

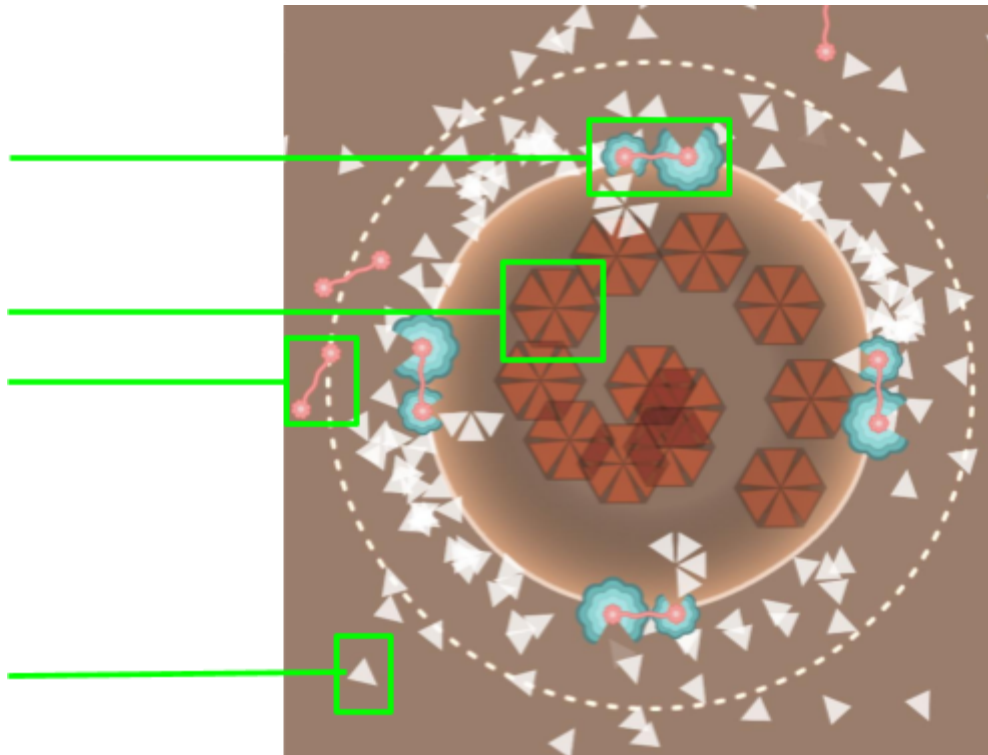
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Geniventure Protein Check-in #1

Answer the questions below to check your understanding of the proteins that give drakes their color. (Complete this worksheet after Mission 3.2.3.)



The pod shown here contains melanin, which gives the drake's scales color.

- 1) Label the parts of the pod in this image from the game.
- 2) Indicate which of the objects in the image are proteins.
- 3) Provide an explanation for how the parts of the pod work to produce color in drake scales.

Exemplar response:

The blue gears on the outside of the pod are proteins. The large gear protein takes the triangles and hands them to the small gear to make the melanin discs. If the gears make a lot of discs, the pod gets darker and turns gray, and you get a gray drake. If they make only a few

discs, the pod stays orange and so does the drake. With no discs, the pod is white and the drake is an albino. The color of the pods determines the color of the drake.



Here are two different versions of the mela-helper protein from the game.

- 4) In what ways do these two versions of the protein work differently to produce color?

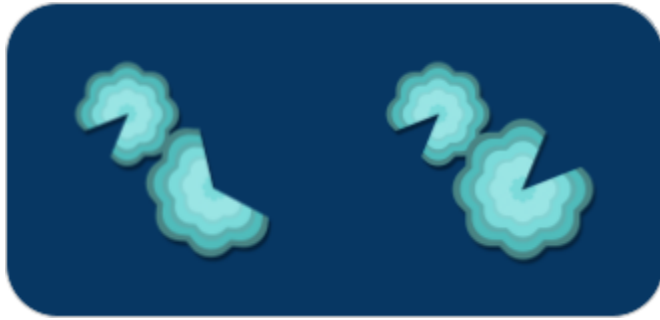
Exemplar response:

The mela-helper proteins connect the protein gears so that melanin discs are made. The version on the left stays connected to the gears so they can make a lot of melanin discs, which makes a large gray pod, and a gray drake. The one on the right has a missing/smaller/different part/shape/end, and so it falls off the gears. In that case, the gears make fewer discs and the pod only gets big enough to be orange, so the drake is orange.

Name: _____

Geniventure Protein Check-in #2

Answer the questions below to check your understanding of the proteins that give drakes their color. (Complete this worksheet after Mission 3.3.3.)



The mela-maker, or “gear” proteins are shown above.

- 1) Which set of gears results in an albino drake? Explain your answer.
- 2) What determines which version(s) of the protein is in the drake’s cells?
- 3) Is it possible to have both versions of the protein in the same cell? Explain your answer.

Exemplar response:

The gears on the left will result in an albino drake, because of the difference in shape. The wedge in the big gear is too wide to hold a triangle well. So the big gears cannot hand the triangles to the small gear to make melanin discs. When there is no melanin made, there is no color in the cells, and the drake is albino. Each version of the protein is made from a different allele of the gene for the mela-maker protein. If the drake is heterozygous for this gene, then both proteins would be made in the drake’s cells.