**Lesson:** *Introduction to Protein Synthesis - Transcription*

**Learning Goals & Success Criteria:**

Students will be able to describe the relationship between DNA and RNA and how DNA is transcribed into RNA. Students will understand the biological need for RNA as a blueprint for DNA. Students will be able to describe the roles of various transcription enzymes and the difference between RNA and DNA.

**Relationship to Unit Structure:**

Students have already become familiarized with the structure of DNA and the process of DNA replication. This will support their understanding of transcription of RNA.

**Engage (5 min):**

Students will play a spot the difference game between an RNA and DNA strand.

**Explore (10 min):**

Students will engage in a "find the pathway" activity where the students are told the end goal of DNA transcription and must propose a mechanism step by step. Students are told simply that in order to use our DNA, the DNA must be read and used to construct proteins and must propose the first step of the process. They are given 1 minute in pairs or groups to think about what the first step must be. Each group shares a first step and are told what happens if their step is used. ie) If a student says enzymes read it and make proteins the students are told enzymes can't get into the nucleus. Students then revise, ie) DNA is taken out of the nucleus and read. Students are then told our DNA gets destroyed after a while if it leaves the nucleus etc... through this trial and error the class discovers the reasons for the various steps of DNA transcription and a very broad overview of the topic.

**Explain (40 min):**

A powerpoint describing the process of DNA Transcription will be presented in detail. The powerpoint will draw connections between transcription and replication and encourage them to use skills and knowledge they already have from DNA replication.

**Elaborate (15 min):**

Students will complete a venn diagram, or other diagram of their choosing, comparing DNA Replication and DNA Transcription. They will be guided to compare the enzymes, the purpose, the products, etc... They will be instructed to save this as it will be the jumping off point for their formative assessment the next day.

**Evaluate (5 min) :**

Students are provided an exit card with a few understanding questions and also asking for students to explain one aspect that made perfect sense, and one aspect that made no sense. Students will complete a practice quiz at the start of next class.

**Exit Card Content:**

1. Fill in the blank. RNA is _____ and DNA is _____.

- Double stranded, double stranded
- Double stranded, single stranded
- Triple stranded, double stranded
- Single stranded, double stranded
- Single stranded, single stranded

2. In 2 sentences, why do we need to make an mRNA copy of our DNA? Why can't we just read DNA?

3. What is the complementary mRNA strand to the following DNA strand: 3'-AATCCGATCG-'5

a. TTCGGATCGA

b. GGAUUCGAUC

c. UUAGGCUAGC

d. AATCCGATCG

e. TTAGGCTAGC

4. Using point form, describe the role of RNA polymerase in DNA transcription. Think about it's job, but also the sequences it must read etc...

5. What is one thing about today's lesson that stuck out, or made perfect sense etc...?

6. What is one thing about today's lesson that didn't make any sense or that you need clarification on?