

KANSAS FARM BUREAU'S AG LEARNING ZONE

YOUTH ACTIVITY: POWER OF PLASMIDS - DNA BRACELETS

OBJECTIVE: YOUTH WILL BE INTRODUCED TO TRANSFERRING AND REPLICATING GENES THROUGH BIOTECHNOLOGY.

Vocabulary Words

- DNA – contains instructions telling the cell what its job is going to be.
- Bacteria – very small living organisms, usually one-celled.
- Biotechnology – Bio stands for life. Technology is the use of knowledge to create useful things and solve problems. In biotechnology we use living things (such as **bacteria**) to improve things that we use.
- Genes – A unit of DNA that controls one or more traits (such as the color of your hair) passed from parent to offspring.
- Plasmids – Small DNA molecules used to transfer and copy genes.

Lesson

Ask youth if they know what **DNA** is. Allow time for responses.

- Explain that we are all made of trillions of cells. There are around 2.5 billion cells in just one of your hands, but they are so tiny we can't see them. If every cell in your hand was the size of a grain of sand, your hand would be the size of a school bus!
- Each of our cells has its own job. Some cells help us detect light and see, some cells help us hear, other cells carry oxygen around. There are over 200 cell types in the body!
- Our cells are told what to do by a very special molecule called DNA.

Fun Facts About Biotechnology

- **Plasmids** are biotechnology tools that can be used to move any **gene** that is inserted into the plasmid.
- Researchers insert DNA into the plasmid when they need to copy a trait, like a pest or disease resistance.
- **Biotechnology** provides farmers with tools that can make production cheaper and more manageable.

Assessments

- True or False? Only humans have DNA. False – all living things have DNA.
- True or False? Biotechnology can help farmers. True!

Hands-on Activity

- Give each student a full-size pipe cleaner. Ask them to make a circle by twisting the ends together. Researchers use a "code" to open the plasmid.
- Have youth open their bracelets and insert their "foreign DNA" into the plasmid by twisting the ends and closing the circle. As their plasmids makes new copies, it will include the new DNA.

Suggested Resources

- One full-size pipe cleaner
- One 2" section of a different colored pipe cleaner (aka foreign DNA)



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