




KEY TO PERCH (*Perca flavescens*) TRAITS

COLOR		RANGE		RESISTANCE	
PHENOTYPE	GENOTYPE	PHENOTYPE	GENOTYPE	PHENOTYPE	GENOTYPE
<p style="text-align: center;">Blue</p> 	Cc	<p style="text-align: center;">High temperature tolerance (7-30°C)</p>	Tt	<p style="text-align: center;">Medium Resistance to Viruses</p>	Vv
<p style="text-align: center;">Red Color</p> 	CC	<p style="text-align: center;">Medium temperature tolerance (10-25°C)</p>	TT	<p style="text-align: center;">High Resistance to Viruses</p>	VV
<p style="text-align: center;">Orange Color</p> 	cc	<p style="text-align: center;">Small temperature range (11-22°C)</p>	tt	<p style="text-align: center;">Low Resistance to Viruses</p>	vv

Scenarios

- 1) In the first scenario, all fish are light blue, there is one predator and fish are able to go anywhere. Allow the hunting to occur for 1 minute. Count how many fish were taken and which ones were left behind.
- 2) In the second scenario, populate the lake with a variety of colored fish. There is one predator fish. The light blue fish are able to hide at the start of the scenario due to their camouflage. Red and orange are in the open. Allow the hunting to occur for 1 minute. Count how many fish were taken and which ones were left behind.
- 3) In the third scenario, abiotic factors are taken into account. There are two predator fish but they are limited by their oxygen requirements. There are three areas that have different temperatures and allow some fish to be out of reach of predators. The light blue fish are able to hide at the start of the scenario due to their camouflage. Red and orange are in the open. Allow the hunting to occur for 1 minute. Count how many fish were taken and which ones were left behind.
- 4) In the fourth scenario, a virus begins to grow due to the runoff event. There are three viruses added to the lake along with one predator. Some fish are resistant to the virus and will not die if tagged by the virus. Some fish need to be tagged twice by two different viruses, other fish die immediately when tagged. The light blue fish are able to hide at the start of the scenario due to their camouflage. Red and orange are in the open. Allow the hunting to occur for 1 minute. Count how many fish were taken and which ones were left behind.
- 5) The students should contribute to designing the last scenario and change one or more variables. Record how many fish were taken and which ones were left behind.

PREDATOR FISH: NORTHERN PIKE
(*Esox lucius*)



Temperature Range: 10-28°C
Actual Color: Green, light blue and orange
Size: 150 cm (59 in) and 25 kg (55 lb).

Name: _____

Date: _____

Natural Selection & Genetic Traits

Round	Scenario	Results	What is the percentage of each?	Analyze Results
1	All fish are light blue	Light blue _____ Red _____ Orange _____	Light blue _____ Red _____ Orange _____	
2	Three colors of fish	Light blue _____ Red _____ Orange _____	Light blue _____ Red _____ Orange _____	
3	Run-off reduces oxygen levels	Light blue _____ Red _____ Orange _____	Light blue _____ Red _____ Orange _____	
4	Viruses enter the lake	Light blue _____ Red _____ Orange _____	Light blue _____ Red _____ Orange _____	
5		Light blue _____ Red _____ Orange _____	Light blue _____ Red _____ Orange _____	

Summary – Explain how the predator-prey game demonstrates evolution by natural selection. Make sure your answer includes the following:

- Data from the game
- The role of predators in an ecosystem
- Examples of genetic traits being preserved
- How abiotic factors can influence the genes of a species
- How resistance to disease is a genetic characteristic that influences a species' traits

How should we improve the game for next time?