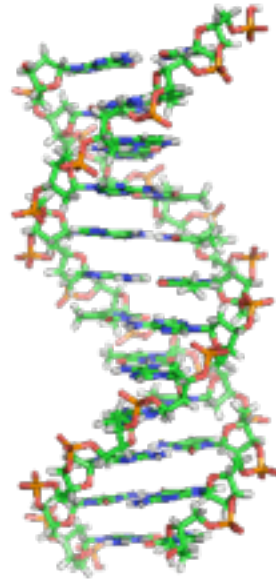


# How to teach 3rd graders about DNA



David Sabatino

# A Fundamental Molecule of Life : DNA

## Objectives :

- 1) Provide background Information elementary students can understand
- 2) Test understanding by asking Questions
- 3) Put theory to practice
  - a) Experiment
  - b) Artistic representation
- 4) Food for thought
  - a) In class assignment
  - b) Homework

# 1. Provide Background Information They CAN Understand

Keep it simple!



Present visual material they can follow with interest.



Courtesy of Genetics 101:

[http://www.youtube.com/watch?v=ubq4eu\\_TDFc](http://www.youtube.com/watch?v=ubq4eu_TDFc)

<http://www.youtube.com/watch?v=tJjXpiWKMyA&feature=relmfu>

<http://www.youtube.com/watch?v=-Yg89GY61DE&feature=relmfu>

<http://www.youtube.com/watch?v=kLpr6t4-eLI&feature=relmfu>

## 2. Test Their Understanding By Asking Questions



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1. What are genes?

“Genes create humans, animals and plants”-how?

2. How do genes make us different from plants and animals?

“We have different number of genes”-why?

## 2. Test Their Understanding By Asking Questions



1. What are genes?  
“Genes create humans, animals and plants”-how?
2. How do genes make us different from plants and animals?  
“We have different number of genes”-why?
3. What are chromosomes?

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3. What are chromosomes?

“Chromosomes are made of DNA”-when?

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2. How do genes make us different from plants and animals?  
“We have different number of genes”-why?
3. What are chromosomes?  
“Chromosomes are made of DNA”-when?
4. What is DNA?



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2. How do genes make us different from plants and animals?  
“We have different number of genes”-why?
3. What are chromosomes?  
“Chromosomes are made of DNA”-when?
4. What is DNA?  
“DNA contains all our information”-where?

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3. What are chromosomes?  
“Chromosomes are made of DNA”-when?
4. What is DNA?  
“DNA contains all our information”-where?
5. How does our DNA make us different from each other?

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“We have different number of genes”-why?
3. What are chromosomes?  
“Chromosomes are made of DNA”-when?
4. What is DNA?  
“DNA contains all our information”-where?
5. How does our DNA make us different from each other?  
“We have different DNA”-what?

# 3. Put Theory to Practice

Translate the genetic code into your physical trait

Gene	Amino Acid Name	One letter symbol	Gene	Amino Acid Name	One letter symbol	Gene	Amino Acid Name	One letter symbol	Gene	Amino Acid Name	One letter symbol
UUU	Phenylalanine	F	UCU	Serine	S	UAU	Tyrosine	Y	UGU	Cysteine	C
UUC	Phenylalanine	F	UCC	Serine	S	UAC	Tyrosine	Y	UGC	Cysteine	C
UUA	Leucine	L	UCA	Serine	S	UAA	stop		UGA	stop	
UUG	Leucine	L	UCG	Serine	S	UAG	stop		UGG	Tryptophan	W
CUU	Leucine	L	CCU	Proline	P	CAU	Histidine	H	CGU	Arginine	R
CUC	Leucine	L	CCC	Proline	P	CAC	Histidine	H	CGC	Arginine	R
CUA	Leucine	L	CCA	Proline	P	CAA	Glutamine	Q	CGA	Arginine	R
CUG	Leucine	L	CCG	Proline	P	CAG	Glutamine	Q	CGG	Arginine	R
AUU	Isoleucine	I	ACU	Threonine	T	AAU	Asparagine	N	AGU	Serine	S
AUC	Isoleucine	I	ACC	Threonine	T	AAC	Asparagine	N	AGC	Serine	S
AUA	Isoleucine	I	AGA	Threonine	T	AAA	Lysine	K	AGA	Arginine	R
AUG	Methionine	M	ACG	Threonine	T	AAG	Lysine	K	AGG	Arginine	R
GUU	Valine	V	GCU	Alanine	A	GAU	Aspartic Acid	D	GAU	Glycine	G
GUC	Valine	V	GCC	Alanine	A	GAC	Aspartic Acid	D	GAC	Glycine	G
GUA	Valine	V	GCA	Alanine	A	GAA	Glutamic Acid	E	GAA	Glycine	G
GUG	Valine	V	GCG	Alanine	A	GAG	Glutamic Acid	E	GAG	Glycine	G

## EXAMPLES:

YOUR HAIR IS: CGUGAAGAU

R E D

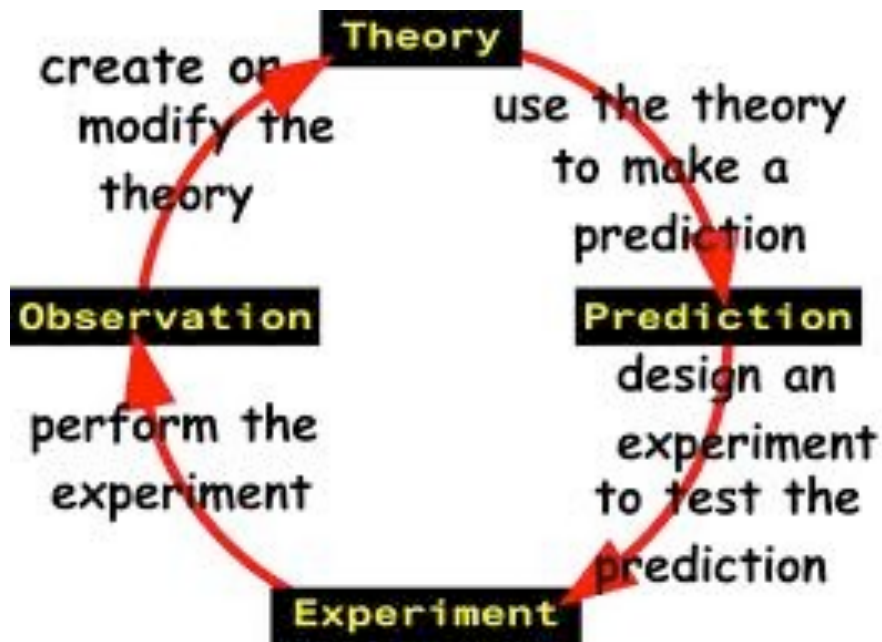
YOUR NOSE IS: UUUAAGGCUACU

F L A T



# 3. Put Theory to Experiment

## DEVELOP A SCIENTIFIC METHOD TO PROVE THE POINT



# 3. Put Theory to Experiment

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### 3. Put Theory to Experiment

- THEORY: DNA EXISTS IN LIVING ORGANISMS
- EXPERIMENT: EXTRACT AND ISOLATE DNA FROM ITS NATURAL SOURCE

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## PROCEDURE:



# 3. Put Theory to Experiment

- **THEORY: DNA EXISTS IN LIVING ORGANISMS**
- **EXPERIMENT: EXTRACT AND ISOLATE DNA FROM ITS NATURAL SOURCE**

## **PROCEDURE:**

### **1. MASH YOUR FRUIT OR VEGGIE**



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# 3. Put Theory to Experiment

- **THEORY: DNA EXISTS IN LIVING ORGANISMS**
- **EXPERIMENT: EXTRACT AND ISOLATE DNA FROM ITS NATURAL SOURCE**

## **PROCEDURE:**

### **1. MASH YOUR FRUIT OR VEGGIE**



### **2. EXTRACT DNA**



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# 3. Put Theory to Experiment

- **THEORY: DNA EXISTS IN LIVING ORGANISMS**
- **EXPERIMENT: EXTRACT AND ISOLATE DNA FROM ITS NATURAL SOURCE**

## PROCEDURE:

### 1. MASH YOUR FRUIT OR VEGGIE



### 2. EXTRACT DNA



### 3. FILTER THE MUSH



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# 3. Put Theory to Experiment

- **THEORY: DNA EXISTS IN LIVING ORGANISMS**
- **EXPERIMENT: EXTRACT AND ISOLATE DNA FROM ITS NATURAL SOURCE**

## PROCEDURE:

### 1. MASH YOUR FRUIT OR VEGGIE



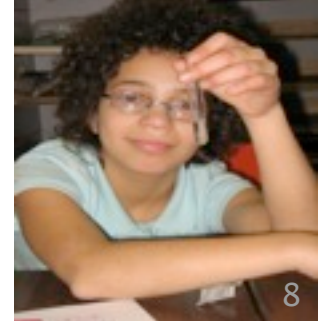
### 2. EXTRACT DNA



### 3. FILTER THE MUSH



### 4. PRECIPITATE DNA



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## 4. Take Home Some Food For Thought

**HOMEWORK ASSIGNMENTS AND REPORTS ARE GREAT  
EXERCISES TO REMEMBER WHAT YOU LEARNED**



# 4. Take Home Some Food For Thought

## HOMEWORK ASSIGNMENTS AND REPORTS ARE GREAT EXERCISES TO REMEMBER WHAT YOU LEARNED

### LAB REPORTS:

Name \_\_\_\_\_ Date \_\_\_\_\_

The Scientific Method Lab Report

Title \_\_\_\_\_

#### I. Think of an Idea or Question

A. The question we are seeking to discover is \_\_\_\_\_

B. Things I already know about this topic are \_\_\_\_\_

#### II. Make a Prediction

A. I predict that \_\_\_\_\_

#### III. Experiment and Investigate

A. Materials: In order to do this experiment we need \_\_\_\_\_

B. Tools: Instruments I will use to gather my data \_\_\_\_\_

C. Procedure: My step-by-step plan to explore the question is \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



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