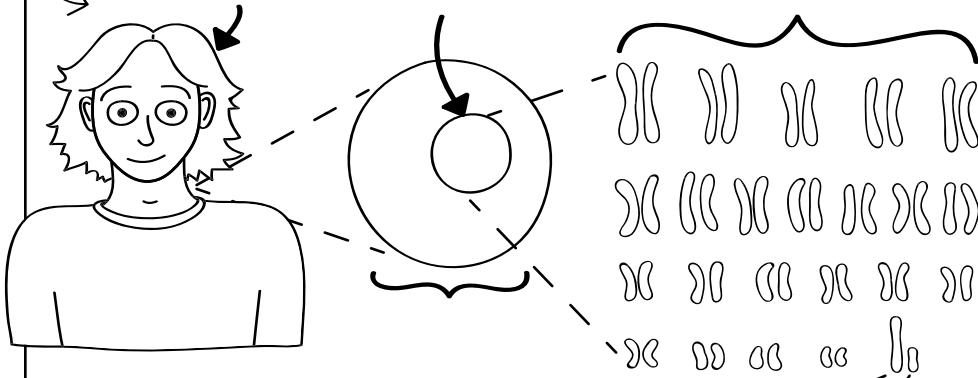


Label this diagram!

# Inheritance of sex

Sex is not the same as gender!

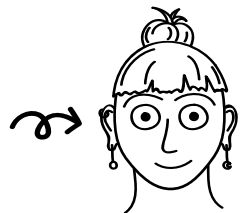


Create a key for the different types of chromosomes:

=  
 =

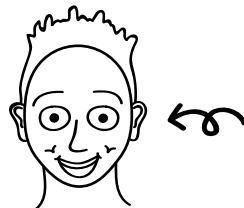


State & draw each person's sex chromosomes:



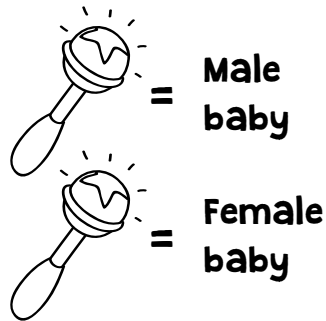
I'm female. That means my sex chromosomes are:

I'm male. That means my sex chromosomes are:



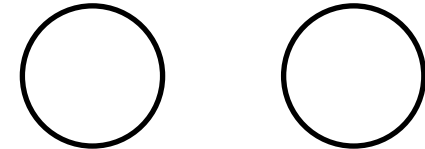
## PUNNETT SQUARES

### KEY



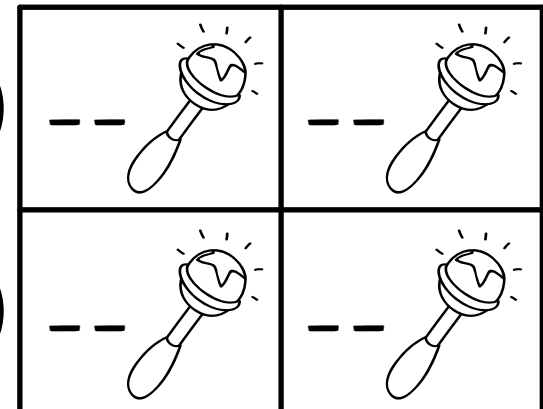
Complete the Punnett Square to show the inheritance of sex. Create a key by coloring in the baby's rattles different colors & use this in the diagram.

MOTHER  
 Genotype: \_ \_



FATHER

Genotype: \_ \_



- ★ What is the probability of a baby being female?
- ★ What is the probability of a baby being male?
- ★ What is the ratio of males to females?

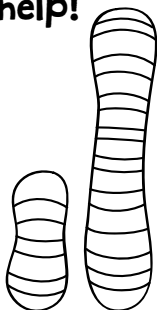
Write a definition for sex-linked traits along the banner:

# Sex-linked traits

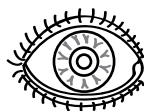
These are traits that are controlled by \_\_\_\_\_ found on the \_\_\_\_\_ chromosomes.

» On which chromosome are most sex-linked traits found & why? Use the picture to help! «

Sex-linked traits are most often found on the \_\_\_\_\_.  
It is much \_\_\_\_\_ than the \_\_\_\_\_ and has many more \_\_\_\_\_.



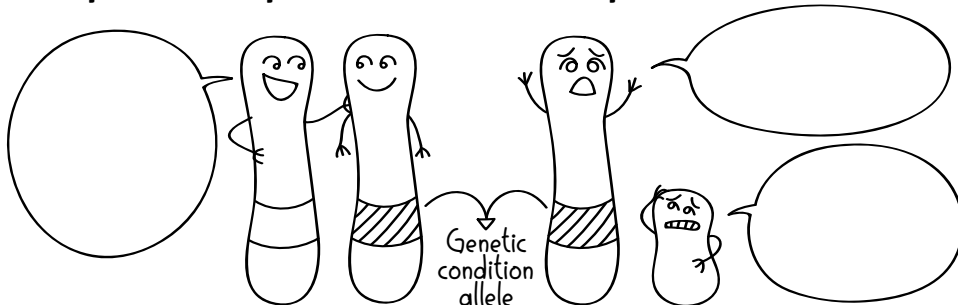
» Examples of sex-linked traits: «



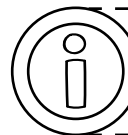
» ? Why do sex-linked conditions affect males more often than females? ? «

Males have only \_\_\_\_\_ X-chromosome whereas females have \_\_\_\_\_. Having two chromosomes means that even if a female does inherit an \_\_\_\_\_ for a sex-linked condition, their second X-chromosome can \_\_\_\_\_ the effects of it (if it has a normal allele). As males only have one X-chromosome, they \_\_\_\_\_ express the \_\_\_\_\_ if they inherit it.

Complete the speech bubbles to explain this ↴



» Annotate the examples below to explain how genotypes can show sex-linked traits. «



Info: Hemophilia is an X-linked condition caused by a recessive allele. It is represented here using the letter "h".

$X^H X^h$

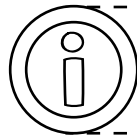
Phenotype:

$X^h Y$

Phenotype:

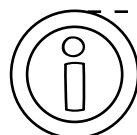
*\* Practice makes  
\* PERFECT! \**

# Practice Problems



Info: ALD is an X-linked condition caused by a recessive allele. It affects the adrenal glands and parts of the brain. Use the letter "a" to represent it.

**Problem #1 : A woman who is a carrier of ALD is having a child with a man who does not have ALD. Work out the possible offspring genotypes:**



Info: In fruit flies, eye color is X-linked. Red eyes are caused by a dominant allele and white eyes are caused by a recessive allele.

**Problem #4 : A white eyed male is crossed with a red-eyed heterozygous female. Work out the possible offspring genotypes:**

**KEY**

- = Normal
- = Carrier
- = Sufferer

Parent 1  
Genotype: \_ \_

Parent 2  
Genotype: \_ \_


Shade each box using your key!

**KEY**

- = Red eyes
- = White eyes

Parent 1  
Genotype: \_ \_

Parent 2  
Genotype: \_ \_

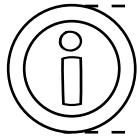

Shade each box using your key!

- ★ What is the probability of the child having ALD?
- ★ If they have a daughter, is it possible for her to have ALD? Explain your answer.

- ★ What is the probability of the offspring having red eyes?
- ★ They produce 312 offspring. How many of these would be expected to have white eyes?

# Practice Problems

Number 4 is a CHALLENGE!



Info: XLA is an X-linked condition caused by a recessive allele. It affects the ability of the body to fight infection. The letter "L" is used to represent it here.

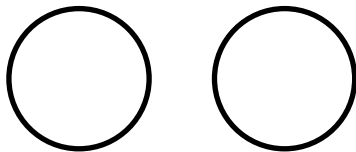
**Problem #3 :** The possible offspring genotypes of a couple are shown below. Use these to work out the parent genotypes.

**KEY**

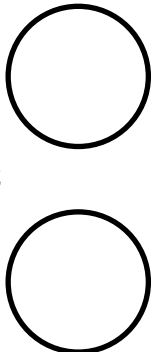
- = Normal
- = Carrier
- = Sufferer

Parent 1

Genotype: \_ \_



Parent 2  
Genotype: \_ \_

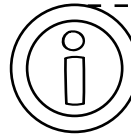


$X^L X^l$	$X^L X^l$
$X^L Y$	$X^L Y$

Shade each box using your key!

★ What is the phenotype of parent 1?

★ What is the phenotype of parent 2?



Info: X-linked ichthyosis causes dry, scaly skin. It is caused by a recessive allele. Use the letter "i" to represent it.

**Problem #4 :** A family has 8 children: 4 boys and 4 girls. Half of each sex has ichthyosis. These are the expected probabilities of inheritance. Use this information to work out the parent genotypes.

Write down your thoughts / deductions here!

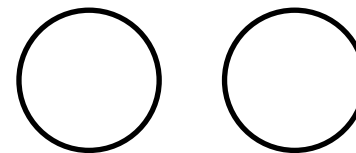
★ Males get their only X-chromosome from their \_\_\_\_\_.  
As 50% of males have ichthyosis, this means...

★ Females get their X-chromosomes from \_\_\_\_ parents.  
As 50% of females have ichthyosis, this means...

Check you're right by completing the Punnett Square!

MOTHER

Genotype: \_ \_



Phenotype of mother:

---

Phenotype of father:

FATHER

Genotype: \_ \_

