Examples of Grimm's Law (not exhaustive!).

Note that (1) PIE palatals and velars always have the same outcomes, and (2) labiovelars are delabialized next to u-vowels and immediately before obstruents.

1) Voiceless stops became voiceless fricatives.

• *p > *f:

PIE *pṓds 'foot (nom. sg.)' (cf. Skt. *pā́t,* Doric Gk. πώς /pɔ́:s/) > PGmc. *fōt- > Goth. *fotus,* ON *fótr,* OE *fōt,* OHG *fuoʒ;*

PIE *péḱu 'cattle, property' (cf. Skt. *páśu,* Lat. *pecū*) > PGmc. *fehu > Goth. *faíhu,* ON *fé,* OE *feoh,* OHG *fihu;*

PIE *peḱ- 'to comb' (cf. Gk. πέκειν /péke:n/; Lith. *pèšti* 'to pluck'), extended *peḱ-t- (cf. Lat. *pectere*) > PGmc. *fehtaną 'to fight' (!; but the Lat. verb can also mean 'to thrash (someone)') > OE *feohtan,* OHG *fehtan;*

PIE *pélh₁u 'much (neut.)' (cf. OIr. *il;* Skt. *purú,* Gk. πολύ /polú/ with remodelled ablaut) > PGmc. *felu > Goth., OHG *filu,* ON *fjǫl-;* cf. OE *fela* with oblique ending;

PIE *pl̥h₁nós 'full' (cf. Skt. *pūrṇás,* Lith. *pìlnas*) > PGmc. *fullaz > Goth. *fulls,* ON *fullr,* OE *full,* OHG *fol;*

PIE *pr̥Hmós 'first' (cf. Lith. *pìrmas;* parallel *pr̥Hwós in e.g. Skt. *pū́rvas,* Toch. B *pärweṣṣe*) >→ PGmc. *fruma-n- > Goth. *fruma,* OE *forma;*

PIE *pórḱos 'pig' (cf. Lat. *porcus;* Lith. *par̃šas* 'barrow') > PGmc. *farhaz 'piglet' > OE *fearh,* OHG *farah;*

PIE *pénkʷe 'five' (cf. Skt. *páñca,* Gk. πέντε /pénte/) > PGmc. *fimf > Goth., OHG *fimf,* ON *fimm,* OE *fīf;* the word-final labial is puzzling;

PIE *paw- 'few' (cf. Lat. pl. *paucī* with k-suffix) > PWGmc. pl. *fawai > Goth. *fawai,* ON *fáir* (with added ending), OE *fēawe,* OHG *fowe;*

PIE *péh₂wr̥ 'fire' (cf. Hitt. *pahhur*), collective *péh₂wōr → *ph₂uṓr (cf. Toch. B *puwar*), oblique stem *ph₂un-´ (remodelled in Gk. πυρ- /pur-/) >→ PGmc. *fōr, *fun- >→ Goth. *fon, funin-,* ON *fúrr* (poetic), OE *fӯr,* OHG *fuïr;*

PIE *pró 'in front, forward' (cf. Skt. *prá,* Gk. πρό /pró/) > PGmc. *fra- > Goth. *fra-,* OE *for-;*

PIE *préwseti 'it burns' (cf. Skt. *plóṣati;* derived noun *pruṣvā́* 'hoarfrost') > PGmc.
  *friusidi 'it freezes' > OE *frīest,* OHG *friusit;* ON *frýss* with ending replaced;

PIE *priHós 'beloved' (cf. Skt. *priyás*) > PGmc. *frijaz 'free' > Goth. *freis,* OE *frīo,*
  OHG *frī;*

PIE *plékteti '(s)he plaits' (cf. Lat. *plectit,* OCS *pletetŭ*) > PGmc. *flihtidi > OHG
  flihtit;

PIE *swépnos 'sleep' (cf. Skt. *svápnas,* Lat. *somnus*) > PGmc. *swefnaz 'sleep, dream' >
  ON *svefn,* OE *swefn;*

PIE *népōts 'grandson' (cf. Lat. *nepōs,* Skt. *nápāt*) >→ PGmc. *nefō̄ 'grandson, nephew'
  (remodelled as an n-stem) > ON *nefi,* OE *nefa,* OHG *nefo;*

PIE *klep- 'to steal' (cf. Gk. κλέπτειν /klépte:n/; Old Prussian *auklipts* 'hidden', OCS
  poklopŭ 'cover') > PGmc. *hlefaną > Goth. *hlifan;*

PIE *Hréwpeti '(s)he will break' (aor. subj.; the present was nasal-infixed, cf. 3sg. Lat.
  rumpit, Skt. *lumpáti*) > PGmc. *riufidi '(s)he tears' >→ ON *rýfr* (with ending
  replaced);

PIE *kápros 'male (animal)' (cf. Gk. κάπρος /kápros/ 'boar', Lat. *caper* 'he-goat') >
  PGmc. *hafraz 'he-goat' > ON *hafr,* OE *hæfer;*

PIE *tetórpe '(s)he enjoys' (cf. Skt. 3pl. *tātṛpúr* 'they are satisfied'; root *terp-, cf. Gk.
  τέρπεσθαι /térpesthai/ 'to enjoy oneself') >→ PGmc. *þarf '(s)he needs' >
  Goth., ON *þarf,* OE *þearf,* OHG *darf.*

• *t > *þ:

PIE *túH 'you' (nom. sg.; cf. Lat. *tū,* Vedic Skt. *tuv-ám*) > PGmc. *þū > Goth., OE
  þū, ON *þú,* OHG *dū;*

PIE *tóm 'that' (acc. sg. masc.; cf. Skt. *tám,* Gk. τόν /tón/) >→ PGmc. *þanō̄ > Goth.
  þana, OE *þone;*

PIE *tód 'that' (neut.; cf. Skt. *tát,* Gk. τό /tó/) > PGmc. *þat > ON *þat,* OE *þæt,* OHG
  daʒ;

PIE *tórmos 'borehole' (cf. Greek τόρμος /tórmos/ 'socket') > PGmc. *þarmaz
  'intestine' > ON *þarmr,* OE *þearm,* OHG *darm;*

PIE *tonéyeti '(s)he extends (it)' (cf. Skt. *tānáyati*) >→ PGmc. *þaniþi '(s)he stretches
  (it)' > OE *þeneþ,* OHG *denit;* Goth. *ufþanjiþ sik* 'strives for' has levelled *j* in
  from other forms, while the ending of ON *þenr* has been replaced;

PIE *ténh₂u-s ~ *tn̥h₂éw-, fem. *tn̥h₂éw-ih₂ ~ *tn̥h₂u-yéh₂- 'thin' (cf. Lat. *tenuis*) >→
  *tn̥h₂ús, fem. *tn̥h₂wíh₂ (cf. Skt. *tanús, tanvī́*) > *þunuz, *þunwī >→ PGmc.
  *þunnuz, *þunnī > ON *þunnr,* OE *þynne,* OHG *dunni;*

PIE *teg- 'to cover' (cf. Lat. *tegere*) in (post-)PIE *togom 'roof' > PGmc. *þaką > ON
  þak, OE *þæc,* OHG *dah;* similar semantics in Lat. *tēctum,* OIr. *tugae;*

PIE *tetórpe '(s)he enjoys' (cf. Skt. 3pl. *tātr̥púr* 'they are satisfied'; root *terp-, cf. Gk.
  τέρπεσθαι /térpestʰai/ 'to enjoy oneself') >→ PGmc. *þarf '(s)he needs' >
  Goth., ON *þarf,* OE *þearf,* OHG *darf;*

PIE *tríns 'three (acc. masc.)' (cf. Skt. *trī́n,* Lat. *trīs*) > PGmc. *þrinz > Goth. *þrins,*
  OHG *drī;* cf. ON *þrjá,* OE *þrīe* with added endings;

PIE *treb- ~ *tr̥b- 'building' (cf. OIr. *atreba* '(s)he dwells'; secondary zero grade in Lat.
  trabs 'beam') in PGmc. *þurpą 'farmstead, village' > ON *þorp,* OHG *dorpf;*
  Goth. *þaúrp* 'field';

(post-)PIE *tong- 'to percieve, to think' (cf. dialectal Lat. *tongitiō* 'nōtiō, idea', OIr.
  tongid '(s)he swears') > PGmc. *þank- in *þankijaną 'to think' > Goth.
  þagkjan, OE *þenċan,* OHG *denken;* ON *þekkja* 'to perceive'; *þank- 'thanks' >
  ON *þǫkk,* OE *þanc,* OHG *dank;*

PIE *bʰréh₂tēr 'brother' (cf. Skt. *bʰrā́tā,* Lat. *frāter*) > PGmc. *brōþēr > Goth. *broþar,*
  ON *bróðir,* OE *brōþor,* OHG *bruoder;*

PIE *kátus 'fight' (cf. OIr. *cath* 'battle'; Luvian *kattawatnallis* 'plaintiff') > PGmc.
  *haþuz 'battle' > OE *heaþu-,* OHG *hadu-;* ON *Hǫðr,* name of the god of battle;

PIE *kʷóteros 'which (of two)?' (cf. Gk. πότερος /póteros/; Skt. *katarás*) > PGmc.
  *hʷaþeraz > Goth. *hʷaþar,* OE *hwæþer;*

PIE *nítyos '(one's) own' (cf. Skt. *nítyas*) > PGmc. *niþjaz 'relative, kinsman' > Goth.
  niþjis, ON *niðr;* OE pl. *niþþas* 'men';

PIE *ánteros 'other (of two)' (apparently a derivative of *ályos 'other' with an archaic *l
  ~ *n alternation) > PGmc. *anþeraz > Goth. *anþar,* ON *annarr,* OE *ōþer,* OHG
  ander;

PIE *wértetor 'it turns' (cf. Lat. *vertitur,* Skt. *vártate*) >→ PGmc. *wirþidi '(s)he
  becomes' > Goth. *waírþiþ,* OE *wierþ,* OHG *wirdit.*

• ***Ḱ and *k > *h:**

PIE *Ḱím 'this' (acc. sg. masc.; cf. Lith. *šį̃*) >→ PGmc. *hinǭ > OE *hine* 'him', Goth.

(*und*) *hina* (*dag*) '(until) this (day)';

PIE *ḱérd- ~ *ḱr̥d- 'heart' (cf. Lat. *cord-,* Lith. *širdìs*) >→ PGmc. *hertan- > Goth. *haírto,* ON *hjarta,* OE *heorte,* OHG *herza;*

PIE *ḱéleti '(s)he hides (it)' (OIr. *celid,* Lat. cpd. *occulit;* for the palatal cf. Skt. *śaraṇás* 'protecting') > PGmc. *hilidi > OE *hilþ,* OHG *hilit;*

PIE *ḱey- 'to be lying down' (cf. pres. 3sg. Skt. *śéte,* Gk. κεῖται /kêitai/) in *ḱóymos 'resting place' > PGmc. *haimaz 'settlement' > ON *heimr* 'world', OE *hām* 'home'; Goth. *haims* 'village' has been remodelled as an i-stem, but note a-stem pl. *haimos* 'countryside';

PIE *ḱonk- 'to hang' (cf. Hitt. pres. 3sg. *gānki;* Skt. *śáṅkate* 'is indecisive, worries') > PGmc. *hanhaną > OE *hōn,* OHG *hāhan;* Goth. *hāhan* 'to suspend (judgment)';

PIE *ḱlew- 'to hear' with derivs. *ḱléwmn̥ 'hearing', *ḱléwtrom 'means of hearing' (cf. Skt. *śrav-, śrótram* 'ear', Av. *srauu-, sraoma, sraoθrəm* 'singing') > PGmc. *hleuman- 'hearing', *hleuþrą 'noise' > Goth. *hliuma,* OE *hlēoþor,* OHG *hliodar;*

(post-)PIE *ḱr̥n- 'horn' (cf. Skt. *śr̥ṅgam,* Lat. *cornū;* see Nussbaum, *Head and Horn* pp. 11-4) >→ PGmc. *hurną > Runic Norse *horna,* Goth. *haúrn,* ON, OE, OHG *horn;*

PIE *kaw(H)- 'to chop' (cf. Lith. *káuti* 'to beat, to chop, to kill', Toch. B /kaw-/ 'kill') > PGmc. *hawwaną > ON *hǫggva,* OE *hēawan,* OHG *houwan;*

PIE *kátus 'fight' (cf. OIr. *cath* 'battle'; Luvian *kattawatnallis* 'plaintiff') > PGmc. *haþuz 'battle' > OE *heaþu-,* OHG *hadu-;* ON *Hǫðr,* name of the god of battle;

PIE *kusdʰo- 'treasure' (cf. Lat. *custōs* 'guardian', Gk. κύσθος /kústʰos/ 'vulva') > PGmc. *huzdą > Goth. *huzd,* ON *hodd,* OE *hord,* OHG *hort;*

PIE *kóryos 'detachment' (OIr. *cuire* 'company'; Lith. *kãrias* 'army') > PGmc. *harjaz 'army' > Goth. *harjis,* ON *herr,* OE *here,* OHG *heri;*

PIE *klep- 'to steal' (cf. Gk. κλέπτειν /klépteːn/; Old Prussian *auklipts* 'hidden', OCS *poklopŭ* 'cover') > PGmc. *hlefaną > Goth. *hlifan;*

PIE *kl̥Hnís 'hill' (cf. Lat. *collis;* Lith. *kálnas* < *kólHnos) > PGmc. *hulliz > OE *hyll;*

(post-)PIE *káykos 'one-eyed' (cf. OIr. *cáech;* Lat. *caecus* 'blind') > PGmc. *haihaz > Goth. *haihs;*

(post-)PIE *kólsos 'neck' (cf. OLat. *collus,* Lat. *collum*) > PGmc. *halsaz (cf. Goth., ON,

OHG *hals,* OE *heals;*

PIE *péḱu 'cattle, property' (cf. Skt. *páśu,* Lat. *pecū*) > PGmc. *fehu > Goth. *faíhu,* ON
fé, OE *feoh,* OHG *fihu;*

PIE *déḱm̥d 'ten' (cf. Skt. *dáśa,* Lat. *decem,* Lith. *dẽšimt*) > PGmc. *tehun > Goth.
taíhun, ON *tíu,* OE *tīen,* OHG *zehan;*

PIE *swéḱuros 'father-in-law' (cf. Skt. *śváśuras,* Lat. *socer*) > PGmc. *swehuraz > OE
swēor, OHG *swehur;* cf. Goth. *swaíhra* with remodelled ending;

PIE *deyḱ- 'point (at)' (cf. Gk. δεικνύναι /deiknúnai/ 'to show', Lat. *dīcere* 'to say') >
PGmc. *tīhaną 'to declare' > Goth. *gateihan* 'to proclaim'; OE *tīon,* OHG
zīhan, both 'to accuse';

PIE *pórḱos 'pig' (cf. Lat. *porcus;* Lith. *par̃šas* 'barrow') > PGmc. *farhaz 'piglet' >
OE *fearh,* OHG *farah;*

PIE *lówkos 'clearing' (cf. Lith. *laũkas* 'field', Lat. *lūcus* 'grove') > PGmc. *lauhaz >
OE *lēah* 'meadow', OHG *lōh* 'copse, grove';

(post-)PIE *déwketi '(s)he leads' (cf. Lat. *dūcit*) > PGmc. *tiuhidi '(s)he leads, (s)he
pulls' > Goth. *tiuhiþ,* OE *tīehþ,* OHG *ziuhit;*

post-PIE *márkos 'horse' (cf. Welsh *march*) > PGmc. *marhaz > ON *marr,* OE *mearh*
(both poetic); cf. OHG *marahscalc* 'horse-servant'.

• ***kʷ and *Ḱw > *hʷ (*h when delabialized):**

PIE *kʷóm 'which? (acc. sg. masc.; cf. Skt. *kám* 'which?, whom?')' > *kʷón 'whom?'
>→ PGmc. *hʷanǭ > Goth. *ƕana,* OE *hwone;*

PIE *kʷód 'which? (neut.)' (cf. Lat. *quod;* Vedic Skt. *kád* 'what?') > PGmc. *hʷat
'what?' > ON *hvat,* OE *hwæt,* OHG *waʒ;*

PIE *kʷóteros 'which (of two)?' (cf. Gk. πότερος /póteros/; Skt. *katarás*) > PGmc.
*hʷaþeraz > Goth. *ƕaþar,* OE *hwæþer;*

PIE *kʷyeh₁- 'to rest', derived noun *kʷyéh₁tis (cf. Lat. *quiēs;* Old Persian *šiyātiš*
'peace'), zero grade *kʷih₁- in PGmc. *hʷīlō 'time' > Goth. *ƕeila,* OE *hwīl,*
OHG *wīla;*

PIE *éḱwos 'horse' (cf. Skt. *áśvas,* Lat. *equos*) > *ékwos > PGmc. *ehʷaz > ON *jór,* OE
eoh (both poetic); cf. Goth. *aíƕatundi* 'thornbush', lit. *'horse-tooth';

PIE *sekʷ- 'to see' (cf. Alb. *sheh* '(s)he sees'; Hitt. *sākuwa* 'eyes') > PGmc. *sehʷaną
> Goth. *saíƕan,* ON *sjá,* OE *sēon,* OHG *sehan;*

PIE aor. subj. *léykʷeti '(s)he will leave (it)' (Gk. pres. indic. λείπει /léipei/ '(s)he is
  leaving (it)'; but the original pres. was nasal-infixed, cf. Skt. *riṇákti,* Lat. *linquit*)
  > PGmc. *līhʷidi '(s)he lends' > Goth. *leiƕiþ,* OE *līehþ,* OHG *līhit;*

PIE aor. subj. *séykʷeti '(s)he will filter' (cf. late Rigvedic Skt. pres. indic. *sécate* '(s)he
  moistens', beside frequent *siñcáti* and aor. 3pl. *asican*) > PGmc. *sīhʷidi '(s)he
  filters' > OE *sīehþ,* OHG *sīhit;*

post-PIE *ákʷeh₂ 'running water' (cf. Lat. *aqua* 'water') > PGmc. *ahʷō 'river' > Goth.
  aƕa, ON *á,* OE *ēa,* OHG *aha.*

☞ **Examples of labials and dorsals immediately preceding obstruents:**

PIE *kh₂ptós 'grabbed' (cf. Lat. *captus* 'taken, caught') > PGmc. *haftaz 'captive' > OE
  hæft, OHG *haft;*

PIE *oḱtṓw 'eight' (cf. Skt. *aṣṭáu,* Lat. *octō*) > PGmc. *ahtōu > Goth. *ahtau,* ON *átta,*
  OE *eahta,* OHG *ahto;*

PIE *swéḱs 'six' (cf. Av. *xšuuaš,* Gk. ἕξ /héks/, Boiotian ϝέξ /(h)wéks/) → *séḱs (by
  lexical analogy with 'seven'; cf. Skt. *ṣáṭ,* Lat. *sex*) > PGmc. *sehs > Goth. *saíhs,*
  ON *sex,* OE *siex,* OHG *sehs;*

PIE *deḱs- 'right(-hand)' (cf. Gk. δεξιός /deksiós/, Av. *dašinō*) > PGmc. *tehswaz >
  Goth. *taíhswa,* OHG *zeso, zesawēr;*

PIE *uksḗn 'bull, ox' (cf. Av. *uxša*) >→ PGmc. *uhsṓ (ending remodelled) > ON *oxi,*
  OE *oxa,* OHG *ohso;* Goth. gen. pl. *aúhsne.*

☞ **Note also, with delabialization:**

PIE *nókʷt- ~ *nékʷt- 'night' (cf. Gk. νύξ /núks/, νυκτ- /nukt-/; Hitt. *nekuz mēhur*
  'evening time') > *nókt- > PGmc. *naht- > Goth. *nahts,* ON *nátt,* OE *niht,* OHG
  naht.

Exception: a PIE voiceless stop immediately following another obstruent was *not*
  affected by Grimm's Law.

☞ **Examples of PIE *s + stop:**

PIE *spr̥dʰ- 'contest' (cf. Skt. *spr̥dʰ-*) > PGmc. *spurd- 'racecourse' > Goth. *spaúrds;*

PIE *spr̥-n-h₁- 'to kick' (cf. Lat. *spernere* 'to despise, to reject', pf. *sprēvisse*) > PGmc.
  *spurnaną 'to kick, to trample' > ON *sporna,* OE, OHG *spurnan;*

PIE *h₂stér- 'star' (cf. Hitt. *hasterz,* Gk. ἀστέρ- /astér-/) >→ PGmc. *sternan- > Goth.
  staírno, ON *stjarna,* OE *steorra,* OHG *sterno, sterro;*

PIE *stéh₂ti- ~ *sth₂téy- 'act of standing, place to stand', → *sth₂tís (cf. Skt. *st^{h}itís*) >
      PGmc. *stadiz 'place' > Goth. *staþs,* ON *staðr,* OE *stede,* OHG *stat;*

PIE *stéyg^{h}eti '(s)he's walking' (cf. Gk. στείχει /stéik^{h}ei/; Skt. *stig^h-,* pres. 3sg.
      stig^{h}nóti) > PGmc. *stīgidi '(s)he climbs' > Goth. *steigiþ,* OE *stī̆þ,* OHG *stīgit;*
      ON *stígr* with ending replaced;

PIE *h₁esti '(s)he is' (cf. Gk. ἐστι /esti/, Lat. *est*) > PGmc. *isti > Runic Norse, Goth.,
      OHG *ist,* OE *is,* early ON *es;*

PIE *g^{h}óstis 'stranger' (cf. Lat. *hostis* 'enemy', OCS *gostĭ* 'guest') > PGmc. *gastiz
      'guest' > Goth. *gasts,* ON *gestr,* OE *ġiest,* OHG *gast;*

post-PIE superlative suffix *-isto-s (cf. Gk. -ιστο-ς, e.g. in ἄριστος /áristos/ 'best') >
      PGmc. *-ista-z, e.g. in *batistaz 'best' > Goth. *batists,* ON *baztr, beztr,* OE *betst,*
      best, OHG *beʒʒisto;*

PIE *sḱéydeti '(s)he will cut (it) off' (cf. Rigvedic Skt. *mā́ c^{h}edma* 'may we not break') >
      PGmc. *skītidi '(s)he defecates' > ModHG *scheißt;* ON *skítr* with ending
      replaced; seldom attested in the older Gmc. documents;

PIE *skab^{h}eti '(s)he's scratching' (cf. Lat. *scabit*) > PGmc. *skabidi '(s)he shaves' >
      Goth. *skabiþ,* OE *scæfþ,* OHG *skebit;* ON *skefr* with ending replaced;

(post-)PIE *pisk- 'fish' (cf. Lat. *piscis*) > PGmc. *fiskaz > Goth. *fisks,* ON *fiskr,* OE,
      OHG *fisc.*

☞ **Examples of PIE *t preceded by a labial or dorsal stop:**

PIE *kh₂ptós 'grabbed' (cf. Lat. *captus* 'taken, caught') > PGmc. *haftaz 'captive' >
      OE *hæft,* OHG *haft;*

PIE *oḱtṓw 'eight' (cf. Skt. *aṣṭáu,* Lat. *octō*) > PGmc. *ahtōu > Goth. *ahtau,* ON *átta,*
      OE *eahta,* OHG *ahto;*

PIE *nókʷt- ~ *nékʷt- 'night' (cf. Gk. νύξ /núks/, νυκτ- /nukt-/; Hitt. *nekuz mēhur*
      'evening time') > *nókt- > PGmc. *naht- > Goth. *nahts,* ON *nátt,* OE *niht,* OHG
      naht.

☞ **Intramorphemic *tt, which occured only in affective words, was also exempt:**

PIE *átta 'dad' (cf. Lat. *atta,* Gk. ἄττα /átta/, both used as polite terms of address for old
      men; Hitt. *attas* 'father') >→ PGmc. *attṓ > Goth. *atta* 'father'.

2) Voiced stops became voiceless stops.

• ***b > *p:**

PIE *dʰéwbu- ~ *dʰubéw- 'deep' (cf. Lith. *dubùs* 'hollow'; *dʰubrós in Toch. B *tapre* 'high') >→ PGmc. *deupaz > Goth. *diups,* ON *djúpr,* OE *dēop,* OHG *tiof;*

PIE *leb- 'lip' (cf. Lat. *labrum;* Hitt. *lilipai* '(s)he licks') > PGmc. *lep- ~ *lip- > OE *lippa,* OHG *leffur;*

PIE *treb- ~ *tr̥b- 'building' (cf. OIr. *atreba* '(s)he dwells'; secondary zero grade in Lat. *trabs* 'beam') in PGmc. *þurpą 'farmstead, village' > ON *þorp,* OHG *dorpf;* Goth. *þaúrp* 'field';

(post-)PIE *gʰreyb- 'to grab, to grasp' (cf. Lith. *griẽbti* 'to grasp at, make a grab for') > PGmc. *grīpaną > Goth. *greipan,* ON *grípa,* OE *grīpan,* OHG *grīfan.*

• ***d > *t:**

PIE *déḱm̥d 'ten' (cf. Skt. *dáśa,* Lat. *decem,* Lith. *dẽšimt*) > PGmc. *tehun > Goth. *taíhun,* ON *tíu,* OE *tīen,* OHG *zehan;*

PIE *deḱs- 'right(-hand)' (cf. Gk. δεξιός /deksiós/, Av. *dašinō*) > PGmc. *tehswaz > Goth. *taíhswa,* OHG *zeso, zesawēr;*

PIE *dn̥ǵʰwéh₂- 'tongue' (cf. Old Lat. *dingua*) >→ PGmc. *tungōn- > Goth. *tuggo,* ON *tunga,* OE *tunge,* OHG *zunga;* the Gmc. word has been remodelled as an n-stem;

PIE *h₁dónt- ~ *h₁dn̥t- 'tooth' (cf. Skt. *dánt-* ~ *dat-,* Gk. ὀδόντ- /odónt-/, Lat. *dent-*) > PGmc. *tanþ- ~ *tund- > ON *tǫnn,* OE *tōþ,* OHG *zand;* Goth. *tunþus* 'tooth', *aíƕatundi* 'thornbush', lit. *'horse-tooth';

PIE *deyḱ- 'point (at)' (cf. Gk. δεικνύναι /deiknúnai/ 'to show', Lat. *dīcere* 'to say') > PGmc. *tīhaną 'to declare' > Goth. *gateihan* 'to proclaim'; OE *tīon,* OHG *zīhan,* both 'to accuse';

PIE *deywós 'god' (cf. Skt. *devás,* Lat. *deus*) > PGmc. *Tīwaz, name of the war god > ON *Týr;* OE *Tīwesdæg* 'dies Martis, Tuesday';

PIE *dayh₂wḗr 'brother-in-law' (cf. Skt. *devā́,* Gk. δᾱήρ /da:ɛ́:r/) >→ PGmc. *taikuraz (under the lexical influence of *swehuraz, see above) > OE *tācor,* OHG *zeihur;*

PIE *dóru ~ *dréw- 'tree, wood' (cf. Skt. *dā́ru,* gen. sg. *drós*) >→ PGmc. *trewą > ON *tré,* OE *trēo;* Goth. dat. pl. *triwam* 'with clubs';

PIE *dwóh₁ 'two' (masc. nom.-acc.; cf. Skt. *dvā́,* Homeric Gk. δύω /dúɔ:/) > ?PGmc. *twō, possibly in OE *twǣgen > twēgen* (*twō inō): or >→ ?PGmc. *twai (with

plural inflection) > Goth *twai;*

(post-)PIE *déwketi '(s)he leads' (cf. Lat. *dūcit*) > PGmc. *tiuhidi '(s)he leads, (s)he pulls' > Goth. *tiuhiþ,* OE *tīehþ,* OHG *ziuhit;*

PIE *ád 'at' (cf. Lat. *ad*) > PGmc. *at > Goth., ON *at,* OE *æt,* OHG *aʒ;*

PIE *tód 'that' (neut.; cf. Skt. *tát,* Gk. τό /tó/) > PGmc. *þat > ON *þat,* OE *þæt,* OHG *daʒ;*

PIE *kʷód 'which? (neut.)' (cf. Lat. *quod;* Vedic Skt. *kád* 'what?') > PGmc. *hʷat 'what?' > ON *hvat,* OE *hwæt,* OHG *waʒ;*

PIE *h₁ed- 'to eat' (cf. Skt. *ad-,* Homeric Gk. ἔδειν /éde:n/, Lat. *edere*) > PGmc. *etaną > Goth. *itan,* ON *eta,* OE *etan,* OHG *eʒʒan;*

PIE *pṓds 'foot (nom. sg.)' (cf. Skt. *pā́t,* Doric Gk. πώς /pǫ́:s/) > PGmc. *fōt- > Goth. *fotus,* ON *fótr,* OE *fōt,* OHG *fuoʒ;*

PIE *wréh₂d- ~ *wr̥h₂d- 'root' (cf. Lat. *rādīx*) > *wrād- ~ *wurd- > PGmc. *wrōt- ~ *wurt- > Goth. *waúrts,* ON *rót;* OE *wyrt,* OHG *wurz* 'root, herb, plant'; ON *urt* 'herb';

PIE *swā́dus 'pleasant, sweet' (*swéh₂dus?; cf. Skt. *svādús,* Gk. ἡδύς /hę:dús/) > PGmc. *swōtuz → PNWGmc. *swōtiz (cf. ON *sœtr,* OE *swēte,* OHG *suoʒi;*

PIE subjunctive *bʰéydeti '(s)he will split' (cf. Skt. *bʰédati*) > PGmc. *bītidi '(s)he bites' > Goth. *beitiþ,* OE *bītt,* OHG *bīʒʒit;* ON *bítr* with ending replaced;

PIE *sḱéydeti '(s)he will cut (it) off' (cf. Rigvedic Skt. *mā́ cʰedma* 'may we not break') > PGmc. *skītidi '(s)he defecates' > ModHG *scheißt;* ON *skítr* with ending replaced; seldom attested in the older Gmc. documents;

PIE *sed- 'sit' (cf. Lat. *sedēre,* Skt. *sad-*) > PGmc. *sitjaną > ON *sitja,* OE *sittan,* OHG *sizzen;* Goth. *sitan* with remodelled stem vowel;

PIE *wóyde '(s)he knows' (cf. Skt. *véda,* Gk. οἶδε /ôide/) > PGmc. *wait > Goth. *wait,* ON veit, OE *wāt,* OHG *weiʒ;*

PIE *wódr̥, *udén- 'water' (cf. Hitt. *wātar,* gen. *widēnas*), collective *wédōr, *udn-´ (cf. Hitt. pl. *widār,* Gk. ὕδωρ /húdǫ:r/) >→ PGmc. *watōr, *watin- ~ *watn- >→ Goth. *wato,* gen. *watins,* dat. pl. *watnam,* ON *vatn,* OE *wæter,* OHG *waʒʒar;*

PIE *ḱérd- ~ *ḱr̥d- 'heart' (cf. Lat. *cord-,* Lith. *širdìs*) >→ PGmc. *hertan- > Goth. *haírto,* ON *hjarta,* OE *heorte,* OHG *herza;*

PIE *h₃ósdos 'branch' (cf. Gk. ὄζος /ósdos/; Hitt. *hasduēr* 'twigs, brush') > *ósdos >

PGmc. *astaz > Goth. *asts,* OHG *ast;*

PIE *nisdós 'seat' (*ni-sd- 'down-sit-', cf. Arm. *nist,* Skt. *nīḍás*), 'nest' (cf. Lat. *nīdus,* OIr. *net,* Welsh *nyth*) > PGmc. *nistaz 'nest' (*nestaz??) > OE, OS, OHG *nest;* the word does not occur in North or East Germanic; the lowering of the vowel in OE is puzzling;

(post-)PIE *gʰayd- 'goat' (cf. Lat. *haedus* 'kid') > PGmc. *gait- > Goth. *gaits,* ON *geit,* OE *gāt,* OHG *geiʒ.*

• *ǵ and *g > *k:

PIE *ǵéwseti '(s)he tastes' (cf. Gk. γεύεται /géuetai/; Skt. *jóṣati* '(s)he enjoys') > PGmc. *kiusidi '(s)he tests' > Goth. *kiusiþ;* OE *ċīest,* OHG *kiusit,* both '(s)he chooses'; ON *kýss* '(s)he chooses' with ending replaced;

PIE *ǵr̥h₂nóm 'crushed, ground' (neut.; cf. Skt. *jīrṇám* 'worn out', Lat. *grānum* 'grain') > PGmc. *kurną 'grain' > Goth. *kaúrn,* ON, OHG *korn,* OE *corn;*

PIE *ǵómbʰos 'row of teeth' (cf. Skt. pl. *jámbʰāsas;* Gk. γόμφος /gómpʰos/ 'peg') > PGmc. *kambaz 'comb' > ON *kambr,* OE *camb,* OHG *kamb;*

PIE *ǵḗnu- ~ *ǵénw- 'jaw' (Gk. γένυς /génus/; Toch. A dual *śanweṃ*) >→ PGmc. *kinnuz 'cheek' > Goth. *kinnus,* ON *kinn,* OHG *kinni;* OE *ċinn* 'chin';

PIE *ǵónu ~ *ǵnéw- 'knee' (cf. Skt. *jā́nu,* Gk. γόνυ /gónu/) >→ PGmc. *knewą > Goth. *kniu,* ON kné, OE *cnēo,* OHG *knio;*

PIE *h₂éǵeti '(s)he is driving' (cf. Skt. *ájati,* Lat. *agit;* Gk. ἄγει /ágei/ '(s)he is leading') > PGmc. *akidi '(s)he goes in a vehicle', inf. *akaną > ON inf. *aka;* ?also OE *acan* 'to ache' (Seebold, *Vergl. u. etym. Wb. der germ. starken Verben,* p. 75);

PIE *h₂éǵros 'pasture' → 'field' (cf. Skt. *ájras,* Gk. ἀγρός /agrós/, Lat. *ager*) > PGmc. *akraz > Goth. *akrs,* ON *akr,* OE *æcer,* OHG *ackar;*

PIE *wérǵom 'work' (cf. Gk. ἔργον /érgon/; for the palatal cf. the related verb below) > PGmc. *werką > ON *verk,* OE *weorc,* OHG *werk;*

PIE *wr̥ǵyéti '(s)he works' (cf. Av. *vərəziieiti*) > PGmc. *wurkīþi > Goth. *waúrkeiþ,* OE *wyrcþ,* OHG *wurchit;* ON *yrkir* with ending replaced;

PIE *h₂melǵ- 'to milk' (cf. Gk. ἀμέλγειν /amélge:n/, Lith. *mélžti*) > PGmc. *melkaną > OE *melcan,* OHG *melchan;*

PIE *éǵh₂ 'I' (cf. Skt. *ahám,* Gk. ἐγώ /egǫ́:/, Lat. *ego,* all with innovative second syllables) > PGmc. *ek, unstressed *ik > Goth. *ik,* ON *ek,* OE *iċ,* OHG *ih;*

PIE *gol- 'cold' (o-grade; cf. Lat. *gelū,* Lith. *gelumà* 'frost') in PGmc. *kalaną 'to be
   cold, to freeze' > ON *kala,* OE *calan,* and *kaldaz 'cold' > Goth. *kalds,* ON
   kaldr, OE *ċeald,* OHG *kalt;*

PIE *glewbʰ- 'to split' (cf. Lat. *glūbere* 'to peel') > PGmc. *kleubaną > ON *kljúfa,* OE
   clēofan, OHG *klioban;*

PIE *yugóm 'yoke' (cf. Skt. *yugám,* Gk. ζυγόν /sdugón/, Lat. *iugum*) > PGmc. *juką >
   ON *ok,* OE *ġeoc,* OHG *joh;* Goth. *juk* 'yoke (of oxen), pair';

PIE *seh₂gieti '(s)he gives a sign' (cf. Hitt. *sākizzi;* Lat. *sāgīre* 'to perceive keenly') >
   PGmc. *sōkīþi '(s)he seeks' > Goth. *sokeiþ,* OE *sēcþ,* OHG *suochit;* ON *sœkir*
   '(s)he meets' with ending replaced;

PIE *teg- 'to cover' (cf. Lat. *tegere*) in (post-)PIE *togom 'roof' > PGmc. *þaką > ON
   þak, OE *þæc,* OHG *dah;* similar semantics in Lat. *tēctum,* OIr. *tugae;*

(post-)PIE *h₂ewg- 'to increase' (remodelling of PIE *h₂weg-; cf. Lat. *augēre*) > PGmc.
   *aukaną > Goth. *aukan,* ON *auka;* OHG *auhhan* 'to add';

(post-)PIE *tong- 'to percieve, to think' (cf. dialectal Lat. *tongitiō* 'nōtiō, idea', OIr.
   tongid '(s)he swears') > PGmc. *þank- in *þankijaną 'to think' > Goth.
   þagkjan, OE *þenċan,* OHG *denken;* ON *þekkja* 'to perceive'; *þank- 'thanks' >
   ON *þǫkk,* OE *þanc,* OHG *dank;*

(post-)PIE *weg- ~ *wog- 'awake' (cf. Lat. adj. *vigil*) > PGmc. *wak- in caus. *wakjaną
   'to wake (someone) up' > Goth. *uswakjan,* ON *vekja,* OE *weċċan,* OHG *wecken;*
   fientive *waknō- ~ *wakna- 'wake up (intr.)' > Goth. *gawaknan,* ON *vakna,* OE
   wæcnan.

• ***gʷ > *kʷ (*k when delabialized):**

PIE subjunctive *gʷémeti '(s)he will step' (cf. Skt. *gámat*) > PGmc. *kʷimidi '(s)he
   comes' > Goth. *qimiþ,* OE *cymþ,* OHG *quimit;*

PIE *gʷḗn 'woman (nom. sg.)' (OIr. *bé*) >→ PGmc. *kʷēniz 'wife' > Goth. *qens,* ON
   (poetic) *kván;* OE *cwēn* 'queen';

PIE *gʷih₃wós 'alive' (cf. Skt. *jīvás,* Lat. *vīvos,* and with analogical full-grade root Gk.
   ζωός /sdǫ:ós/) > *kʷikwós > PGmc. *kʷikʷaz > ON *kvikr,* OE *cwic,* OHG *quec;*

PIE *gʷréh₂u- ~ *gʷr̥h₂éw- 'heavy' (cf. Lat. *gravis*) → *gʷr̥h₂ús (cf. Skt. *gurús,* Gk.
   βαρύς /barús/) > PGmc. *kuruz > Goth. *kaúrus;*

PIE *gʷṓws, *gʷów- 'cow' (cf. Skt. *gáus,* Gk. βοῦς /bôus/) > PGmc. *kʷō- ~ *kū- (?) >

ON *kýr,* OE *cū* but OHG *kuo;*

PIE *$h_1$régʷos ~ *$h_1$régʷes- 'darkness' (cf. Skt. *rájas* 'empty space', Gk. ἔρεβος /érebos/ 'hell'; for the meaning cf. the related formation *h_1r̥gʷónt- in Toch. B *erkeṃt* 'black (obl. sg. masc.)') > PGmc. *rekʷaz ~ *rikʷiz- > Goth. *riqis,* ON *røkkr;*

PIE *$h_3$éngʷn̥ 'ointment' (cf. Lat. *unguen*), collective *$h_3$éngʷō̄ > PGmc. *ankʷō̄ > OHG *ancho* 'butter';

(post-)PIE *bʰruHgʷ- 'use, enjoy' (cf. Lat. *fruī* < *frūvī, ptc. *frūctus*) > *bʰrūgʷ- > PGmc. *brūkaną > OE *brūcan,* OHG *brūhhan;* Goth. *brūkjan* has been remodelled on the basis of the verb's weak past.

3) Breathy-voiced stops became voiced obstruents.

• *bʰ > *b:

PIE *bʰéreti '(s)he's carrying' (cf. Skt. *bʰárati,* Gk. φέρει /phérei/, Lat. *fert*) > PGmc. *biridi > Goth. *baíriþ,* OE *birþ,* OHG *birit;*

PIE *bʰéydʰeti '(s)he trusts, (s)he believes' (cf. Lat. *fīdit,* Gk. πείθεται /péithetai/) > PGmc. *bīdidi '(s)he waits (for)' > Goth. *beidiþ,* OE *bītt,* OHG *bītit;* ON *bíðr* with ending replaced;

PIE *bʰéwdʰeti '(s)he makes (someone) aware' (cf. Skt. *bódʰati* '(s)he wakes (someone) up'; Homeric Gk. middle πεύθεται /péuthetai/ '(s)he finds out') > PGmc. *biudidi '(s)he offers, (s)he commands' > Goth. *anabiudiþ,* OE *bīett,* OHG *biutit;* ON *býðr* with ending replaced;

PIE *bʰendʰ- 'tie' (cf. Skt. *bandʰ-*) > PGmc. *bindaną > Goth., OE *bindan,* ON *binda,* OHG *bintan;*

PIE subjunctive *bʰéydeti '(s)he will split' (cf. Skt. *bʰédati*) > PGmc. *bītidi '(s)he bites' > Goth. *beitiþ,* OE *bītt,* OHG *bīȝȝit;* ON *bítr* with ending replaced;

PIE *bʰāǵʰus 'arm' (cf. Skt. *bāhús;* Gk. πῆχυς /pȇːkhus/ 'forearm') > PGmc. *bōguz > ON *bógr* 'shoulder', OE *bōg* 'arm, shoulder, bough';

PIE *bʰuh₂- 'to become' (cf. aorist 3sg. Skt. *ábʰūt,* Gk. ἔφς /éphuː/) → pres. *bʰuh₂-ye/o- > PGmc. *būaną 'to dwell' > Goth. *bauan,* ON *búa,* OE *būan;*

PIE *bʰréh₂tēr 'brother' (cf. Skt. *bʰrā́tā,* Lat. *frāter*) > PGmc. *brōþēr > Goth. *broþar,* ON *bróðir,* OE *brōþor,* OHG *bruoder;*

PIE *h₃bʰrúHs 'eyebrow' (cf. Gk. ὀφρύς /opʰrú:s/, Skt. *bʰrū́s*) > *brūz → PGmc.
    *brūwō > OE *brū;*

(post-)PIE *bʰr̥ǵʰ- 'hill' (cf. OIr. *brí, brig-;* the root is PIE 'high') > PGmc. *burg- 'hill-
    fort' > Goth. *baúrgs,* ON *borg,* OE, OHG *burg,* all 'town';

(post-)PIE *bʰruHgʷ- 'use, enjoy' (cf. Lat. *fruī* < *frūvī, ptc. *frūctus*) > *bʰrūgʷ- >
    PGmc. *brūkaną > OE *brūcan,* OHG *brūhhan;* Goth. *brūkjan* has been
    remodelled on the basis of the verb's weak past;

PIE *webʰ(H)- 'to weave' (cf. Skt. *vabʰ(i)-,* Toch. B /wəpa-/) > PGmc. *webaną > ON
    vefa, OE *wefan,* OHG *weban*);

PIE *skabʰeti '(s)he's scratching' (cf. Lat. *scabit*) > PGmc. *skabidi '(s)he shaves' >
    Goth. *skabiþ,* OE *scæfþ,* OHG *skebit;* ON *skefr* with ending replaced;

PIE *glewbʰ- 'to split' (cf. Lat. *glūbere* 'to peel') > PGmc. *kleubaną > ON *kljúfa,* OE
    clēofan, OHG *klioban;*

PIE *ǵómbʰos 'row of teeth' (cf. Skt. pl. *jámbʰāsas;* Gk. γόμφος /gómpʰos/ 'peg') >
    PGmc. *kambaz 'comb' > ON *kambr,* OE *camb,* OHG *kamb;*

PIE *h₂n̥tbʰí 'on both sides' (cf. Gk. ἀμφί /ampʰí/, Lat. *amb(i)-* 'around') > PGmc.
    *umbi 'around' > ON *um(b),* OE *ymbe,* OHG *umbi.*

• ***dʰ > *d:**

PIE *dʰéh₁ti- ~ *dʰh₁téy- 'act of putting' (cf. Gk. θέσις /tʰésis/; Av. *zraz-dāti-* 'belief'
    (lit. 'putting faith'), Skt. *vásu-dʰiti-* 'bestowal of goods') >→ *dʰētís > PGmc.
    *dēdiz 'deed' > ON *dáð,* OE *dǣd,* OHG *tāt;* Goth. *missadeþs* 'misdeed, sin';

PIE *dʰóh₁mos 'thing put' (cf. Greek θωμός /tʰọ:mós/ 'heap') > PGmc. *dōmaz
    'judgment' > ON *dómr,* OE *dōm,* OHG *tuom;* Goth. *doms* 'fame';

PIE *dʰugh₂tḗr 'daughter' (cf. Skt. *duhitā́,* Gk. θυγάτηρ /tʰugátẹ:r/) > PGmc. *duhtēr
    > Goth. *daúhtar,* ON *dóttir,* OE *dohtor,* OHG *tohter;*

PIE *dʰwór- ~ *dʰur- 'door' (cf. Gk. θύρα /tʰúra:/, Lat. pl. *forēs*) > PGmc. *dur- > ON
    pl. *dyrr,* OE *duru;* OHG *turi;* Goth. *daúr,* OE *dor,* OHG *tor* 'gate';

PIE *dʰéwbu- ~ *dʰubéw- 'deep' (cf. Lith. *dubùs* 'hollow'; *dʰubrós in Toch. B *tapre*
    'high') >→ PGmc. *deupaz > Goth. *diups,* ON *djúpr,* OE *dēop,* OHG *tiof;*

PIE *dʰeyǵʰ- ~ *dʰiǵʰ- 'make (out of clay)' (Skt. *dihánti* 'they daub', Lat. *fingere* 'to
    shape, to mold' with nasal infix), *dʰóyǵʰos 'malleable substance' > PGmc.
    *digan 'to make (pottery)', *daigaz 'dough' > Goth. *digan, daigs,* OE *dāg,* OHG

teig; ON *deig* with shifted gender;

PIE *dʰedʰórse '(s)he dares' (cf. Skt. *dadʰárṣa*) >→ PGmc. *(ga)dars > Goth. *gadars;*
OE *dearr,* OHG *gitar* have generalized *rz from the plural;

post-PIE *dʰrewgʰ- (meaning?; cf. *dʰrowgʰos in Lith. *draũgas,* OCS *drugŭ* 'friend') >
PGmc. *dreuganą 'serve, be a retainer' > Goth. *driugan* 'to campaign', OE
drēogan 'to act, to accomplish';

PIE *médʰu 'sweet (nt.), honey, mead' (cf. Skt. *mádʰu* 'sweet', OCS *medŭ* 'honey',
OIr. *mid* 'mead', Homeric Gk. μέθυ /métʰu/ 'wine') > PGmc. *medu(z) 'mead'
> ON *mjǫðr,* OE *meodu,* OHG *metu;*

PIE *h₁widʰéwh₂ ~ *h₁widʰwéh₂- 'widow' (cf. Skt. *vidʰávā,* Lat. *vidua*) >→ PGmc.
*widuwōn- > Goth. *widuwo,* OE *widuwe,* OHG *wituwa;*

PIE *gʷʰédʰyeti '(s)he is asking for' (cf. Av. *ǰaδiieiti,* OIr. *guidid;* intensive in Gk.
ποθεῖ /potʰêi/ '(s)he longs for') >→ PGmc. *bidiþi, inf. *bidjaną > Goth. *bidjiþ,*
bidjan, ON *biðr* (ending replaced), *biðja,* OE *bitt, biddan,* OHG *bitit, bitten;*

PIE *médʰyos 'middle' (cf. Skt. *mádʰyas,* Gk. μέσος /mésos/, Lat. *medius*) > PGmc.
*midjaz (cf. Goth. *midjis,* ON *miðr,* OE *midd,* OHG *mitti;*

PIE *wedʰ- 'join' (cf. Skt. *vádʰram* 'leather strap', Welsh *gwedd* 'yoke') > PGmc.
*wedaną > Goth. *gawidan,* OHG *wetan;*

PIE *sámh₂dʰos 'sand' (cf. Gk. ἄμαθος /ámatʰos/) > *sámədʰos > *sámdʰos > PGmc.
*samdaz (sic) > MHG *sam(b)t* beside ON *sandr,* OE *sand,* OHG *sant;*

PIE *spr̥dʰ- 'contest' (cf. Skt. *spr̥dʰ-*) > PGmc. *spurd- 'racecourse' > Goth. *spaúrds;*

PIE *kusdʰo- 'treasure' (cf. Lat. *custōs* 'guardian', Gk. κύσθος /kústʰos/ 'vulva') >
PGmc. *huzdą > Goth. *huzd,* ON *hodd,* OE *hord,* OHG *hort;*

PIE *misdʰó- 'reward' (cf. Gk. μισθός /mistʰós/; Skt. *mīḍʰám* 'prize') > PGmc. *mizdō
> OE *mēd, meord,* OHG *miata;* Goth. *mizdo* has been remodelled as an n-stem.

• ***ǵʰ and *gʰ > *g:**

PIE *ǵʰáns 'goose' (cf. Gk. χήν /kʰḗːn/, Lith. *žąsìs*) > PGmc. *gans > ON *gás,* OE *gōs,*
OHG *gans;*

PIE *ǵʰelHwos 'yellow' (cf. Lat. *helvos* 'bay (horse)'; for the palatal cf. OCS *zelenŭ*
'green') > PGmc. *gelwaz > OE *ġeolu,* OHG *gelo;*

PIE *wéǵʰeti '(s)he's transporting (it)' (cf. Skt. *váhati* (aor. *ávāṭ* with reflex of palatal
cluster), Lat. *vehit*) > PGmc. *wigidi '(s)he moves' > OE *wiġþ,* OHG *wigit;*

PIE *h₃méyǵʰeti '(s)he's urinating' (cf. Skt. *méhati* (past ptc. *mīḍhás* with reflex of palatal cluster), Gk. ὀμείχει /oméikʰei/) > PGmc. *mīgidi > OE *mī̆ġþ;* ON *mígr* with ending replaced;

PIE *séǵʰos, *séǵʰes- 'power, victory' (cf. Skt. *sáhas,* Av. *hazō*) > PGmc. *segaz, *sigiz- >→ Goth. *sigis,* ON *sigr,* OE *siġe,* OHG *sigi, sigu;*

PIE *bʰāǵʰus 'arm' (cf. Skt. *bāhús;* Gk. πῆχυς /pê:kʰus/ 'forearm') > PGmc. *bōguz > ON *bógr* 'shoulder', OE *bōg* 'arm, shoulder, bough';

PIE *dʰeyǵʰ- ~ *dʰiǵʰ- 'make (out of clay)' (Skt. *dihánti* 'they daub', Lat. *fingere* 'to shape, to mold' with nasal infix), *dʰóyǵʰos 'malleable substance' > PGmc. *digan 'to make (pottery)', *daigaz 'dough' > Goth. *digan, daigs,* OE *dāg,* OHG *teig;* ON *deig* with shifted gender;

(post-)PIE *bʰr̥ǵʰ- 'hill' (cf. OIr. *brí, brig-;* the root is PIE 'high') > PGmc. *burg- 'hill-fort' > Goth. *baúrgs,* ON *borg,* OE, OHG *burg,* all 'town';

PIE *gʰóstis 'stranger' (cf. Lat. *hostis* 'enemy', OCS *gostĭ* 'guest') > PGmc. *gastiz 'guest' > Goth. *gasts,* ON *gestr,* OE *ġiest,* OHG *gast;*

(post-)PIE *gʰayd- 'goat' (cf. Lat. *haedus* 'kid') > PGmc. *gait- > Goth. *gaits,* ON *geit,* OE *gāt,* OHG *geiʒ;*

PIE *stéygʰeti '(s)he's walking' (cf. Gk. στείχει /stéikʰei/; Skt. *stigʰ-,* pres. 3sg. *stigʰnóti*) > PGmc. *stīgidi '(s)he climbs' > Goth. *steigiþ,* OE *stīġþ,* OHG *stīgit;* ON *stígr* with ending replaced;

PIE *dl̥h₁gʰós 'long' (cf. Skt. *dīrgʰás,* OCS *dlŭgŭ*) > PGmc. *tulgaz 'firm' >→ Goth. *tulgus* 'firm, steadfast' (*'long-lasting'), transferred into the u-stems; OE adv. *tulge* 'firmly';

PIE *légʰyeti '(s)he's lying down [eventive]' (cf. OCS *ležetŭ* [stative], Homeric Gk. aor. λέκτο /lékto/ '(s)he lay down') >→ PGmc. *ligiþi (stative) > Goth. *ligiþ,* OE *liġþ,* OHG *ligit;*

PIE *h₂égʰos, *h₂égʰes- 'emotional pain, distress' (cf. Homeric Gk. ἄχος /ákʰos/) > PGmc. *agaz, *agiz- 'fear' >→ Goth. *agis,* OE *eġe;*

PIE *mogʰ- 'be able' (cf. OCS *mogǫ* 'I can', OIr. *mochtae* 'powerful', Skt. *magʰám* 'possessions') > PGmc. *mag '(s)he can' > Goth., OHG *mag,* ON *má,* OE *mæġ;*

PIE *h₃nogʰ(w)- 'claw, nail' (cf. Gk. ὀνυχ- /ónukʰ-/, Lith. *nãgas*) >→ PGmc. *naglaz > ON *nagl,* OE *næġl,* OHG *nagal;* cf. Goth. *ganagljan* 'to nail (something)';

post-PIE *dʰrewgʰ- (meaning?; cf. *dʰrowgʰos in Lith. *draũgas,* OCS *drugŭ* 'friend') >
PGmc. *dreuganą 'serve, be a retainer' > Goth. *driugan* 'to campaign', OE
drēogan 'to act, to accomplish'.

• ***gʷʰ and *ǵʰw> *b-, *-gʷ- after *n, otherwise *g ~ *w (*g when delabialized):**

PIE *gʷʰédʰyeti '(s)he is asking for' (cf. Av. *ǰaδiieiti,* OIr. *guidid;* intensive in Gk.
ποθεῖ /potʰêi/ '(s)he longs for') >→ PGmc. *bidiþi, inf. *bidjaną > Goth. *bidjiþ,
bidjan,* ON *biðr* (ending replaced), *biðja,* OE *bitt, biddan,* OHG *bitit, bitten;*

PIE *gʷʰen- 'strike, kill' (cf. pres. 3sg. Skt. *hánti,* Hitt. *kuēnzi*), o-grade *gʷʰon- (cf. Gk.
φόνος /pʰónos/ 'murder') in PGmc. derived nouns *banō 'murderer' > ON *bani,*
OE *bana,* OHG *bano;* *banjō 'wound' > Goth. *banja,* ON *ben,* OE *benn;*

PIE *gʷʰreh₁- 'smell' (cf. Skt. *gʰrā-*) > PGmc. *brē- in OE *brǣþ* 'smell, vapor';

PIE *gʷʰénti- ~ *gʷʰn̥tí- '(act of) killing, (a) blow' (cf. Skt. *hatís;* for the labiovelar cf.
Hitt. *kuēnzi* 'kills') → *gʷʰn̥tis > *gʷʰúntis > PGmc. *gunþiz 'battle' > ON
gunnr, guðr; OE *gūþ* has been remodelled as an ō-stem;

PIE *ǵʰwér- ~ *ǵʰwér- 'wild animal' (cf. Gk. θήρ /tʰḗːr/, Lith. *žvėrìs;* Lat. *ferus* 'wild')
> PGmc. *berō 'bear' > OE *bera,* OHG *bero;* with different suffix in ON *bjǫrn;*

PIE *dn̥ǵʰwéh₂- 'tongue' (cf. Old Lat. *dingua*) >→ PGmc. *tungōn- > Goth. *tuggo,* ON
tunga, OE *tunge,* OHG *zunga;* the Gmc. word has been remodelled as an n-stem;

PIE *h₂énǵʰus, fem. *h₂n̥ǵʰéwih₂ 'constricted' (cf. Skt. *aṃhús;* OIr. compound *cumung*
'narrow') >→ pre-PGmc. *angʰus, *angʰwī > PGmc. *anguz, *angʷī 'narrow' >
Goth. *aggwus* (with levelling of the labiovelar into the masc.; cf. *aggwiþa*
'tribulation', etc.), ON *ǫngr,* OE *enǵe,* OHG *engi;*

post-PIE *magʰus 'boy' (cf. Goth. *magus;* OE *magu* 'son', Ogham Irish *magu-,* OIr. *mug*
'slave'), deriv. *magʰwī 'girl' > *magʷʰī > PGmc. *mawī > Goth. *mawi;*

PIE *sengʷʰ- 'to chant', derived noun *sóngʷʰos (collective *songʷʰéh₂ > *honkʷʰā́ >
Gk. ὀμφή /ompʰḗː/ 'divine voice') > PGmc. *singʷaną 'to sing', *sangʷaz 'song'
> Goth. *siggwan,* ON *syngva,* OF *siunga,* OE, OS, OHG *singan;* Goth. *saggws,*
ON *sǫngr,* OF *song,* OE *song ~ sang,* OS, OHG *sang;*

PIE *sneygʷʰ- 'to snow' (cf. Gk. νείφειν /néipʰeːn/, Old Lat. pres. 3sg. *nīvit* (*nĭvit?*)),
derived noun *snóygʷʰos (cf. Lith *sniẽgas,* OCS *sněgŭ*) > PGmc. *snīwidi 'it's
snowing', *snaiwaz 'snow' > ON *snýr,* OHG *snīwit;* Goth. *snaiws,* ON *snjór,*
OE *snāw,* OHG *snēo;*

PIE *negᵂʰró- 'kidney' (cf. pl. Gk. νεφροί /nepʰrói/, dialectal Lat. *nefrōnēs*) >→ PGmc.
    *neurṓ (n-stem, like the Latin word) > ON *nýra,* OHG *nioro;*

PIE *h₁lṇgᵂʰrós 'light (in weight)' (cf. Gk. ἐλαφρός /elapʰrós/ 'light, nimble'; for the
    nasal cf. full-grade superlative *h₁léngᵂʰistos > Av. *rənǰißtō* 'swiftest') >
    *lungᵂʰrós > PGmc. *lungraz 'swift' > OS *lungar* 'powerful'; OE adv. *lungre*
    'quickly, soon'.

Appendix.

☞ **All labials and dorsals appear as *f and *h before *t and *s.**

(The simplest hypothesis is that they had all become *p and *k before Grimm's Law
    occurred, though that is not the only possibility.)

Examples inherited from PIE or intermediate protolanguages:

PIE *h₂eǵ-s- 'axle' (cf. Skt. *ákṣas,* Lat. *axis,* Lith. *ašìs;* deriv. of *h₂éǵ- 'drive', see
    above) > PGmc. *ahsō > OE *eax,* OHG *ahsa;*

PIE *dʰugh₂tḗr, *dʰugtr-´ 'daughter' (cf. Skt. *duhitā́,* Gk. θυγάτηρ /tʰugátẹ:r/ with
    laryngeal generalized, Osc. **futír** with layngeal-less stem generalized) >→ PGmc.
    *duhtēr > Goth. *daúhtar,* ON *dóttir,* OE *dohtor,* OHG *tohter;*

PIE *wobʰseh₂ 'wasp' (cf. Old Prussian *wobse,* Balochi *gvabz;* ?Av. *vaßžakō,* name of
    a daēvic animal; apparently derived from *webʰ- 'weave', see above) > PGmc.
    *wafsō > OHG *wafsa;* OE *wǽfs* has been transferred into the masc. a-stems;

PIE verbal adj. *wr̥ǵtós 'worked, fashioned' (Av. *vərəštō;* to *wr̥ǵyéti '(s)he is working',
    see above) > PGmc. ptc. *wurhtaz 'made' > Goth. *waúrhts,* ON *ortr,* OE worht,
    OHG *giworaht;*

PIE *h₃r̥ǵtós 'straightened' (verbal adj. of *h₃reǵ- 'put in a straight line', cf. Lat. *regere*
    'to guide'; Gk. ὀρέγειν /orége:n/ 'to reach', Lith. *réžti* 'to reach') >→ *h₃reǵtós
    (cf. Lat. *rēctus*) > PGmc. *rehtaz 'straight, right' > Goth. *raíhts,* ON *réttr,* OE
    riht, OHG *reht;*

PIE *h₂wégseti '(s)he increases (it)' (cf. Homeric Gk. ἀέξει /aéksei/): root *h₂weg-, but
    at some point the present was resegmented to give a new root *h₂wegs-, whence
    derived pres. *h₂wogs-éye/o- (cf. Skt. causative *vakṣáyati* '(s)he makes it grow')
    > PGmc. (intensive?) *wahsijaną 'to grow' > Goth. *wahsjan,* ONorw. *vexa;* >→
    PNWGmc. *wahsaną > ON *vaxa,* OE *weaxan,* OHG *wahsan;*

PIE or post-PIE *wébʰtis 'act of weaving' (to *webʰ(H)- 'weave', see above) > PGmc.
PGmc. *wiftiz 'act of weaving' > OE *wift* 'weft', OHG *gewift* 'fabric';

post-PIE *h₂eǵsleh₂ 'shoulder-joint' (cf. Lat. *āla* 'wing'; deriv. of 'axle', see above) >
PGmc. *ahslō > ON *ǫxl,* OE *eaxl,* OHG *ahsala.*

Germanic formations based on inherited roots:

PIE *h₁lengʷʰ- 'light' (e.g. in *h₁l̥ngʷʰrós, see above; *h₁léngʷʰistos > Av. *rənǰištō*
'swiftest') + suffix *-to- (formation unclear) > PGmc. *linhtaz 'light(weight)' >
Goth. *leihts,* ON *léttr,* OE *līoht,* OHG *līht;*

PIE *glewbʰ- 'to split' > PGmc. *kleubaną (see above): PGmc. *kluftiz 'act of splitting'
> OE *ġeclyft* 'cleft', OHG pl. *clufti* 'shears';

PIE *mogʰ- 'be able' > PGmc. *mag '(s)he can' (see above): PGmc. *mahtiz 'power'
> Goth. *mahts,* OE *miht,* OHG *maht;*

PIE *h₃méyǵʰeti '(s)he's urinating' > PGmc. *mīgidi (see above): PGmc. *mihs- 'urine'
→ 'dung', with various extensions in Goth. *maíhstus,* OE *meox, mixen,* OS *mehs,*
OHG *mixin, mist;*

PIE *seh₂gieti '(s)he gives a sign' > PGmc. *sōkīþi '(s)he seeks' (see above): PGmc.
ptc. *sōhtaz 'sought' > OE *sōht,* OHG *gisuoht;* ON *sóttr* 'met';

(post-)PIE *tong- 'percieve, think' > PGmc. *þankijaną 'to think' (see above): PGmc.
ptc. *þanhtaz 'thought' > OE *þōht,* OHG *gidāht;* ON *þáttr* 'perceived';

(post-)PIE *weg- ~ *wog- 'awake' > PGmc. *wak- (see above): PGmc. *wahtwō 'night
watch' > OHG *wahta;* Goth. dat. pl. *wahtwom;*

post-PIE *dʰrewgʰ- > PGmc. *dreuganą 'serve, be a retainer' (see above): PGmc.
*druhtiz 'band of retainers' > ON *drótt,* OE *dryht,* OHG *truht;* Goth. *gadraúhts*
'soldier'; further PGmc. *druhtinaz 'lord' > ON *dróttinn,* OE *dryhten,* OHG
truhtin.

The same pattern holds for roots and formations not securely attested outside of Gmc.;
in addition to the following unusual formations, there are many derived nouns in
*-ti-:

PGmc. *slīkaną 'to slide, to slip' (> OHG *slīhhan* 'to creep'; related nominals include
OE *slīċ* 'slick', ON *slíkisteinn* 'whetstone'): PGmc. *slihtaz 'smooth' > Goth.
slaíhts, ON *sléttr,* OHG *sleht;* OE adv. *eorðslihtes* 'thick on the ground';

PGmc. *þunkijaną 'to seem' (intrans. to *þankijaną, with zero-grade root; > Goth.

þugkjan, ON *þykkja,* OE *þynċan,* OHG *dunchen*): PGmc. ptc. **þunhtaz* 'seemed'
> ON *þóttr,* OE *ūht,* OHG *gidūht;*

PGmc. **bugjaną* 'to buy' (> Goth. *bugjan,* OE bycgan): PGmc. ptc. **buhtaz* 'bought' >
Goth. *baúhts,* OE *boht;*

PGmc. **bringaną* 'to bring' (> Goth. *briggan,* OE, OHG *bringan*): PGmc. ptc. **branhtaz*
'brought' > OE *brōht,* OHG *brāht.*

☞ **A PIE phonological rule inserted *s between dental stops at morpheme bound-**
aries; *Tst > PGmc. *ss, simplified to *s after anything but a short vowel.

Examples:

PIE **widstós* 'known' (cf. Skt. *vittás;* verbal adj. of **wóyde* '(s)he knows', see above) >
PGmc. **(ga)wissaz* 'certain' > OE *ġewiss,* OHG *giwis;* Goth. *unwiss* 'uncertain';

PIE **sedstós* 'seated' (verbal adj. of **sed-* 'sit down', see above) > PGmc. **sessaz* 'seat'
> ON, OE *sess;*

PIE **wéd^{h}stis* 'act of joining' (to **wed^h-* 'to join', see above) > PGmc. **gawissiz* 'joint'
> Goth. *gawiss;*

pre-PGmc. **g^{w}étstis* 'act of speaking' (**g^{w}ét-e/o-* > PGmc. **k^{w}eþaną* 'to say') > PGmc.
*k^{w}issiz in Goth. *samaqiss* 'agreement', OE *andcwiss* 'answer';

pre-PGmc. **k^{w}h$_1$dstós* 'sharpened' (**k^{w}eh$_1$d-e/o-* > PGmc. **h^{w}ētaną* 'to strike'; cf. also
PGmc. **h^{w}atjaną* 'to sharpen') > PGmc. **h^{w}assaz* 'sharp' > ON *hvass,* OE
hwæss, OHG *was;* Goth. adv. *hᵥassaba;*

pre-Gmc. **káydstis* 'act of calling' (**kayd-e/o-* > PGmc. **haitaną* 'to call, to command')
> PGmc. **haisiz* 'command' > OE *hǣs;*

pre-PGmc. **pn̥tstós* (meaning difficult to determine; derived from **pent-* 'travel' >
PGmc. **finþaną* 'to find') > PGmc. **funsaz* 'ready to go, hastening' > ON *fúss,*
OE *fūs,* OHG *funs;*

pre-Gmc. **weydstos* 'knowledgeable' (also a derivative of 'know' (see above), but the
ablaut grade and meaning are unexpected) > PGmc. **wīsaz* 'wise' > ON *víss,* OE,
OHG *wīs;* Goth. *unweis* 'ignorant';

pre-PGmc. **(h$_1$)ēdstos* 'eaten' (cf. Lat. *ēsus?;* but the long vowel is as likely to be a
Germanic innovation based on the past stem of this verb) > PGmc. **ēsaz* 'food;
carrion' > OE *ǣs.*