

## Cutubka

6<sup>aad</sup>

## ILAYSKA

**Natiijooyinka cutubka:** markau dhamaado cutubkani waxaad awoodi doontaa in aad

- ✓ Fahamtid fikiradaha la xidhidha ilayska.
- ✓ Waxad kor uqaadi (xirfadahaaga) kusaabsan masalooyinka la xidhidha ilayska
- ✓ Ku dhiiranaashaha xidhiidhka ka dhexeeya dhahamaan wal xaha
- ✓ In aad isticmaashid waxa kasta oo aad ku kordhin karayso oo suurto galah aqoontaada fisigiska

### 6.1 Waa Maxay Ilaysku?

#### Hawlgalka 6.1

- Qeex waa maxag ilays? Xubnaha dareenka tee baad u isticmaashaa ilayska.
- Cadee ilaha kala duwan ee ilayska
- Sidee buu ilaysku u socodaa isha illayska illaa indhahaaga?

Inagu markeynu socono meel (madaw) mugdi ah waxba inaga dambeeya sabatu waa ma'arkeyno waxa inagu xeersan. Waxa ugu weyn qaybtaa maxaan ka ognahay caalamka ingu xeersan inaga natijadu waa araga. Ilagysku waxa u inoo sameeyaa in aan wax inagu xeersan aragno ayna inoosoo saarayaan dareenkeenu. Iftika ku dhacay indhaha iyo maskaxda Jan 6.1 ilaysku waxuu inaga caawiyaa aragtida waxa inagu xeeran.



*Jaantuska 6.1 Jlays kainaga caawinaga argtida waxa inagu xeersan.*

**Laan kamidah laamaha  
Fisigiska dabiciga, hantida  
iyo waxyaabaha kale een  
ku egyno ilayska ka waxa  
lagidhaa obtikis**

ilaysku waliba waxa uu noo sameeyaa nolosheena siday doonta. Ilaysku wa xa u samayn dhirtu inay baxdo si ay u soo saarto cuntada aan cuno. Dhirtu waxaay kaydsadaan tamarta taasoo ay ka helaan qoraxda. Tamartan keydsan waxa loo badalaa shidaal sida dhuxusha iyo xaabada.

Ilaysku waa hirka birlab danabowga kaaso ku siidaaya jidhka wax kulul tan waxaa soo saara dareemayaasha ilayska biniaadamka isha si ilays loo soosaaro waxa la adeegsan habkale tamarta logu'badalo ilays. Tusaale dabka korontada tamarta danabka waxa loo badali tamarkul iyo tamar ilays.

### waa maxay ilaha ilaysku

Ilaha ilayska ee walxuhu waa kuwa loo rogo (lobadalo) ama bixiya ilayska tamarta leeyihin. Kuwaa waxa la yidhaa walxaha bixiya ilayska (luminous bodies). Tusaale qoraxda, dabka, iftiinka laambada, shamaca waa ilays bixiyeyaal. Waa ilaha ilayska.

Walxaha ugu badan ee aan soo saarin ilayska laftooda. Kuwa noocanah waxa la arkaa oo kaliya marka ilayska ayka qaatan ifayaasha soona celiyaan indhaheena si ay u qabtaan. Walxaha ilayska bixiya waxaa layidhaa ilaysicellyayaal (illuminahed) tusaale. Darbiga, dadka, buuga, dayaxa, iyo buuruhu waa ilaysiceliya yaal. Muxu dayaxu u noqon waayey il ilays ?

### Hubin 6.1

1. Waa maxay ilaysku?
2. Qeex ifeyaasha iyo ma ifeyaasha mid walba tusaale ka bixi.
3. Qar maqacaw ilaha ilayska ee deegaankiina.

## 6.2 Sidee Buu Ilays Ku Usocdaalaa?

### Hawlgalka 6.2 inago ufiirsanyna socdaalka ilayska.

Kooxsaxi badaaya kala shaqee hawlgaladan sosocda. Qeex sida ilaysku u socdaalo. Majidtoosan buu maraa mise mid xoogdan? Qalabka loo baahan yahay 3 waraaq kaartomeed oo madow (eeg Jan 6.2) ilaha ilayska (shamaca ama lamp)

3 waraaq kaartomeed ee ubaahan dalolo badhtanka qiyaas siman leh.

*Jidka laraacayo:*

1. U hagaaji kartoona sida ka muuqata jaantuska 6.2
2. Katafi miqa dalolka, riix oogiji si'aaduga dhigtid da lool dariiq toosan ah
3. Meeldhig shamaca iftiimaya, danbayso karfoonka. Tijaabi inaad aragtid shamaca gubanaya holacisa dhanka kale sida ka muqata Jaantuska 6.2 (waa in aad aragtid holaca shamaca eegaya dalolka)
  - i. Ma'ka arkaysaa hulaca dalolka?
  - ii. Haddi kaartonka la dhaqaajiyo inyar booskiisa. Ma'arkaysaa ilaa hada holacisa?
  - iii. Maxaaynu ku gabagabayni socodka ilayska? Ilaysku geesaha muu u socdaalaa



b. Dalolo toosa

t. Dalolo aan habaysnayn

### Jaantuska 6.2 socodka ilayska

Hawlgalka 6.2 waxa lagayaabaa inaad fahamtay dalolada kaartonka midwalba hubi qiyaas is ku mid ah ma arki kartaa ilayska shamaca (Jan6.2a) lakiin haddii kaartonka (kaarka) la dhaqaajiyo (aan habaysnayn) inyar oo ka baxsan laynka ilayska la'arkimaayo sababtu waa holaca ilaysku waa uu ka xidhmi oogada kaarka barabaxay (jan 6.2t) ilaysku ku wareegi maayo geeska.

Hawlgalkani waxa ina tusayaa socdaalka ilaysku in u yahay mid toosan.

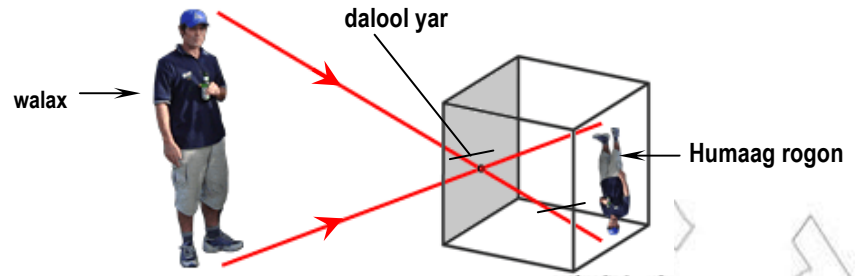
Aan so qaadano ficilka tusaale ahaan nolol maalmeedkeena ka mid ah

Hadii aad furto daaqada ujeeda ilayska cadceeda ama dhanka geedka aad ukasocotid meesha cadceedu kaso baxdo ama u dhacdo waxaa arkaynaa ilays usoo burqanaya sitoos ah. Kanasoo gudbaya daaqada, gidaarka kaso horjeeda ama udhexeeya caleemaha Geedka ee socda dhulka

Saamaynta oo kale waliba waxa lagu arki hoolka filimaanta oo kale sida ilaysku usoconayo (ugasocodaalayo) dhanka mishinka filinka kuna dhacaya shaashada muraayada T.4. dhacdooyinkan waxay cadaynaayan ilaysku inu ku socdaalo xariiq toosan.

Run ahaantii waxaan arkaynaa ilayska sabab tu waa marka u ku dhaco saxarada ka gudba ama ka noqoda indheheena jihada u'ugudbayo ilaysku waxa layidhaa fallaadh. Marka ay u taalo xariiq toosan waa fallaadh. Koox fallaadho ilays ah waa dhudo ilays.

Waxa jira noocyo fallaadho oo kala duwan waxa lagu mujiyey jaantuska 6.3 iyagoo barbaro ah, urursan ama firidhsan dhuduhu.



Jaantuska 6.4 kamarada biindaloolka (kaamerada bini – hoolka)

### Hawlgalka 6.3 Rikibida (samaynta) kaamerada bin - doolka

**Qalabka loo baahanyahay:** Sanduq waraa qadah, macdan qalin ah, warqadka lar caag leh (warqadsalideed), musmaar yar iyo koolo.

**Jidka laraa cayo:** marka dalolka musbaarka u haldhinac sanduqa kayahay.

- Udhaqaaji lidkajihada sanduuqa iyo kubadal warqada salida ama warqada caaga.
- Ku daool dhinaca sanduqa koolada, si una ilaysku gudaha sanduqa ugalin (jan 6.4)
- Isticmaal daloolka musbaarka ee kaamerada waa in aad diyaarisid walxaha kugu xeersan sida calanka, shamaca shidmay ama Geedka dhanka cadeedka soo baxa

**Muraayadaha waa eilmiga barashedo ilaysku waa laan kamid ah obtikada taa soo daraasaadku samaysa ilayska lana isticmaalayo ilayska "Fallaadh" qaab dhismeed**

Humaagu waxa u kusamaysmi shaashada si aad uga argatid caadi ahaan Haddi hawsha lagu qabto qol madaw madamo ilaysku ku socodo xariiq toosan barkasta oo kamid ah humaaga shaashadu waxa uuku ifayaa ilayska ku socodaalaya xariiq toosan barta ilaha saxarada. Saxarada yar yar ee ilayska walxaha oo la iskugeyn si ay usameeyaan humaag qaliban (foorar), walaxdu waxaa inatusi jaantuska. Haddi dalolku wayn yahay. Humaagu waxa u noqon midisku dhexjira. Sawir nadifah maheeshay marka dololku yar yahay sida daloolka musbaarka.

Waxaan ka fikiraynaa dalolka wayn inu legyahay koox daloloah oo yar-yar iskuna xidhan siwadajir ah. Waxay so saarayaan humaagyo is le'eg. Iyo kuwo isku laaban waxaa sababa bixida humaaga isku dhexdarsama (laka la saarimaayo)

#### **Hadhka**

Marka walax ilays magudbiye ah ladhigo meel udhaxaysa isha ilayska iyo shaashada. Hadhku waxa u ku samaysmi shaashada dusheeda. Tansababteedu waa socodaalka ilayska ee xariqatoosan, ma awoodo inu kuwareego walaxda. Habku usamaysmo hadhku waa hawlqabad. Tusaale ilayska ku socodaalaya xariiq toosan marka ilaysku aad u yar yihiin taasi waa barta ilayska. Hadhku waxa uu soo saaraa madow iyo fiiqan iswadaleg dhamaan. Marka ishu ay weyntahay. Siday dontaba ha. Ahaatee, hadhku waxa u leeyahay hal madow oo badhtanka ah lana ururiyey kuna wareegsan Anbara ilayska falgalka wax layidhaa Bin – Anbaro.

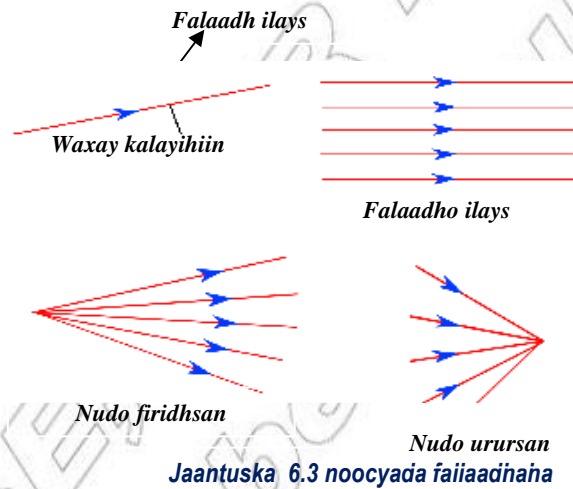
**Hubin 6.2**

1. Qeex habka ilays uu u faafo
2. Waa maxay daloolka musbaarka yar ee kaameradu? Sharax isticmaalkeeda.
3. Sharax humaaga dabigigu sidu ugu samaysmo daloolka musbaarka yar ee kaamerada.
4. Waa maxay macnaha weedh hani mootige, seebe, iyo gaabe, tusaale ka bixi mid walba.

**6.3 Ilays Noqod**

Socodaalka ilayska ee jihooyin isku dhan ah ka imanaya ilaha.

Faafida ilayska waxaa u taagan fallaadho ilays. Ilaysku waxa uu ku socdaa xariiq toosan ee madhanaha marka ilays ku gaadho xadka ama sohdinta, dhexyaalka il haduna ka gudbeynin masocdaalayo. waxa laga yaabaa in isbadal ku dhaco.



Noocyada ilaysku utabaan (u faafaan)

- Ilayska ku socdaala xariiq toosan waxa uu ku socdaa madhanaha Isagoo shay ahaan ku dhex maraya walxaha qaar sida, darbiga, ilaaysku kamagudbo habayaraate walxaha noocan ah waxa layidhaa Gabe.

Walxaha kale oo ilayska gudbiya qaybahaan waxa layidhaa saabe dhalooyinka khaaska ah ee lo isticmaalo su'liyada iyo Qolka maydhiga, daaqadaha iyo biyaha.

**Tusaale.** Qalabka noocan ah sida hawada, daaqadaha caadiga ah ee u gudbiya ilayska.

Siwanaagsan baad waxuga dhex arki. Walxaha noocanah waxala yidhaa mootiye

Waxayu ush aqeyn sidhe xe oo faafid ilayska ah

Walaxda Gabe ilayska wayceliyaan dhamaanti, inkastoo saabuhu uu celiyo qeyb ka mid ah

### Daloolka yar ee mismaarka kaamerada (pin – hole camera)

➤ Daloolka yar ee mismaarka kaameradu waxa ka kooban tahay sanduuq, daloolyar, dhinaca wajiga kule, ama shaashada, dharka yaroo cad, eeg jan 6.4

i. In xaddi ilays ah ayaa la nugi laga nugi xadka walxda

ii. Inta kale dibaa loo soo cilin walaxda koowad. Haddi ogada la mariyo inta badan ilays ku dibu'u sonoqonayaa kuna soo noqonayaa ogada dhacdada noocan ah ee ilayska waxa layidhaa ilays noqod.

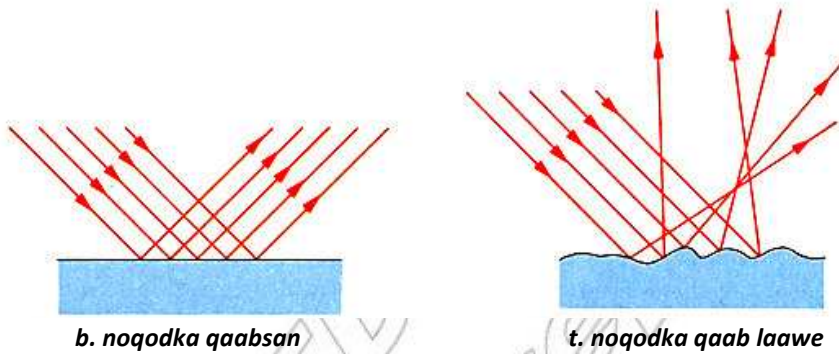
Ilays noqod waa dibu noqo sho ama dibusooboodiid ilaysku marka uku dhaco walxo kaladuwan

Marka fallaadhaha ilaysku ay kudha can Gabe dhaman waysoo laabanayaan. Miyaad aragteg inunxiidhidh udhexeya xagasha Fallaadhaha ilayska ekudhaca shayga Gabe ama xaga sha

#### waxa jira laba nooc noqodka ah ilays

i. Mid habsami ah (noqodka toosan) waa noqodka walxada joogtada, ilayka, ogada siman/ tusaale muraayada (Jan 6.5b)

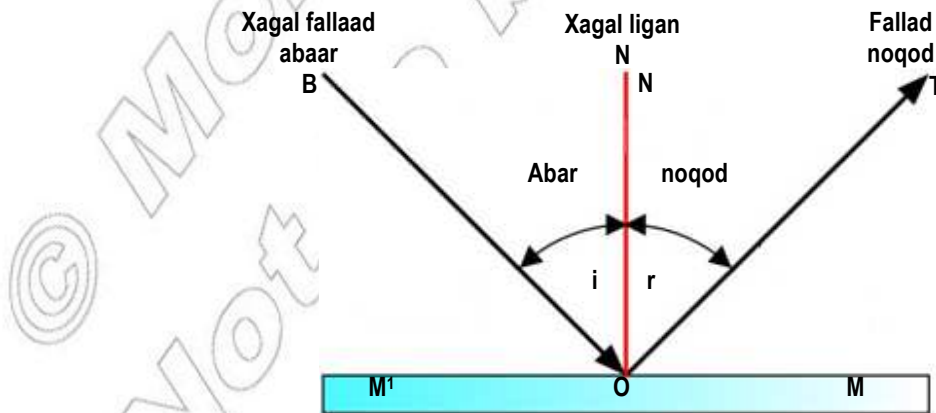
ii. Qaab laawaha:- noqodkani Qaab laawe ama ogada aan sinayn (Jan 6.5b)



Jaantuska 6.5 qaabsame iyo qaablaawe

Fallaadha ku dhacaysa oogada waxa layidhaa fallaadh abaar (incidentray) halka fallaadhaha dibu noqonaya dhanka ogada layidhaa (reflected ray ) fallaadh noqod.

Markad isku eegtid murrayda fallaadh abaar ku waxay katagi wajigaga kuna dhici murrayada waxay dibugu noqon fallaadh noqodkii fallaadha hani markay so gaadhaan



Jaantuska 6.6 weedha loo istiemaalo noqodka ilayska.

MM' waa ogada noqodka ilayska muraayada siman

BO waa jihada ilaysku kaga imanayo isha. lagadareemayo noqodka ogada ayaa layidhaa fallaadh abaar. Bart 'O' waa bart noqodka OT tahay fallaadh noqod ilauska NO waa liganaha MM' waxana layidhaa quman (ligane) xagasha ka samaysantay fallaadh abaarka iyo liganaha waxa layidhaa xagasha abaarka. Xagasha ka samaysantay noqodka fallaadha iyo liganaha waxana layidhaa xagasha noqodka waxa u taagan yihiin sida  $\hat{i}$  amd  $\hat{r}$  si' iskuxigta

$\hat{i}$  = xagasha abaar

r = xagal noqod

**Hawlgalka 6.4 barashada xeerka noqodka**

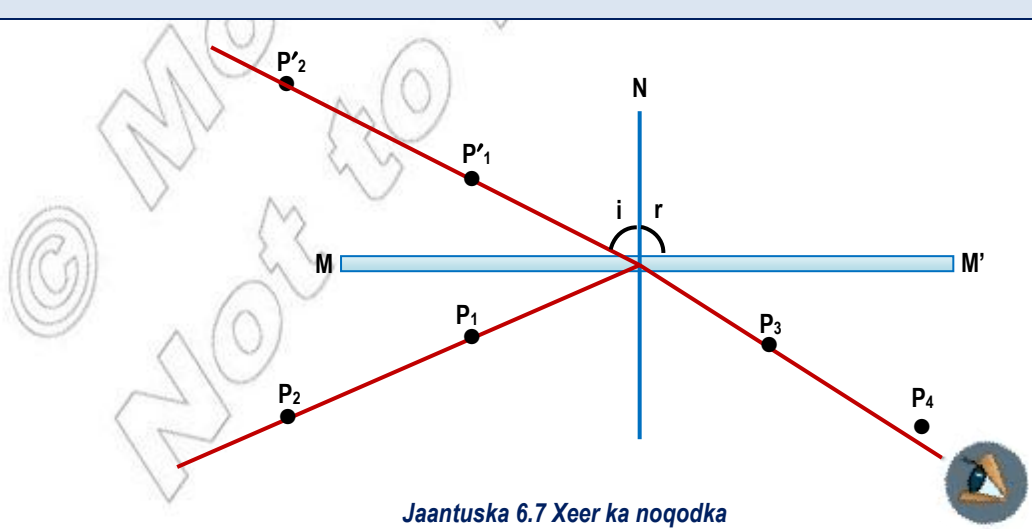
Qalin iyo warqad cad kadibna sawir xariq Jiifa ilaa badhtanka warqada mid jilicsan, iyo waraaq karton jiifah hanoqodo isticmaal afar barood odaloola waraaga kaarton (shaxda) Jan 6.7

Meel muraada siman oo madhan joogahaan taasiwaa macdan silfara (qalinah) ogadeeda (taasi muraayadi danbe) waa laynka aadka sawiraysid iyaga siman laynka MM', kudhagan labad barood  $p_1$  iyo  $p_2$  warqada korkee da muraayada marka laynka isku Joogi  $P_1$  iyo  $P_2$  xagasha MM'. dalool  $P_1$  iyo  $P_2$  waa in aad u dhaxaysid 5 ama 6cm. indhahaaga markaad ka eegtid bar qoman ufiirso humaaga  $P_1$  iyo  $P_2$  la bada musbaarkayer ku khaji labad kale  $P_3$  iyo  $P_4$  si xariiq toosan ah humaago udagi sida sha xan ku ku to Jan 6.7 Hada muraayada dhaqaajiigo musbaarkaba sawir leyka  $P_1P_2$  ama  $P_4P_3$  kago MM' Haddi aad tijaabisay sidaxadar lee laynasha ku kulma barta MM' kuma gacaw bart "O" sawirna liganaha MM' sida ku muqata.

Cabbirka xagasha  $\hat{i}$  iyo  $\hat{r}$  diwaa gali natijada. Ku celitijaabada xaglo kala duwan ama natijada kuqor shaxda hoose,

Shaxda 6.1 xagahsa  $\hat{i}$  ama  $\hat{r}$  waa xaglo, xagal abaar iyo xagal nogod sijogoto ah

Shaxanka 6.1		
Tirada tijaabada	Xaga abaar(i)	Xagal noqodka (r)
1	$10^\circ$	-
2	$20^\circ$	-
3	$30^\circ$	-
4	$45^\circ$	-
5	$60^\circ$	-



Jaantuska 6.7 Xeer ka noqodka

Helida natijada tijaabada kasoobaxday waxa lagu gabagabayn karaa xeerka noqodka.

### Xeerka noqodka

Xagasha abaarku waxay le'eg tahay xagasha noqodka. Xagasha a baarka, xagasha noqodka, iyo liganaha, ogada noqodka barta abaarka dhamaanatood waxay dhacayaa ogada siman.

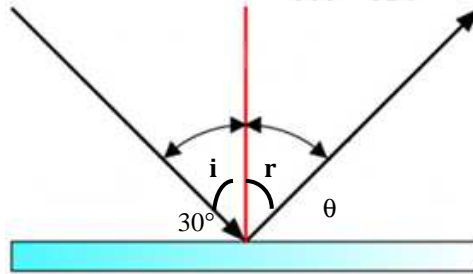
### Tusaale

Xagal abaarka kudhagan ogada muraagada xagasha  $30^\circ$ . waa imisa

- b. Xagal noqodku?
- t. xagasha udhaxaysa noqodka iyo muraagada?

### Furfuris

- Sawir liganaha bartisa halka xagasha abaarku kaga dhagan yahay muraayada



Jaantuska 6.8 Muraayad siman

- b) Xagasha u dhaxaysa abaarka iyo liganuhu waa  
 $= 90^\circ - 30^\circ = 60^\circ$

Sidaas darted xagal noqodku waa  $= 60^\circ$  ilayn waxa is leeg  $\hat{i} = \hat{r} = 60^\circ$ .

- t) Xagasha u dhaxaysa noqodka fallaadha iyo muraagadu waa  
 $90^\circ = \hat{r} + \theta^\circ \Rightarrow \theta^\circ = 90 - \hat{r}$   
 hadi  $r = 60^\circ$  markaa  $\theta^\circ = 90^\circ - 60^\circ = 30^\circ$

Fallaadhaha qaablaaweyaasha iyo fallaadhah qaabkasan sifudud baa loosharixi karaa iyadoo la isticmaalayo xeerka labaadee nudaha bar-barada ee ku dhagan ogada aan sinayn xagasheeda dhamaan falaadhaha nuduhu markay abaarayaan xaglaha kala duwan agagaarada kuwa kale noqodkooda Fallaadhaha kala duwan natijadodu way kala duwanaan sida xagal noqodka fallaadhahedu kala duwan yihiin Natijadoduna waykala duwanaan jihooyin dhan.



## Humaagu siduu ugu samaysmo muraayada siman

Muraayada simani waa dhalo siman oo dhankeeda midka midabb laga mariyey madaw ama macdan qalin ah (silver) ogada celinaysa waa dhinaca aan waxa lamarin fallaadhahailayska ku dhacaya muraayada waxay unu qonayaan jihoyin kala duwan.

Fallaadh noqodka walxaha ee muraayada waxa layidhaa humaag.



Jaantuska 6.9 Humaaga muraagada siman.

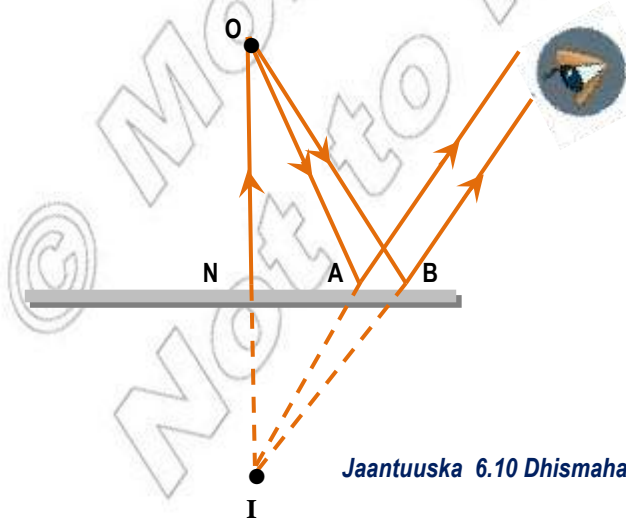
### Hawlgalka 6.5 aan ufiirsano humaagaga muraayada siman qalabka loo baahan yahay muraayad siman

**Jidka lamarayo:** so qaado

**Muraayad siman meeldhig hortaadah (wajigaaga)ah**

- Ufirso nooca humaaga ee muraayadu kaa qabatay.
- Humaaguwaa noocce, maqaliban yahay mise cidhifyada isbadaley muraayada waaside boskiisu dhanka muraayada? Jaantuska 6.9
- Maka Aragtey humaagag ay shashadu qabtay (warqadu) ama lagu taabto gacantaad?
- Humaaga noocan ah maxa layidhaa?

Ka fikir barta walaxda **O**, inuyahag oolka shamacu midliica, hordhig muraayada hortisa. Labada fallaadhod **OB** iyo **OT**. Waxay ku dhagan yihiin muraayada bart **B** iyo **T** sida ka muqata Jaantuska 6.10 Fallaadhuu markay noqodaan waxay qabanayaan indhaha hadii aykayimaadeen dhanka **I** indhuhu waxay qabanayaan bart **I**. sido kale, taa **ON** waxay leegtahay **IN** ama **ONI**. Waxay muraayada ku yihiin ligane Run ahaanti Fallaadho ka imanayaan 'I', humaagu waxa u cadenayaa inu quman yahay. .ama arkayo shashada bart 'I'



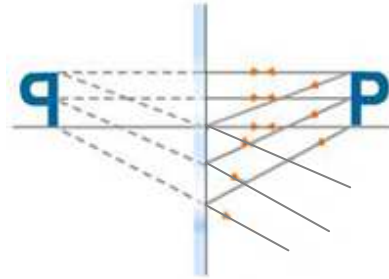
Jaantuska 6.10 Dhismaha humaaga loo istic maalayo fallaadha jaantuska.

Humaaga ka samaysma muraayada siman waxay layihin sifooyinka soo socda tani waa mid taagan, mafooraro

- Waxa uu le'eg yahay walaxda.
- Geesahaan u qaliban yahay (taasiwaa cidhifyadisu way isku roganyihiin)
- Fogaan iskumidah buu ujiraa gudaha muraayada sida walaxdu uhortaalo. Taa macnehedu waa humaaga ka samaysma muraayada siman waxa u tusaa in ay ka fogtahay muraayada

Kaniwaa humaag Been ah humaag beenaad ku fallaadhaha ilaysku ka dhexgudbaan lakiin lama arkikaro ishu maqabato humaagbeenedku waa rogan yahay humagu waa muraayadaha dhalaala.

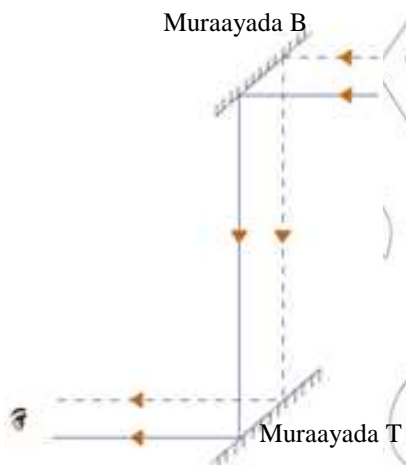
Humaaga runti waa mid fallaadh ah a ilaysku ay kagudbaan shaashada barteeda humaag runt a waxa laga arkaa shaashada.



Jaantuska 6.11 Humaaga xarfaka p ee muraayada siman

### Xoqada (periscope)

Xoqadu waa aalad kaa cawisa daawashada shayga walaxda inagu xeeran gabe. Isticmaalka xoqada waxaad ku arki ciyaaraha kubada gadaasha darbiga dheer.



Jaantuska 6.12 Xoqada

isticmaalka xoqada waa laba muraayadood oo siman tubada dheer sida kamuqata jan 6.12 muraayda waxa la dhig tubada dhamaadkeeda xagasha  $45^\circ$  si laga fiirsado jihada. Humaaga ku samaysmayo muraayada sare ay aa laga daawan muraayada hoose

### Humaaga kusamaysmaya labad muraayadood

Marka labada muraayadood xagal janjeedhka ku '0' tira da humaaga samaysmay waxa u ku samaysmay tirada fallaadh noqodka

$$\text{Tirada humaagu} = \frac{360^\circ}{\theta} - 1$$

Tusaal: Humaaga ku abuurma laba muraayadood jan jeedh ka  $90^\circ$  waa:  $\frac{360^\circ}{90^\circ} - 1 = 4$  Humaag.

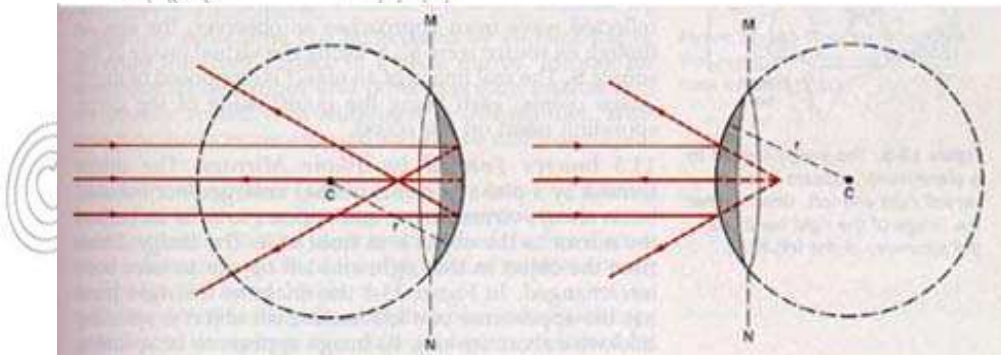
**Muraayadaha Barbarada:** Humaaga tirada aan dhamaadka lahayn waxa uka samaysmaa walxada udhaxaysa meesha labada muraayadood ee bar barada ah. Humaagyadan duljiifa xariiqtoosan dhemaraga walaxda liganaha kuah muraayada meesha ladhigayo humaaga waxa laga yaabaa caa di ahaan in lo dhiso, si aan u'xasu'sano humaag kaste, oo laga arkay muraayad iyagoo matalayo humaag beeneed ama soosaaraya humaaga muraayada

### Hubin 6.3

1. Waa maxay falaadh noqodku?
2. Waa maxay faraq u dhaxeeya fallaadh noqodka qaabsan iyo kuwa qaab laawe?
3. Qeex weedhaha. Fallaadh abaar, Fallaadh noqod, layka liganaha (sicadufaah faahi)
4. Qeex oo cadee xeerka noqodka.
5. Waa imisa xagasha u dhaxeeya fallaadh abaarka iyo fallaadh noqodka hadii xagal abaarku yahag  $40^\circ$ ?
6. Cadee humaaga dabiiciga ku samaysma muraayada siman
7. Qeex farqiga udhexeeya humaag rumeedyo humaag beeneed
8. Waa maxay xoqada? Cadee sida loosameeyo

### 6.4 Humaaga Ka Samaysma Muraayada Qaloocon (xoodan )

Muraayada qaloocon waxay kasamaysan tahay walxa qaab goobeed leh. Ka fikir daloolka qalocsanka dhala da goobada ah, waxaan soo saaraynaa oogo qaloocon inago goynayna qaybta (turayna) qaloocon goobada Haddii ilaysku kasoonoqodo ogada dibada. Waxaa samays mi muraayad tuur leh hadii fallaadhaha. Noqonaya ilayskoodu gudaha ogada, waxaynuhe li muraayad xoodan. Muraayadaha noocan ah waxa layidhaa muraayadaha qaloocon san



b. Muraayad xoodan

t. muraayad tuur leh

Jaantuska 6.13 Muraayadaha qaloc



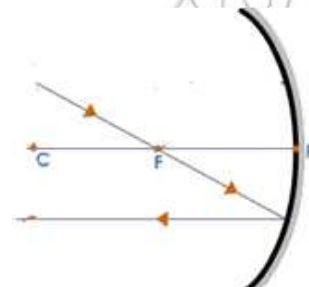
Waxaan hagaajinaynaa barnaamij fu'dud oo anaga ah laqada nayo fallaadhaha jihadooda kadibnoqodka fallaadhaha. Waan fahmaynaa ama sifudu baanusawiraynaa kuwa sosocda waa fallaadha jihadooda lagaranayo

- Fallaadha bar – barada xeerka udub dhex gudbaya xeerka kulmiska (F) Kadibnoqodka Jan 6.15(b)
  - Samiga xeerka kulmiska(F) waa noqodka bar barada udubka as aasiga Jaantuska 6.15(t)
  - Fallaadha badhtanka dhaxma raysa xoodan (c)
- waa fallaadha ku noqonaysa wada deedi (Jaantuska 6.15 J) iska horimaadka fallaadha ugu yaraan laba fallaadhod ka humaaga walaxda hortaal muraayada

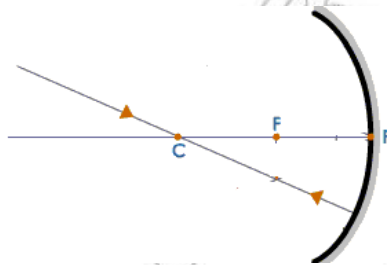
### Humaaga ay sameeyaan muraayadaha xoodan iyo kuwa tuurta leh



b. Fallaadhah as aasiga bar barada noqod keedu waxay dhexmari



t. Fallaadh kasta oo dhexmaraysa f noqod keeda bar bar as aasiga



J. Fallaadh kasta oo dhexmaraysa 'C' waxay kudhici xagasha midig waxaynakunoqo xarriiq toosan  
Jaantuska 6.15 dhismaha fallaadha ah muraay adaha

### Hawlgalka 6.6 Ufiirsashada Humaaga

- muraayada xoodan
- muraayada tuurta leh

**Qalabka:** Muraayada tuur, xoo dan (sida deegaanka loga he layo, walxaha dha laa la og'doda)

**Jidka lamarayo:**

#### b. Muraayad xoodan

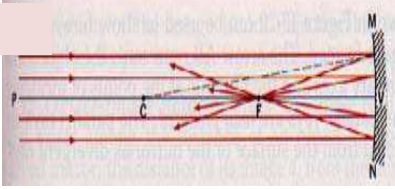
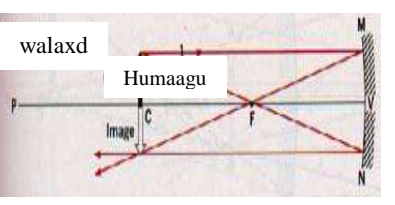
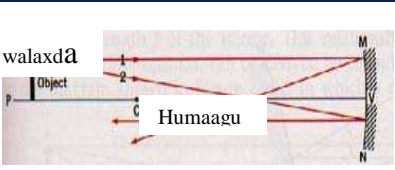
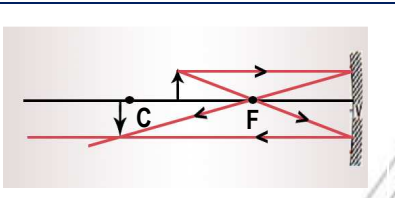
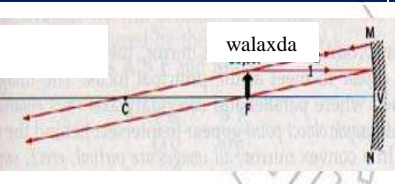
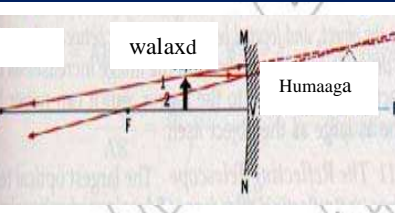
- Dhig horteeda muraayada xoodan Fogaan ujirta, tijaabi humaaga inaad fahamto.
- Ku soodhaw muraayada sitartiibah aan ufirsano nooca humaaga samays may.
- Ugu dabayn aad ugu soo dhawaw qeex nooc humaga una fiirso markaad usoo dhawaatid muraayada

#### t. muraayada tuurta leh

si aad u faham to talaaboyinka muraayada xoodan ee xaga sare ku qoran.

### i. Humaaga kasamaysma muraayada xoodan

Dabicinga ama meesha humaagu ku samays mayo muraayada xoodan ka fogee meesha walaxda hor teeda muraayad xoodan, waxan ka fahmi karnaa, sawirka fallaadhaha jantuska qiyaasta jantuska fallaadha eeg Jaantuska 6.16 Sharaxay faraq humaagu kusamays mayo fogaanta walaxda

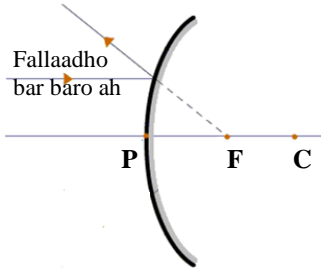
<p>b.</p> 	<p>Walaxdu dhamaad malaha (aadbagu fogtahay)</p>	<p>Humaagu waa</p> <ol style="list-style-type: none"> <li>1. At F</li> <li>2. Run</li> <li>3. Qaliban</li> <li>4. Kayar walaxda</li> </ol>
<p>t</p> <p>walaxd</p>  <p>Humaagu</p>	<p>Walaxda 'C' (<math>S_o = 2F</math>)</p>	<p>Humaagu waa</p> <ol style="list-style-type: none"> <li>1. Run</li> <li>2. Qaliban</li> <li>3. Way is leeg yihiin</li> <li>4. At C</li> </ol>
<p>j</p> <p>walaxdā</p>  <p>Humaagu</p>	<p>Walaxda kada bag sa C (<math>s_o &gt; 2f</math>)</p>	<p>Humaagu waa</p> <ol style="list-style-type: none"> <li>1. Run</li> <li>2. Qaliban</li> <li>3. Walaxda ka yar</li> <li>4. Udhexeya C iyo F</li> </ol>
<p>X</p> 	<p>Walaxdu waxay udhaxay saa fiyoc (<math>2f &gt; s_o &gt; f</math>)</p>	<p>Humaagu waa</p> <ol style="list-style-type: none"> <li>1. Run</li> <li>2. Qaliban</li> <li>3. 3(Jibaar) ayuu kawanyahg walaxda</li> <li>4. Ka danbeeyeel C</li> </ol>
<p>h</p> <p>walaxda</p> 	<p>Walaxda F (<math>s_o = f</math>)</p>	<p>Humaagu waa liqay</p>
<p>d</p> <p>walaxd</p>  <p>Humaaga</p>	<p>Walaxda udhaxaysa F iyo P (<math>f &gt; s_o</math>)</p>	<p>Humaagu</p> <ol style="list-style-type: none"> <li>(1) Been</li> <li>(2) Kawayn yahaywalaxda</li> <li>(3) Taagan</li> <li>(4) Muraayad ga daasheeda</li> </ol>

Jaantuska 6.6 Humaaga kasamaysma muraayada xoodan

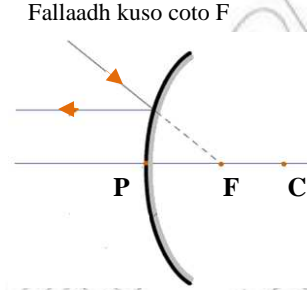
Jaantuska 6.16 waxanu ina tusayaa humaaga meeshisa kala duwan ee boska walaxda muraayada xoodan waxa helaynaan labad Humaag run iyo been humaaga run ti waa ka samaysma kaqiiqdii fallaadhah ilayska ayaa ku dudhacaya shaashada (screen)

**Muraayado xoodan**

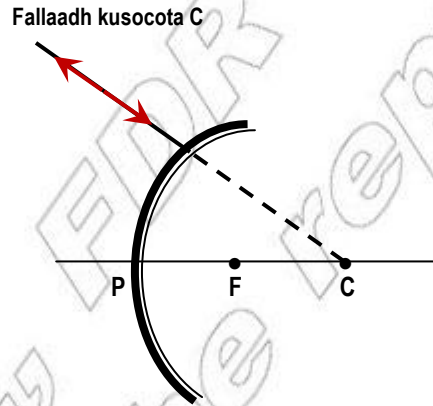
1. Hadii walaxda meelkadanbeysa dherer kulmiska ladhigo, humaagu waa run iyo qaliiban baxada iyo meeshu waxa kusalay san yihiin fogaan tawalaxda ka muraayada.
2. Hadiiwalaxda udhaxayso dherer kulmiska iyo muraayada humaaguwaa Been, taagan, iyo kawayn walax da.

**i) Humaaga kasamaysma muraayada tuurta leh**

b. Fallaadh kas to bar barola'ah udubka as aasigu u celinayaa waxay kamuuqan ka "F"



t. fallaadhkas to tagaysa kulma s aasiga waa lasocelin iyado bar baro ah udubka

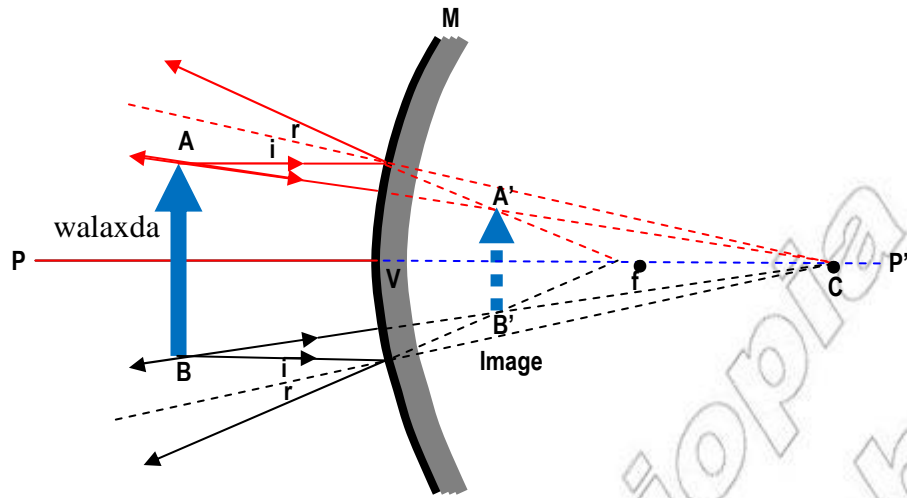


j. Fallaadh kasta oo tagaysa C waa celiye toos bay unoqon

**Jaantuska 6.17 dhismaha fallaadhaha muraayada xoodan**

Jaantuska 6.17 waxan muujinayaa dhismaha jaantuska ee muraayada tuurta leh. Humaagani waaxa samayn muraayada tuurta leh. Kuma salaysan fogaantau dhexaysa. Walaxda iyo muraayada barta fallaadh noqoku waxay abaari inay kala tagaan, waydinta humaaga, tababarqaadsho, siday dontaa hahate, raacida fallaadha midka mid ah labada fallaadho waxay ina karsiin boodinta ta booska humaaga

muraayada tuurta leh humaageedu waa taagan yahay. Yaraan, Been, ama gadaasha muraayada dhamaan welxaha booskooda. (Jan 6.18)



Jaantuska 6.18 Samaynta fallaadha ha muraayada tuurtaleh.

Muraayada inta badan la dha qaajinayo waa muraayada tuurta Jaantuska . Ilayskoodu waa culusyaday bed balladhan iyo Fogaana ta walxada a ga' gaarkeeda sitoos ah Fallaadha isha darawalka, sidan sababta isaga ama iyadu waxay arkayaan si yar baxada walaxda iyo dhamaan waxa gadaashisa **isaga** iyo **iyada jooga**.

#### Hawlgalka 6.7 Kaladood su'aa lahan sosocda saaxiibadaa

Waa maxay farqiga uhaxeeya humaag beened iyo humaag rumeed? Isticmaal samaysanka humaagtan muraayada, tuurta, xoodan, iyo dhalo fahfaahin kabix?

Walaxda iyo humaagu waxa laga helaa “O” iyo I si joogka ah Jaantuska 6.14 iyo Jaantuska 6.18 waxay inaa tusayaan booska iyo dabecada humagu so saara muraadagd qalocan , marka ilaysku kala baxo, makulmaan, dib bayu noqonayaan humagu waxa u ku samaysmaa meesha Fallaadh xariiq ahaan ay ku kulmaan waxana layi dhaa Humaag Rumeed humaaga ku abuurma kala baxa, fallaadhaha waxa layidhaa humaag beened.

#### Hubin 6.4

1. Qeex muraayad, qalloocda, (fusaale kaxibx), xoodan,
2. Sharax wedhaha
  - Dhidibka aasaasiga ah
  - Kulmiso
  - Dhererkulmis
  - Gacanka xoodan
  - Cidhifka muraayada
3. Qeex dabecada iyo barta humaag ku samays mo muraaya da xoo dan isticmaalkeeda fallaa dhaha marka walax da meelo kala duwaan laga eego



## 6.5 Firdhka (Baaha) Ilayska

### Hawlgalka 6.8 Ufirsu baaha ilays ka ee wal xaha kala duwan

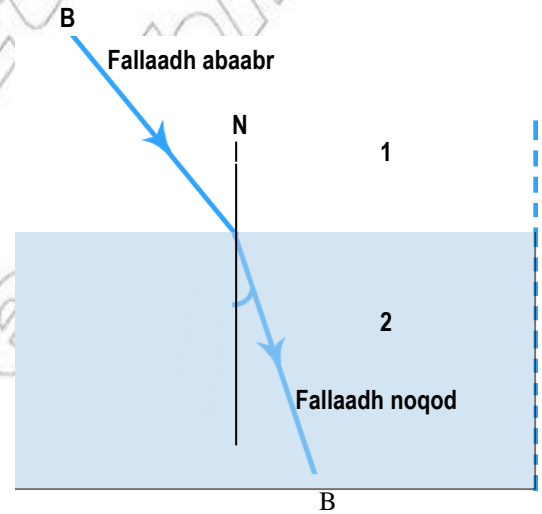
**Qalabka loobaahanyahay:** toosh, kartoon dalool dhuban, biyo, caag, saxan dhalo ah.

**Jidka lamarayo:** Ku qabo hawshan meel madow (mugdiah)

- Diyaari tooshka sida kamuqata jan 16 waxa samaysmi fallaadh
- Fallaadh tooska ogada biyaha ama xagasha dhalada.
- Ufirsu waxa dhacaya fallaadhu markag ku dhacdo xadka u dhexeya hawda, biyaha (dhalada)
- Jihadee buu ilays ku biyaha uga tafi (sadka dhaladee?)
- Fallaadha dibada uso baxaysa dhankadhalada (biyaha) u fiiriso siday u fidayaso

Casharkii hore waxaad ku so baratay in ilaysku u socodaalo xariiq toosan ee walaxda lagusiye lakiin taniwaa Run oo kaliya ilaysku marku socodo walxah dhexdo oda waala cabbiri cufnaanta obtikadooda.

Cufnaanta obtickadu waa astaan ta ag walxahu ugud baan, iyo cabbirka xawaara ha ilaysku ugudo walxaha tusaale: xawaarha ilaysku marku dhexmarayo meelyar  $\frac{3}{4}$  oo xawaare ah ilayska. Hawada cufnaantoda obtikadu waa  $\frac{3}{4}$  gorooka biyaha marka fallaadha ilaysku ka gudbayo meel ilaa walax kale ay ugudbiso ilayska Jihadeedu waa silama filaan ah inu isku badalo. Intayna oo ogada ku kala qaybsamin (labad walxod) tani waxaay dhacdaa ookaliya marka ilaysku kudhago ogada firdhinay sa. (celinagsa). Ilayska ku socodalaya jidka toosan marka badhtanka walax cusub ligane ku noqoto jihadu way isla badashaa fa Ilaadhaha ilayska waxana la yidhaa qaloocsan ka ilayska



**Jaantuska 6.19 Fallaadha qalooc sanku ilays ka**

Sidaas darged qaloocsanka ilayska waxa uu ku dhacaa ilayska socodaalaya hawda ilaa dhalada hawada ilaa dareeraha dhalada ilaa hawada iyo dareeraha ilaa hawad qaloocsanka dhacaya dhanka walxaha kaynaankodu kala duwan yahay sida walxahoodu u kala duwan yihiin.

Qaloocsanka ilaysku waa qaloocinta fallaadhaha ilayska u gudbaya walax ilaa walax kale. Waxay dhici marka ilaysku socodaalayo in yar kala duwanaashaha kaynaanka ee walxaha kala duwan. Fallaadha soogalaysa waxa layidhaa fallaadh abaar. Qaloocsan ka kadib walaxda cusub waxay kee ni qaloocsan

**Laynkuna waxa uligane kuno qon sohdinta labada walxod barkaliga halka fallaadha abaarku ukagalayo waxa layidhaa ligane.**

Dhacdada qaloocsanka fah'faahinteedu barkad lagudabaasho oo biyo ah sijoogta ah uga muqdo gunteed taasa ah waxa kalo lagu fahfaahin karaa qalin Ama shay qaloocsan marka aad muqurtid biyahadhalada dhexdisa ama dareere kalaba.

### Qeexida wedhaha

Ufirso fallaadhaha ilayska ka imanaya walxaha 1 ilaa 2 isticmaal jan 6.19 waxan isticmaalaynaa kuwan sosocda.

1. **Fallaadh abaar:-** waa jidka dheeree ilaysiu ku sosocodo walaxda koowaad
2. **Qaloocsanka fallaadha:-** waa Jidka dheer ee ilaysku ku socodo walaxda labaad.
3. **Xagal abaar:-** waa xagasha udhaxaysa fallaadh abaarka iyo liganaaha.
4. **Xagal noqodka:-** waa xagasha u dhaxagsa noqodka iyo liganaaha oogadiisa.

Eeg Jan 6.19 waxa uu ku tusayaa fallaadh qalloocsanka dhanka liganaaha. Tani waxay dhacdaa marka falladhu walaxda cufan ku dhacdo. Haddii fallaadhu ka bilaabnto (kasocoto) walaxda 2, wado is ku mid ah bay marayaan. Taasi waa OB fallaadh abaar OT Fallaadh noqod. Sababtan waa walaxda cufnteedu yar ta hay qalocsankeedu waxa uuka fogaada liganaaha si kale hadaan u dhigno Fallaadha ku socodaalaysa meesha cufan walaxda qalocsanka way ka fogaan meesha ay ka gudbayso ogada kala baxa walxaha waxaan kusoo koobaynaa

#### Xeerka qalloocsanka

Xeerka qaloocsanka waxaa loo qeexaa sidan sosocto a:-

- Fallaadh abaarka, liganaaha, barta abaarka fallaadh qalocsanka, waxay dhacaan salax iskumid ah
- Qalocsanka ilayska dhanka liganaaha waa dhexyaal cufan ama qalocsanka katagaya liganaaha dhexyaalka fu'dud

#### Hubinta 6.5

1. Waa maxay qaloocsan ka ilaysku?
2. Sawir ama qeexi fallaadh jantuska caddeena sida ilaysku u socodo dhexyaalka uguna gudbo ka kale.
3. Qeex xeerkaa wakhti ugu yar ee feermat (fermat's)

### 6.6 Bikaacooyin

#### Hawlgalka 6.8 Hawlshaqsi

- i) Waa maxay Bikaaco?
- ii) Qeex waa maxay Bikaacooyinka fallaadhaha bar barada leh
- iii) Tax faa iidooyinka bikaacada
- iv) Waa maxag daloolka. Kamarado biindaloobka ay utaagan tahay

Bikaacadu waa Arag - gudbiye dhexyaalka, inta badan dhalo, isku haysta laba xoodane oogada ama halshaxan hal ooga xoodan

Erayga “Bikaaco” “lentil” iyo magacu waxuu ahaa kii ugu horeeyey ee la siyo bikaacada tuurta leh sabab ta way isuegyihiin xaga qaab midhaha lentil (midhaha miisirka) Bikaacooyinka waxa lo isticmaalaa Qalabyo (qalabahaan) waxa lagu isticmaalaa Gudaha kaameerada, Muraayada indhaha, borjaktor (Projector). Way nayso, dirada iyo kuwo kale (sharax ka laduwanaashaha isticmaalkoda bikaacooyinka la inagu tusay jantuska (6.20)



b. Kaamerad



t. Habeen arg to (Habeenkii baa waxalgu arka)



J Muraayad indhood



x. Sabuurada ilayska bixisa (ilays gudbiye)



Kh. dirada



d waynayso

Jaantuska 6.20 Kala duwa naashaha

Isticmaalka bikaacooyinka.

Bikaacooyinku waxay soo saaraan Humaagrumed ama humaagbeen aad

### Noocyada bikaacooyinka

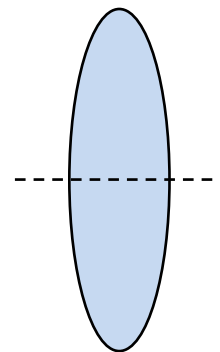
Waxa jira laba nooco oo bikaacooyin ah waxayna kala yihiin

1. Bikaaco tuur leh
2. Bikaaco xoodan

#### 1. Bikaaco tuur leh

Bikaacooyinkani way dhumuc yar yihiin xaga dhexda walibana xaga geeska. Wayka yar yihiin bikaacooyinka tuurta lehiwaxa layidhaa bikaacooyinka ururiso

Bikaaco tuurleh waxay samaysaa fallaadho bar – baro ah ilayskilowgii ka yimid isha ilayska way kulminayaan waxana la yidhaa kulmiso (focus): tani waxay samaynaysaa laba humaag mid run ah iyo mid been ah Humaaga beenta ahiwaa la weeyneyn laakiin humaaga runta waana laweeyneyn karaa ama waa la yarayn araa waxa uu ku salaysan yahay fogaanta walaxda ayujirto bikaacada



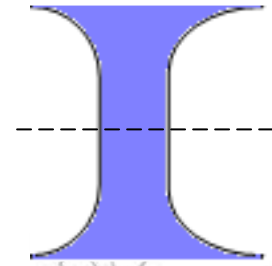
Jaantuska 6.21 Bikaacotuutleh waa kulmiso

## 2. Bikaacooyin xoodan

Bikaacoynkani wey dhudhuban yihiin dhanka dhexda, cidhifkana way ka dhumusan yihiin bikaacada xoodan waxa layidhaa firdhiso.

Bikaaco kulmiso waxay samaysaa fallaadhoo bar – baro la ah ilayska dhexamaraya way firdhin ama way baahin

Markaad ka dhex eegtid bikaaco tuurleh, marwalba waxaad arki yaraan ama humaag rogan.



Jaantuska 6.22 n Bikaaco fiirdhiso

### Erayadan u isticmaalayo bikaacada.

1. Xeerka udubka bikaacadu waa xariiq qiyaased oogada badhtanka qallooca.
2. Bikaaco kasta bartuu dhexmareyoo fallaadhaha ilaysku bilaw la'aan waxa lamarin bikaacada bartani waa badhtan ka obtikada ee bikaacada
3. **Xeerka kulmisada (F):-** bikaaco kulmisadu waa barta dhamaan fallaadhaha bar – barada ahi xeerka udubka Run ahaanti kulmiso kadib qalocsanka bikaacad.
4. **Xeerka kulmisada (F)** bikaaco firdhisadu waa barta fallaadhaha bar – bardu ka imanayaa xeerka udubka ee kamauqda firdhisada kadib qalocsanka dhermaraya bikaacada.
5. **Dhererkulmiska (f)** waa fogaanta udhaxaysa badhtanka obtikada (O) iyo xeerka kulmisada (F) bikaacada.

### Jaantuska fallaadha lo isticmaalayo in lagu kala saaro dabecada humaaga iyo meesha dhacayo humaagu bikaacada dhexde da.

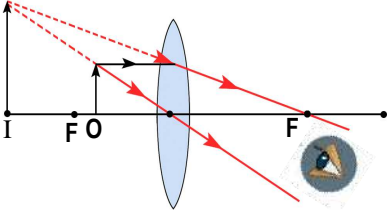
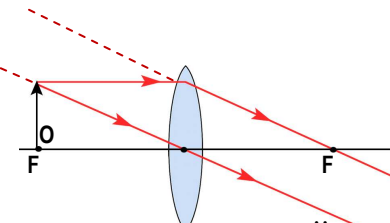
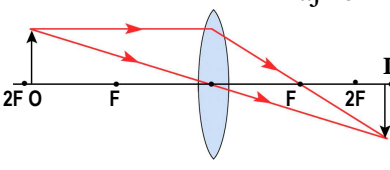
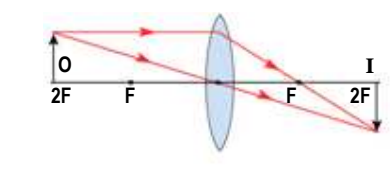
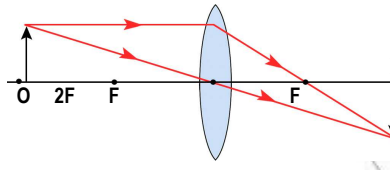
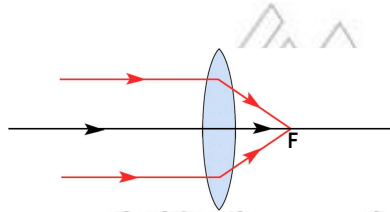
Dhisida fallaadha jaantuska muraayada qalocsan waa in laga helo meel ladhigo iyo dabecada humaaga ukaga samays mayo **bikaacada fallaadhahani waxay** kala **yihiin**

- b. Fallaadhaha bar – barada xeerka udub dhexaadka, ka dhexgudbaya kulmisada qaloocsanka badiba.
- t. Fallaadhaha ka dhex gudbaya badhtanka obtikada, marayana bikaacada. Qalloocsanka samimaayaan taasi, jidadodu is badalimayso

### Samaysanka humaagu ku samaysmo bikaacada xoodan

Humaaga ay sameynagso walaxda bikaacad waxa u dhacaa barta halka ugu yaraan laba fallaadho oo qaloocsan insku golayn marka la dhisayo fallaadha jantuska waxaaanu taaganahay walaxda iyo humaaga liganaha xariiqda ee fallaadha madaxa ku leh.

Markaan dhisano jaantus fallaadheedka, waxaan ku muujin karnaa walaxda Ama humaaga xariiq qotonta oo madaxana fallaad ku leh.

	<p>Walaxda udhexaysa bikaakada iyo F</p>	<p>Humaagu waa</p> <ol style="list-style-type: none"> <li>1. Walaxdu ka dabeyaa</li> <li>2. Been</li> <li>3. Taagan</li> <li>4. Kawayn walxda</li> <li>5.</li> </ol>
 <p>majiro</p>	<p>Walaxda bay saran tah F</p>	<p>Humaag majiro</p>
	<p>Walaxtaala F iyo 2 F dhexdood</p>	<p>Humaagu wuxuu dhacaa</p> <ol style="list-style-type: none"> <li>1. 2F dabadeed</li> <li>2. Run</li> <li>3. Rogan</li> <li>4. Kaweyn walxda</li> </ol>
	<p>Waalaxda udhexaysa F iyo 2F</p>	<p>Humaagu waa</p> <ol style="list-style-type: none"> <li>1. Ga daasha 2F</li> <li>2. Run</li> <li>3. Qaliban</li> <li>4. kawaynwalxda</li> </ol>
	<p>Walaxda kadabaysa 2F</p>	<p>Humaaguwaa</p> <ol style="list-style-type: none"> <li>1. udhexeya F iyo 2F</li> <li>2. Run</li> <li>3. Qaliban</li> <li>4. Kayar walxda</li> </ol>
	<p>Walaxda dhamaad malaha (aadufog)</p>	<p>Humaagu waa</p> <ol style="list-style-type: none"> <li>1. Saaran F</li> <li>2. Run</li> <li>3. Qaliban</li> <li>4. Kayarwalxda</li> </ol>

Jaantuska 6.23 Samays ka humaagu ku samays mo bikaada cada xoodan.

### Hawigalka 6.10

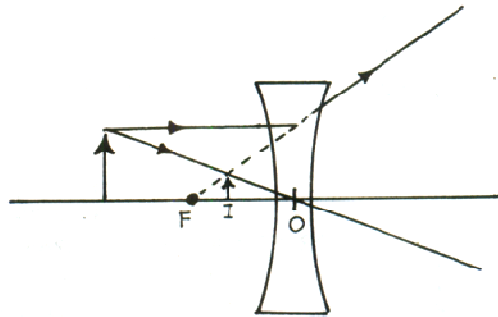
Sidee buu uqabanayaa humaagu bikaacada

- b) Kadood walaxda gal daasha iyo bart F?
- t) Udhexeeya F iyo bikaacada

Sida muraayada qaloocda, weynu kala soocaynaa humaaga runta iyo humaaga beenta waxan ku celinay naa marlabaad humaag runti waa midka qabta ama ku turashaashada (projected) xaqiiqdi fallaadhaha ilaysku way ka gudbayaa. Humaaga beentu waa mid u dhexmarayo fallaadhaha ilaysku si ay u sameeyaan oo kaliya muqashada gudubka oo kaliya, xaqiiqdi hawl la'aan la kirimaayo lumaag beened ku lagu kalimaa iyo, sidaas darted haku firdhiyo shashad a

### Humaaga ay samayso bikooco xoodan

Meelkasto ladhigo walaxda, humaaga waysamayn bikaacada xoodani mar walbana waa been, taagan yahay, yar-yahay wuxuu waliba dhacaa inta u dhaxaysa xeerka kulmiska "F" iyo badhtanka obtikada bikaacdu (O). Jan 6.24 waxay inatusayaa wadada ay fallaadahu socodaalan iyago barbaro ah xeerka udub dhexeedka iyo halka dhexgudbayo badhtanka obtika da (O) bikaacada. Fallaadhahan waxa lo isticmaala in lagu cadeeyo humaaga meesha uu dhaco.



Jaantuska 6.24 Humaaga kasamaysma bikaaco xoodan.

Noocyada Bikaacada	Meesha ladhigayo walaxda	Meesha iyo dabecada humaagu ku samaysmo	Isticmaal ka
1. Bikaaco Tuurta leh (kulmiso)	• Walaxda ka dabaysa 2F	- Run - Qaliban - yar	- kaamerada Telyskob Brojakter
	Walaxda 2F ah	- Run - qaliban - baxad leeg	Weyneysada maraayad
	Walaxdau dhexaysa 2F iyo F	- Run - Qaliban - waynegso	
2. Bikaaco xoodan fiirdhiso	Meelkasto ka hor imanaysa bikaacad	- Been - Taagan - yar	muraagadin dhocd.

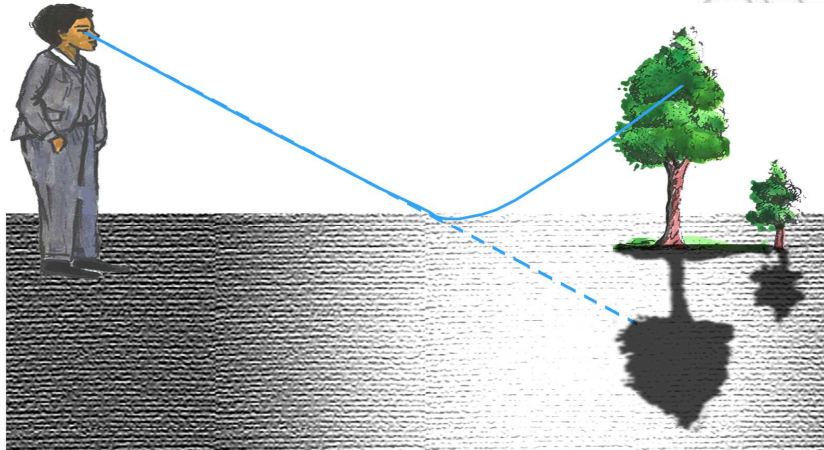
Bikaaco tuur leh waxay leeda hay kulmisrun ah lakiin bikaaca da xoodani waxay lee dahay kulmis beened.

**ABDI**

Dadka, keebaa socodaalay qoraxdu markag kulushahay go'eega humaag beenedka, fogaanta ay walaxdu aan sugnay barkada biyaha Waydi saaxibada ama waalidkaa abdiwaxa ufah may laamiga korkisa ag kulushahay.

Abdiwaxa usameyey noqodka ilayska ee kusocdaalaya udhaxaynta maalinta kulu iyo qabow.

Dhalaan hababistu waxay ka samaysantaa qalloocsanka ilayska ku socda ee udhexeeya hawada kulul iyo ta qabow.



Jaantuska 6.25 Abdi

**Firidhka Ilayska****Hawlgalka 6.11**

*Markaan Fiirino ilays cad waxaa samaysma midabo kala duwan.*

Waa maxay Deegaantu? Sidey usamaysantaa? Imisa midab ayaa laga heli Deegaanta Dhex deeda?

Kooxda midabada ah ee aad ku Aragtid muraayada dusheeda waxaa la dhahaa shucaac. Kala jajabida ilayska caddi u kala jajabo midabada kala duwan waxaa la yidhaa firdhin. Ilayska. Waxaa sababa qalloocsanka ilayska caddi uu u qalloocsamayo xaglo kala duwan ee quruurada firdhisada ah (Birisamka) sida jaantuska 6.26

Ileyska midabka ugu dheereeyaa waa ka aad ugu qalloocsama, halka ilayska ugu socodka yari uu ka yahay ka ugu qalloocsanka yar. Horsanaanta midabada shucaacu waa sidan soo socota. Casaanka ayaa ugu sareeya, waxaa ku xiga midabka liinta, Huruud, doog, buluug, Buluug takhah, Basali baa ugu hooseeya Basaliga ayaa ah ka ugu qalloocsan badan, casaankuna waa ka ugu qalloocsanka yar Hadaba, Ilayska caddi wuxuu ka samaysan yahay todoba midab.



Jaantuska 6.26 Firdhint alayska

Deegaantu waa koox ama shucaac midabo ah waxaa sameeya marka qalloocsanka ilaysku uu dhexmaro dhibcaha biyaha ah ee samada.

### Hubint (xaqiiqinta) 6.6

1. Waa maxay bikaacooyinku?
2. Sharax faraqa u dhexeeya bikaaco tuurleh iyo bikaaco xoodan.
3. Qeex badhtanka muraayada, dhererka kulmiska, barkulmiska, gacanka qalloocsan iyo udub dhexaadka bikaacada.
4. Sharax ama qeex humaaga ay samayso bikaaco xoodan iyo bikaaco tuuro adigoo isticmaalaya jaantusyo
5. Waa maxay muhimada ay u leedahay teknoolojiga bikaacooyinku?
6. Sharax ama qeex firdhka ilayska magacowna midabada shucaaca ilayska?
7. Waa maxay Adigoo bar bar – dhigaya qalloocsanka (mirage) qeexna.



## Soo koobidda Cutubka

Cuttubkan waxaad ku soo baratay in

- Ilaysku yahay hirarka birlab danabow, kaasoo ka soo baxa walax kulul
- Ilaha ilaysku waa cadceeda, guluub shidmaya, shamacyo, iyo toosh
- Ilaysku wuxuu ku safraa xariiqyo toosan walaxda kaliya ee qaada dhexdeeda
- Ilaysku wuu ka wada gudbaa dhammaantii walxaha gudbiyeyaasha ah a kuwa badh gudbiyaha ahna wuu ka badh. Gudbaa Kama gudbo walxaha saabaha ama ma gudbiyaha ah wey soo celiyaan ama wey nuugaan (liqaan).
- Nogodka ilaysku waa soo noqodka ilayska marka uu la kulmo saabe ama ma gudbiye (opaque). Walax ah.
- Xeerka noqodku wuxuu sheegayaa in xagal abaarku ay la mid tahay xagal noqodka.
- Humaaga ay samayso muraayada sallaxa ahi waa dhab, taagan, le'eg walaxda kana dambeeya muraayada.
- Muraayda xoodani waa laba nooc. Muraayad Golxo iyo muraayad tuurleh.
- Muraayada golxo waxay samaysaa humaagyo run ah kalana Rogan. Xajmiga iyo meesha uu dhacaa waxay ku xidhan tahay fogaanta walaxdu ujirto muraayada. Walax taala Barkulmiska iyo muraayada dhexdeeda Humaadgu waa humaag Beenaad, taagan, kana weyn ka walaxda.
- Humaaga ay samayso muraayada Tuur ta lehi had iyo jeer wuu taagan yahay, yar yahay, Beenaad wuxuuna dhacaa muraayada dabadeeda.
- Qalloocsanka ilaysku waa qalloocsanka uu ilaysku qalloocsamo marka uu walax ka gudbayo ee uu u gudbayo gudbiye kale
- Bikaacooyinku waa laba nooc: Bikaaco tuuro iyo tu Golxo Bikaacada Tuuro Fallaadhaha Barbarada ah ayey ku kulmisaa Bar la yidhaahdo Bar kulmis (Ama Godka udub dhexaadka). halka Bikaacada Golxo ay kala fogayso fallaadhaha Barbarada ah
- Kala jajibinta Iftiinka lookala jjabiyoo midabo kala duwan waxaa la dhahaa firdhisn. Midabka cadi wuxuu ka samaysan yahay todoba midab.

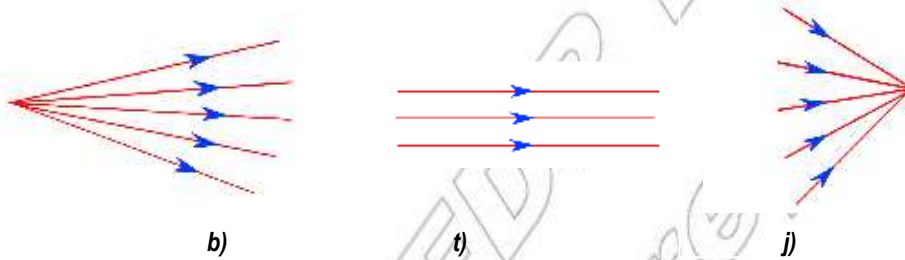
## Nakhtiinka su'aalaha iyo masalooyinka

### 1. Ku Buuxi shaxdan soo socota tusaaleyaal

Walax	Seddex tusaale midkasta
Gudbiye	1 2 3
Badh Gudbiye	1 2 3
Saabe	1 2 3

### 2. Kuqor noocyada fallaadhaha ilayska ee lagu tilmaamay magacdooda meelaha bannaan ee lagu sii yey. Jaantuska 6.27

- b) \_\_\_\_\_  
 t) \_\_\_\_\_  
 j) \_\_\_\_\_

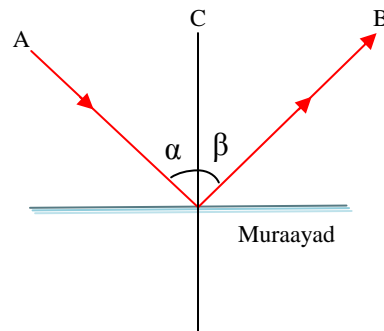


Jaantuska 6.27 Noocyada fallaadhaha ilayska

### 3. Ku sharax tusaale Gacan ka qabad ah sida fallaadha ilaysku u safaan

### 4. Qeybaha ilays noqodka ee ka yimaada muraayadu waa la calaamadeeyey maxay u taagay yihiin xarfahani

- A. \_\_\_\_\_  
 B. \_\_\_\_\_  
 C \_\_\_\_\_  
 $\alpha$  \_\_\_\_\_  
 $\beta$  \_\_\_\_\_



Jaantuska 6.28 Noqodka Fallaadha ilayska

### 5. Qeex

- b) Ilays Noqodka  
 t) Qalloocsanka Ilayska  
 j) Firdhisanka Ilayska

6. Sharax waxa muraayda golxo iyo muraayada Tuuro ay ku sameeyaan fallaadha Barbarada ah eeku socda wajiyadooda.
7. Dhis jaantuska fallaadhaha si aad u heshid humaaga shamac shidmaya oo yaala muraayada sallaxa horteeda.
8. Qeex samayska humaaga ay samayaan bikaacooyinka Tuuro iyo kuwa Golxo. Buuxi shaxanka hoos lagugu siiyey.

Noocyada Bikaacada	Nooca humaaga
Bikaaco Tuuro	
Bikaaco golxo	

9. Waa maxay faraqa u dhexeeya Humaagyada Beenaadka iyo ka Runta ah?
10. Sawir Fallaadhaha Noqodka iyo fallaadh Abaarada
  - b) Muraayada Golxo
  - t) Bikaacada tuuro

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