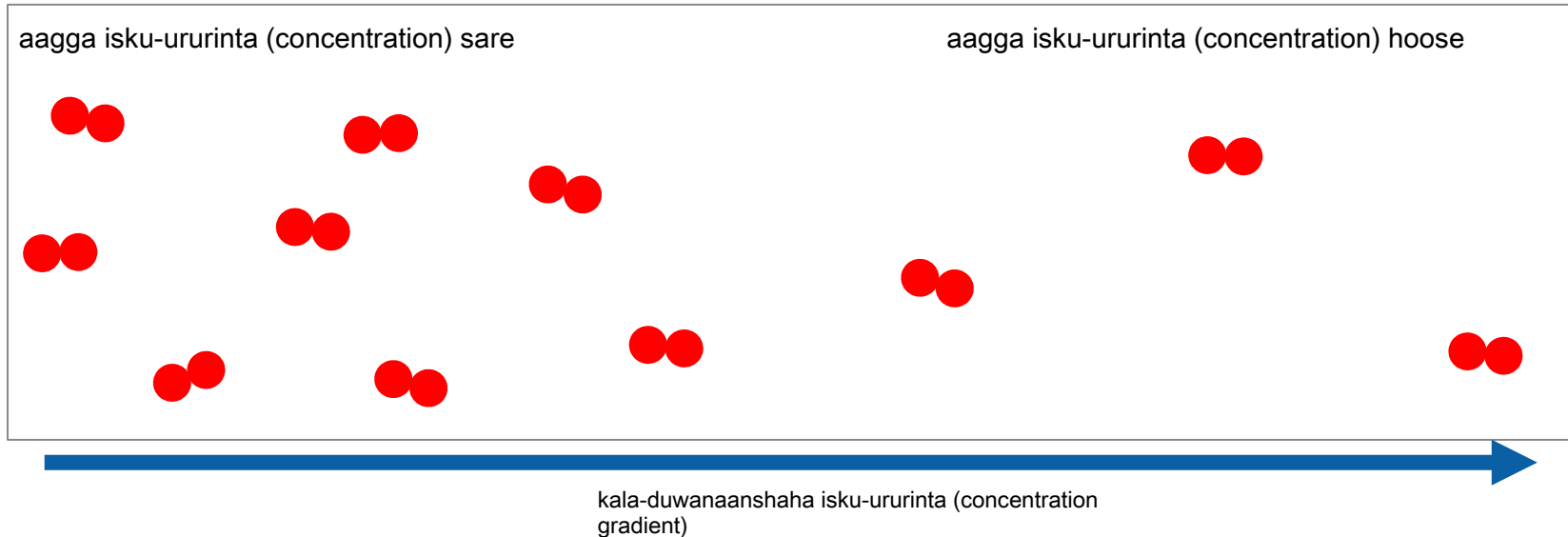


isku-ururinta (concentration) hoose ee walxaha (particles)

Haddii walxaha (particles) ay yihiin...

- isku-ururin (concentration) badan oo ku taal hal meel
- iyo isku-ururin (concentration) yar oo ku taal meel kale

...tani waxay abuurtaa kala-duwanaanshaha isku-ururinta (concentration gradient).



Waa maxay kala-duwanaanshaha isku-ururinta (concentration gradient)?

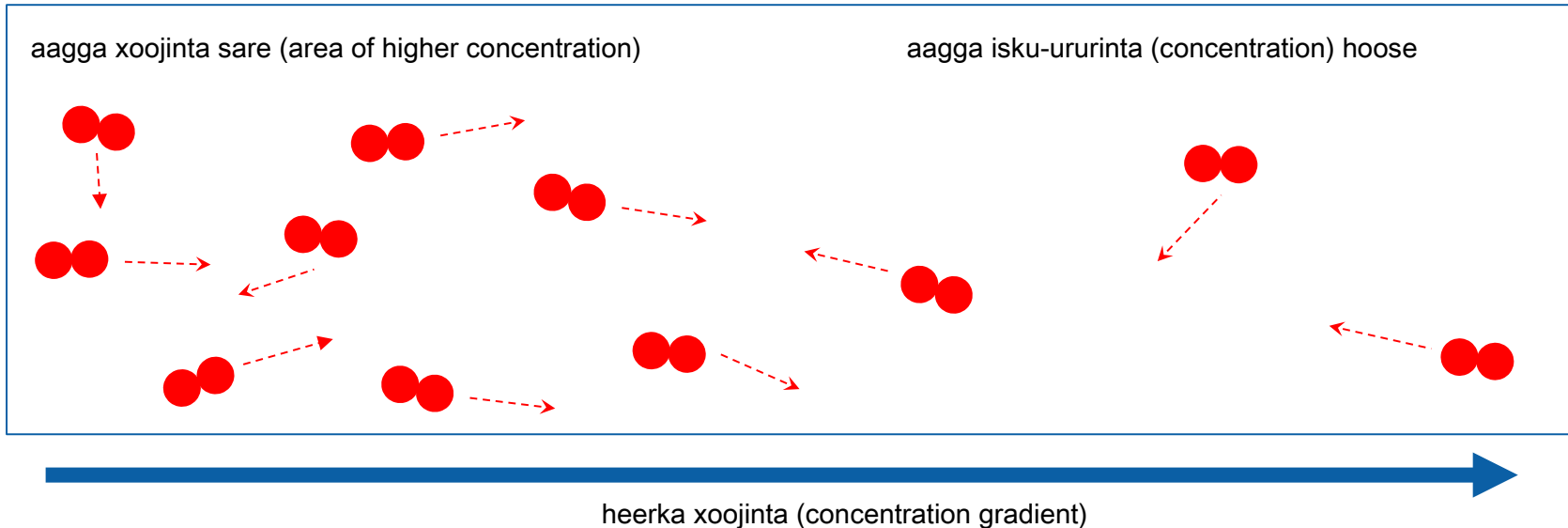
a Cabbirrada kala duwan ee walxaha (particles) ee walaxda (substance).

b Farqiga isku-ururinta (concentration) ee walaxda (substance) ee aagga. ✓

c Tirada walxaha (particles) ee aagga la siiyay.

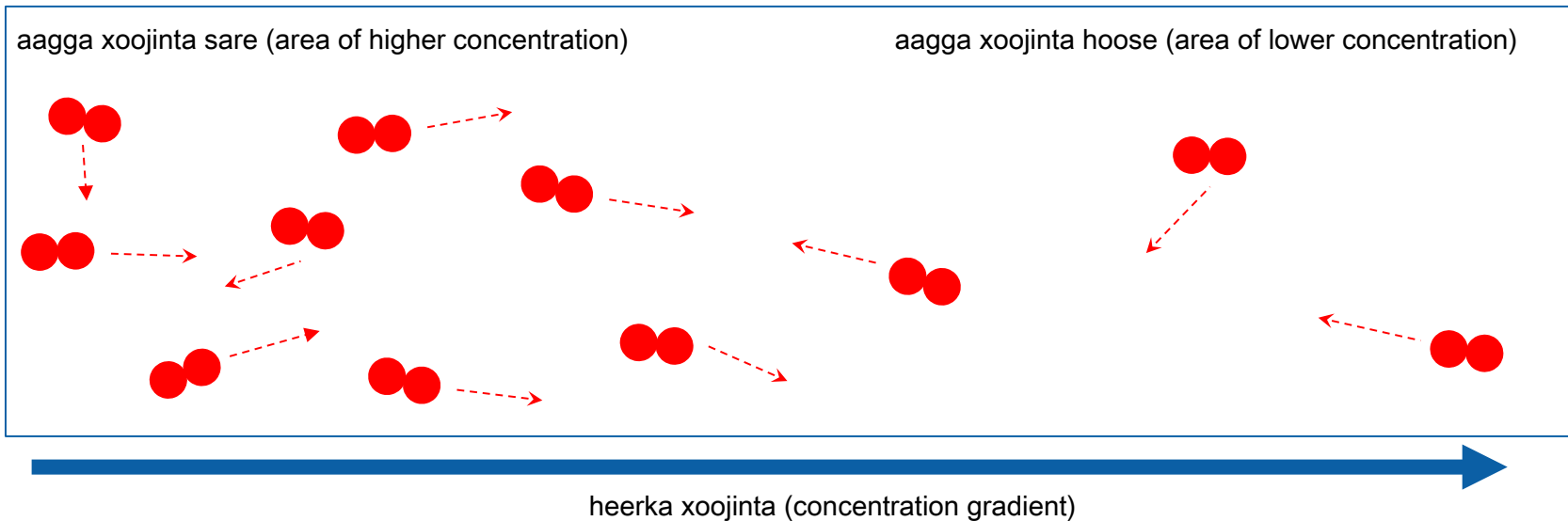
Walxaha (Particles) waxay u dhaqaaqaan jihooyin kala duwan (random directions).

Tani waxay ka dhigan tahay in walxaha (particles) ay u dhaqaaqaan labada jiho ee kala-duwanaanshaha isku-ururinta (concentration gradient).



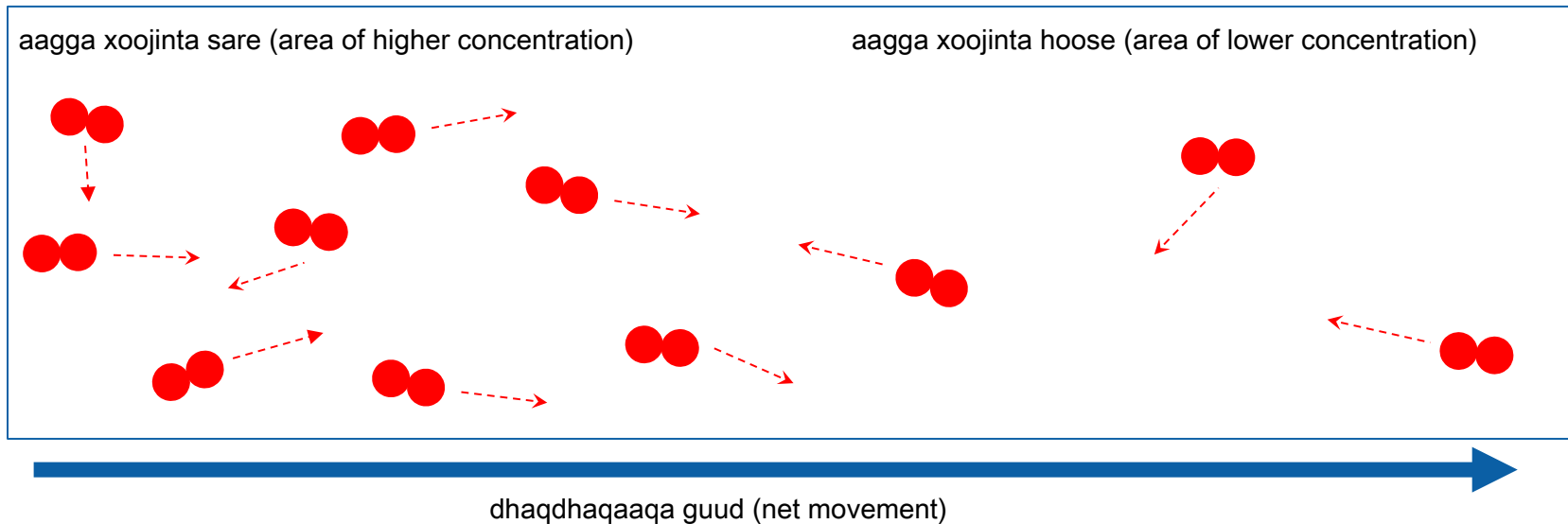
Hase yeeshee:

- qaybo badan ayaa dhaqaaqaya...
- laga soo bilaabo aagga xoojinta sare...
- ilaa aagga xoojinta hoose.



Qaybo badan ayaa ku dhaqaaqaya hal jiho marka loo eego kuwa kale.

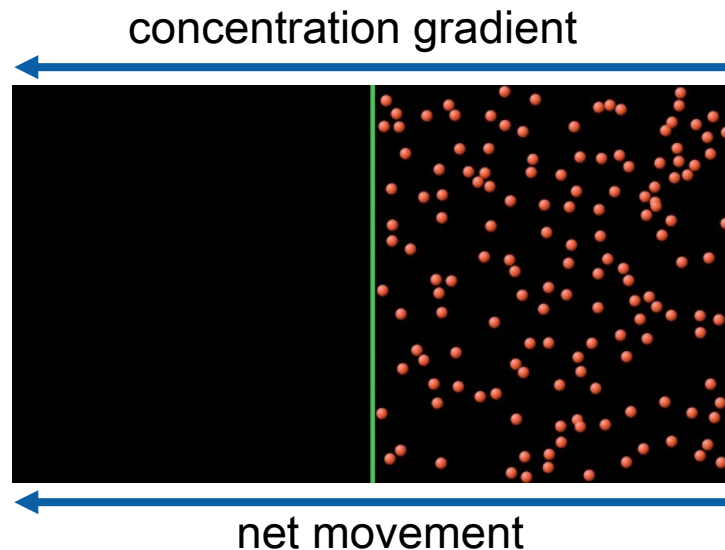
Tani waxaa loo yaqaan dhaqdhaqaaqa guud (net movement).



Xoojinta iyo dhaqdhaqaaqa guud (Concentration and net movement)

Dhaqdhaqaaqa guud (net movement) waa:

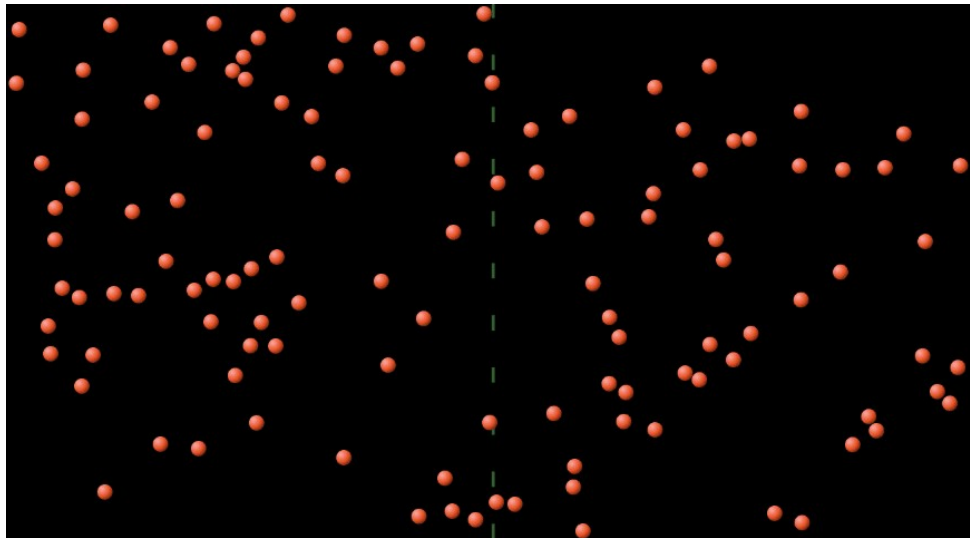
- hoos u dhac ku yimaada heerka xoojinta (concentration gradient)...
- laga soo bilaabo aagga xoojinta sare...
- ilaa aagga xoojinta hoose.



Concentration and net movement

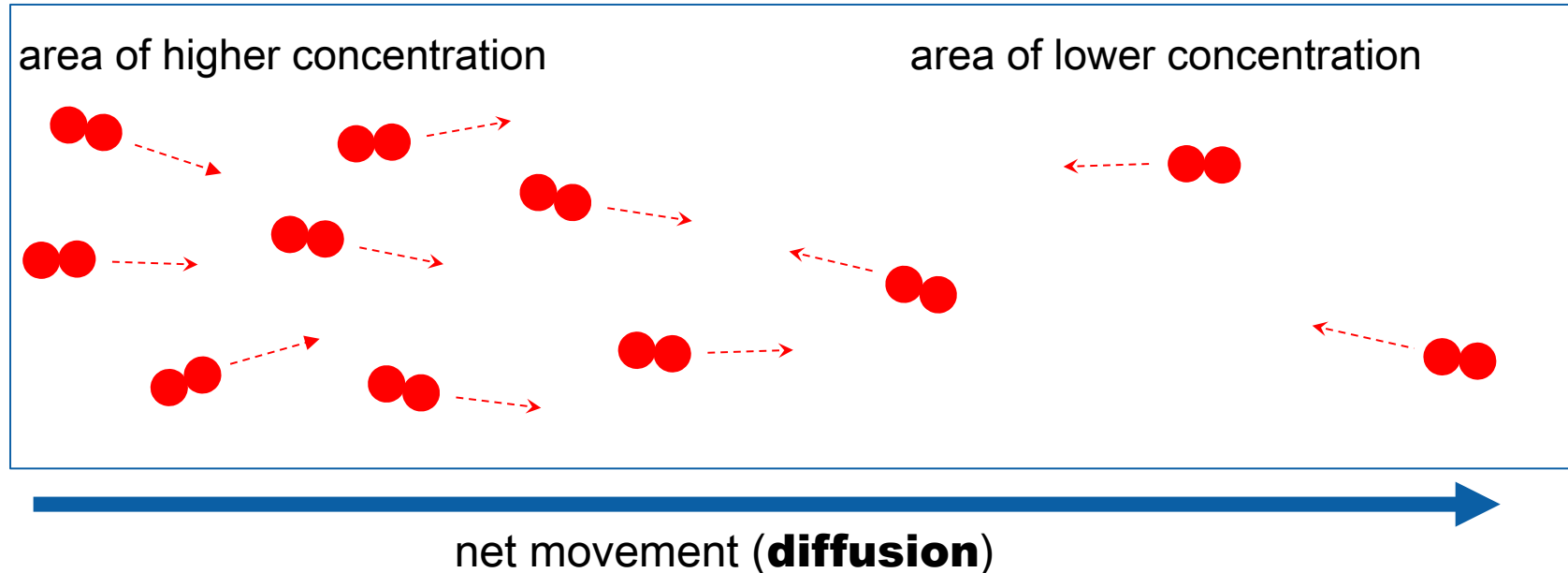
After a while, the particles become evenly mixed.

Halkan, walxuhu way sii socdaan, laakiin ma jiro gradient xaddiga iyo dhaqdhaqaaq saafi ah.



Concentration and net movement

Dhaqdhaqaaqa saafiga ah ee walxaha hoos u dhaca gradient xaddiga waxaa loo yaqaan diffusion.



Concentration and net movement

Waa kuwee labada soo socda ee loo baahan yahay si diffusion u dhaco?

a

a liquid or gas



b

a concentration gradient



c

extra energy

d

a living organism

Xoogga (Concentration) iyo dhaqdhaqaaqa guud (net movement)

Maxaa dhacaya marka walxuhu si siman isku qasmaan?

- a** The particles slow down or stop.
- b** Walxuhu way sii socdaan laakiin ma jiro dhaqdhaqaaq saafi ah. 
- c** The particles continue to move, resulting in net movement of particles.
- d** Diffusion continues to take place.

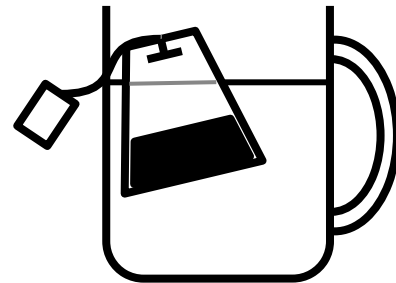
Suad iyo Yacquub waxay ka hadlayaan samaynta shaaha baraf leh iyagoo isticmaalaya biyo (water) qabow.

Yaa aad la raacsan tahay?

Sharax jawaabtaada.

Waxaan u malaynayaa inaad samayn karto shaaha baraf leh adigoo ka tagaya xaashi shaaha (tea bag) biyo (water) qabow.

Waxaad u baahan tahay inaad isticmaasho biyo (water) kulul oo aad walaaqdo, haddii kale waxaad ku dambayn doontaa biyo (water) kaliya.



Jawaabaha:

Suad

Yacquub

Suad

Waxaan u malaynayaa inaad samayn karto shaaha baraf leh adigoo ka tagaya xaashi shaaha (tea bag) biyo (water) qabow.

Yacquub

Waxaad u baahan tahay inaad isticmaasho biyo (water) kulul oo aad walaaqdo, haddii kale waxaad ku dambayn doontaa biyo (water) kaliya.

- Shaaha wuxuu ka kooban yahay walxo yaryar (particles).
- Walxaha shaaha (tea particles) waxay si joogto ah u dhaqaaqaan, iyagoon u baahnayn tamar dheeri ah oo ka timaadda kuleylka.
- Waxaa jira kala duwanaansho xoogeed (concentration gradient) oo u dhexeeya xaashida shaaha (tea bag) halkaasoo walxaha shaaha (tea particles) ay ku yihiin xoog sare (higher concentration), iyo biyaha (water) halkaasoo ay ku yihiin xoog hoose (lower concentration).
- Fiditaanka (Diffusion) wuxuu dhici doonaa sababtoo ah waxaa jiri doona dhaqdhaqaaq guud (net movement) oo walxaha shaaha (tea particles) ah oo hoos u dhacaya xagga kala duwanaanshaha xoogeedka (concentration gradient) oo ka yimaada xaashida shaaha (tea bag) una gudbaya biyaha (water).
- **Jawaabaha:** Waxaan u baahan tahay inaad isticmaasho biyo (water) kulul oo aad walaaqdo, haddii kale waxaad ku dambayn doontaa biyo (water) kaliya.

Diffusion: moving particles



Walxaha (Substances) iyo dhaqdhaqaaqa walxaha yaryar (particle movement)



Concentration and net movement



Diffusion in cells

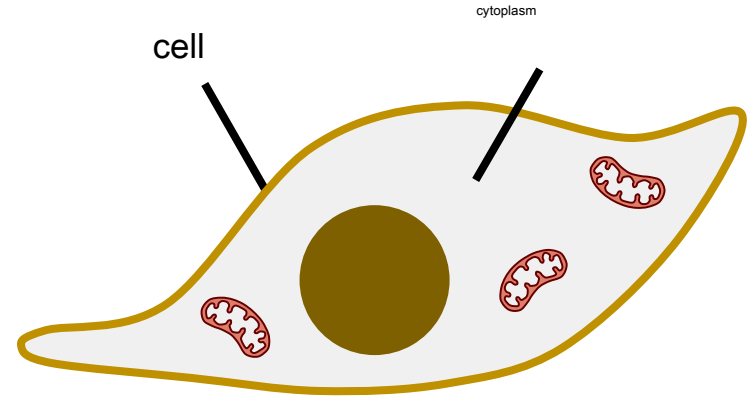
Diffusion in cells

The cytoplasm in a cell contains many substances.

Examples of substances in the cytoplasm are:

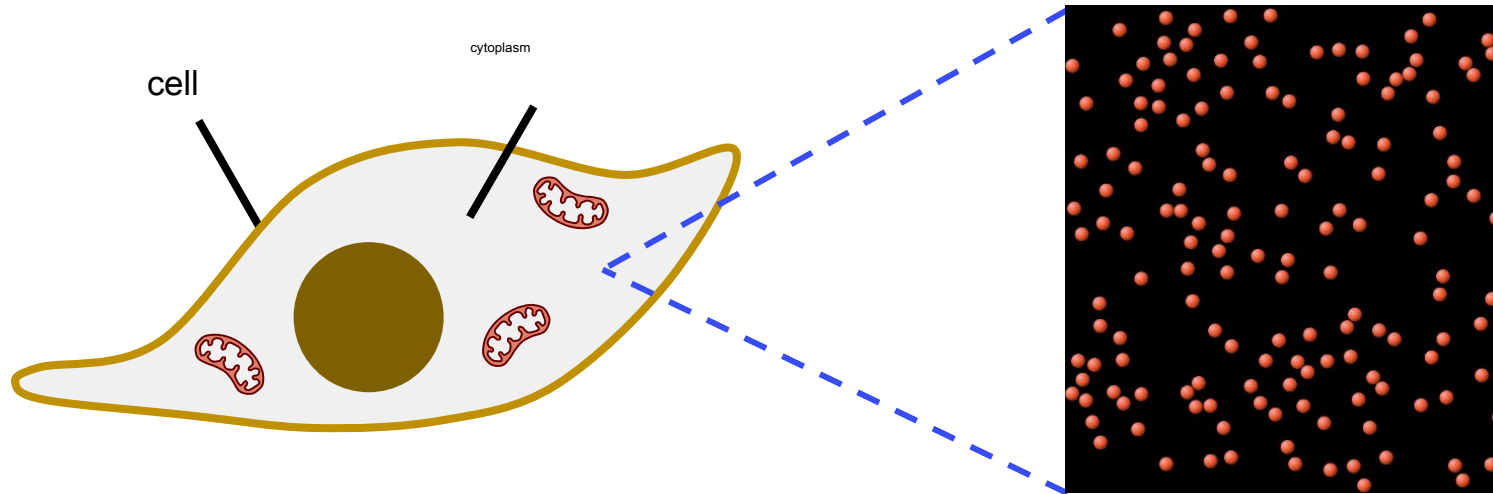
- water
- oxygen
- sugar
- carbon dioxide

Dhammaan walxahan iyo cytoplasm waxay ka kooban yihiin walxo.



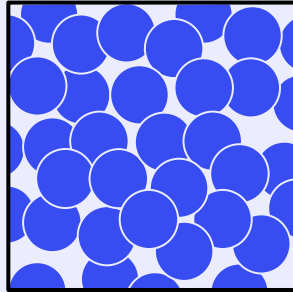
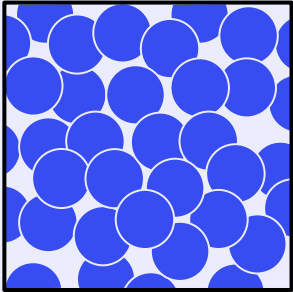
Diffusion in cells

The particles in the cell cytoplasm are constantly moving.

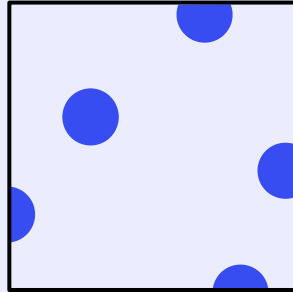


The movement is in all directions and random, which leads to diffusion taking place.

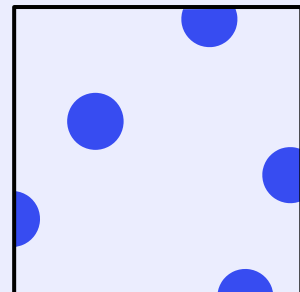
Cytoplasm unuggu wuxuu ka kooban yahay walxo. Qiyaas inaad arki karto walxaha. Jaantus iyo sharaxaad kee ayaa ugu fiican waxa aad arki lahayd?



Walxaha si xor ah u
dhaqaaqaya (Particles
moving freely)



Walxaha (Particles)
**aan dhaqaaqayn (not
moving)**



Walxaha si xor ah u
dhaqaaqaya (Particles
moving freely)

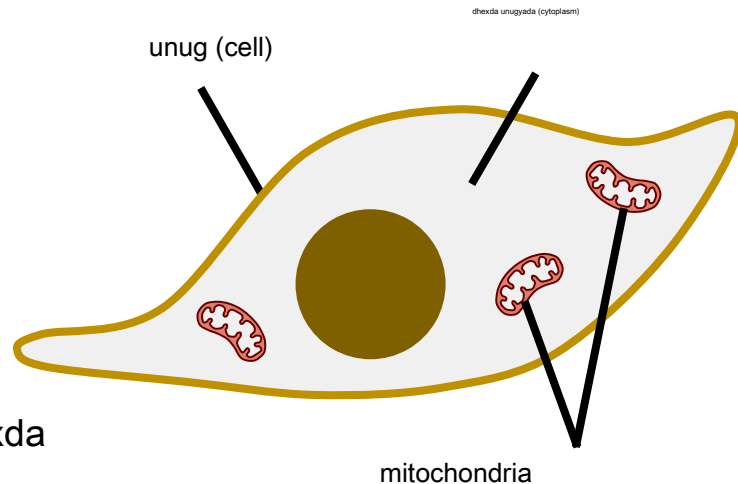
Faafintu (Diffusion) aad ayay muhiim ugu tahay unugyada.

Tusaale ahaan, mitochondria waxay u baahan yihiin sahay fiican oo ah:

- sonkor (sugar)
- oksijiin (oxygen)

...waa neefsashada unugyada (cellular respiration).

Walxaha sonkorta iyo oksijiinta waxay ku faafaan (diffuse) dhexda unugyada (cytoplasm) si ay u gaaraan mitochondria.



Run mise been?

Walxaha ku jira dhexda unugyada (cytoplasm) waxay ku dhaqaaqaan faafin (diffusion).



Run



Been

Sabab u sheeg jawaabtaada

a

Tani waa sababta oo ah unuggu wuxuu si ula kac ah u faafiyaa walxaha (diffuses) qayb ka mid ah una gudbiyaa qayb kale.

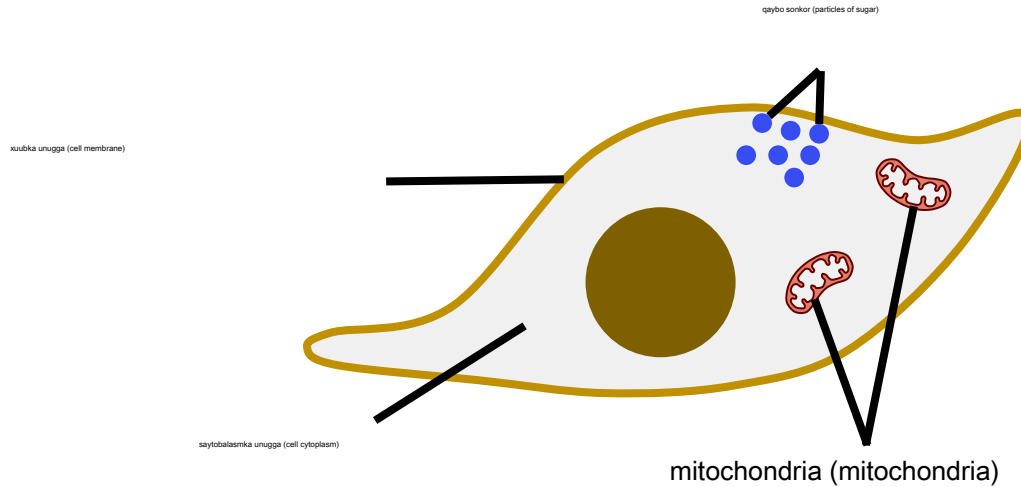
b

Tani waa sababta oo ah walxuhu si joogto ah ayay u dhaqaaqaan dhamaan jihooyinka.



Mitochondria waxay u baahan yihiin sahay fiican oo sonkor ah.

Sharax sida walxaha sonkorta ugu gaaraan mitochondria.

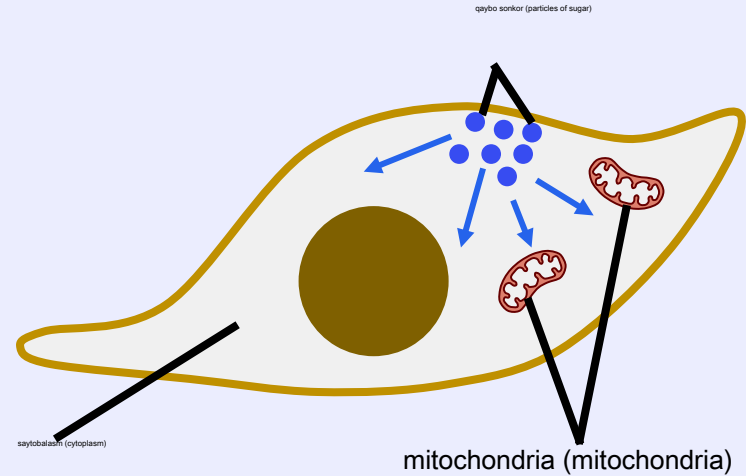


Sharax sida qaybaha sonkorta u gaaraan mitochondria.

Qaybaha sonkorta waxay si joogto ah u dhaqaaqaan jihooyin kala duwan.

Dhaqdhaqaaqa (movement) guud ee qaybaha sonkorta wuxuu ka yimaadaa aagga isku-ururinta sare ee u dhow xuubka unugga (cell membrane) una gudbaa aagagga isku-ururinta hoose ee bartamaha saytobalasmka (cytoplasm).

Iyada oo loo marayo dhaqdhaqaaqan (movement), qaybaha sonkorta waxay ku faafaan (diffuse) saytobalasmka (cytoplasm) ilaa mitochondria.



Soo koobid

Diffusion (Diffusion): qaybaha dhaqaaqaya

- Walxaha oo dhami waxay ka kooban yihiin qaybo (particles).
- Shidaalka iyo gaasaska, dhaqdhaqaaqa (movement) joogtada ah ee qaybaha ayaa sababa diffusion (diffusion), halkaas oo dhaqdhaqaaqa (movement) guud ee qaybuhu uu hoos ugu dhaco heerka isku-ururinta.
- **Diffusion (Diffusion) waa hab dabiici ah oo aan u baahnin tamar dheeri ah.**
- Saytobalasmka (cytoplasm) unugga wuxuu ka kooban yahay walxo badan oo ku dhaqaaqa unugga sababtoo ah diffusion (diffusion).

