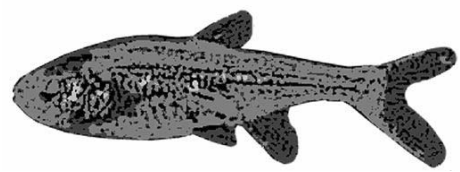
Complementation Clicker Question



You study eye formation using Mexican cave-dwelling blind fish. You know that blindness is a trait controlled by multiple genes and inherited in a recessive manner.

A blind fish from a true-breeding line in one cave was crossed to a blind fish from a true-breeding line in another cave. If the mutation that causes blindness is in two different genes in the two fish, you should see:

A. None of the offspring are blind
B. 25% of the offspring are blind
C. 50% of the offspring are blind
D. 75% of the offspring are blind
E. All of the offspring are blind

Article citation: Smith M (2012) A Fishy Way to Discuss Multiple Genes Affecting the Same Trait. PLoS Biol 10(3): e1001279. doi:10.1371/journal.pbio.1001279

A Complementation Table

You isolate 3 fish strains from different cave ponds, all the fish are blind because of autosomal recessive mutations. You mate the fish together (don't worry about sex) and get the following results:

#1, #2, #3=Parental fish strains from different caves

	#1	#2	#3
#1	-	-	+
#2	-	-	+
#3	+	+	-

Offspring phenotypes:

- = no complementation, blind fish
+ = complementation, fish can see

Fish strains #1 and #2 have defects:
A. In the same gene
B. In different genes

Let's add more fish

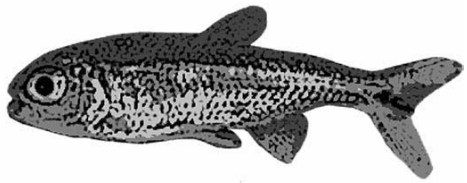
You isolate two more blind fish strains (#4 and #5), cross them to #1, #2, and #3, and get the following results:

	#1	#2	#3	#4	#5
#1	-	-	+	+	+
#2	-	-	+	+	+
#3	+	+	-	+	-
#4	+	+	+	-	+
#5	+	+	-	+	-

Based on these results, at least how many genes are working to produce sight?

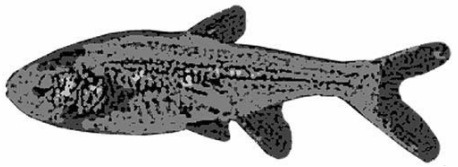
A. 1
B. 2
C. 3
D. 4
E. 5

What if we find a new blind fish strain?



Sighted surface fish

X



Blind strain #6

Blind offspring

Can we use the Strain #6 fish for complementation testing?

A. Yes
B. No