



# Saol Rúnda Bheacha na hÉireann.

Nótaí Cúlra do Mhúinteoirí.

Gníomhaíochtaí agus Bileoga Oibre don 1ú agus don 2ú Rang.



## Saol Rúnda Bheacha na hÉireann

### Nótaí cúlra do mhúinteoirí.

Tá clár “Saol Rúnda Bheacha na hÉireann” ceaptha chun cabhair a thabhairt maidir le tuiscint an linbh ar thimpeallachtaí, agus ar a fhreagracht/freagracht as caomhnú agus feabhsú na dtimpeallachtaí sin a chothú. Tá beacha tábhachtach mar speiceas tásach a mhéid a bhaineann le leas na bithéagsúlachta laistigh den éiceachóras. Déanann beacha pailniú ar 90% de na bláthphlandaí ar fad dá bhfuil ann ar phláinéad an Domhain. Is ionann sin is a rá go bhfuil beacha freagrach as an gcuid is mó de na torthaí agus de na glasraí a ithimid, agus as na bláthanna áille a thagann chun bheith ina gcnónna agus ina sméar agus a fheidhmíonn mar bheatha do na hainmhithe uile eile is bonn leis an mbia-eangach mhistéireach, iontach, dhinimiciúil, chasta arb éard í bithsféar an Domhain. Le blianta beaga anuas, is léir go bhfuil meath ag teacht ar an líon beach atá ann agus cé nach eol dúinn cad iad na cúiseanna go léir leis an meath sin tá na hiarmhairtí a ghabhfadh le domhan gan beacha doshamhalta.

Chun cabhair a thabhairt maidir leis an méid sin a thuiscint, tá sé tábhachtach go ndéanfaidh eolaithe faireachán a dhéanamh ar dháileadh an speicis. Tá idir 101 agus 103 chineál beiche ann in Éirinn. Beacha fiáine, nó beacha aonair, atá i gceist le 80% díobh. Is iad na beacha fiáine atá freagrach as pailniú a dhéanamh ar an gcuid is mó bláthphlandaí dá bhfuil ann in Éirinn agus ar fud an domhain. Tá eolas forleathan ann faoi beacha meala a choinnítear ar chúl an tí agus faoi bhumbóga ach is beag an méid eolais atá ann faoi na beacha fiáine. Trí fhaireachán a dhéanamh inár gcuid ceantar áitiúil, trí thaifead a dhéanamh ar na beacha a dtagaimid orthu agus trí na sonraí sin a roinnt le taighdeoirí, is féidir linn cabhrú le heolaithe tuiscint a fháil ar dháileadh beach fiáin ar fud na tíre. Sa tslí sin, is féidir linn teacht ar na cúiseanna agus ar na héifeachtaí a bhaineann le hathrú timpeallachta i gcoitinne.

### Beacha mar Mhionphéisteanna

Baineann beacha leis an aicme *Insecta* sa réimse *Animalia* agus tagann siad faoi réim na catagóire ar a dtugtar *Mionphéisteanna*. Is cineál inveirteabraigh iad feithidí ag a bhfuil eisichreatlach (blaosc chrua ar an taobh amuigh), trí bhall coirp (ceann, tóracs, bolg), trí péire cos, comhshúile agus péire amháin aintéiní. Tá cuma shiméadrach ar a gcorp. Cónaíonn siad sa timpeallacht agus is ionann a líon agus 90% de na foirmeacha beatha a bhfuil eolas orthu ar an Domhan, is é sin, an grúpa ainmhithe is ilchineálaí dá bhfuil ann ar an bpláinéad. Dá ndéanfaí na feithidí go léir dá bhfuil ann a mheá agus a meáchan a chur i gcomparáid le meáchan na ndaoine go léir, bheadh feithidí i bhfad níos troime ná speiceas rathúil an chine dhaonna.

Tá staidéar mionphéisteanna ina bhealach éifeachtach chun breathnóireacht dhíreach a dhéanamh ar choincheapa bitheolaíochta sa timpeallacht áitiúil agus sna tailte thart ar an scoil. Is féidir leo cabhrú linn timthriallta beatha, biashlabhraí, anatamaíocht, gnáthóga agus éiceachórais a thuiscint. Tá ról ar leith acu ar fad i ndáil le hathchursáil agus pailniú laistigh de bithsféar an Domhain agus tá siad tábhachtach i dtaca le tuiscint a fháil ar staid na bithéagsúlachta sa timpeallacht.

Tháinig beacha chun cinn ó fhine na bhfoichí (Crabronidae). Is creachadóirí feoiliteacha iad foichí agus déanann siad iad féin a bheathú go formhór ar fheithidí atá níos lú ná iad. Tháinig beacha chun cinn mar veigeatóirí a itheann pailin agus is ó phailin a fhaigheann siad an phróitéin agus na cothaithe atá uathu. Baineann na hiontaisí beiche is luaithe dá bhfuil eolas orthu leis an tréimhse Chailceach a bhí ann 100 milliún bliain ó shin. Faightear beacha ar gach ilchríoch seachas an tAntartach agus faightear iad i ngach gnáthóg ina bhfuil bláthphlandaí.

Baineann beacha meala leis an ngéineas *Apis Mellifera* ('iompróir meala' sa Laidin) agus bailíonn siad agus stórlann siad mil. Déanann speicis eile é sin freisin ach ní go feadh an méid chéanna. Bhí a fhios ag luathshibhialtachtaí daonna conas mil a bhailiú ó bheacha meala fiáine agus tá léiriú air sin le feiceáil ar phéintéireachtaí carraige a bhaineann le tréimhse a bhí ann 15,000 bliain ó shin. Ina dhiaidh sin, is é sin, 4,500 bliain ó shin, bhí daoine tar éis a fhoghlaim conas beacha a oiliúint nó conas feirmeoireacht a dhéanamh orthu. Tá tuairim is 20,000 speiceas beach ann agus tá an bheach mheala ina measc. Baineann an bheach mheala leis an ngrúpa *Apis* a bhfuil 44 fhospiceas díobh ann.

### Beacha Meala v Beacha Fiáine/Aonair

Tugann **Beacha Meala Ceansaithe** mil agus céir bheach dúinn agus, chomh maith leis sin, táthar tar éis iad a oiliúint chun barra feirme a phailniú. Cónaíonn siad i gcoirceoga a thógann daoine dóibh. Laistigh den choirceog, tógann siad cior mheala as céir chun neachtar agus pailin a stóráil inti agus, ina theannta sin, mar chill inar féidir leis na larbhaí a bheith ag fás. Tá struchtúr sóisialta agus córas cumarsáide an-eagraithe acu agus tá eolaithe ag teacht ar thuiscint ar na nithe sin anois.

Is féidir le coilíneachtaí coirceoige cóiríocht a sholáthar do suas go 40,000 beach (tá meastacháin ann a luaitear 80,000 beach in aghaidh na coirceoige) aon tráth áirithe. Ní bhíonn ach Chráinbheach amháin ann i gcoirceog. Is í sin máthair na mbeach uile eile sa choirceog, ar beacha baineanna iad a bhformhór gan cumas atáirgthe acu. Dá bhrí sin, is beacha baineanna iad na beacha go léir ar a dtugtar '*beacha oibre*'. Tugtar '*ladrainn*' ar bheacha fireanna agus is é atá sa phríomhchúram atá acusan ná cúpláil a dhéanamh le cráinbheacha agus coilíneachtaí nua coirceoige a fhoirmiú. Is féidir leis an gCráinbheach agus cuid de na beacha eile codladh geimhridh a dhéanamh. Is féidir le cráinbheach maireachtáil suas go 7 mbliana.

Tá 'gléas ceilge' ag beacha meala oibre ach ní féidir leo é a úsáid ach uair amháin. Gléas deilgneach atá sa ghléas ceilge. Nuair a úsáidtear é, réabann sé bolg na beiche agus faigheann an bheach bás. Ní úsáidtear an chealg ach amháin i gcás ina ndéantar ionsaí ar bheach nó ar choilíneacht na mbeach.

Baineann **Bumbóga** leis an ngrúpa *Bombus*. Tá cónaí orthu san fhiántas agus is san fhiántas a thógann siad a gcuid neadacha. Tá eolas ann faoi thart ar 250 speiceas. Tá cónaí ar an gcuid is mó bumbóg i gcoilíneachtaí, déanann roinnt acu tochailt agus tógann cuid eile díobh neadacha céarach ar an talamh nó i lomáin. Is féidir le gach beach bhaineann larbhaí a bhreith ach is í an chráinbheach amháin atá in ann larbhaí baineanna a bhreith. Maireann na coilíneachtaí ar feadh séasúir ach déanann roinnt cráinbheacha codladh geimhridh. Beathaíonn siad iad féin ar neachtar agus ar phailin agus bailíonn siad neachtar agus pailin dá gcuid larbhaí. Tá siad tábhachtach do dhaoine mar go ndéanann siad pailniú ar bharr. Tá siad tábhachtach don bhithéagsúlacht mar go bhfuil ról mór acu i ndáil le pailniú bláthanna fiáine. Tá a ngléas ceilge biorach seachas deilgneach mar atá gléas ceilge na beiche meala. Is féidir le bumbóga an gléas ceilge a úsáid go minic gan aon damáiste a dhéanamh dóibh féin ach, de réir an eolais atá ann fúthu, ní úsáideann an chealg ach amháin i gcás ina ndéantar ionsaí orthu.

Is iad na **Beacha Aonair** an grúpa is líonmhaire ar fad de na speicis beach atá ar eolas ag daoine (80%-90%) agus tá cuid mhór *genera* ann ina measc; an bheach chearpantóra, an bheach shaoir cloiche, an bheach dhuillghearrthach, an bheach allais, an bheach tholltach, etc. Tugtar beacha aonair orthu ós rud é go mbíonn gach ceann baineann díobh torthúil agus go ndéanann gach ceann ar leith a larbhaí féin a bhreith i nead atá tógtha aici féin. Níl aon bheacha oibre ann. Is féidir

leo maireachtáil i bpoill shimplí i mballa nó i gcrann nó i gcraobhóga tolla agus tochlaíonn cuid díobh poill dóibh féin. Tar éis don mháthair-bheach a nead a thógáil agus a shéalú gheobhaidh sí bás.

Déanann siad suas go 70% de bharr feirme agus suas go 80-90% de na bláthphlandaí eile a phailniú. Bailíonn cuid mhór de na beacha aonair pailin ó phlanda d'aon speiceas amháin nó ó líon beag speiceas plandaí. Is speisialtóirí iad agus bíonn gaolmhaireacht shiombóiseach acu leis na plandaí a ndéanann siad pailniú orthu. Baileoidh siad neachtar ó raon plandaí éagsúla, áfach. Ní stóráilann beacha aonair mil; ina ionad sin, meashtar beagáinín neachtair leis an liathróid phailine le go mbeidh beatha ag na larbhaí agus iad ag fás. Maireann siad beo ar feadh séasúir ach faigheann siad bás nuair a thagann an geimhreadh. Níl aon ghléas ceilge ag an gcuid is mó beach aonair agus ní féidir leo sin cealg a chur ionat.

Is furasta a cheapadh gur fíorbheacha iad **beacha gabhair**. Déanann siad *aithris* ar anatamaíocht na beiche, tá bolg stríocach orthu agus déanann siad dordán. Cé go bhfuil siad cosúil le beacha, níl aon ghléas ceilge acu agus, de ghnáth, ní dhéanann siad dochar do dhaoine mura rud é go n-itear iad. Baineann siad leis an ngrúpa ar a dtugtar *Syrphidae*. Tá tuairim is 180 speiceas díobh ann in Éirinn. Faigheann beacha gabhair aosacha a gcuid bia go formhór ó neachtar agus ó mhill. Faigheann na hóga, ar a dtugtar cruimheanna, a gcuid bia i bhfoirm Aifidí agus lotnaidí beaga eile. Ní thógann siad nead agus is fearr leo a gcuid uibheacha a bhreith in uisce marbháanta. Tá siad tábhachtach d'fheirmeoirí mar bhithshrianadh nádúrtha ar lotnaidí agus mar gheall ar a ról mar aosaigh i dtaca le pailniú de.

## Pailniú

Beacha is mó a dhéanann pailniú ar Phláinéad an Domhain agus déanann siad pailniú ar suas go 80% de na bláthphlandaí ar fad dá bhfuil ann. Tá oiliúint curtha ar Bheacha Meala chun barra bia a phailniú agus tá beacha fiáine freagrach as pailniú a dhéanamh ar an gcuid is mó de na bláthphlandaí eile atá ann sa timpeallacht i gcoitinne. Tá pailniú tábhachtach do leathadh plandaí agus mar bhonn leis an ngréasán casta bia atá againn ar ár pláinéad.

Tagann bláthanna ar phlandaí ag tráthanna éagsúla den bhliain de réir mar a athraíonn na séasúir. Chun beacha a mhealladh chucu táirgeann plandaí neachtar, ar substaint chumhra í as ar féidir le beacha mil a dhéanamh, agus táirgeann siad pailin a úsáideann beacha mar bhia. De réir mar a ghluaiseann beacha ó phlanda go planda bailíonn siad pailin ón gcuid fhireann de bhláth, is é sin, an *stáimín*. Titeann an phailin ó chorp clúmhach na beiche ar an gcuid bhaineann de bhláth, is é sin, an *phistil*, nuair a thugann siad cuairt ar bhláth nua, agus is sa tslí sin a dhéantar pailniú. Chomh maith leis sin, bailíonn beacha pailin chun í a stóráil agus chun í a úsáid mar bhia dá larbhaí. Bailíonn siad an phailin sin i saic phailine ar a gcosa deiridh. Tar éis bláthanna a phailniú tiontaítear iad ina dtorthaí, ina nglasraí, ina sméar nó ina gcnónna ina mbíonn na síolta le fáil. Itheann mamaigh bheaga agus éin bheaga iad sin. Caitear na síolta ar leataobh rud a chuidíonn le leathadh na bplandaí. Agus bíonn bia le fáil ag mamaigh mhóra agus ag éin mhóra i bhfoirm na mamach beag agus na n-éan beag.

Beacha a dhéanann pailniú ar an gcuid is mó de na torthaí, na glasraí, na cnónna agus na sméara a ithimid. Is fusa liosta a thabhairt de na torthaí agus na glasraí **nach** ndéanann beacha pailniú orthu:

- Torthaí nach ndéanann beacha pailniú orthu: bananaí, anainn.
- Glasraí féinphailnithe: pónairí, piseanna.

- Glasraí a phailnítear le pailín ghaothshéidte: arbhar milis, biatais, meacain dhearga.

Cad a bheadh le hithe againn mura mbeadh beacha ann? Conas a d'fhéadfaimis plandaí a phailniú?

## Cuardach Bia

Nuair a fheiceann tú beacha agus iad ag eitilt thart ó phlanda go planda tá siad ag cuardach bia nó uisce. Déanann beacha cuardach ar rudaí éagsúla ag tráthanna éagsúla den bhliain; neachtar, pailín, uisce, gliú beach agus ábhair eile dá n-eadacha.

- **Neachtar:** Substaint ina bhfuil neart siúcra agus a úsáidtear mar fhoinsé bia carbaihiodráite. Stóráilann beacha meala neachtar mar bhia don séasúr codlata geimhridh. Déantar '*mil*' den neachtar stóráilte. Táirgeann plandaí neachtar cumhra nuair atá bláthanna orthu.
- **Pailín:** Tá neart próitéine ann i bpailín. Tá pailín an-tábhachtach do gach neach beo, fiú amháin daoine. Cabhraíonn sé lenár gcoirp éirí láidir. Cuireann beacha liathróid phailíne thart ar a lárbaí agus itheann na lárbaí í sin rud a chabhraíonn leo fás agus teacht chun bheith ina mbeacha aosacha. Déantar pailín a bhailiú i saic phailíne ar chosa deiridh na mbeach oibre.
- **Uisce:** Chun maireachtáil, ní mór uisce a bheith ag gach neach beo. Ní dhéanann beacha uisce a bhailiú nó a stóráil agus ní mór dóibh uisce a ól.
- **Gliú Beach:** Substaint ghreamaitheach a bhailíonn beacha ó bhachlóga nó ó fhoinsí eile sú. Úsáidtear é chun an choirceog/nead a thógáil agus a dheisiú. Faightear é ar chrainn agus ar thoir.
- **Ábhair don nead:** Tógann beacha fiáine, bumbóga, beacha gabhair agus foichí a gcuid neadacha i gcuid mhór áiteanna éagsúla. Déanann cuid acu tochairt faoin talamh agus maireann cuid acu i bpoill sa bhalla nó i gcoirt crainn. Le go mbeidh na neadacha compordach agus te le linn mhíonna an gheimhridh, déantar iad a líneáil le duilleoga agus le peitil. Úsáidtear láib chun an nead a shéalú agus a chosaint i rith an gheimhridh.

Déanann beacha meala agus bumbóga a neadacha/gcoirceoga as céir, ar seachtháirge é a thagann ó dhíleá neachtair agus é measctha le pailín agus le gliú beach.

## Saolré.

Tagann *meiteamorfóis iomlán* ar bheacha ó chéim na huibhe go céim an aosaigh. Tá 4 phríomhchéim ann: Ubh, lárba, pupa, aosach. Bíonn an méid ama a thógann na céimeanna sin ag brath ar an gcineál beiche atá i gceist: *Cráinbheach*, 16 lá; *beacha oibre*, 21 lá; *ladrainn*, 24 lá. Is garbh-amanna iad sin agus bíonn siad ag brath ar an speiceas. Ní mhaireann an chuid is mó beach aosach ach thart ar mhí amháin ach is féidir le cráinbheacha maireachtáil ar feadh tréimhse i bhfad níos faide ná sin.

- Bíonn coilíneachtaí beach meala ann ar bhonn ilbhliantúil, rud a chiallaíonn go maireann siad roinnt mhaith blianta agus maireann cráinbheacha suas go seacht mbliana trí chodladh geimhridh a dhéanamh. De ghnáth, ní mhaireann beacha oibre níos faide ná bliain amháin. Maireann ladrainn tríd an ngeimhreadh chun cabhair a

thabhairt do chráinbheacha óga nua le linn dóibh coirceoga dá gcuid féin a bhunú i suímh nua.

- Tagann cráinbhumbóga chun cinn ag deireadh an tsamhraidh agus i dtús an fhómhair chun teacht ar nead inar féidir leo codladh geimhridh a dhéanamh. De ghnáth, is iad na chéad bheacha a fheicimid san earrach, agus feictear cuid acu chomh luath le mí Feabhra.
- Bíonn saolré na mbeach aonair i bhfad níos giorra i gcomparáid le saolré speiceas eile beach agus, i gcás na beiche saoir cloiche, ní mhaireann siad ach thart ar sé seachtaine sa samhradh. Ní bhíonn aon chráinbheacha ná oibrithe ann, is é sin, ní bhíonn ann ach cinn bhaineanna agus ladrainn fhireanna. Tar éis do na cinn bhaineanna a neadacha a thógáil agus a n-uibheacha a bhreith faigheann siad bás agus, dá bhrí sin, ní thugann siad aire dá n-óga. Déanann na larbhaí codladh geimhridh agus bia le fáil acu ó liathróidí pailine agus ó neachtar agus tagann siad amach san earrach.

## Cumarsáid

Tá córas cumarsáide an-fhorbartha ag feithidí agus is dócha gur ag beacha atá an córas cumarsáide is speisiúla. Is é is cúis leis an *dordán* a dhéanann beacha ná fuaim a n-eití a bhuaileann de réir ráta dhochreidte 250 buille sa tsoicind. Is ráta an-tapa é sin! Ní dhéanann siad cumarsáid tríd an dordán; ina ionad sin is trí bholadh (fearamóin) a dhéanann siad cumarsáid agus is trína gcuid aintéiní a bhraitheann siad an boladh. Dá bharr sin, tá siad in ann teachtaireachtaí a sheoladh agus rianta a fhágáil ina ndiaidh. Chomh maith leis sin, baineann siad úsáid as 'Damhsa Longadain' aisteach casta. Tá modhanna nua-aimseartha eolaíochta ag cabhrú le heolaithe tuiscint a fháil ar an tslí ina bhfuil beacha in ann cumarsáid a dhéanamh agus teacht ar ghrúpa sonrach bláthanna atá suas go 2 km ar shiúl ón gcoirceog.

## Caomhnú

Ó bhí blianta na 1970-idí ann, tá eolaithe tar éis meath ar dháileadh na speiceas beach a thabhairt dá n-aire. D'éirigh an meath sin measartha géar sa bhliain 2013 sa mhéid nár éirigh le beagnach 33% de choilíneachtaí beach meala ar fud an domhain maireachtáil tríd an ngeimhreadh (suas go 50% in Éirinn). Tá cuid mhór cúiseanna leis sin, lena n-áirítear lotnaidicídí agus modhanna nua-aimseartha feirmeoireachta, galair, seadáin agus athrú aeráide. Go dtí seo, níl na heolaithe cinnte faoin bpríomhchúis atá leis. Is féidir faireachán a dhéanamh ar bheacha meala ceansaithe agus is féidir linn breathnú ar nithe a dhéanann difear dóibh ach tá sé níos deacra faireachán a dhéanamh ar bheacha fiáine/aonair.

Is féidir linn cabhrú leis na beacha aonair trí ghnáthóg chairdiúil a chur ar fail dóibh chun maireachtáil inti. Má phlandálann tú garraí bláthanna fiáine, is féidir leat an bia atá uathu a chur ar fáil agus má thógann tú Óstán Beach Fiáin is féidir leat áit a sholáthar dóibh chun nead a thógáil agus uibheacha a bhreith inti.

Tig leis an 1ú rang & an 2ú rang siúl thart ar thailte na scoile chun eolas a fháil faoi ghnáthóga a bhféadfadh beacha fiáine cónaí a dhéanamh iontu agus chun a fháil amach conas a mhaireann beacha, cén áit ina maireann siad agus cén tráth den bhliain ina mbíonn siad gníomhach. Is féidir leo foghlaim faoi bhithéagsúlacht trí bhreathnú ar na mionphéisteanna atá ann i dtailte na scoile agus faoi anatamaíocht trí mhasc súl feithide a dhéanamh as papier-maché; ina theannta sin is féidir leo foghlaim faoi tslí ina ndéanann beacha cumarsáid lena chéile; agus an bhfuil an 'Damhsa Longadain' ar eolas agat?

**Tá mé ag tnúth le teacht chuig do scoil chun Dordán a chruthú faoi Bheacha!**

## Activity and Worksheets: 1<sup>st</sup> & 2nd Classes.

### Skills development:

#### Working scientifically

- Observing
- Investigating and experimenting
- Analysing
- Recording and communicating

#### Designing and making

- Exploring
- Planning
- Making

### Strands

#### Living things

- Plants and animals

#### Materials

- Properties and characteristics of materials
- Materials and change

#### Environmental awareness and care

- Caring for my locality

Tá cuid de na hacmhainní atá ann sa phaca seo ceaptha lena n-úsáid in éineacht le físeáin agus le grafaic a shuiteálfar ar ríomhairí na scoile ar lá an chur i láthair. Beidh feidhmchlár ann sa phaca acmhainní ar feidhmchlár é a bheidh le húsáid ar chláir bhána nó ar theilgeoirí seomra ranga agus beidh comhéadan ann atá éasca lena úsáid chun rochtain a fháil ar fhíseáin a bhaineann le hábhair, ar ghrafaic agus ar naisc le láithreáin ghréasáin. Is féidir acmhainní a chur ar fáil ar ríomhairí mhic léinn na scoile freisin.

Title	Bug-eye mask	Arts & Crafts
Age	5-8	
Objective	To create a bee costume. Learning about Bee anatomy. Compound eyes; symmetry, antennae, proboscis, mandibles.	
Learning outcome	Ss will learn about the anatomy of an insect head. Changing materials to make things. Materials; Papiér Maché. Construction.	
Skills development	Designing and making.	
Strands	Living things. Materials and change.	
Time Frame	2-4 days 1 hr sessions over 1 week.	
Resources	Paper strips, ballons, head boppers, party blower, water, flour, scissors, poster paints (red, brown, black), pipe cleaners.	
Video	How do bees eat? How do bees see?	
Graphics		
Assessment		

## Bee Anatomy

Insects have three body parts; head, thorax and abdomen. The head has four main components; antennae, compound eyes, proboscis, mandibles, the head parts are symmetrically placed on the head. The Antennae are used to communicate through smell (pheromones) and touch. Compound eyes are made up from many small lenses, none of which is very good on it's own. Bees, and most insects, see in the infra-red spectrum of UV light, red is invisible to them. The Proboscis is used to collect; nectar, pollen, water, propolis. Mandibles are used to help munch up food.

Title	What plants are in our garden?	Field Trip
Age	5-8	
Objective	To identify the plants and habitats around the school grounds. Make a list of plants.	
Learning outcome	Scientific discovery. Ss will learn the tools for scientific exploration and rules for observing nature. Identifying the plants in the local eco-system.	
Skills development	Observing, investigating, recording and communicating.	
Strands	Living things, caring for my locality.	
Time Frame	1-2 hrs, this activity can happen on several occasions over the year, as the seasons and plant life change.	
Resources	Magnifying glass, note paper, pencil, drawing paper,	
Video		
Graphics		
Assessment		

## Background

Bees are the greatest pollinators on Planet Earth pollinating up 90% of all the flowering plants. Honeybees have been trained to pollinate crops for food, wild bees are responsible for pollinating all of the other flowering plants. Pollination is important for the spread of plants and as the basis for the complex food web here on Planet Earth.

Plants flower at different times of the year, as the seasons change. In order to attract bees they make nectar, a sweet smelling substance from which bees can make honey. As bees move from plant to plant they collect pollen on their hairy bodies, the pollen falls off when they visit a new flower. When flowers are pollinated they turn into fruit, berries or nuts, which contain the seeds. The fruit and berries are eaten by small mammals and birds, the seeds are discarded which helps the plants to spread. The small mammals and birds become the food for bigger mammals and birds.

Title	Bee anatomy	Arts & Crafts / Vocabulary
Age	5-8	
Objective	To create a bee anatomy poster. Head, thorax, abdomen, 6 legs, wings (2 sets of 2).	
Learning outcome	The names of the body parts of insects. Learning to draw shapes and connect different shapes. Ovals and circles.	
Skills development	Recording and communicating	
Strands	Living things	
Time Frame	1 hr	
Resources	Paper, crayons, poster paint, painting aprons, cloth,	
Video		
Graphics		
Assessment		

#### Background:

Bees are insects and all insects have similar symmetrical anatomy;

- 3 body parts: head, thorax, abdomen.
- 2 antennae.
- 2 compound eyes
- Proboscis.
- Mandibles.
- 3 pairs of legs (6 in all).
- Bees have 2 pairs of wings.

The body parts are circular and oblong in shape. Bees are covered in fine hairs which give bees their colour.

Title	Do the Waggle Dance	Vocabulary
Age	5-8	
Objective	To learn about the strange way that honeybees can communicate.	
Learning outcome	Learn about honeybee communication through learning the 'Waggle Dance'.	
Skills development		
Strands	Animals	
Time Frame	15 min	
Resources		
Video	Video: How do honeybees communicate?	
Graphics		
Assessment		

#### Background:

Honeybees have a peculiar way of communicating. They can use their antennae to smell pheromones, but most peculiar of all is the 'Waggle Dance'. The waggle dance has a set of moves that can tell direction, distance and type of pollen or nectar.

Title	Where do bees live?	
Age	5-8	
Objective	To learn about the different habitats that bees live in.	
Learning outcome	Identifying the difference between honeybee hives and wild bee nests.	
Skills development	Working scientifically; Observing; Investigating and experimenting	
Strands	Living Things	
Time Frame	30 min	
Resources		
Video		
Graphics		
Assessment		

Background:

Different bee species build their nests in a variety of ways.

- Honeybees have been *trained* by humans to pollinate crops and to provide honey. They live in hives built by humans. Over 40,000 can live in the one hive.
- Bumblebees build their nests in walls, on the ground, or, under the ground in a burrow. Nests can hold up to 250, but some bumblebees prefer to live on their own, they are solitary.
- Wild solitary bees build their own nest, a hole in a wall or a trunk of a tree, some underground.

Title	Bees v Wasps v Hoverfly	
Age	5-8	
Objective	To learn the difference between bee, wasp and hoverfly markings.	
Learning outcome	Identifying difference between the species.	
Skills development		
Strands	Painting and drawing	
Time Frame	1 hr, can be split over 2 class periods (30 min)	
Resources		
Video		
Graphics		
Assessment		

#### Background:

Bees can often be confused with wasps or hoverflies, which are very common in Ireland. They are all insects but their anatomy and markings are different. Bees and wasps come from the same family, they are about the same size, have 2 sets of wings, wasps tend to be more yellow than bees, Irish bees being mostly brown. Hoverflies are from a different family but mimic bee and wasp markings as a defence mechanism. They have no stinger and are not really dangerous to humans, unless eaten. We can identify them because they only have 1 pair of wings and their abdomen is flatter than bees and wasps.

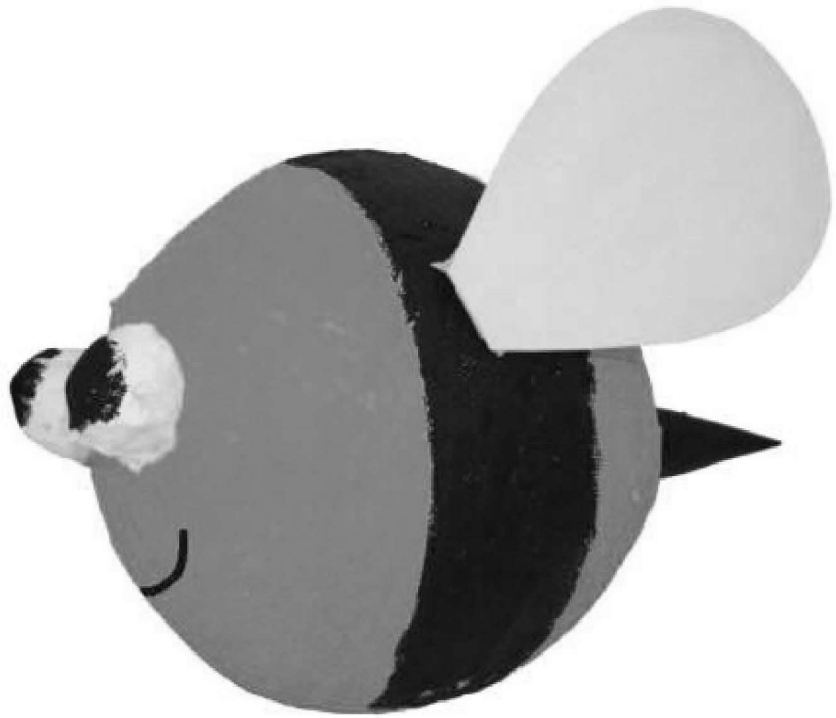
### **LEATHANAIGH GHNÍOMHAÍOCHTA:**

Sna leathanaigh sin ina dhiaidh seo, gheofar acmhainní atá ar fáil go réidh ar líne. Tá comhordú déanta ina leith anseo chun rochtain orthu a éascú, níl aon éileamh ag 'Saol Rúnda' orthu agus tá siad á dtairiscint chun críoch oideachais. Fanann gach ceart ina leith le sealbhóir an chóipchirt. Tá na gníomhaíochtaí seo ceaptha mar cheachtanna aonair agus ní leantar aon ord áirithe maidir leo.

DLTK's Crafts for Kids

# Bumblebee Paper Mache Craft

This is a relatively easy paper mache project that uses a balloon as the base. The project can be filled with candy and made into a pinata or it can just be used as a decoration.

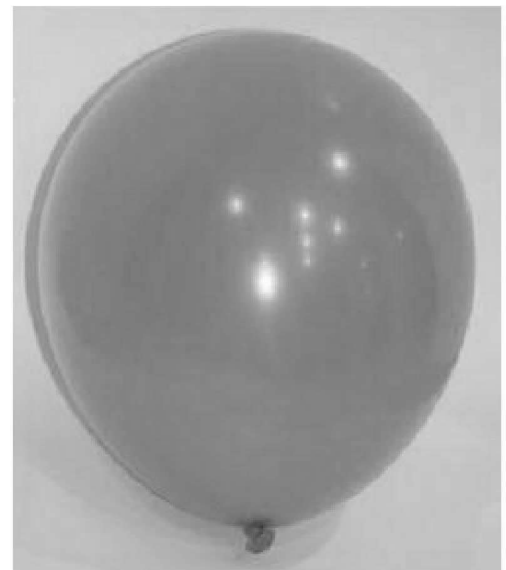


## Materials:

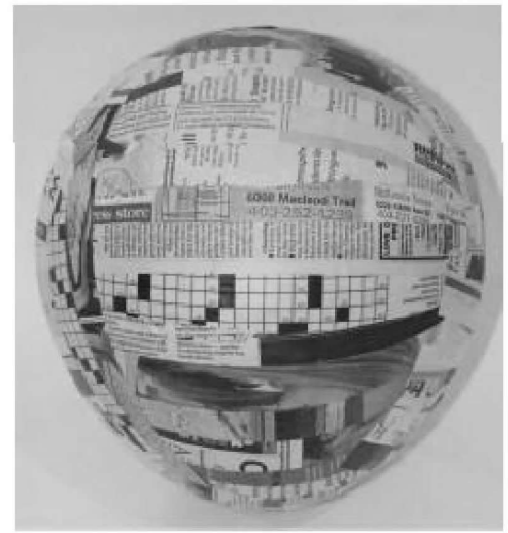
- 1 balloon
- tape
- newspaper ripped into strips
- flour
- glue,
- scissors,
- scrap paper for the eyes and stinger
  
- black, white and yellow paint,
- paint brush,
- white paper,
- cardboard.

## Instructions:

- Read the [tips to paper mache](#) for how to make paste and tricks on machining.
- Blow up one balloon all the way.



- Cover the entire bumblebee with 2 layers of paper mache. You MUST do this in one sitting -- if you half mache a balloon it will pop when the mache starts to dry.
- Let the project dry completely (12 to 24 hours depending on your humidity level). You can put a fan near it to speed up the drying.



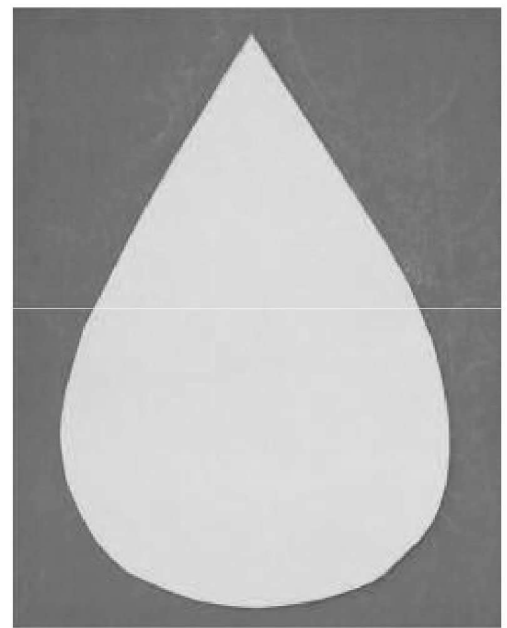
- If making a pinata:
  - cut an opening in the top of the bird. (Use a damp cloth to soften the mache if you have trouble cutting the opening).
  - Fill with candy or small toys.
  - Add a string or rubber band that is attached to the inside of the bird -- make sure you attach it inside but don't let it completely disappear when you paper mache (you'll use this string or rubber band to hang up your pinata).
  - Tape shut.

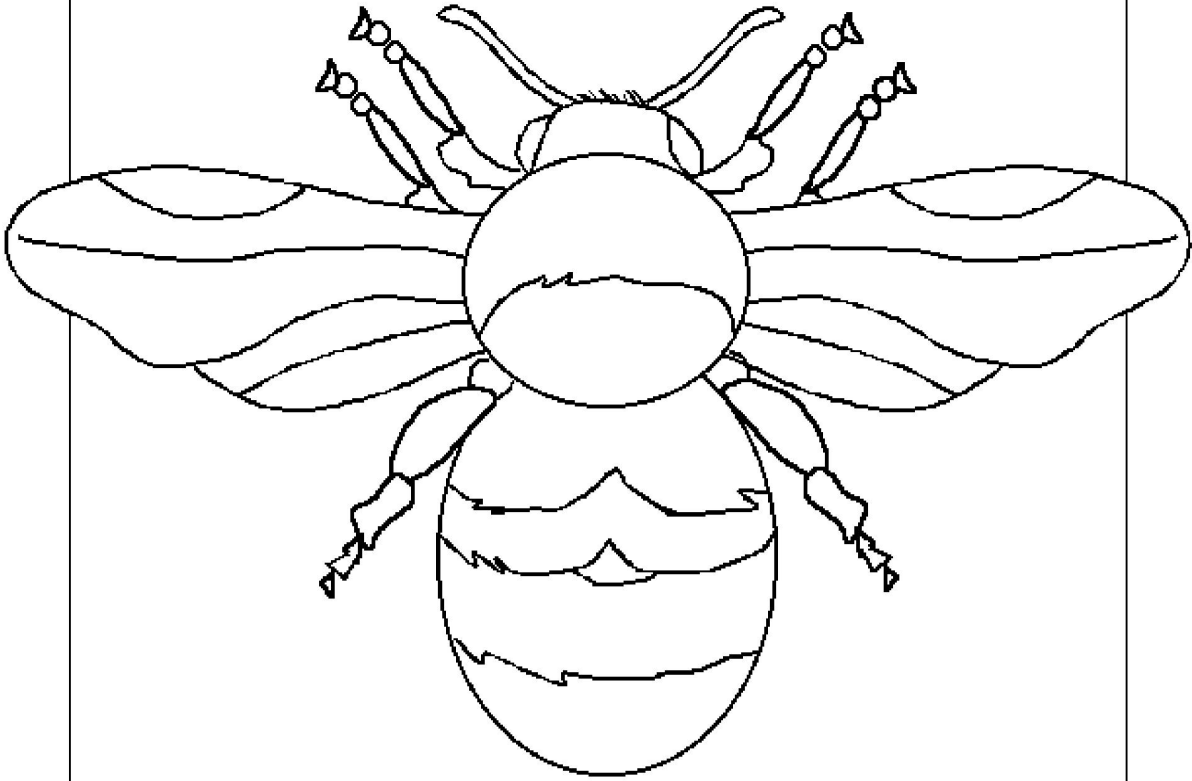


- Use scrap paper to make the eyes and the stinger. For the eyes scrunch up the paper like you are making a ball and tape them to the front of the paper mache'd balloon. For the stinger make a cone out of paper and tape it to the back of the paper mache'd balloon.
- Once dry, cover the entire bumblebee with 1 or 2 more layers of paper mache covering the eyes and stinger so it makes a bumblebee shape. I like to use scrap white paper or paper towel for this layer since it's easier to decorate. Don't let the paper mache be too wet or it may start to soak the project and cause it to crush. If this starts to happen, stop, let it dry and then continue.
- Let the project dry completely (12 to 24 hours depending on your humidity level). You can put a fan near it to speed up the drying.



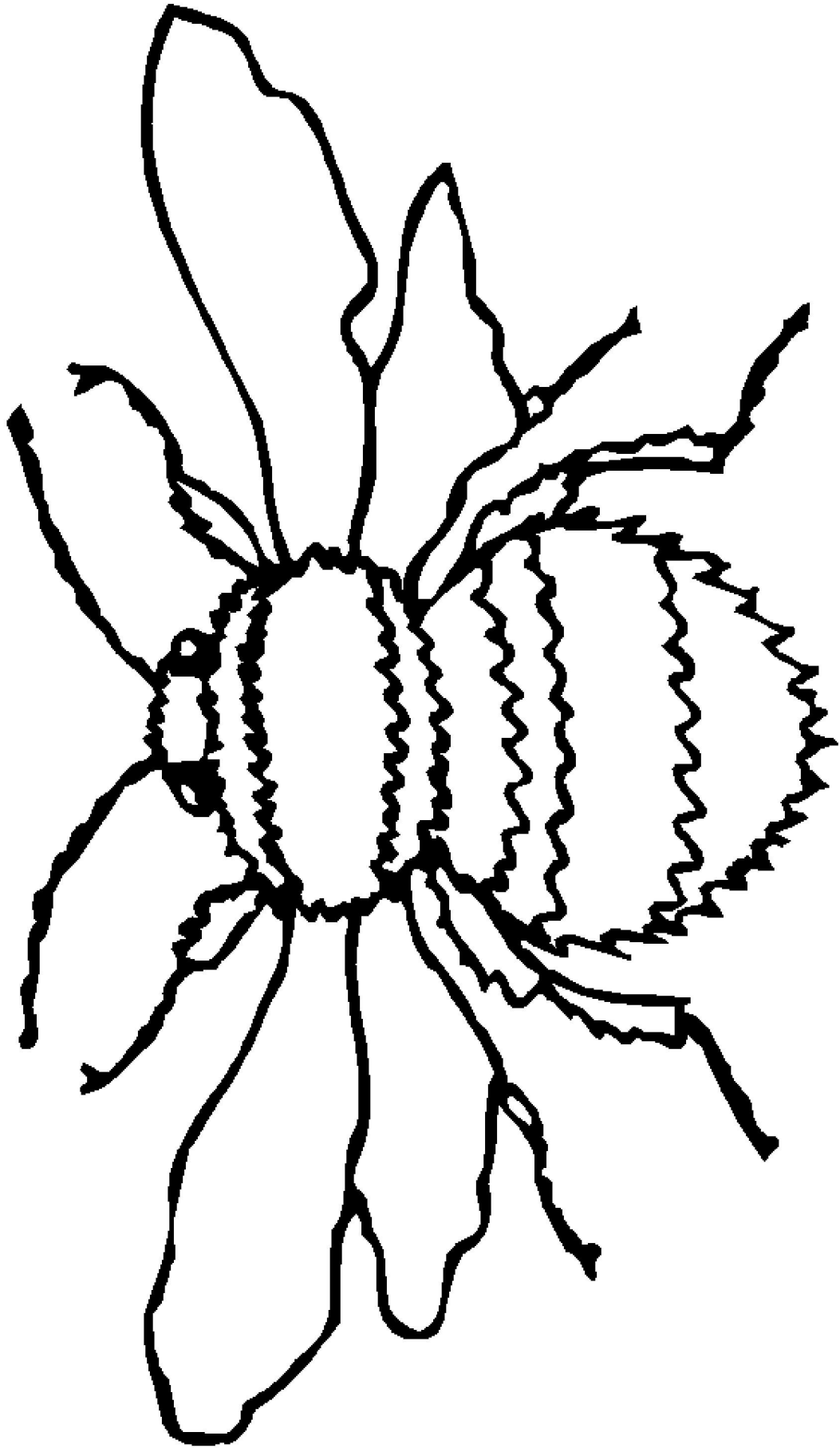
- Paint the project yellow and let dry.
- Paint a black stripe down the center of the bumblebee.
- Paint the stinger black and the eyes white with a black circle in the middle.
- Paint a black mouth onto the bumblebee.
- Cut out two wings from white paper or construction paper, they should be teardrop shaped. Glue them to the bumble bee where the wings would go. If you want your wings to be more sturdy, support them with cardboard or cardstock.





BUMBLE

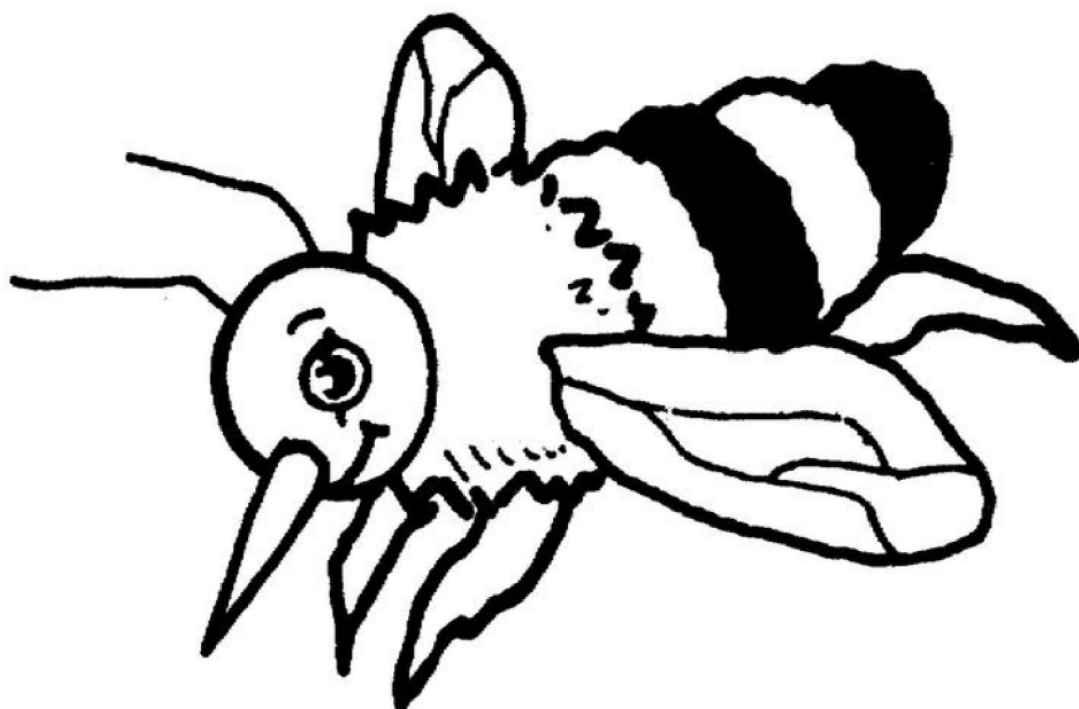
BEE





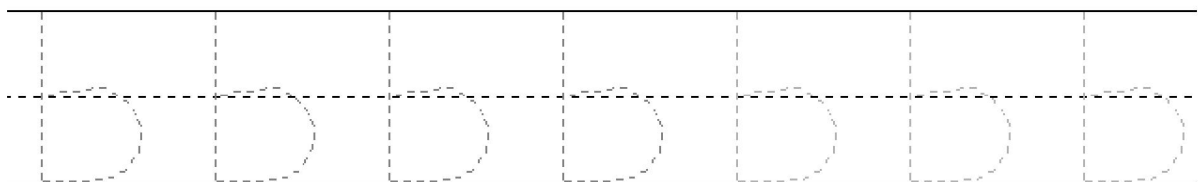
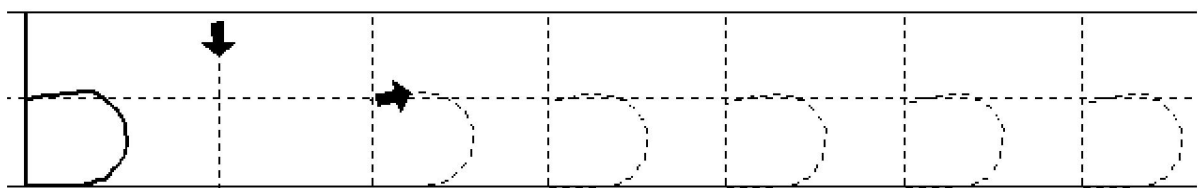
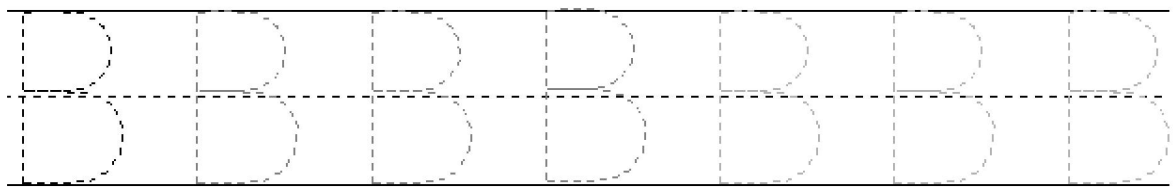
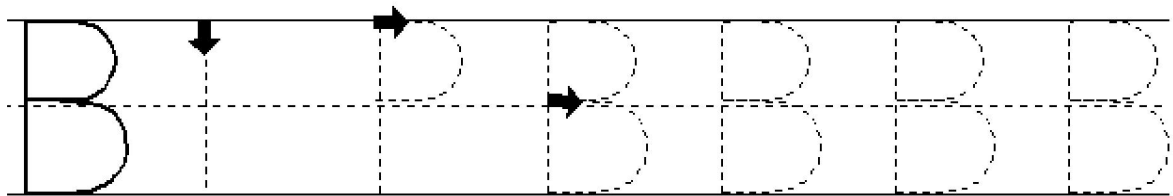
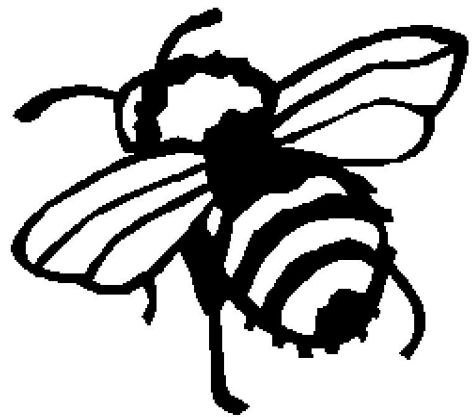
Bb is for  
Bumblebee

Bb



bee

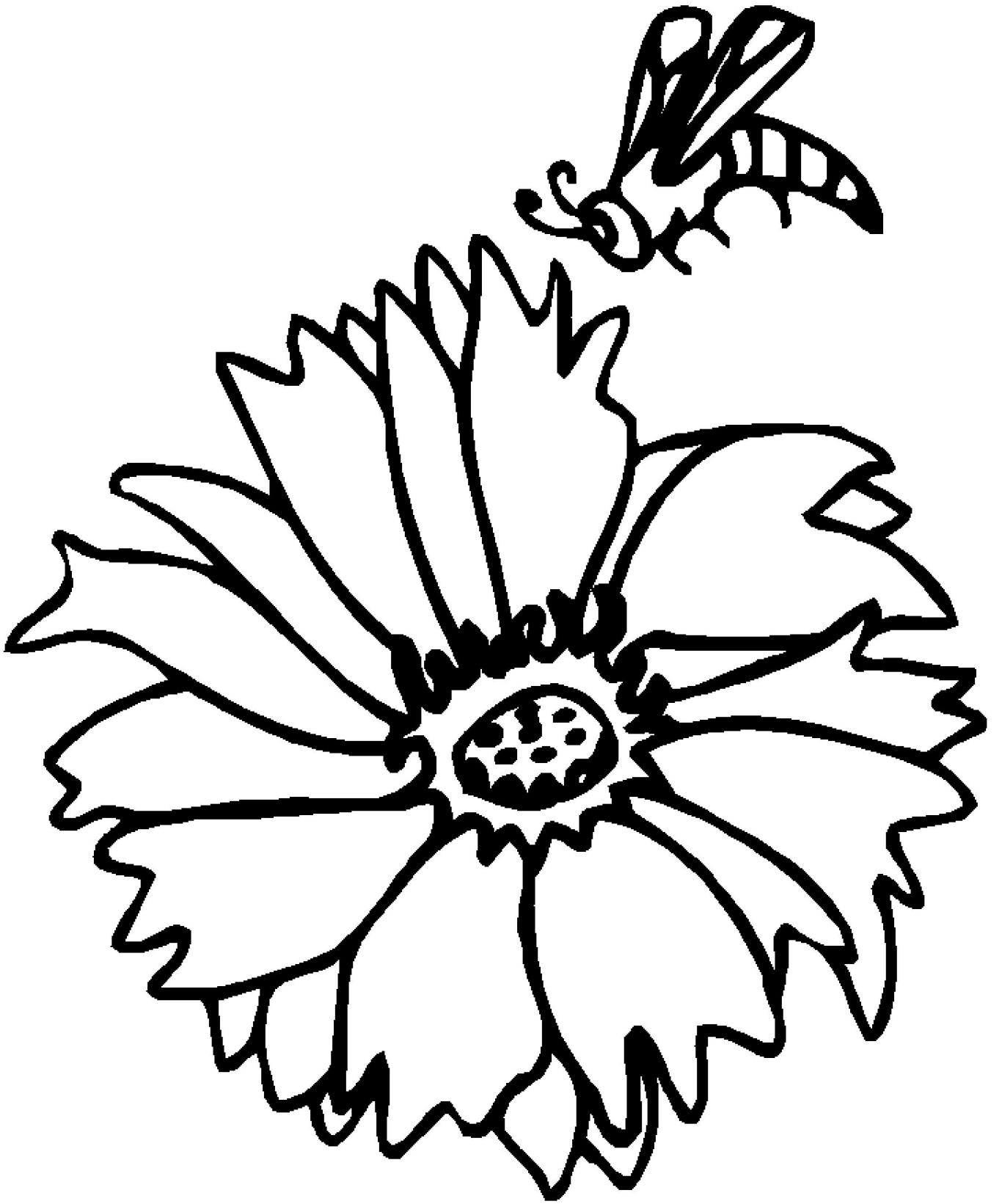
B IS FOR  
BUMBLEBEE

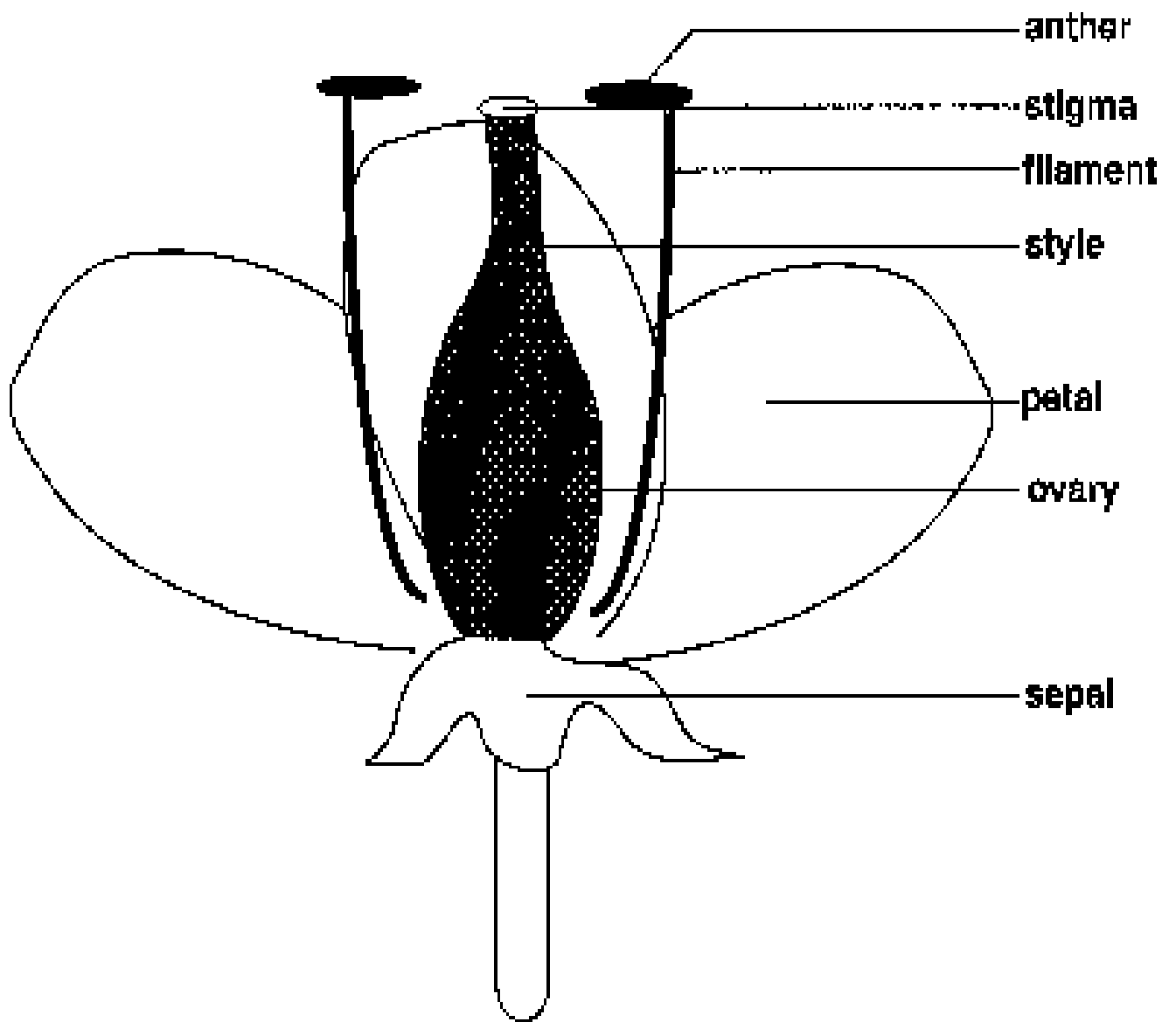


# Bb

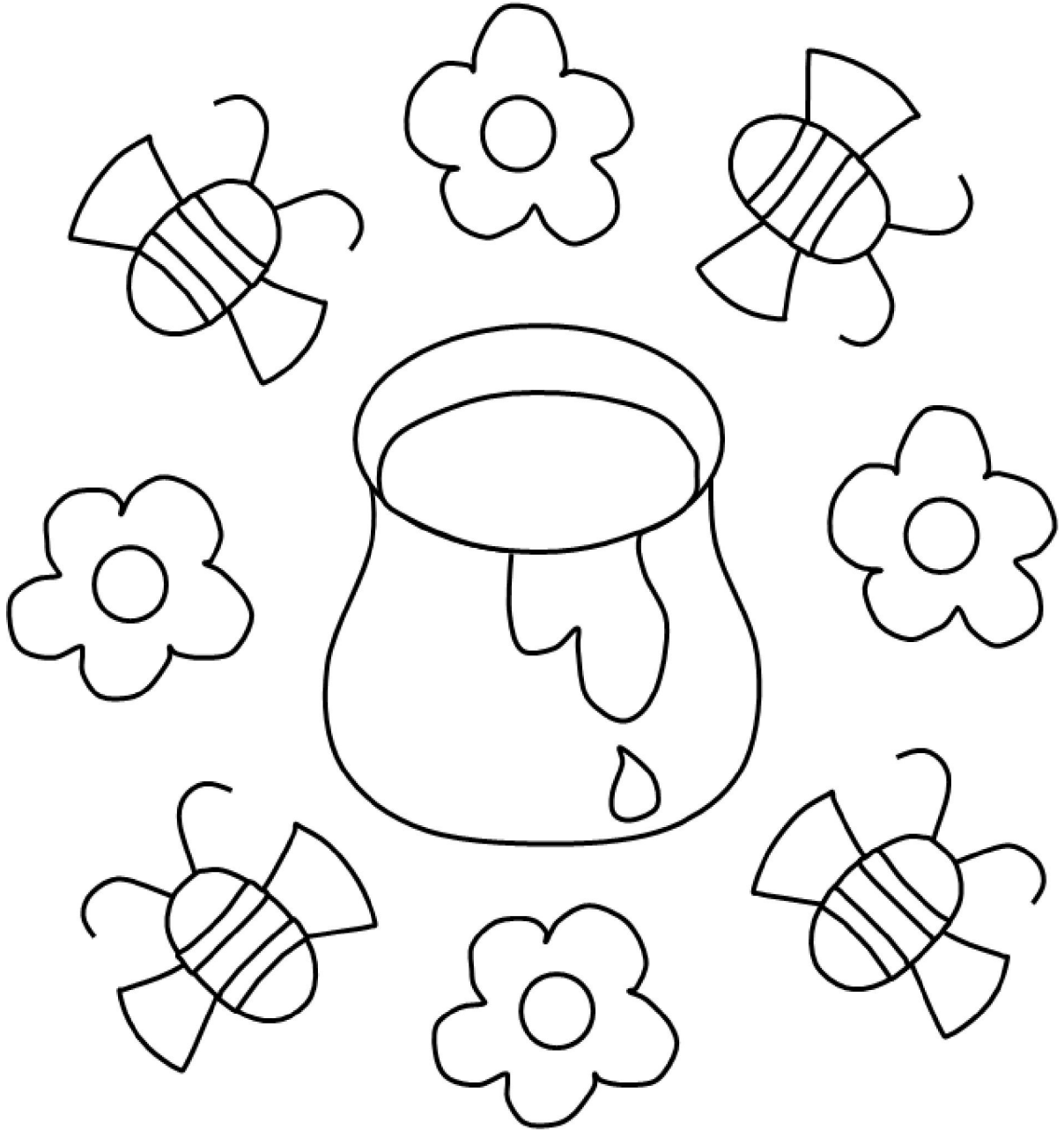


## Beehives

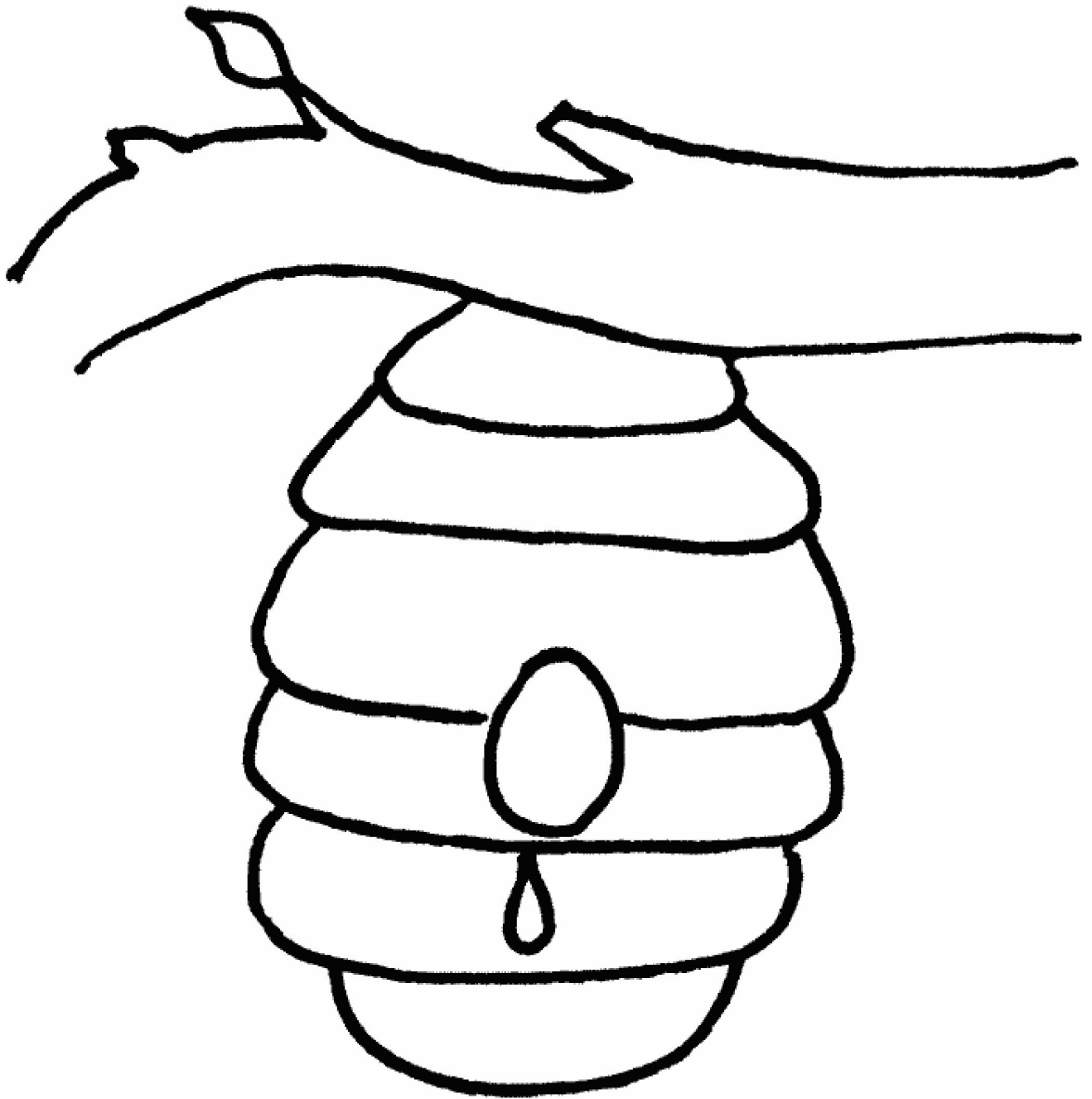


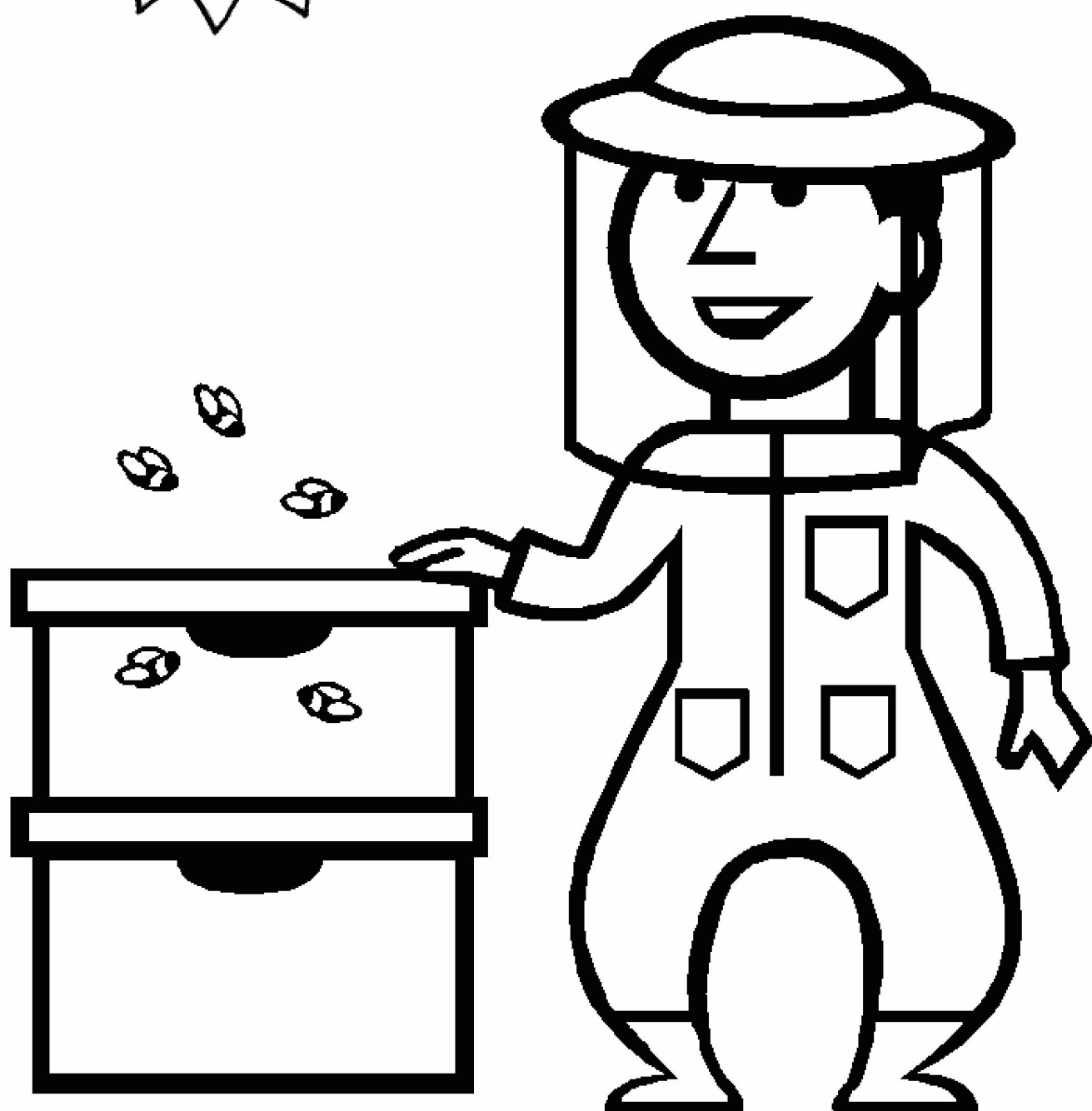
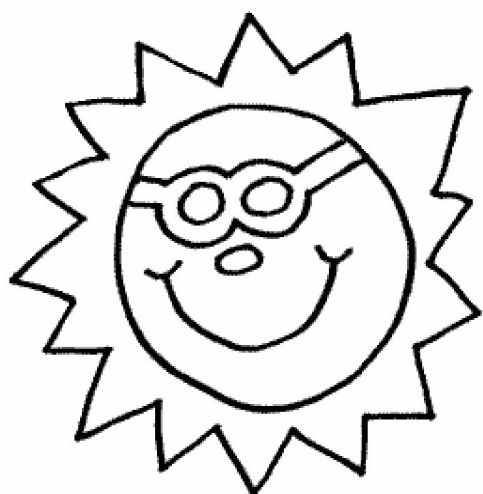


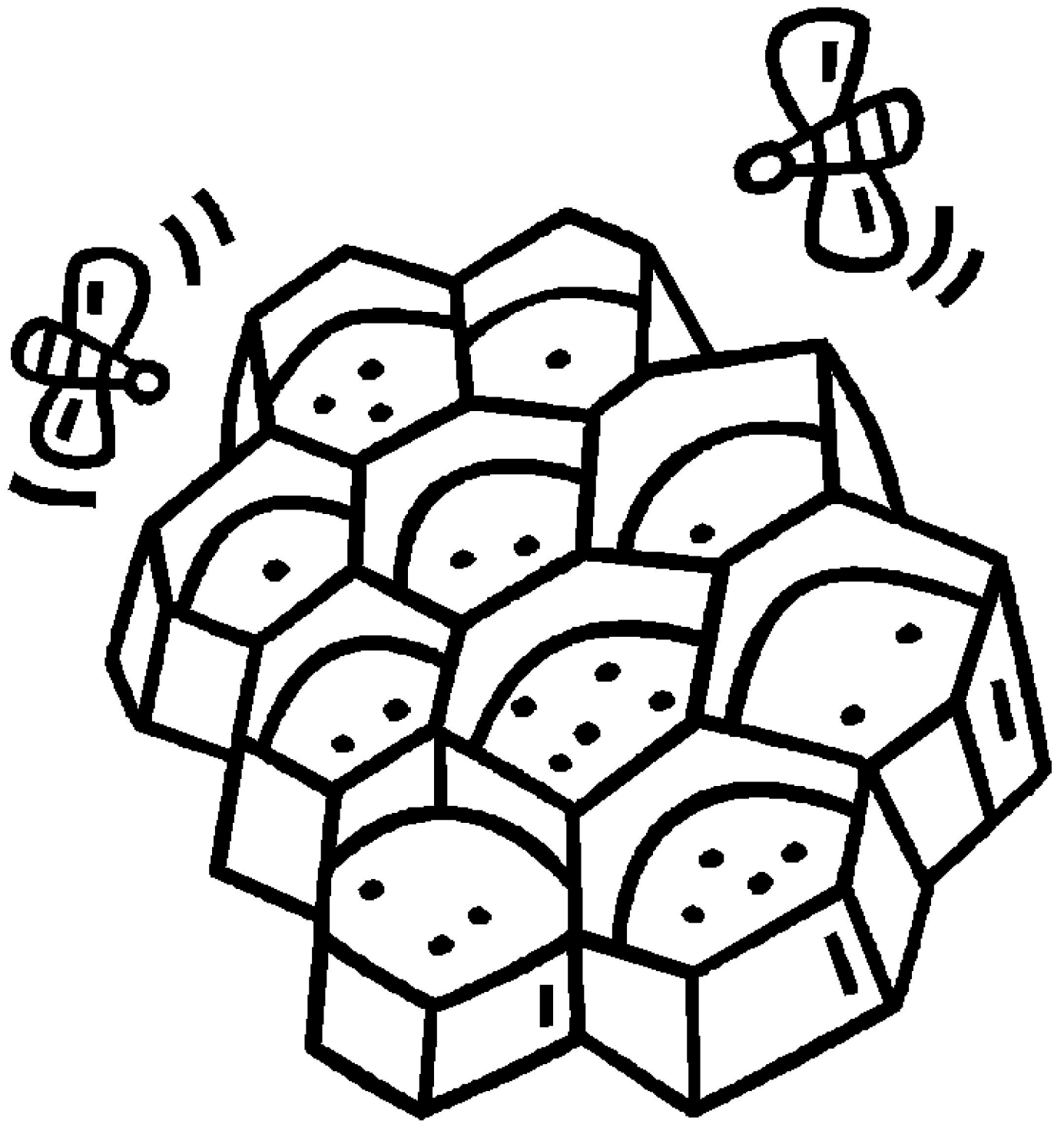
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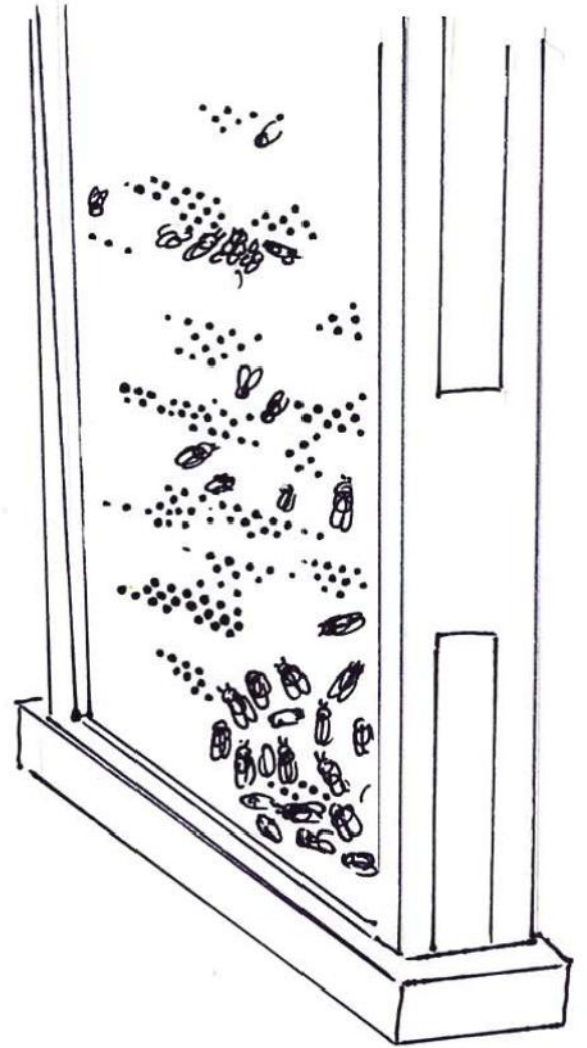
honey







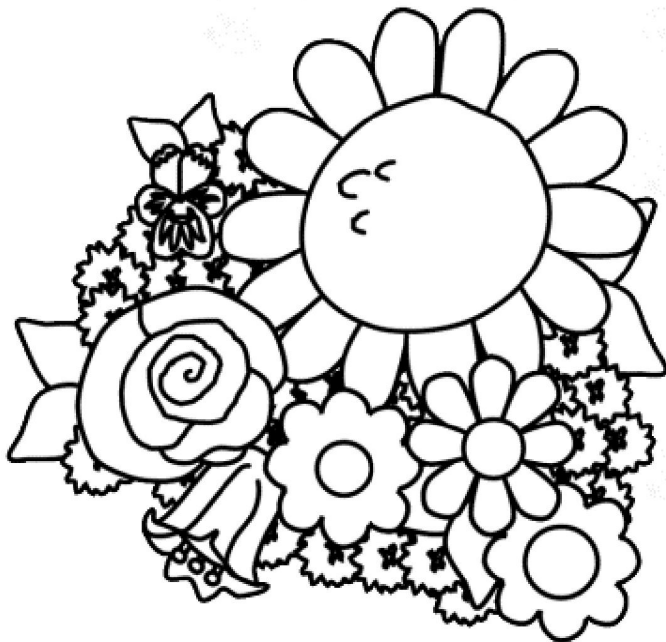
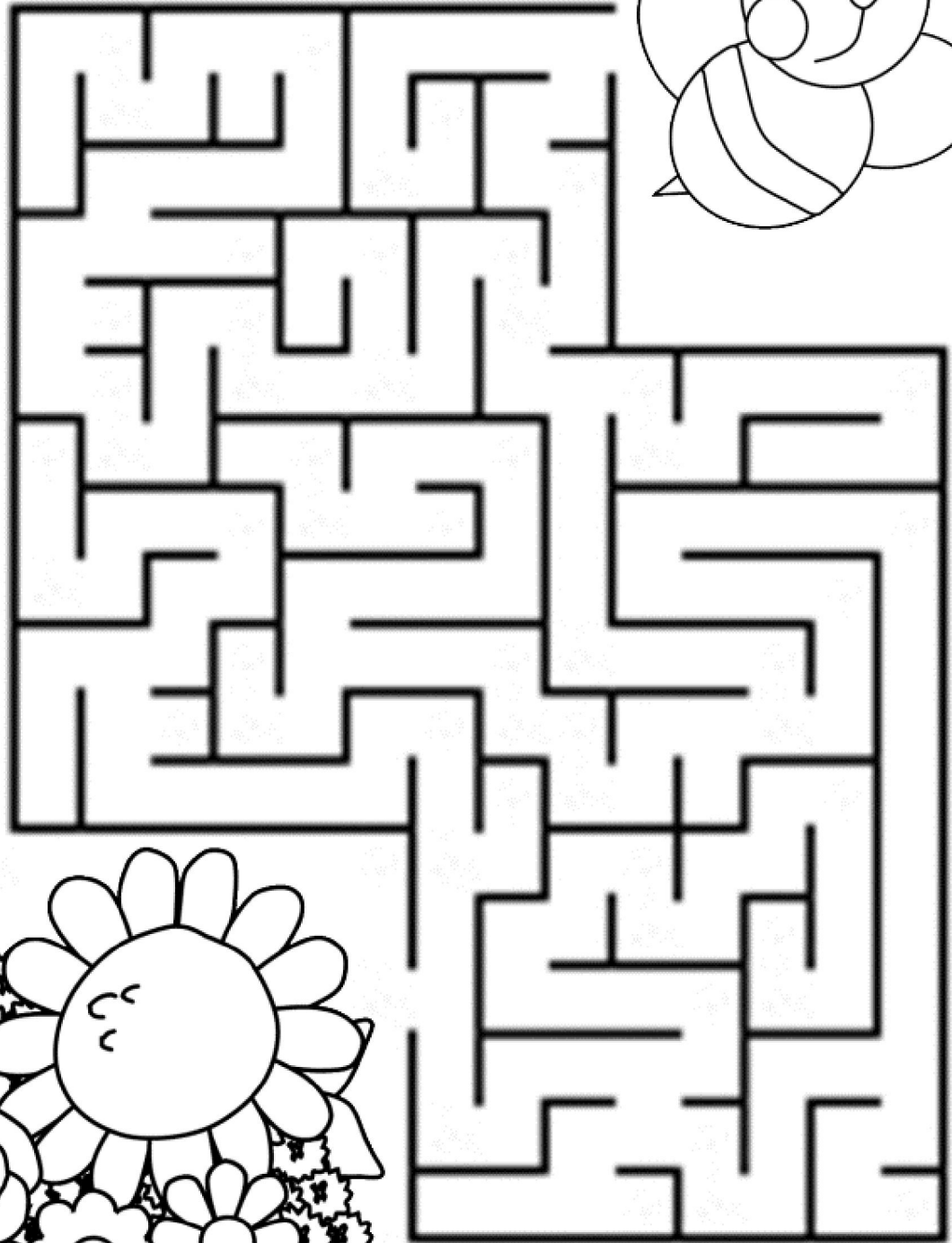
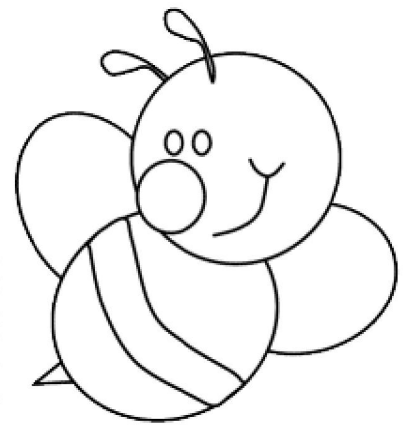
**Observation hives help  
introduce beekeeping to  
young people.**

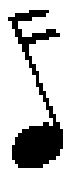




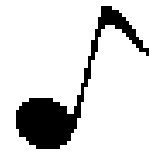
# Summer Maze

Help get the bumblebee find the flower garden.



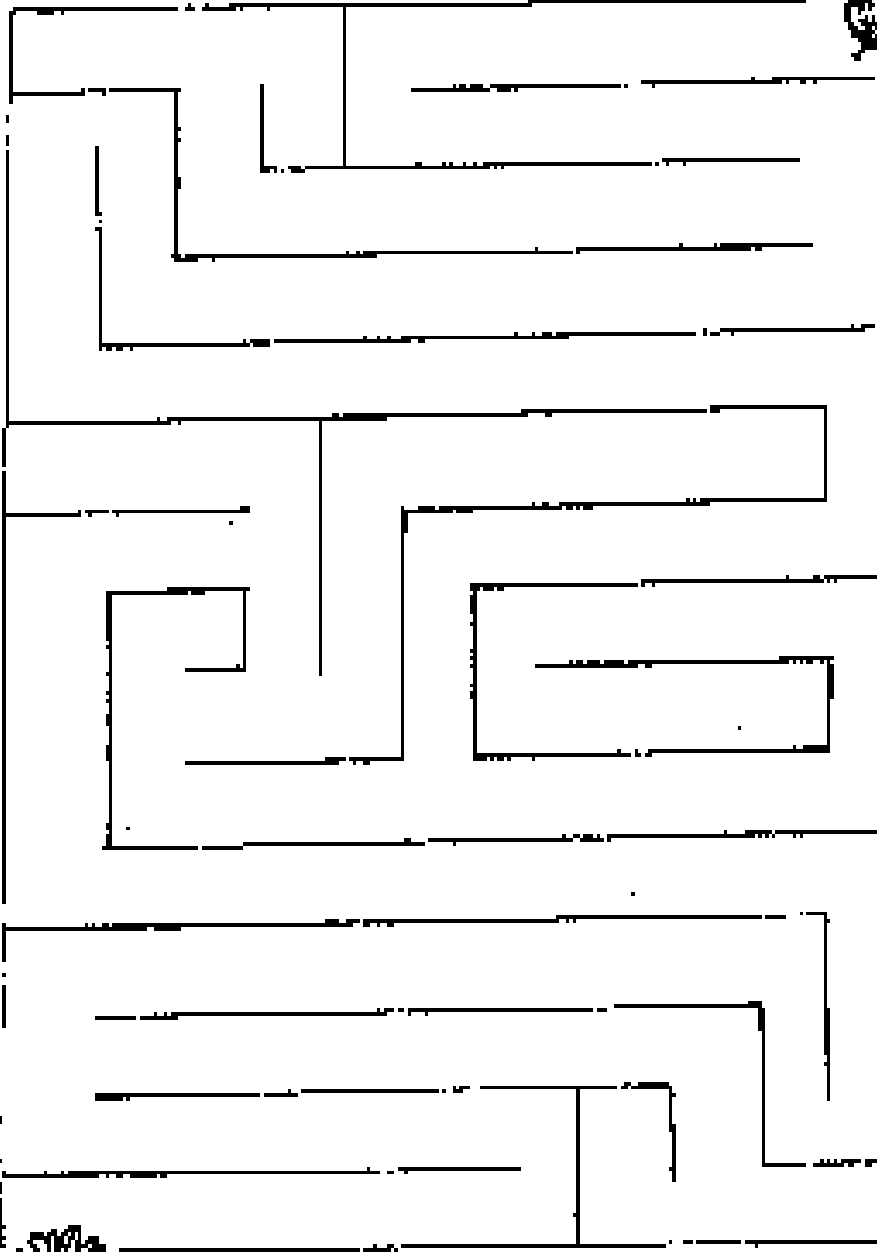


# Dancing Bees



Honey bees tell each other things by dancing. The dances tell worker bees where to find food.

This bee has lost her dancing friends! Help her find her way to the flower.



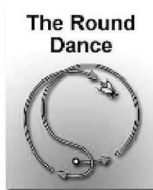


# Dances with Bees



A honeybee hive needs a lot of honey, and that means a lot of flower nectar. When a scout bee finds flowers, she (almost all bees are shes) goes back to the hive to tell the other bees where the flowers are. How does she tell them? She dances!

If a scout bee performs a Round Dance, the other bees know there are flowers very near the hive.



A Waggle Dance means there are flowers far from the hive. But where are they?

Can you do a dance that will explain where to find food? Give it a try!

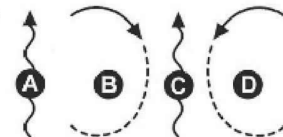
## Let's try a waggle dance!

### Here's what to do:

1. Pick a hive area in the room, where all the bees hang out.
2. Choose one person to be the scout bee. That person should secretly hide the flower somewhere in the room where no one can see it.
3. The scout bee goes back to the hive and performs a Waggle Dance that will tell the other bees where the food is. The diagram at right shows the dance steps.
4. Perform the dance so that the "waggle line" (steps A and C) points to the food. The speed of your waggle tells how far the food is -- waggle fast if the food is close (honeybees can waggle 15 times per second).
5. The other bees in the hive should observe the dance and then fly off to see if they can find the food. *Did the scout bee's dance help them find it?*
6. Next, have someone else try being the scout bee!

**Here's  
all you  
need**

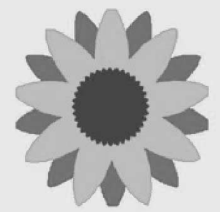
- at least one friend
- a flower (or a drawing of a flower)



### Here's more about bee dancing:

Inside a bee hive, where scout bees do their dancing, it is completely dark. So how do the other bees figure out the dance? They take turns holding on to the scout bee while she performs, and are able to feel what the dance is communicating. When the scout performs the dance quickly and includes lots of waggles, the flowers are very near the hive. The dance also shows what direction the food is. Performing it straight up the walls of the hive means the flowers are in the direction of the sun. If food is 30° to the right of the sun, the scouts perform the dance 30° to the right of straight up. It's kind of like a dance on a compass!

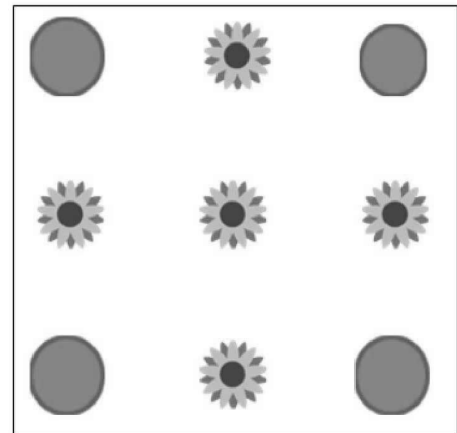
Copyright 2011. American Association for the Advancement of Science



## Pollen Game

### What you will need:

- A large open space, i.e. a games hall or garden
- Buckets or hula hoops (the flowers)
- Bean bags or small balls (the pollen)
- Teams of children (the worker bumblebees)
- One hula hoop per team (the nest)



### How to play:

1. Split the children into teams of equal size and give each team a hula hoop (a nest – blue in diagram).
2. Place hula hoops containing bean bags/ small balls around the hall, ideally an equal distance from each team's nest. These represent the flowers which contain the pollen (pink flowers in diagram).
3. Number the players in the team. When you shout out a number, the corresponding child from each team has to run to a flower, collect a piece of pollen and bring it back to the nest. Only one piece of pollen can be carried at a time. This is repeated until the pollen has run out.

The **aim of the game** is for each nest to collect as much pollen as possible before the pollen runs out. It is a race and the team with the most pollen in its nest at the end is the winner. Make the game easier/ harder by adding/ taking away pollen.

In nature bumblebees need pollen and nectar from flowers to survive. If the pollen or nectar was to run out the bees would eventually die. This is why it is really important that we plant lots of pollen- and nectar-rich flowers in our gardens; so that there are plenty of flowers throughout the year to feed all of the bees.

A **variation for this game** would be to replace the pollen (bean bags) with nectar (water) and give each team a cup/ jug to carry the nectar from the buckets (the flowers) back to their nests (also buckets). The team with the largest volume of water at the end of the game would be the winner. This variation would be best played outdoors.

Or, why not use bumblebee names instead of numbers for each team member.

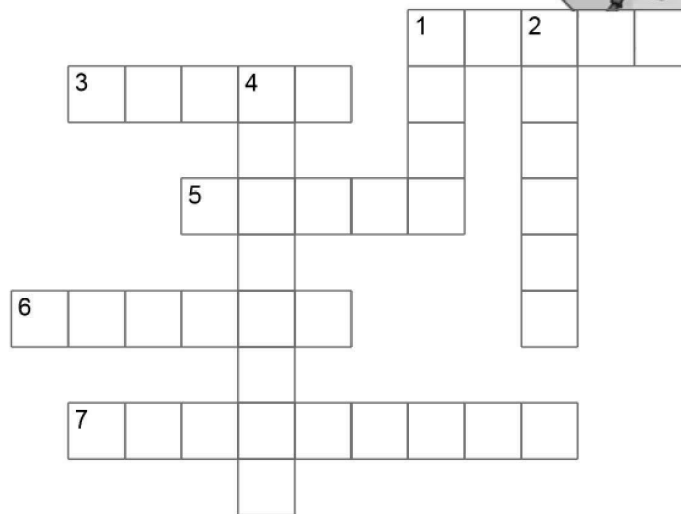
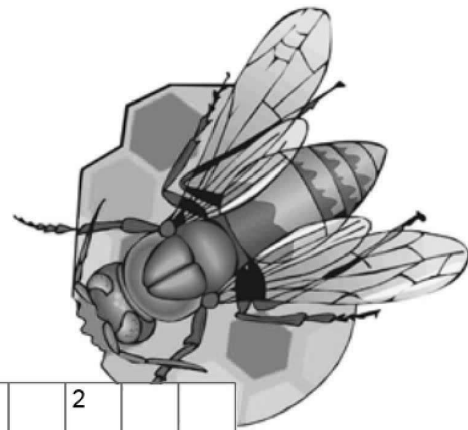


Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Bees Crossword Puzzle

Complete the activity.



### ACROSS

1. A sweet fluid produced by bees from nectar
3. Bees depend on this for their defense
5. Male bee whose only function is to mate with the queen
6. Dustlike cells of the anthers of flowers
7. Cells where honey is stored

### DOWN

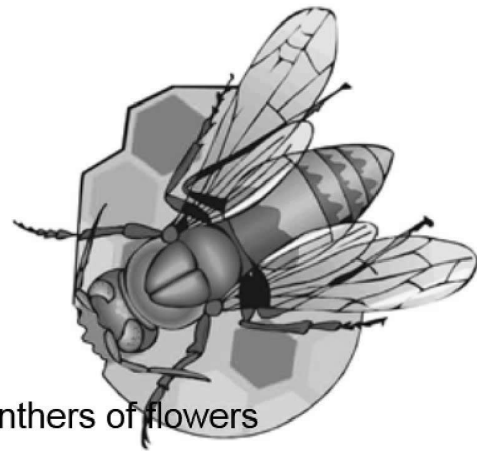
1. A structure for housing bees
2. Sweet liquid of flowers gathered by bees for making honey
4. ~~Worker~~ Worker bee that attend to the queen, the babies, or larvae of the hive

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Bees Vocabulary

Complete the activity.



1. \_\_\_\_\_ Dustlike cells of the anthers of flowers
2. \_\_\_\_\_ Male bee whose only function is to mate with the queen
3. \_\_\_\_\_ Worker bee that attend to the queen, the babies, or larvae of the hive
4. \_\_\_\_\_ Female bees who collect nectar and pollen from flowers
5. \_\_\_\_\_ A structure for housing bees
6. \_\_\_\_\_ Bees depend on this for their defense
7. \_\_\_\_\_ Cells where honey is stored
8. \_\_\_\_\_ Sweet liquid of flowers gathered by bees for making honey
9. \_\_\_\_\_ Female bee whose only job is to lay eggs
10. \_\_\_\_\_ A sweet fluid produced by bees from nectar

honey	nurse bee	honeycomb	hive
sting	drone	worker	nectar
queen	pollen		

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Bees Challenge

Complete the activity.



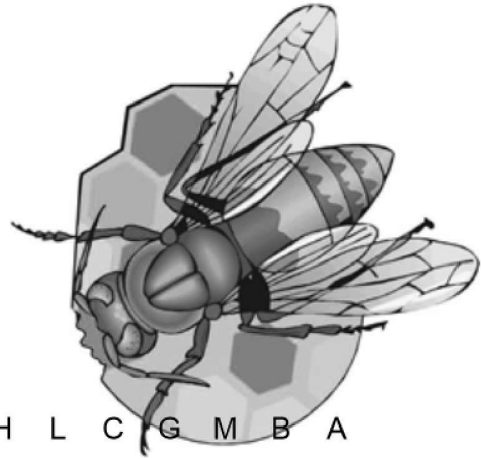
- \_\_\_ 1. Cells where honey is stored  
A. worker B. sting C. honeycomb D. hive
- \_\_\_ 2. A sweet fluid produced by bees from nectar  
A. nectar B. nurse bee C. honey D. drone
- \_\_\_ 3. Bees depend on this for their defense  
A. pollen B. sting C. nectar D. queen
- \_\_\_ 4. Sweet liquid of flowers gathered by bees for making honey  
A. drone B. worker C. honeycomb D. nectar
- \_\_\_ 5. Female bees who collect nectar and pollen from flowers  
A. honeycomb B. hive C. worker D. honey
- \_\_\_ 6. Male bee whose only function is to mate with the queen  
A. drone B. honeycomb C. sting D. honey
- \_\_\_ 7. A structure for housing bees  
A. queen B. hive C. pollen D. nectar
- \_\_\_ 8. Dustlike cells of the anthers of flowers  
A. pollen B. honeycomb C. sting D. hive
- \_\_\_ 9. Female bee whose only job is to lay eggs  
A. queen B. drone C. sting D. honeycomb
- \_\_\_ 10. Worker bee that attend to the queen, the babies, or larvae of the hive  
A. nurse bee B. honey C. nectar D. hive

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Bees Word Search

Complete the activity.



Y D Q U E E N B G W H L C G M B A  
R W R W R S F W Z B Q M M T I M R  
R W A O A H I X S W M J I B U O O  
B Y D D N Z M S O A P T H P K J B  
E I V F L E X R O C W N B O T T O  
B N K E B M K V P H F C E S N V Q  
O M V B H E R O O P Z Y P F D E N  
Z I P H R P L N S K P V S M C U Y  
D H G N D L E C W C K O W C R U N  
Y E U S E Y B H N K N V L S X M Y  
F C I N C F F X V E L T E V O W H  
Y E D O S Y Z P Z M C B R Y Q I N  
T F M U O O K J M U E T A A V L Q  
Q B Y K Q X L I T E L N A E F G P  
K W M R B L K E D Q N S V R W H N  
N T F B W Y Z X H E B V K J A I W  
J D D S T I N G N N T E P T R S M

pollen  
honey  
hive  
worker

nectar  
sting  
nurse bee

drone  
honeycomb  
queen

# Honey Bee Stinging Apparatus

