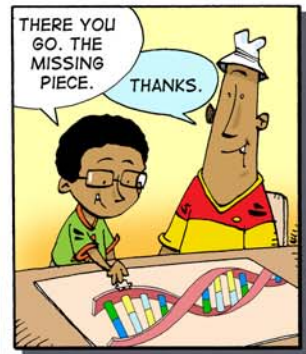
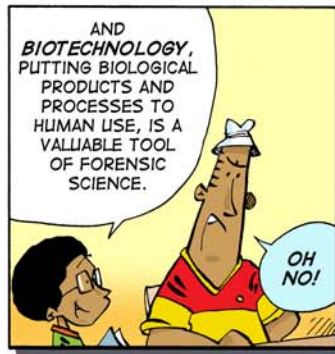


BIOTECHNOLOGY: FORENSICS



DNA FINGERPRINTING

LIKE FINGERPRINTS, **DNA** CAN LINK A SUSPECT TO A CRIME SCENE.

1 POLICE COLLECT TRACES OF BODY TISSUE FROM THE SCENE OF A CRIME; A SMEAR OF BLOOD, OR SKIN SCRAPPED OFF IN A STRUGGLE.

2 IN A LABORATORY, THE FORENSIC SCIENTIST EXTRACTS THE DNA FROM THESE CELLS AND COMPARES IT TO DNA TAKEN FROM A SUSPECT.

DNA RECORDS OF CONVICTED CRIMINALS WILL SOON BE KEPT TO COMPARE WITH DNA FOUND AT NEW CRIME SCENES.

3 IDENTICAL DNA LINKS THE SUSPECT TO THE CRIME SCENE.

DO YOU THINK WE ARE PLACING TOO MUCH TRUST IN THE INTEGRITY OF FORENSIC SCIENTISTS?

DNA IS A MOLECULE THAT DETERMINES HOW OUR BODIES ARE BUILT. IT IS FOUND IN ALL BODY TISSUES, AND EVERYONE (EXCEPT IDENTICAL TWINS), HAS **UNIQUE** DNA.

A SUSPECT HAS BEEN CONVICTED BECAUSE OF DNA FOUND ON THE BACK OF A **STAMP!** SALIVA CONTAINS SMALL QUANTITIES OF CELLS, FROM THE WALLS OF THE MOUTH. THESE WERE LEFT ON THE STAMP WHEN THE SUSPECT LICKED IT - POSITIVELY LINKING HIM TO THE CRIME.

BLOOD RELATIVES?

CHILDREN OFTEN LOOK LIKE THEIR PARENTS, BUT CAN WE BE SURE WHO THE TRUE PARENTS ARE?

WHEN A **SPERM CELL** AND AN **EGG CELL** JOIN, THEIR DNA **MIXES** IN THE NUCLEUS OF THE EGG CELL.

1

2 BUT A SMALL AMOUNT OF DNA IS CARRIED IN A CELL ORGAN CALLED THE **MITOCHONDRIA** (THE ENERGY CENTRE OF THE CELL), AND DOES NOT MIX.

SO WHILE MOST OF OUR DNA IS A COMBINATION FROM BOTH PARENTS, SOME **ONLY** COMES FROM OUR **MOTHERS**.

BECAUSE THIS DNA STAYS UNCHANGED FOR GENERATIONS, IT CAN BE USED TO TRACE WHERE CULTURAL GROUPS COME FROM.

COMPARING **DNA** CAN PROVE A PARENT-CHILD RELATIONSHIP, BECAUSE CHILDREN RECEIVE **HALF** THEIR DNA DIRECTLY FROM **EACH** PARENT.

DNA mixes

THE **LEMBA TRIBES**-PEOPLE OF SOUTH AFRICA HAVE LONG BELIEVED THAT THEY ARE DESCENDED FROM ONE OF **ISRAEL'S TWELVE TRIBES**. DNA TESTING HAS NOW REVEALED STRONG SIMILARITIES BETWEEN THIS TRIBE AND SOME JEWISH COMMUNITIES.

FORENSIC ENTOMOLOGY

WHEN PEOPLE OR ANIMALS DIE, THEIR DECAYING BODIES ATTRACT INSECTS.

ENTOMOLOGY IS THE STUDY OF **INSECTS**.

FORENSIC ENTOMOLOGISTS COLLECT THESE INSECTS.

BY COMPARING THEM TO THE KNOWN LIFECYCLES OF THE INSECTS, THEY CAN LEARN ABOUT THE TIME AND CIRCUMSTANCES OF DEATH.

LIFECYCLE OF A FLY

FLIES FOR EXAMPLE LAY EGGS NEAR THE HEAD AND NEAR OPEN WOUNDS SOON AFTER DEATH.

THE **EGGS** TAKE BETWEEN EIGHT HOURS AND TWO DAYS TO HATCH INTO LARVAE.

THE **LARVAE** TAKE FROM FOUR DAYS TO THREE WEEKS TO DEVELOP.

THE **PUPAE** EMERGE AT LEAST ONE WEEK LATER.

DIFFERENT STAGES OF DECAY ATTRACT DIFFERENT INSECTS. EVEN THE DRIED SKIN AND BONES ARE EATEN BY SPECIFIC BEETLES AND TICKS. THEIR PRESENCE HELPS TO DETERMINE THE TIME OF DEATH.

FORENSIC ENTOMOLOGISTS INVESTIGATING SOUTH AFRICAN SERIAL KILLER **MOSES SITHOLE** DETERMINED THE TIME OF DEATH OF HIS VICTIMS BY THE PRESENCE OF SPECIFIC INSECTS. THIS HELPED THEM DETERMINE A PROFILE OF THE KILLER, LEADING TO HIS ARREST.

