

Exploring difference in the Biology classroom: focus on family history

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DOES NOT HAVE ANY RELEVANT DISCLOSURES.

Macdonald - Bennett
By Maren 5-20-07



Objectives



- ✓ Define gender terms that increase inclusivity
- ✓ Recognize inclusive pedigree symbols and family structures

Key References

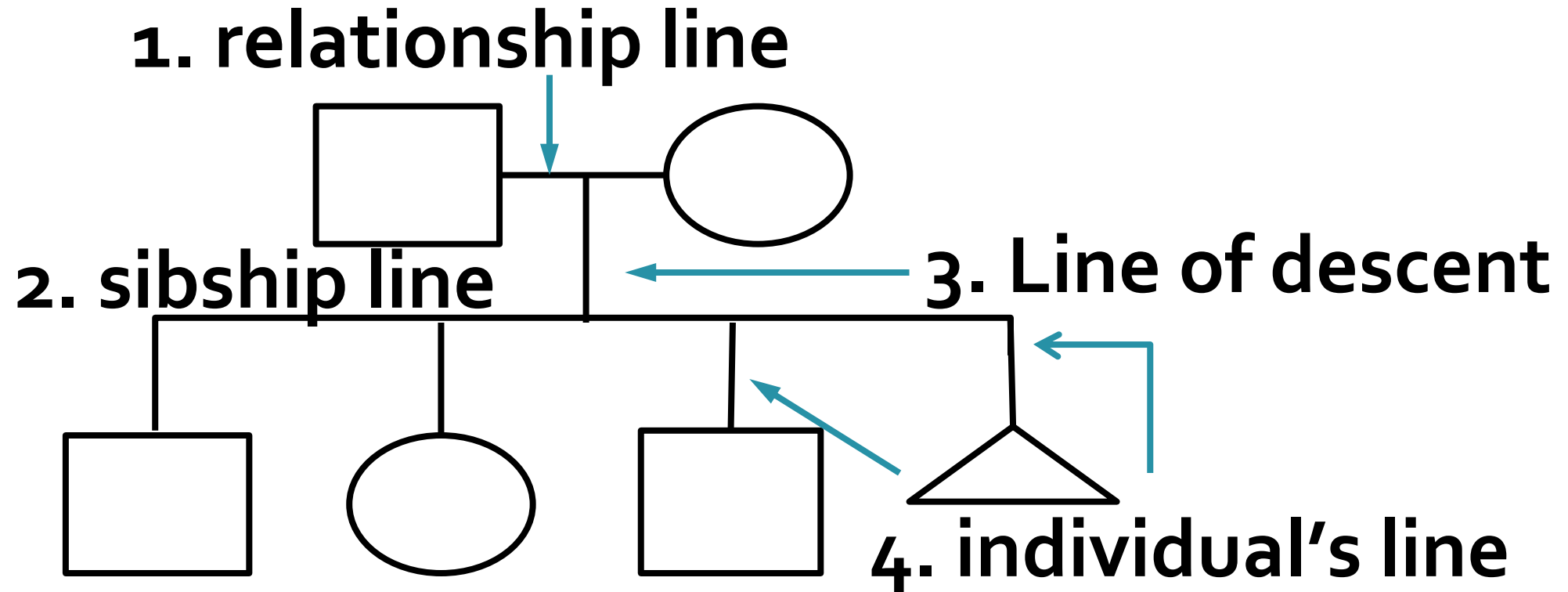


Bennett RL, French KS, Resta RG, Austin JH (2022). Practice Resource-Focused Revision: Standardized pedigree nomenclature centered on sex and gender inclusivity: A Practice Resource of the National Society of Genetics Counselors. *Journal of Genetic Counseling*

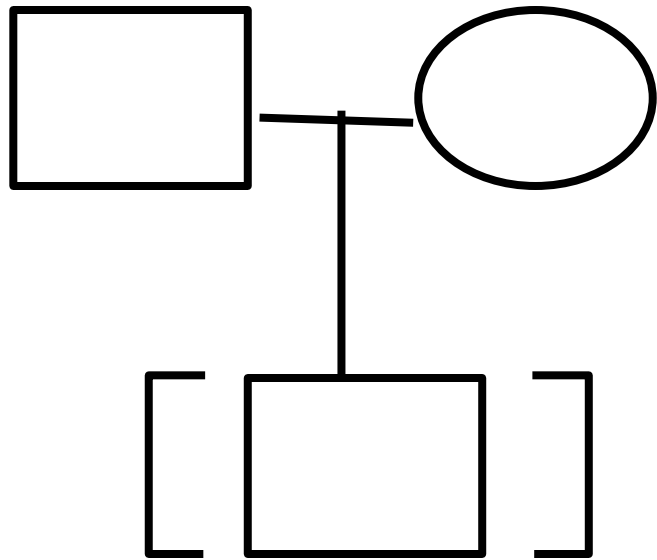
Cho MK, Duque ML, Amarillo I, Mintz KT, Bennett RL, Brothers KB (in press). Words matter: the language of difference in human genetics. *Genetics in Medicine*.

Resta, RG, French, KS, Bennett RL, Austin J (2022). Both sides now: Changing a long-standing pedigree tradition of men on the left and women on the right. *Journal of Genetic Counseling*, 00, 1–2. <https://doi.org/10.1002/jgc4.1662>

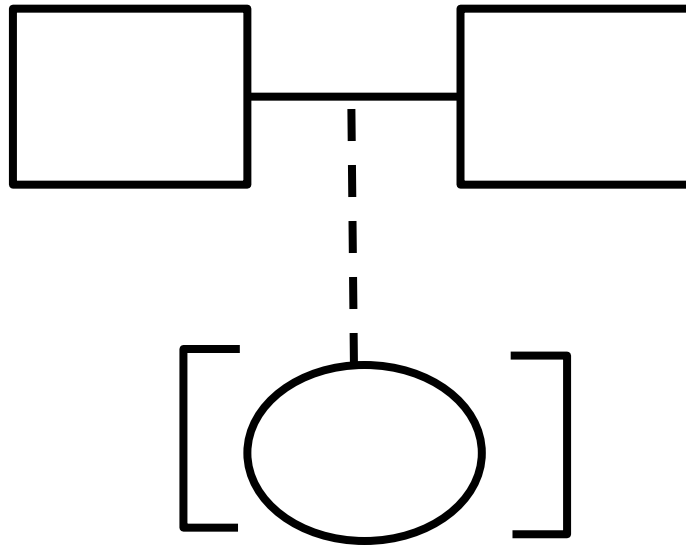
Pedigree line definitions



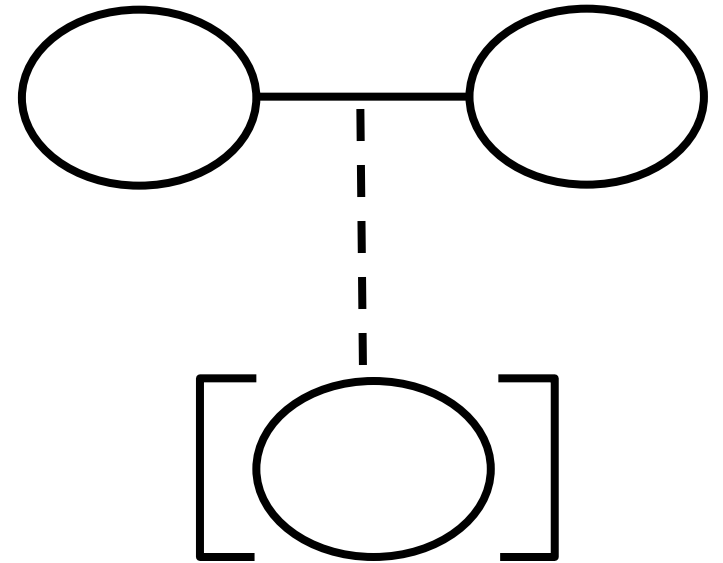
Adoption



Genetic relationship
Adopted "out"

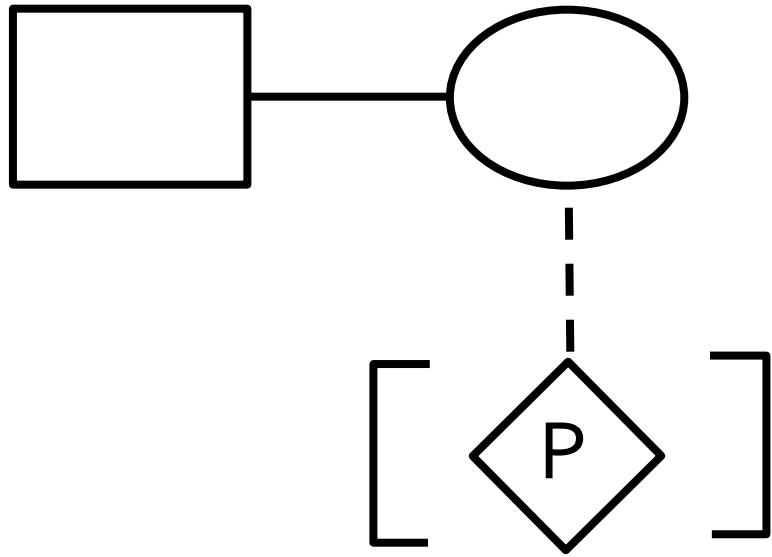


No genetic relationship
Adopted "in"



Adapted from Bennett et al., *J Genet Couns* 2008

Adoption (*in vitro*)

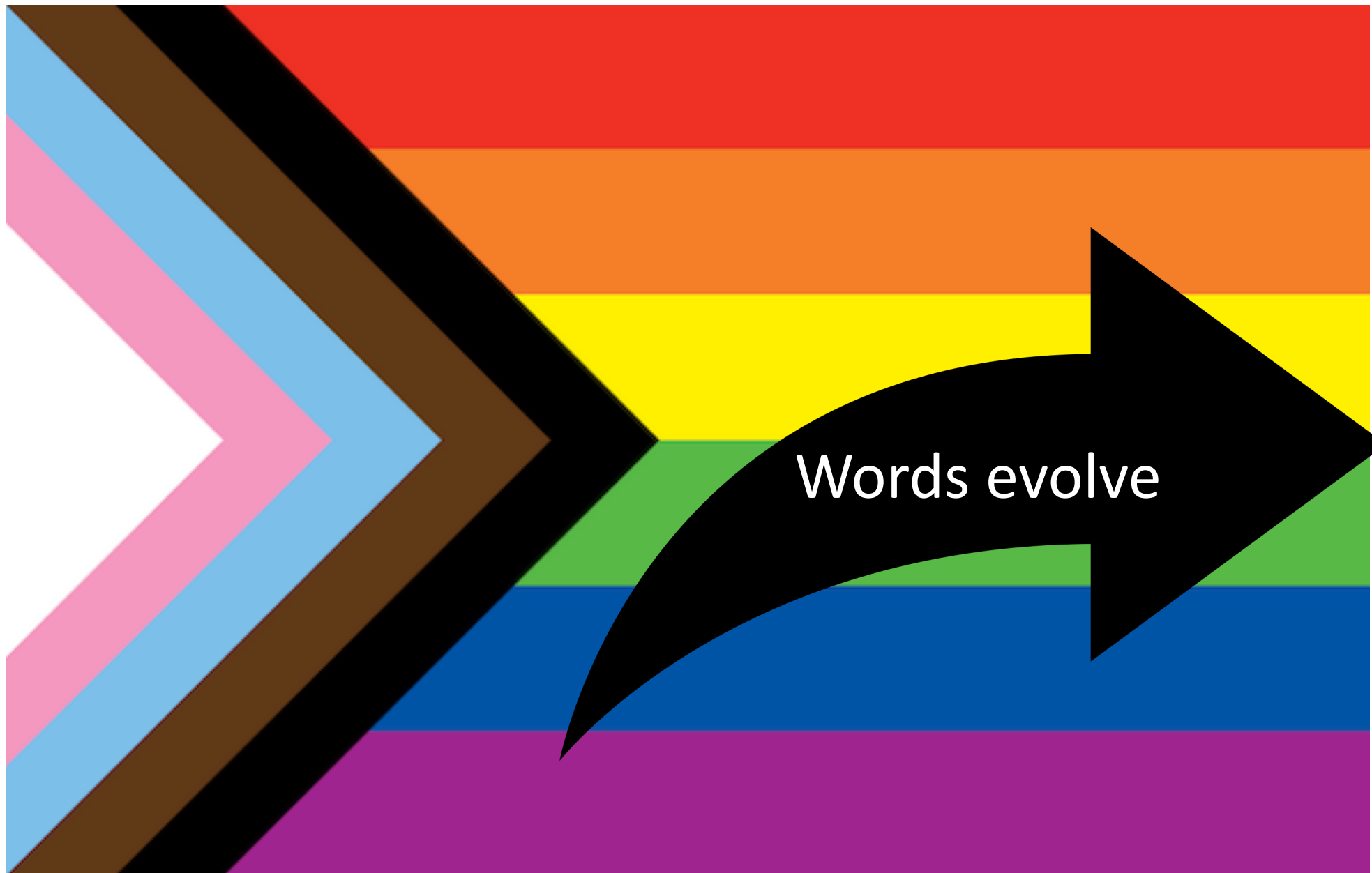


Donor embryo, no biological relationship

Words Matter

- Direct & indirect impacts on the people who hear and read them
- Influences how we present and interpret our science
- What we say and don't say





Some Vocabulary

Sex - A category often assigned at birth based on biological attributes (e.g., the appearance of genitalia or secondary sex characteristics).

Gender Identity - A person's sense of self and how they fit into the world, from the perspective of gender, which may or may not align with sex assigned at birth.

Cis/cisgender - An individual whose gender identity aligns with the sex they were assigned at birth.

Gender Diverse - An umbrella term that is used to describe gender identities that demonstrate a diversity of expression beyond the binary framework.

- Non-binary - A person who does not identify as either only male or only female, but instead identifies as something between or outside of these identities.
- Trans/Transgender - A person whose gender identity or gender expression does not align with the sex they were assigned at birth. People who are transgender can use the terms trans man, trans woman, transmasculine, transfeminine, non-binary, gender non-conforming, genderqueer, etc. to describe their gender identity.

Some Vocabulary

Variations in Sex Characteristics (VSC)

- A broad description of varied conditions which lead to differences in the development of the urogenital tract, external genitalia, development of secondary sex characteristics, and other clinical characteristics.
- Sometimes referred to as intersex, differences of sex development, or by using the name of a specific variation.

Some
Vocabulary

Four Important Acronyms

AFAB = Assigned Female At Birth

AMAB = Assigned Male At Birth

UAAB = Unassigned at Birth

VSC = Variation(s) in Sex Characteristics

Gender-First nomenclature

Gender is not binary or fixed

Gender and sex are two different categories

Pedigree symbols should reflect a person's self-identified gender, not their sex

Symbols must also communicate biological and genetic information critical to accurate and appropriate genetic counseling

Pedigrees need to communicate both sex and gender

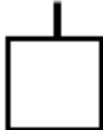
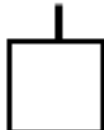
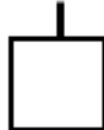






Karyotype included only if known

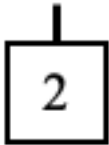



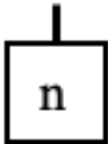
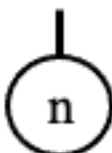
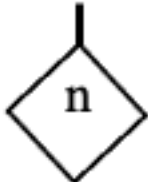
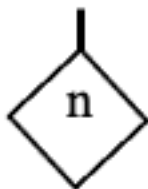
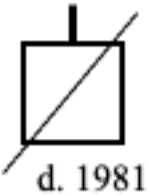



The Diamond Symbol



- A Diamond, with one of these annotations below it, for people who do not identify as male or female
- Diamond with no annotation indicates someone whose sex or gender is not known or relevant
- A diamond with an embedded number but no annotation indicates multiple people of unknown or mixed sexes and genders

Figure 1. Sex and Gender in Pedigree Nomenclature

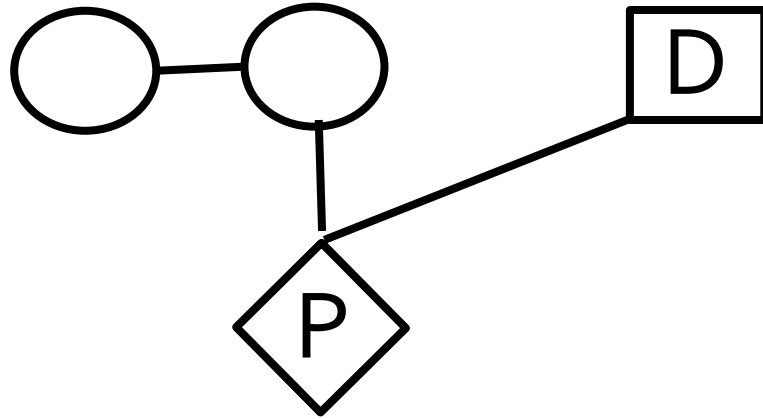
Gender	Sex		
	Male	Female	Unassigned at Birth
Man/Boy	 56y	 AFAB 34y	 UAAB 28y
Woman/Girl	 AMAB 56y	 34y	 UAAB 28y
Non-binary/Gender Diverse	 AMAB 56y	 AFAB 34y	 UAAB 28y

	Identifies as Man/Boy	Identifies as Woman/Girl	Identifies as Non- Binary/Gender Diverse	Sex and/or gender are not known or not specified
Multiple individuals, number known			 AMAB	
Multiple individuals, number unknown or not specified			 AMAB/ AFAB	
Deceased individual	 d. 1981	 d.4 mo	 d.86 AFAB	 d. 2002

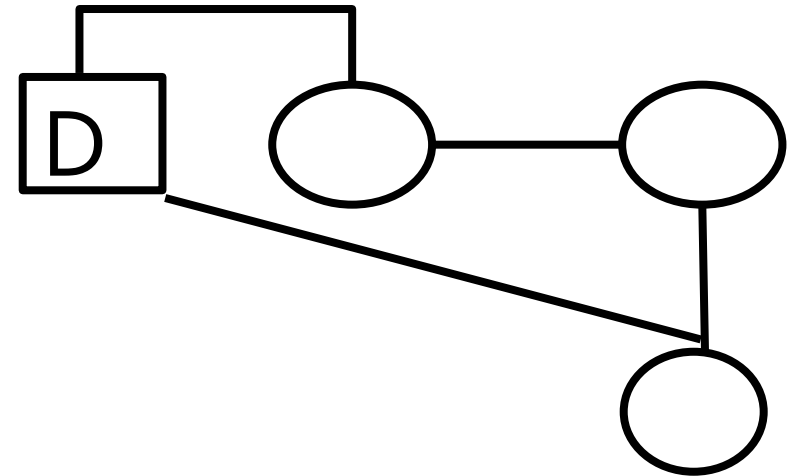
Ex: Donor (D) gamete (sperm)

(P=pregnancy)

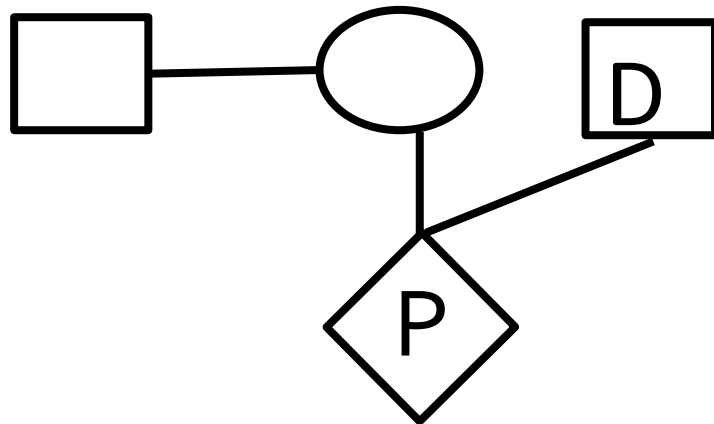
A.



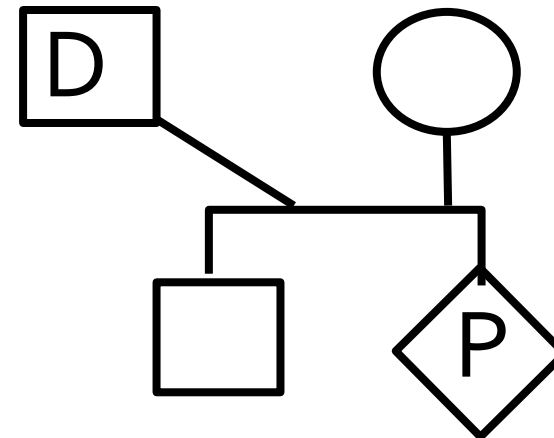
C.



B.



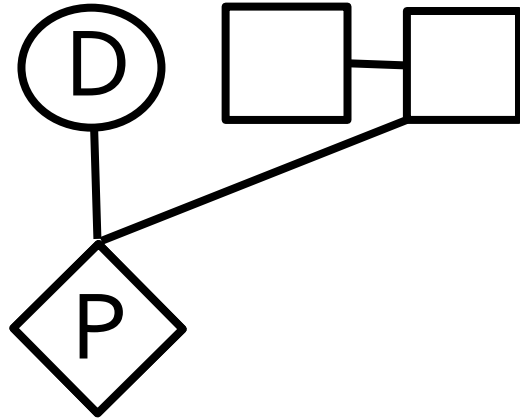
D.



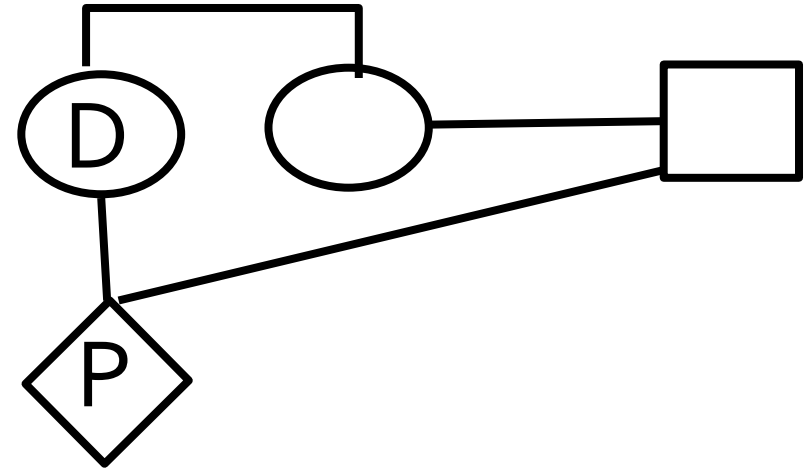
Ex: Donor (D) gamete (egg)

(S= surrogate)

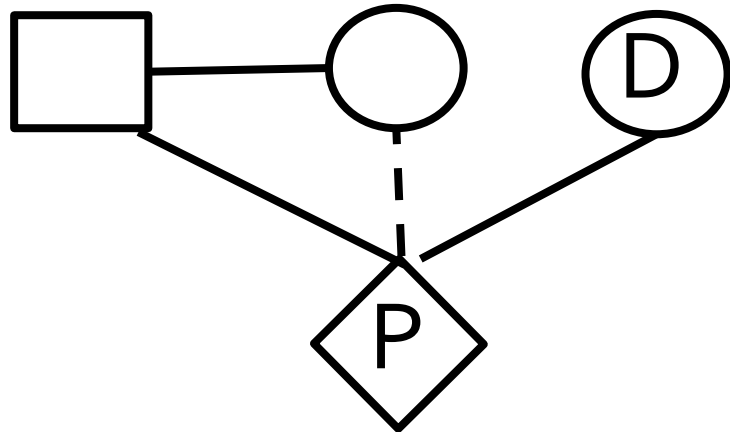
A.



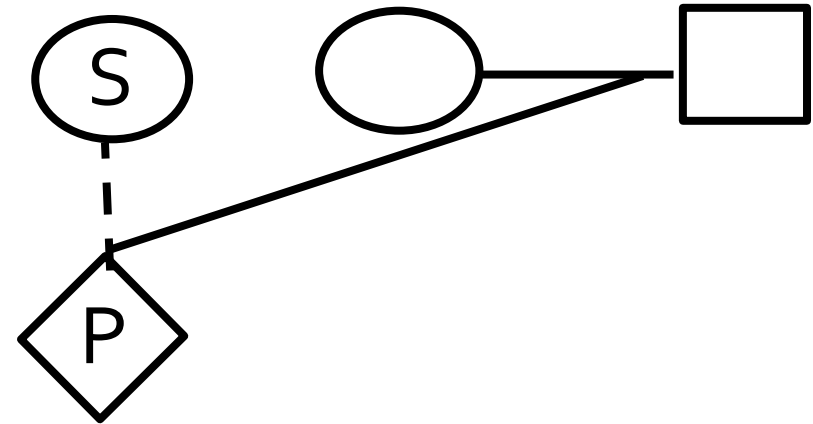
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B.

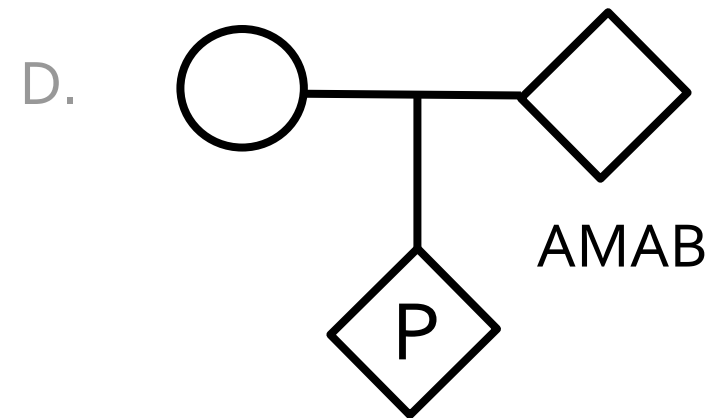
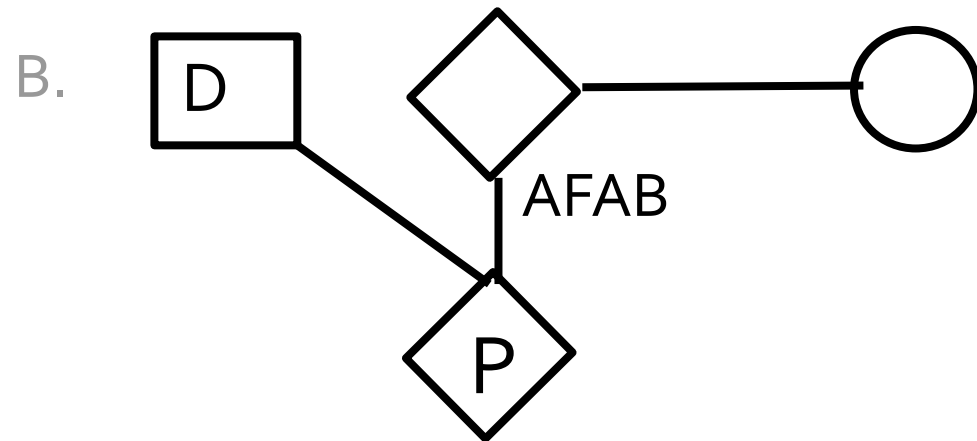
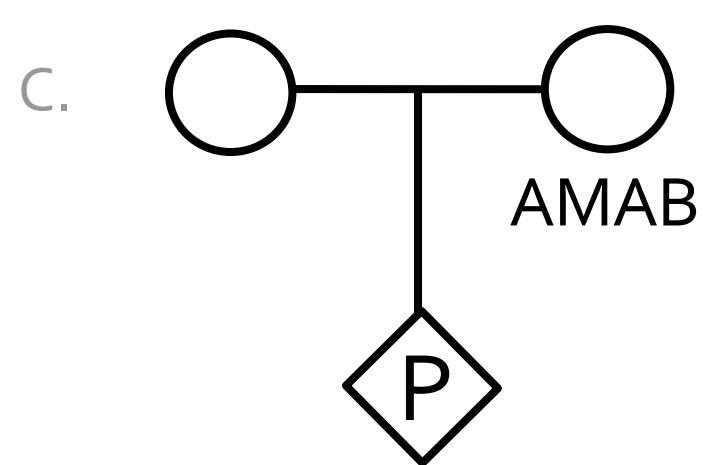
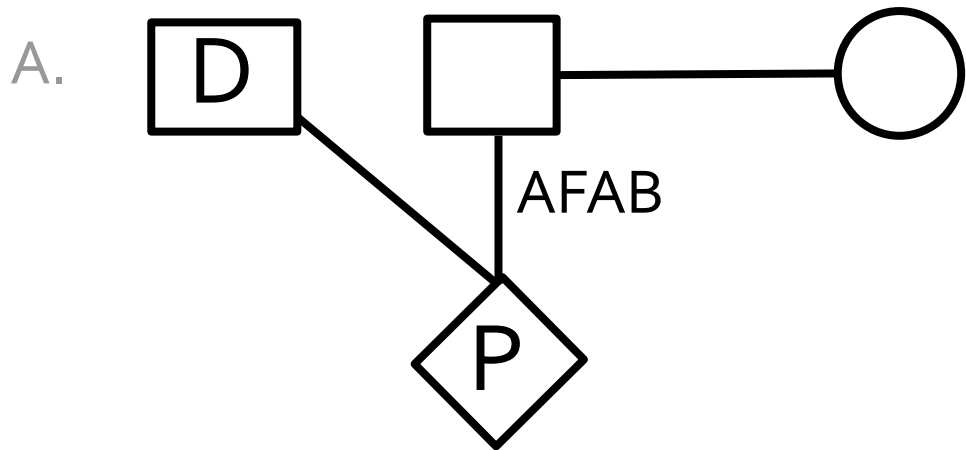


D.



Representing individuals who are gender-expansive and transgender

AFAB= assigned female at birth; AMAB= assigned male at birth



Take-aways

Family history can be considered the first genetic test

All learners have a family history that can be recorded

Pedigree symbols should reflect a person's self-identified gender, not their sex

Family history and a pedigree can be used to teach genetic principles

Words matter: gender inclusive language is not only essential, it is more accurate when teaching genetic principles

- Kyle Brothers
- Mildred Cho
- M. Laura Duque Lasio
- Ina Amarillo
- Kevin Tod Mintz
- Robert Resta
- Kathy Steinhaus
- Jehannine Austin
- Lex Powers

