WLHS/Biology

Name_____

Measuring Variation Within a Species

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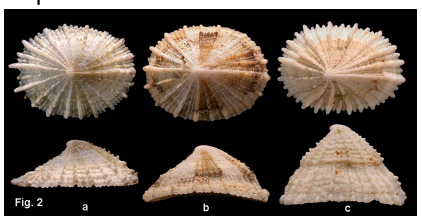

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·Metric ruler ·String ·*Homo sapiens*

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B. Eye Width

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1. Define variation.

2. Which group shows the widest range of variation?

3. Which graph has the highest peak?

4. What are the similarities among the graphs? What are the differences?

5. What is the average size for each of the characteristics we measured?

6. Looking at the averages above and at your graphs, as the degree of variation from the average size increases, what happens to the frequency of the variation?

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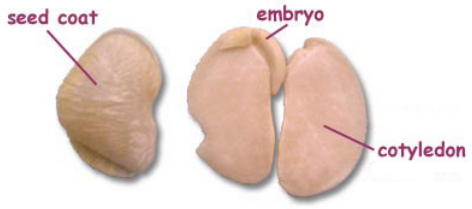

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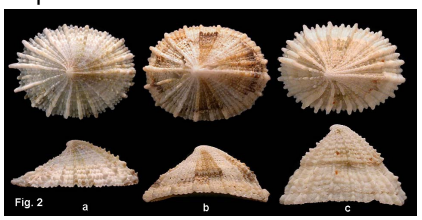

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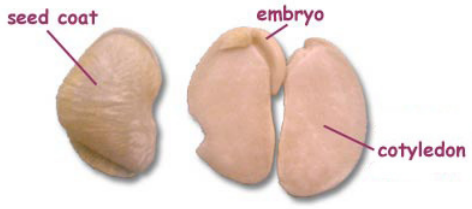

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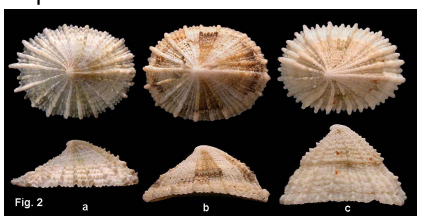

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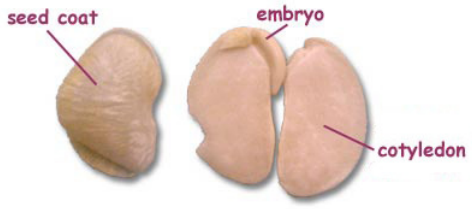

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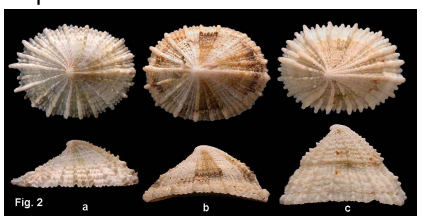

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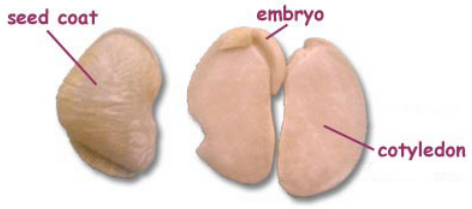

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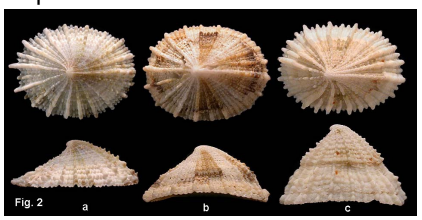

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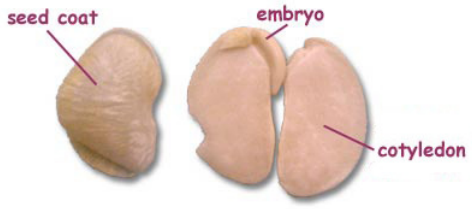

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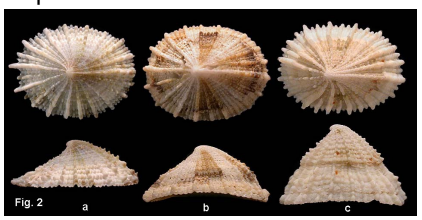

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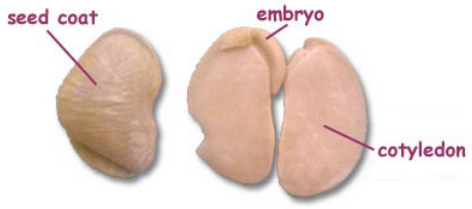

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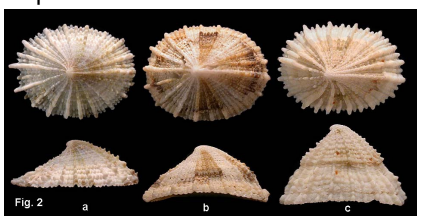

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5. What is the average size for each of the characteristics we measured?

6. Looking at the averages above and at your graphs, as the degree of variation from the average size increases, what happens to the frequency of the variation?

7. What do you think is the best adapted size for each of the characteristics we measured? Explain your answer.

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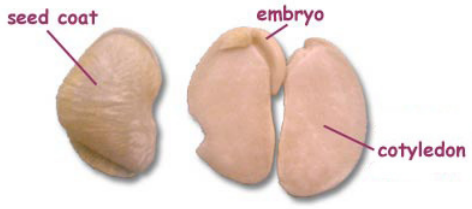

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WLHS/Biology

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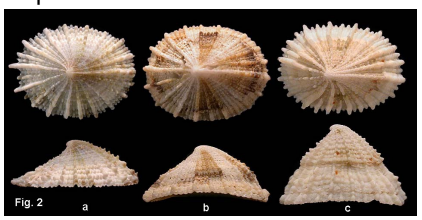

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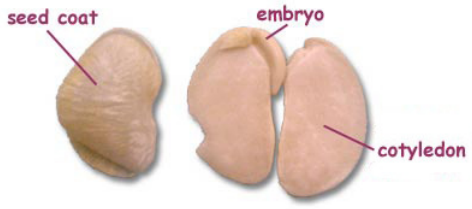

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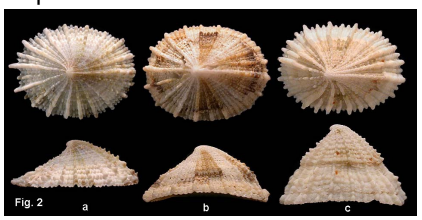

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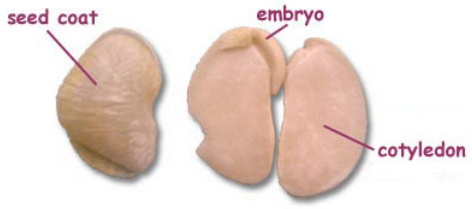

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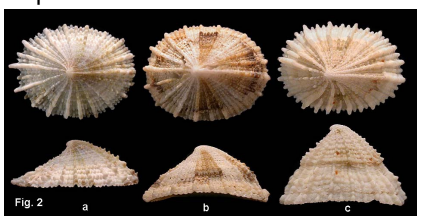

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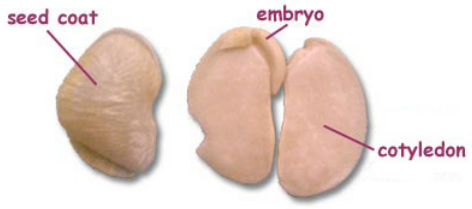

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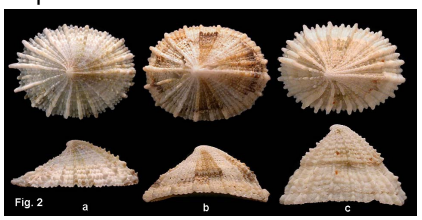

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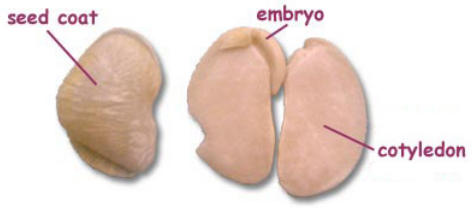

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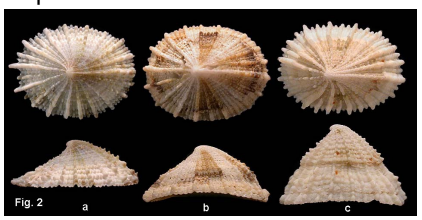

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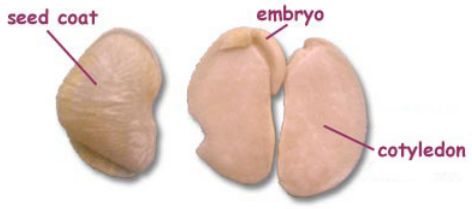

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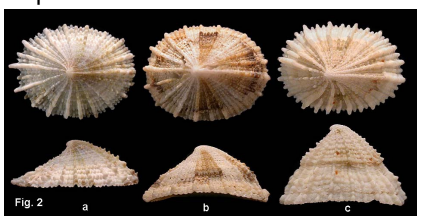

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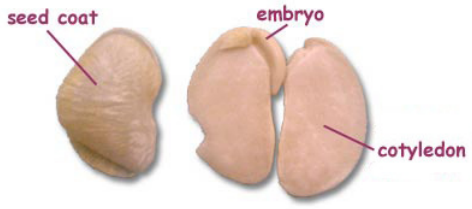

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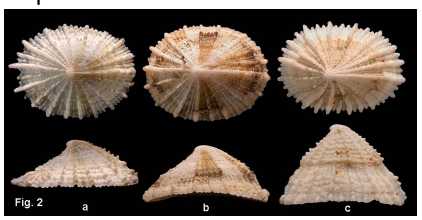

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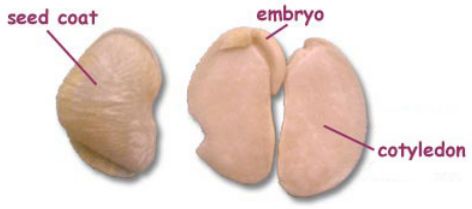

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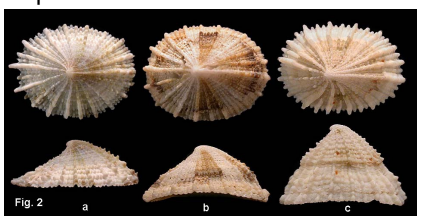

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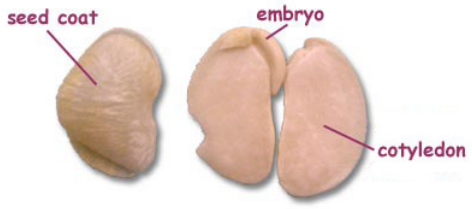

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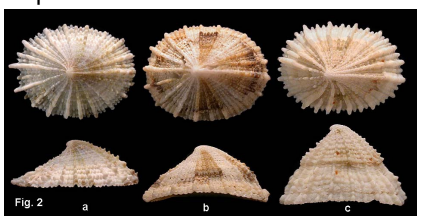

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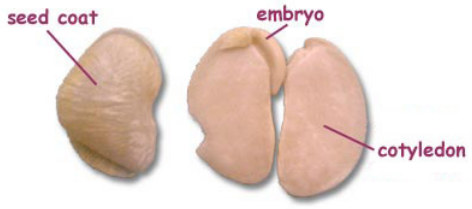

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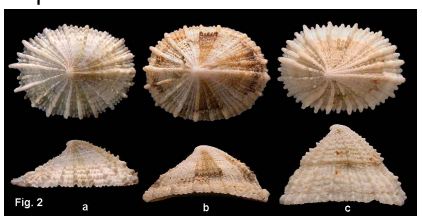

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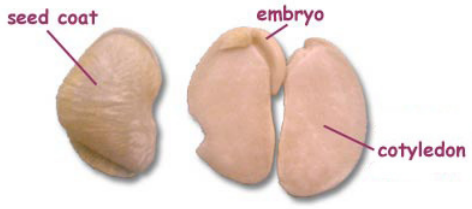

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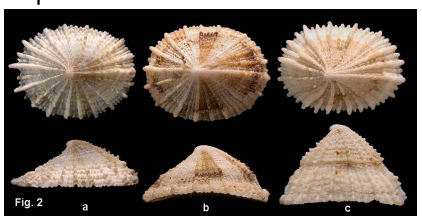

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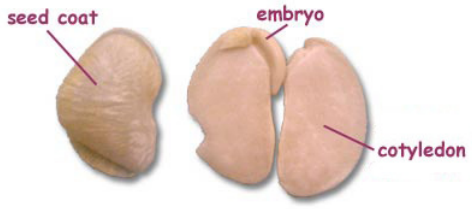

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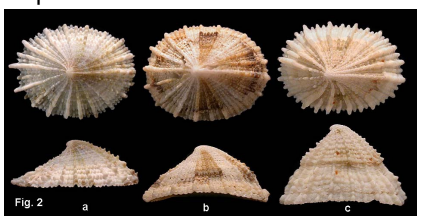

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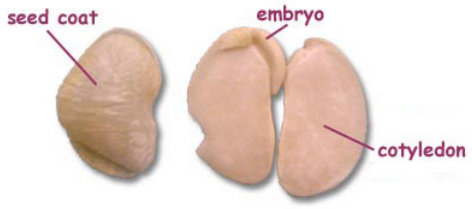

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WLHS/Biology

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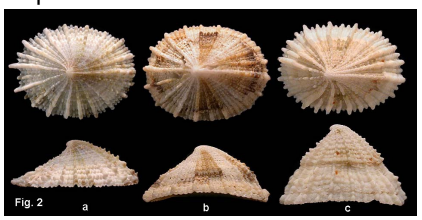

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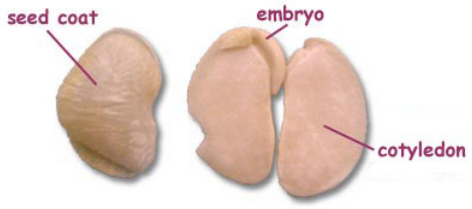

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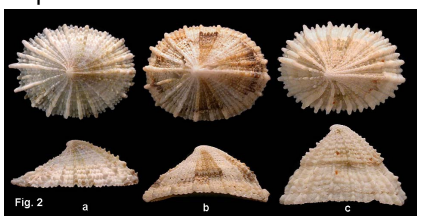

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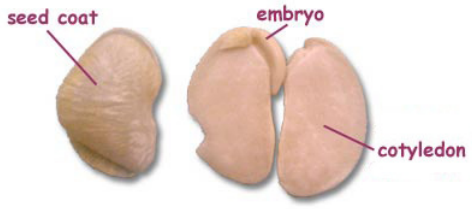

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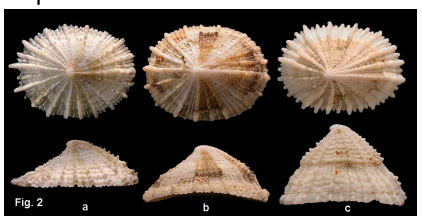

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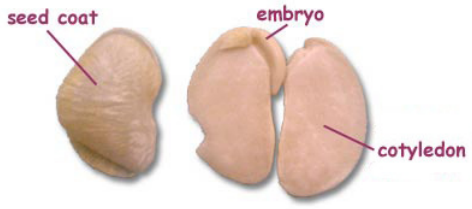

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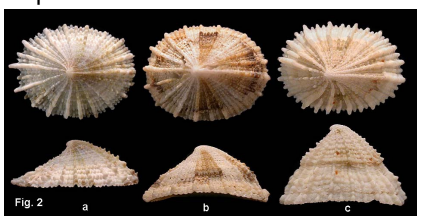

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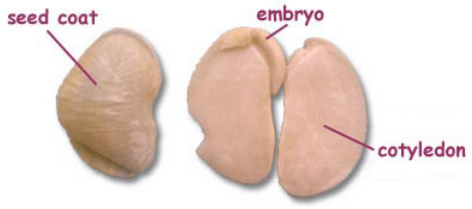

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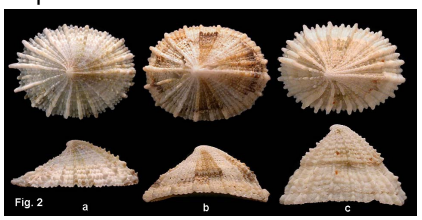

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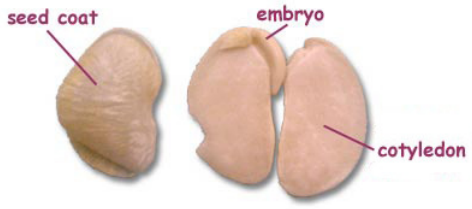

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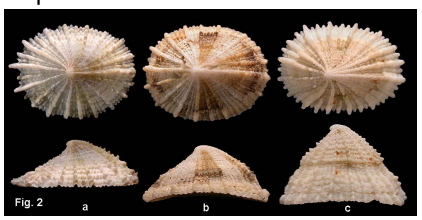

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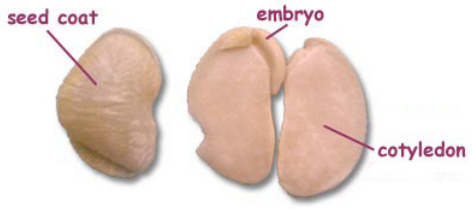

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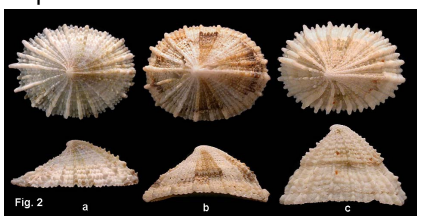

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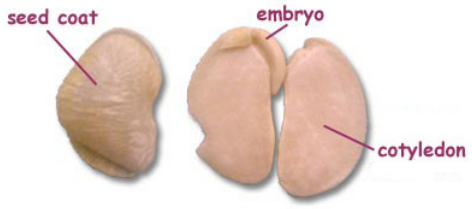

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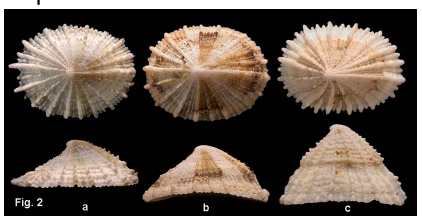

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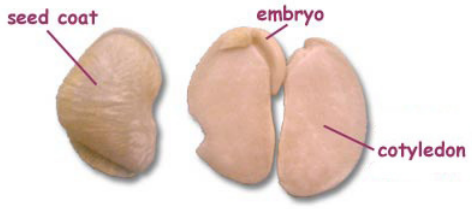

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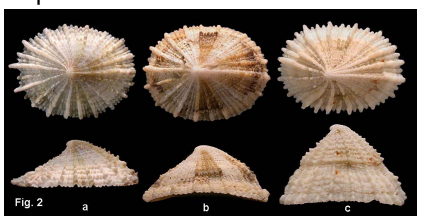

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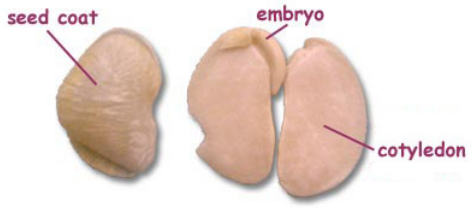

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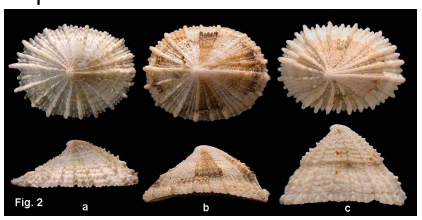

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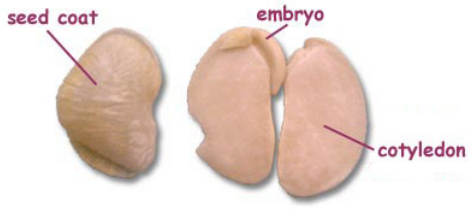

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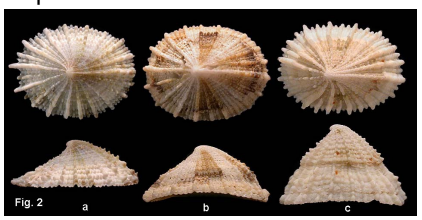

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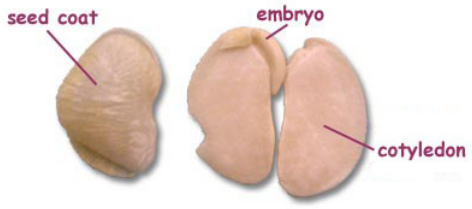

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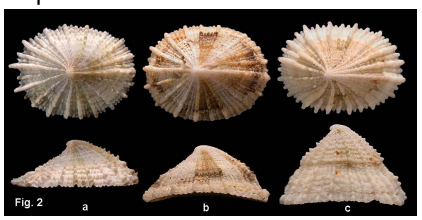

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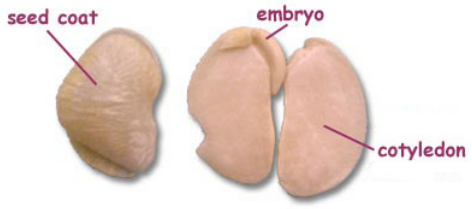

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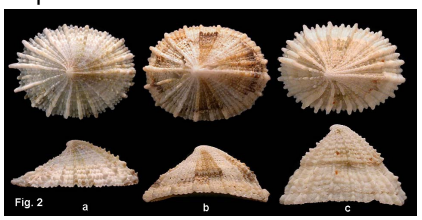

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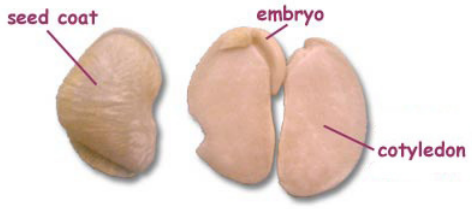

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WLHS/Biology

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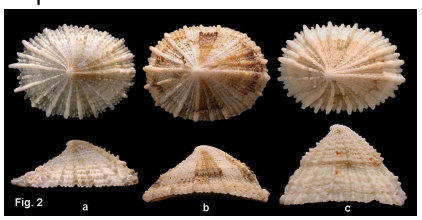

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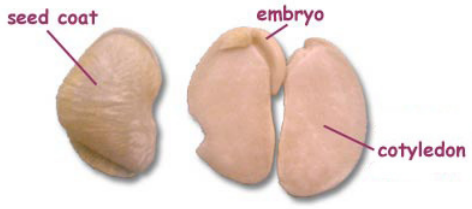

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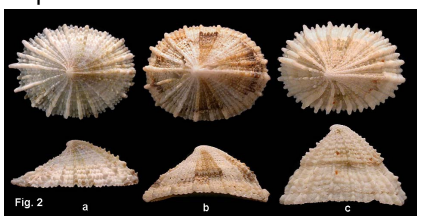

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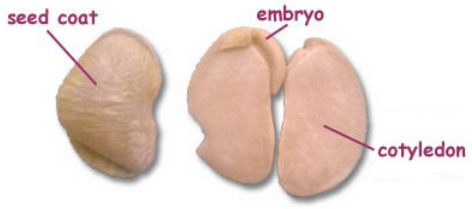

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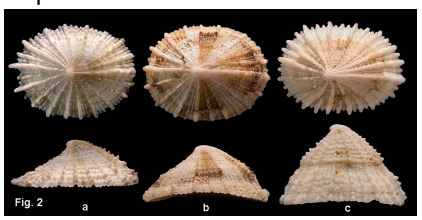

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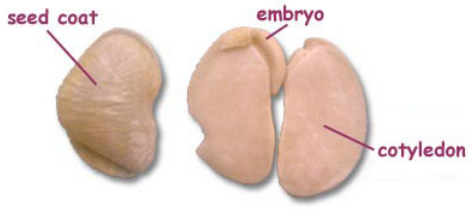

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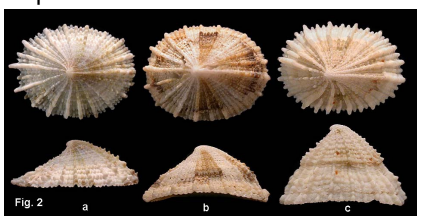

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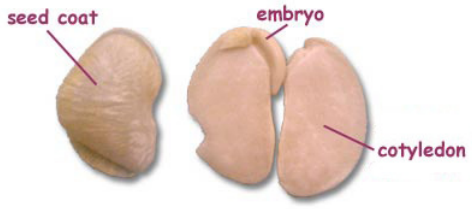

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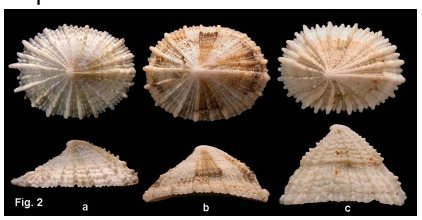

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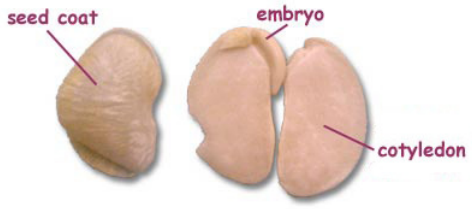

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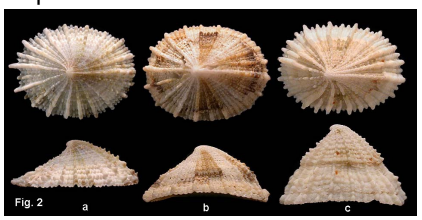

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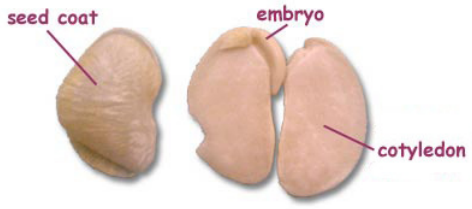

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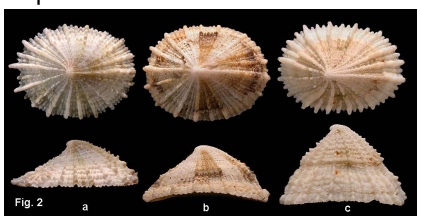

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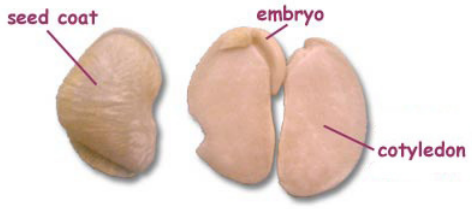

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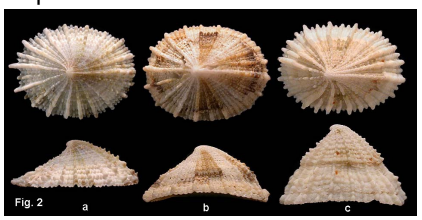

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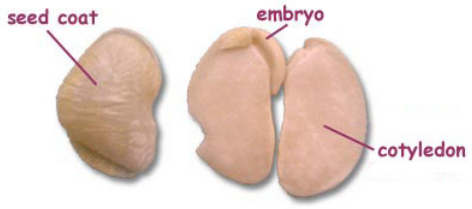

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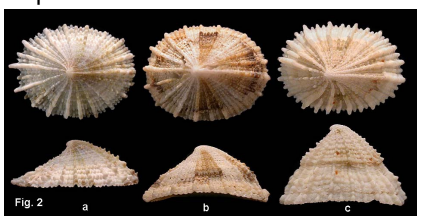

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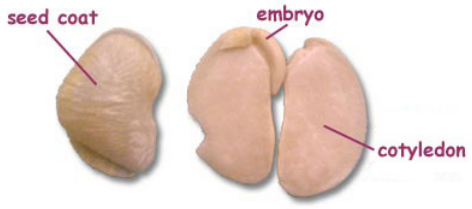

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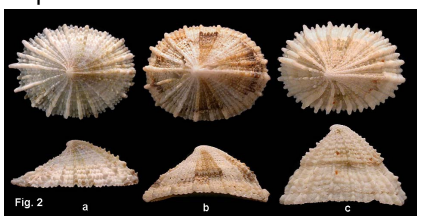

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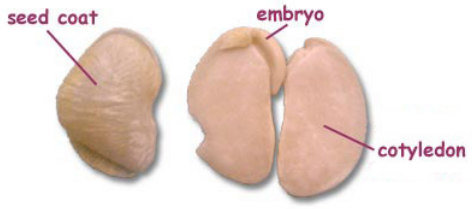

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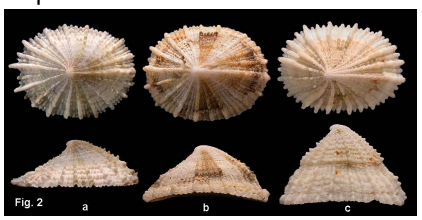

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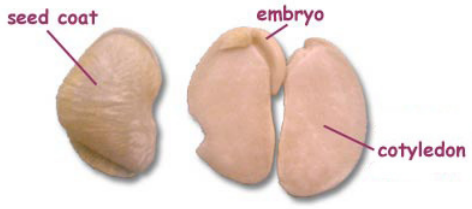

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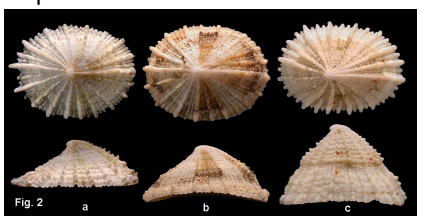

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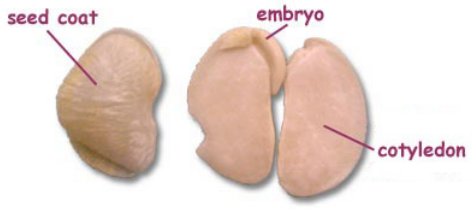

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WLHS/Biology

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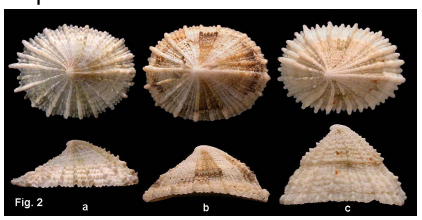

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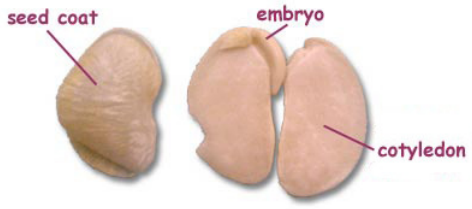

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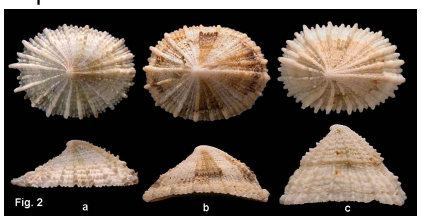

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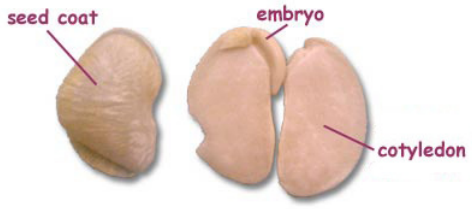

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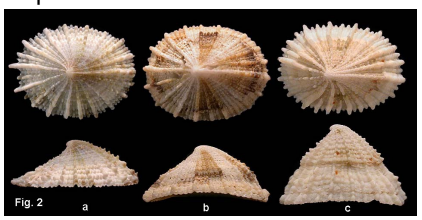

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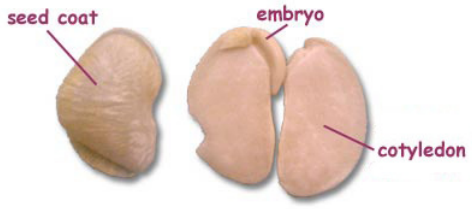

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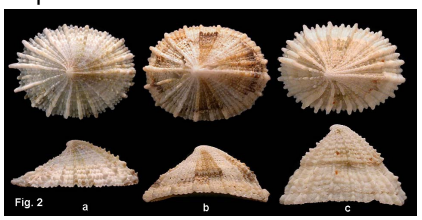

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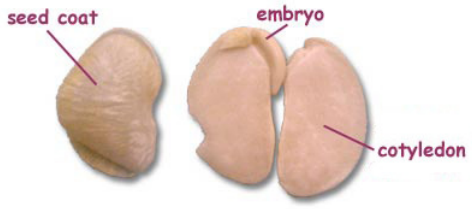

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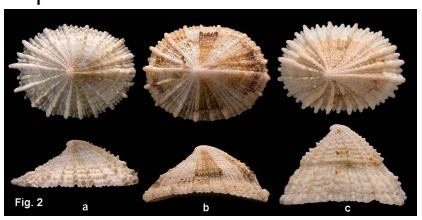

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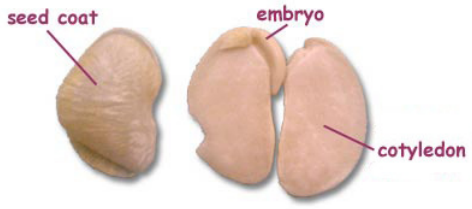

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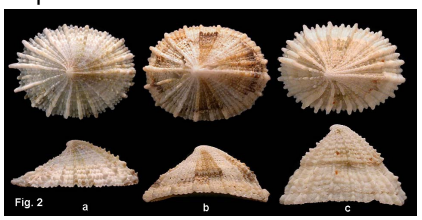

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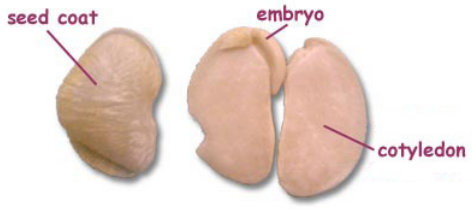

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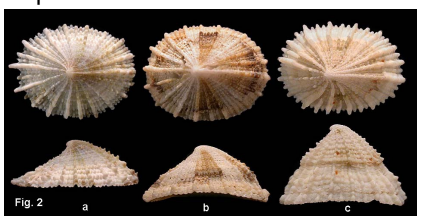

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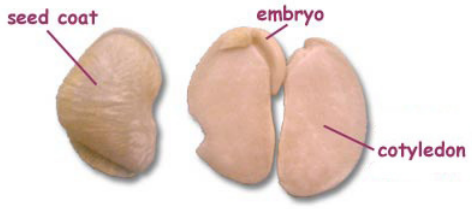

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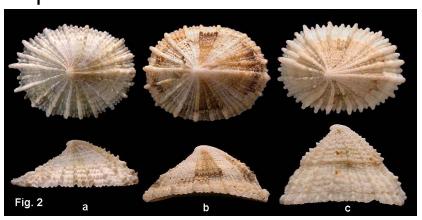

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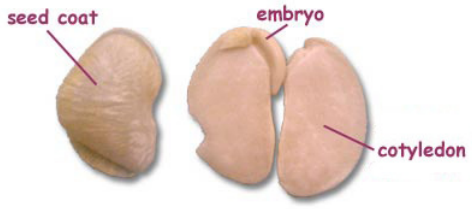

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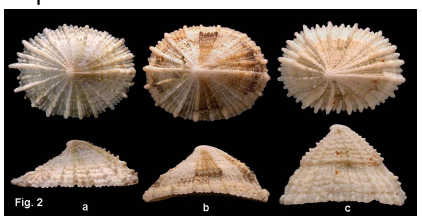

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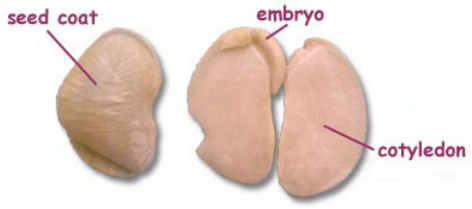

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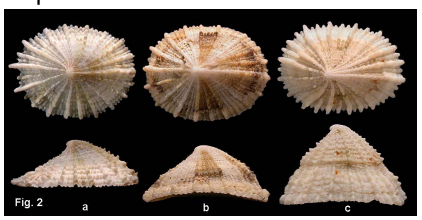

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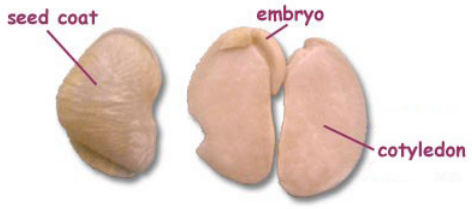

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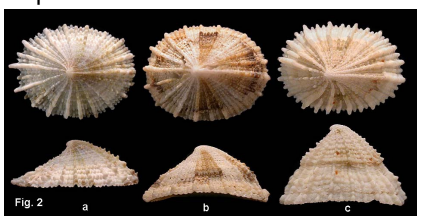

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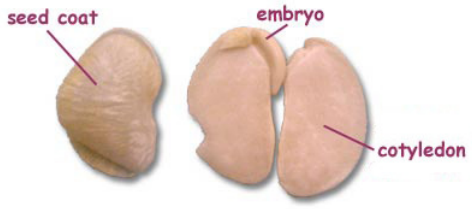

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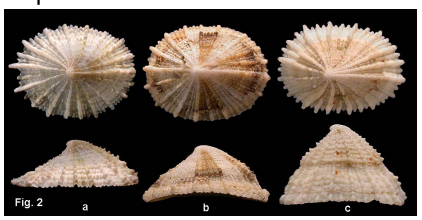

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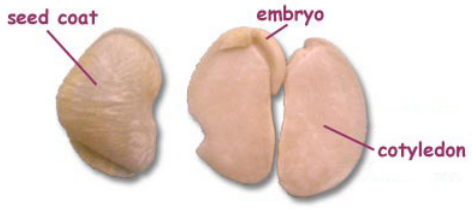

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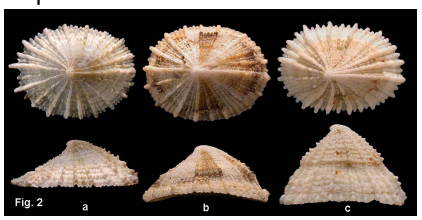

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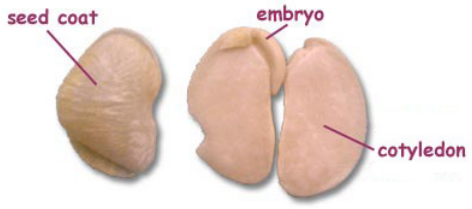

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WLHS/Biology

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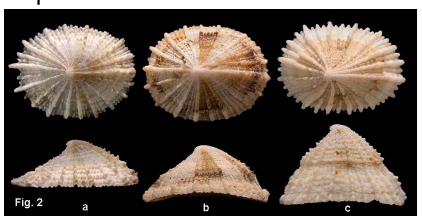

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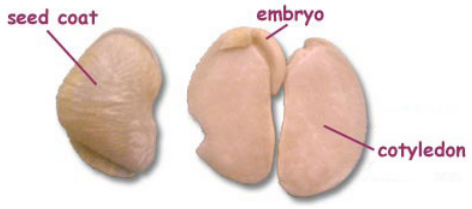

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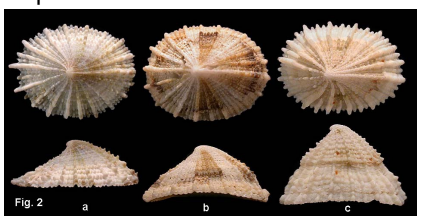

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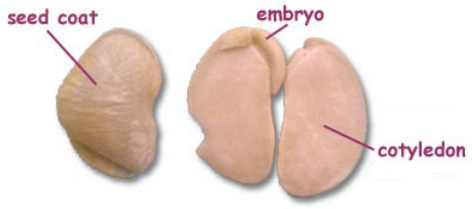

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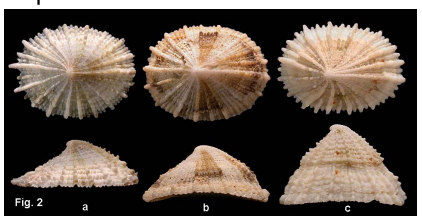

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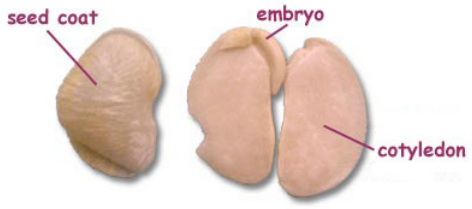

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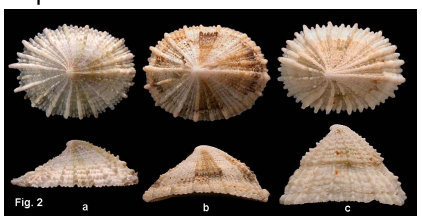

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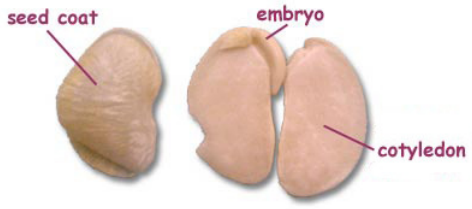

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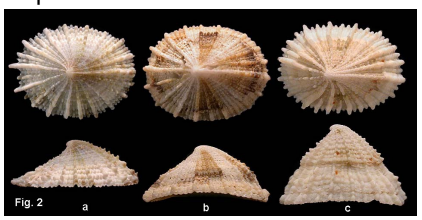

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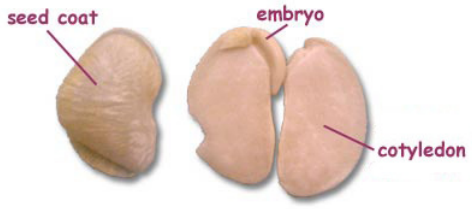

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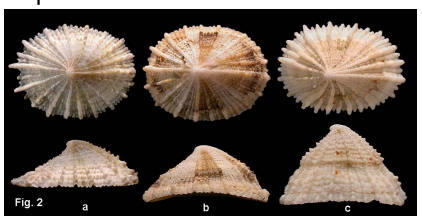

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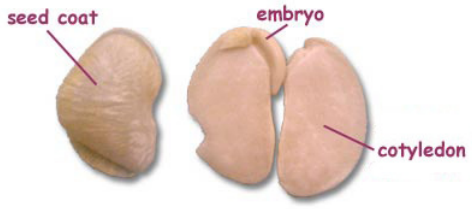

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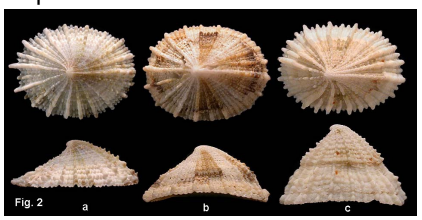

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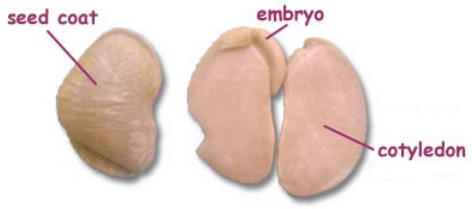

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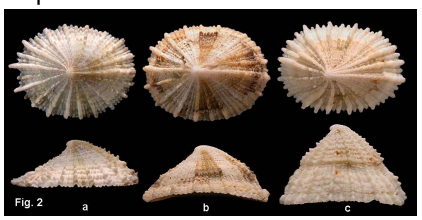

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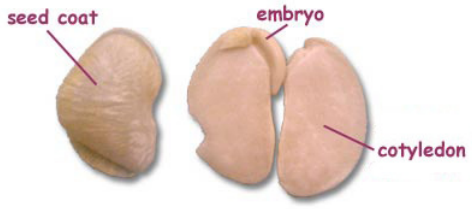

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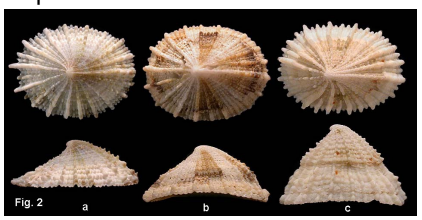

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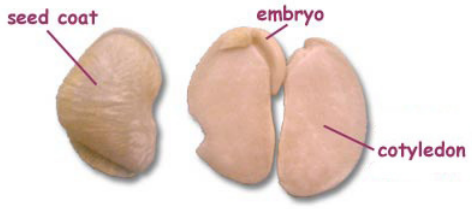

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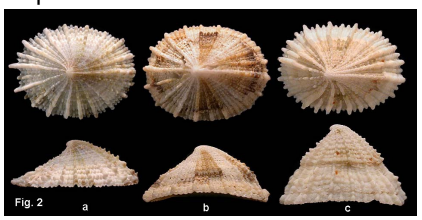

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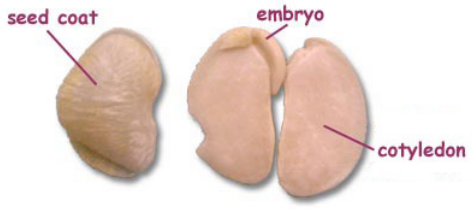

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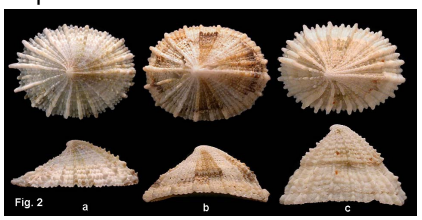

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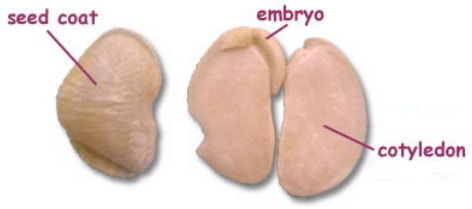

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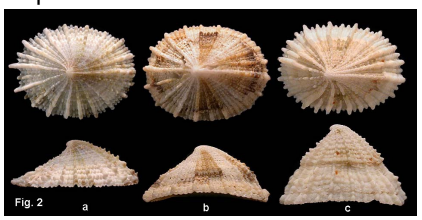

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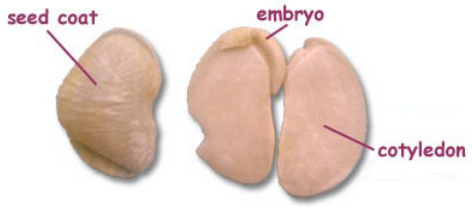

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WLHS/Biology

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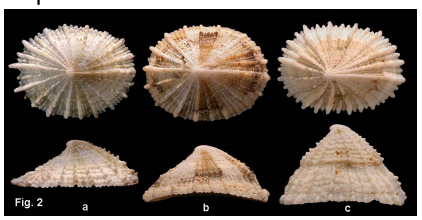

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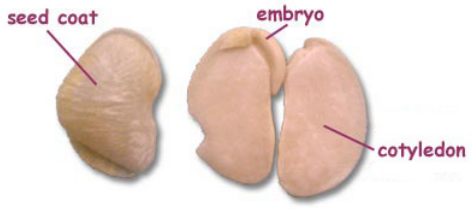

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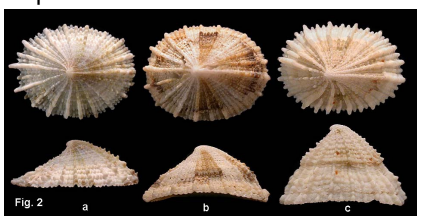

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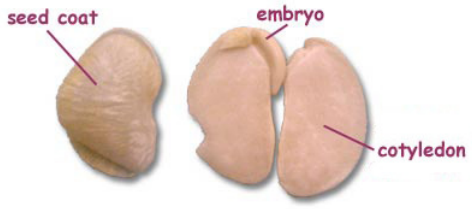

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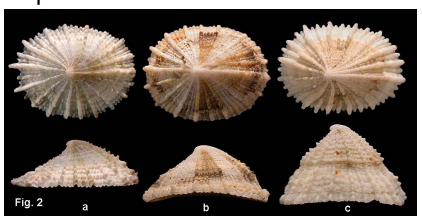

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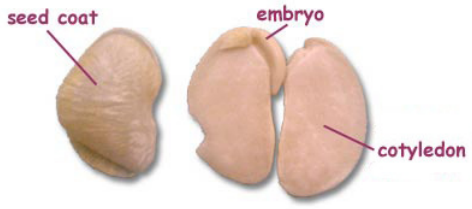

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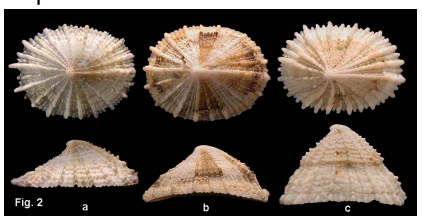

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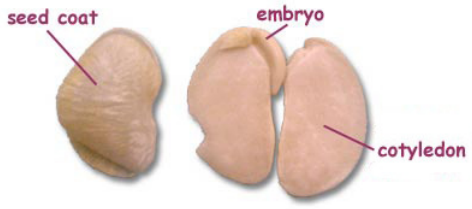

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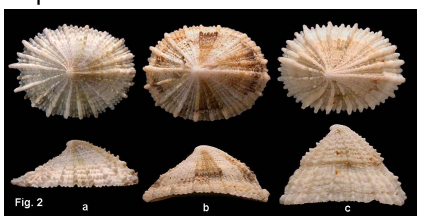

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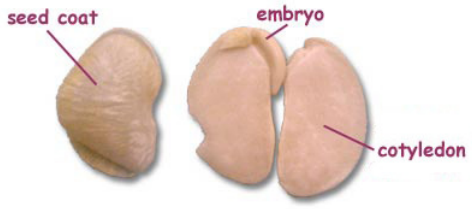

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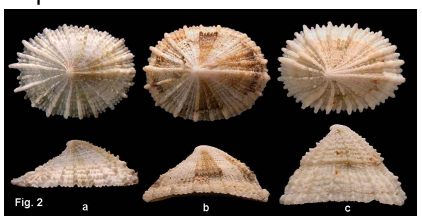

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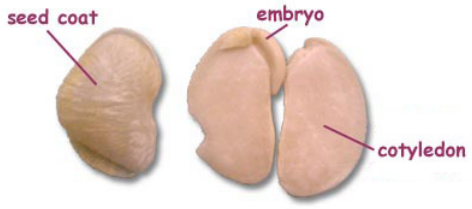

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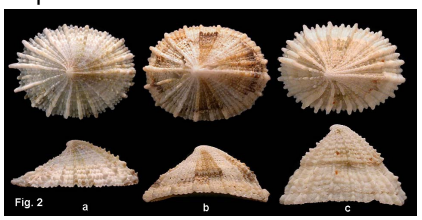

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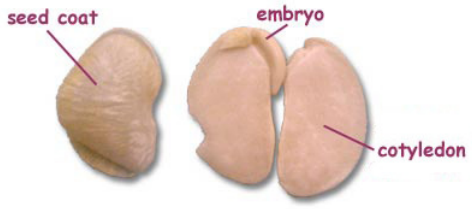

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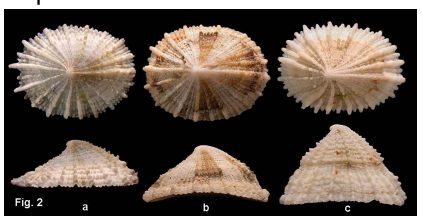

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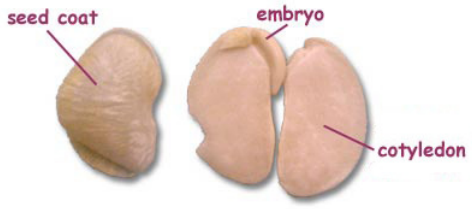

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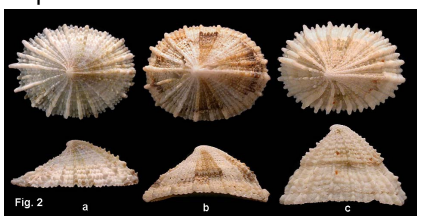

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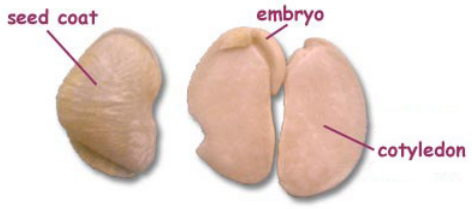

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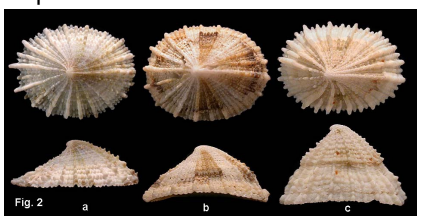

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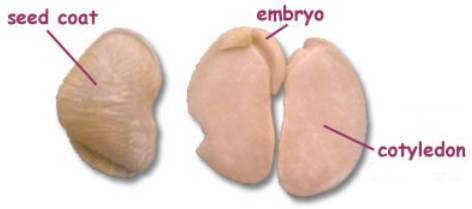

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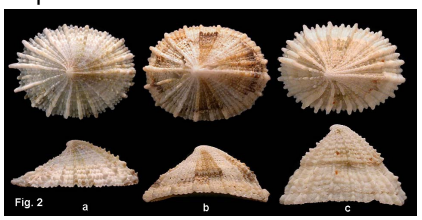

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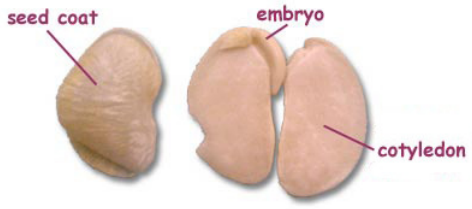

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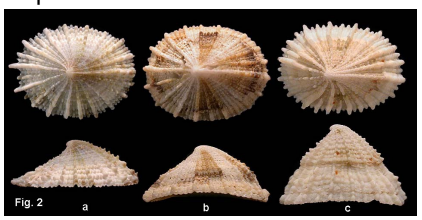

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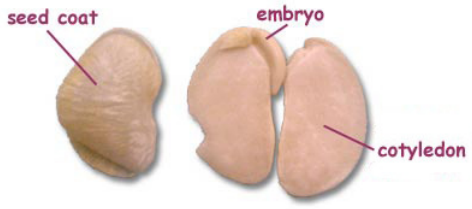

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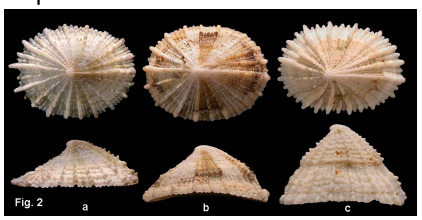

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With a partner, use a piece of string to measure your wrist circumference to the nearest millimeter.

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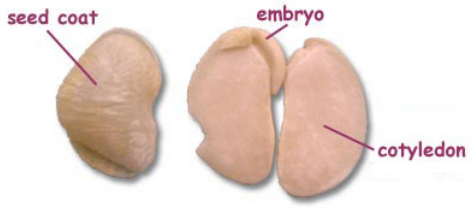

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WLHS/Biology

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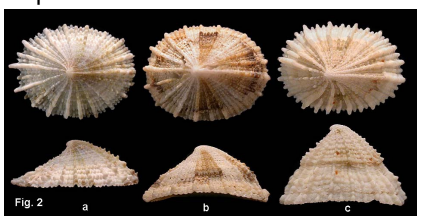

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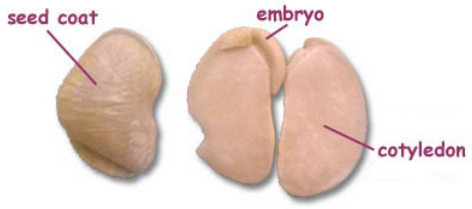

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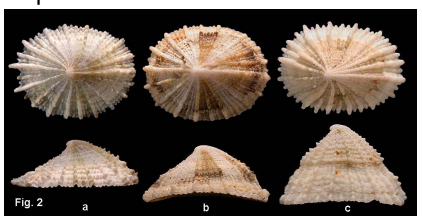

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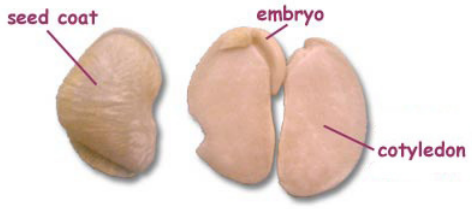

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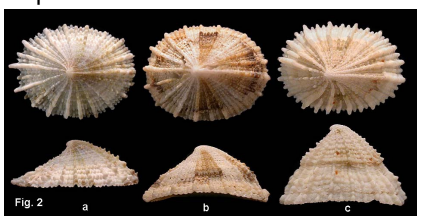

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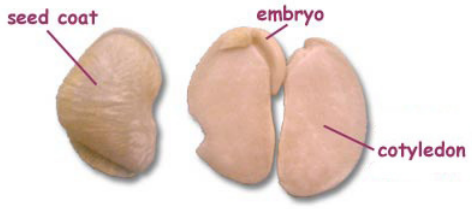

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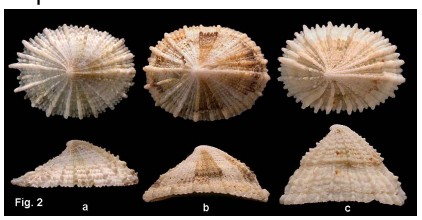

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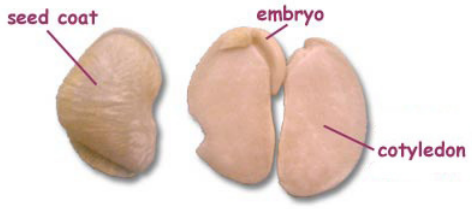

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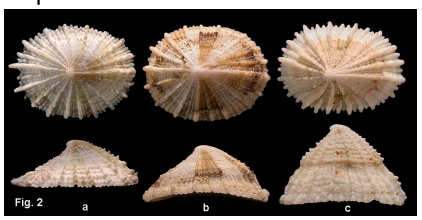

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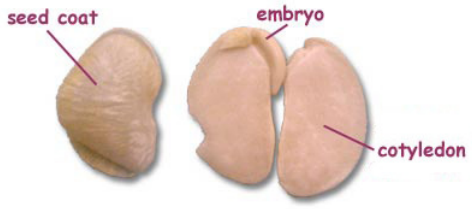

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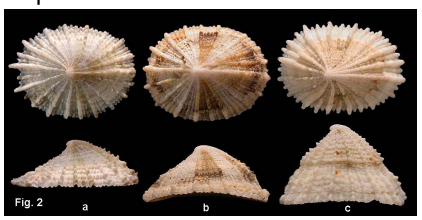

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B) For <u>each</u> set of data, make a <u>separate</u> graph. Place measurements on the x-axis and the number of people on the y-axis. Plot the points and then draw a SMOOTH curve (do not connect the dots!) through or near each dot. Your graphs must include a title, labeled x and y axes, and units.

CONCULSION

Answer the following questions in <u>complete</u> sentences.

1. Define variation.

2. Which group shows the widest range of variation?

3. Which graph has the highest peak?

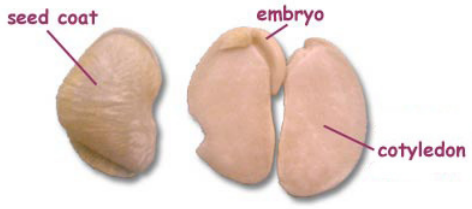
4. What are the similarities among the graphs? What are the differences?

5. What is the average size for each of the characteristics we measured?

6. Looking at the averages above and at your graphs, as the degree of variation from the average size increases, what happens to the frequency of the variation?

7. What do you think is the best adapted size for each of the characteristics we measured? Explain your answer.

8. In plant seeds, each half of the seed contains food and the plant embryo. How could a seed be too big or too small to be well adapted? (What are the disadvantages?)



9. Describe a situation in which long fingers in humans might be advantageous.

10. Describe a situation in which small wrist circumference in humans might be advantageous.

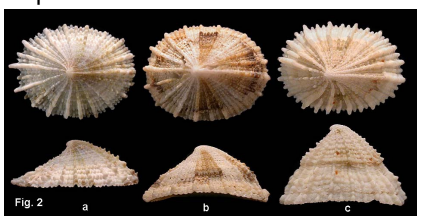
11. Why are variations within a species generally necessary for that species to adapt to changing environments?

WLHS/Biology

Name_____

Measuring Variation Within a Species

INTRODUCTION:
A species is a group of organisms that can interbreed and produce fertile offspring. However, all members of a species do not all look exactly alike. The differences between members of the same species are called variations.



Variations are present in all species. For example, rabbits of the same species can have different colored fur and plants of the same species can have different colored flowers. Some organisms can be taller or shorter than others or have more or less hair. Look at the picture to the right of the shells. The shells are the same species but have slightly different shapes and designs.

When Charles Darwin visited the Galapagos Islands, he found 13 species of finches. The main difference among these species was the shape of their beaks. Darwin reasoned that this variety was the basis of natural selection – that the environment determines which variations are most advantageous. Although we cannot predict in advance which variations will be most advantageous, we can measure and describe variations among species and hypothesize which variations are likely to be most advantageous.

MATERIALS
·Metric ruler ·String ·*Homo sapiens*

PROCEDURE
A. Height

Each person in the group will remove their shoes and stand with their back against the wall. Put something flat across the top of their head (like a hand or binder) and move it until it touches the wall. Using a meter stick, measure the person's height to the nearest centimeter.

Record your height here _____

B. Eye Width

With a partner, take a piece of string and measure the distance from the outer corner of one eye, across the bridge of the nose, to the out corner of the other eye. A knot tied in the string as a point of reference will increase your accuracy. Again, measure to the nearest millimeter.

Record your eye width here _____

C. Wrist Circumference

With a partner, use a piece of string to measure your wrist circumference to the nearest millimeter.

Record your wrist circumference here _____

D. Index Finger Length

You will measure the index finger of your right hand. Place a ruler on the desk. Place your hand on the ruler so that you can measure from the bottom of your finger to the tip. DO NOT include your fingernail measurement Measure to the nearest millimeter.

Record your index finger length here _____

Record all of your data onto the class data sheet and copy the class data onto the data table attached.

Table 1: Class data for variations in human characteristics.

Height	Wrist Circumference	Eye Width	Index Finger Length

ANALYSIS

A) For each characteristic, arrange the characteristic from smallest to largest and count the number of people in each category. Record data into Table 2

Table 2: Class data

Height		Wrist Circumference		Eye Width		Index Finger Length	
Height in cm	# of people	Circum. in mm	# of people	Width in mm	# of people	Length in mm	# of people

B) For <u>each</u> set of data, make a <u>separate</u> graph. Place measurements on the x-axis and the number of people on the y-axis. Plot the points and then draw a SMOOTH curve (do not connect the dots!) through or near each dot. Your graphs must include a title, labeled x and y axes, and units.

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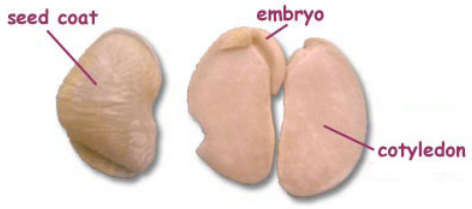

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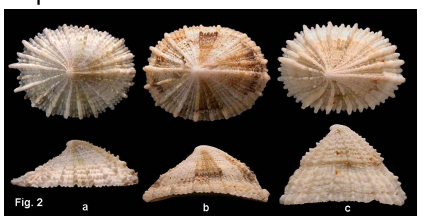

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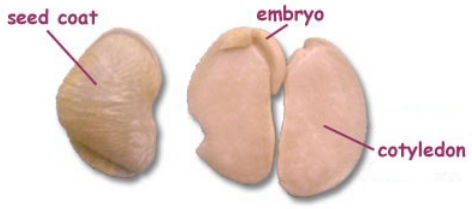

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