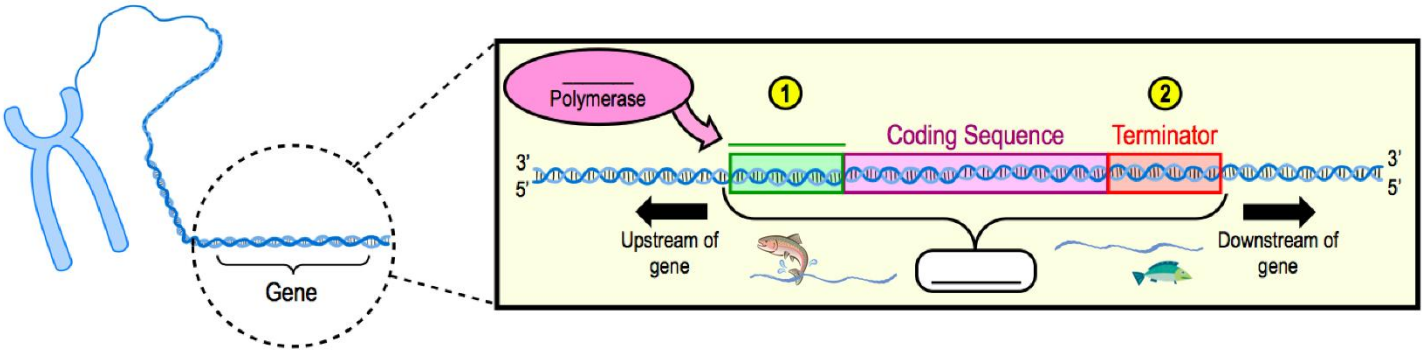
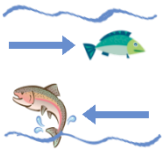
CONCEPT: INTRODUCTION TO TRANSCRIPTION

- *Recall:* **Transcription**: process that builds _____ using DNA within a *gene* as the coding template.
  - □ **Genes**: small units of _____ that encode a product (ex. protein).
- Specific sequences of DNA mark where transcription of a gene *begins* & *ends*:
  - (1) **Promoter**: DNA sequence where transcription _____ (site of RNA polymerase attachment).
  - □ _____ **Polymerase**: an *enzyme* that polymerizes/builds _____ from scratch (no primer needed).
  - (2) **Terminator**: DNA sequence where transcription _____.



- □ "_____*stream*" refers to DNA sequences in the _____ direction of transcription.
- □ "_____*stream*" refers to DNA sequences in the _____ direction of transcription.



PRACTICE: Which of the following is the best definition of a gene?

a) An RNA molecule transcribed from a sequence of DNA.
b) A stretch of DNA that can be transcribed.
c) A sequence of DNA where the process of transcription ends.
d) A sequence of DNA that encodes a product like an RNA or a protein.
e) A sequence of DNA where the process of transcription begins.

PRACTICE: Which of the following statements is false?

a) Transcription is the process that creates an RNA product from a sequence of DNA.
b) RNA polymerase builds RNA molecules from a DNA template.
c) A promoter is a sequence of DNA within a gene where RNA polymerase can begin transcription.
d) RNA polymerase, like DNA polymerase, requires a primer to begin RNA synthesis.

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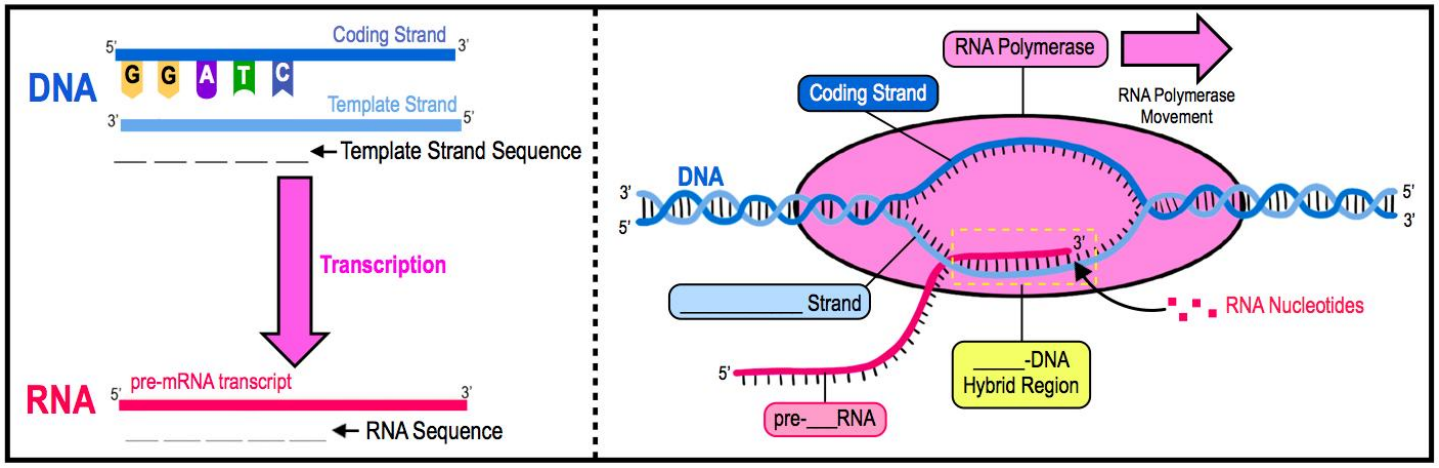
Overview of Transcription

- The 2 strands of DNA in a gene are referred to as: 1) _____ Strand & 2) _____ Strand
  - □ RNA molecules have *same sequence* as the _____ DNA strand (except *replacing* T with U).
- During transcription, RNA is built from _____ to _____ end by pairing *free RNA nucleotides* on a *DNA template*.
  - □ Nucleotide pairing occurs via *Watson & Crick Base-Pairing*: A T (or A ___) & ___ C .

EXAMPLE: Determine the sequence for the template DNA strand and mRNA transcript given the following coding strand.



PRACTICE: The strand of DNA that has the same sequence as the RNA molecule being created during transcription is the:

a) Lagging strand.
b) Leading strand.
c) Coding strand.
d) Template strand.
e) Parent strand.

PRACTICE: Transcription is sometimes described as a process in which RNA is "copied" from the template strand of DNA. This statement is potentially misleading since _____.

a) The nucleotides in RNA contain ribose and cannot be an exact copy of DNA.
b) RNA molecules contain uracil instead of thymine and cannot be an exact copy of DNA.
c) The RNA transcript has a sequence complementary to the template.
d) The RNA transcript and the DNA template strand are antiparallel.
e) All of the above.