Questions to accompany “All about Birds” Feathers website.

1. Compare and contrast structural and functionality between 5 different type of feathers.

Include **labeled sketches** showing structural detail for each feather type.

2.a How does the structure of wing feathers support flight?

2b. Describe what preening is and its multiple benefits.

3. How does the structure of down work to insulate the bird?

3b. How does down help with buoyancy?

4. a Some feathers have a plumulaceous region. Sketch this on a feather. What is the value of this region?

4.b Describe how Manakins use there unique, highly specialized feathers

5. Where did feathers come from and what functions did they serve in flightless ancestors?

6. a What did the first feathers look like?

6.b Describe the major changes to feather development from the fuzz found on dinosaurs. Include labeled sketches.