



## What are GENES?

- Genes are made of **DNA**. They're **instructions** that tell your body how to make something it needs.
- For example, when you **eat something** your genes tell your body how to make '**insulin**', a **protein** which helps you **digest sugar**.
- All humans have the **same basic set of genes**, which is why **we look similar**.
- Other living things have genes too: **Humans** have about **25,000**, **honey bees** about **10,000** and **rice plants** about **50,000**!

## GENETIC DISORDERS

- ### TREATMENTS and CURES
- A few **genetic disorders** can be treated by putting a **working copy** of the gene back into the body. This is called **gene therapy**.
  - **Gene Therapy** has already been successfully used to treat children born with a condition called **X-SCID**, which means their **bodies can't fight off germs**.
  - Now scientists are trying to find out whether the treatment will **work for other genetic disorders**.
  - Money raised on **Jeans for Genes Day** helps to fund this **vital research**.

- A **genetic disorder** happens when a **change** in one or more genes causes **vital proteins** in the body to be **missing or faulty**.
- Most disorders are **recessive**, occurring when someone inherits **two copies** of the faulty gene – one from each parent.
- Others are **dominant**, meaning a **single copy** of the faulty gene is enough to cause the condition.
- **X-linked disorders** are caused by a faulty gene on the **x-chromosome**, of which **girls** have two (**XX**) and **boys** only one (**XY**).
- **Genetic disorders** are the biggest **cause of death** for children **aged 14 and under**.
- Some other examples of genetic disorders include **Cystic Fibrosis**, **Sickle Cell Anaemia**, **Huntington's Disease** and **Haemophilia**.

## USEFUL LINKS

- Learn genetics: <http://learn.genetics.utah.edu>  
Hands-on activities and teaching resources on genetics.
- Your genome: [www.yourgenome.org](http://www.yourgenome.org)  
Find out about genes and genomes from the people behind the Human Genome Project.
- BioNews: [www.bionews.org.uk](http://www.bionews.org.uk)  
Read something about genes in the news? Find out more here.

## CURRICULUM LINKS

- **KS1 Science:** Ourselves; Variation.
- **KS1/2 PSHE and Citizenship:** Respecting the differences between people; Community cohesion.
- **KS3 Science:** Variation and classification; Inheritance and selection.
- **GCSE Science:** Genetics and inheritance.
- **KS3/4 PSHE and Citizenship:** Identities and diversity; Prejudice and discrimination; Community cohesion.

FOR MORE RESOURCES LIKE THESE AND TO SIGN UP FOR JEANS FOR GENES DAY, VISIT US AT [WWW.JEANSFORGENES.ORG](http://WWW.JEANSFORGENES.ORG)