ANSWER ANSWER ANSWER

Round: 4A

There is a relationship between wave energy striking the shoreline and sand grain sizes that may accumulate on a beach.

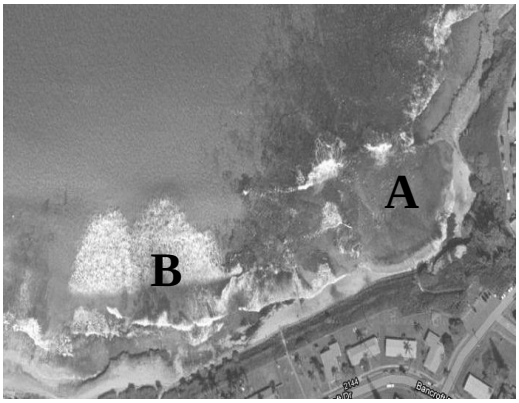
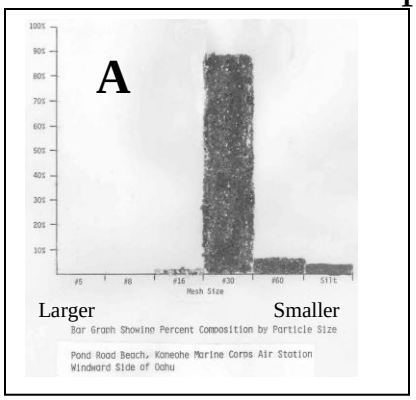
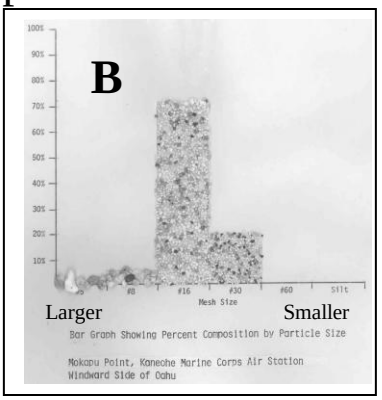


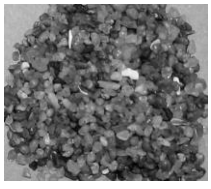
Image 1: Mōkapu Point, O'ahu, 2011

1. Image 1 shows two beaches, labeled A & B, located near one another on the island of O'ahu. Which beach appears to receive more or less wave energy?
   a. More wave energy: *B (1 pt)*
   b. Less wave energy: *A (1 pt)*
2. Provide two (2) likely reasons for the amount of wave energy each beaches receives.
   Beach A: *This beach is more protected. (1 pt)*
Rock outcrops on its seaward side break the force of incoming waves. (1 pt)
   Beach B: *This beach is more exposed. (1 pt)*
No rock outcrops protect it, so incoming waves hit this beach directly. (1 pt)
3. The bar graphs below document sand size frequency distributions from these two beaches. Do the sand size profiles of these 2 beaches support the evaluation you made in Question 1?

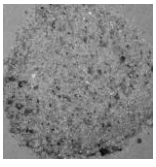




   a) Which beach experiences greater wave energy? Why?
B (1 pt) - It shows a higher proportion of larger sand grain size. (2 pts)
   b) Which beach experiences less wave energy? Why?
A (1 pt) - It shows a higher proportion of smaller sand grain sizes. (2 pts)
4. In one sentence, describe how wave energy hitting a beach relates to sand grain size. *The stronger the wave action, the larger the sand grains that accumulate on th beach (4 pts) OR There is a direct relationship between strength of wave action and size of sand grains deposited. (4 pts)*
5. Using the relationship you developed in Question 4, rank the following beach materials according to the wave energy associated with them. (1 = lowest wave energy, 4 = highest wave energy)


2 (1 pt)


4 (1 pt)


1 (1 pt)


3 (1 pt)

References:
*Neal, W.J., O.H. Pilkey & J.T. Kelly. Altantic Coast Beaches. 2007. Mountain Press Publishing. Pg. 68-74.
*Siever, R. 1988. Sand. Scientific American Library. W.H. Freeman & Company.
* http://geology.uprm.edu/Morelock/beachsys.htm
Photos: C Hopper Brill, Bourgebros.com, theenergycollective.com