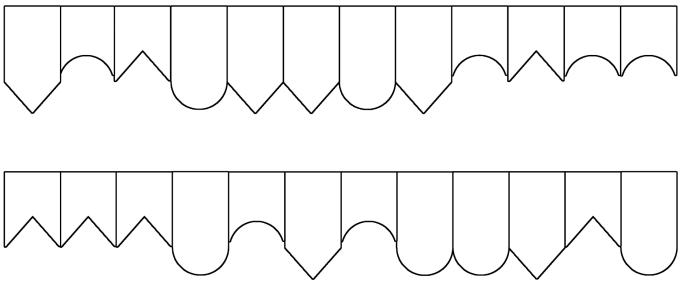
The Mystery of the Central Dogma

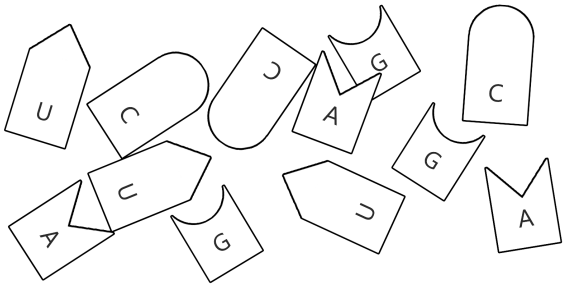
Dr. Anna Phase has asked you, the world's best detective, to figure out who broke into her lab and stole her life's work!

As you examine the crime scene, you notice that the thief left behind two clues:

Clue #1:



Clue #2:



You believe that if you can crack the code, you'll figure out where the thief took their stolen research. You immediately get to work deciphering the code.

Activity 1: Assembling the puzzle
Try to fit the pieces from Clue #2 into Clue #1.

Reflection questions:
Did you notice any patterns in where the letters went?
What would happen if you tried to pair an A with a G? What about an A with a C?

What does this mean?
The first step in getting a protein is reading the **DNA**. In this case, the DNA is like Clue #1: a long strand of specific base units. Next, **RNA** is synthesized off of the DNA one unit at a time. You did this when you matched the pieces from Clue #2 to Clue #1. Just like in the activity, A only pairs with U and G only pairs with C.

After you assemble the puzzle, Dr. Phase gasps and points to a chart hanging on the wall of her lab:

	2nd				
1st	U	C	A	G	3rd
U	F	S	Y	C	U
	F	S	Y	C	C
	L	S	*	*	A
	L	S	*	W	G
C	L	P	H	R	U
	L	P	H	R	C
	L	P	Q	R	A
	L	P	Q	R	G
A	I	T	N	S	U
	I	T	N	S	C
	I	T	K	R	A
	M	T	K	R	G
G	V	A	D	G	U
	V	A	D	G	C
	V	A	E	G	A
	V	A	E	G	G

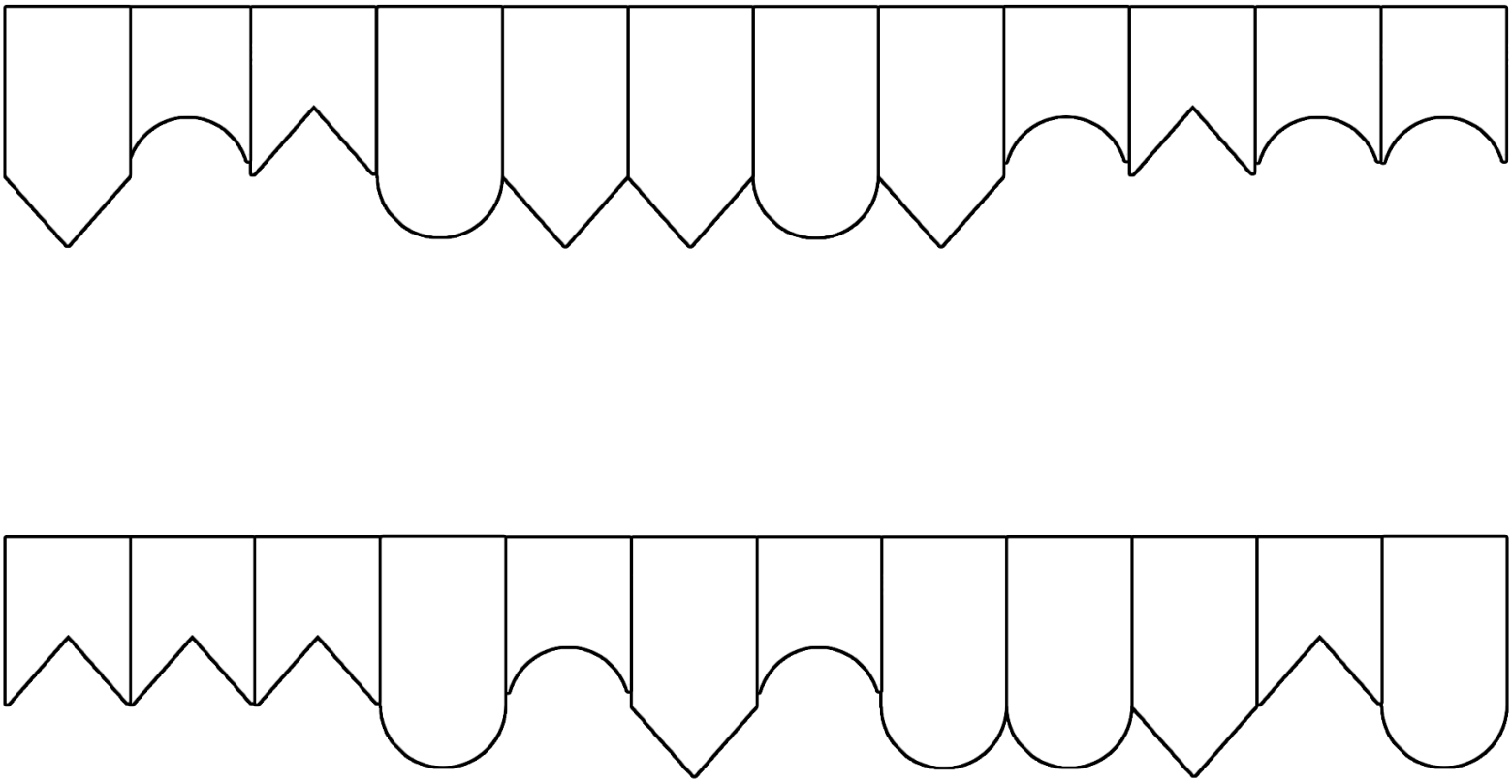
Taken from: https://www.mun.ca/biology/scarr/Genetic_code_single_letter.jpg

Activity 3: Decoding the Message
Break up the letter code into groups of 3 and try converting the three-unit codes into letters to spell out the secret message!

Reflection Questions:
Were you able to get the correct message the first time? If not, where did you make a mistake? Would it be possible to write a different message using this system? If so, how would you do it?

What does this mean?
RNA is read three units at a time, and we call these three-unit RNA sequences **codons**. The chart is used by biologists to see how a codon sequence codes for a particular **protein**. This is exactly like how you saw which codon codes for which letter. Each letter corresponds to a different **amino acid**. Amino acids are the building blocks of proteins. Just like how the secret code can be changed to make different words, different combinations of amino acids can give us lots of different proteins in our body!

DNA Mystery Handout: Clue #1



DNA Mystery Handout: Clue #2

Cut along the dotted lines

A	A	A	A	A	A
U	U	U	U	U	U
G	G	G	G	G	G
C	C	C	C	C	C