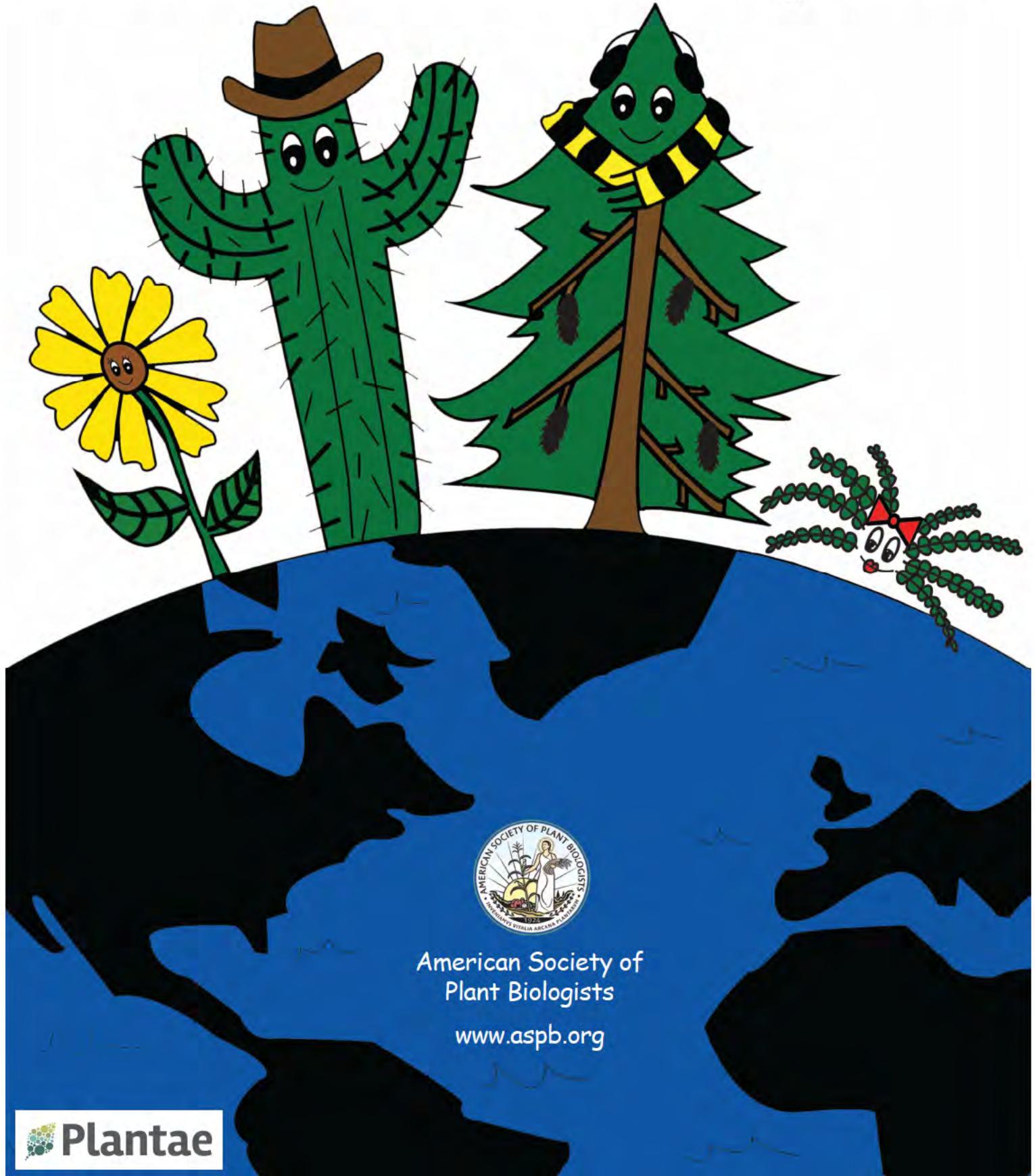


Umweo Wandinge ci



American Society of
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www.aspbi.org

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⁴Lusaka, Zambia, ⁵Mission Press Ndola.]

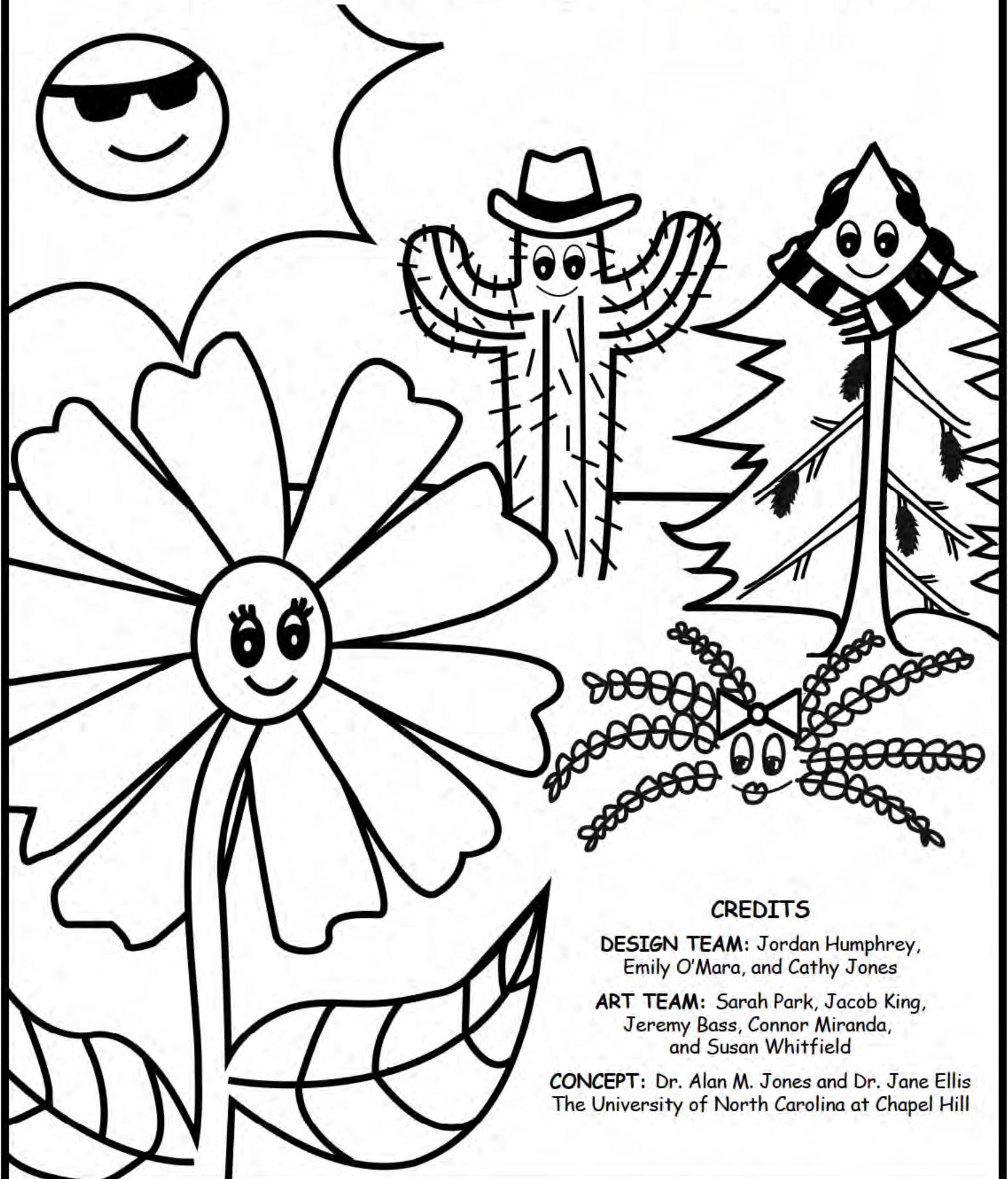
https://en.wikipedia.org/wiki/Bemba_language

<https://web.archive.org/web/20041106020742/http://www.anthropology.emory.edu/FACULTY/ANTDS/Bemba/>

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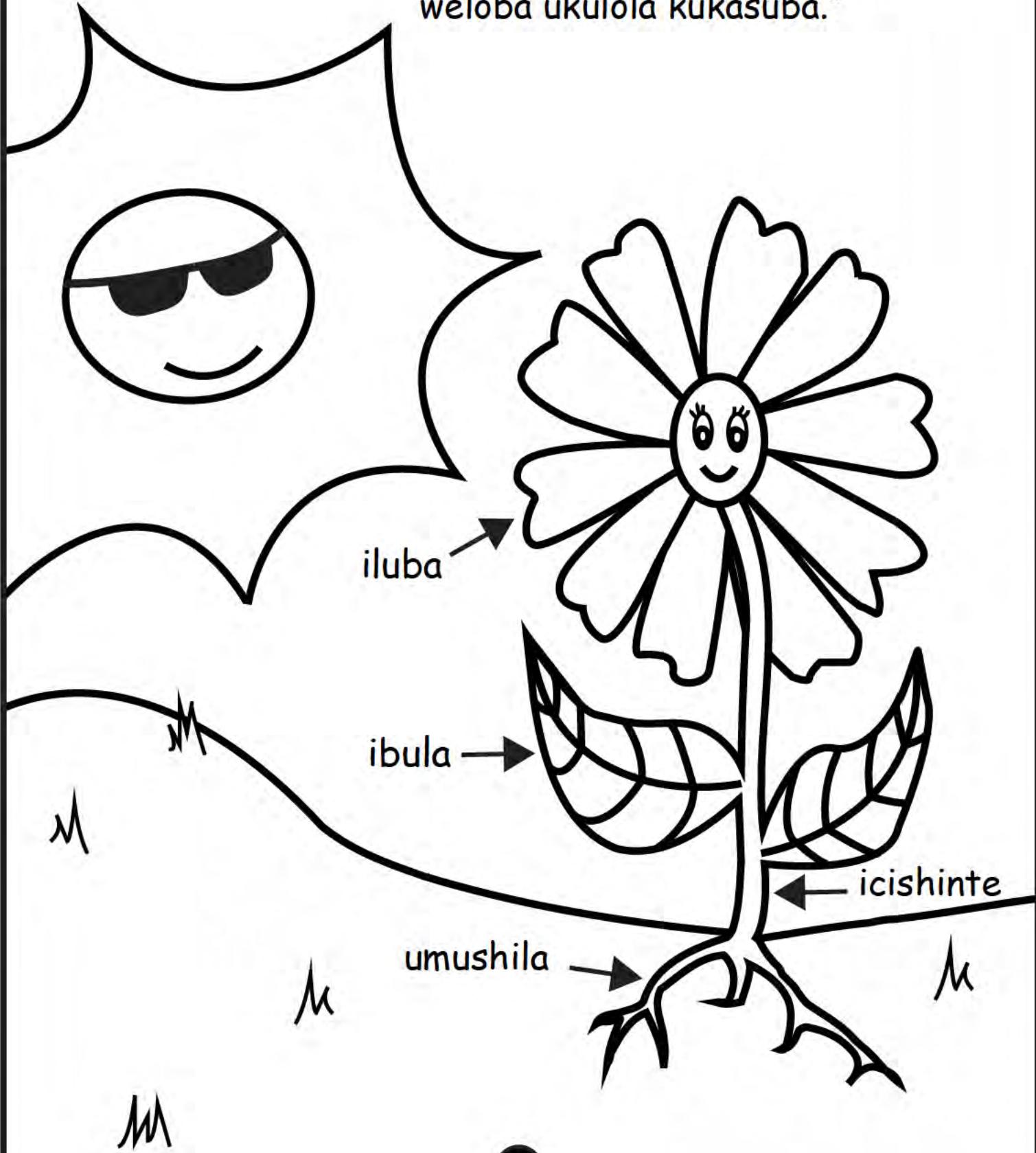
DESIGN TEAM: Jordan Humphrey,
Emily O'Mara, and Cathy Jones

ART TEAM: Sarah Park, Jacob King,
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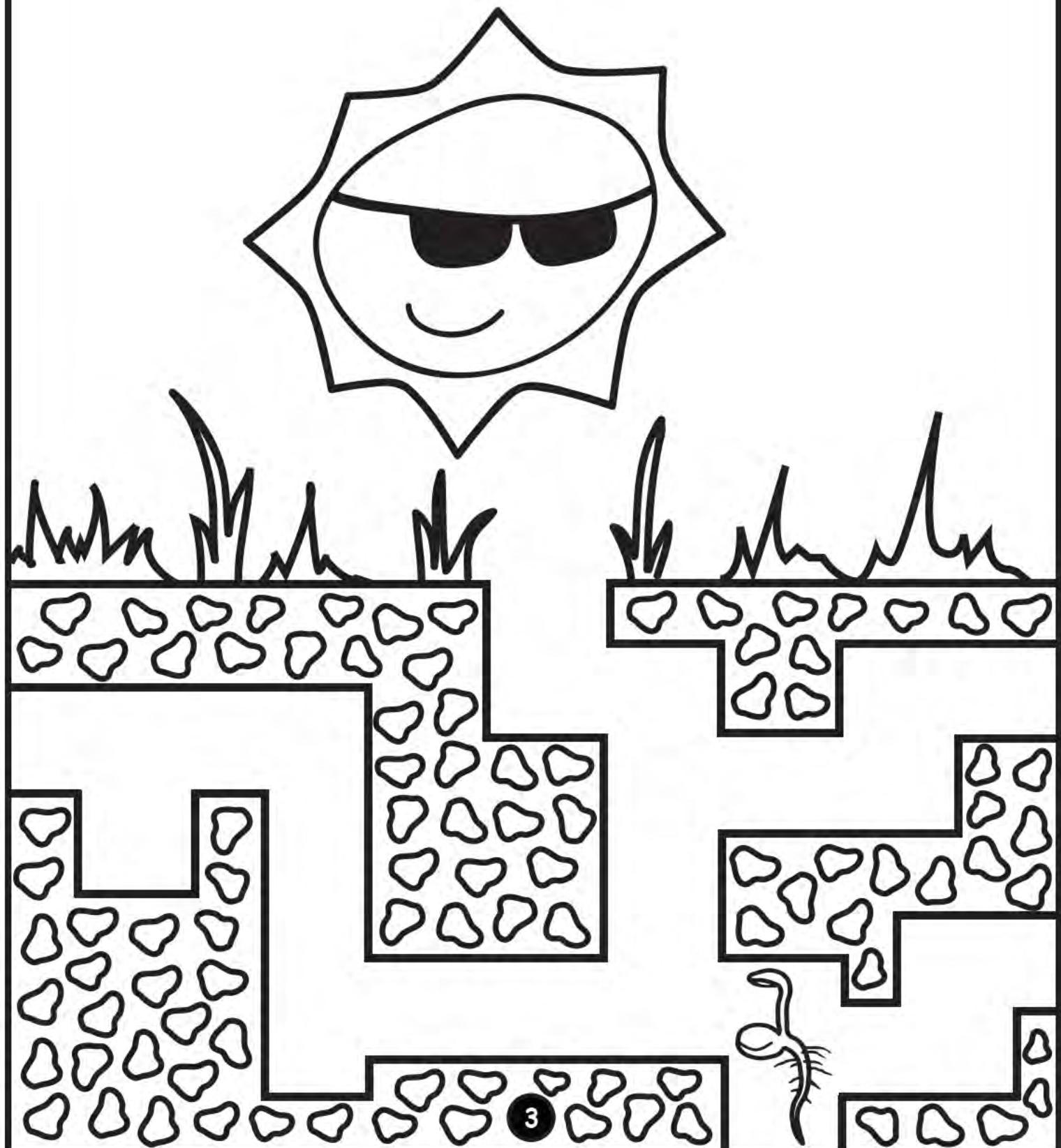
CONCEPT: Dr. Alan M. Jones and Dr. Jane Ellis
The University of North Carolina at Chapel Hill



"Shani! Ninebo Jelita mjjvulolesha kasuba!
Imishila o Shikala PANSI yeloba elo
amabula yandi yasangwa PAMULU
weloba ukulola kukasuba."

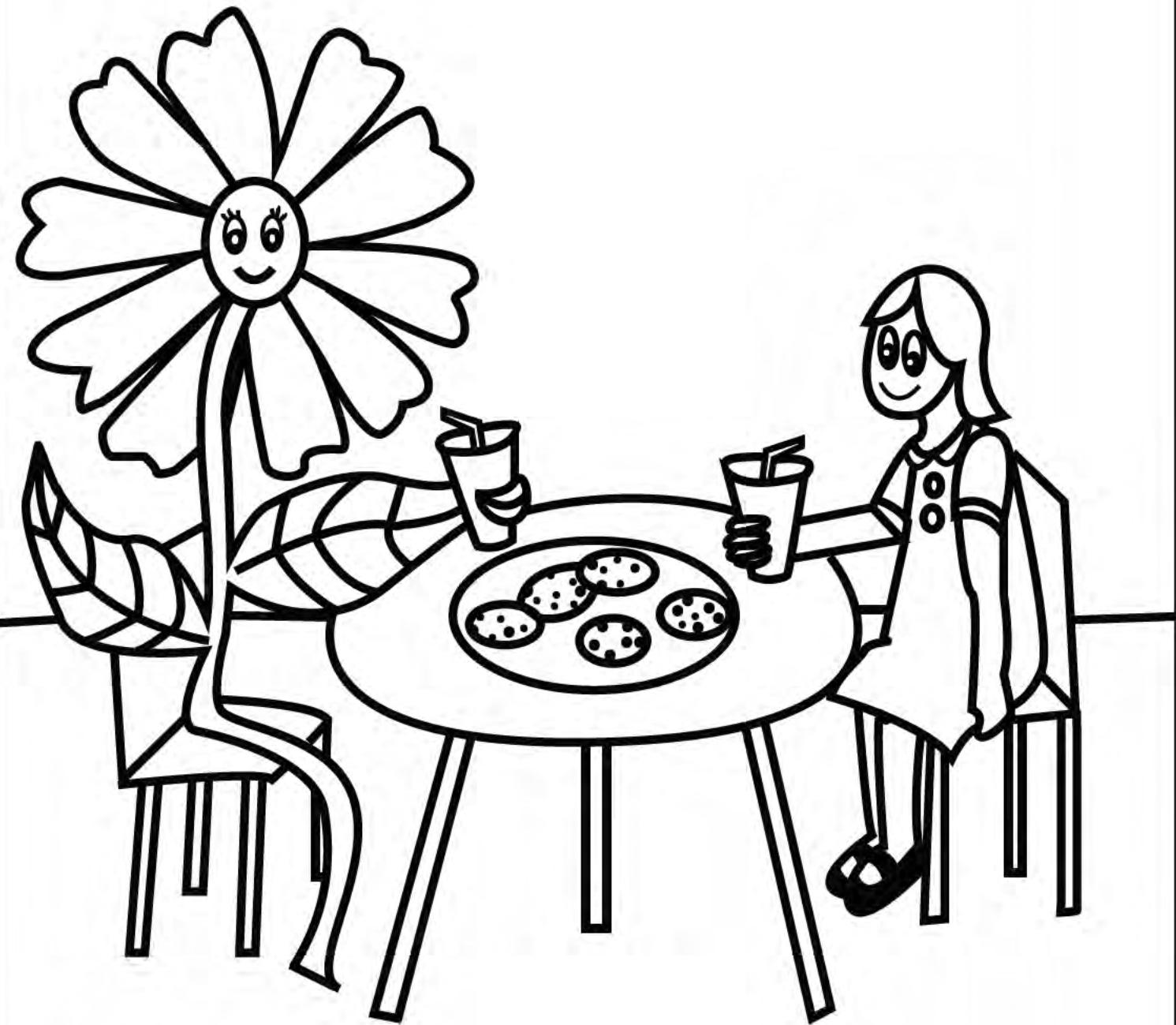


Ifi mewa fikula ukufuma ku nseke kulola kukasuba.
Afwilisha icimenwa-cinono ukusanga akasuba.

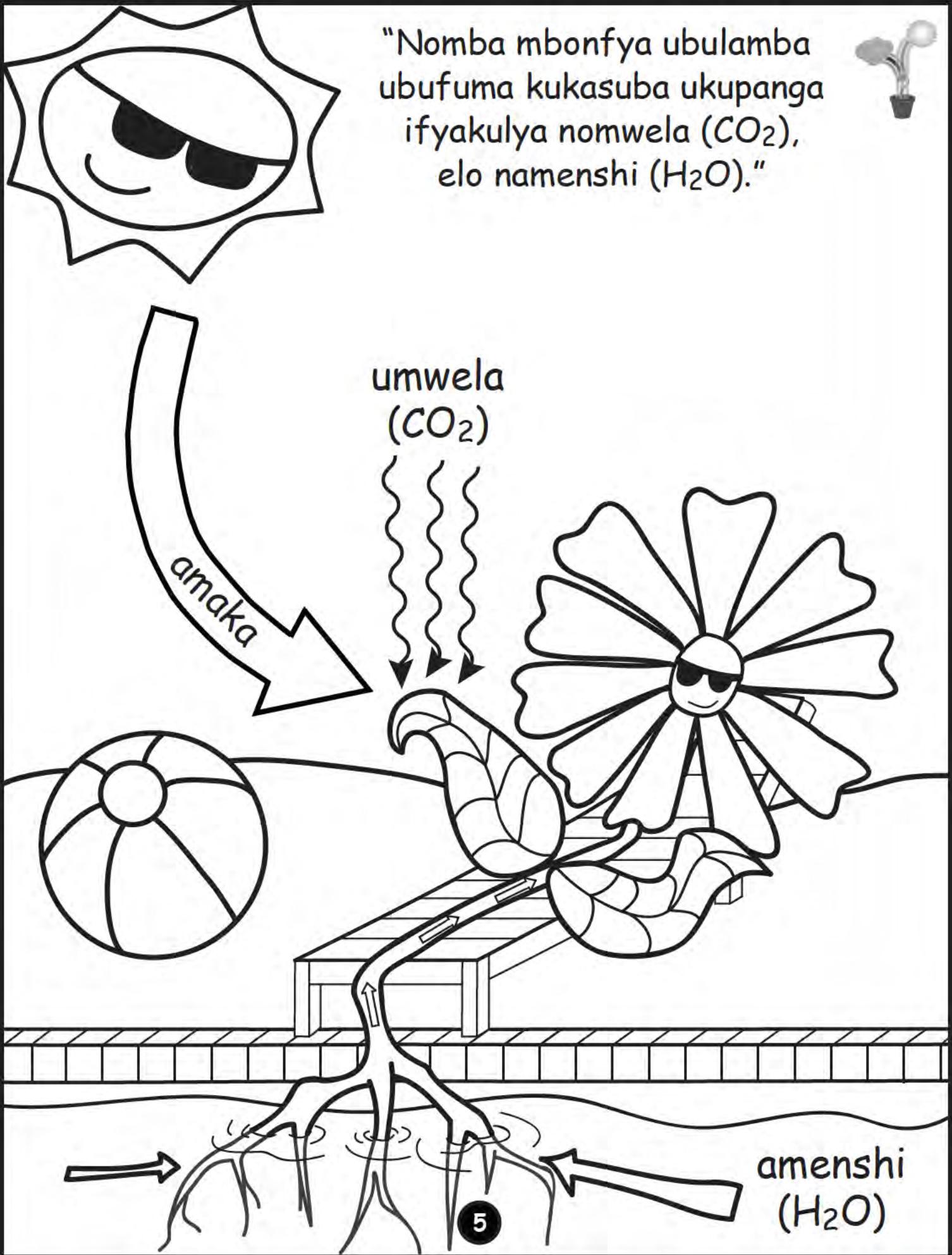




"Ndakabila ifyakulya pakuti nkule nga IWE!"



"Nomba mbonfy a ubulamba
ubufuma kukasuba ukupanga
ifyakulya nomwela (CO_2),
elo namenshi (H_2O)."



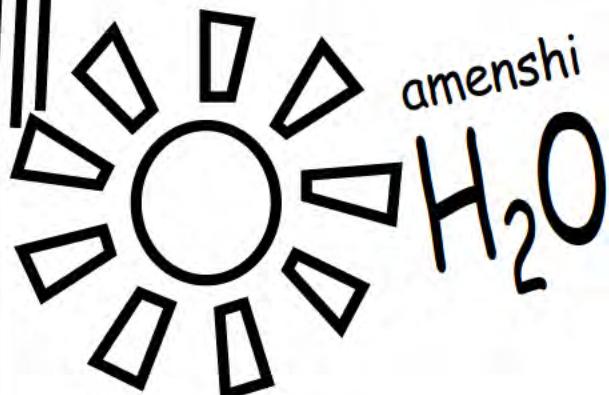
"Iwe naine bonse tukabila ifyakulya,
nomba tupekanya ifyakulya munshila
ishya pusana. Katupalanye imipikile."

Ifyakulya fyakwa Jelita:

Ukupekanya ifyakulya
ukubomya ubulamba
bwa kasuba:

- Akasuba
- Umwela (CO_2)
- Balala (pigment/color)
- Amenshi (H_2O)
- Amabwe

Sankanyeni sana pakuti
mupange umusukale na
umwela usuma (O_2)

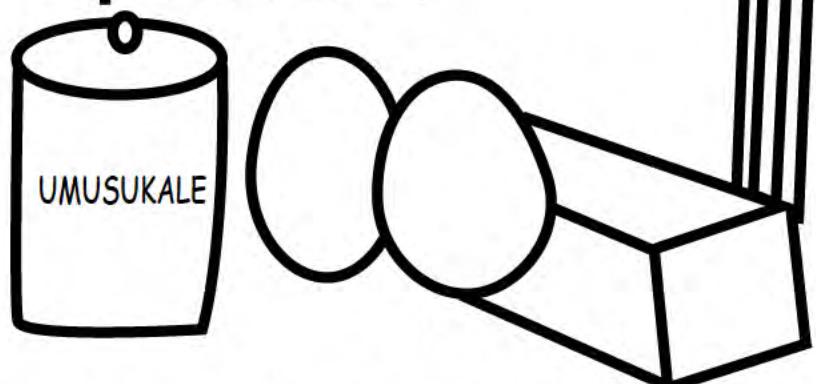


Icakulya cabantu:

Ifisashi

- Inkomeki shi sano na shibili
ishama bula ya musalu
uwaputulwa
- Inkomeki imo na chitika
iya ntwilo
- Tomato imo iyalinga
iyaputulwa
- Inkomeki shibili ishamenshi
- Umucele uwalinga

(Iyi imipikile yafisashi yafumine kuli ba
Prof. Tembo Mwizenge: <http://people.bridgewater.edu/~mtembo/menu/nshima/nshima.shtml>)



"Eyaaa.....fyamoneka ukulowa. Katwipike nomba!
Inshita yonse lomba ubwafwilisho kubakalamba."

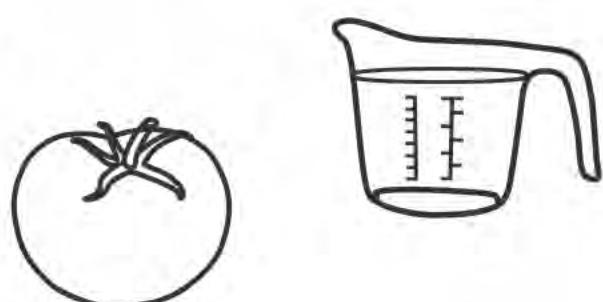


Imipikile ya fisashi

Ipusha ubwafwilisho kubakalamba.

Bika Inkomeki ya menshi yimo mu
mpoto iyalinga.

Bika imponto pa mulilo uwalinga.



Posamo amabula ya musalu na tomato
no kubilausha.

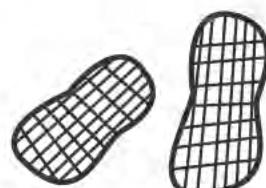
Leka fipile pamo muli ba mineti ukufuma
pali basanu kufika kuli chine konse konse.

Bika inkomeki yimo na citika iyantwilo,
no mucelle uwalinga, kabili itilamo
inkomeki imo iyamenshi mu mpoto.



Elyo ulecita fyonse ifi, ninshi ulekumbawila ukutina
ukulungulila panshi.

Elyo intwilo no musalu fya kundankana,
bweshako umulilo.

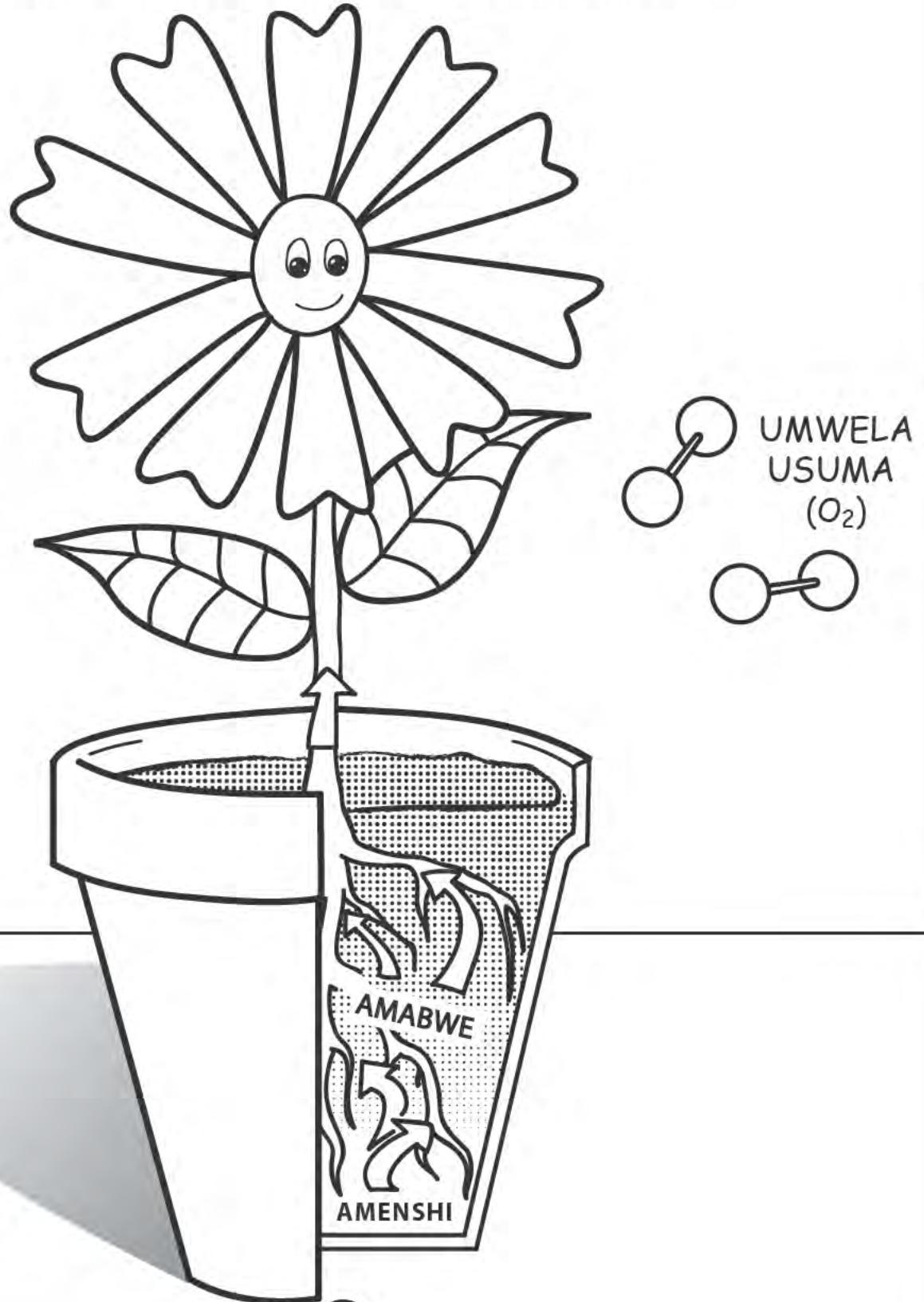


Leka fipyé mukashita kanono elyo ule lengula
ukutina ukushikisa.

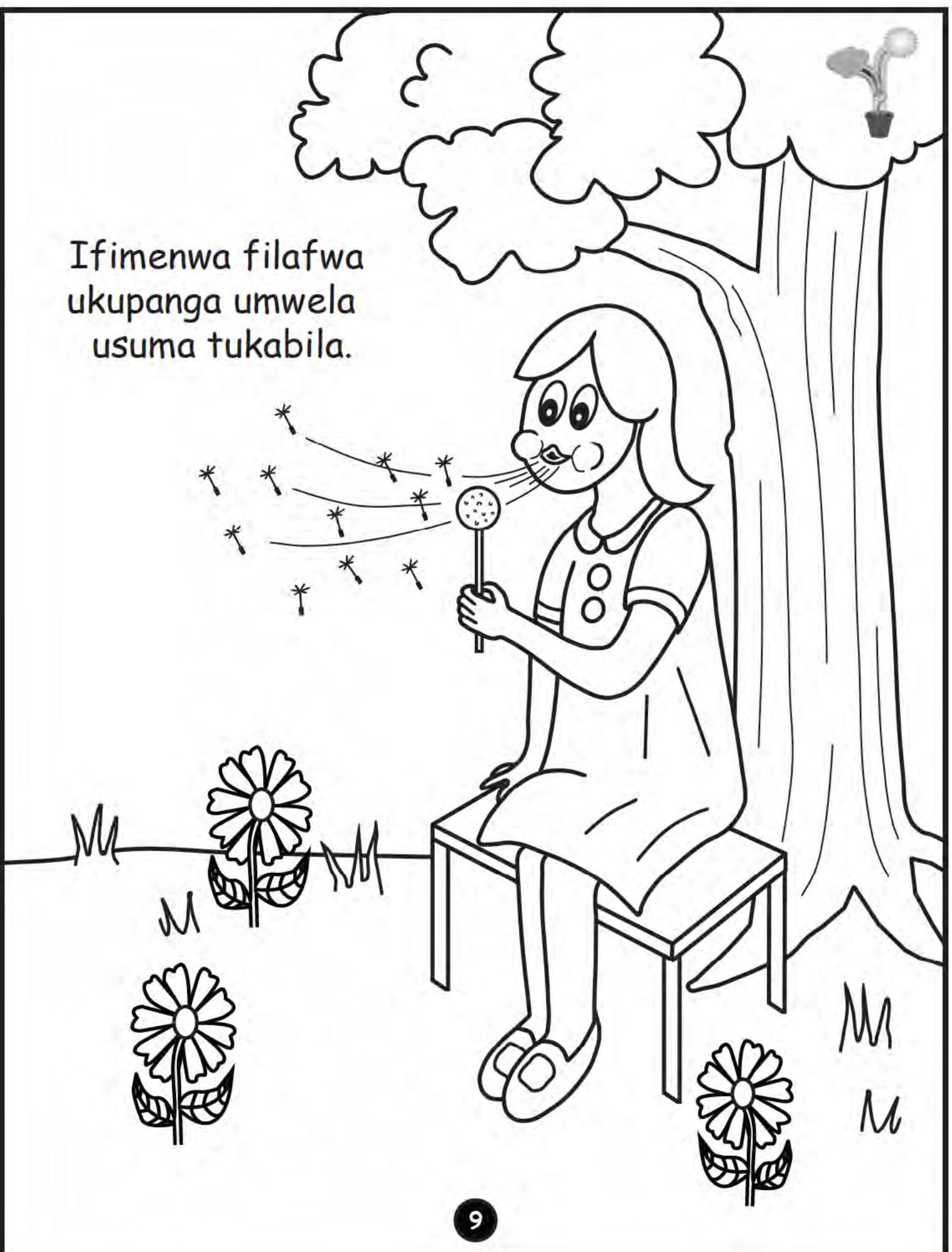
Bushe nawishiba ati fyonse ifisangwa
mu fisashi fifuma ku fimenwa?



"Akasuba kalangafwa ukupanga ifyakulya efyo nkabila.
Nokulundapo ndakabila umwela usuma (O_2),
amenshi (H_2O) namabwe. Ifi filangafwa
ukusangula ifyakulya fyandi mu AMAKA!"

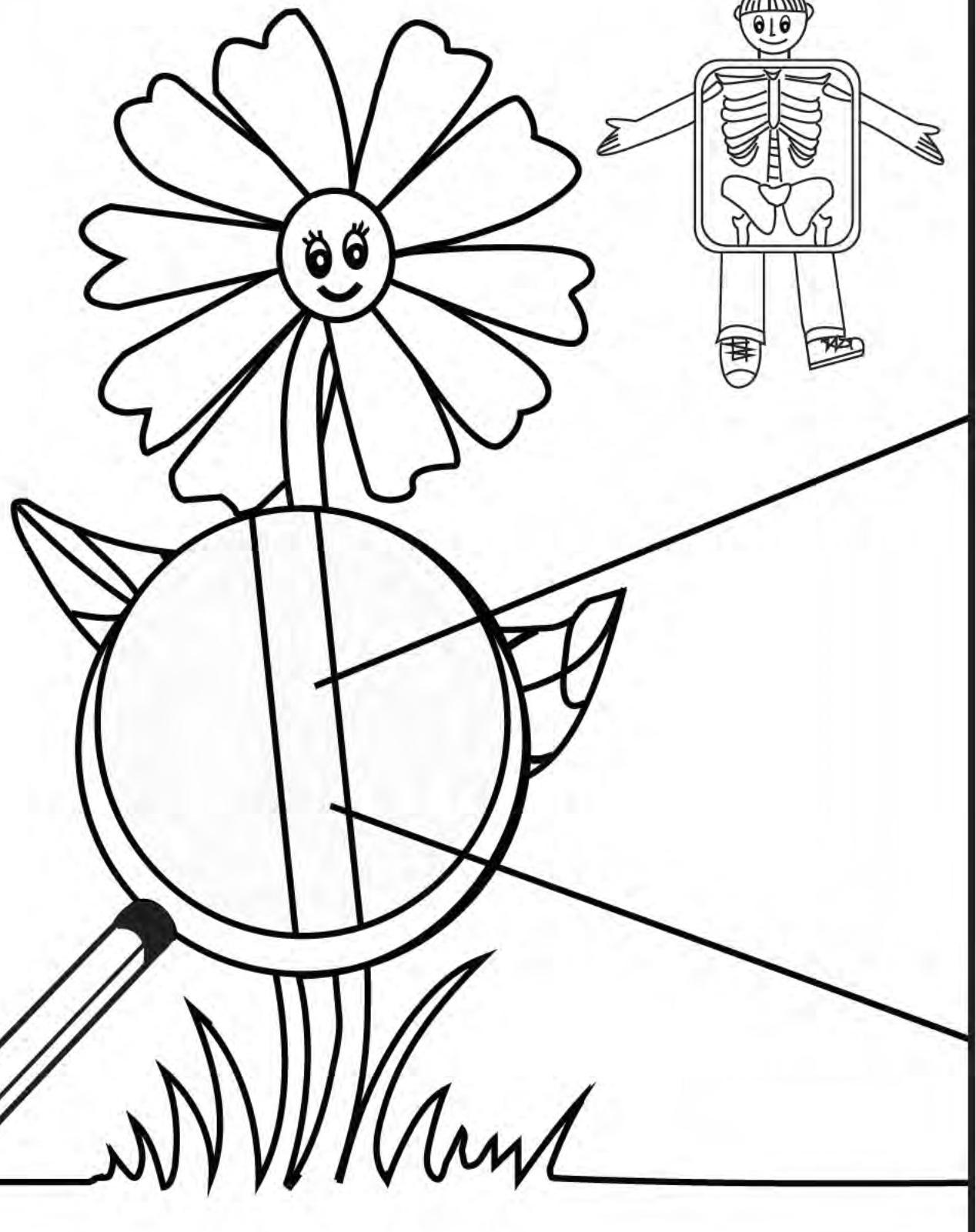


Ifimenwa filafwa
ukupanga umwela
usuma tukabila.





"Walikwata ama fupa. Ine nalikwata utubumba
twa nsandensande. Ifi filatukosha ilyo tulekula."



Penta yonse ama bumba ya nsandensande (W) mwi balala iyakashikila.

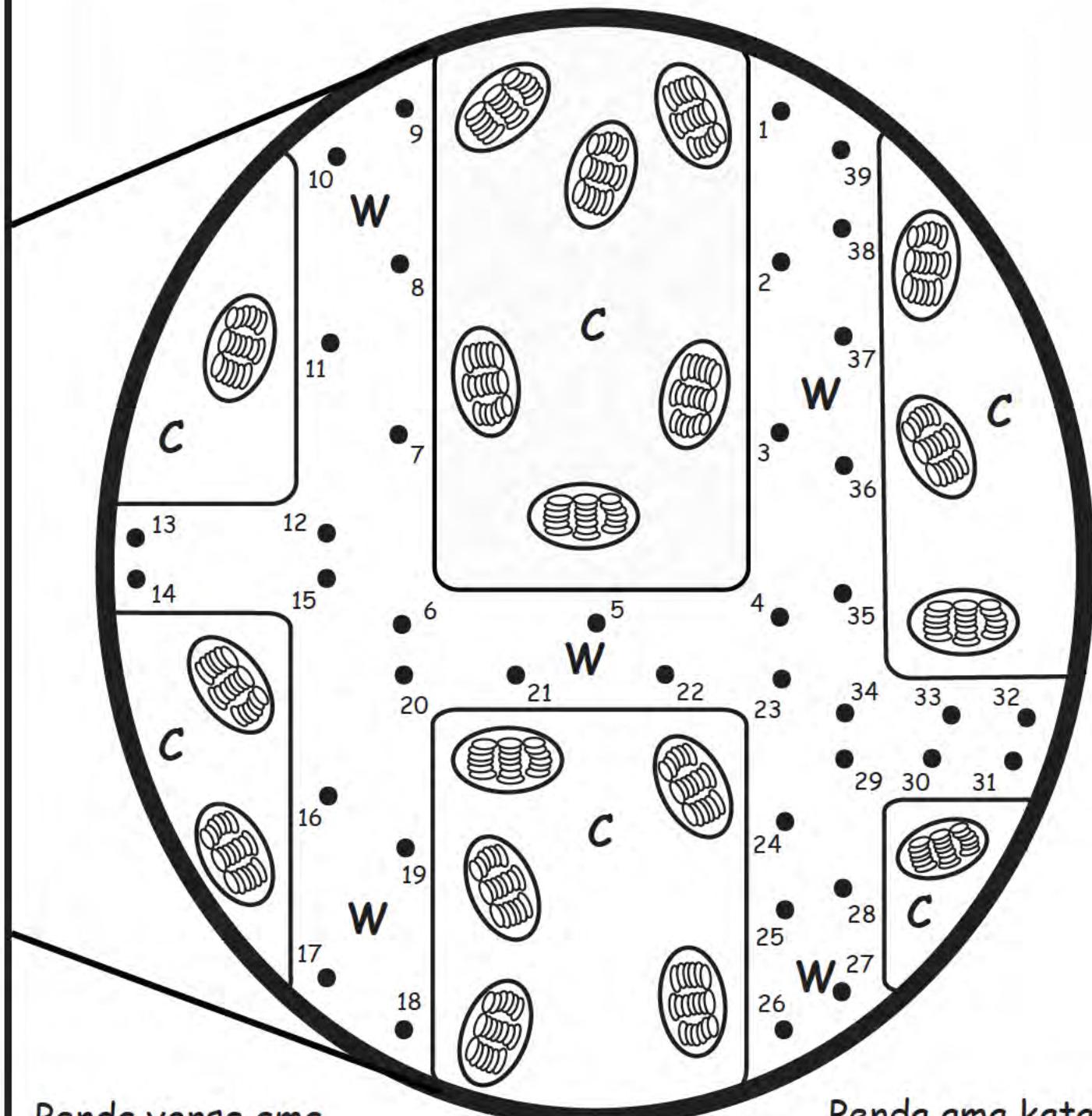
Penta yonse ama nsandensande (C) mwi balala iyacikaasu.

Kumbinkanya ama ntoni yama bumba ya nsandensande yakwa Jelita.



Penta fyonse ifya katapa katapa.  Fitwa ati "chloroplasts."

Efilenga Jelita ukumoneka katapa katapa.

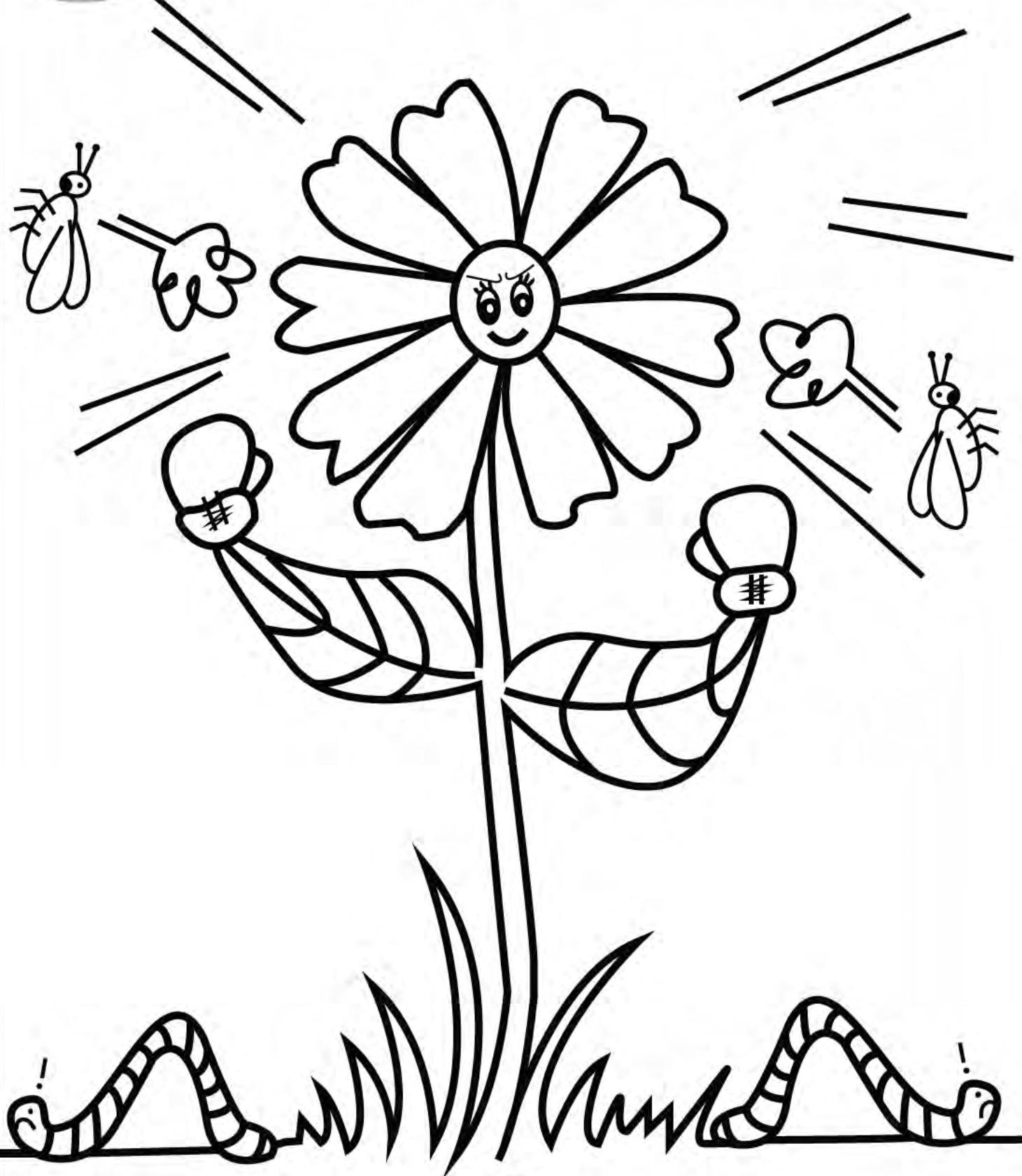


Penda yonse ama
nsandensande _____

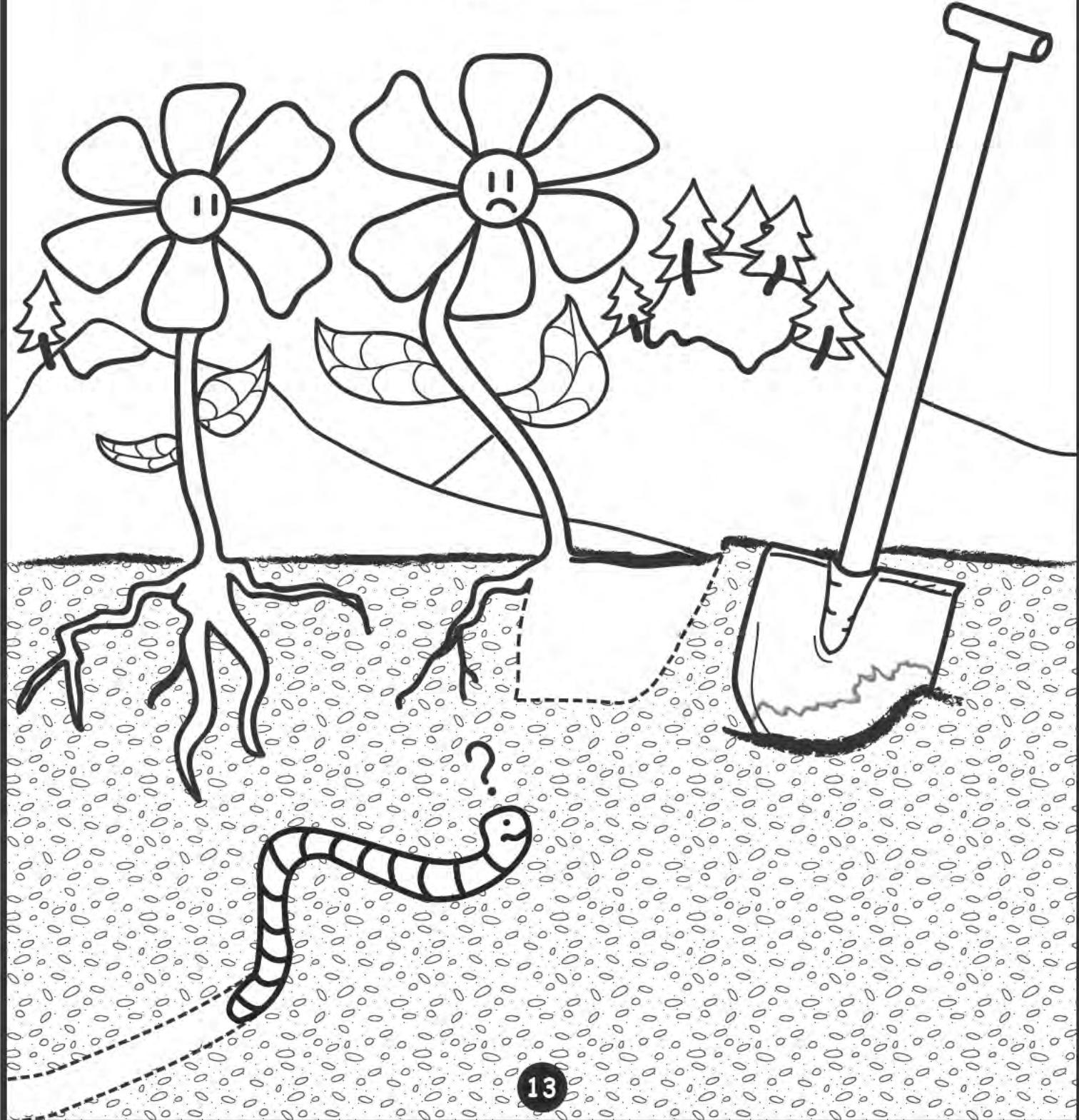
Penda ama katapa
katapa  _____



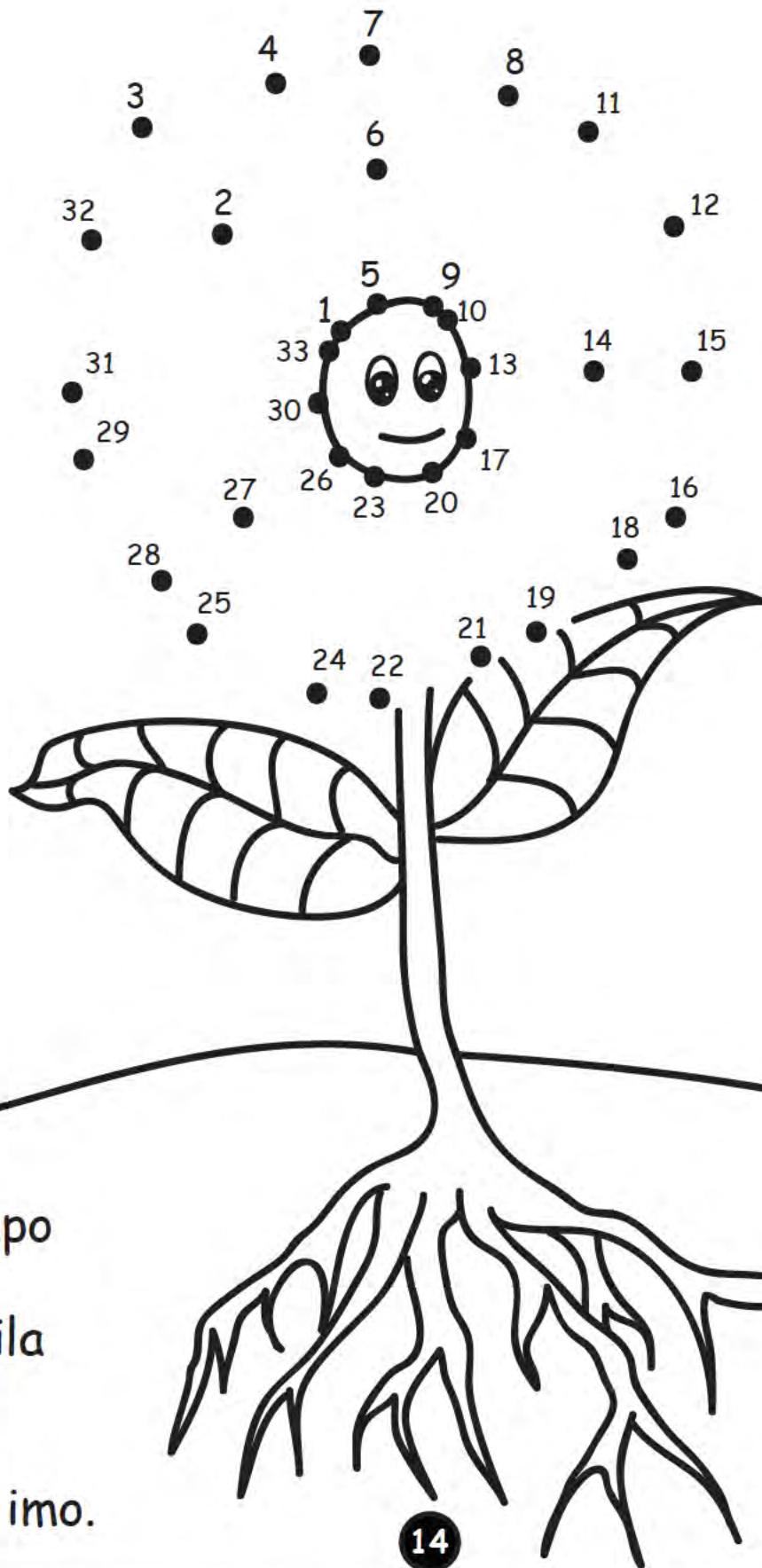
"Ulaleta umuti wa tudoyo ku cibansa.
Ine kuti natamfyा utudoyo ukwabula umuti!"



Ifimenwa filacenekwa kwati efyo ucenekwa iwe.
Ifimenwa filakula ifipande ifipy. Abantu tabachita ifyo.
Lenga imishila ishipya pama luba palya pansi
apaciputulwa na shovolo.
Ama luba yalemoneka aya butuluka.
Kuti mwayapelako ibalala?



"Kumbinkanya yonse ama ntoni ukulanga ewo naba!
Mpenta."



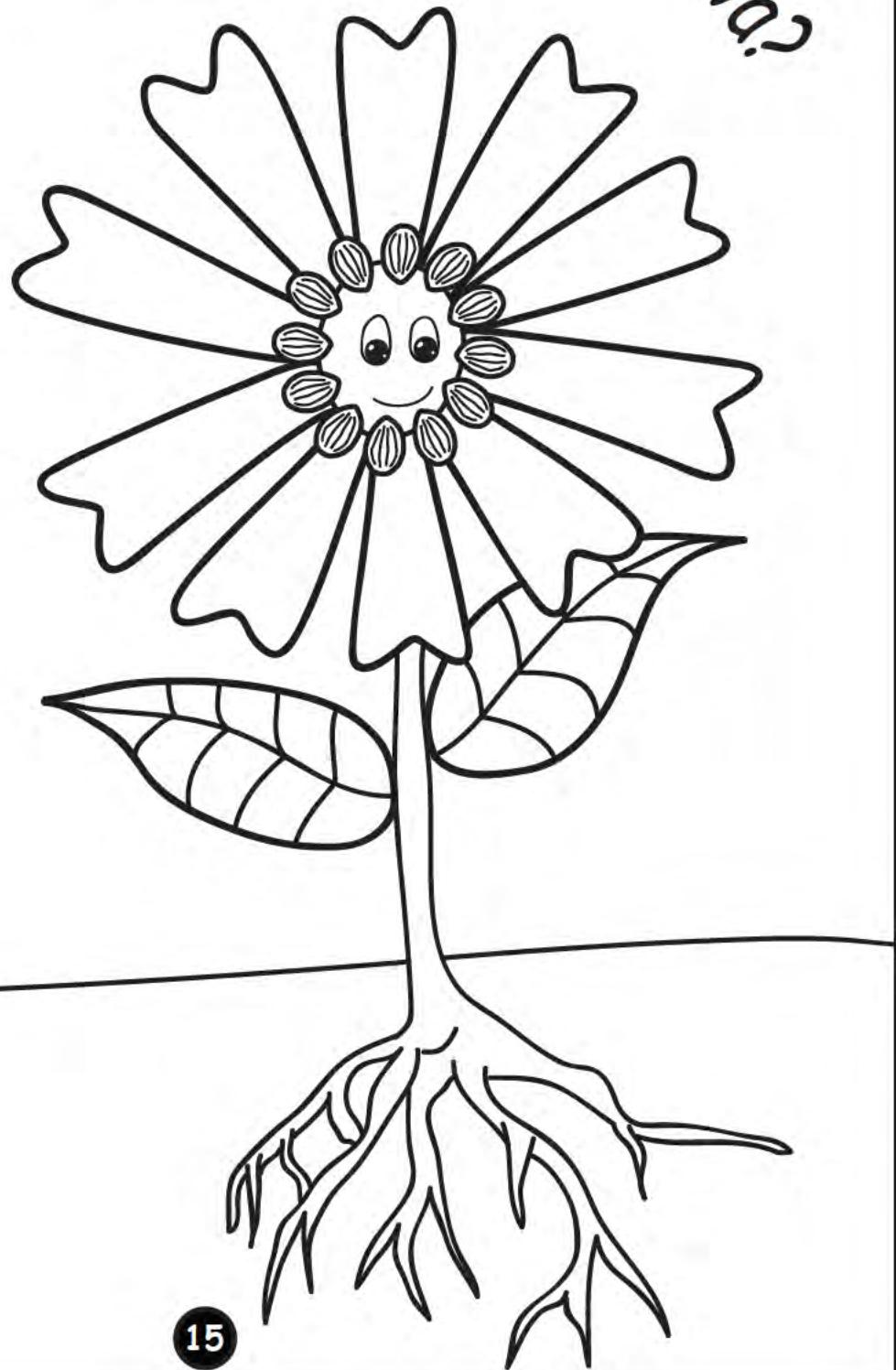
Ulemonapo
impela
shamishila
shinga?

Langapo imo.

Kuti wasanga ifipande fya fimenwa?

Lenga icishilwa kuli ifi
ifipande fyakwa Jelita...

1. Amabula yamaluba
2. Inseke
3. Icishinte
4. Imishila



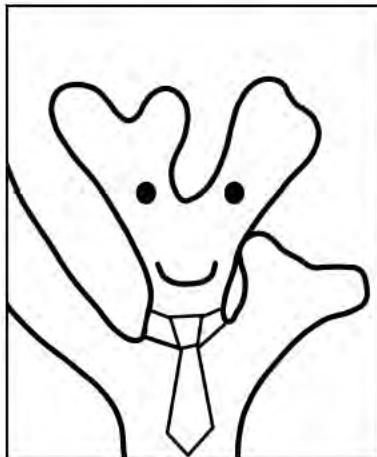


Ifi fikope fyalupwa lwakwa Jelita.

"Nakulile kulupwa ulwakale.

Ulupwa lwandi lwalipinduluka pamyaka ishingi.

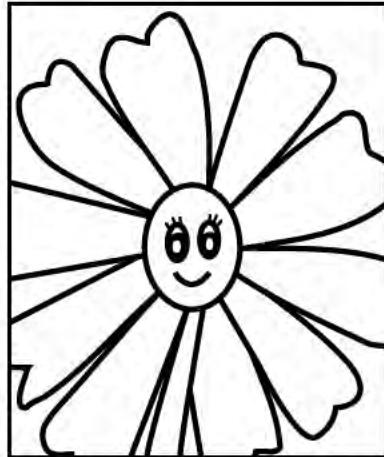
Ifi efyapanga ewo naba lelo."



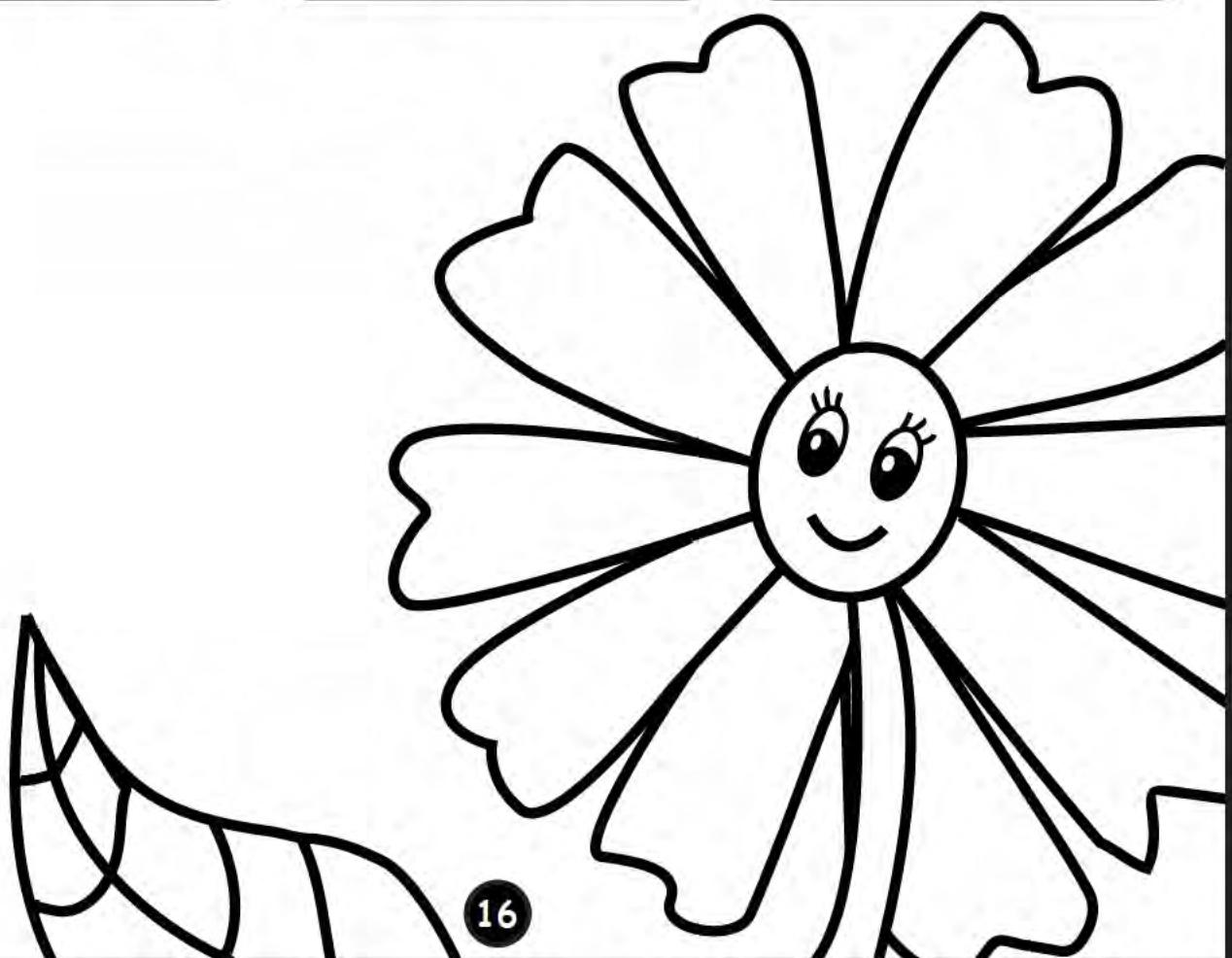
BA SHIKULU BA
ALGAE



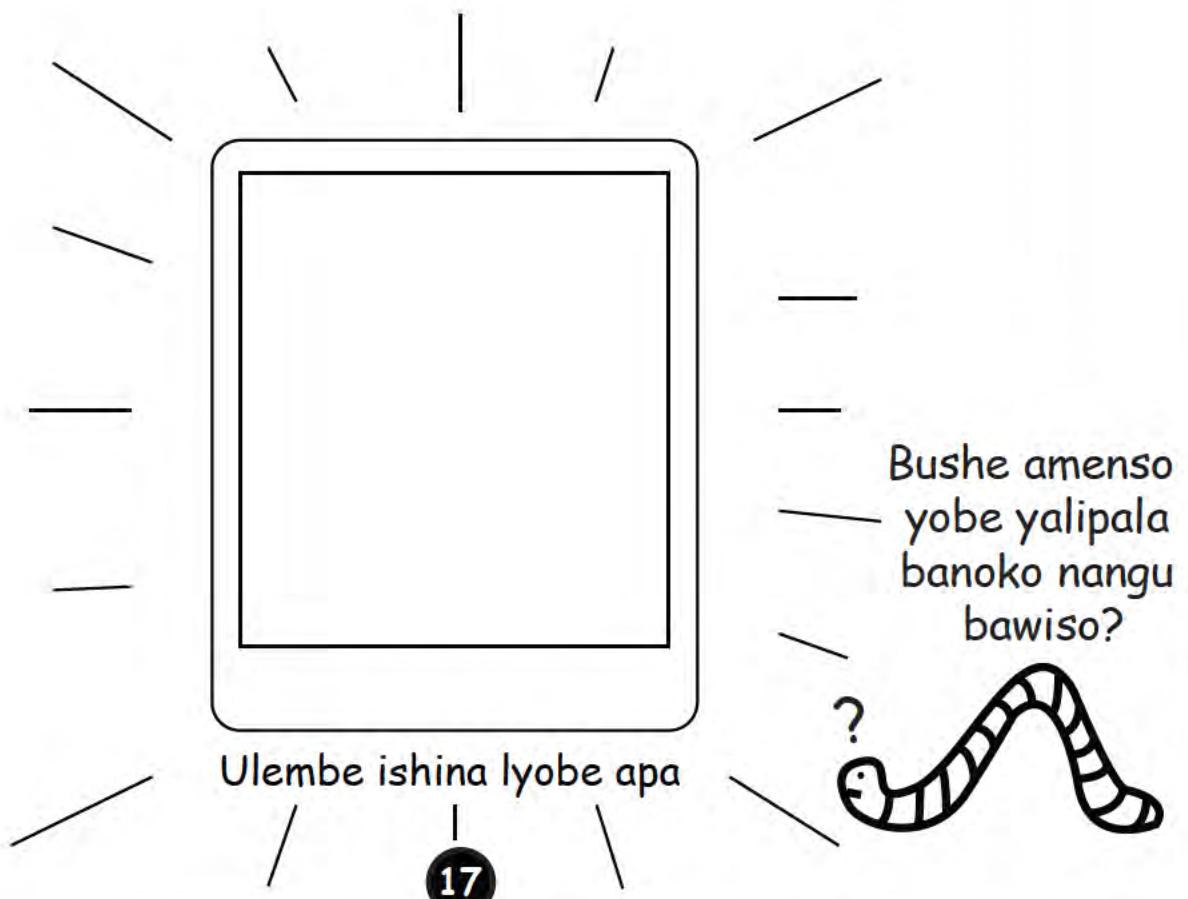
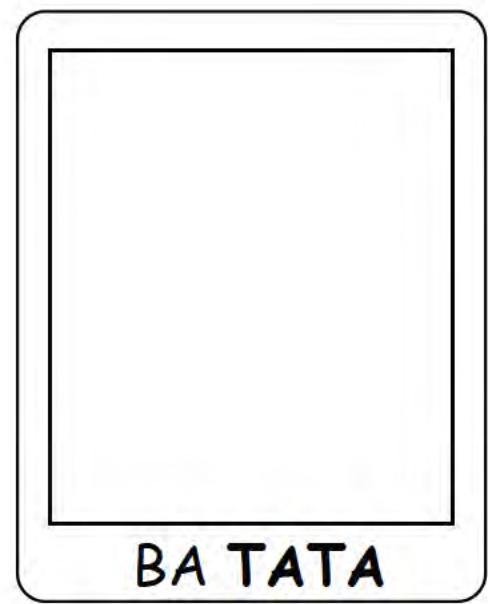
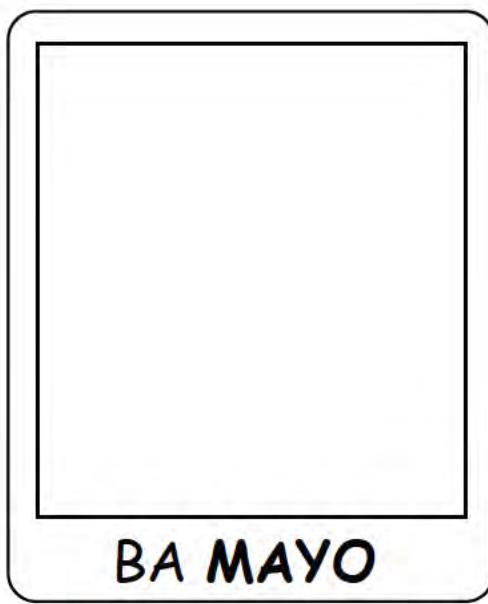
BA SHIKULU BA
MOSS



NAINE!

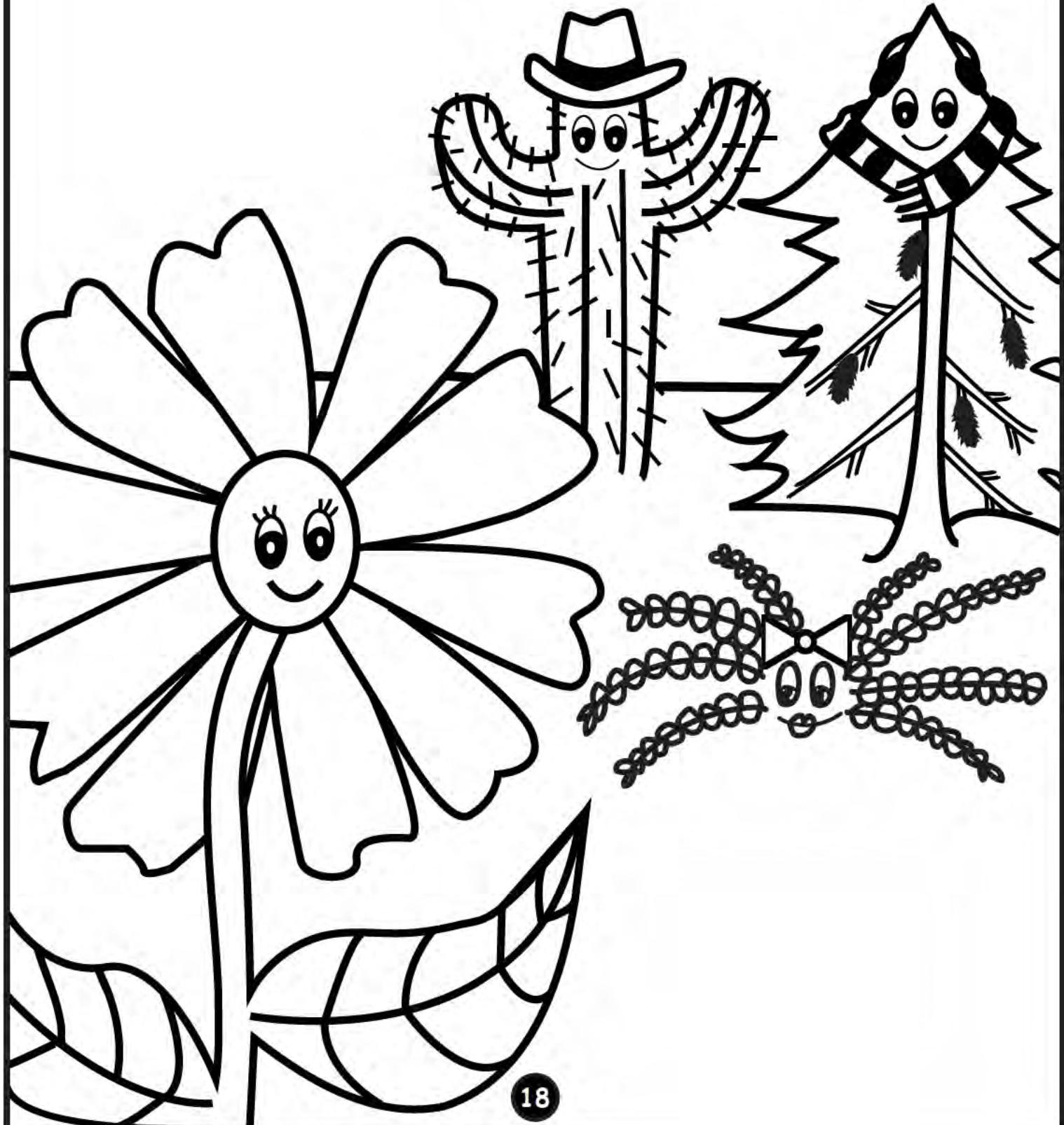


**"Nomba njebako pa lupwa lobe!
Kuti wa lenga ulupwa lobe naiwe?"**





"Abanandi baba mu misango ne fipimo
ifyalekana lekana."





Kabiye kalengule!
Lenga noku penta ifyo wamona!



Sanga amabula aya misango ne fipimo
ifyalekana lekana.

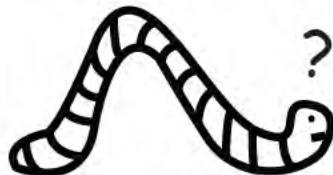
Sanga ifimenwa ne finama ifikala pamo.



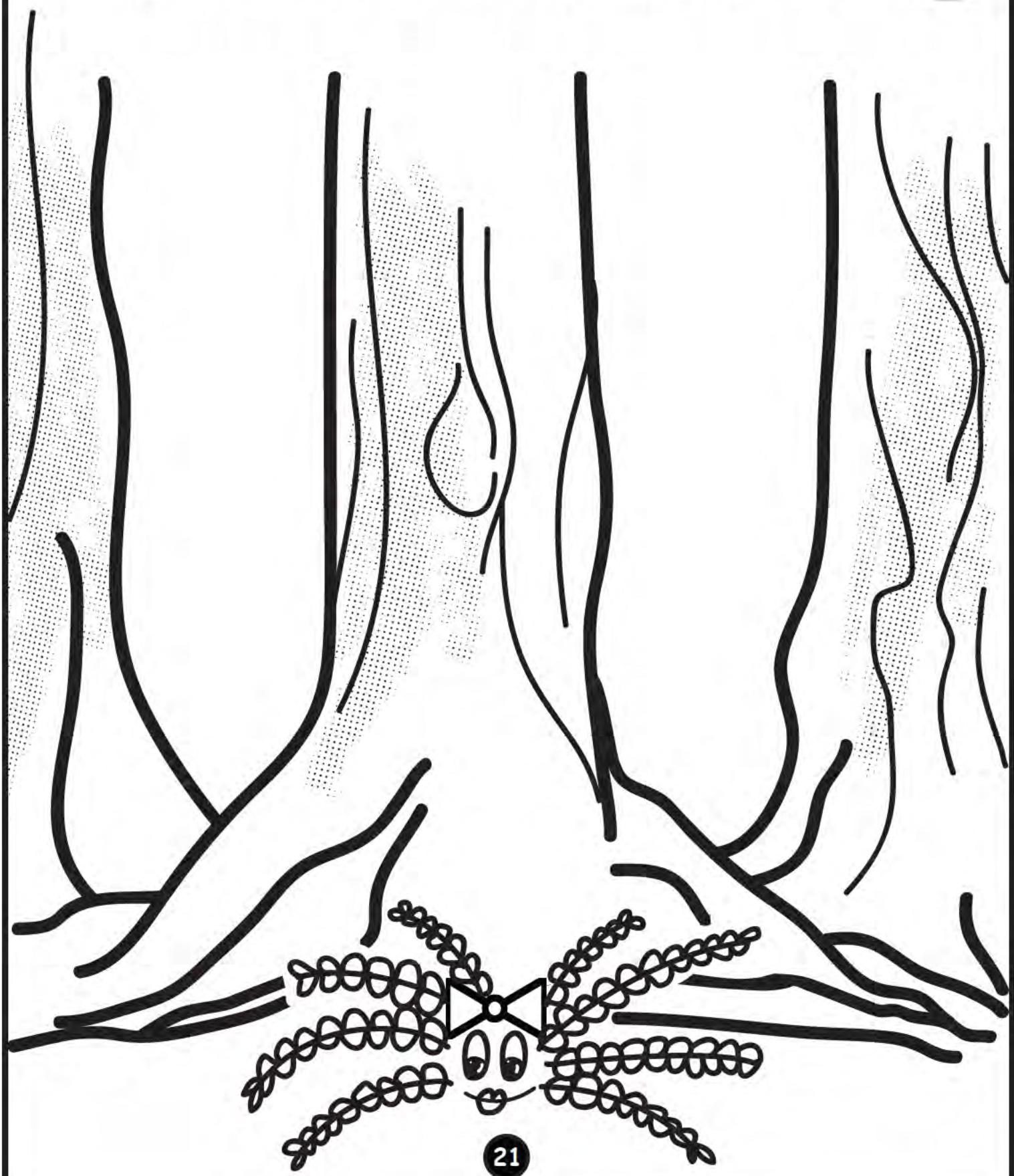
"Shani! Ninebo Mulenga cimuti icikalamba Fir.
Njikala mumpili. Ndasunga utumabula
twandi utwaonda umwaka wonse.
Abanabakwa Mulenga Fir bamena kunseke
ishisangwa muma cones."



"Ndelanguluka nati nibanga abana
bakwa Mulenga cimuti icikalamba Fir
benga kula mupepi nankwe Mulenga?"

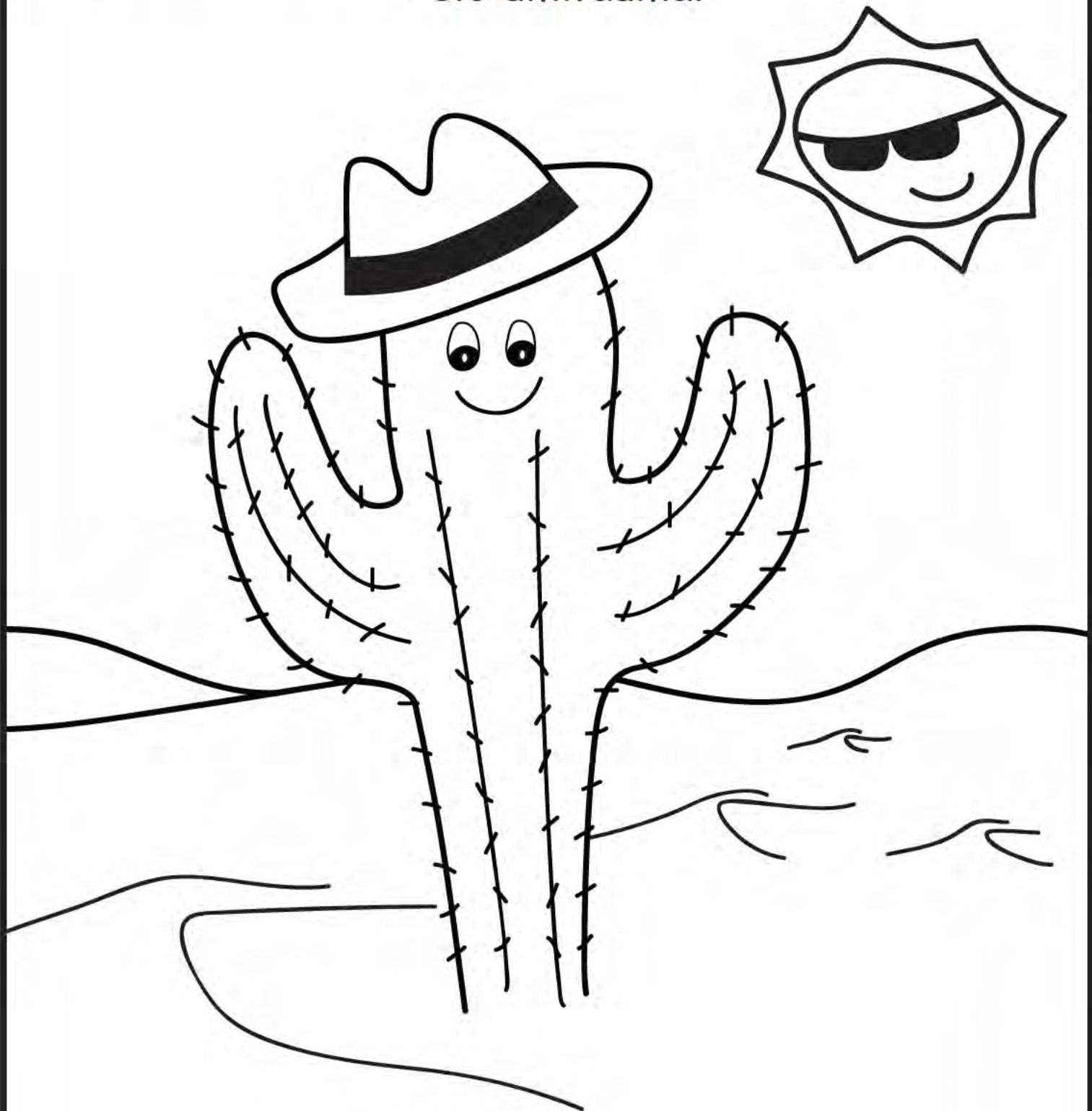


"Shani! Ninebo Robert Fern.
Njikala muncende umwafita panshi ya fimiti."

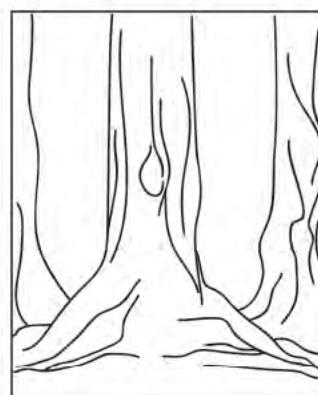
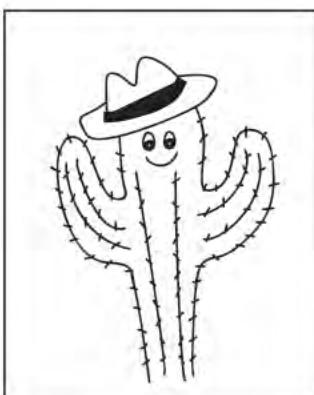
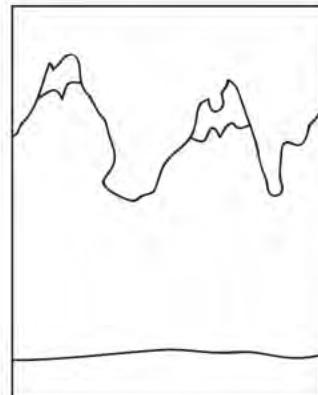
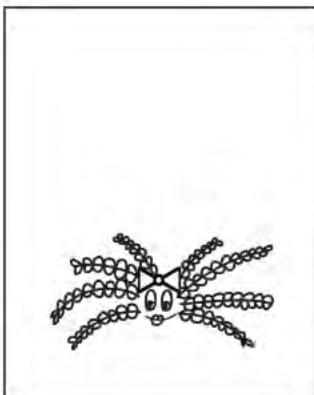
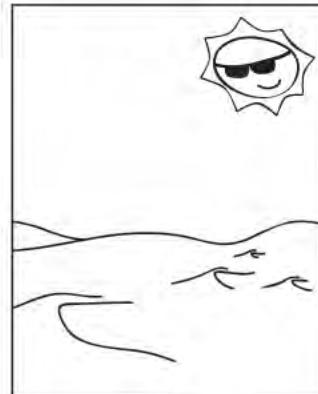




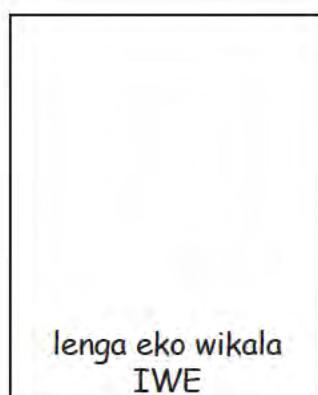
"Shani! Ninebo Sarah Cactus.
Njikala mu ciswebebe umwakaba
elo umwauma."



Kuti walinganya icimenwa nencende
eko cikala?



ilenge WEMWINE



lenga eko wikala
IWE



"Uku konse ukukula nokwangala
kwansha necilaka! Leka nweko
amenshi (H_2O) elo mpemeko bwino!"





Plumbing ya fimenwa



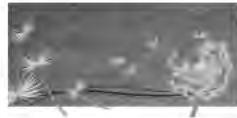
Efyo walakabila:

- Inkomeki imo (iyafina)
- Icani cimo
- Umuti wakupentela ifyakulya

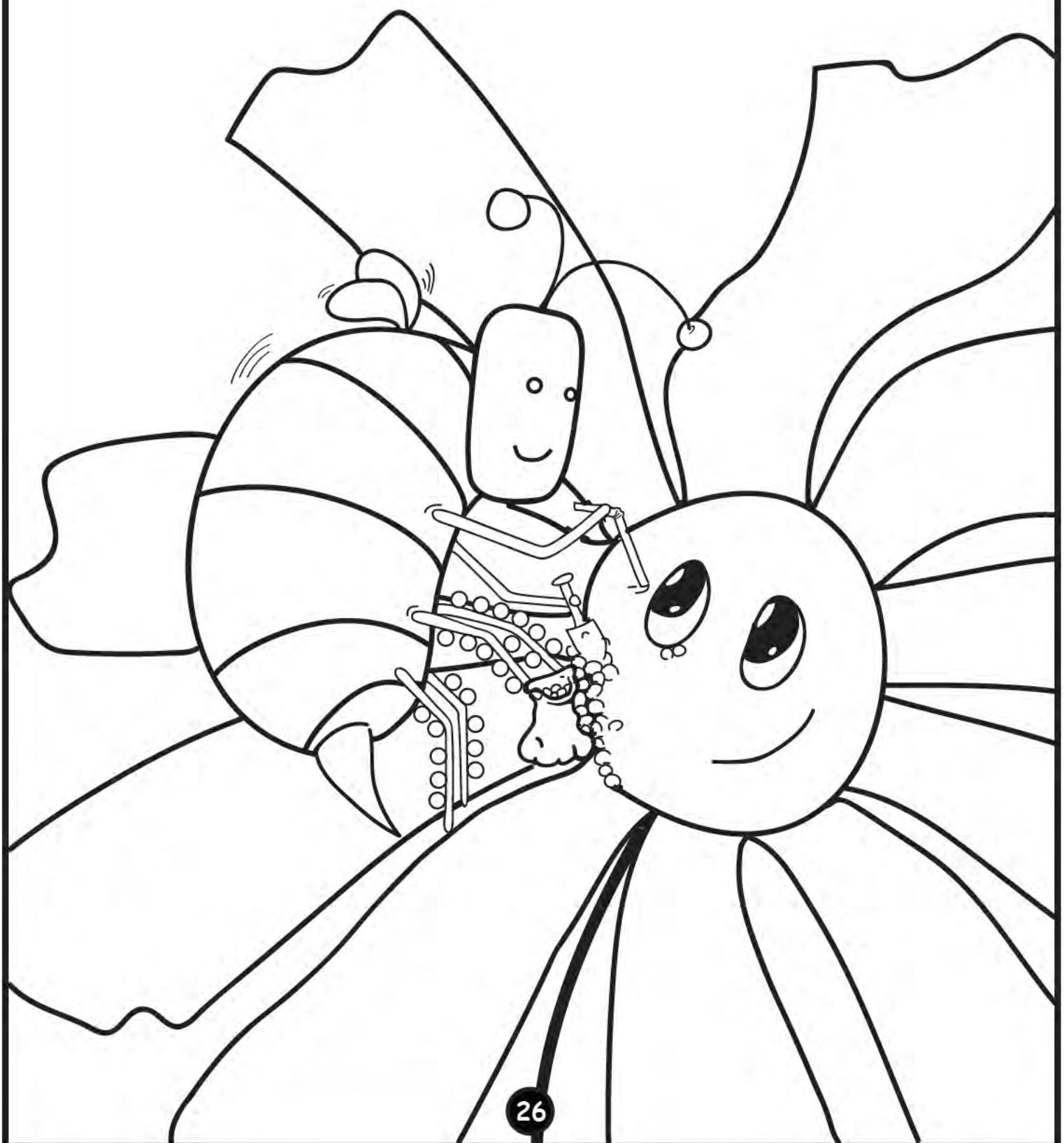
1. Isusha inkomeki namenshi pakati.
2. Posamo utunono utumuti twakupentelako ifyakulya munkomeki elo kumbawila.
3. Zembululako kumpela kwacani.
4. Bika icani mu menshi. Bika ukwazembuluka mupepi namenshi.
5. Finshi fyalachitika ku cani? Lenga ifingacitika.
6. Mona ifyalacitika. Konkanyapo ukumona ifyalachitika ngapapita inshita iyalinga.
7. Finshi ulemona nomba? Lenga.
8. Putula icani pakati. Mulinshi mukati? Lenga.

Bwekeshapo ne fimenwa fimbi ifya kwata inshinte ishitali.
Finshi fichitika ifya palana? Finshi ifya pusanapo?

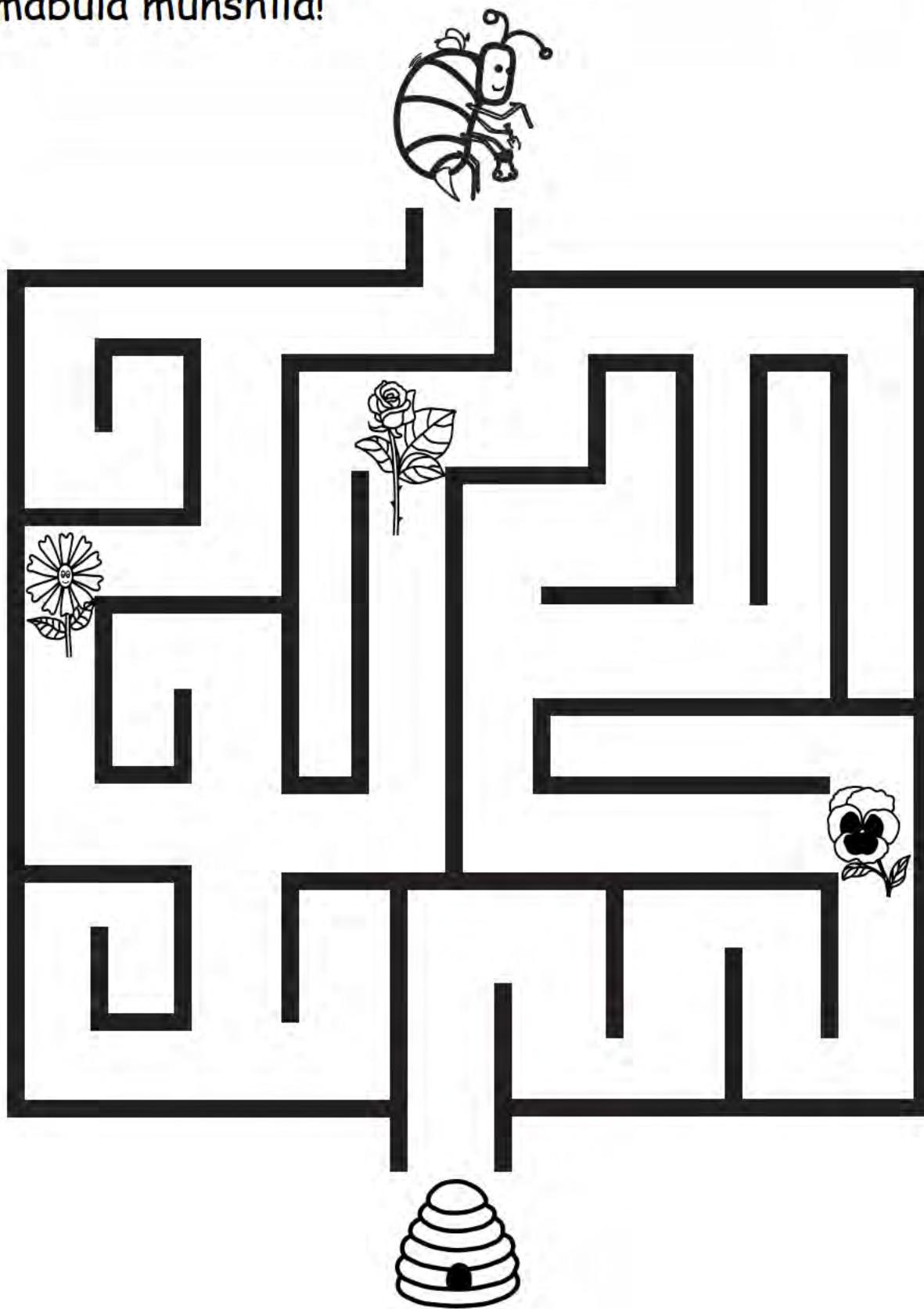
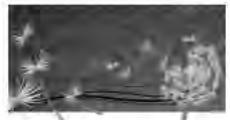


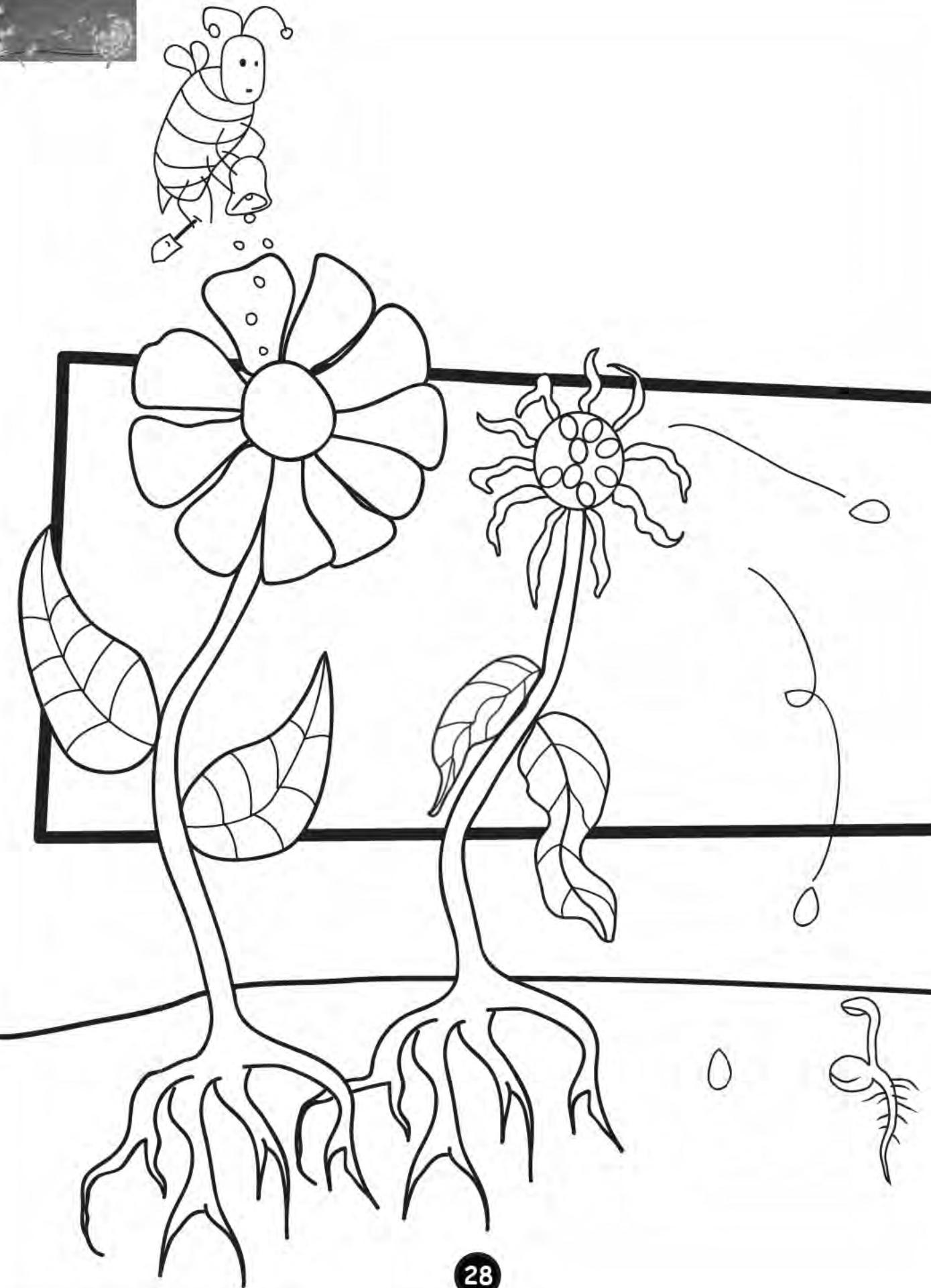
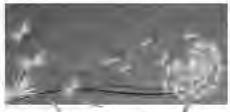


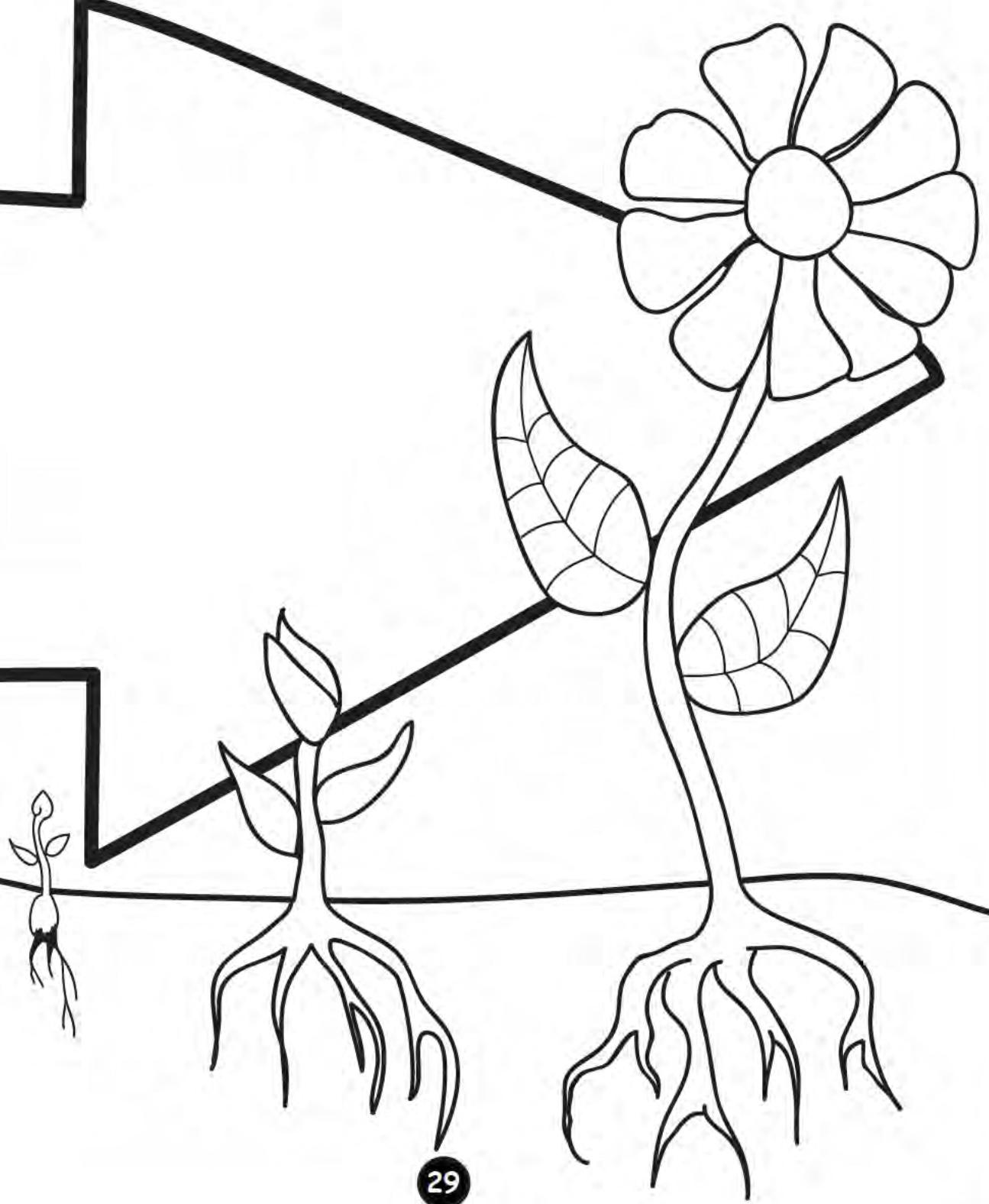
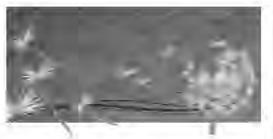
"Umunandi Inonge inshimu ala salanganya
inseke yamaluba yandi. Alabombesha!
Ndapelako umuto wandi uwalowa kuli Inonge."



Langa Inshimu Inonge ku kanganda
kakwe aka buci, nakulatola inseke
shamabula munshila!



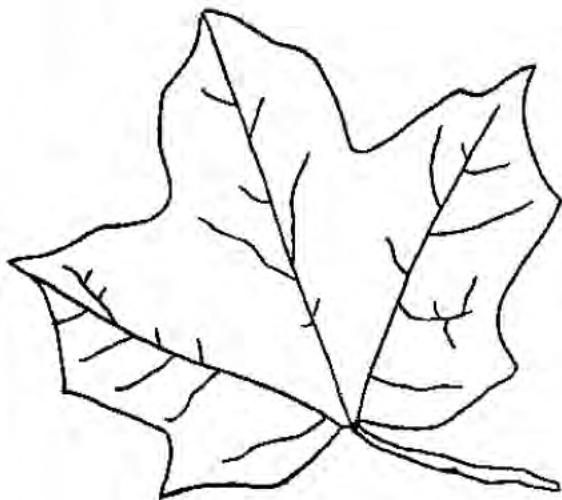
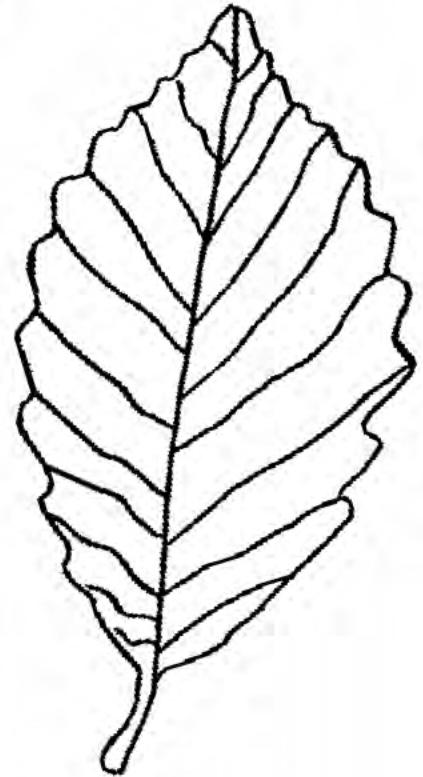
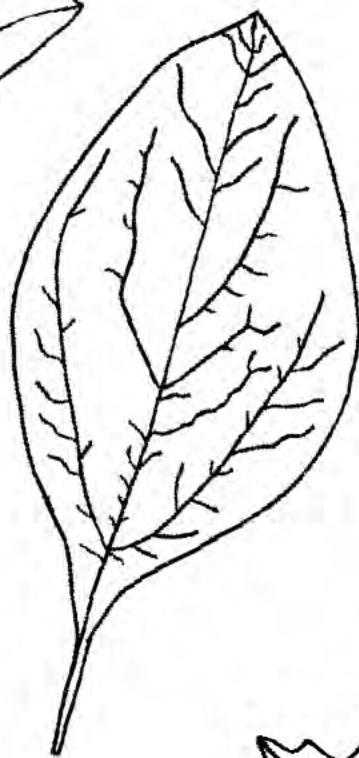




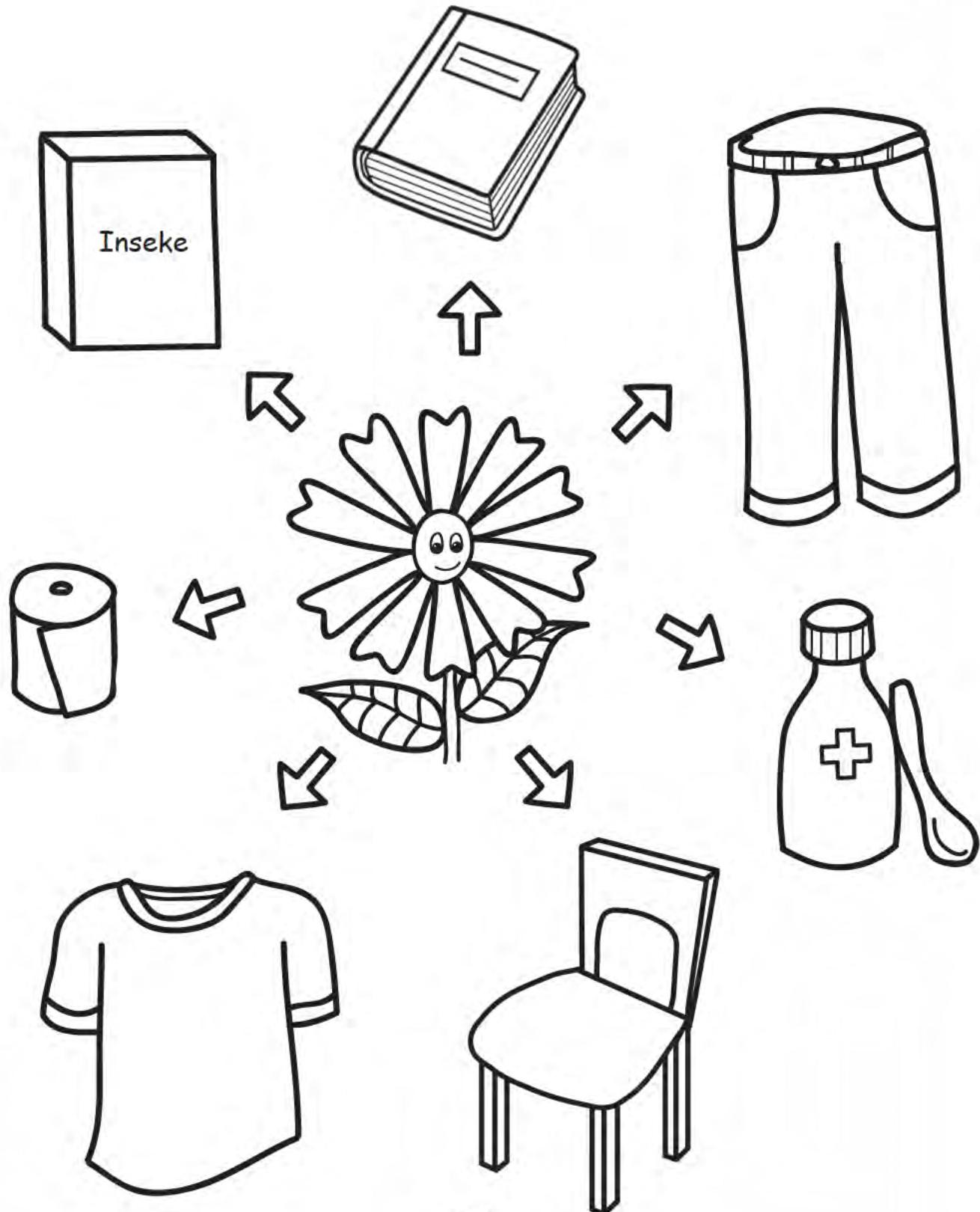


Amabula ya mu mpepo

Mu mpepo, amabula ya fimenwa ifingi yalaleka ukubonfy a ibalala ya katapa katapa. Ibalala ya katapa katapa ila butuluka. Penta amabula mumabala aya lekana lekana.



Ifintu ifingi fyapangwa ukufuma
ku fimenwa.



Lenga fyonse ifintu ifyapangwa ukufuma ku fimenwa.



Ifyangalo fyakupenta ukubomfyia Ifi menwa

Ifyo walakabila:

- Imisalu iyalekana lekana mumi monekele, ifisabo, amaluba nemisango yakubonfyia nangula ama lubeni (mulberries) (aya talalala nangu aya fuma kucimuti leloline), ama caloti, coffee, mustard, imisalu (repu, spinach), curry powder nefyashala efyo wingatewmwa ukwesha
- Ama kunkubiti ayanono
- Ifyakupentelako
- Amenshi
- Ngaulefwaya: icakunwa capangilwa namapela olo na soda

Amaboko ayafwilisha



Ifyakucita:

Mufikunkubiti ifyalekana lekana, bika ifimena ifyatwiwa calimo ifyalinga pamo namenshi ayalinga. Sankanya pamo paka fyatikama pakuti kyabonfyewa uku pentela. Ifyashala filekabila ukuputulwa nangu ukufitwa pamo namenshi ayalinga. Kuti wabonfyia ama lubeni, ama caloti, impilimpili, nangula rapu olo spinachi. Ngawapwisha ukutwa, amenshi ayapangwa kuti yasefekwa ukubonfyia sefa iya coffee. Ibalala lya katapa katapa kuti yapangwa nomusalu ngawasunka coin (1 kwacha) pamulu wamusalu. Ibalala ya katapa katapa yalamoneka pacipepala. Amalubenzi nefisabo ifya kolokondwe ifingi, imisalu namaluba yonse yala cinga ama balala ngawayabika mu mencende isha sasamina nangula isha lula. Ngawa sankanya tu vinegar (utwasasamina) utunono kumenshi yamalubenzi, fyalasanguka ibalala ya pink. Ngawa sankanya soda notumenshi utunono, amenshi yamalubenzi yala sanguka ibalala ya kolokondwe iyawama. Kuti wa bonfyia ifi fyonse uku daisha insalunamani aya ku boila.



Ifyakucita nafimbi!

Lisa imisalu yobe!



Ifyo walakabila

- Inseke sha cilemba ishalinga
- Inkomeki shibili ishaku byala inseke
- Iloba
- Amenshi
- Umufundo

Bika inseke mitanda mumenshi ubushiku bonse. Senda inkomeki shibili ishaisula namaloba ayabomba. Bika inseke shitatu munkomeki munshi yeloba. Bika inkomeki pa window nokulayamona cila bushiku. Wikaleka yakome! Nga wamona ukutila umusalu watampa ukukula, bika umufundo ku nkomeki imo. Konka ifisangilisho ifya lembwa pali fertilizer pakuti waishiba impendwa ya fertilizer iyakubula. Wibika fertilizer mu nkomeki imbi. Nga papita imilungu shitatu nangu shisano, fumya imisalu mu maloba olo uya lenge pacipepala. Bushe nimumisangoshi imisalu ishi shibili shipusene mumikulile?

Ifimena nomufundo

Ifimena ifyabula umufundo



Ifyakucita nafimbi!

Efyo ifimena fipanga fimena fibiyel!



Ifyo walakabila

- Cilemba, inseke sha mulolakasuba, inseke sha cipushi
- Amenshi
- Inkomeki ishinono
- Iloba

Bika cilemba mumensi pansiha iyitali. Ukubonfya ubwafwilisho bwa bafyashi bobo, senda ciemba imo nokuiputula pakati. Lolesha cilemba inono mukati iyakwata utumabula notu mishila. Bika cilemba mitanda, nangula, shine lubali, nangula shine konse konse, olo inseke ishilishonse, mumensi ubushiku bonse. Byala inseke mu nkomeki ayakwete iloba ilya bomba nokuyabika pa window. Cilabushiku walamona ati cilemba yobe yalakula. Kuti waputula pamulu wa caloti noku ibika muci shis ici nono umuli amenshi. Konkanyapo ukubikamo amenshi nokumona ati cikakula ukwabula inseke!



Ku kulila kwisa?

Ifyo walakabila

- Inseke sha cilemba
- Impoto nangula Inkomeki ishinono ishaku byalilamo inseke
- Iloba
- Amenshi

Bika inseke mitanda, nangula, shine lubali, nangula shine konse konse mumensi ubushiku bonse. Senda impoto nangu inkomeki shibili ishinono bikamo iloba ilya bomba. Bika inseke shitatu munkomeki munshi yeloba. Bika inkomeki pa window nokulayamona cila bushiku. Wikaleka yakome! Ilyo inseke shakula ngefikondo fitatu, sesha impoto imo ukuloesha kumbi. Finshi fyalacitika kuli cilemba nomba? Tamba ifyalacitika mumulungu uwakonkapo. Ngapapita inshiku ikumi limo, fumya cilemba mumpoto noku yasamfy aukufumya iloba. Finshi ficitikile kuli cilemba? Bika cilemba pa cipepala olo lenga noku penta cila cilemba pansiha pamalembo aya. Bushe mumatontokanya yobe, finshi fyalenga ukuti cilemba ikule mumisango iyapusana? Bwekeshapo iyi experiment nafuti, bika inkomeki imo umwa fita, olo inkomeki imbi umwabuta. Mumatontokanya yobe finshi fyala citika kuli cilemba iyilekula umwafita? Lolela inshiku ikumi limo olo fumya cilemba iyilekula umwafita. Finshi fyapusanapo pali cilemba iyi lekula umwafita?

Lenga noku penta cilemba yobe apa.

Ba kafundisha, aba fyashi, na bakafwilisha:

Ici citabo capangilwe

Nobwafwilisho ukufuma kuli ba
American Society of Plant Biologists
pakukoselesha bakasukulu bonse nabanono
mucimonya caba American Society of Plant
Biologists cakwafwilisha bonse abantu
ukumona ubukulu nobusuma bwa fimenwa
mu myeo shesu cilabushiku.

Ici citabo calikwata Ifikomo ikumi limo na
fibili ifya mikulile ya fimenwaifya pangilwe

Naba ASPB Education Foundation
(lolesheni kumpela ya citabo ici)
munshila ishakweba ati abashaishibisha
ukubelenga bwino bwino,
Kuti basambilila.

Ici citabo cifwile ukusambilisha infinitu
ifya fimenwa munshila iya wama.

Pakwipusha ifikope fyacitabo ici
nangula ukwipusha paku sanga ama plant
scientists bambi muncende yenu,
lolesheni pa info@aspb.org.

Paku sanga fimbi ifyakufundilako ba grade 12,
lolesheni pa www.aspb.org/education.

Ifikomo ikumi limo na fibili ifya mikulile ya fimenwa

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1. Ifimenwa fyakwata umusango umo wine uwa kupangilwamo pamo no tushishi utushingamoneka ku meno ne finama. Nomba kwena, ifimenwa fyaliba ifyaibeela pa mulandu wakuti fyena fyalikwata amaka ya kubomfy a ubulamba bwa kasuba pamo ne miti imbi ilyo filekula. Uyu musango wa kukulilamo kwa fimenwa kupeela isonde amaka na ifyakulya.
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2. Ifimenwa filakabila amaka yamo aya kukulilamo elyo kabilo filabomba umulimo uukankala mu kushingulukamo kwa filyo mu ncende fikulila.
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3. Ifimenwa fya pa mushili fyatuntuka ku fikolwe fyafiko mu mimana ikalamba, pamo nga limbwelimbwe, elyo nakuba ifimenwa fyalibomba umulimo uukankala mu kupilibuka kwa bumi, ukubikapo fye no mulimo wa kulundapo umwela usuma na ukupakamisha ubucingo bwa lwelele.
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4. Ukusandana kwa fimenwa ifikwata amaluba fichtika no kukumana kwa caume ne canakashi nokuleta inseke. Kusandana kumo kucitika ukwabula ukukumana kwa canakashi ne caume.
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5. Ifimenwa, ukulingana ne finama notushishi utushingamoneka ku meno, filapema no kubomfy a ubulamba bwa kasuba pa kukula no kusandana.
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6. Ifibumba fya nsandensande fipela ukukosa ku fimenwa nakaili fileta inshishi nefyo abantu babonfy a ukubumbilako, utushishi, ufyuni na fyonse ifipema.
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7. Ifimenwa fikula mu cipimo ne misango ukufuma ku insandesande sheka, ukushinta na ku fiumiti ifikalamba.
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8. Ifimenwa e ntuntuko yakubalilapo ukufuma ifintu ifikankala nga umuti ne fintu fimbi ifingi ifyo tushingapenda ifyo tubomfy a cila bushiku.
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9. Ifimenwa, nge finama, filacenwa no kufwa pa mulandu na malwele ya lwambu ayaletwa no tushishi utushingamoneka ku meno. Ifimenwa fyalikwata inshila ishaibeela ishakuicingililamo ku ututushishi na malwele.
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10. Amensi cipande cimo icikankala icisangwa mu nsandesande ne fipandwa fya fimenwa. Mu kusansha ku mulimo ukankala mu kupangwa kwa fimenwa, ukuya pantanshi, nokukula, amensi kuti yabomba nomulimo ukalamba uwa kusalanganya kwa fyakulya fya fimenwa ne micele.
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11. Ukukula nokuya pantanshi kwa fimenwa kutungululwa ne miti ipangwa mukati ka fimenwa kabilo kuti kwayafwilishiwa ne fintu fya kunse pamo nga ulubuuto, amaka ya calo ayatintila ifintu panshi, ukwakukumya nangu amafya mu ncende mulya filemena.
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12. Ifimenwa fisangwa nokubelesha incende ishapusana-pusana. Ifimenwa filapeela incende ya kwikalamo ku fyuni, utushiishi uto finganonkelamo, ne nama sha mpanga shimbii mu mikalile ya kushintilila pali cimo ne cibiye.

**Twalomba ukuti ici citabo kuti capangululwa –
capangwa ne fimenwa**