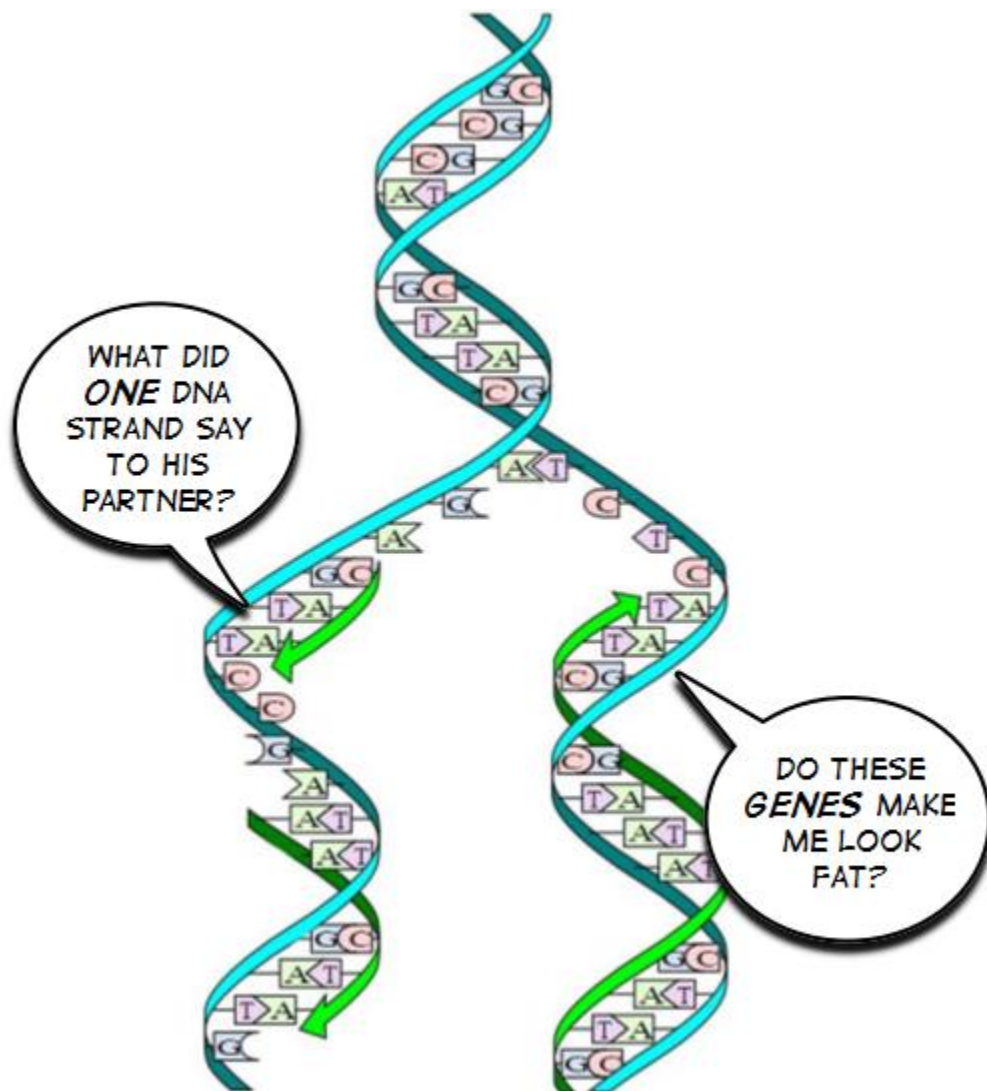


Chapter 30

Organelles Part I



Day One:

Today, you and your child will:

1. Read the text
2. Review the text with your child
3. Complete the student worksheets
4. Collect the materials you will need for days two and three

National Science Education Standards covered this week:

Cells have organelles that perform specific tasks within the cell. Every cell is surrounded by a membrane that separates it from the outside world. Inside the cell is a concentrated mixture of thousands of different molecules which form a variety of specialized structures that carry out such cell functions as energy production (mitochondria), transport of protein ("ER"), synthesis of new chemical messengers (ribosomes), and the storage of DNA.

Definitions

Nucleus	"new-klee-us"; the largest organelle in a plant or animal cell; contains the DNA
Ribosomes	"ri-bow-so-m"; make protein for the cell
ER	quickly sends protein messages to organelles
RNA	"messages" sent by DNA that are read by ribosomes
Mitochondria	"might-o-con-dree-on"; an organelle that takes nutrients from plants and animals and changes it into energy for the cell

Sample questions to ask your child after completing the weekly reading.

What is the most important job of the nucleus?

The most important job of the nucleus is to hold onto the DNA.

Does DNA make protein for the cell?

Not really. It sends out "orders" to the ribosomes so they can make proteins.

What is the goey fluid that contains all of a cell's organelles?

The goey fluid is cytoplasm.

Why is it so important that you eat a lot of protein in your food?

Protein is digested by your body and recycled to make new protein for your cells.

Answers to worksheet questions:

Page 1:

Nucleus

ER

Mitochondria

Ribosomes

Page 2:

4 - nucleus

1 - ribosomes

2 - ER

3 - mitochondria

Page 3:

"Color the animal cell...."

Day Two:

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

The following text will give you the most important items to review for your activity today.

DNA inside the nucleus of a cell sends out "orders" to ribosomes within the cytoplasm to make specific proteins.

These "orders" are actually small copies of the DNA itself which are made in the nucleus and then sent through the cytoplasm. These copies act as blueprints for making specific proteins. The ribosomes "read" these copies and decode the blueprints to make specific proteins that will be needed by the cell.

The hidden code of cells

Objective:

Children will explore how DNA sends orders through a special code.

Materials:

popsicle sticks and glue OR gumdrops and toothpicks OR clay and toothpicks
OR some kind of construction toys
hidden code chart and secret code (see attached)

Procedure:

Inform the child that the DNA inside the nucleus of a cell sends out messages that are "de-coded" by ribosomes. The code that DNA uses is very good; however, sometimes mistakes are made that can be good, bad or not important to the cell. In this activity, the child will be playing the part of a ribosome, de-coding a message from the DNA. It is up to the child to follow the instructions the DNA is asking them to do! You may give them a hint...

The child is going to be building something!

Provide the child with the "hidden code chart". The "secret code" can be found on the following page.

Once the child de-codes the message, provide them with the necessary materials to build their object.

For the parents: the object that is to be built is a cube with a four-sided "roof."

Explanation:

When the child has finished building their home, inform them:

The coded message was the DNA, The ribosome was the child, and the protein was the home.

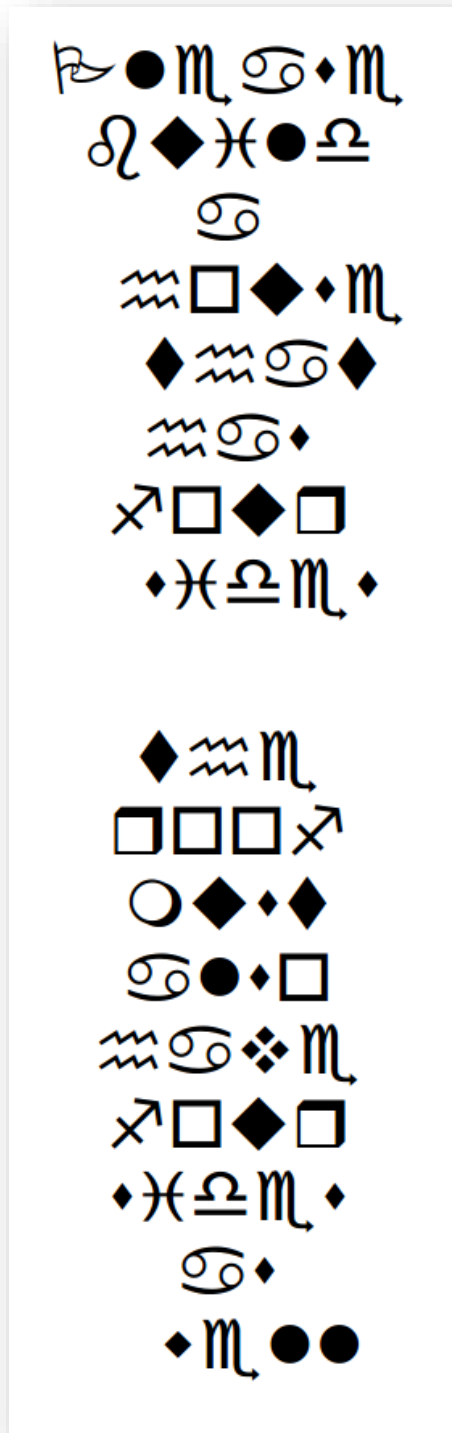
This action takes place every time that DNA needs to send a message to the organelles in the cell. A coded message is sent out that is read by the ribosomes. The ribosomes then send the message to the organelles in the form of protein. The secret code is translated into the following message:

*Please build a house that has four sides
The roof must also have four sides as well*

Hidden Code Chart

A	☉	H	☿	O	□	V	❖
B	♈	I	♃	P	♁	W	◆
C	♏	J	er	Q	□	X	⊠
D	♎	K	&	R	□	Y	⊞
E	♍	L	●	S	◆	Z	⌘
F	♊	M	○	T	◆		
G	♏	N	■	U	◆		

Secret code:



Day Three: Lab Activity

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

The following text will give you the most important items to review for your activity today.

Removing DNA from cells is the primary job for scientists who study molecular genetics.

Expensive equipment is not needed to obtain a sample of DNA from an organism.

Cracking open the nucleus

Objective:

Children will take the DNA out of a banana.

Materials:

banana
salt
warm water
blender
liquid soap
toothpicks
strainer
glass jar
rubbing alcohol

Procedure:

Cut the banana into small pieces.

Place the pieces into a blender. Add a teaspoon of salt and cover the mixture with warm water.

Mix in the blender for 10 seconds.

Pour the blended mixture through the strainer and collect the liquid in the glass jar. You should receive a generous amount of liquid.

Add two teaspoons of liquid soap to the liquid and slowly mix it in. Do not create bubbles while you stir.

Carefully pour an equal amount of rubbing alcohol down the side of the glass. Allow the mixture to stand for at least five minutes. Do not mix.

Use the toothpick to scoop up the white/milky-looking substance that is floating in the rubbing alcohol. This substance is your DNA.

Explanation:

The material your child removed from the banana was the blueprints for a banana tree to stay alive. The DNA you took from this fruit, at one time, was contained inside of the plant cell's nucleus. This is the material that sent messages throughout the cytoplasm for the ribosomes to read and make protein.

Why liquid soap? The cell membrane and nuclear membrane of any plant is made up of fats called lipids. We use soap everyday (hopefully) to break apart things like dirt and grime. But soap also breaks apart oils and fats too. So, all of those lipids that are used to protect the cell in its membrane cannot stay together when you put a lot of soap on them. The soap actually breaks apart the membranes of the cell, without hurting the organelles inside! Cool, huh?!?!?