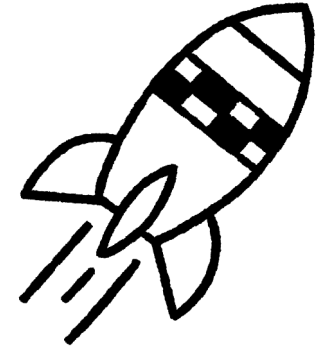


Nidaamka is-weydaarsiga gaaska ee bini'aadamka iyo neefsashada



Sayniska

Cutub: Neefsashada iyo neefsiga

Natiijo

Waxaan qeexi karaa sida bini'aadamku u neefsado, oo ay ku jiraan doorka qaybaha kala duwan ee nidaamka is-weydaarsiga gaaska.

nidaamka is-weydaarsiga gaaska

cadaadis (pressure)

mug (volume)

neefsasho (inhalation)

neefsasho (exhalation)

Erayada muhiimka ah

Nidaamka is-weydaarsiga gaaska ee bini'aadamku waa koox xubno ah oo wada shaqeeya si ay noo suurto geliyaan inaan neefsano.

Molekyuulada gaaska ee ku jira weel ayaa isku dhaca derbiyada weelka taasna waxay abuurtaa cadaadis.

Mugga gaasku waa qadarka booska 3D ee uu buuxiyo.

Neefsashada gudaha waxaa loo yaqaan inhalation.

Neefsashada dibadda waxaa loo yaqaan exhalation.

Qaabka casharka

Nidaamka is-weydaarsiga gaaska ee bini'aadamka iyo neefsashada



Nidaamka is-weydaarsiga gaaska



Cadaadis, mug iyo neefsasho

Bini'aadamka, xayawaanka kale, dhirta iyo fangaska waxay u baahan yihiin oksijiin (oxygen) hawada si ay u noolaadaan.

Waxay u baahan yihiin oksijiin (oxygen) neefsiga unugyada (cellular respiration) ee mitochondria, unugyadooda.

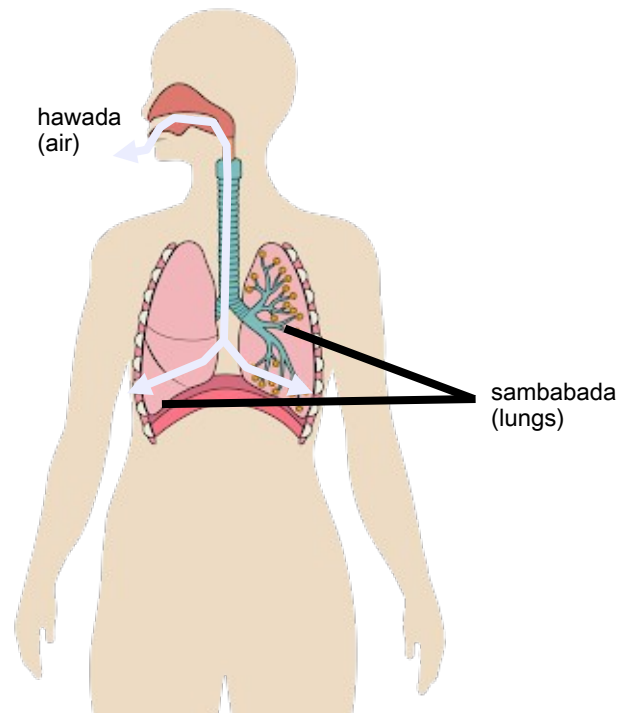


Laakiin dhammaan nooluhu ma neefsadaan.

Bini'aadamka iyo xayawaanka qaarkood waxay neefsadaan si ay hawada uga qaataan oksijiin.

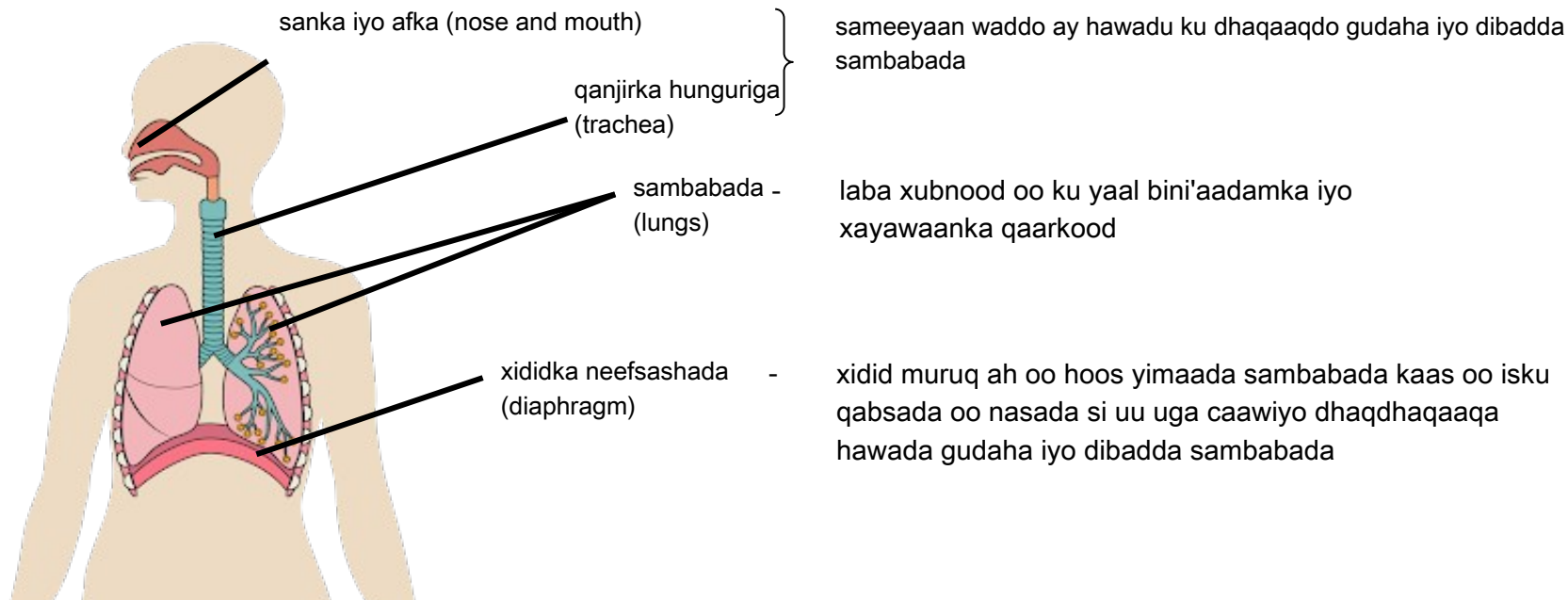
Neefsashadu waxay ku lug leedahay sambabada (lungs).

Marka aan neefsanayno, hawadu waxay u dhaqaaqdaa gudaha iyo dibadda sambabada.



Si kastaba ha ahaatee, ma aha oo kaliya sambabada ku lug leh neefsashada!

Qaybo badan oo ka mid ah nidaamka is-weydaarsiga hawada ayaa wada shaqeeya si ay noo suurto geliyaan neefsashada.



Nidaamka is-weydaarsiga hawada (Gas exchange system)



Qaab-dhismeedkee ayaan ka mid ahayn nidaamka is-weydaarsiga hawada ee bini'aadamka?

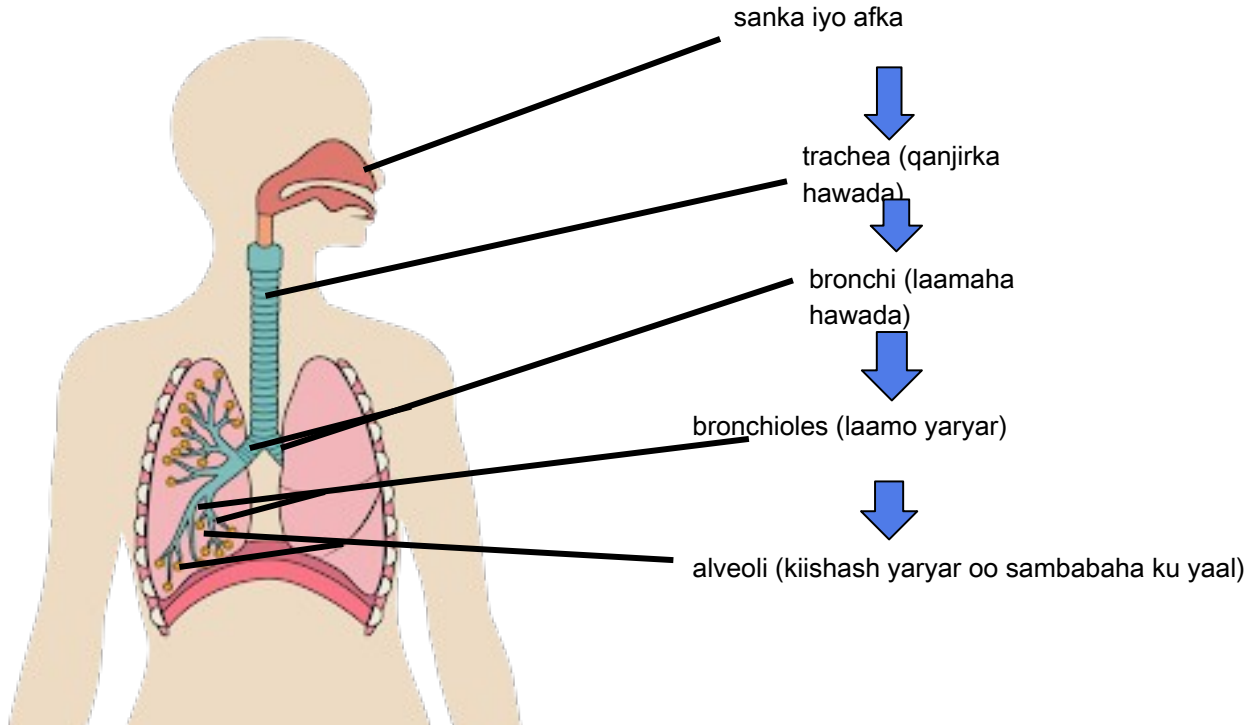
a xididka neefsashada (diaphragm)

b wadnaha (heart) ✓

c sambabada (lungs)

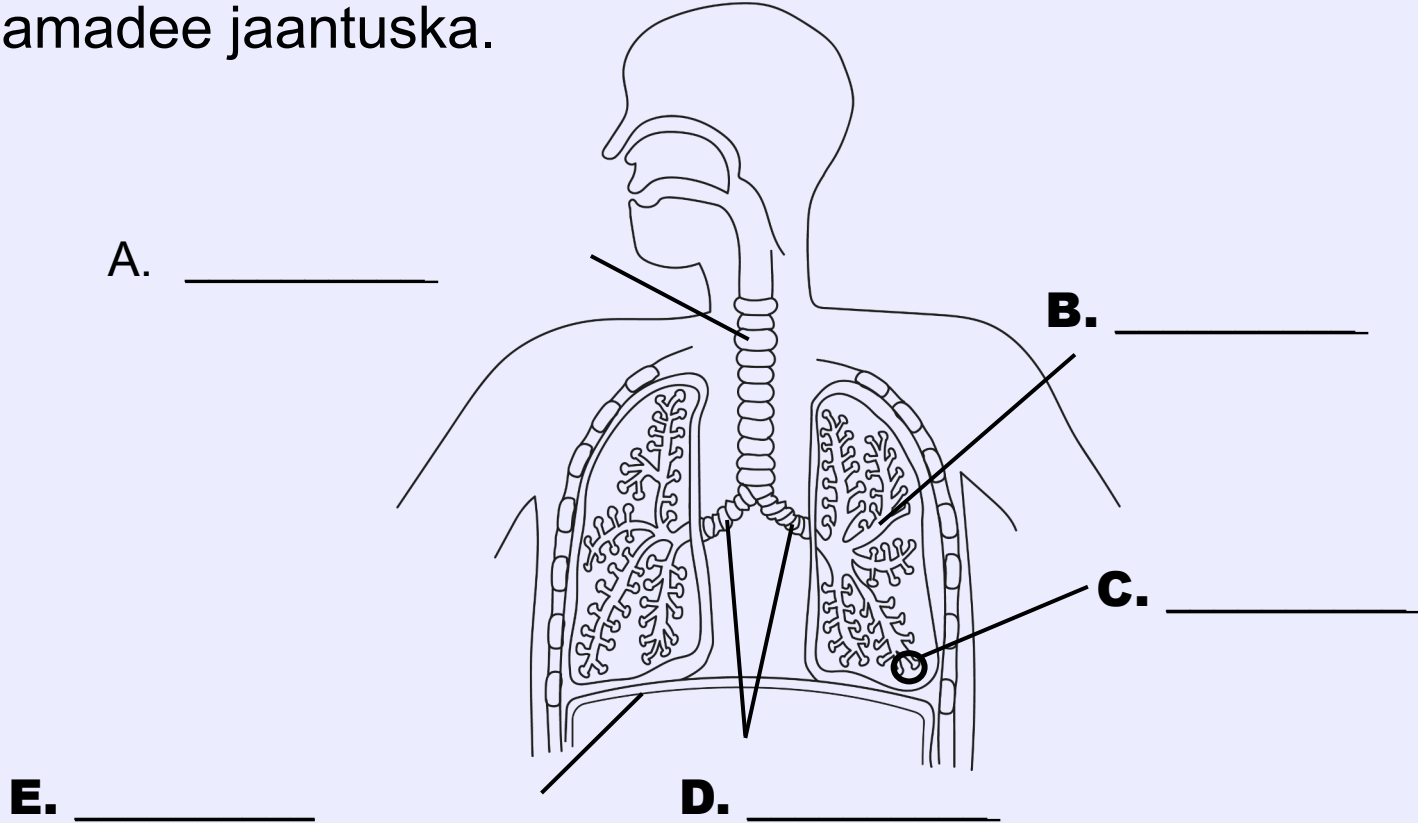
d qanjirka hunguriga (trachea)

Markaan neefsano, hawadu waxay martaa qaababkan soo socda:



Nidaamka is-weydaarsiga gaasaska (gas exchange system)

Ku calaamadee jaantuska.



Nidaamka is-weydaarsiga gaasaska (gas exchange system)



Hubi

Laga bilaabo afka, kala saar qaababkan sida ay hawadu u marto markaan neefsano.

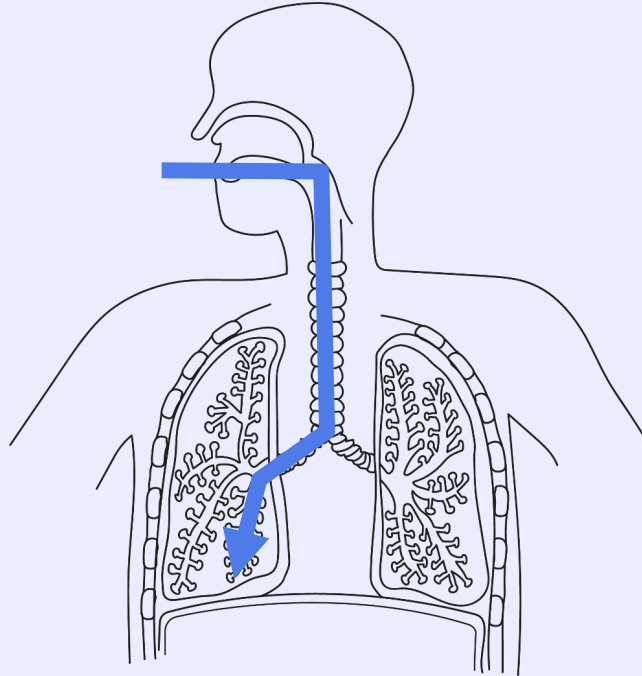
1. afka
2. trachea (qanjirka hawada)
3. Bronchi (Neef-mareenka weyn)
4. Bronchioles (Neef-mareenka yar)
5. Alveoli (Kiishadaha hawada)

aryar)

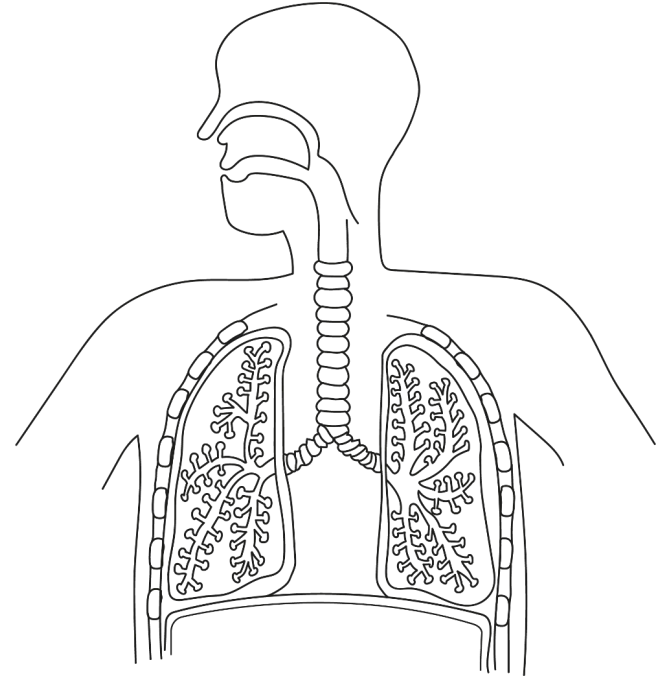
o yaryar)

hawada)

hawada)



Sharax socdaalka unugga oksijiinta (oxygen molecule) ee afka ilaa alveolus (kiishad yar oo hawada) ee sambabada.



Sharax socdaalka unugga oksijiinta ee afka ilaa alveolus (kiishad yar oo hawada) ee sambabada.

- Unugga oksijiinta wuxuu ka soo guuraa afka galinta tuubbo la yiraahdo trachea (neef-mareenka weyn).
- Kadib wuxuu u guuraa mid ka mid ah labada tuubbo oo cidhiidhi ah oo la yiraahdo bronchi.
- Intaas ka dib, wuxuu u guuraa tuubbo ka sii cidhiidhi ah oo la yiraahdo bronchiole.
- Kadib unugga oksijiinta wuxuu u guuraa alveolus, oo ah kiishad yar oo hawada ah ee sambabada.

Qaabka casharka

Nidaamka is-weydaarsiga gaaska ee bini'aadamka iyo neefsashada



Nidaamka is-weydaarsiga gaaska



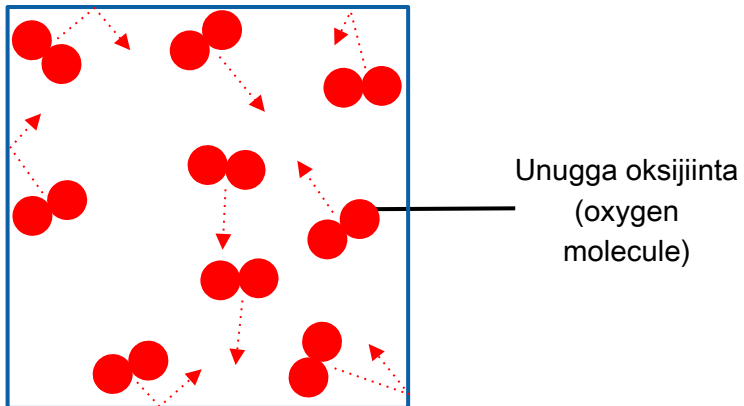
Cadaadiska (Pressure), mugga (volume) iyo neefsashada

Si loo fahmo sida neefsashadu u dhacdo, waa inaan ka fikirnaa cadaadiska iyo mugga.

Qiyaas sanduuq ay ka buuxaan gaaska oksijiinta (oxygen gas).

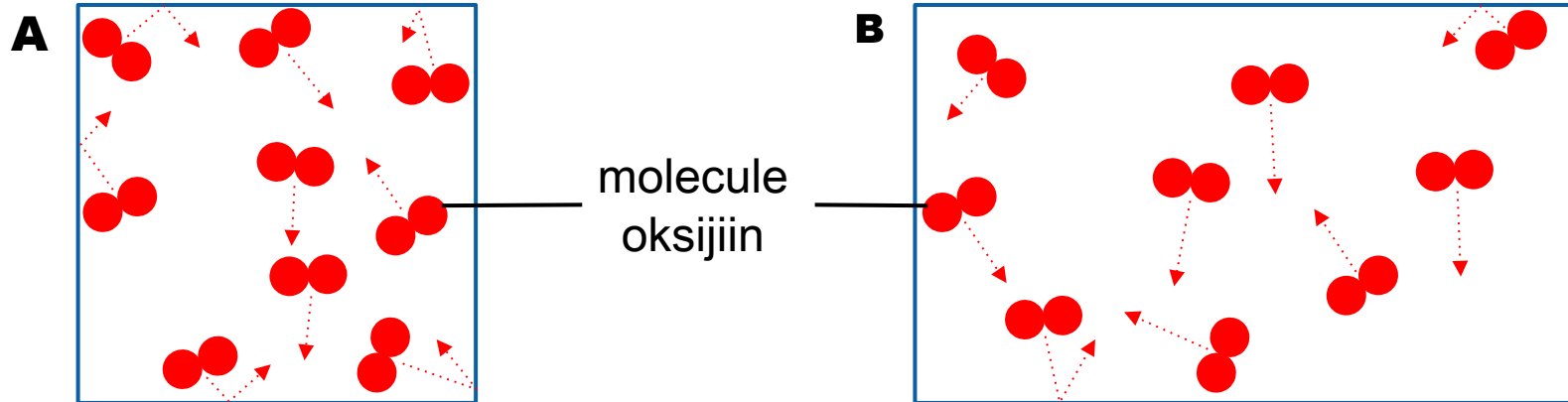
Unugyada oksijiinta ee sanduuqa dhexdiisa waxay u dhaqaaqaan si aan kala go' lahayn.

Waxay isku dhacaan derbiyada sanduuqa, taas oo abuurta cadaadis (pressure).



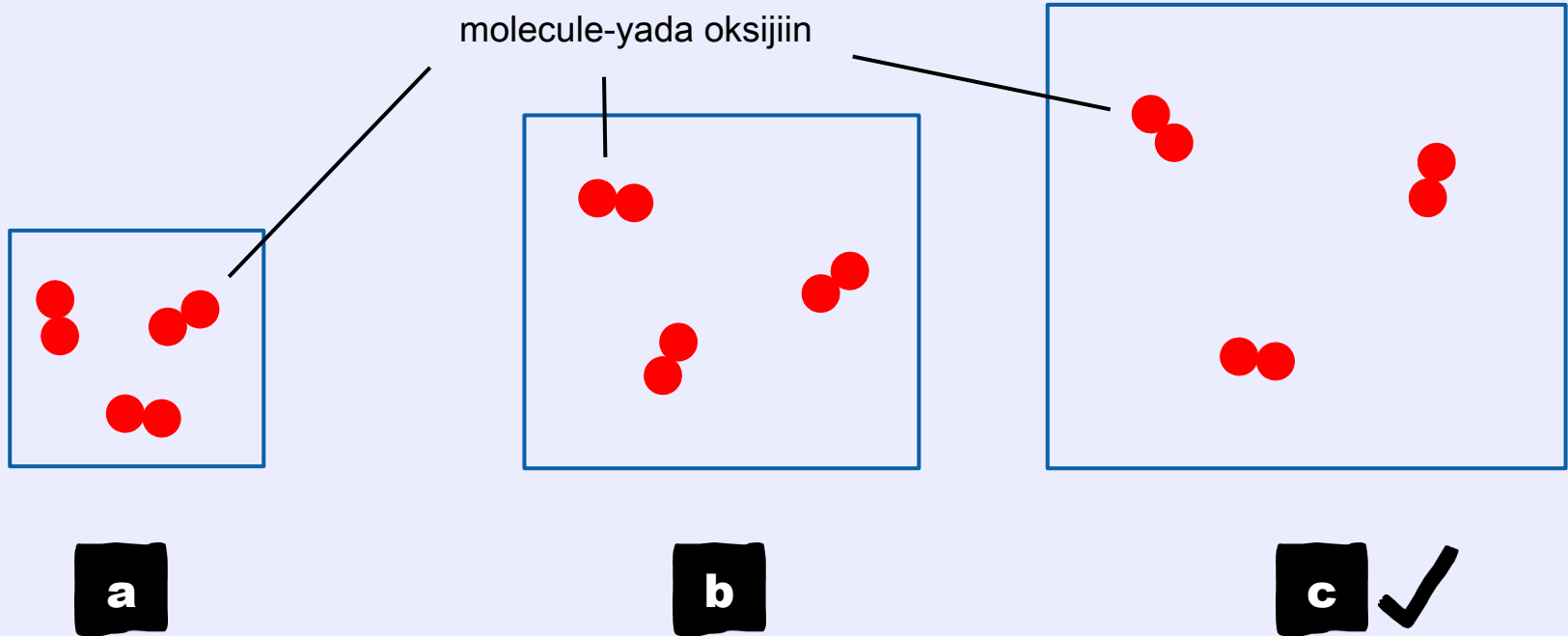
Sanduuqa B wuxuu leeyahay mug (volume) ka weyn sanduuqa A, laakiin wuxuu ka kooban yahay isla qadar gaas oksijiin ah.

Sanduuqa B, molecule-yadu waxay leeyihiin meel badan oo ay ku dhaqaaqaan, marka waxay la kulmaan gidaarada si yar. Marka cadaadiska gudaha sanduuqa wuu hooseeyaa.



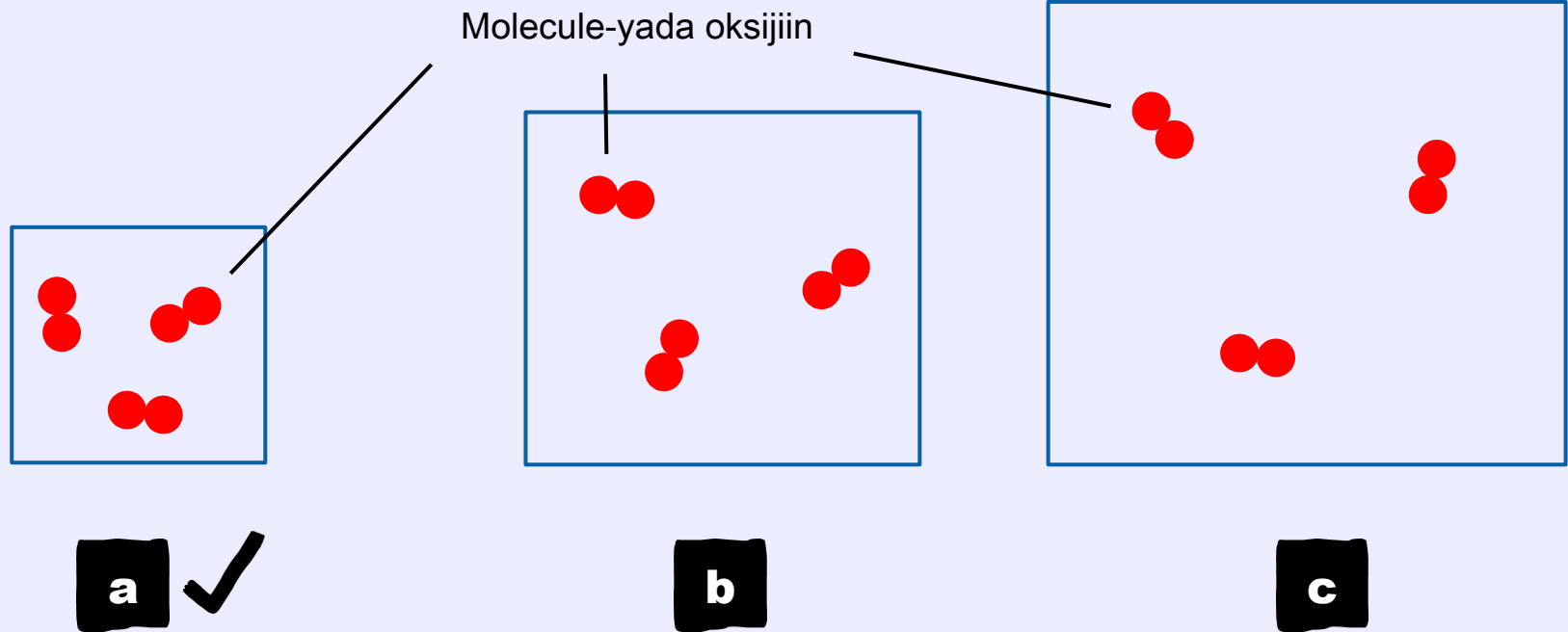
Cadaadis (Pressure), mug (volume) iyo neefsasho

Sanduuqee ayaa leh mugga (volume) ugu weyn?



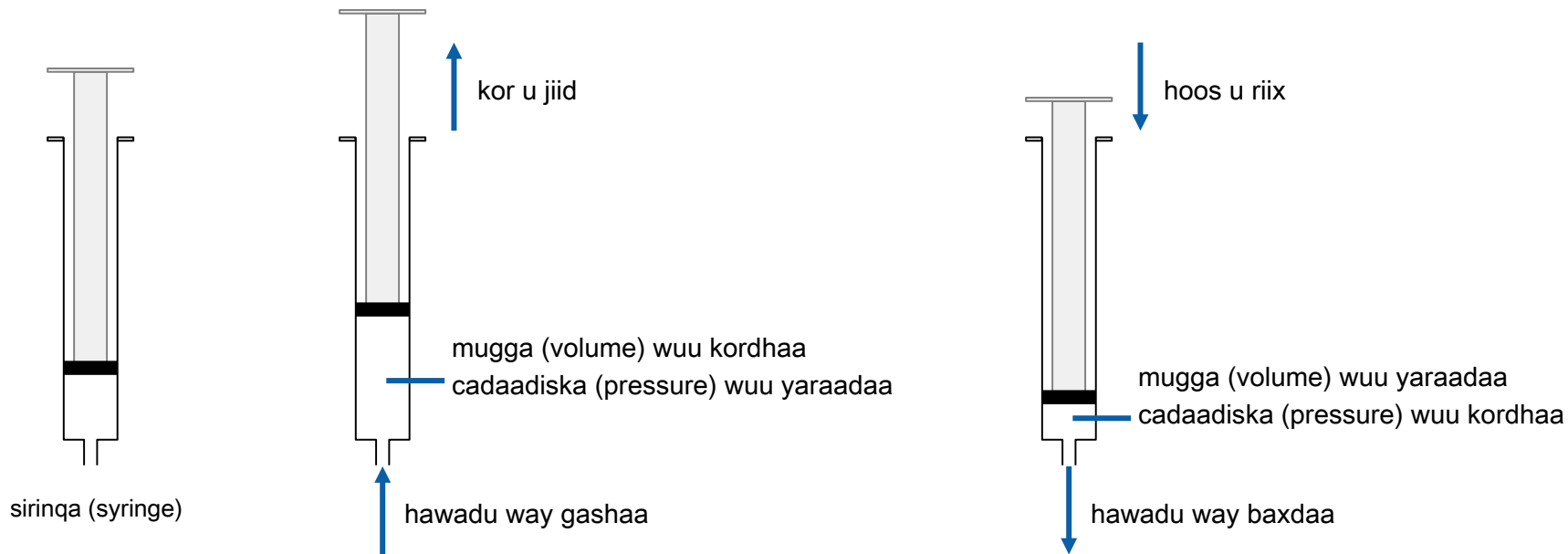
Cadaadis (Pressure), mug (volume) iyo neefsasho

Sanduuqee ayaa leh cadaadiska (pressure) ugu sarreeya?

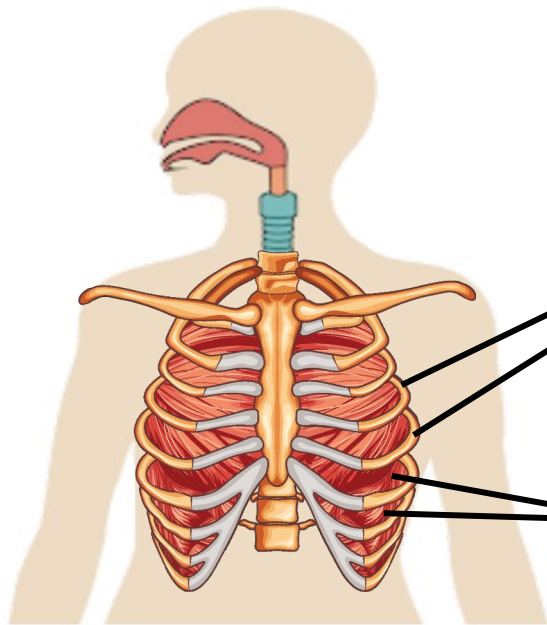


Haddii hawadu ay geli karto oo ka bixi karto weel, waxay:

- geli marka cadaadiska gudaha uu hooseeyo
- bixi marka cadaadiska gudaha uu sarreeyo.



Markaan neefsanayno, muruqyada iyo lafuhu way dhaqaaqaan si ay u beddelaan mugga (volume) iyo cadaadiska (pressure) ku jira laabta.



feeraha -

Lafaha feeraha waxay sameeyaan qaab loo yaqaan sanduuqa feeraha (ribcage) oo ku wareegsan sambabada

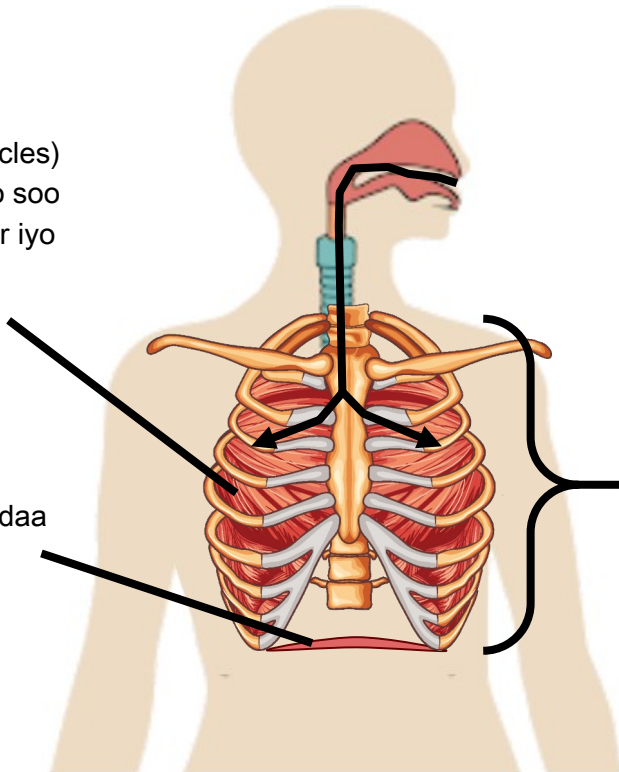
muruqyada intercostal -
(intercostal muscles)

muruqyada u dhexeeya feeraha, kuwaas oo isku qabsan kara (contract) oo nasan kara (relax)

Neefsashada gudaha waxaa loo yaqaan inhalation.

Muruqyada intercostal (intercostal muscles) way isku qabsadaan (contract), taas oo soo jiidaysa sanduuqa feeraha (ribcage) kor iyo dibadda.

Diaphragm-ku (diaphragm) wuu isku qabsadaa (contracts) oo wuu fidsanaadaa (flattens).

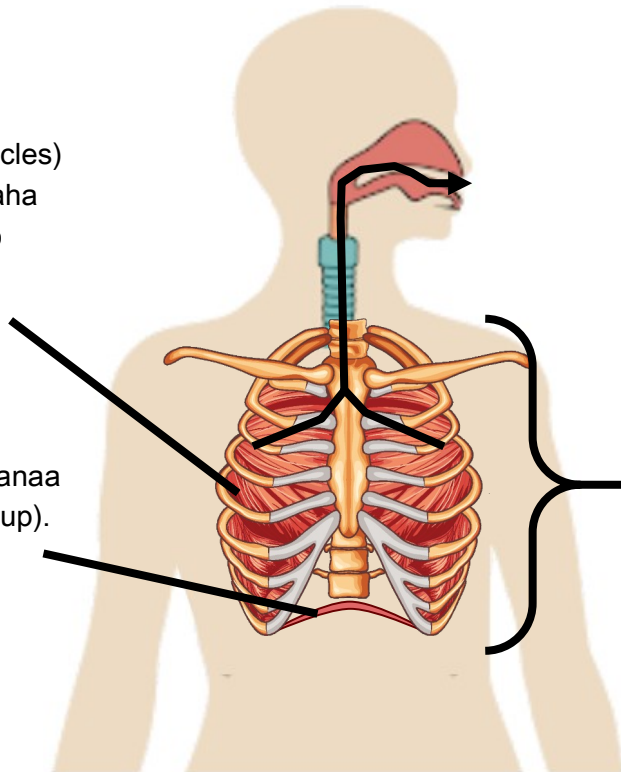


muggu (volume) wuu kordhaa
cadaadiska (pressure) wuu yaraadaa

Neefsashada dibadda waxaa loo yaqaan exhalation.

Muruqyada intercostal (intercostal muscles) way nastaanna (relax), sanduuqa feeraha (ribcage) wuxuu u dhaqaaqaa hoos iyo gudaha.

Diaphragm-ku (diaphragm) wuu nastaanaa (relaxes) oo wuu qaloocamaa (curves up).



muggu (volume) wuu yaraadaa
cadaadiska (pressure) wuu kordhaa

Cadaadis (Pressure), mug (volume) iyo neefsasho



Kala sooc weedhahan ku saabsan inhalation (inhalation) si ay ugu habboonaato nidaamka.

Kii ugu horreeyay ayaa lagu sameeyay:

1. Muruqyada intercostal (intercostal muscles) way isku qabsadaan (contract).
- Diaphragm-ku sidoo kale wuu isku qabsadaa oo wuu fidsanaadaa.
- Tani waxay yaraysaa cadaadiska (pressure) sambabada.
- Tani waxay soo jiidataa lafta feeraha (rib cage) kor iyo dibedda.
- Hawadu waxay soo gashaa sambabada.
- Mugga (volume) sambabada wuu kordhaa.

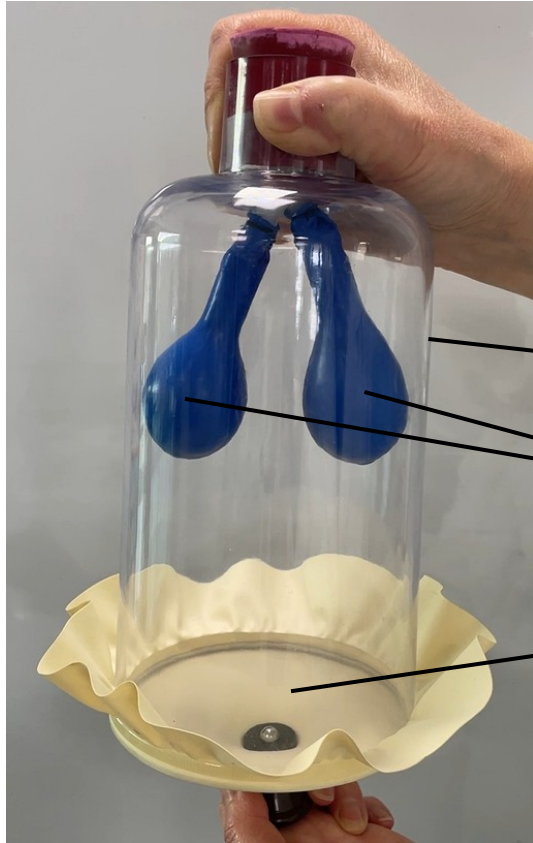
Kala saar weedhahan ku saabsan neefsashada (inhalation) si ay ugu qulqulaan sida saxda ah.

Kii ugu horreeyay ayaa lagu sameeyay:

1. Murqaha intercostal (intercostal muscles) way isku qabsadaan.
2. Tani waxay soo jiidataa lafta feeraha kor iyo dibedda.
3. Diaphragm-ku sidoo kale wuu isku qabsadaa oo wuu fidsanaadaa.
4. Mugga sambabada wuu kordhaa.
5. Tani waxay yaraysaa cadaadiska sambabada.
6. Hawadu waxay soo gashaa sambabada.

Cadaadis, mug iyo neefsasho

Qalabkani waa moodel (model) isbeddellada ku dhaca laabta inta lagu jiro neefsashada (inhalation) iyo neefsashada (exhalation).



weel dhalo ah
(bell jar)

- wuxuu u taagan yahay lafta feeraha (ribcage)

buufinno
(balloons)

xaashi caag ah
(rubber sheet)

- wuxuu matalaa xuubka hawo-mareenka (diaphragm)

Neefsasho (Inhalation)

- Xaashida caagga ah ayaa hoos loo jiidaa
- Tani waxay mataleysaa xuubka hawo-mareenka (diaphragm) oo is-jiidaya (contracting)
- Tani waxay kordhisaa mugga (volume), waxayna yaraysaa cadaadiska (pressure)
- Buufinnada ayaa barara (inflate)
- Tani waxay mataleysaa hawadu oo u dhaqaaqeysa sambabada



Neefsasho (Exhalation)

- Xaashida caagga ah ayaa kor loo riixaa
- Tani waxay mataleysaa xuubka hawo-mareenka (diaphragm) oo nasanaya (relaxing)
- Tani waxay yaraysaa mugga (volume), waxayna kordhisaa cadaadiska (pressure)
- Buufinnada ayaa ciriirima (deflate)
- Tani waxay mataleysaa hawadu oo ka baxaysa sambabada

Cadaadis (Pressure), mug (volume) iyo neefsasho

Maxay xaashida caagga ah u taagan tahay (represent) qaabka dharabka (bell jar) ee neefsashada?

a

Xuubka hawo-mareenka (Diaphragm)

b

Sambabada (Lungs)

c

Feeraha (Ribs)



Sharax isku ekaanshaha iyo kala duwanaanshaha u dhexeeya neefsashada bini'aadamka iyo qaabka dharabka (bell jar) ee neefsashada.



Sharax isku ekaanshaha iyo kala duwanaanshaha neefsashada bini'aadamka iyo qaabka bell jar ee neefsashada.

Isku ekaansho

- Xaashida caagga ah waa la kor riixaa, taas oo la mid ah sida diaphragm-ku u qallooco marka neefsashada (exhalation).
- Buufinadu way buuraan oo way dheeraan, taas oo la mid ah sida hawadu u gasho oo uga soo baxdo sambabada marka mugga iyo cadaadiska laabtu isbeddelaan.

Kala duwanaansho

- Ma jiraan wax matalaya murqaha intercostal ee qaabka bell jar.
- Bell jar-ku ma dhaqaaqo, laakiin feeraha (ribcage) waa la kor u jiidaa oo dibadda loo sii daa marka neefsashada (inhalation), ka dibna hoos iyo gudaha ayuu u dhaqaaqaa marka neefsashada (exhalation).

- Qaybo badan oo ka mid ah nidaamka isweydaarsiga gaaska ayaa si wada jir ah u shaqeeya si aan u neefsano.
- Murqaha ku jira nidaamka isweydaarsiga gaaska ayaa isku qandacsada oo nasasha, taas oo beddesha mugga iyo cadaadiska laabta gudaheeda.
- Tani waxay keentaa in hawadu u gasho sambabada (inhalation) oo ka soo baxdo (exhalation).