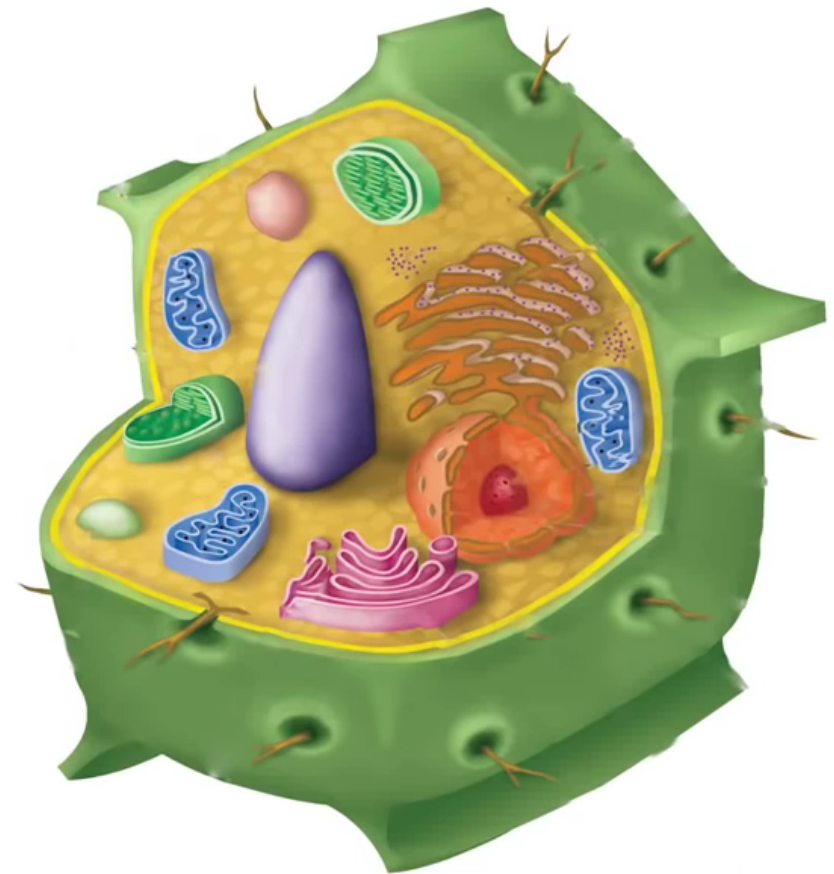
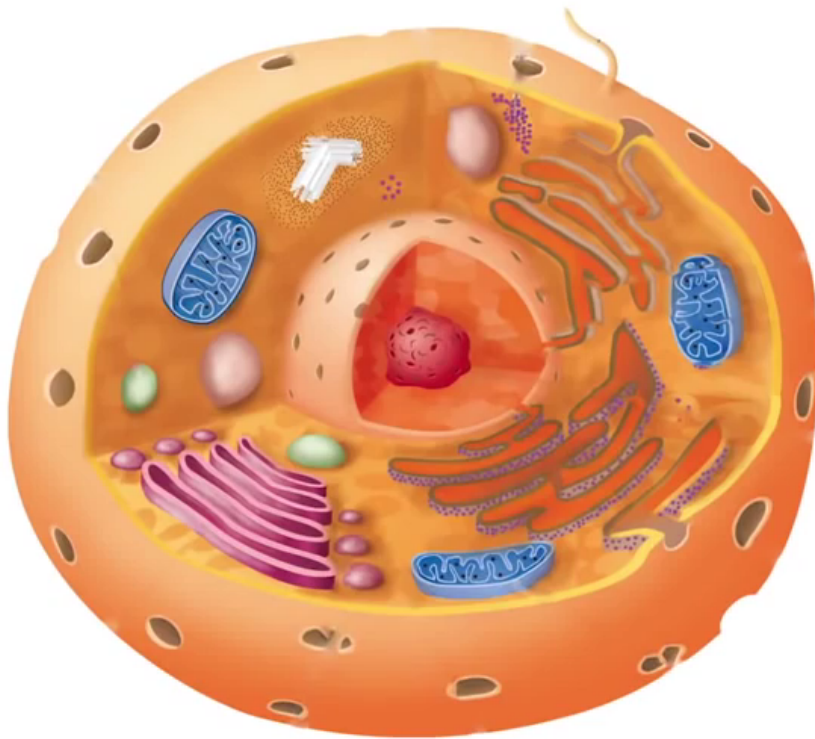
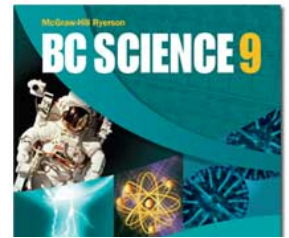
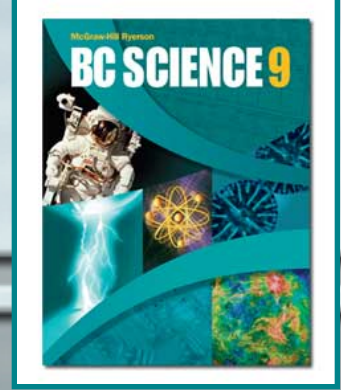


4.1 The Function of the Nucleus within the Cell

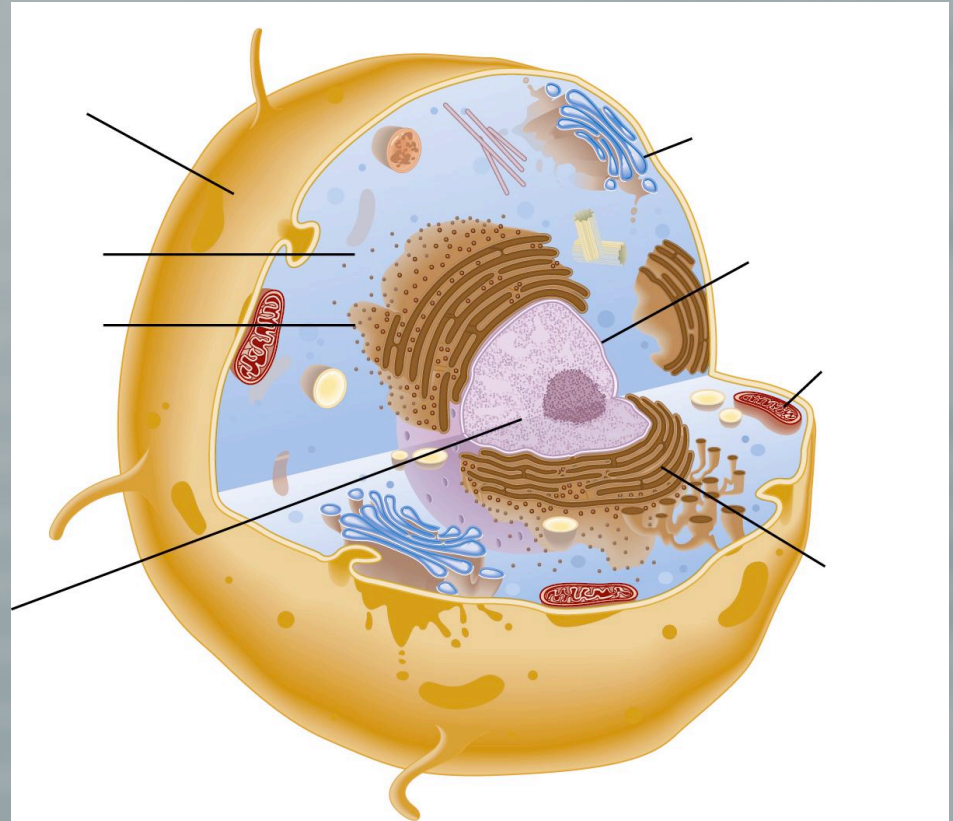


4.1 The Function of the Nucleus within the Cell



Animal Cells

Animal cells are equipped with many structures that allow the cell to perform a variety of functions.



See page 122

Cell Parts and Organelles



Animal Cell Parts (also found in plant cells)

cell membrane - thin covering that controls the flow of materials in and out of the cell.

cytoplasm - jelly-like substance contains the organelles (specialized cell parts)

mitochondria – membrane-bound, provide energy for cells

ribosomes – **proteins** that are manufacturing factories for proteins

endoplasmic reticulum - membrane-covered channels that act as a transport system for materials made in the cell

vesicles - membrane-covered sacs formed by the endoplasmic reticulum. Vesicles transport new proteins to the Golgi body.

Golgi body – membrane-bound, sorts and packages proteins for transport

nucleus - controls all cell activities

nucleolus - membrane-free organelle that makes ribosomes

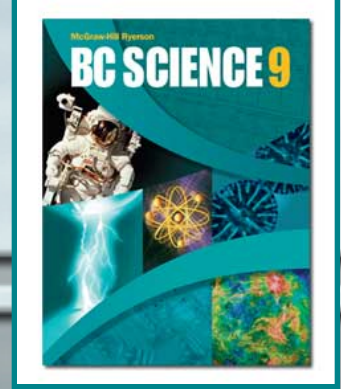
nuclear membrane - protects the contents of the nucleus

Nuclear pores - openings in the nuclear membrane that allow only certain materials to pass

vacuoles - membrane-bound storage containers

See pages 122 - 124

Cell Parts and Organelles



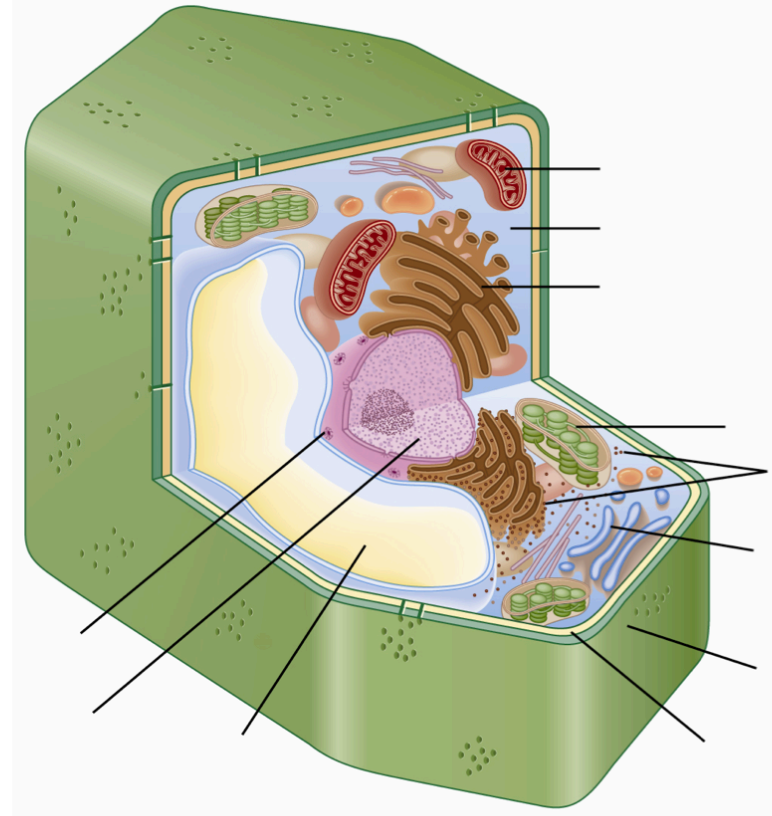
Plant Cells

Plant cells are equipped with some structures that animal cells do not have.

chloroplasts – membrane-bound, trap energy from Sun to make glucose, food for the plant

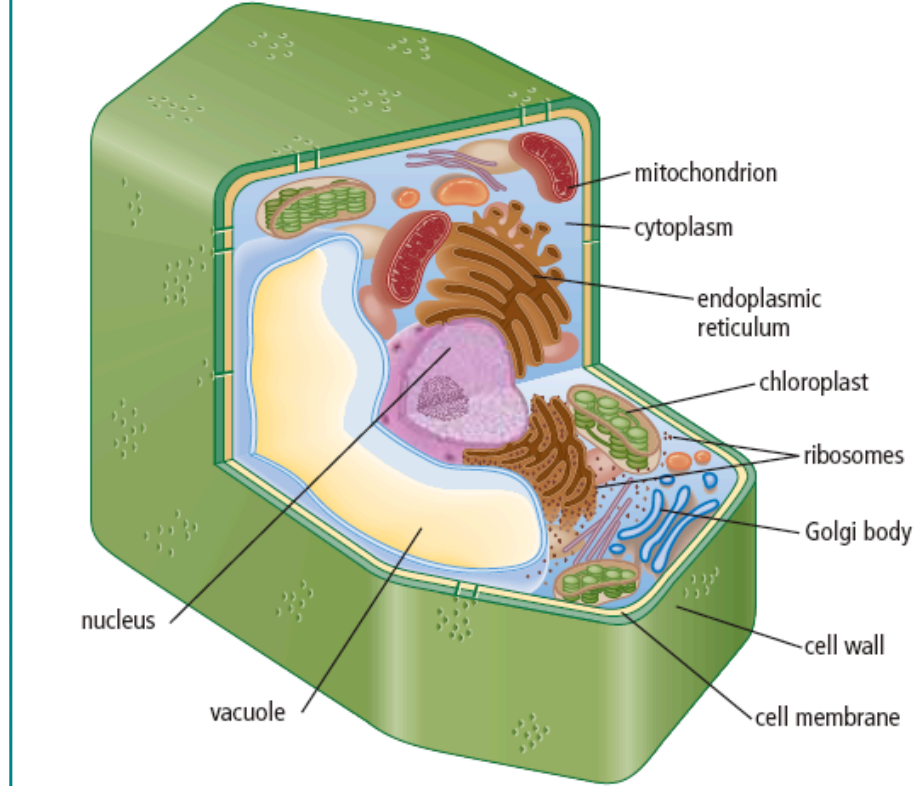
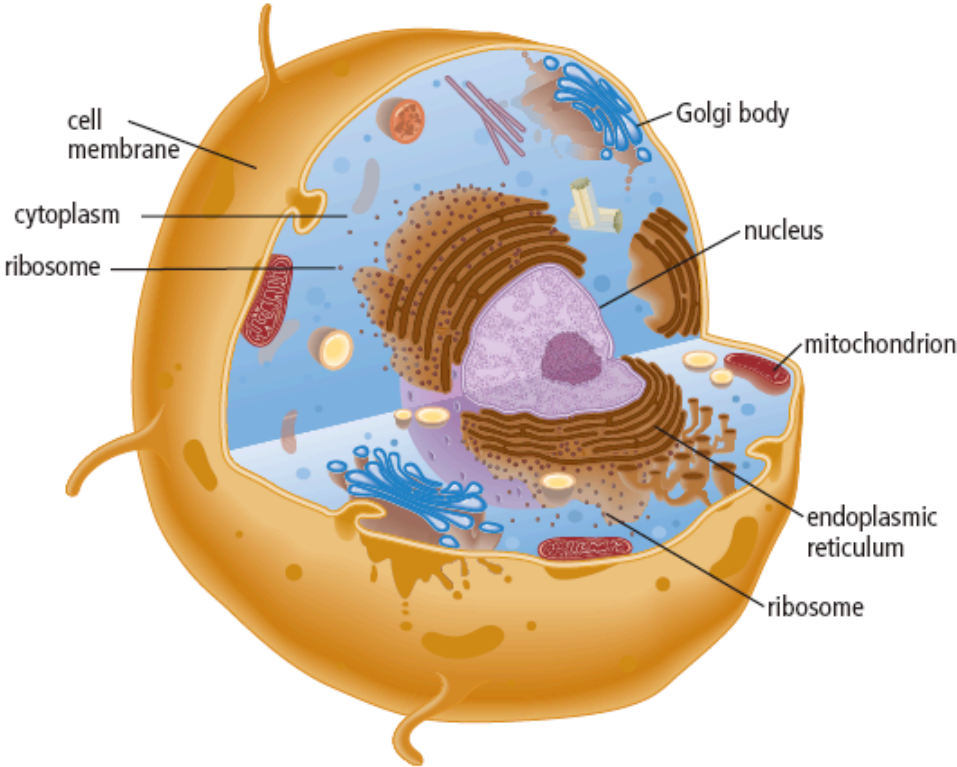
cell wall - tough, rigid structure that surrounds cell membrane, provides protection and structural support

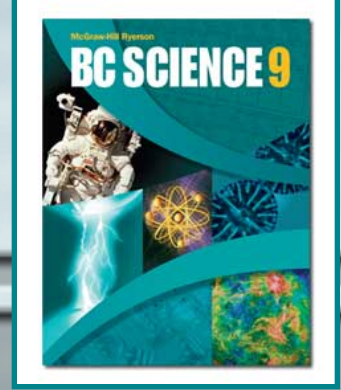
large vacuoles – membrane-bound, plant cells are equipped with a large vacuole for storing water



See pages 122 - 124

Cell Parts and Organelles





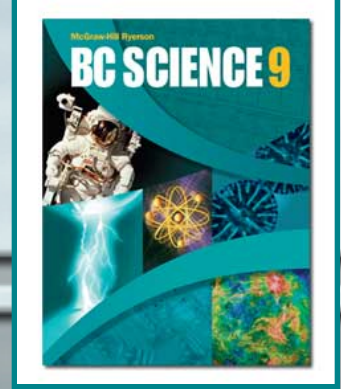
ACTIVITY: The Cell as like a...

On the right column, compare your cell to something like a city, a factory, a company, a human body, a school, etc.

City

Human Body

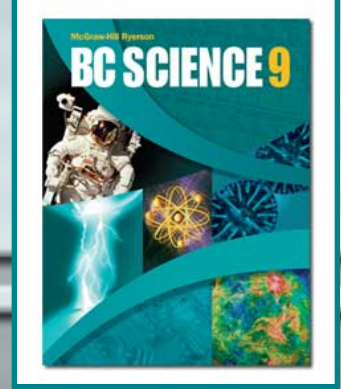
E.g. Nucleus...



HOMEWORK Qs

- Checking Concepts pg. 135
 - Question 1 only
 - **BRING SCISSORS TOMORROW!**

- ◆ ALL of Chapter 4 Questions will be handed in when we finish the Chapter!
 - Keep them together! Keep them safe!

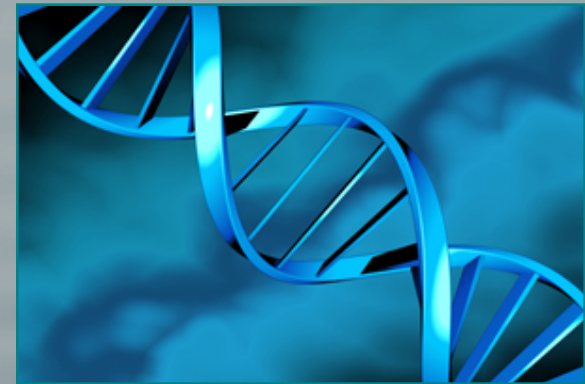


The Nucleus and DNA

- The nucleus contains DNA (deoxyribonucleic acid); DNA is the molecule that has the master set of instructions for how cells function, what they will produce, and when they will die.

Structure of DNA

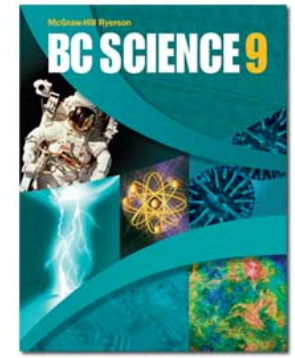
- DNA looks like a twisted ladder - two strands wrap around each other in a spiral shape.
- The sides of the DNA ladder are made of sugar and phosphate.
- The steps of the ladder are made of four nitrogen bases:



adenine (A), guanine (G), cytosine (C), and thymine (T).

- The bases join in a specific way
 - A always joins with T
 - G always joins with C
- Sugar + Phosphate + Nitrogen base = NUCLEOTIDE

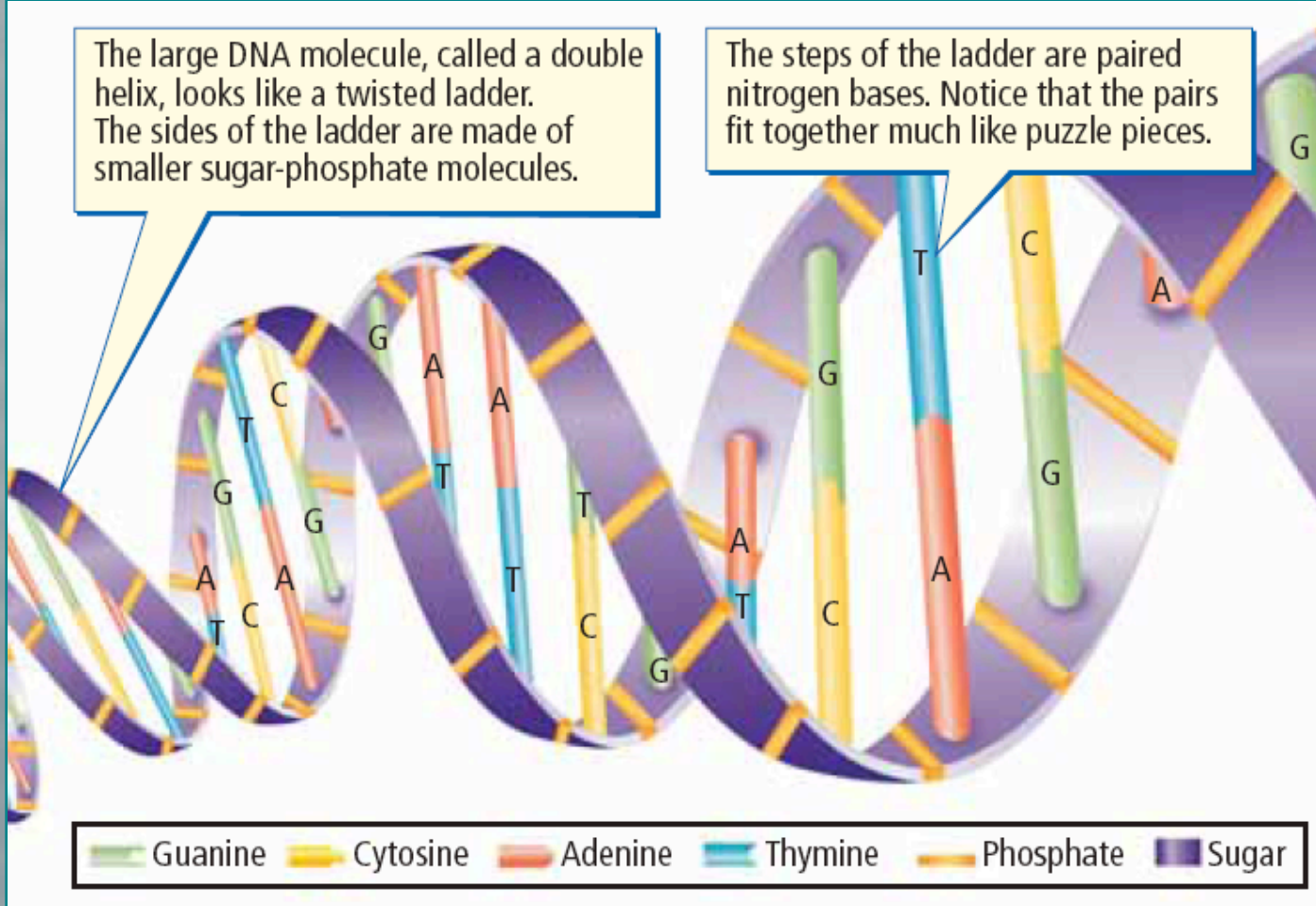
See page 126



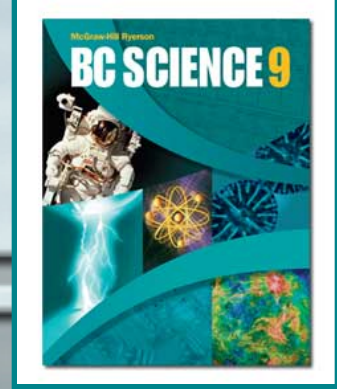
DNA Structure

The large DNA molecule, called a double helix, looks like a twisted ladder. The sides of the ladder are made of smaller sugar-phosphate molecules.

The steps of the ladder are paired nitrogen bases. Notice that the pairs fit together much like puzzle pieces.

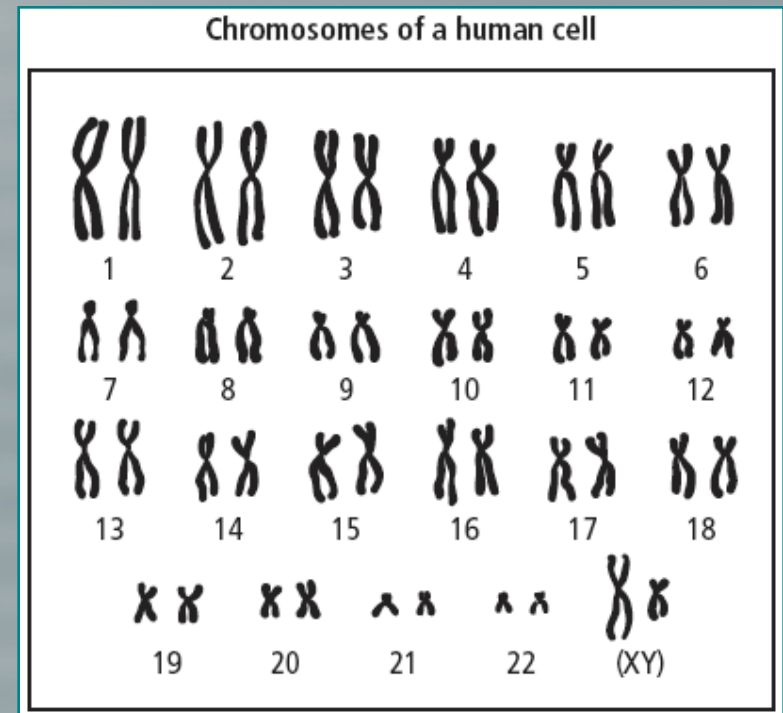


See page 126



DNA in the Nucleus

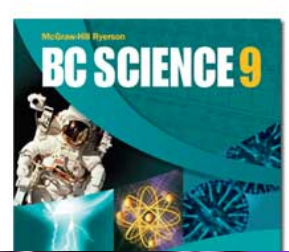
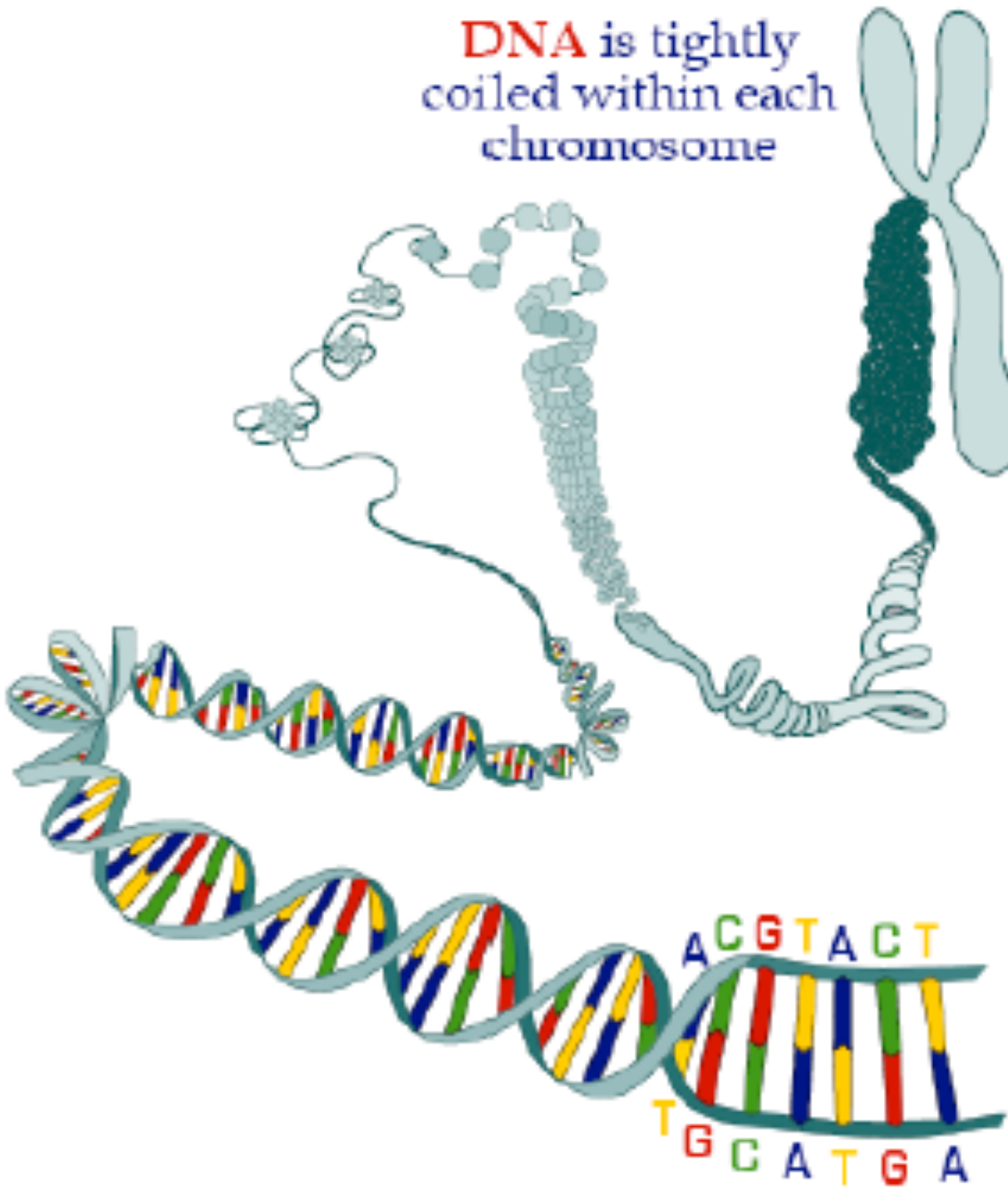
- Most of the time DNA is in the form of **chromatin**
- Chromatin coils tightly into X-shaped **chromosomes** when it's time for the cell to divide.
- Every organism has a specific number of chromosomes
- Human cells have 46 chromosomes arranged in 23 pairs
- The 23rd pair determines gender;
 - XX for females
 - XY for males



See pages 127 - 128

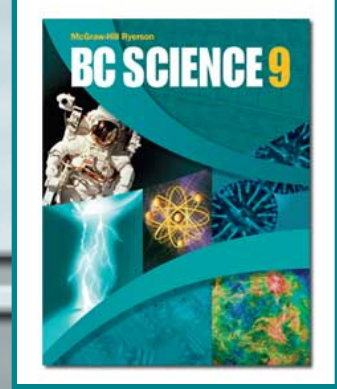
DNA in

DNA is tightly coiled within each chromosome

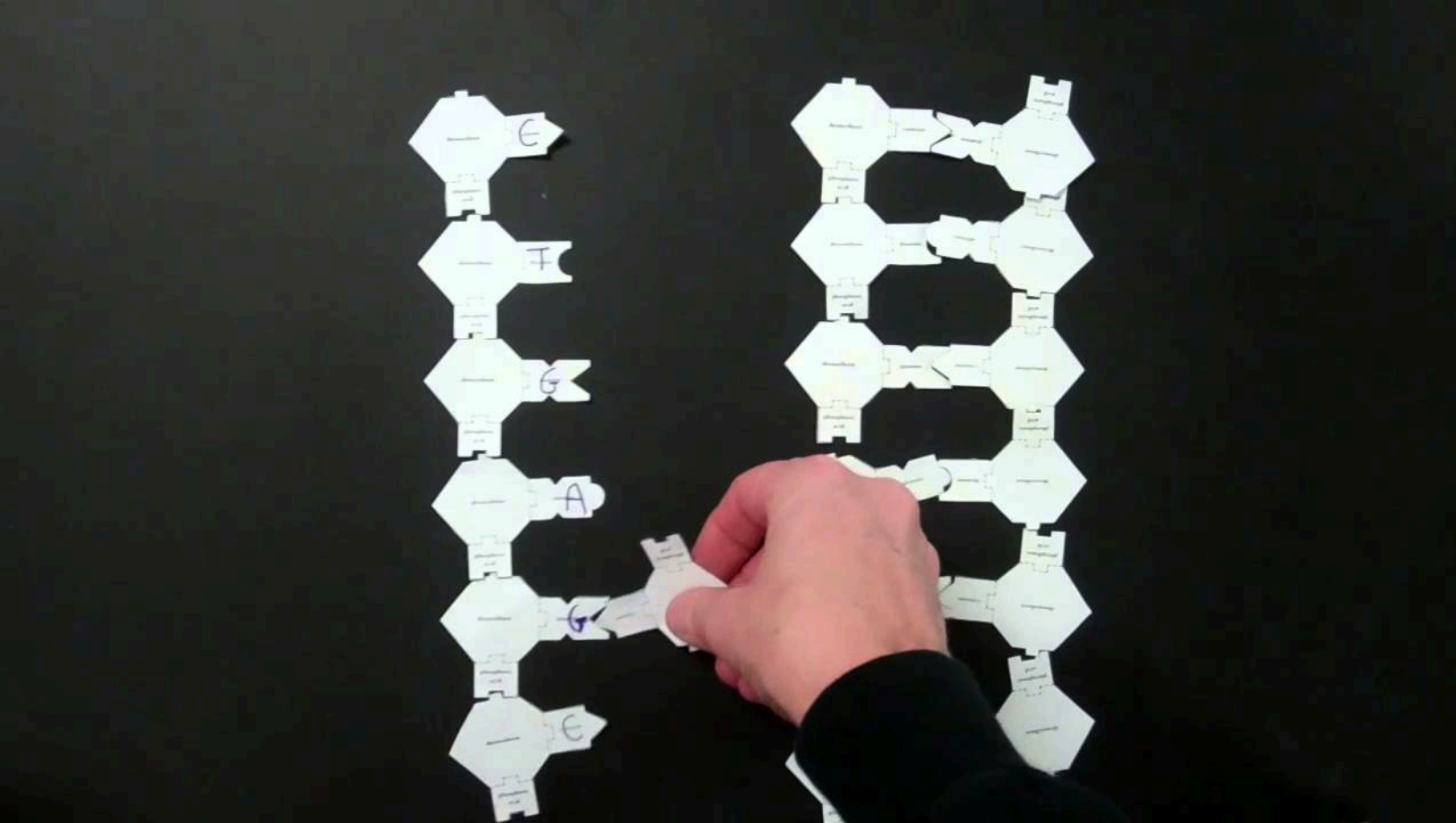


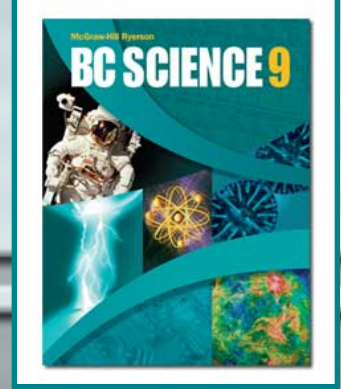
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ACTIVITY: Modelling DNA

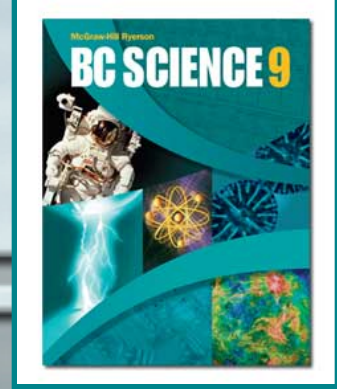




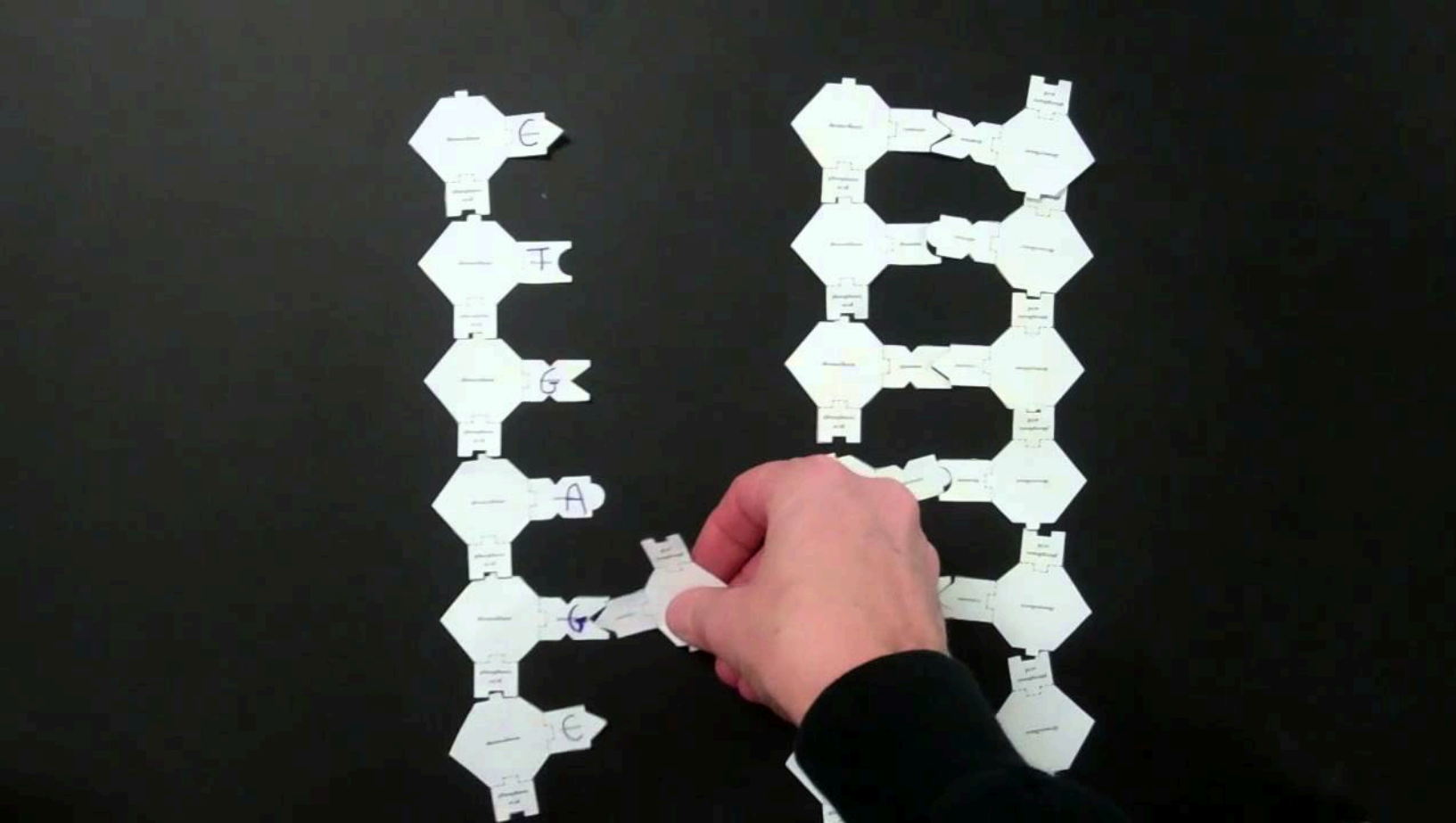
HOMEWORK Qs

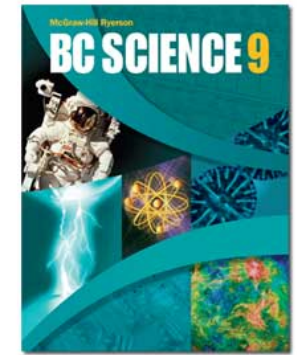
- Check Your Understanding pg. 135
 - Question 7, 8, 9, 13

- ◆ ALL of Chapter 4 Questions will be handed in when we finish the Chapter!
 - Keep them together! Keep them safe!



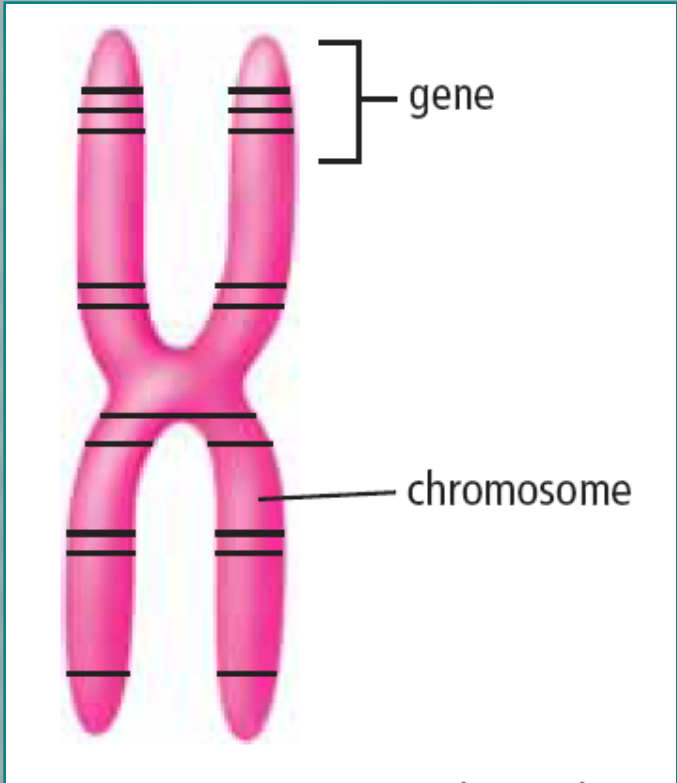
ACTIVITY: Modelling DNA



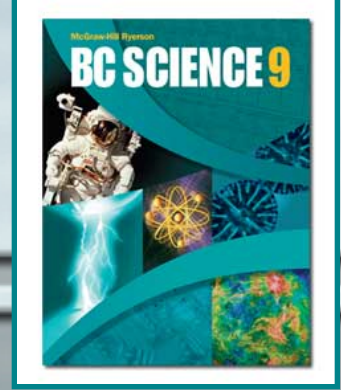


Genes

- Genes are small segments of DNA located on a chromosome
- Genes store the information needed to produce proteins
- Each chromosome can carry thousands of genes
- All your body cells have the same genes, but only specific genes are “read” in each cell to produce specific proteins
 - E.g. hemoglobin
- Specialized proteins called **enzymes** and **hormones** carry out important specific functions in the body



See pages 129 - 130

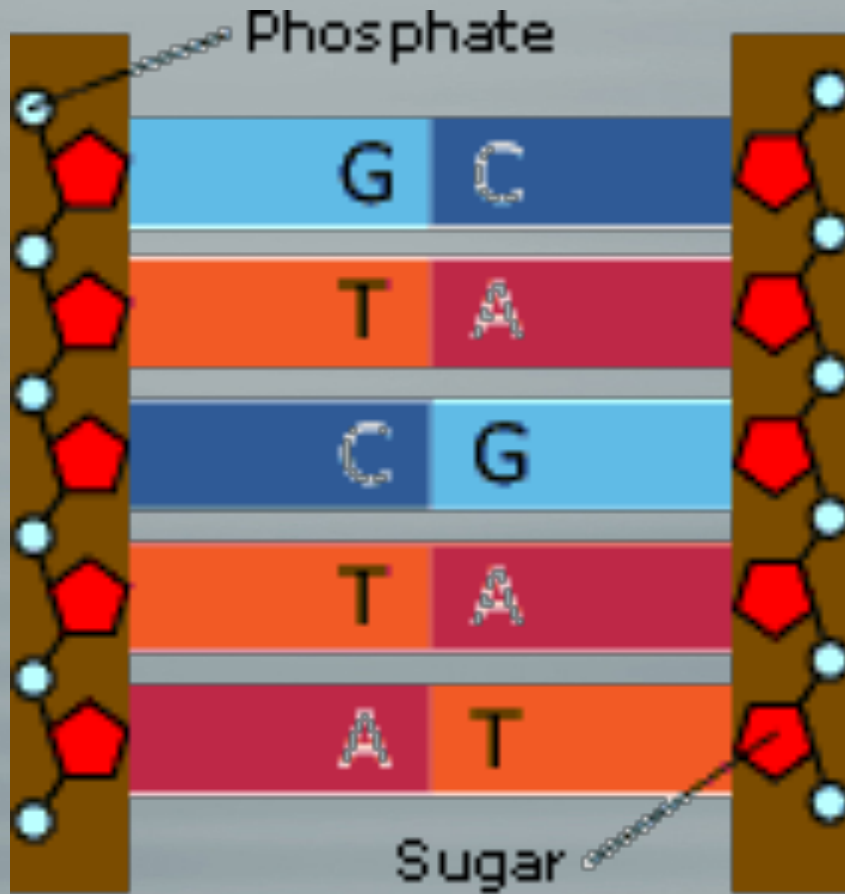


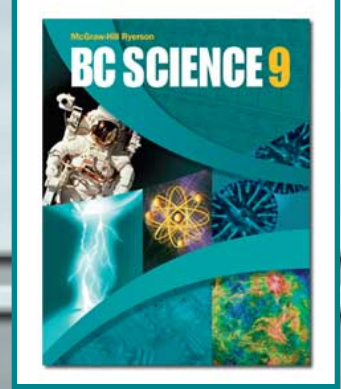
HOMEWORK TIME

YOUR HOMEWORK SO FAR...

- Check Your Understanding pg. 135
 - Question 1, 7, 8, 9, 13
 - Study for Cell Organelles QUIZ tomorrow!
- ◆ ALL of Chapter 4 Questions will be handed in when we finish the Chapter!
 - Keep them together! Keep them safe!

REVIEW: Classroom DNA

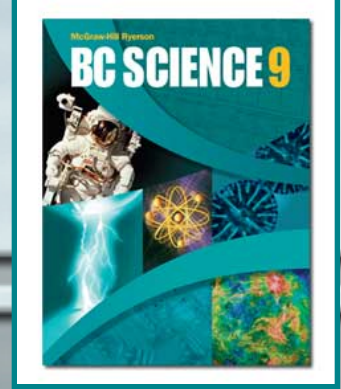




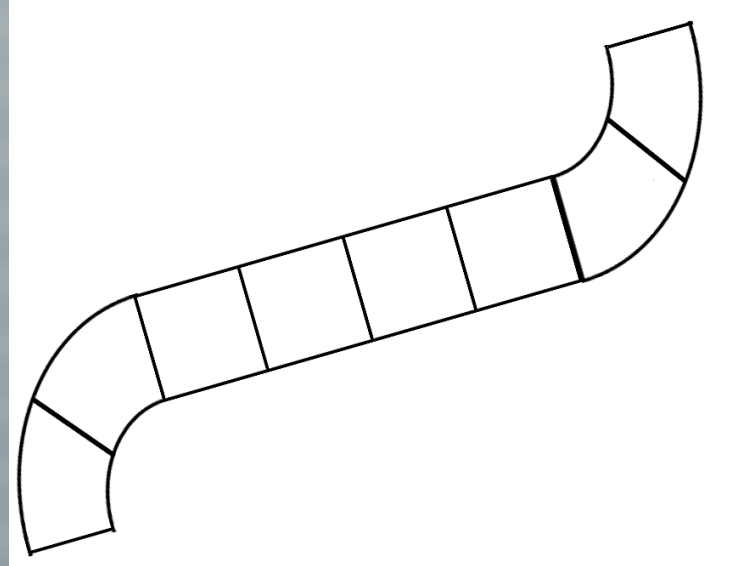
Production of Proteins

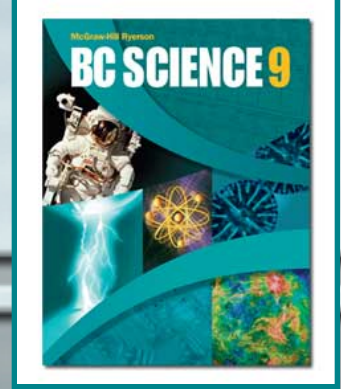
- Protein production in the cell involves several important steps (E.g. Insulin):
 1. The nucleus receives a chemical signal to make a specific protein.
 2. The DNA message (gene) for the protein is copied into a small molecule called RNA.
 3. RNA leaves the nucleus through a nuclear pore.
 4. The RNA message is delivered to a ribosome, the ribosome makes the protein.
 5. The manufactured protein enters the endoplasmic reticulum (ER).
 6. A vesicle forms at the end of the ER, and carries the protein to the Golgi body.
 7. The Golgi body repackages the protein for transport out of the cell.
 8. A vesicle forms off the end of the Golgi body to carry the protein to the cell membrane.
 9. The vesicle attaches to the cell membrane, and its protein contents are released out of the cell.

See page 131



ACTIVITY: Teach me how to PROTEIN!





HOMEWORK Qs

- Checking Your Understanding pg. 135
 - Question 3, 4, 5, 6
- ◆ ALL of Chapter 4 Questions will be handed in when we finish the Chapter!
 - Keep them together! Keep them safe!