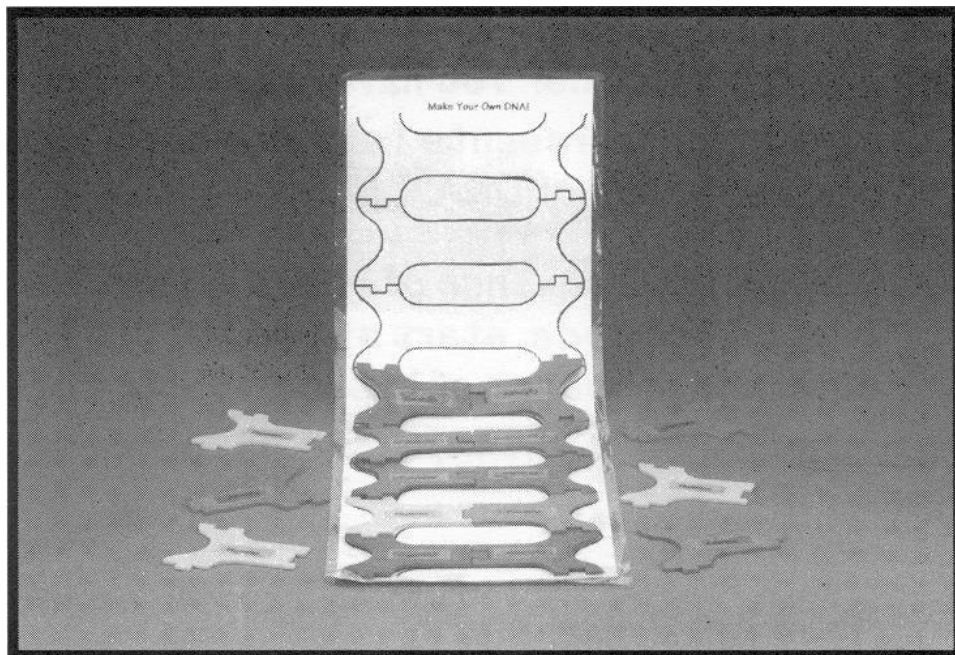


SIDE DISPLAY

# Make Your Own DNA

Visitors match puzzle pieces to outlines of a DNA strand. The puzzle pieces represent the four chemicals making up DNA base pairs: adenine, thymine, guanine, and cytosine. Visitors can place the pieces sequentially in any order, but the only pieces that fit together as pairs are guanine with cytosine, and adenine with thymine. These are the bases that bond to form pairs in a DNA molecule.



## OBJECTIVES:

Visitors learn the basic structure of a DNA strand. They learn that DNA is composed of millions of base pairs consisting of four chemicals—adenine, thymine, guanine, and cytosine—that bond together only in certain ways. They also learn that the sequence of the base pairs determines genetic information.

SCIENCE TOPICS	PROCESS SKILLS	VOCABULARY
DNA	Observing	Atom
Chemical Bonds	Investigating	DNA
Atomic Structure	Making Models	Molecule
	Comparing/Contrasting	Sugar



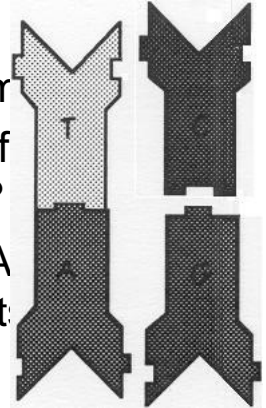


# Make Your Own DNA

## To do and notice:

1. Fit the pieces together inside the outline.
2. Use each piece face up, so you can read the name.
3. The order doesn't matter, but only certain pairs of colors fit together. Which base pairs fit together?

Congratulations! You have made a segment of DNA. Each color represents 1 of the 4 basic structural units or bases of DNA.

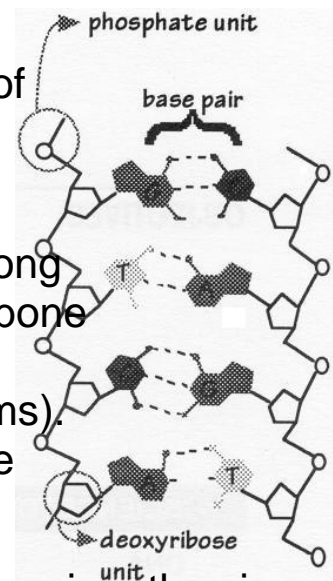


What is the sequence of bases in the DNA segment you made? To read the code, start at 1 end of the DNA and read down the sequence of bases on 1 side, for example, “**guanine**, **thymine**, **cytosine**, **adenine**, etc.”

## What is going on?

This model shows a small section of 1 strand of DNA. A strand of DNA in your body contains about 3 billion base pairs!

DNA (deoxyribonucleic acid) is made up of 2 long strands of atoms. These strands have a backbone of deoxyribose (a sugar) units alternating with phosphate units (phosphorus and oxygen atoms). The 2 strands are held together in a ladder-like formation by base pairs.



The sequence of the four bases — adenine, guanine, thymine, and cytosine — determines the genetic information on a DNA

strand. Because of their chemical structures, guanine will bond only with cytosine and adenine will bond only with thymine.

## MATERIALS

(with amounts to have on hand)

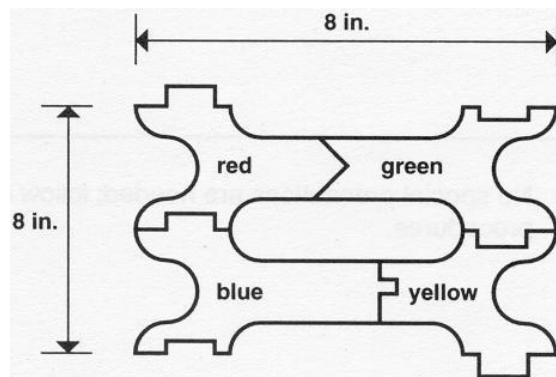
- Sheets of ¼-in. plastic in four different colors (red, yellow, blue, and green) — **OR** — ¼-in. wood and four colors of paint
- Three pieces of 8½-in. x 11-in. white paper
- Laminating material
- One black permanent marker

## Setup/Takedown Procedures

### ORIGINAL SETUP



- ❑ Construct puzzle pieces by cutting out wood or plastic following the sample pattern below. Make at least five of each piece (each color), for a minimum of 20 pieces.



- ❑ Label the top side of each red piece “Cytosine.”
- ❑ Label the top side of each yellow piece “Thymine.”
- ❑ Label the top side of each blue piece “Adenine.”
- ❑ Label the top side of each green piece “Guanine.”
- ❑ On top of the white paper, fit pieces together to form a ladder-like shape. Using a black permanent marker, trace the outline of the puzzle onto the paper. Remove the puzzle pieces and laminate the paper.

### WEEKLY SETUP

- ❑ Set out the public copy in Plexiglas holders.
- ❑ Set out the laminated puzzle outline.
- ❑ Set out the puzzle pieces.

**DAILY SETUP**

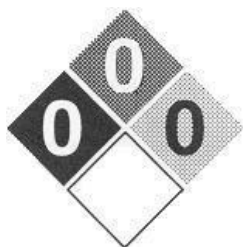
- ☐ Check that the puzzle pieces and puzzle outline are in good shape.

**RUNNING SUGGESTIONS**

- ◇ Check the setup periodically during the day. Take the puzzle apart so that new visitors can reassemble it.

**EXTENSIONS**

Visitors can relate the puzzle they make to the DNA Model and to the Onion DNA activities.

**SAFETY & DISPOSAL**

No special precautions are needed; follow standard lab safety procedures.