Unit 1: Lesson 4 – Defending Our DNA: How Cells Protect Against Foreign Genetic Material

Guided Observation Sheet

First Viewing – Watch the big picture
You will watch the animation once, all the way through, without stopping. Don't write yet, just watch. As you watch, look for each successive layer of defense the cell uses. As you watch, keep these three things in mind:

- The different barriers or defenses shown
- Where each defense is located
- What happens to the foreign DNA at each stage

Second Viewing – Pause and record
Your teacher will replay the animation and pause at each point below. Record what you observe about the defense shown, where it is located, and what happens to the foreign DNA.

#	Stage in the animation	What I observed
1	**Sources of foreign DNA**	*List the sources of foreign DNA shown (e.g., bacteria, food, vaccines). What does the animation suggest about how often we are exposed?*
2	**Extracellular enzymes (DNases in blood & tissues)**	*Describe what happens to DNA fragments outside the cell. How are they affected before they ever reach a cell?*
3	**The cell membrane barrier**	*Explain what the cell membrane (lipid bilayer) does to foreign DNA. Why can't DNA freely pass through it?*

#	Stage in the animation	What I observed
4	**Cytoplasmic nucleases**	*Describe what happens to any DNA that does manage to enter the cell. Where does this degradation occur?*
5	**The nuclear envelope & nuclear pores**	*How is the host's own DNA protected inside the nucleus? What role do the nuclear pores play?*
6	**Conclusion**	*In your own words, summarize why it is virtually impossible for foreign DNA fragments to alter your host DNA.*

In the space below, list the defenses in the order foreign DNA encounters them. Start with number 1 as outside the body and add each layer until you reach the nucleus.