

Carefully read the description of the experiment below. Be prepared to answer the questions that follow the design description as a class quiz.

Salmon build nests (redds) in the gravel bottoms of streams. The eggs are spawned on these nests and covered with gravel. The levels of dissolved oxygen in the water and the permeability of the stream bed are important variables in spawning success. A student of fisheries biology is examining the physical and chemical aspects of salmon spawning grounds. One of the relationships of interest is the percent of fine gravel (<2 mm diameter) because it is related to permeability and hence oxygen supply to the salmon eggs.

To take samples of the stream bed the student inserted a pipe into the streambed and filled the pipe with liquid nitrogen. This freezes the stream bed sediment next to the core which can then be extracted and later thawed to determine stream bed characteristics.

The student located 9 redds and used his frozen sample technique to obtain 4 core samples inside each redd and 4 cores outside, but right next to, each redd. This provides a total of 72 observations. What type of analysis would be used in determine if the percent of fine gravel (< 2 mm) differed inside and outside the redds?

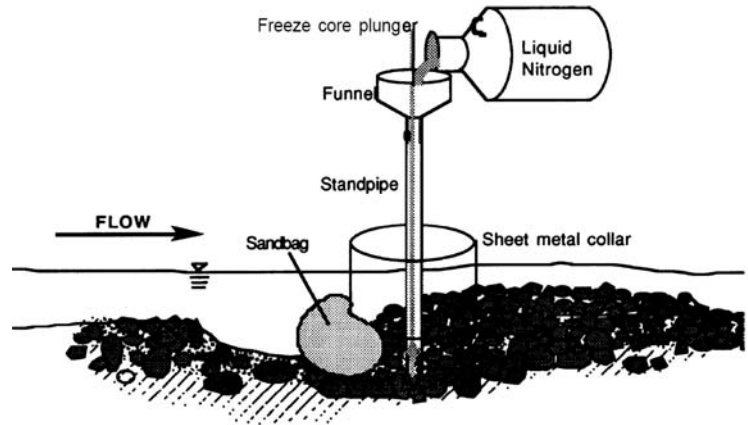


Figure 8. Freeze core sampling with the permeability/freeze core standpipe on coho redds in the Freshwater Creek basin, Humboldt County, 1988.

Answer choices:	(A) redd	(B) liquid nitrogen	(C) position (inside versus outside redd)
	(D) core	(E) percent fine gravel	(F) redd, position combination

Name _____ Quiz Number _____ Date ____ / ____ / 2012

Circle the appropriate letter for each question below.

- 1) What is the experimental unit for this experiment? A B C D E F G
- 2) What is the sampling unit for this experiment? A B C D E F G
- 3) What is the dependent variable for this experiment? A B C D E F G
- 4) What is the treatment variable for this experiment? A B C D E F G
- 5) If the design is RBD, what are the blocks? A B C D E F G NA
- 6) Does it seem more likely that the treatments are fixed or random? (A) fixed (B) random
- 7) What is the treatment arrangement for this experiment? (A) single factor (B) factorial (C) nested
- 8) What is the experimental design for this experiment? (A) CRD (B) RBD (C) LSD (D) Split-plot (E) Repeated measures
- 9) The degrees of freedom for testing treatment are _____ .
- 10) The degrees of freedom for the error used for testing treatments are _____ .