

Notes : Protein Synthesis Part 1 (Transcription)

What is a gene?

A gene is a _____ of DNA that contains _____ that is important for cells and organisms to survive and reproduce.

What types of information do genes have?

- Some genes have information that is copied into _____ and these _____ molecules have a function in the cell or organism. These are called _____.
- Some genes have information that is copied into _____ and these RNA molecules have instructions on how to build a _____. These are called _____.

Promoter

Region of a gene that tells _____ where to "latch on" to the _____

Transcriptional Start Sequence

Where _____ starts transcribing or copying information into a _____

Transcript Region

This region contains the _____ that RNA Polymerase copies into RNA. The transcript that is built is called the _____.

Terminator

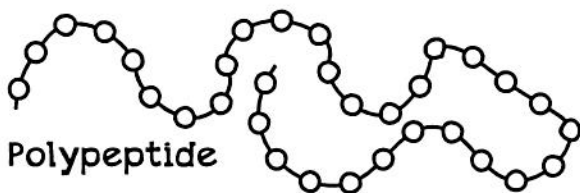
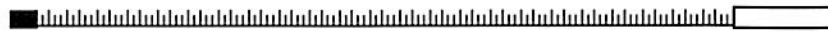
Region of a gene that tells the _____ to stop copying and unattach from the _____



pre-mRNA transcript



mature mRNA transcript



Name: _____ © BETHANY LAU

Gene Structure

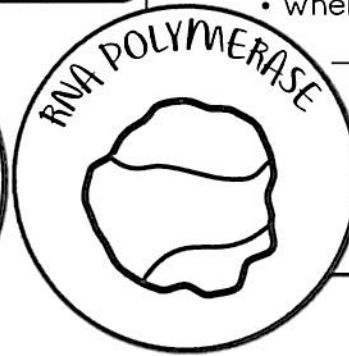
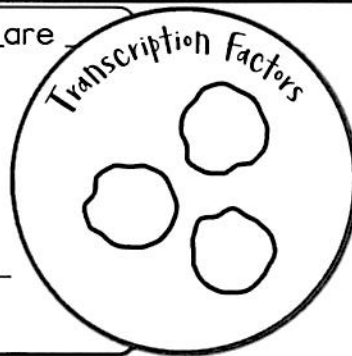
Purpose of Transcription

- The cell needs to make _____ of the short sequences of DNA information and use those outside the nucleus to build _____.
- The "code photocopy" is made of a special type of RNA called _____.

Name: _____

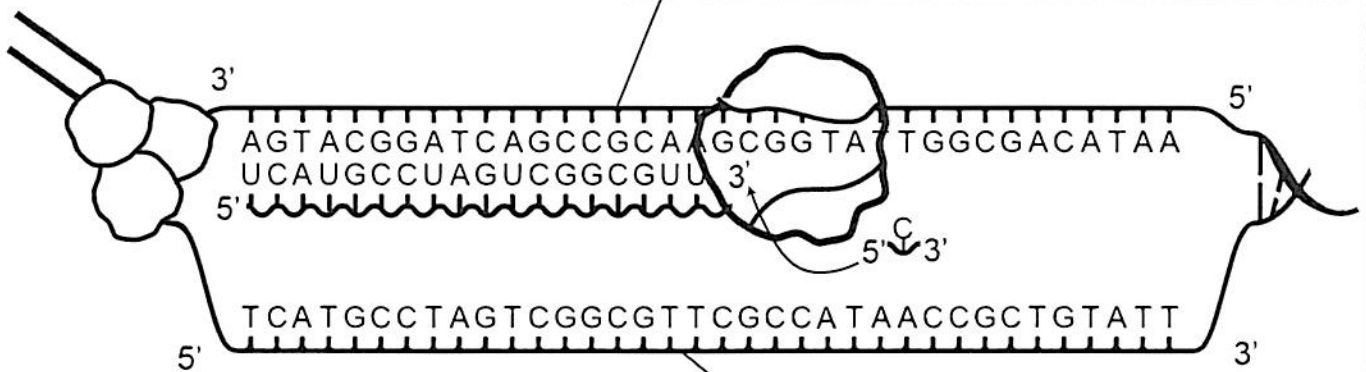
- _____ is the key enzyme that builds _____ molecules using the _____ code
- It starts at the _____ region and begins to transcribe.
- When it reaches the _____

• _____ are _____ that attach to the _____ region of a gene and "tell" the _____ to start there.



_____ sequence, it detaches from the DNA and stops transcribing.

This is the _____ strand that RNA polymerase attaches to and builds the complementary _____ strand next to it. It is called the _____ or _____.



This is the DNA strand that is _____ to the template strand. This strand is called the _____ or the _____.

pre-mRNA transcript 5' UCAUGCCUAGUCGGCGUUUCGCCAUAACCGC 3'

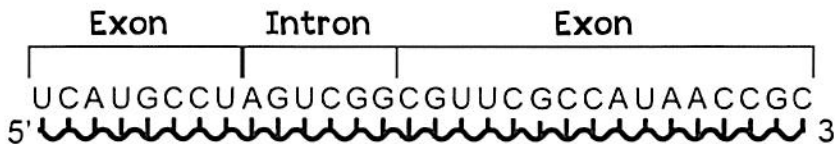
The pre-mRNA transcript is _____ before its instructions are used to build a _____.

Transcription

Purpose of mRNA Processing

- In eukaryotes, the _____ has to be modified before it can leave the _____.
- _____ need to be added.
- Portions of the mRNA that are not used for _____ instructions need to be taken out.

Name: _____



pre-mRNA transcript



protective ends added



mature mRNA transcript

Introns and Exons Spliced

- A group of enzymes called the _____ cuts out small portions of the pre-mRNA that are not needed to make the _____. These small portions are called _____.
- _____ are portions that are left in the mRNA.

Protective Ends Added

- Protective ends called _____ and _____ are added to the mRNA to form the _____, which is then ready to leave the _____.
- In the eukaryotic cell's _____, there are active enzymes called _____ that "hunt down" and destroy or "chew apart" any _____ that they do not recognize as the cell's own _____.
- This is one way eukaryotic cells protect themselves against _____. _____ molecules that might have infected the cell do not usually have _____ or _____. The _____ are supposed to destroy _____. The 5' cap and 3' tail protect the cell's own _____ from being destroyed quickly.

mRNA Processing