Modes of Inheritance

Name: _____

Map out the following crosses. The P0 generation is given, along with the mode of inheritance for the mutant phenotype. Give the expected phenotypic and genotypic ratios in the F1 and F2 generations. Mate F1 siblings together in all possible combinations. Use an extra piece of paper if you need to.

Possible modes of inheritance

AR = autosomal recessive   XR = X-linked recessive
AD = autosomal dominant   XD = X-linked dominant
RL = recessive lethal

Autosomal recessive for mutant white
R^+ = red (WT), r = white (mut)

P0   **R^+R^+ x rr**

Autosomal dominant for mutant *Shaking*
S = shaking (mit), s+ = not shaking (WT)

P_0 **s+s+   x   SS**

Autosomal recessive lethal*
RR = dead, Rr^+ = white (mutant), r^+r^+ = red (WT)

F1   **Rr^+ x Rr^+**

Autosomal recessive lethal, cont. (dif. scenario)*
RR = dead, Rr^+ = white (mutant), r^+r^+ = red (WT)

F1   **Rr^+ x r^+r^+**

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*Note for R mutation:
•Lethal phenotype = recessive (needs two copies in order to show lethality)
•Mutant viable phenotype (white) = dominant (appears in the heterozygote)

X-linked dominant trait—rough teeth

X-linked recessive mutation	X-linked recessive mutation cont. (dif scenario)
X^w= white eyed (mut), X^+ = red-eyed (WT)	X^w= white eyed (mut), X^+ = red-eyed (WT)
P_0 X^wY x X^+X^+	P_0 X^+Y x X^wX^w

X-linked dominant mutation	X-linked dominant mutation, cont.(dif scenario)
X^R= rough teeth, X^+ = smooth teeth (WT)	X^R= rough teeth, X^+ = smooth teeth (WT)
P_0 X^RY x X^+X^+	P_0 X^+Y x X^RX^R